

# Atlas of Nonindigenous Marine and Estuarine Species in the North Pacific



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**Atlas of Nonindigenous Marine and Estuarine Species  
in the North Pacific**

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## EXECUTIVE SUMMARY

Marine and estuarine nonindigenous species (NIS) are found across the world's oceans, and designing effective management strategies to mitigate this economic, ecological and human health threat requires a basic understanding of the existing invasion patterns at regional to global scales. However, to date, syntheses at ocean basin scales have essentially been nonexistent. To fill the gap for the North Pacific, we synthesized the distributions, invasion history, environmental tolerances, and natural history of the near-coastal nonindigenous species (NIS) reported from the member countries of the North Pacific Marine Science Organization (PICES; United States, Canada, China, Republic of Korea, Japan, and Russia). The hierarchical "Marine Ecoregions of the World" (MEOW) biogeographic schema was used as the framework for assessing species' distributions, with the modification that we added a "region" level to differentiate eastern and western sides of oceans. The two North Pacific regions are the Northeast Pacific (NEP), which extends from the Gulf of California to the Aleutian Islands, and the Northwest Pacific (NWP), which extends from the East China Sea to the Kamchatka Shelf. To have complete coverage of the United States, we included the MEOW Hawaii Ecoregion as a separate reporting unit. To have complete coverage of Japan and China, we combined five MEOW ecoregions in southern China and Japan into the North Central-Indo Pacific (NCIP) Region. The various types of information were synthesized in a Microsoft Access database, the "PICES Nonindigenous Species Information System", which is further described in the "User's Guide and Metadata for the PICES Nonindigenous Species Information System" (Lee et al., 2012). The PICES database was then used to generate two-page "species profiles" that map the native and introduced distributions of each species and provide a standardized summary of its invasion history, environmental tolerances, and natural history. These species profiles form the bulk of the "Atlas of Nonindigenous Marine and Estuarine Species in the North Pacific".

A total of 747 near-coastal nonindigenous species were identified in the PICES countries, with four phyla (Arthropoda, Chordata, Mollusca, and Annelida) constituting more than 70% of these invaders. The NEP and Hawaii have similar numbers of reported nonindigenous species, 368 and 347, respectively. In comparison, the NWP has about 60% of the number of reported NIS, 208. The NCIP contains only 73 NIS, though there is limited information for these ecoregions. When evaluated at an individual MEOW ecoregion scale, the Hawaii Ecoregion was the most invaded with 347 invaders, followed by the Northern California Ecoregion, which includes the San Francisco Estuary, with 287 NIS. The most invaded ecoregion in the NWP was the Central Kuroshio Current Ecoregion, which includes Tokyo Bay, with 87 reported NIS. Eight potential reasons for this geographical discrepancy in the extent of invasion were considered. The two most important appear to be: 1) the milder temperature regimes in the NEP and Hawaii are more conducive for NWP species to invade the NEP and Hawaii than the reverse and 2) there has been a greater search effort for NIS in Hawaii and the NEP at least for certain taxonomic groups.

In terms of how the NIS were transported, hull fouling was potentially the most important vector in the NEP, NWP, and Hawaii, with ballast water discharges the second most important in all three regions. Intentional stocking and aquaculture escapees were relatively more important in the NWP than the NEP or Hawaii, reflecting the extensive aquaculture in Asia. Aquaculture associated species (i.e., aquaculture hitchhikers) was relatively important in the NEP, reflecting the historical influx of invaders with the importation of Atlantic and Pacific oysters.

# INTRODUCTION

## Overview

Marine and estuarine nonindigenous species (NIS) are a global issue, with nonindigenous species found in every ocean of the world. Effectively addressing such a global threat requires knowledge across multiple spatial scales and topics, ranging from knowledge of the habitat preferences of an invader to the global distributions of potential invaders as input into risk assessments. Over the last several decades, considerable progress has been made in understanding the number and biogeographic distribution of marine/estuarine nonindigenous species on the Pacific Coast of the United States and Canada, from Carlton's omnibus doctoral dissertation on the San Francisco Estuary (Carlton, 1979) to the formation of the Canadian Aquatic Invasive Species Network (CAISN, <http://www.caisn.ca/en/>) and a monograph of invaders in Hawaii (Carlton and Eldredge, 2009). Although the extent of earlier research does not appear to be as extensive in Asian countries, a number of recent studies indicate a growing recognition of the economic, health and environmental threat of near-coastal invaders (e.g., Iwasaki, 2006, Otani, 2006; Seo and Lee, 2008; Chavanich et al., 2010; Doi et al., 2011; Zvyagintsev et al., 2011). While these and many other studies provide critical information for specific species, locations, or countries, what has been lacking is a comprehensive analysis of near-coastal invaders at the North Pacific scale.

To generate the baseline information needed to manage nonindigenous species in the North Pacific, we initiated a synthesis of the distributions, invasion history, environmental tolerances, and natural history of the near-coastal nonindigenous species reported from the member countries of the North Pacific Marine Science Organization (PICES; United States, Canada, China, Republic of Korea, Japan, and Russia). Information was synthesized from a variety of sources written in multiple languages, including input from PICES scientists, peer-reviewed literature, agency reports, and web sites. This diverse information was synthesized in a Microsoft Access database, the "PICES Nonindigenous Species Information System" (hereafter referred to as the PICES database) designed for Access 2003 and 2007 running under Windows XP and Windows Vista operating systems (32 bit only). The PICES database was used to generate this document, the "Atlas of Nonindigenous Marine and Estuarine Species in the North Pacific" (hereafter referred to as the Atlas). A companion document, "User's Guide and Metadata for the PICES Nonindigenous Species Information System" (Lee et al., 2012), provides instruction on how to use the PICES database and detailed definitions for all classifications used in the database.

The "Marine Ecoregions of the World" (MEOW) biogeographic schema (Spalding et al., 2007) was used as the framework for assessing and mapping species' distributions (Figures 1-23). Based on the MEOW framework, the spatial patterns of invasion of the total number of invaders (Figures 24 and 26) and of individual taxonomic groups (Figures 25 and 27 to 58) were evaluated. We then conducted a preliminary analysis on the potential reasons for geographical differences in the extent of invasion by evaluating the extent of invasion of foulers versus non-foulers (Figure 59) and on the likely vectors (Figure 60) by which the NIS were introduced into each of the major regions. The remainder of the Atlas consists of "species profiles" for each of the 747 NIS reported from the PICES countries. The profiles provide a standardized format

(Figures 61 and 62, Tables 1-12) for the summary of the distributional, habitat, and natural history information for each species.

Besides providing basic information on the biogeographic and natural history of North Pacific near-coastal species, the information in the Atlas and PICES database can be used to address a number of management issues:

1. Establish a baseline of the number and identity of the reported NIS by MEOW ecoregion. By coupling these data with rapid assessment surveys (RAS) and/or monitoring programs it becomes possible to assess whether a NIS reported from a region represents a new invasion.
2. Collating data on life history and environmental requirements for NIS can help identify what habitats and resources will be at greatest risk to a range expansion of an existing NIS or to invasion by a new NIS.
3. Analysis of source (native) region(s) of NIS can be used to determine high risk regions and to develop focused quarantine procedures for imports.
4. On a global scale, enumeration of the total number of ecoregions invaded by a species can help identify high risk invaders. Further, the maps in the Atlas are a simple and visual approach to conveying the distribution of these species to managers and the public.
5. The Atlas disseminates information about NIS to the public and managers in an easily used format.
6. Development of standardized protocols in the Atlas and database provide a framework for developing countries to use in their efforts to assess and manage invasive species.

As a real world example of the use of such baseline information, the authors recently developed an approach to setting ballast water discharge standards based on historical invasion rates, historical ballast discharge rates, and organism concentrations in untreated ballast water (Reusser et al., in press). Another example is the use of global patterns of invaders as a screening procedure for potential invaders (Reusser and Lee, 2005; Locke, 2009).

### **Caveats**

This Atlas and PICES database are initial attempts at synthesizing a variety of data types across an entire ocean basin, and as such they represent the state of the science. However, they are not the final answer. We are aware that we have not captured the complete biogeographic distributions or natural history profiles of many of the species. Additionally, there may be errors in interpretation on our part. Rather than a deficit, we hope that illustrating the existing knowledge in a standardized fashion will assist in identifying any such errors and in highlighting key information gaps. In many cases, we classified species scattered around the globe with limited information. As such, the classifications presented here should be taken as “hypotheses” subject to further taxonomic, biogeographical, and genetic analysis.

## APPROACH AND DEFINITIONS

### Marine Biogeographic Schema and Geographic Scope of the Atlas

One of our main objectives was to synthesize the global distributions of near-coastal nonindigenous species that occur within the PICES countries. To achieve this, we used the “Marine Ecoregions of the World” (MEOW) biogeographic schema (Spalding et al., 2007; <http://www.worldwildlife.org/science/ecoregions/marine/item1266.html>) as the framework for analyzing and displaying species’ distributions. MEOW is a hierarchical biogeographical schema for near-coastal ecosystems to an approximate 200 meter depth, and it is increasingly being used to evaluate regional and global patterns (e.g., Molnar et al., 2008; Piepenburg et al., 2011; Ocean Biogeographic Information System, OBIS, <http://iobis.org/mapper/>).

The MEOW schema consists of 12 realms, 62 provinces, and 232 ecoregions. However, one limitation is that it does not split the Pacific and Atlantic into east/west components. The lack of such a split limits the ability to analyze patterns of transoceanic invasions, which account for most near-coastal invasions in the Northern Hemisphere (see Ruiz et al., 2000). To accommodate transoceanic invasions, the 12 realms were divided (Figure 1), adding a new level between the realm and province levels to provide east-west breaks (Reusser and Lee, 2011). This modification divided the MEOW North Pacific Realm into Northeast Pacific Region (NEP), composed of nine ecoregions ranging from the Gulf of California through the Aleutian Islands (Figures 2 and 8), and the Northwest Pacific Region (NWP) composed of eight ecoregions ranging from the East China Sea through the Kamchatka Shelf (Figures 2 and 5). Other modifications include the addition of Caspian Sea, Aral Sea, and Sea of Asov ecoregions, which were combined with the Black Sea to form the Ponto-Caspian Region (Figure 17), and the addition of a High Arctic Region (Figure 1) above the Arctic ecoregions. These modifications result in a total of 20 regions (Figure 1).

Capturing all the non-Arctic shorelines bordering the PICES countries required adding several ecoregions outside the North Pacific Realm. The Hawaii Ecoregion, which is in the Eastern Indo-Pacific Realm (Figures 2 and 7), was included to complete coverage of the U.S. Pacific states. For complete coverage of China and Japan, nonindigenous species were also reported from five ecoregions in the Central Indo-Pacific Realm (Southern China, Gulf of Tonkin, South China Sea Oceanic Islands, South Kuroshio, and Ogasawara Islands; Figures 2 and 6). We refer to these five ecoregions as the North Central-Indo Pacific (NCIP) and they were analyzed as a group even though they do not form a natural biogeographic entity. Because of the sparse information on the ecoregions in the NCIP and the artificiality of the NCIP as a biogeographic unit, we report the number of NIS from the NCIP but do not analyze the results in detail.

The specific objective of the project then became the synthesis of the distributions and habitat/natural history attributes of all the reported near-coastal NIS in the 23 MEOW ecoregions in the NEP, NWP, NCIP, and Hawaii (Figure 2). Nonindigenous species found only in the Arctic ecoregions of PICES countries (e.g., Eastern Bering Sea, Chukchi Sea, Beaufort Sea, Siberian Sea) were not included in PICES database or the Atlas. While the distributions of NIS were mapped at the ecoregion scale, most of the analyses in the Atlas were conducted on the four biogeographic units (NEP, NWP, NCIP, and Hawaii). Additionally, the PICES database is designed around analyses at the region scale. While analyses at the ecoregion scale are possible

in the PICES database, the queries will require care and have certain limitations, as described in Lee et al. (2012).

Maps of the 232 MEOW ecoregions plus our modifications are provided to assist users in understanding the extent and boundaries of the ecoregions (Figures 1-23). In addition, all four hierarchical MEOW levels can be viewed in the PICES database (Lee and Reusser, 2012) while the User's Guide (Lee et al., 2012) contains an appendix listing all the realms, regions, provinces, and ecoregions along with their database identification numbers.

### **Taxonomic Scope of the Atlas**

The taxonomic scope of our analysis includes fungi, protozoa, microalgae, macroalgae, marine plants, fishes, and all macroinvertebrate groups. Bacteria, amphibians, reptiles, and mammals were not included. Freshwater species that only incidentally occur in estuaries were excluded (e.g., crayfish that are washed downstream after storms), though species that are primarily fresh water but periodically occur in estuaries (e.g., New Zealand mud snails) were included. We also excluded species that are primarily terrestrial, though species that occur in the supralittoral zone and coastal dunes were included. We did not include tidal marsh plants (other than *Spartina*) in part due to the difficulty in obtaining information on similar species in Asia.

### **Definitions for Species' Invasion and Population Status**

Species were assigned to one of six classifications regarding their origin – Native, Nonindigenous, Cryptogenic, Transient, Unknown, or Conflict – at any of the four biogeographic levels (realm to ecoregion). Criteria to evaluate whether a species is native or introduced were developed by Chapman and Carlton (1991 and 1994), and these criteria are discussed in Lee et al. (2012). The following definitions were used for these classifications in the Atlas and PICES database:

Native: A species that occurs naturally in the area with no human intervention. Native species have an evolutionary history within the area.

Nonindigenous: A species that has been introduced into an area through human activities, whether accidentally or on purpose. Other terms used include alien, aquatic nuisance species (ANS), exotic, introduced, non-native, adventive, and naturalized. In the United States, use of “invasive” is largely limited to invaders that have or are likely to cause adverse ecological, economic, or human health impacts.

Cryptogenic: Cryptogenic species those that are not clearly native or introduced based on current information. As originally defined by Carlton (1966), this term was to capture uncertainty regarding a species biogeography and invasion history. However, “cryptogenic” is increasingly used for species with taxonomic uncertainties, such as sibling (cryptic) species or species complexes. To avoid mixing uncertainty over invasion history with taxonomic uncertainty, we restricted the use of cryptogenic classifications to locations where there is some evidence for invasion. Cryptogenic species were not included in the NIS counts for regions and ecoregions..

Unknown: A species was classified as unknown when there was insufficient information to make a judgment as to its origin. This was the default classification in the absence of any evidence. In addition, taxa with an uncertain taxonomy (e.g., species complexes, taxon only identified to genus) were assigned an unknown classification except in cases when there is evidence that the taxon was recently introduced into an area (e.g., recent appearance of genus never observed within a region). Species with uncertain taxonomies have also been classified as “unresolved” (CANOD, 2009).

Transient: Transient species are those that temporarily migrate into an area as a result of unusual climatic conditions, such as El Niño (e.g., Rosales-Casian, 2004). Their movement into the area is via natural mechanisms rather than mediated through direct human activities. The terms “vagrant” or “migrant” have been used in a similar fashion. Transient species were not included in the counts of NIS in regions or ecoregions.

Conflict: In some cases, invasion experts disagree as to whether a species is nonindigenous versus native or cryptogenic within an area. If the available information was insufficient for us to make a decision among the conflicting classifications, species were assigned a “conflict” classification. Our use of “conflict” instead of “cryptogenic” is to highlight cases where some, but not all, of the experts believe that there is sufficient information to consider a species introduced. “Conflict” species were included in the counts of NIS in regions or ecoregions.

### **Definitions for Species’ Population Status**

In addition to classifications related to origin, species were also classified in terms of their population status. Lee et al. (2012) present a set of criteria to evaluate population status. The following definitions were used in the Atlas and PICES database:

Established: A species with a self-maintaining population as indicated by its population size, occurrence over time, widespread geographical distribution, presence of juveniles, and/or presence of reproductive adults. Pragmatically, the occurrence of a species in a probability-based survey (vs. targeted sampling of optimum habitat type) is reasonably strong evidence that the species is established based on the relatively small areas sampled in such random surveys (e.g., tens of square meters for benthic surveys). Native species are assumed to be established.

Not Established: A species that has been reported from an area but that does not constitute a self-maintaining population or that has gone extinct within the region. One indication of non-establishment is not observing the species for  $\geq 25$  years, assuming that the appropriate habitat types were surveyed. Other indications include lack of juveniles or reproductive adults. By definition, transient species are considered not established. Nonindigenous species classified as not established were not included in the counts of NIS in regions or ecoregions.

Unknown: A species for which there is insufficient spatial and/or temporal records to assess population status. This was the default population status. Nonindigenous species



that were classified with an unknown population status were included in the counts of NIS in regions or ecoregions.

Stocked: Species maintained through active human intervention, usually for aquaculture. Stocked species known only to exist in aquaculture facilities were given a population status of not established and were not included in the counts of NIS. Stocked species that had been reported from the wild were assigned a population status of established, not established, or unknown, as appropriate. In many cases it was unclear whether a stocked species occurred in the wild, especially in Asia. If there was a potential that the species could occur in the wild, the stocked species was assigned an unknown population status and included in the counts of NIS. Inclusion of these stocked species in the counts of NIS could potentially overestimate the actual number of NIS in the region.

### **Taxonomy and “Also Known As” Alternative Names**

The taxonomy of each of the species in the Atlas was recorded on the species profiles. Taxonomy above the level of genus was based on the World Register of Marine Species (WoRMS; <http://www.marinespecies.org/index.php>), an international database with the objective of providing the authoritative list of names of all marine species globally. In most cases, WoRMS was also used for species designations, though for some taxa regional authoritative references were used (e.g., Coan et al., 2000 for bivalves in the NEP).

In addition to the higher level taxonomy, up to five “Also Known As” or alternative names were recorded in the Atlas. These are other scientific names by which the selected species may also be known. The primary purpose in listing these alternative species names is to assist invasion biologists in tracking the global distribution and invasion history of a species. They are not meant for formal taxonomic evaluations, and the users should consult the taxonomic literature for complete synonym lists and authorities. The seven types of alternative names recognized in the Atlas are:

Synonym: A scientific name that was previously applied to a taxon but is no longer accepted. As used in the Atlas and the PICES database, the objective was to limit synonyms to those with a one-to-one relationship with the currently accepted scientific name.

Ambiguous synonym: A possible synonym of the species, such as when it is not certain exactly what species is being referred to (i.e., *Polydora* nr. *cornuta*). Ambiguous synonyms are also associated with species complexes; the cases in which a species name is now believed to consist of more than one valid species but which are not, as yet, individually named. Because of the taxonomic uncertainties, all synonyms of species complexes are referred to as ambiguous, with the exception of names explicitly identifying the taxon as a complex (e.g., complex, hyperspecies, etc.). We classify pro parte synonyms as “partial synonyms” rather than as ambiguous.

Partial Synonym: Partial synonyms are species names that are synonyms of two or more valid species. Thus, there is not a one-to-one relationship between a partial synonym and a valid species name. This can happen when an older species is split into two or more

new species. In these cases, the partial synonyms are identified either by 1) including the taxonomic author's name as part of the partial synonym; 2) including "of authors" as part of the partial synonym when many authors have used the partial synonym; or 3) including "in part" as part of the partial synonym. Inclusion of these markers is to warn the user from using the partial synonym as a general synonym. These are also referred to as "pro-parte synonyms".

Convention: A different version of a species' name. Alternates may include the inclusion/omission of a subgenus or a difference in the gender of the name. Because subspecies were not recorded in the PICES database, subspecies are also considered alternatives to the base species.

Nomen nudum: An invalid scientific name because the species was not originally described with sufficient detail, and thus the name is considered "naked" (see International Commission on Zoological Nomenclature; <http://www.nhm.ac.uk/hosted-Zites/iczn/code/index.jsp?booksection=glossary&nfv=true>).

Misspelling: An incorrect spelling of a taxon that was erroneously incorporated into the scientific literature. Only common misspellings are listed.

Misidentified: An incorrect identification assigned to a species. Misidentifications specific to a publication but not to the original description of a species include the author names (e.g., "*Tellina (Angulus) meropsis* of Coan 1971"; "*Ensis californicus* of authors not Dall 1899 in part") or region (i.e., "*Macoma irus* of NEP authors") or a combination of both (i.e., "*Penitella gabbii* of NEP authors, not Tryon, 1863"). Inclusion of the author's name keeps the misidentified species name from being incorrectly considered as a general synonym.

Two nonstandard taxonomic definitions were used for a few species to better reflect their current taxonomic standing.

Species Complexes: With increasing scrutiny, including genetic analysis, it's becoming apparent that several previously recognized "species" are composed of a number of different, and often undescribed, species that have been referred to under the same name. Because of their uncertain taxonomic position, species complexes are generally not classified as nonindigenous. However, in a few cases, species complexes can be classified as nonindigenous over some portion of their range based on their recent arrival in an area or by possessing other attributes of nonindigenous species. We identify species complexes by adding the suffix "Cmplx" to the name of the purported species. Because of the taxonomic uncertainty, synonyms of species complexes are considered "ambiguous synonyms".

Provisional Species: Provisional species are "organisms suspected of being new species or whose identities cannot be determined from available literature" (SCAMIT, 2012). Thus, these species are considered to be valid species in a particular region even though they cannot be assigned to an officially recognized species name. Provisional species can

be considered nonindigenous based on their recent arrival in an area or by possessing other attributes of nonindigenous species. Our convention to naming provisional species was to append a citation from a major publication to the provisional species' name. For example, "*Bryopsis* sp. (Cohen and Carlton, 1995)" is a provisional species from the Cohen and Carlton (1995) report. By appending the citation to the species, it becomes possible to find a major source for the species. Appending the citation also avoids the problem of having different provisional species with the same name from different areas, as can happen when a letter or number is used as a suffix (e.g., *Bryopsis* sp. A). When known, the person originally identifying the provisional species is listed as the taxonomic authority, while the type locality is used to identify the general geographical area over which the provisional name is applicable.

### **Species Profiles - Summarizing Distributions and Natural History**

The environmental tolerance, habitat, and natural history characteristics of a species can help predict the likelihood that it will invade an area and the possible consequences if an invasion occurs. For example, salinity and depth ranges help define the range of habitats a new NIS could potentially colonize. Trophic level, such as whether an invader is a suspension feeder or a predator, can help predict likely ecological impacts. However, it is our opinion that species attributes are underutilized in invasion ecology. As discussed in Reusser and Lee (2011), major reasons for this underutilization include the lack of a standardized schema for such data and the idiosyncratic manner in which such information are presented in the literature. One of the objectives in designing the PICES database was to develop a practical hierarchical topology using a class structure to effectively organize different types of habitat and natural history attributes. An ancillary objective was to design a standardized two-page format for species profiles that summarize the salient information about a species. With the use of the species profile key (Figures 61 and 62) and the tables of abbreviations and definitions (Tables 1-12), a user can determine the class or quantitative value for any of the attributes included.

The companion User's Guide (Lee et al., 2012) provides additional details on the attributes captured in the species profiles. Here we summarize key points important in interpreting the information in the profiles. First, we provide both classes and quantitative values for a number of habitat attributes (e.g., salinity, depth). However, the number of values going into the quantitative ranges varies widely, from several hundred values to only a single number. Because of this variation, the class values are generally more reliable than the quantitative ranges.

Second, three major classes are used to define the physical habitat of a species – Regime, Ecosystem, and Substrate (see Tables 3, 4, and 5). Regime is a large scale classification of where a species occurs (e.g., estuary vs. ocean); it does not define the specific habitat occupied. Ecosystem is the overall ecosystem type that the species occupies, and it is embedded within the Regime. For example, a species occurring in the estuary regime may occur in an unconsolidated or consolidated ecosystem. Substrate classes define the specific substrate type a benthic species lives in, which is embedded within the ecosystem. Infaunal organisms live in unconsolidated sediment, which is an unconsolidated ecosystem. However, substrate type and ecosystem do not have to match. Barnacles may inhabit the dead shells (a consolidated substrate) that accumulate on the surface of sand flats (an unconsolidated ecosystem). Worms that live in the sediments that

accumulate in rocky intertidal tide pools live in unconsolidated sediment in a consolidated ecosystem.

Third, most of the natural history attributes are classified as either “Observed” or “Preferred”. We make this distinction because many marine/estuarine species can be found across a wide range of environmental conditions, yet the majority of the population occurs in a much more restricted range. An example is the occasional offshore records of estuarine species. While we do not have hard and fast rules, Observed is used to capture the full range of conditions over which a species has been reported, even if the conditions are marginal. Preferred is used to indicate the conditions that the species normally occupies. Indicators of Preferred habitats include: 1) species occurring frequently within the habitat range; 2) species occurring at high densities within the habitat range; 3) presence of breeding populations within the habitat range, and 4) experts identifying the habitat as preferred.

Lastly, we note temperature is not included in the species profiles. We excluded temperature because the temperature classes in the PICES database were derived from Hall’s (1964) biogeographic analysis of mollusks, which we do not consider adequate. To the extent that they are known, the quantitative temperature ranges for adults and reproduction are given in the PICES database.

## **RESULTS AND ANALYSIS**

### **Taxonomic Patterns of Invasion**

The patterns of invasion by taxonomic group are displayed in Figure 25 and Figures 27 to 58, with taxa that contain four or more NIS in any one biogeographic unit plotted individually. Four phyla constituted more than 70% of the 747 NIS (Figure 25) - Arthropoda (224), Chordata (114), Mollusca (110), and Annelida (89). Within the arthropods, the invaders were divided among five classes - Malacostraca (127), Insecta (45), Maxillopoda (36), Pycnogonida (12) and Ostracoda (4). Amphipods were the most numerous nonindigenous group within the Malacostraca, with a total of 50 NIS, while the isopods were the second most numerous, with a total of 34 NIS. The patterns of these two peracaridan groups differed geographically. Substantially more nonindigenous amphipods occurred in the NEP (37) than Hawaii (20) or the NWP (7) (Figure 47). In comparison, the NEP and Hawaii had approximately equal numbers of nonindigenous isopods, 20 and 21 respectively (Figure 48). The only other malacostracan taxon with more than 10 NIS was the decapods, which had a total of 29 NIS. Substantially more nonindigenous decapods occurred in the NWP (16) than Hawaii or the NEP (Figure 50). However, nine of the 16 nonindigenous decapods in the NWP are aquaculture species or were intentionally released into the environment, and removing these species from the counts resulted in similar numbers of decapod invaders across the three biogeographic units.

The copepods were the most numerous taxon within the Maxillopoda, with 22 nonindigenous species (Figure 51). Copepods were predominantly found in the NEP (18 NIS). Copepod invaders within the NEP consisted of 12 pelagic Cyclopoida and Calanoida, four benthic Harpacticoida, and two parasitic Poecilostomatoida. Barnacles constituted the other taxon within the Maxillopoda, with a total of 14 nonindigenous species. The NWP contained more than twice the number of nonindigenous barnacles compared to Hawaii or the NEP (Figure 52).

Nonindigenous insects were predominantly found in Hawaii (40 NIS), with only five and one nonindigenous marine/estuarine insect reported from the NEP and NWP, respectively (Figure 54). Many of the nonindigenous insects in Hawaii occur in saline streams (Englund, 2002; Carlton and Eldredge, 2009) and are members of families in which the juvenile stage typically occurs in fresh water (e.g., dragonflies).

The Chordata are composed of two dramatically different groups - the tunicates, with a total of 48 NIS, and fishes (Actinopterygii), with a total of 66 NIS. Nonindigenous tunicates were most numerous in Hawaii (29 NIS) and the NEP (23 NIS) with only 9 species found in the NWP (Figure 56). With the fishes, the NWP contained the largest number of nonindigenous species (34) compared to Hawaii (28) or the NEP (25) (Figure 57). However, the most of the nonindigenous fish in the NWP were intentionally released into the wild or are maintained in aquaculture facilities, and in many cases it is not known if they are established in the wild.

The numbers of nonindigenous mollusks were similar among the gastropods (57 NIS) and bivalves (53 NIS). The number of nonindigenous bivalve species was similar across the NEP, Hawaii, and NWP (Figure 44). One similarity across all three locations was that each contained one or more introduced oyster species and wood boring *Teredo* species. The number of nonindigenous gastropods was highest in the NEP (28) and similar in Hawaii (19) and the NWP (20) (Figure 45).

The nonindigenous annelids primarily consisted of polychaetes (81 NIS), with a similar number of invaders in the NEP and Hawaii (Figure 42). One pattern with the polychaete invaders is that there are proportionally fewer species in the NWP that exclusively or primarily inhabit soft-bottom sediments compared to fouling species or those associated with oysters and other biotic substrates.

### **Spatial Patterns of Invasion**

As mentioned, a total of 747 NIS have been reported from the 23 ecoregions analyzed. In terms of the total number of invaders, the NEP and Hawaii have approximately equal numbers, 368 and 347 NIS respectively (Figures 24 and 26). In comparison, the NWP, with 208 NIS, has substantially fewer invaders. With 73 NIS, the NCIP has the fewest reported invaders; however there is limited information on the five ecoregions making up the NCIP. The pattern of the extent of invasion by taxonomic group (Figures 25 and 27-58) generally follows the same pattern. Of the 25 non-aggregated taxonomic groups (e.g., Isopoda and Amphipoda but not Arthropoda), the NEP had the most or was tied for the most invaders with 15 taxonomic groups, while Hawaii had the most or was tied with the most invaders for 9 taxonomic groups. The NWP had the most or was tied with the most invaders with 5 taxonomic groups (Phaeophyceae, Chlorophyta, Decapoda, Cirripedia, and Actinopterygii). As discussed above, the high numbers of invaders with the decapods and fishes in the NWP were partially a result of the large proportion of aquaculture and intentionally released species, many of which have an unknown population status.

On an individual ecoregion basis, the Hawaii ecoregion is considerably more invaded than any other ecoregion, with 347 NIS (Figure 24). The Northern California Ecoregion, with 277 NIS, is

the second most invaded. The Northern California Ecoregion includes the San Francisco Estuary, which has been considered the most invaded estuary in the United States (Cohen and Carlton, 1998). Our comparison does not include marsh plants, which could reduce the difference between Hawaii and Northern California. Nonetheless, these results suggest that the near-coastal waters of Hawaii are more invaded than the San Francisco Estuary. The next three most invaded ecoregions all occur in the NEP; Southern California Bight (213 NIS), Oregon, Washington, Vancouver Coast and Shelf (179), and Puget Trough/ Georgia Basin (125). The next four most invaded ecoregions all occur in the NWP (East China Sea, Central Kuroshio Current, Yellow Sea, and Sea of Japan) but they are considerably less invaded (69 to 87 NIS) than Hawaii or the more invaded NEP ecoregions.

These observations raise the question as to why the NWP appears to be less invaded than the NEP and Hawaii. As a preliminary analysis, we consider eight possible causes for the smaller number of invaders reported from the NWP, listed in approximate order of their potential importance.

1) *More benign environment in the NEP and Hawaii than NWP.* This “environmental matching” argument suggests that the greater temperature ranges on the western sides of oceans compared to eastern sides contribute to the asymmetrical invasion pattern. Support for this explanation comes from an ecoregional-scale analysis of near-coastal sea surface temperatures (SST) in the North Pacific (Payne et al., 2012). This analysis demonstrated a much greater seasonal and monthly range in SSTs in the NWP than the NEP for ecoregions at approximately the same latitude. For example, the Northeastern Honshu and Northern California ecoregions have very similar 29-year mean near-coastal SSTs, 13.4 C versus 13.5 C. However, over the 29 year record, the Northeastern Honshu displayed a mean monthly annual range of 16.4 C versus 3.4 C for Northern California. Although not included in this analysis, SSTs in Hawaii also show small seasonal and among-year ranges (e.g., Keeling et al., 2004). Based on the concept of “environmental matching” (e.g., Gollash, 2006; Herborg et al., 2007), the greater temperature tolerances of Asian species should allow more of them to survive in Hawaii and the NEP than the reverse. A similar argument has been previously suggested by Chapman (2000) and Reusser and Lee (2005). Although further analysis is needed, we suggest that the occurrence of more constant temperature regimes in the NEP and Hawaii is an important factor in their susceptibility to invasion from Asia and potentially other parts of the world.

2) *Differences in search effort for NIS.* It is recognized that differences in search effort can bias the number of reported invaders (Ruiz et al., 2000). The Pacific Coast of North America may be the most intensely studied area for marine/estuarine nonindigenous species in the world (e.g., Cohen and Carlton, 1995; Ruiz et al., 2000, Wonham and Carlton, 2005, CANOD, 2009), followed closely by Hawaii which has been extensively surveyed through the efforts of the Bishop Museum and other researchers, culminating in a synthesis by Carlton and Eldredge (2009). While there has been an increasing interest in nonindigenous species in Asia (e.g., Iwasaki, 2006; Zvyagintsev et al., 2011), the level of effort does not yet appear to be equal to that on the U.S./Canadian Pacific coast for most taxa. One indication of the difference in the effort devoted to detecting NIS between these two regions is that at least eight rapid assessment surveys (RAS) have been conducted on the Pacific Coast of the United States since 1993 (e.g., Cohen et al., 1998, 2005a). In comparison, the first rapid assessment surveys in the NWP appear

to be those initiated by PICES, with the first one in Dalian, China in 2008 ([http://www.pices.int/publications/pices\\_press/volume19/v19\\_n1/pp\\_30-31\\_Kobe-WS\\_f.pdf](http://www.pices.int/publications/pices_press/volume19/v19_n1/pp_30-31_Kobe-WS_f.pdf)).

To evaluate the potential effect of search effort, we calculated the relative percent of nonindigenous fouling organisms to non-fouling invaders in each ecoregion (Figure 59). Foulers were defined as barnacles, tunicates, bryozoa, hydroids, and serpulid polychaetes. Because of their economic importance to shipping and aquaculture, a reasonable effort appears to have been put into their enumeration on all coasts. Additionally, fouling invaders are more obvious than cryptic guilds of invaders, such as infaunal species, and are more likely to be detected and reported. We assume, therefore, that fouling invaders are less likely to be underreported compared to non-fouling invaders. Thus, the relative percent of foulers to non-foulers should be higher in less well surveyed regions. The two most intensively studied locations, Hawaii and the NEP, have similar relative percentages of foulers (27.6% versus 26.5%). In comparison, in the least studied location, the NCIP, foulers constitute about half of the non-foulers (49%). The NWP has an intermediate value (32.5%). While not conclusive, this increase in the relative percent of nonindigenous foulers relative to other types of invaders supports the contention that differences in search effort was an important factor contributing to lower number of NIS in the NWP and NCIP. It is important to note that the lesser search effort appears to vary substantially among taxa. Macroalgae have been extensively studied in Japan and China (e.g., Lewis and Norris, 1987; Yoshida and Yoshinaga, 2010) which may partially explain why there are a relatively large numbers of nonindigenous brown and green macroalgae reported from the NWP (Figures 29 and 31).

3) *Differences in the application of criteria used to classify species as nonindigenous.* Except in cases of stocked species, classifying a species as nonindigenous usually requires a judgment call based on incomplete data. We suggest that researchers in the United States and Canada may be more likely to classify a species as nonindigenous than their Asian counterparts. One indicator of such an effect is the regional difference in the number of provisional species (species not yet identified to species) classified as nonindigenous. There were 31 provisional species classified as NIS in the NEP (8.4% of total NIS) and 22 provisional species classified as NIS in Hawaii (6.3% of total NIS). In comparison, there were only two provisional species classified as NIS in the NWP (0.95% of total NIS). This disparity in the number of species with unknown identities and origins classified as nonindigenous is suggestive of a different viewpoint as to what constitutes sufficient information to classify a species.

4) *Differences in the number of taxonomic groups evaluated in detail for nonindigenous species.* A factor related to search effort is the difference in the number of taxonomic groups that have been evaluated in detail for the presence of NIS. In the NEP, nearly every taxonomic group has been evaluated for nonindigenous species to some degree. It is our impression that in Asia most of the effort has focused on larger taxonomic groups, especially those with economic value. Support for this theory comes from the observation that groups with a relatively large number of NIS in the NWP include taxa important to aquaculture (brown and green macroalgae and fishes, Figures 29, 31, and 57) or have direct negative economic impacts (barnacles, Figure 52). In comparison there are relatively few nonindigenous polychaetes reported from the NWP (Figure 42). Although there have been a number of studies on Japanese polychaetes (e.g., Imajima and Hartman, 1964) our evaluation of this literature is that it focused on the taxonomy and natural

history of the species but not whether species were native or introduced, even in cases where the species had been reported from the East or West coast of the United States.

5) *Historical Introductions*. There is a long history of ship traffic among Asian countries and between Asia and the rest of the world. As a result of this historical trade, it is possible that the origins of some of the Asian species may be lost in antiquity, and that some of the “native” species in Asia were actually introduced a century or more ago. A similar case occurred on the U.S. East coast with the snail *Littorina littorea*, which required extensive genetic analysis of both the snail and its parasite to demonstrate that it had been introduced from Europe about 500 years ago (Blakeslee et al., 2008). With heavy ship trading not being a major vector until about the mid- to late-1800s for Hawaii and the Pacific coast of the United States, such under reporting of historically introduced species is presumably relatively less important in the NEP and Hawaii.

6) *Language barriers*. Language barriers limited our access to the original Asian literature. In many cases, we only had access to an English abstract while in other cases we were aware of a paper but either could not obtain it or it did not have an English abstract. There is no doubt that this language barrier limited our ability to fully parse the distributions and natural history characteristics of Asian species. However, we do not believe that the language barrier resulted in a substantial underestimate of the number of reported NIS in the NWP. First, we worked with PICES members from each of the countries to identify the reported NIS in their respective countries. Second, there have been a number of relatively recent English summaries for NIS in each of these countries (e.g., Zvyagintsev et al., 2011). While the language barrier is not likely to have been a major factor in enumerating the previously reported NIS, it is a greater limitation for taxonomists evaluating foreign taxonomic literature. Without the ability of taxonomic experts to scrutinize foreign literature, there is a danger that introduced species will be described as new native species in a region (see Carlton, 2009).

7) *Greater propagule pressure in Hawaii and the NEP*. The NWP could be less invaded if it experiences a substantially lower propagule pressure (rate and extent of new invaders being introduced). However, given the extent of commercial shipping between Asia and the rest of the world it seems highly unlikely that there is a lower propagule pressure from ballast water or hull fouling in Asia. In addition, aquaculture escapees should be at least as important in Asia as in North America and Hawaii. While certain specific vectors may be more important in the NEP and/or Hawaii (e.g., airplanes for insects in Hawaii) it seems unlikely that a reduced propagule pressure was a factor in the lower number of reported NIS in the NWP.

8) *Greater invasibility in NEP and Hawaii compared to the NWP*. The last possibility is that NEP and Hawaii ecosystems have a greater invasibility; that is they are easier to invade. As used here, invasibility refers to strength of the ecological interactions resisting the establishment of a new invader. Invasibility is the result of species interactions, which is different than the NEP and Hawaii having more benign environments mentioned above in the environmental matching argument (#1). We have no evidence to support or refute the invasibility hypothesis, but note that if it is a major factor it would have to operate across a number of different taxa and habitat types, including fouling, soft-bottom, and plankton assemblages.



## Vectors of Introduction

The last topic we address is an evaluation of the major vectors by which invaders were transported into the NEP, NWP, and Hawaii (see Table 2). The six vectors analyzed were ballast water discharges, hull fouling, intentional stocking, aquaculture escapees, aquaculture associated species, and aquarium/plant trade. Aquaculture escapees are species that are intentionally stocked but that escaped into the wild. Aquaculture associated species live on or in association with an aquaculture species and are accidentally transported along with them (e.g., species transported along with oyster stocks).

One or more of these six vectors were considered as a possible transport mechanism for 92% of the invaders in the NEP, 93% in the NWP, and 86% in Hawaii (Figure 60). The lower percentage in Hawaii is primarily due to the large number (40) of nonindigenous insects, many of which were introduced via other vectors such as from airplanes, cargo, or solid ballast. In evaluating the results, it is important to recognize that many, if not most, invaders are polyvetic (Carlton and Ruiz, 2005b) and can be transported by more than one vector. Thus, the values in Figure 60 can sum to more than 100%.

Hull fouling was the major vector in all three locations, and was considered a possible vector for 47% of the invaders in the NWP to 61% in Hawaii (Figure 60). Ballast water discharges were the second most important vector in all three locations, with its potential importance ranging from about 40% of the invaders in the NWP to 53% in the NEP. One major difference among the locations was the greater importance of intentional stocking and aquaculture escapees in the NWP compared to the NEP and Hawaii. These two vectors combined were potential routes of introduction for about 46% of the invaders in the NWP compared to about 9-10% in the NEP and Hawaii. The high percentage of these two aquaculture related vectors in the NWP reflects the active aquaculture efforts in Asia, though we caution that for many of these nonindigenous aquaculture species it is not known if they have established wild populations. Another difference among the locations was the importance of aquaculture associated species, which was a potential vector for approximately 42% of the invaders in the NEP compared to 15% to 29% in Hawaii and the NWP, respectively. The greater importance of this vector in the NEP reflects the large number of invaders historically introduced via the extensive importation of the Atlantic oyster (*Crassostrea virginica*) from the U.S. East Coast and from the Pacific oyster (*Crassostrea gigas*) from Asia. The importance of this vector in NEP has declined both with a reduction in the number of oysters imported from outside the NEP and with the institution of more stringent quarantine procedures.

## MAPS OF MEOW REGIONS

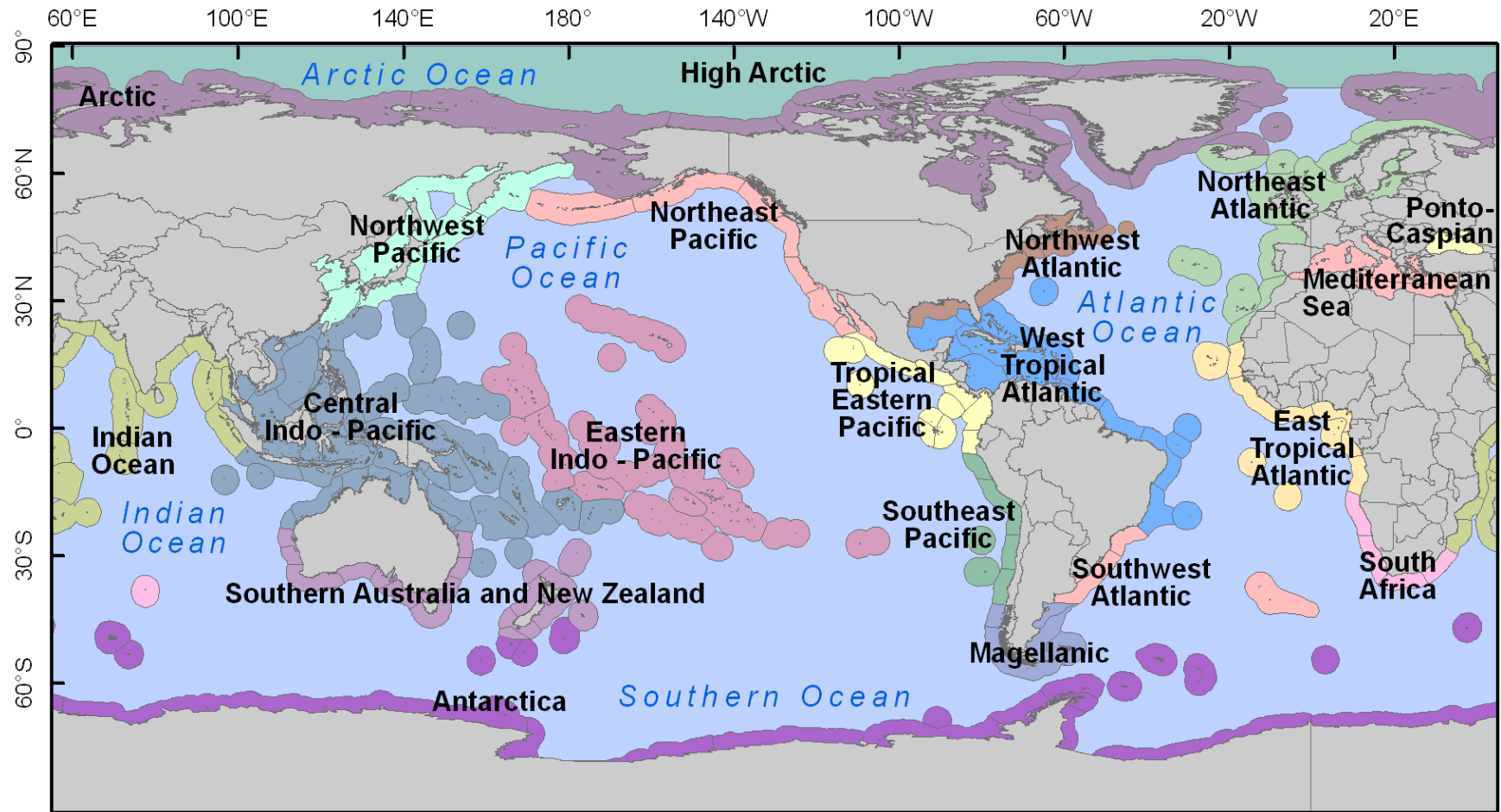


Figure 1: Map of the region divisions added to the Marine Ecoregions Of the World (MEOW) to facilitate capturing species classifications.

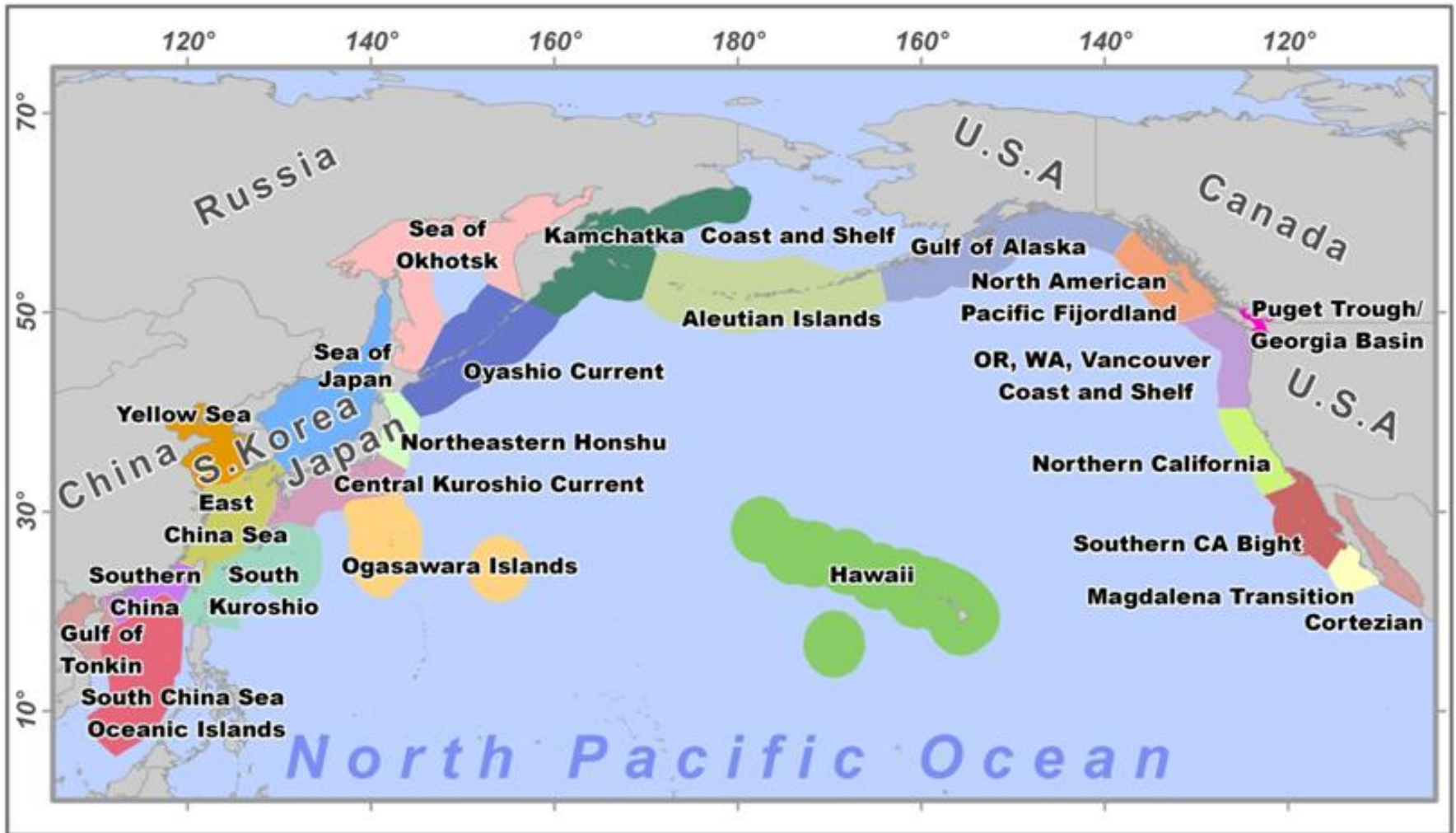


Figure 2: Twenty-three MEOW ecoregions analyzed for reported near-coastal nonindigenous species. The Northeast Pacific (NEP) region is defined as the ecoregions from the Cortezian Ecoregion northward through the Aleutian Islands Ecoregion. The Northwest Pacific (NWP) region is defined as the East China Sea Ecoregion northward through the Kamchatka Coast and Shelf Ecoregion. The Northern Central Indo-Pacific (NCIP) is defined as the Southern China, Gulf of Tonkin, South China Sea Oceanic Islands, South Kuroshio, and Ogasawara Island Ecoregions. The Hawaii Ecoregion is contained within the Eastern Indo-Pacific Region.

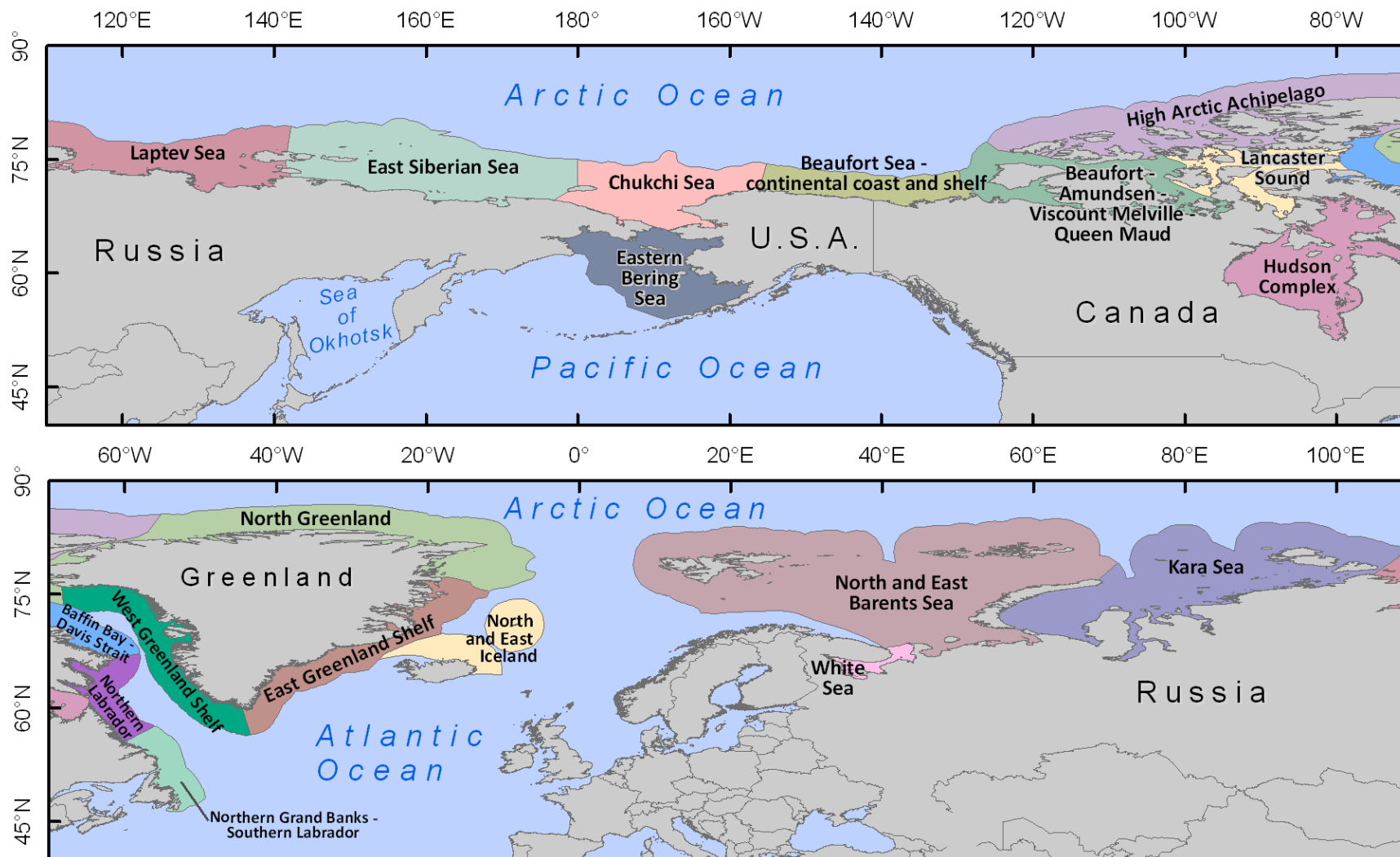


Figure 3: Maps in geographic projection of the Arctic region of the modified MEOW schema as shown in the PICES database.

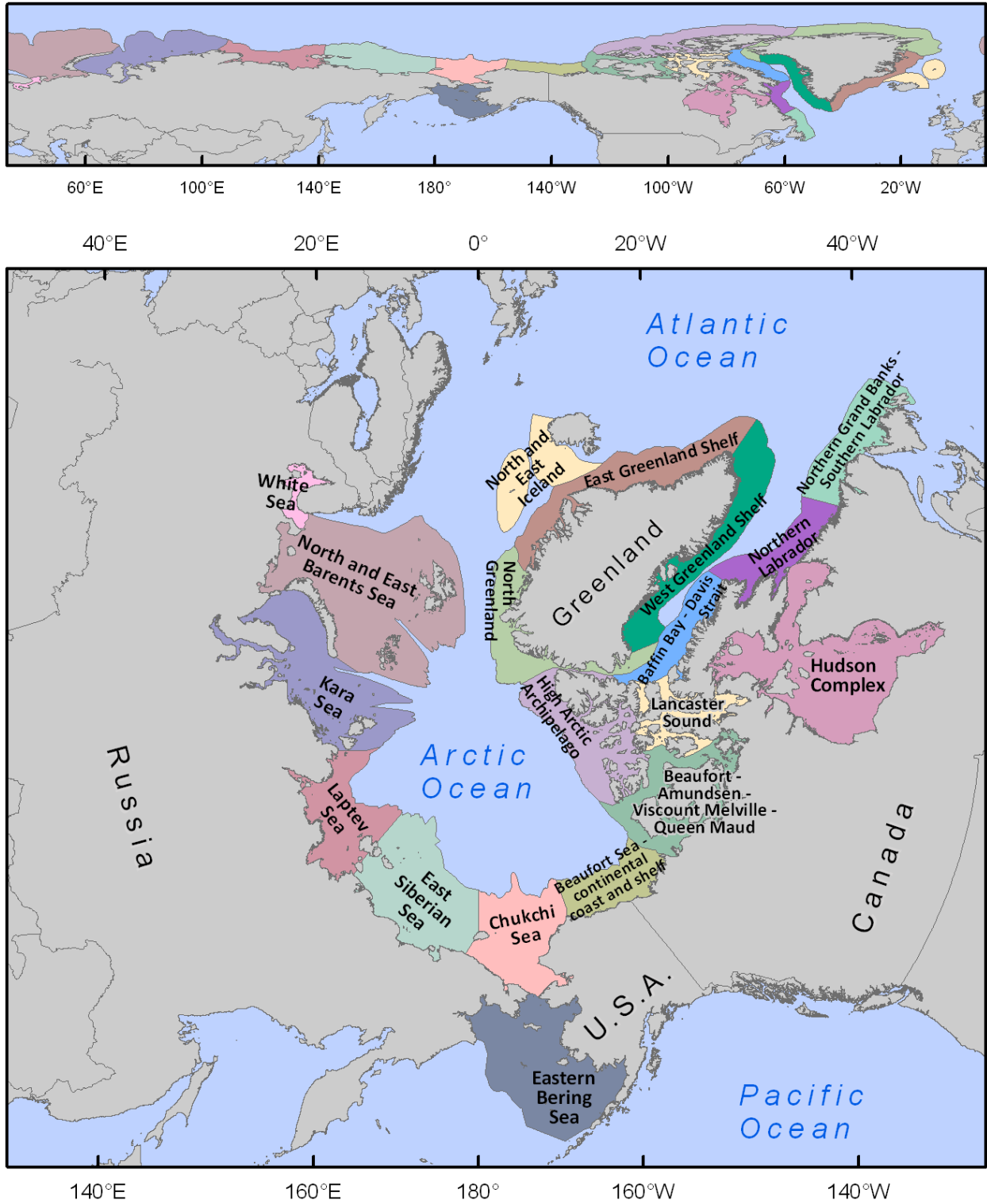


Figure 4: Alternate map in a polar stereographic projection of the Arctic region in the modified MEOW schema.



Figure 5: Map of the Northwest Pacific (NWP) region of the modified MEOW schema.

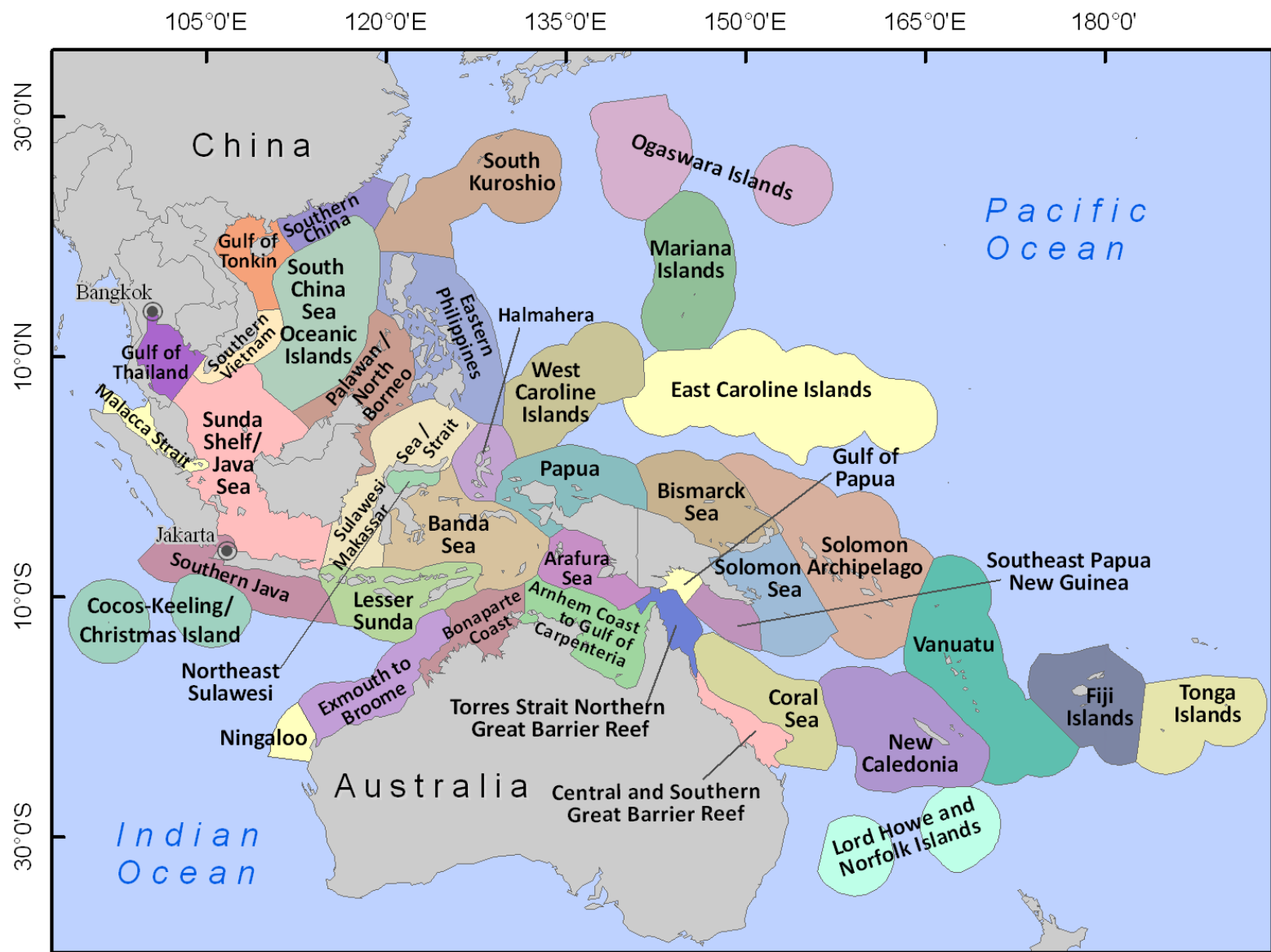


Figure 6: Map of the Central Indo-Pacific region of the modified MEOW schema.

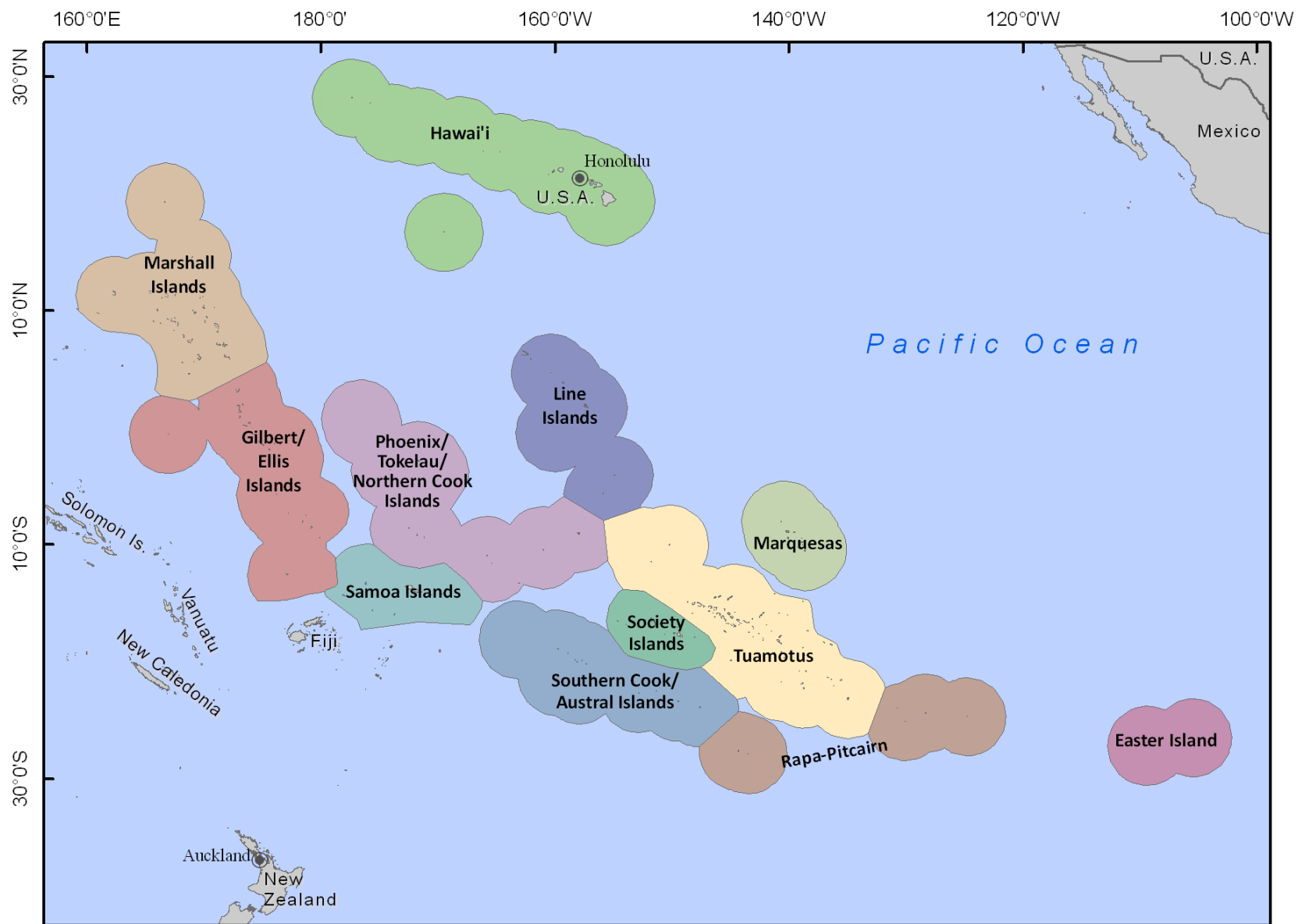


Figure 7: Map of the Eastern Indo-Pacific region of the modified MEOW schema.





Figure 8: Map of the Northeast Pacific (NEP) region of the modified MEOW schema.



Figure 9: Map of the Tropical Eastern Pacific region of the modified MEOW schema.

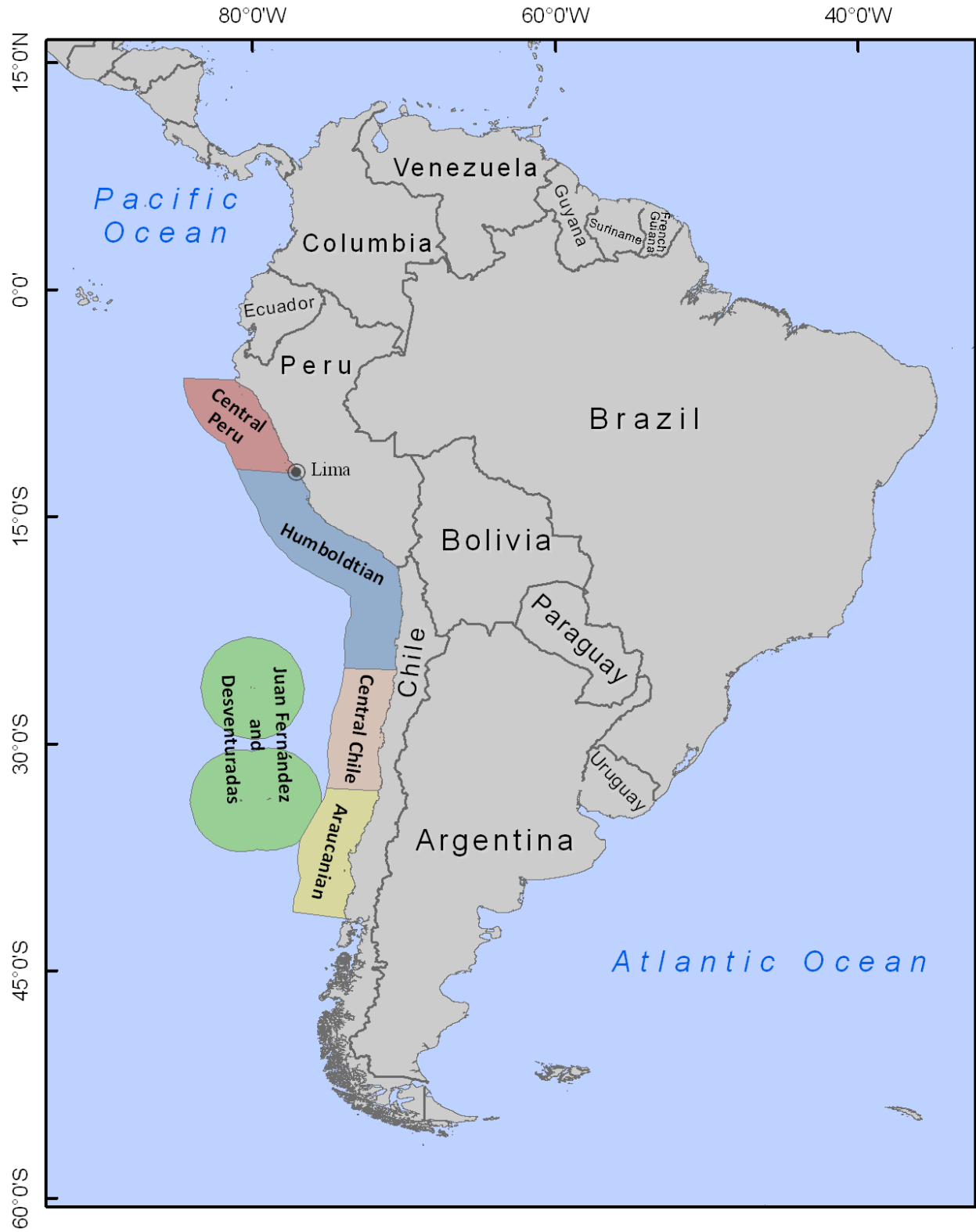


Figure 10: Map of the Southeast Pacific region of the modified MEOW schema.

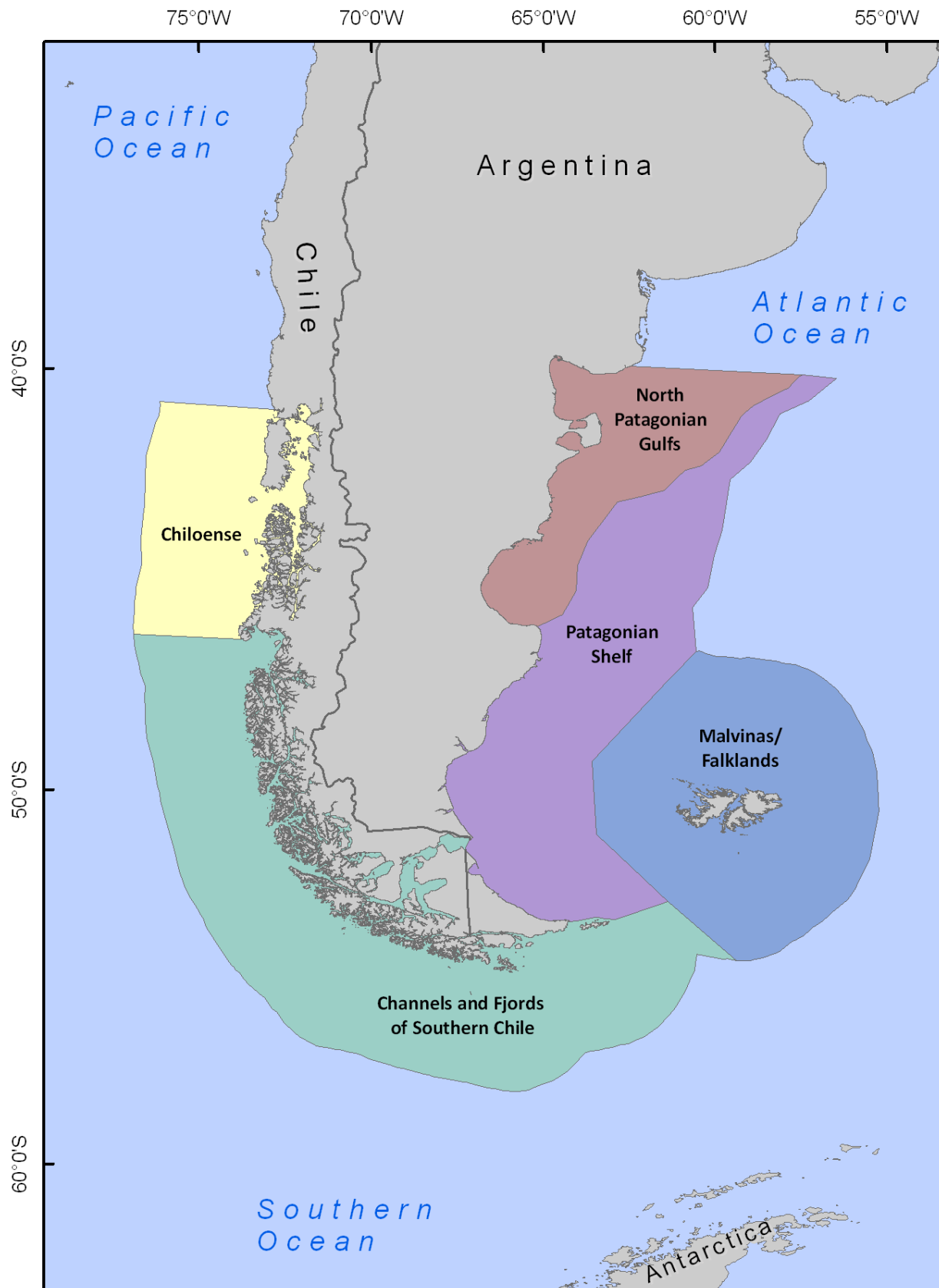


Figure 11: Map of the Magellanic region of the modified MEOW schema.



Figure 12: Map of the Southwest Atlantic region of the modified MEOW schema.

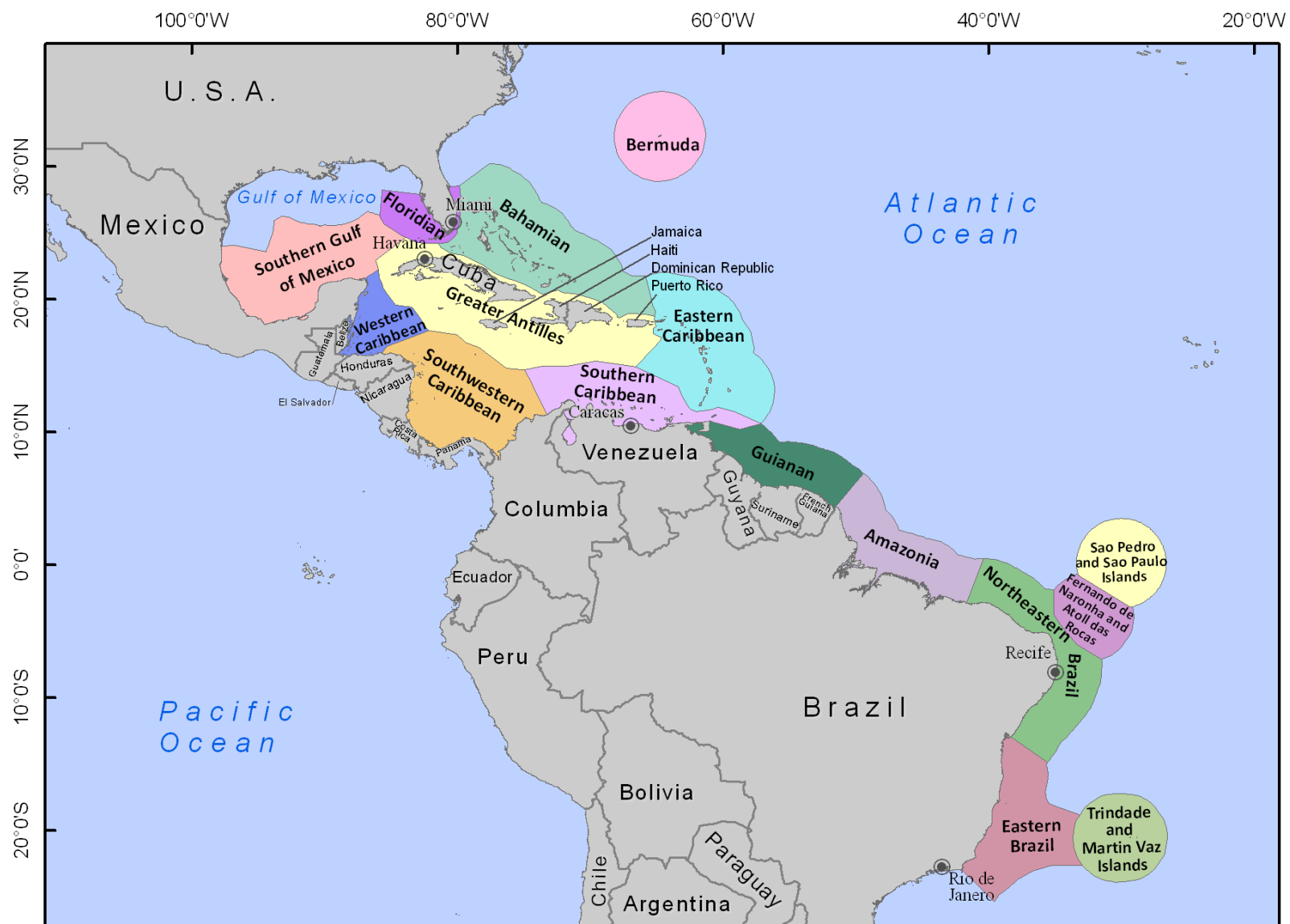


Figure 13: Map of the West Tropical Atlantic region of the modified MEOW schema.

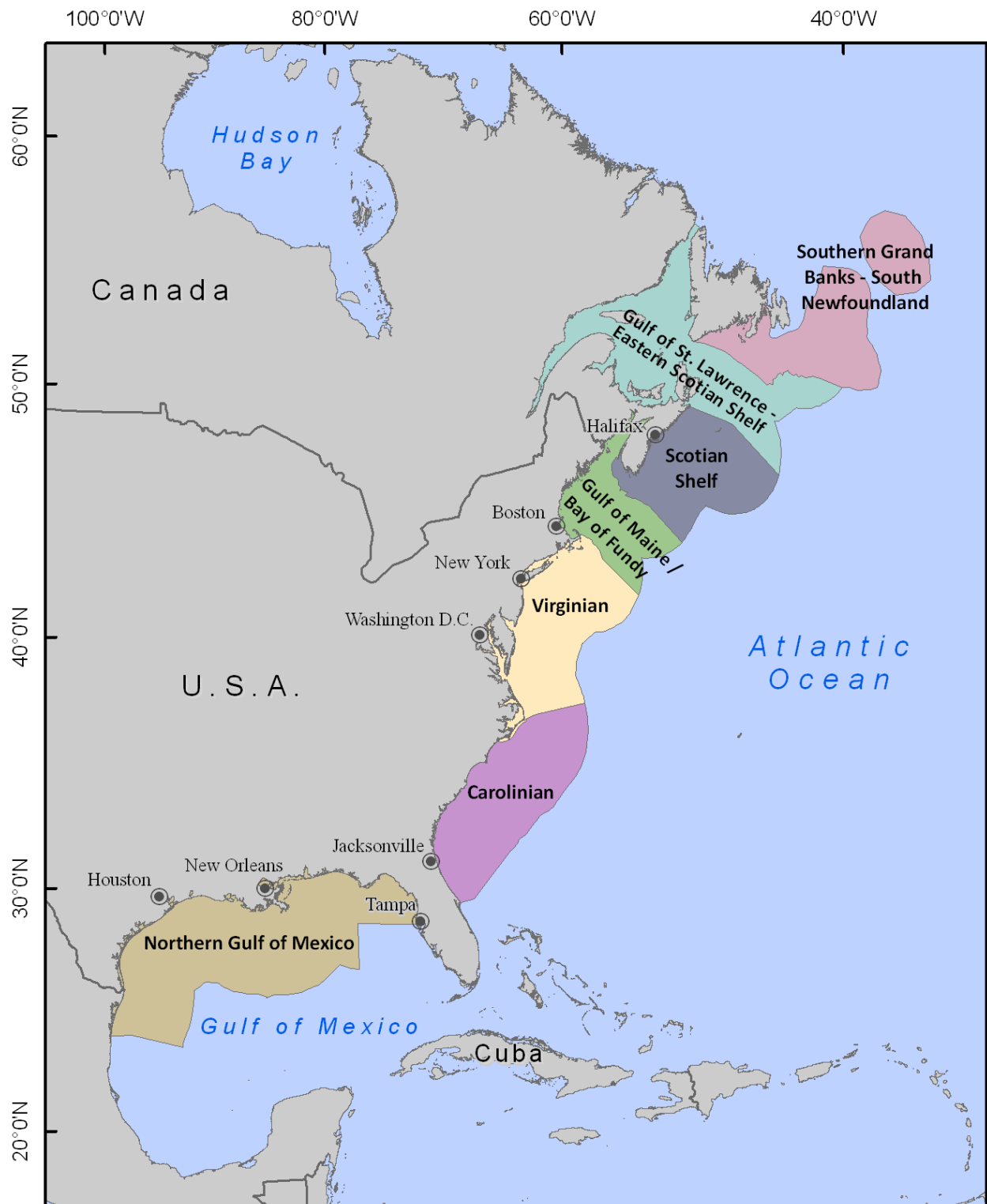


Figure 14: Map of the Northwest Atlantic region of the modified MEOW schema.

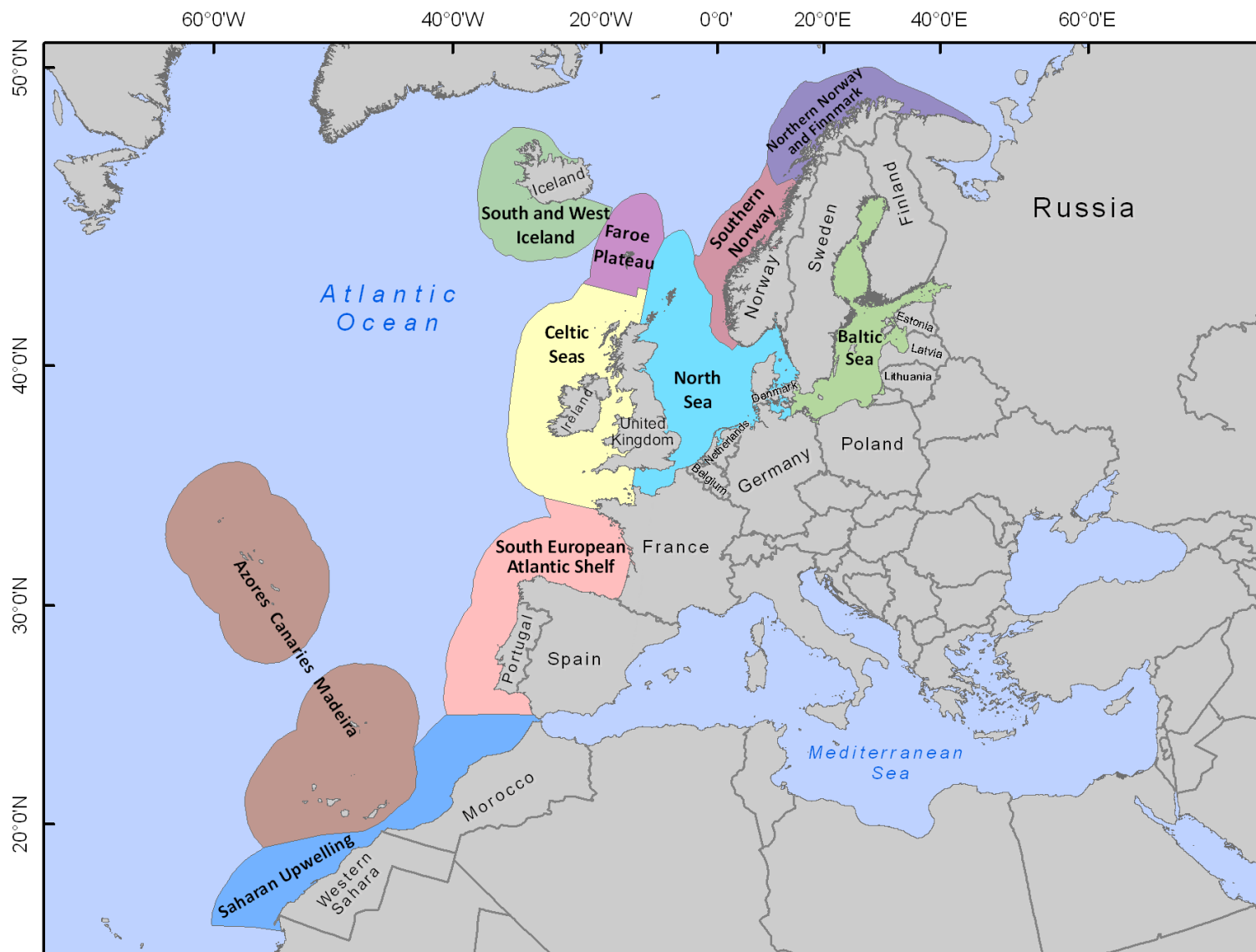


Figure 15: Map of the Northeast Atlantic region of the modified MEOW schema.





Figure 16: Map of the Mediterranean Sea region of the modified MEOW schema.



Figure 17: Map of the Ponto-Caspian region of the modified MEOW schema.

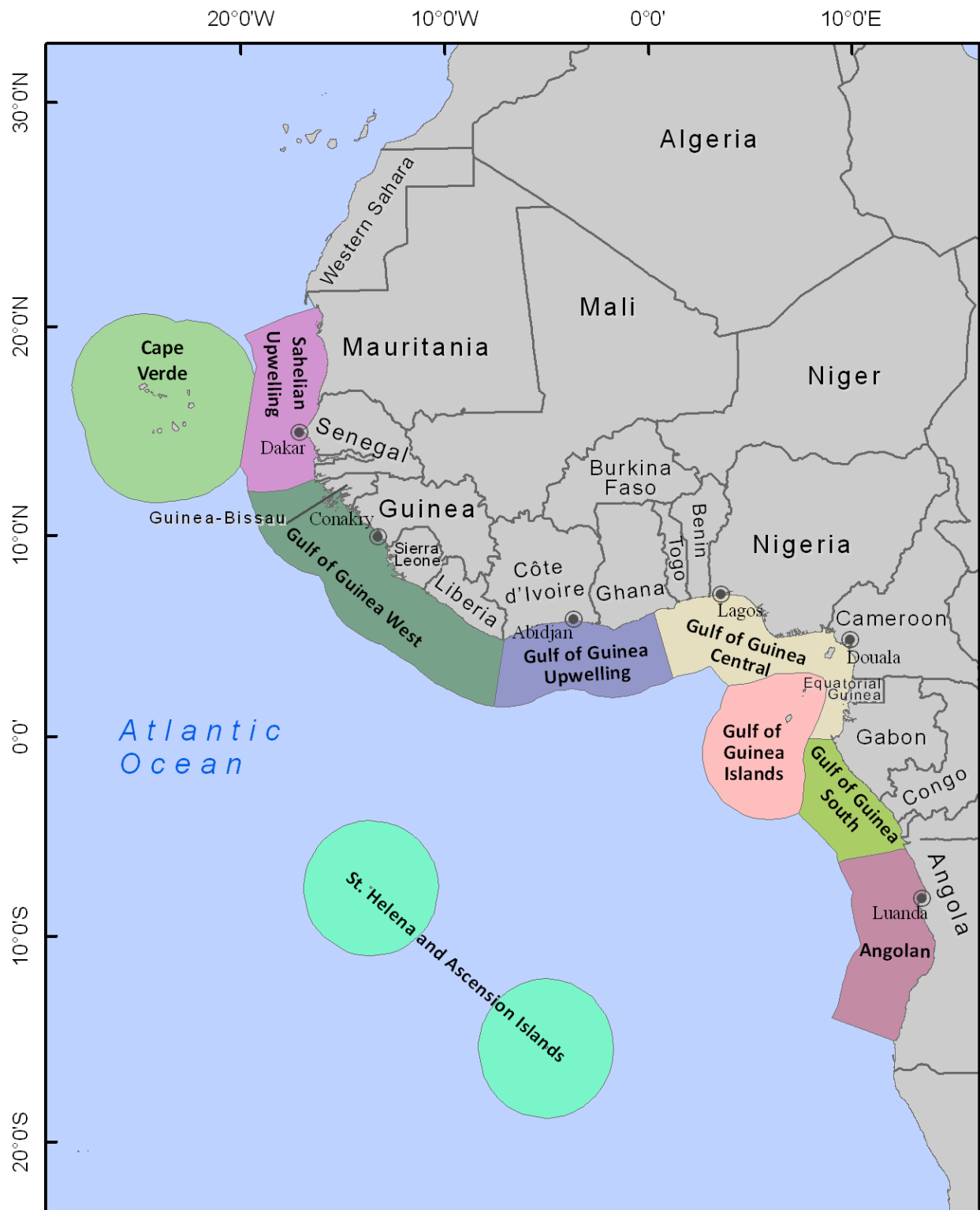


Figure 18: Map of the East Tropical Atlantic region of the modified MEOW schema.

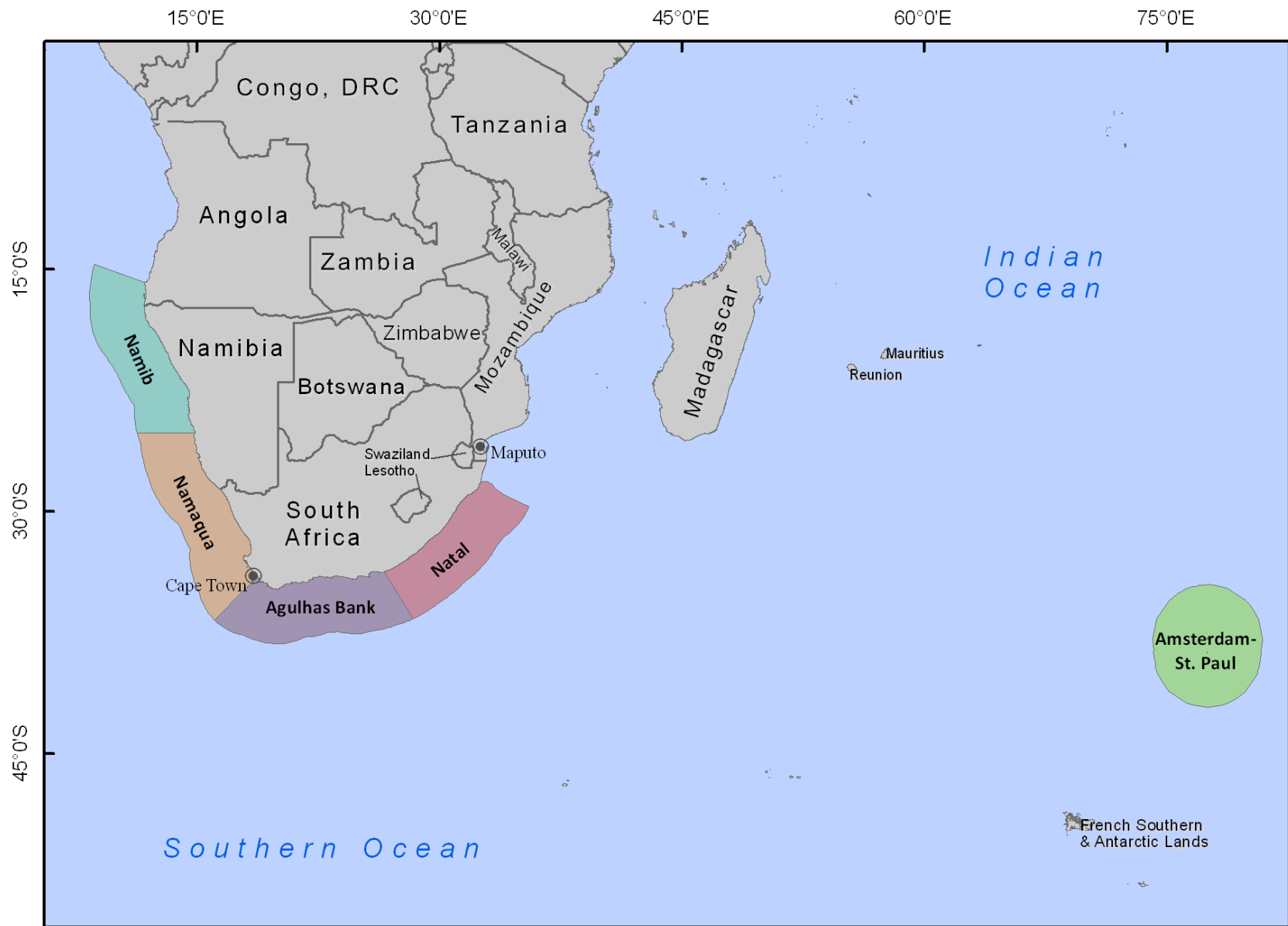


Figure 19: Map of the Southern Africa region of the modified MEOW schema.

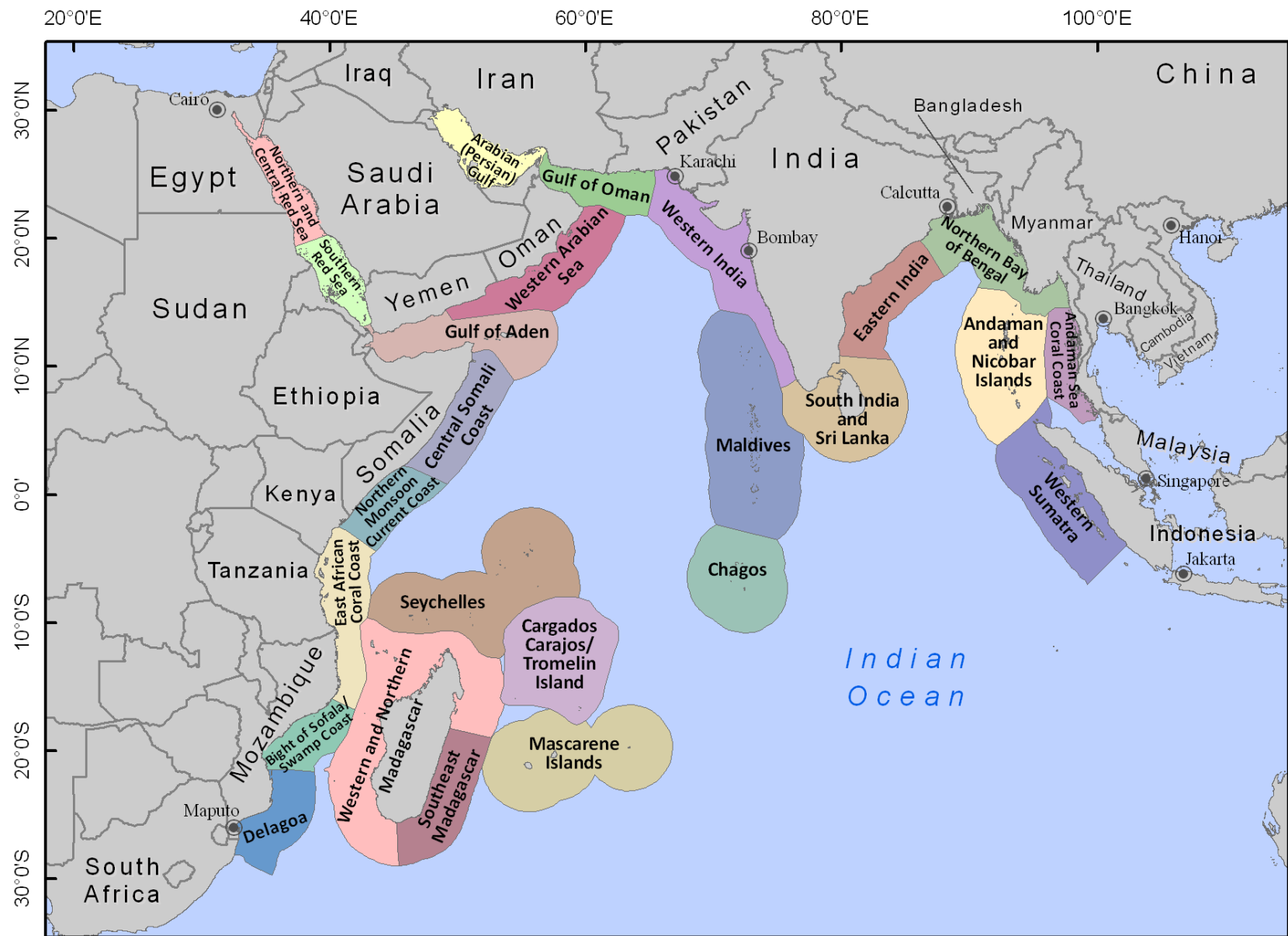


Figure 20: Map of the Indian Ocean region of the modified MEOW schema.



Figure 21: Map of the Southern Australia and New Zealand region of the modified MEOW schema.

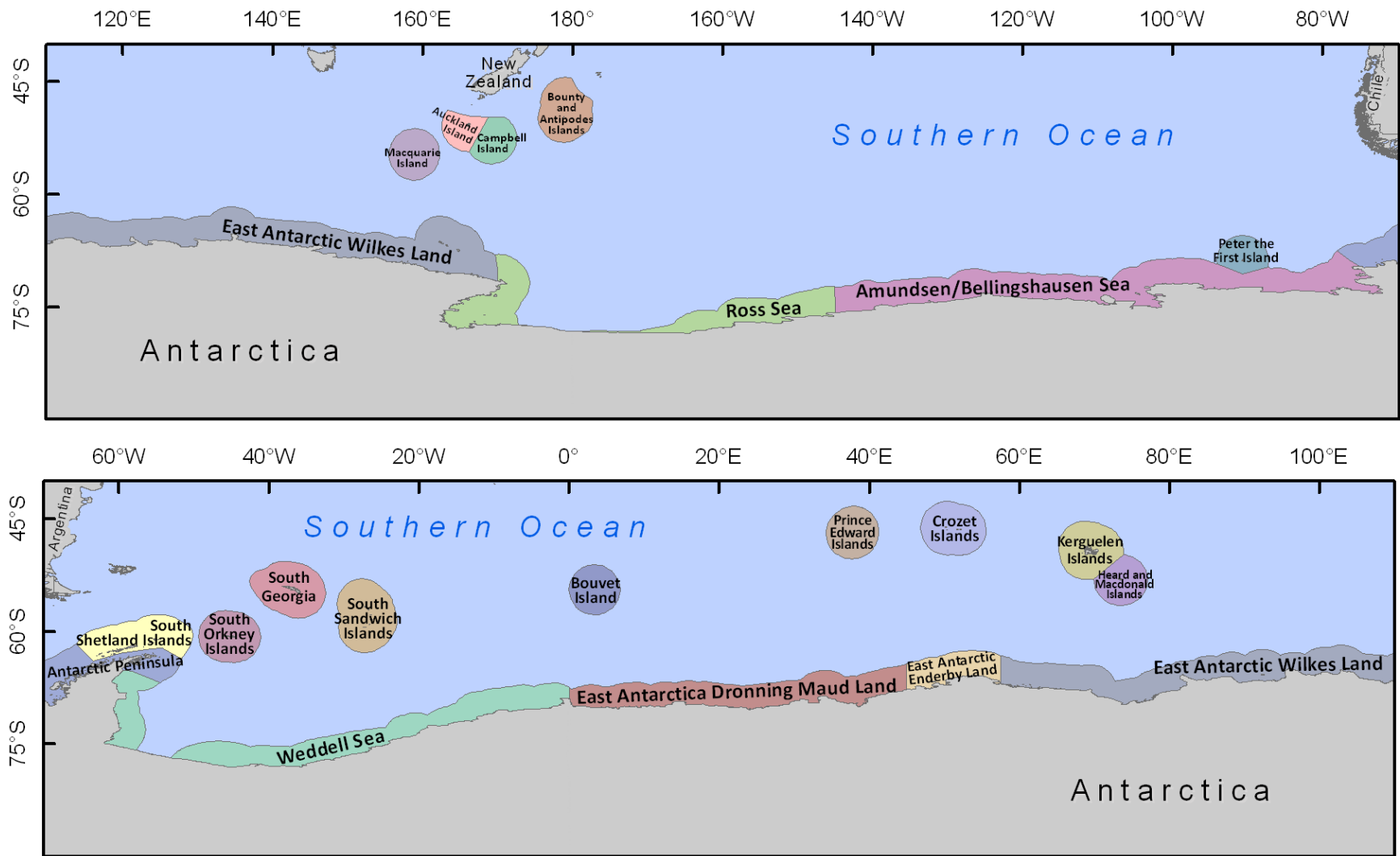


Figure 22: Map of the Antarctica region of the modified MEOW schema.

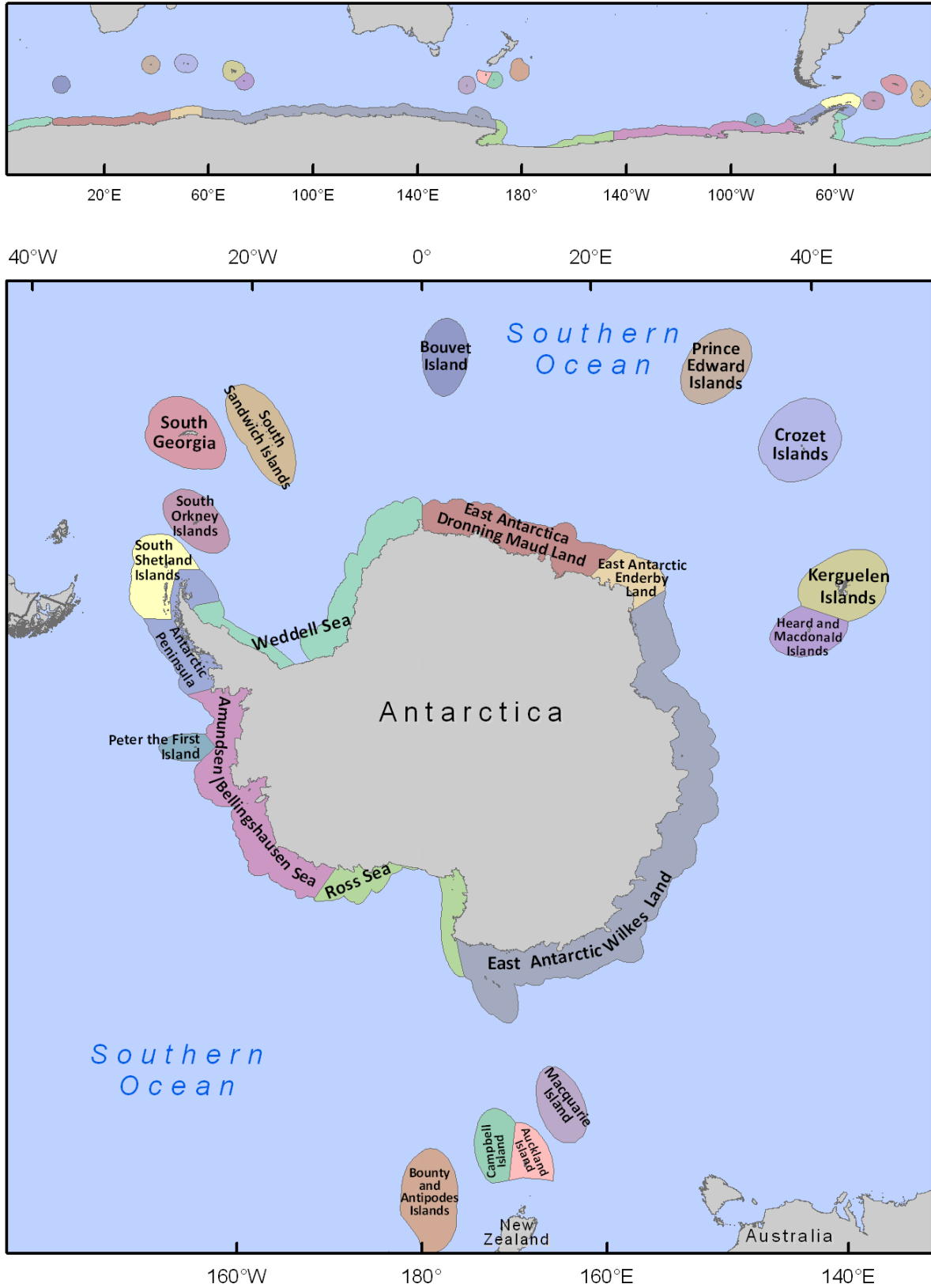


Figure 23: Alternate map in polar stereographic projection of the Antarctica region in the modified MEOW schema.



## GRAPHS OF NONINDIGENOUS SPECIES DISTRIBUTIONS BY TAXA AND REGION

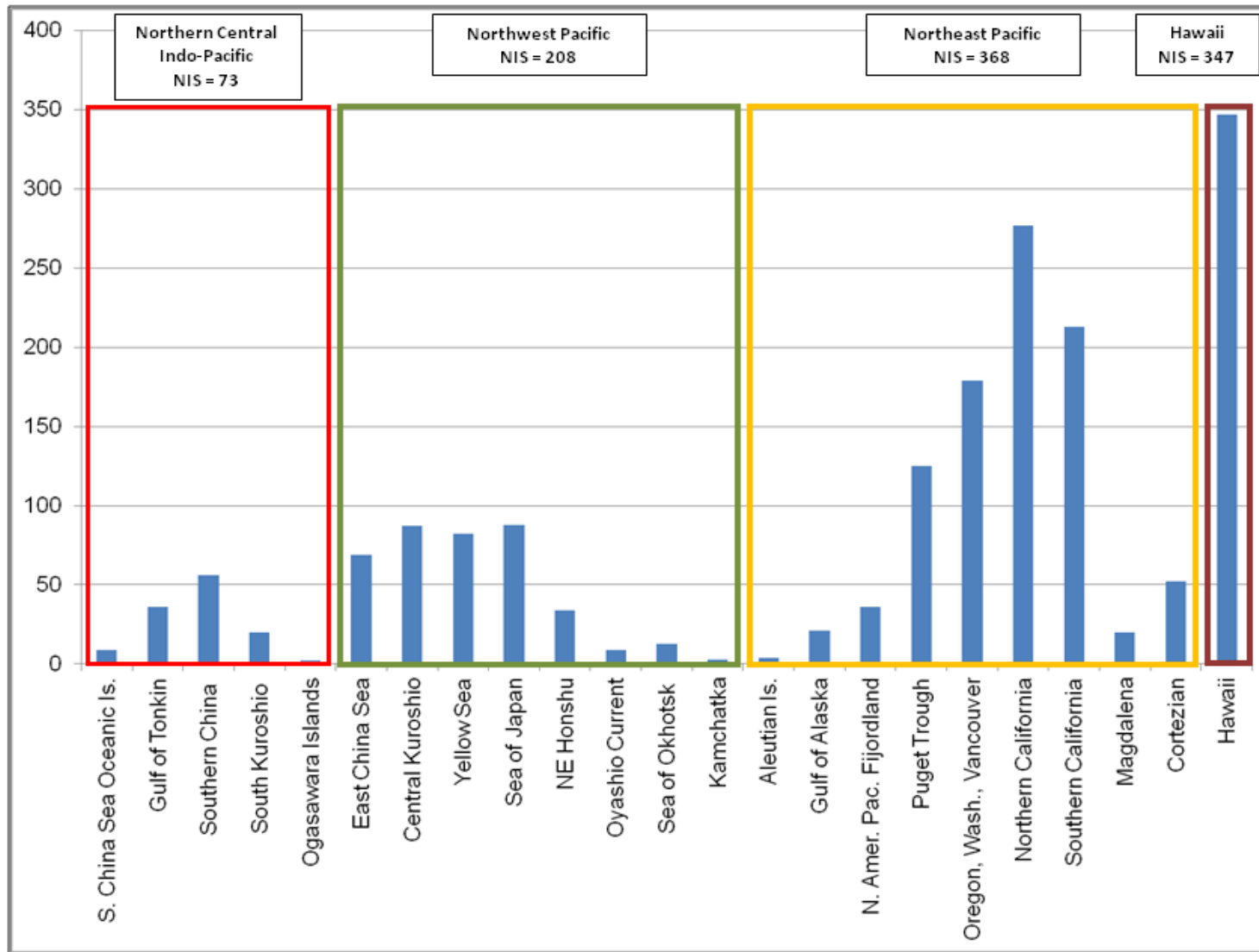


Figure 24: Number of reported nonindigenous species by MEOW ecoregion.

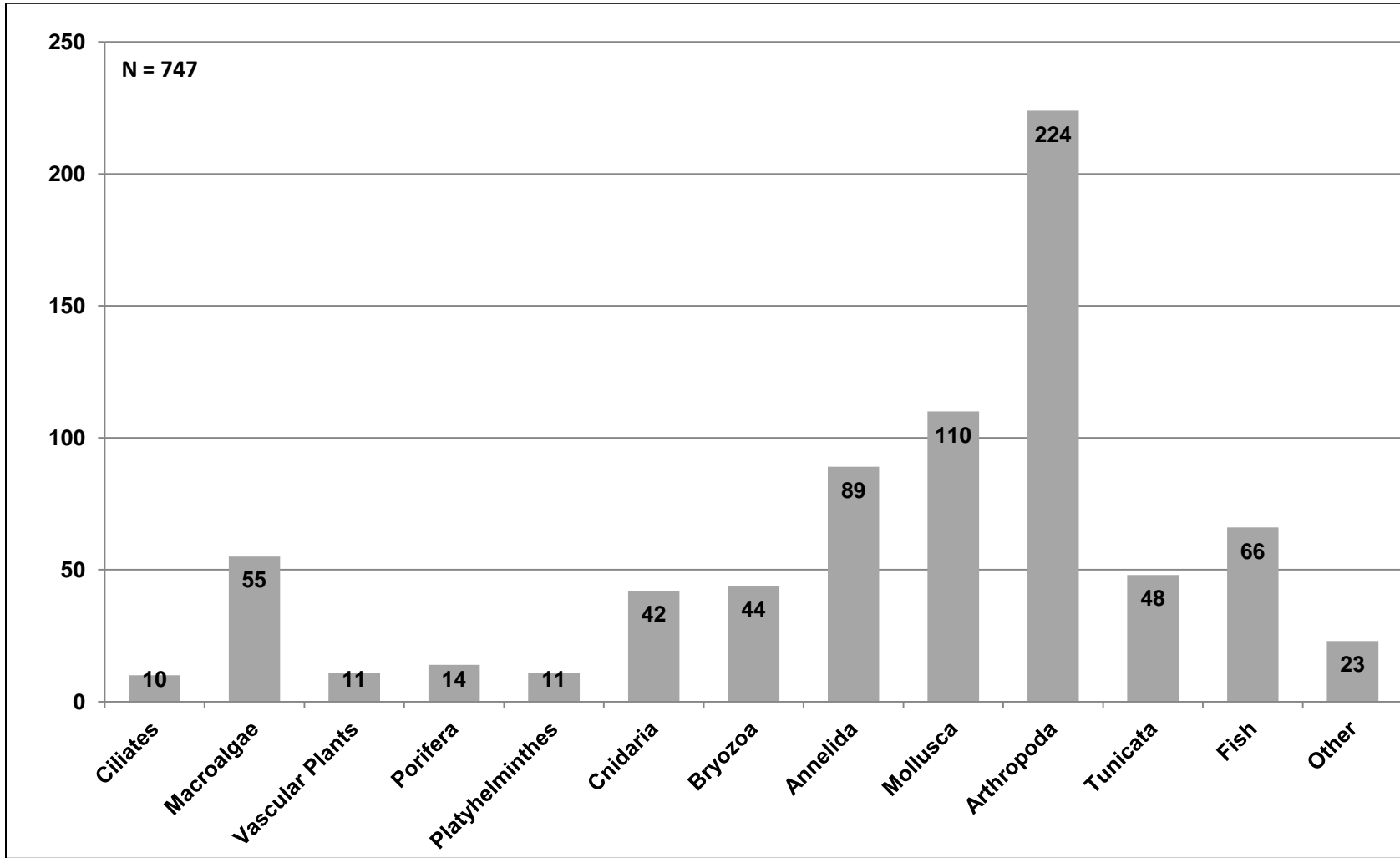


Figure 25: Total Number of nonindigenous species in the North Pacific region and South China by taxa.

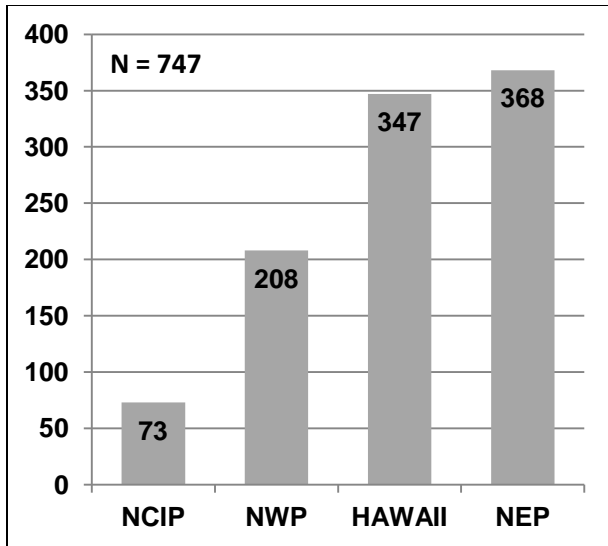


Figure 26: Total number of nonindigenous species with a population status of established or unknown by region.

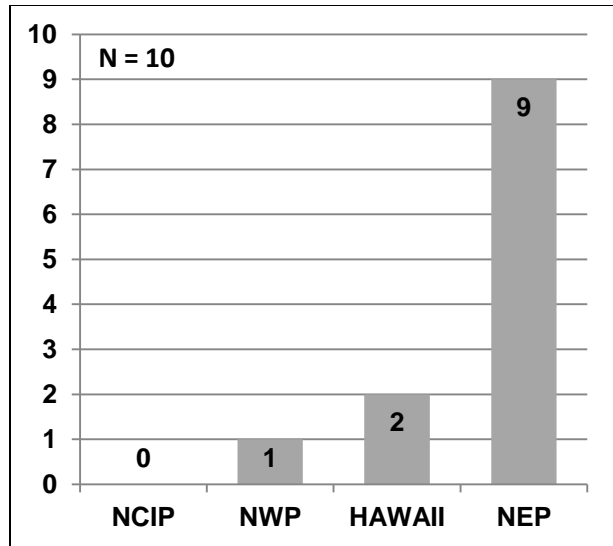


Figure 27: Ciliophora: Total number of nonindigenous Ciliophora with a population status of established or unknown by region.

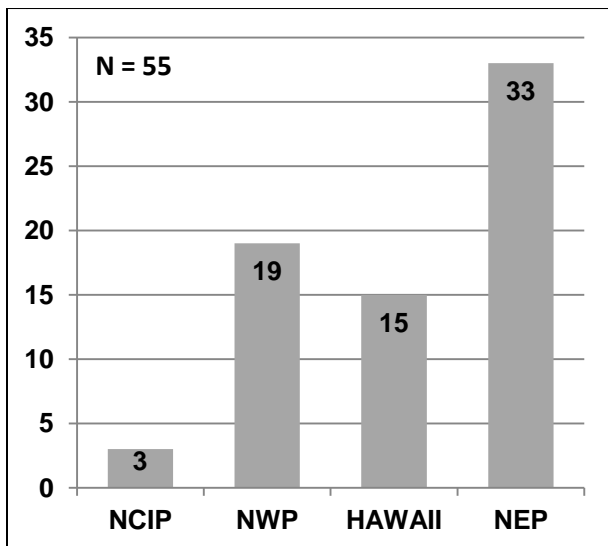


Figure 28: Macroalgae: Number of nonindigenous Macroalgae with a population status of established or unknown by region.

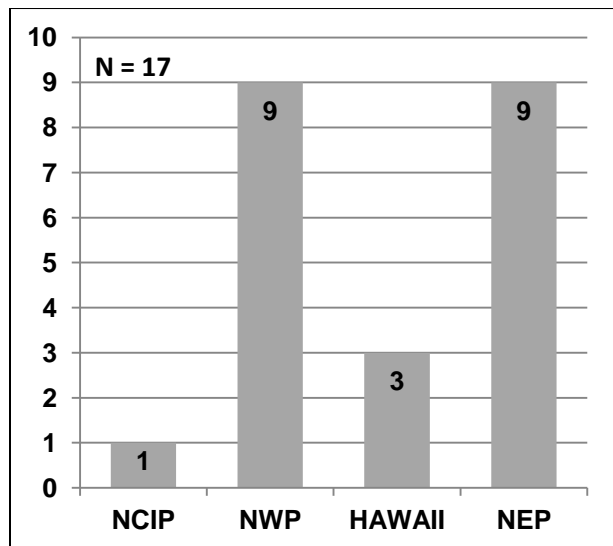


Figure 29: Class Phaeophyceae: Number of nonindigenous Phaeophyceae with a population status of established or unknown by region.

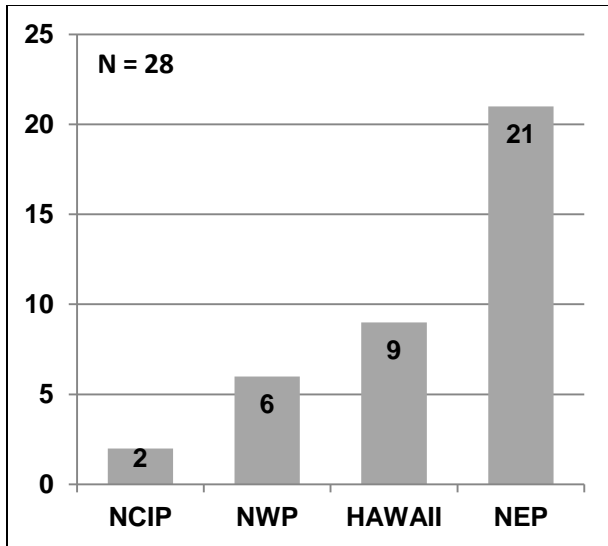


Figure 30: Phylum Biliphyta–Rhodophyta: Number of nonindigenous Rhodophyta with a population status of established or unknown by region.

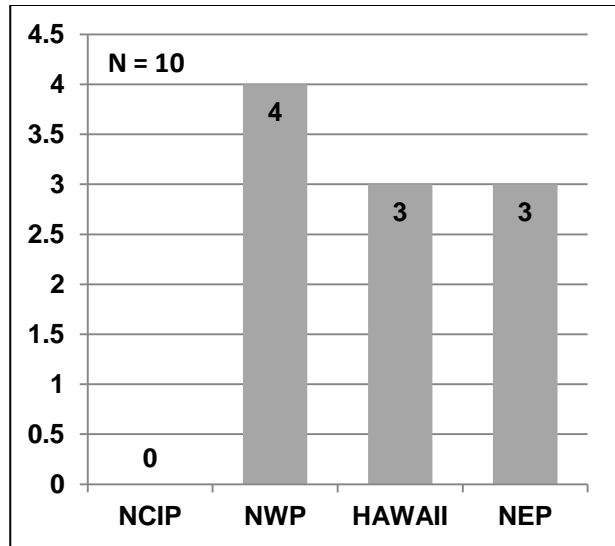


Figure 31: Phylum Viridaeplantae–Chlorophyta: Number of nonindigenous Chlorophyta with a population status of established or unknown by region.

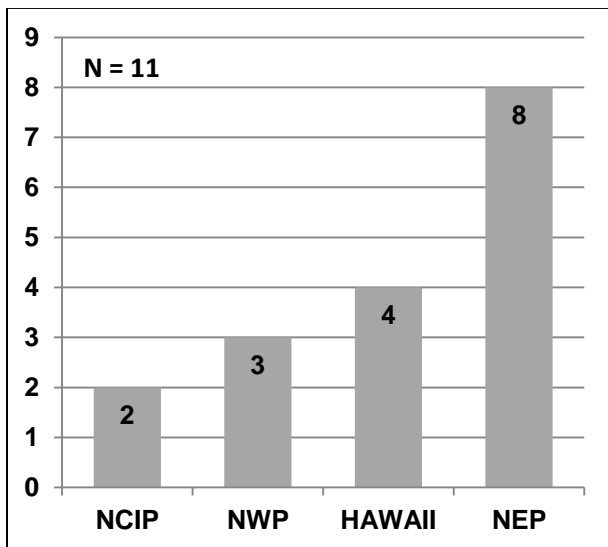


Figure 32: Phylum Magnoliophyta: Number of nonindigenous Magnoliophyta with a population status of established or unknown by region.

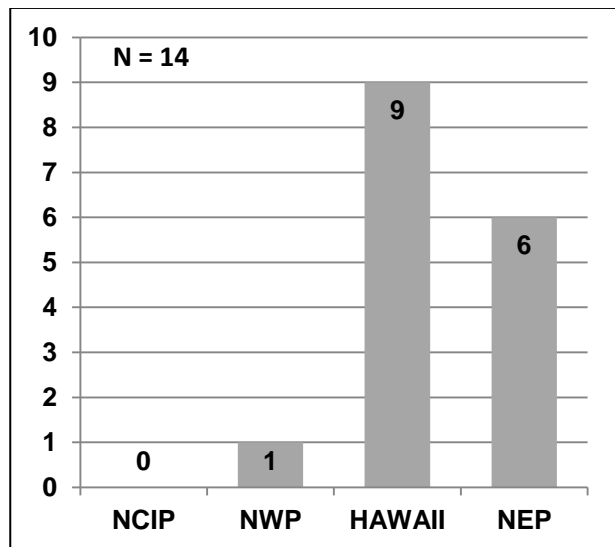


Figure 33: Phylum Porifera: Number of nonindigenous Porifera with a population status of established or unknown by region.

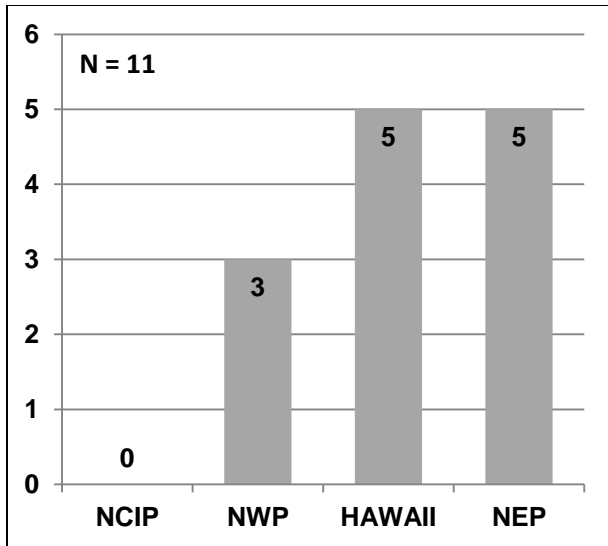


Figure 34: Phylum Platyhelminthes: Number of nonindigenous Platyhelminthes with a population status of established or unknown by region.

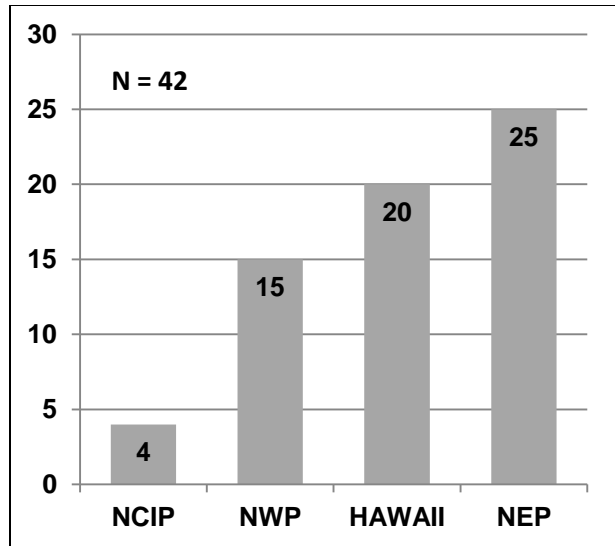


Figure 35: Phylum Cnidaria: Number of nonindigenous Cnidaria with a population status of established or unknown by region.

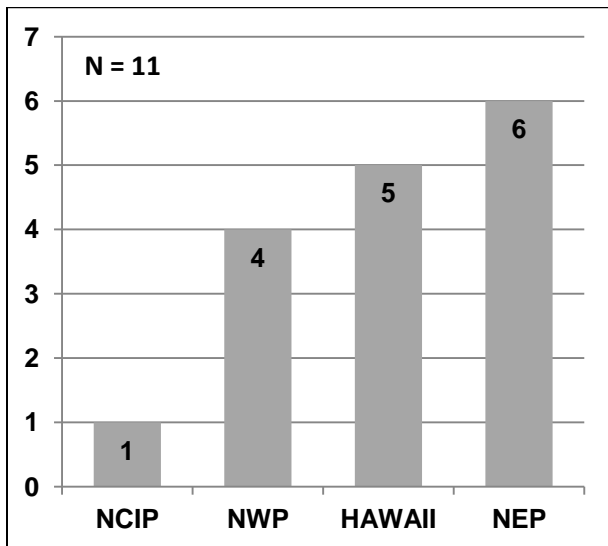


Figure 36: Cnidaria–Anthozoa: Number of nonindigenous Anthozoa with a population status of established or unknown by region.

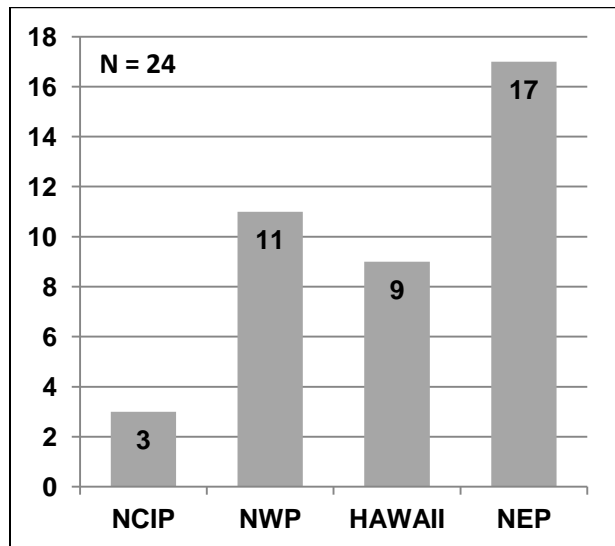


Figure 37: Cnidaria–Hydrozoa: Number of nonindigenous Hydrozoa with a population status of established or unknown by region.

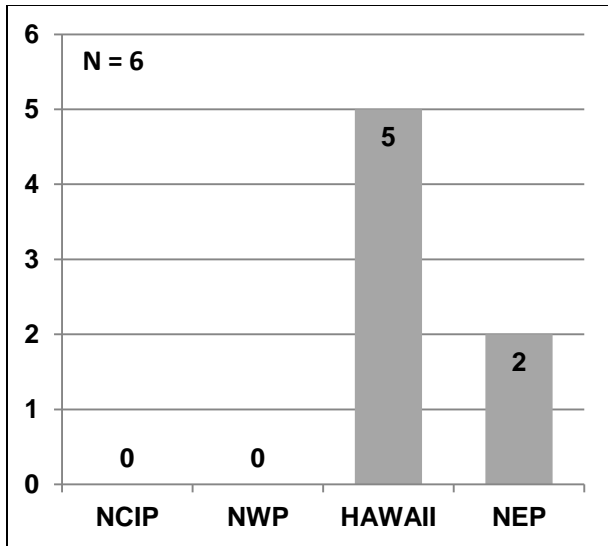


Figure 38: Cnidaria–Scyphozoa: Number of nonindigenous Scyphozoa with a population status of established or unknown by region.

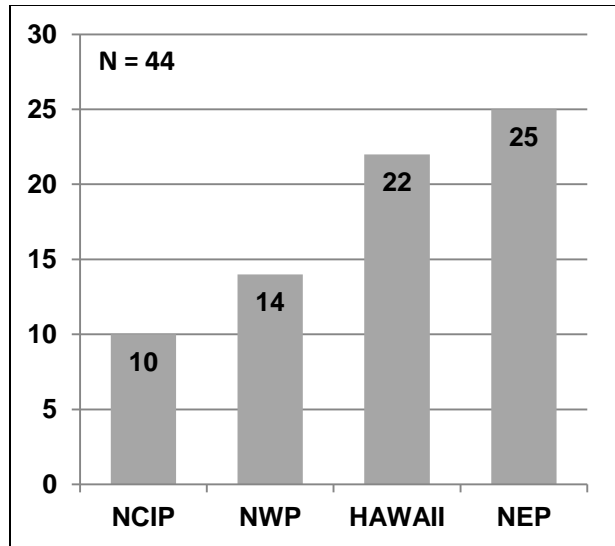


Figure 39: Phylum Bryozoa: Number of nonindigenous Bryozoa with a population status of established or unknown by region.

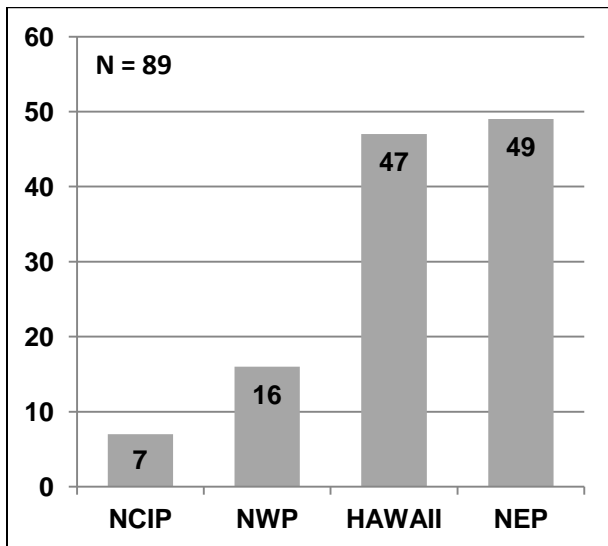


Figure 40: Phylum Annelida: Number of nonindigenous Annelida with a population status of established or unknown by region.

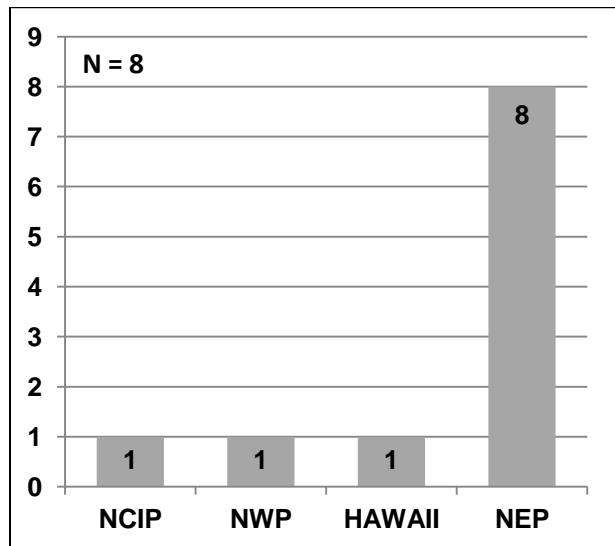


Figure 41: Annelida–Clitellata: Number of nonindigenous Clitellata with a population status of established or unknown by region.

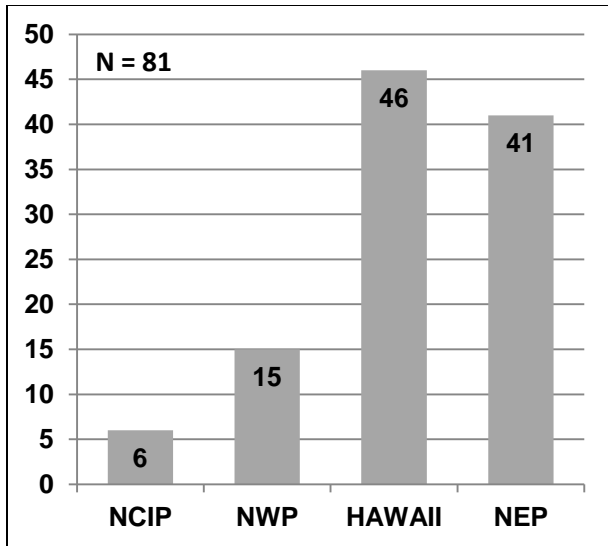


Figure 42: Annelida–Polychaeta: Number of nonindigenous Polychaeta with a population status of established or unknown by region.

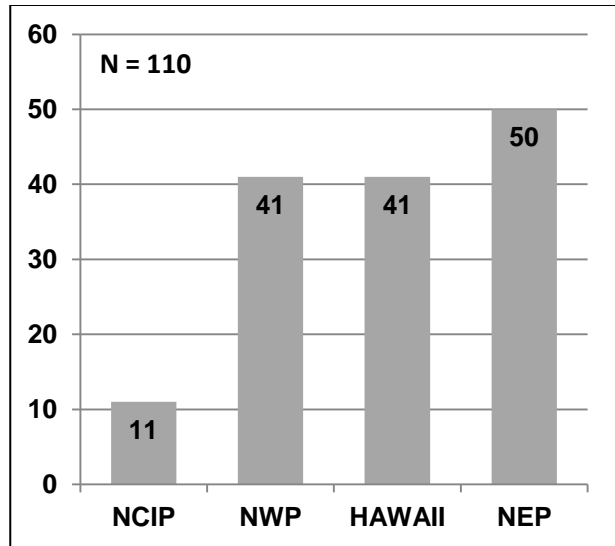


Figure 43: Phylum Mollusca: Number of nonindigenous Mollusca with a population status of established or unknown by region.

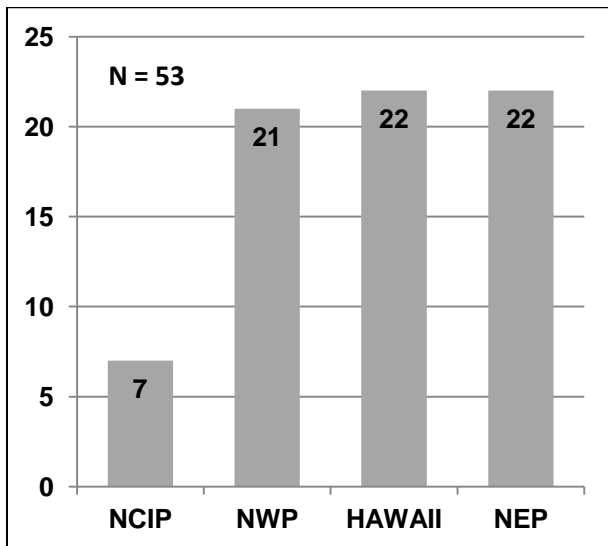


Figure 44: Phylum Mollusca–Bivalvia: Number of nonindigenous Bivalvia with a population status of established or unknown by region.

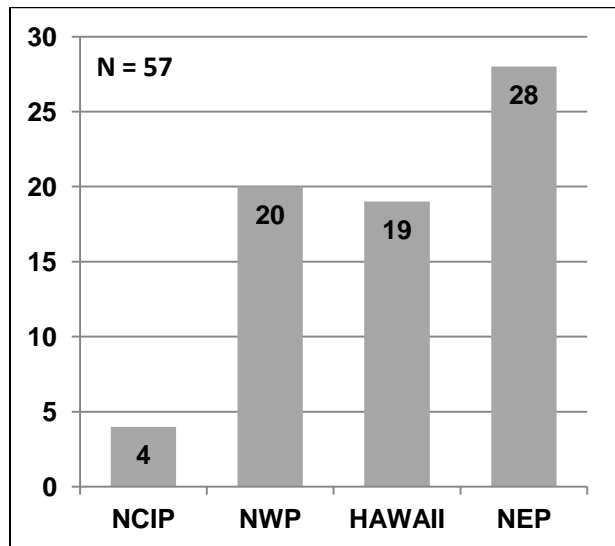


Figure 45: Mollusca–Gastropoda: Number of nonindigenous Gastropoda with a population status of established or unknown by region.

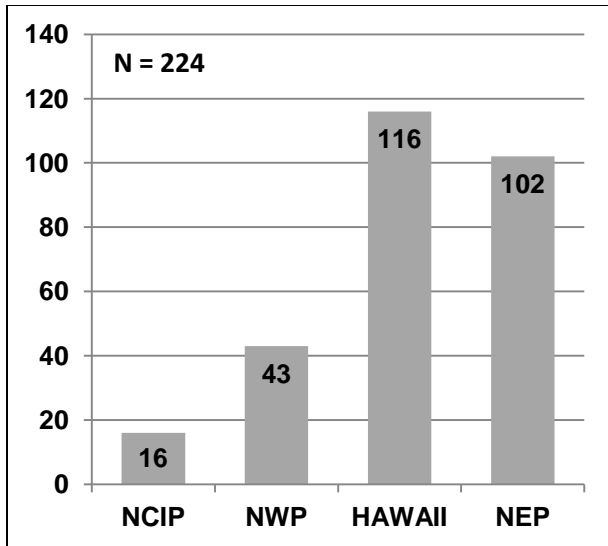


Figure 46: Phylum Arthropoda: Number of nonindigenous Arthropoda with a population status of established or unknown by region.

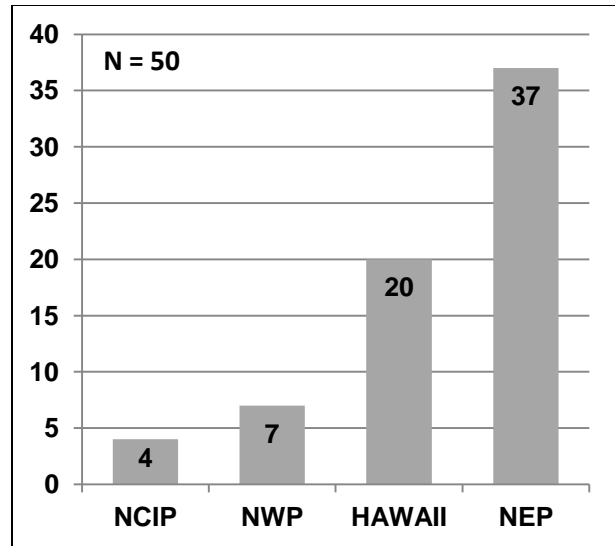


Figure 47: Arthropoda–Amphipoda: Number of nonindigenous Amphipoda with a population status of established or unknown by region.

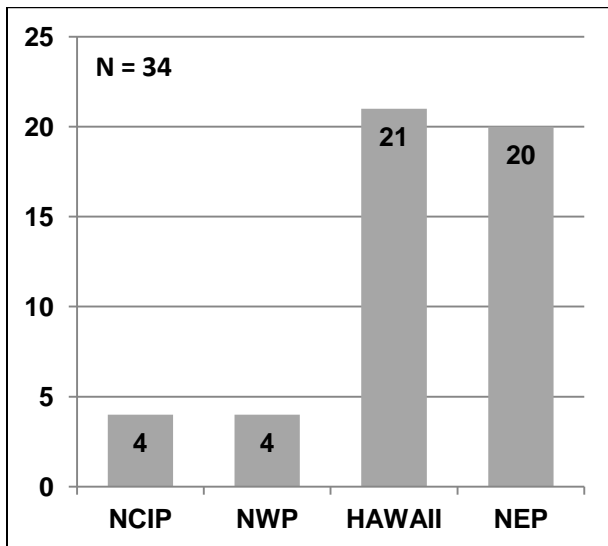


Figure 48: Arthropoda–Isopoda: Number of nonindigenous Isopoda with a population status of established or unknown by region.

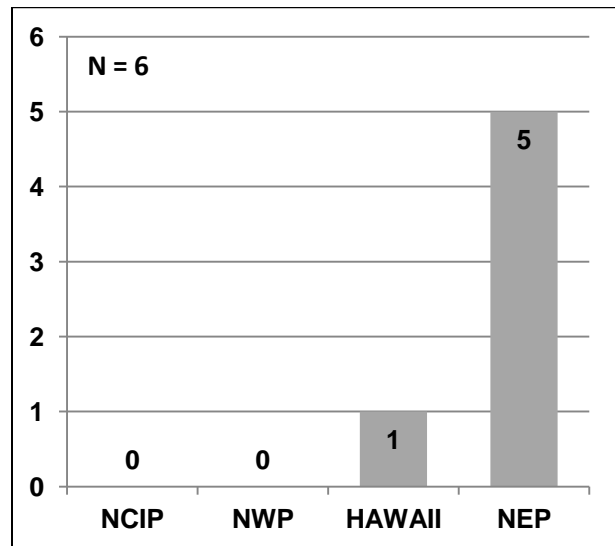


Figure 49: Arthropoda–Mysida: Number of nonindigenous Mysida with a population status of established or unknown by region.



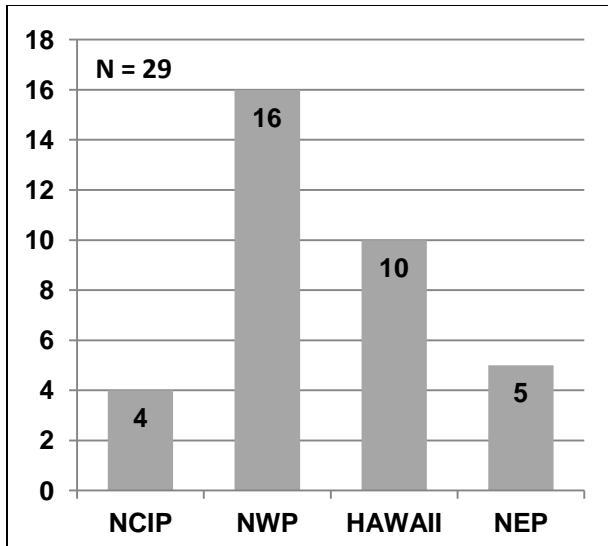


Figure 50: Arthropoda–Decapoda: Number of nonindigenous Decapoda with a population status of established or unknown by region.

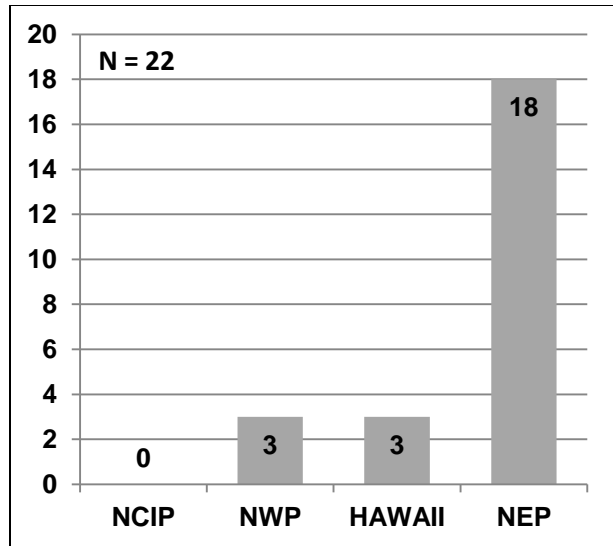


Figure 51: Arthropoda–Copepoda: Number of nonindigenous Copepoda with a population status of established or unknown by region.

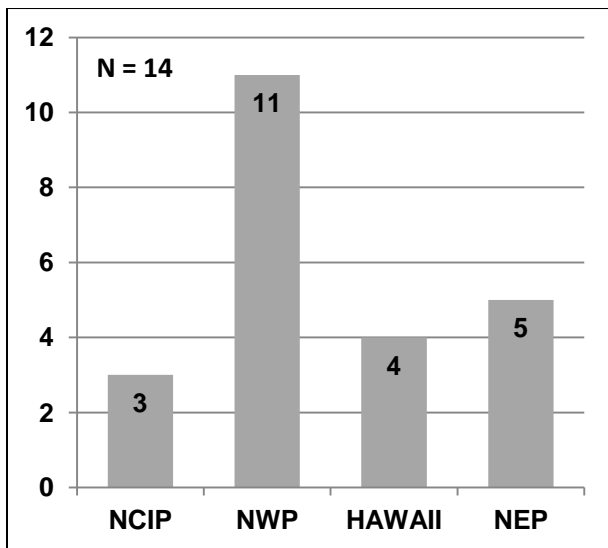


Figure 52: Arthropoda–Cirripedia: Number of nonindigenous Cirripedia with a population status of established or unknown by region.

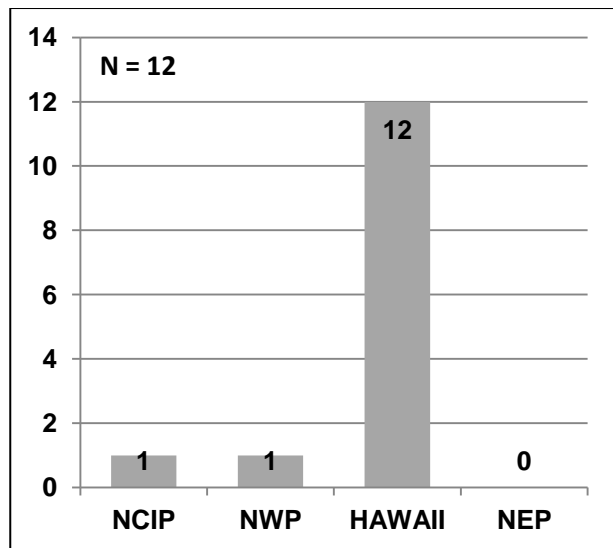


Figure 53: Arthropoda–Pycnogonida: Number of nonindigenous Pycnogonida with a population status of established or unknown by region.

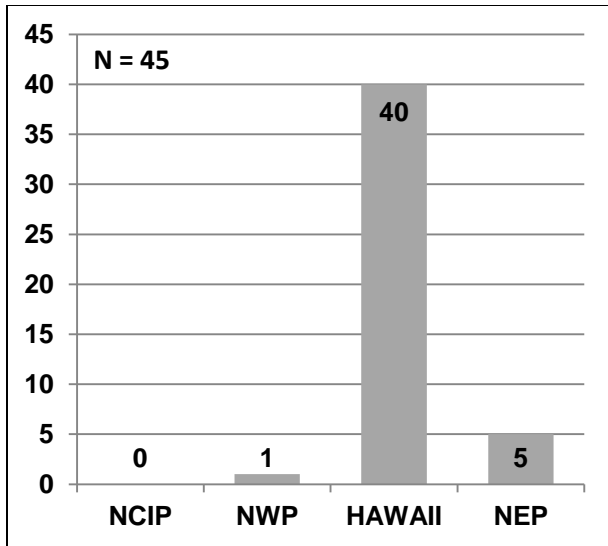


Figure 54: Arthropoda–Insecta: Number of nonindigenous Insecta with a population status of established or unknown by region.

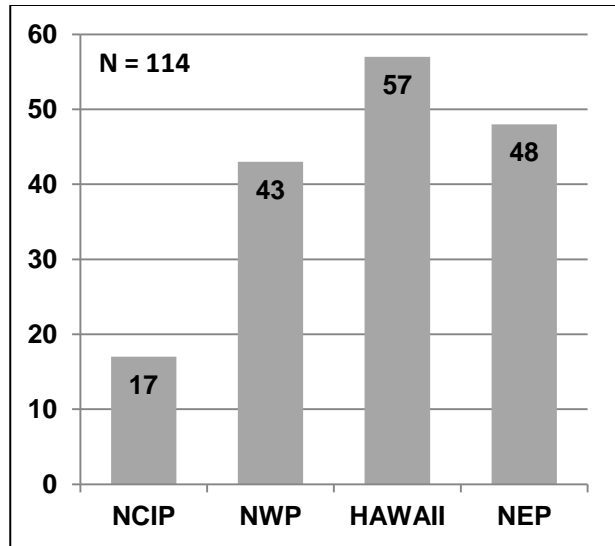


Figure 55: Phylum Chordata: Number of nonindigenous Chordata with a population status of established or unknown by region.

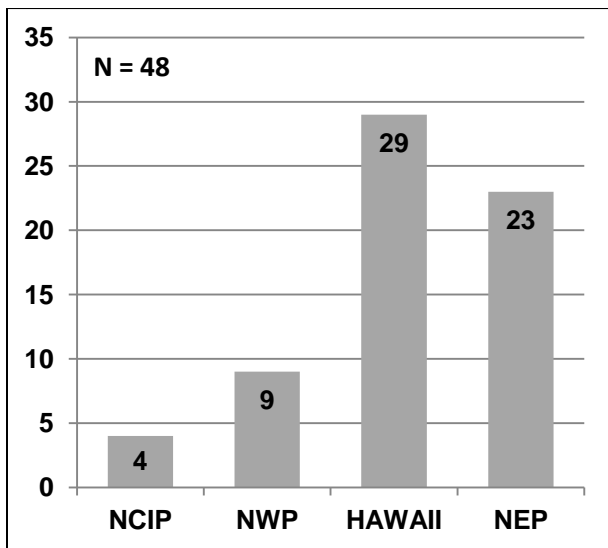


Figure 56: Chordata–Tunicata: Number of nonindigenous Tunicata with a population status of established or unknown by region.

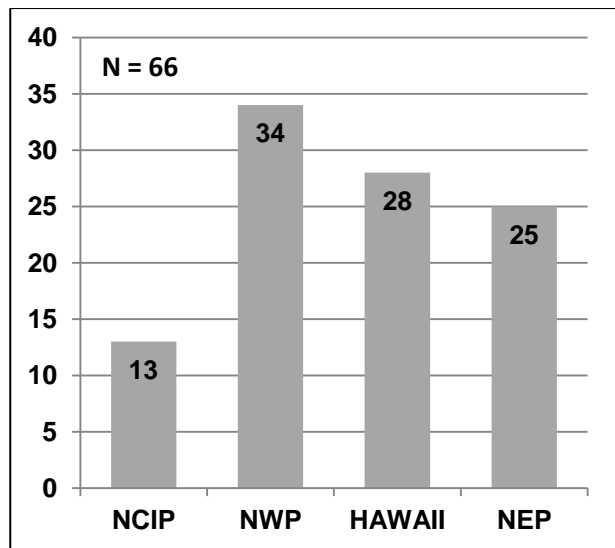


Figure 57: Chordata–Actinopterygii: Number of nonindigenous Actinopterygii with a population status of established or unknown by region.

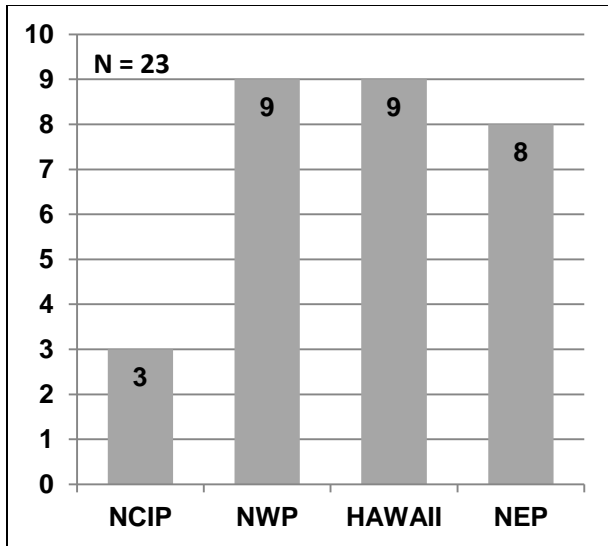


Figure 58: Number of other nonindigenous species with a population status of established or unknown by region.

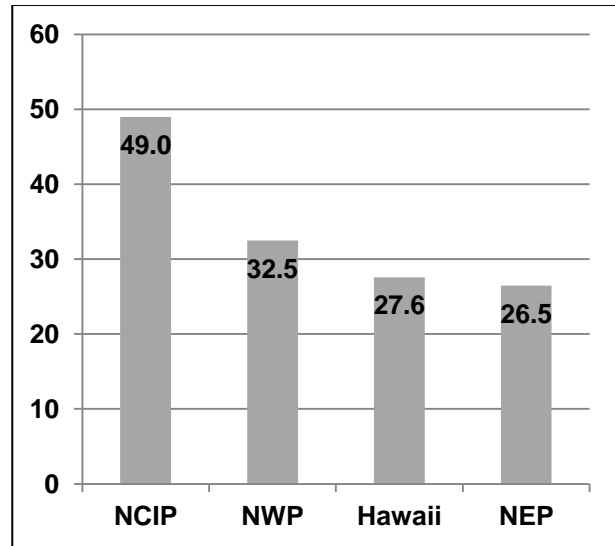


Figure 59: Relative percent of foulers as calculated as the ratio of foulers to non-fouling invaders in each ecoregion.

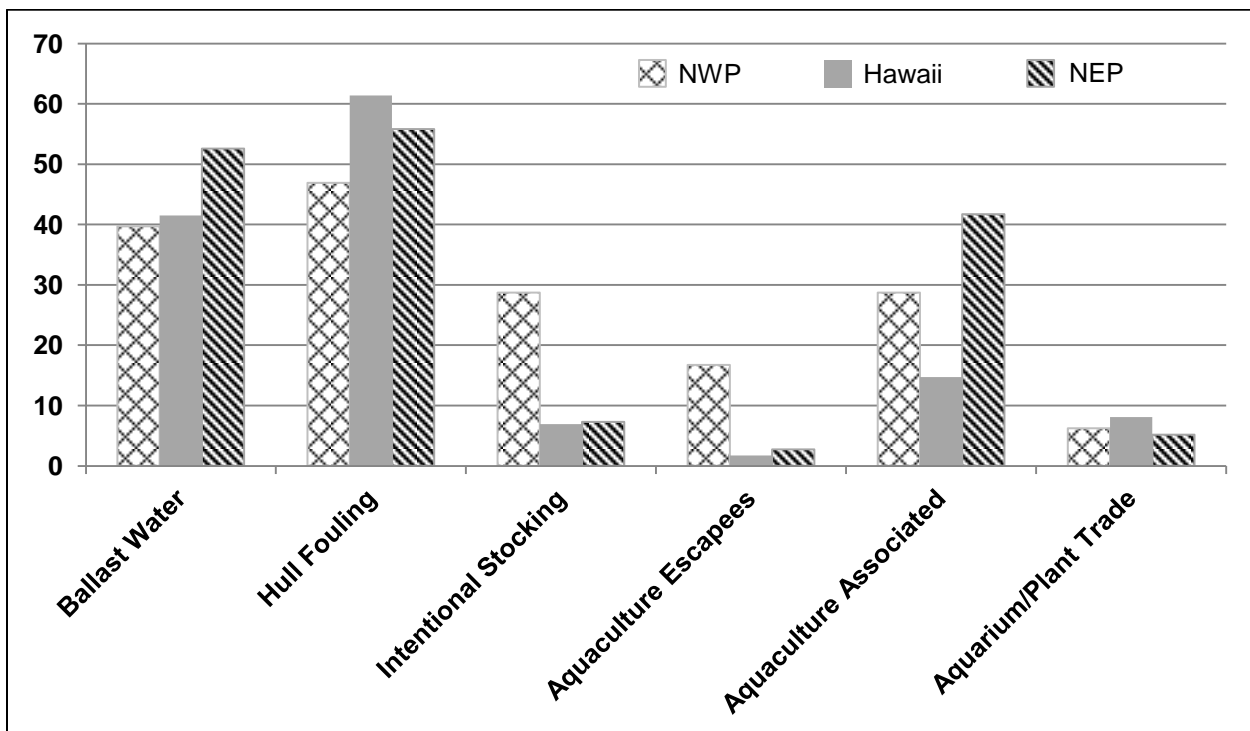


Figure 60: Percent of the total number of nonindigenous species within the NWP, Hawaii, and NEP that were potentially transported by each of the six most important vectors. The NCIP was not included in this analysis. Because species can be transported by multiple vectors, the sum of the percents within an ecoregion can exceed 100%.

# DECIPHERING SPECIES INFORMATION: KEY TO ABBREVIATIONS IN SPECIES PROFILES

#Test

## Key to Species' Profiles

Species ID: 100828

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**Taxon:** N/A

**Kingdom:**

**Subphylum:**

**Subclass:**

**Order:**

**Superfamily:**

**Taxonomic Author:**

**Subkingdom:**

**Superclass:**

**Infraclass:**

**Suborder:**

**Family:**

**Phylum:**

**Class:**

**Superorder:**

**Infraorder:**

**Subfamily:**

**Also Known As (Name - Type):**

Type of "Also Known As" Synonym Partial synonym Misidentified Misspelling Convention (e.g., subspecies)
--

**Common Names:**

--

**Type Locality:** Location where species first described. For provisional species, general location where species description may apply.

Ecoregion-level distribution

Puget Trough/Georgia Basin

Rio de la Plata

Master Classifications
Print Date: 10/20/2010 9:39:54 AM

<span style="display: inline-block; width: 10px; height: 10px; background-color: #00FF00; border: 1px solid black;"></span> Native	<span style="display: inline-block; width: 10px; height: 10px; background-color: #FF0000; border: 1px solid black;"></span> Nonindigenous	<span style="display: inline-block; width: 10px; height: 10px; background-color: #FFD700; border: 1px solid black;"></span> Cryptogenic	<span style="display: inline-block; width: 10px; height: 10px; background-color: #00FFFF; border: 1px solid black;"></span> Transient	<span style="display: inline-block; width: 10px; height: 10px; background-color: #800080; border: 1px solid black;"></span> Unclassified	<span style="display: inline-block; width: 10px; height: 10px; background-color: #8B4513; border: 1px solid black;"></span> Conflicting Classification	<span style="display: inline-block; width: 10px; height: 10px; background-color: #FFFFFF; border: 1px solid black;"></span> Unidentified
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**NWP**

**Date 1st record:** Date first record within Region

**Loc 1st record:** Location where first recorded within Region

**Established:** NIS population established anywhere within Region

**Hawaii**

**NEP**

VECTORS

SH Ships			MS Movable Structure		AF Aquaculture & Fisheries				ID Infra-structure	RE Res. Edu.	AP Aquarium & Plant Trade		REC Recreation	SF Sea Food	HR Habitat Restore	O Other
BW Ballast Water	SE Solid Ballast	HF Hull Fouling	S/R Stocking/Release	AE Aquacult. Escape	AA Aquaculture Associated	AO Atlantic Oyster	PO Pacific Oyster	IR Illegal Release	Devel.	A Aquarium	P Plant					

Comments: "Master Comments" -- limited to four lines.

Figure 61: First page of the key to the species profiles. The abbreviations are given in Table 1 and definitions for habitat and natural history attributes are in Tables 2 to 12.

**REGIME** General location where species occurs

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	Semi-enclosed w/full or close to ocean salinity	0 - 30 m	>30 - 200 m	> 200 m	Dunes & semi-terrestrial wetlands	Includes streams	Includes ponds	

**ECOSYSTEM** Ecosystem type in which the species occurs. Ecosystems are embedded within Regimes.

Unconsolidated				Consolidated										Pelagic	
Unvegetated				SAV	MAR	MAN	D	RI	Rocky Inter.	SR	CR	O/M	F	K	Water column
UV-CS	UV-TF	UV-SUB	Sub. Aquat. Veg.	Marsh	Man-grove	Dune	TP	RI-PH	Subtidal Rocky	Coral Reef	Oyster/Mus. Reef	Foul-Ing	Kelp Forest		
Coastal Shore	Tidal Flat (estuarine)	Subtidal (estuarine or oceanic)					Tide Pool	Phyllo-padix							

**DEPTH** Observed and preferred numerical depth range.

**Benthic Depth** Depth classes for benthic, demersal, and hyperbenthic species.

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
Dunes & semi-terrestrial wetlands	Splash Zone	Between high and low tides levels	Sub-Shallow	Sub-Deep	>200 - 2000 m	>2000 - 6000 m	>6000 m
			>0 - 30 m	>30 - 200 m			

**Pelagic Depth** Depth classes for species living in the water column.

Epipelagic 0 - 200 m			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep	>200 - 1000 m	>1000 - 2000 m	>2000 - 6000 m	>6000 m
0 - 1 m	>1 - 30 m	>30 - 200 m				

**UNCONSOLIDATED SUBSTRATE**

Sediments including cobble & gravel. This is the actual substrate type the organism occupies, which is embedded in the Ecosystem.

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
Silts & Clays	Sands	Mixture of silt/clays and sand	Unconsolidated 2 - 64 mm	Unconsolidated 64 - 254 mm	Mixture of mud/sand with gravel/cobble	Primarily consisting of detritus

**CONSOLIDATED SUBSTRATE**

The actual consolidated substrate type the organism occupies, which is embedded in the Ecosystem.

R Rocky	HP Hard Pan	Biogenic Living or Dead Organisms							Artificial Substrate					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		Coral	Oyster	Mussel	Worm Reef	Coralline Algae	Kelp	Rooted Aquatic	Mangrove	Drift Wood	Rip-Rap	Pilings	Hull/ Ballast	Other

**SALINITY** Observed and preferred numerical depth range.

Fresh 0 - <0.5 psu	Brackish 0.5 - <30 psu						Marine 30 - <40 psu		Hyper >40 psu
	Oligohaline 0.5 - <5 psu		Mesohaline 5 - <18 psu		Polyhaline 18 - <30 psu		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	30 - <36 psu	36 - <40 psu	
	0.5 - <3 psu	3 - <5 psu	5 - <10 psu	10 - <18 psu	18 - <25 psu	25 - <30 psu			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF Deposit Feeder	
Parasite	Symbiotic Algae	Primary Producer	Herbivore	Predator	Scavenger	Detritovore	Decomposer	Suspension Feeder	DF-SUR	DF-SUB

**REPRODUCTION**

Sexual						Asexual					
H Hermaphrodite	G/D	SF Spawning / Fertilization Type				BF	BUD	PAR/AGA	VP	SP	
SynH	SeqH	Gonochoeristic Dioecious	IF	FEE	FCS	P	Binary Fission	Budding	Parthenogenesis	Vegetative Propagation	Sporogenesis
Synchronous	Sequential		Internal Fertilization	External Fertilization	Free-Cast Spawner	Pollination					

**EARLY DEVELOPMENT** Relationship of Egg or Fetus to Parent

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP Larval Phase		FR	SD	SP
Live Birth w/Nutritional Supply	Egg Laying	Live Birth w/ No Nutritional Supply	Direct Development	LP-B Benthic Larvae	LP-P Planktonic Larvae	Fragments	Seeds	Spores

**HABITAT ASSOCIATION** Specifics of where the species lives within its habitat.

Pelagic Lives On/In Water Column			Benthic Lives On/In Consolidated or Unconsolidated Substrate										Epibiotic Lives On Organisms	
PL	NE	SUB	DEM Demersal - Mobile	SUR Surficial - Non-motile			UR	B	N	SF	IN	EPP	EPZ	
Pleuston - Floats at Sea Surface	Neuston - Floats Below Sea Surface	Submerged in Water Column	BP Benthic - pelagic - Swimming w/Contact Above Bottom	EPS Epibenthic - Swimming w/Contact w/Substrate	EPU Epibenthic - Unconsolidated Substrate	EPC Epibenthic - Consolidated Substrate	Under Rocks	Borer in Wood or Rock	Nestler - In Crevice	Semi-Infauanal	Infauanal	Epiphytic - On Plants	Epizoic - On Animals	

Figure 62: Second page of the key to the species profiles. The abbreviations are given in Table 1 and definitions for habitat and natural history attributes are in Tables 2 to 12. O = Observed habitat range; P = Preferred habitat range.

## TABLES

### Table Key to Species Profiles

Table 1: Tables associated with attributes in the species profiles and list of abbreviations used in the key to the species profiles (Figures 61 and 62).

Attribute / Level in Species Profile	Abbreviations	Meaning	Table / Figure
Date of 1st Record		First published report of a NIS	
	NWP	Northwest Pacific	
	NEP	Northeast Pacific	
Established		Whether NIS is established in NEP, Hawaii, or NWP. Natives assumed to be established.	
Vectors - Level 1			Table 2
	SH	Ships	“
	MS	Moveable structures	“
	AF	Aquaculture and fisheries	“
	ID	Infrastructure development	“
	RE	Research and education	“
	AP	Aquarium and plant trade	“
	REC	Recreation	“
	SF	Seafood	“
	HR	Habitat restoration and migration	“
	O	Other	“
Vectors - Level 2			“
	BW	Ballast water	“
	SB	Solid ballast	“
	HF	Hull fouling	“
	S/R	Stocking and release	“
	AE	Aquaculture escape	“
	AA	Aquaculture associated	“
	IR	Illegal release	“
	A	Aquarium	“
	P	Plant	“
Vectors - Level 3	AO	Atlantic oyster	“
	PO	Pacific oyster	“
Regime			Table 3
Ecosystem - Level 2			Table 4
	SAV	Submerged aquatic vegetation	“
	MAR	Marsh	“
	MAN	Mangrove	“
	D	Dunes	“
	RI	Rocky intertidal	“
	SR	Subtidal rocky	“
	CR	Coral reef	“
	O/M	Oyster/mussel reef	“
	F	Fouling assemblage	“
	K	Kelp forest	“
Ecosystem - Level 3			“
	UV-CS	Coastal shore	“
	UV-TF	Tidal flat (estuaries)	“
	UV-SUB	Subtidal (estuaries and oceanic)	“
	TP	Tide pool	“

Attribute / Level in Species Profile	Abbreviations	Meaning	Table / Figure
	RI-PH	Rocky intertidal - <i>Phyllospadix</i>	“
Depth			Table 5
Unconsolidated Substrate			Table 6
Consolidated Substrate - Level 1			Table 6
	R	Rocky	“
	HP	Hard pan	“
Consolidated Substrate - Level 2			“
	C	Coral	“
	O	Oyster	“
	M	Mussel	“
	W	Worm Reef	“
	CA	Coralline algae	“
	K	Kelp	“
	RA	Rooted aquatics	“
	MAN	Mangrove	“
	DW	Drift wood	“
	R	Rip-rap	“
	P	Pilings	“
	H + B	Hull/Ballast	“
	Oth	Other	“
Salinity			Table 7
Trophic Level and Feeding - Level 1			Table 8
	PAR	Parasite	“
	SA	Symbiotic algae	“
	PP	Primary producer	“
	H	Herbivore	“
	P	Predator	“
	S	Scavenger	“
	DET	Detritivore	“
	DEC	Decomposer	“
	SF	Suspension feeder	“
	DF	Deposit feeder	“
Trophic Level and Feeding - Level 2			“
	DF-SUR	Surface deposit feeder	“
	DF-SUB	Subsurface deposit feeder	“
Reproduction - Level 2			Table 9
	H	Hermaphrodite	“
	G/D	Gonochoristic/Dioecious	“
	SF	Spawning/Fertilization type	“
	BF	Binary fission	“
	BUD	Budding	“
	PAR/AGA	Parthenogenic/Agamospermy	“
	VP	Vegetative propagation	“
	SP	Sporogenesis	“
Early Development - Level 1			Table 10
	V	Viviparous	“
	OVI	Oviparous	“

<b>Attribute / Level in Species Profile</b>	<b>Abbreviations</b>	<b>Meaning</b>	<b>Table / Figure</b>
	OVO	Ovoviviparous	“
Juvenile development and dispersal - Level 1			Table 11
	LP	Larval phase	“
	FR	Fragments	“
	SD	Seeds	“
	SP	Spores	“
Juvenile development and dispersal - Level 2			“
	LP-B	Benthic larvae	“
	LP-P	Planktonic larvae	“
Habitat Association - Level 2			Table 12
	PL	Pleuston	“
	NE	Neuston	“
	SUB	Submerged in water column	“
	DEM	Demersal - motile	“
	SUR	Surficial - non-motile	“
	UR	Under rocks	“
	B	Borer	“
	N	Nestler	“
	SF	Semi-infaunal	“
	IN	Infaunal	“
	EPP	Epiphytic	“
	EPZ	Epizoic	“
Habitat Association - Level 3			“
	BP	Benthopelagic	“
	EPS	Epibenthic - swimming	“
	EPU	Epibenthic - unconsolidated	“
	EPC	Epibenthic - consolidated	“



## Vectors

Table 2: Definitions of terms for primary vectors of invasion.

Level 1	Level 2	Level 3	Definition
Ships and Boats			Transport associated with commercial vessels and recreational boats.
	Commercial		Transport associated with commercial vessels including cruise ships and fishing boats.
		Ballast Water	Transport of organisms in ballast water, including species growing on the interior of ballast water tanks and in the sediment in the bottom of ballast tanks.
		Solid Ballast	Transport of organisms living on or associated with solid ballast such as rocks. More important historically.
		Hull Fouling	Transport of organisms living on or associated with the hulls of commercial vessels, including organisms ensnared on propellers.
		Other	Transport associated with other mechanisms on commercial vessels, including bilge water and anchor chains.
	Recreational		Transport of organisms associated with recreational boats, including boats limited to coastal/inland use and ocean-going yachts.
		Ballast Water	Transport of organisms in ballast water, including species growing on the interior of ballast water tanks and in the sediment in the bottom of ballast tanks. Usually not a major vector in recreational boats.
		Solid Ballast	Transport of organisms living on or associated with solid ballast such as rocks. More important historically.
		Hull Fouling	Transport of organisms living on or associated with the hulls of recreational boats, including organisms ensnared on propellers.
		Other	Transport associated with other mechanisms on recreational boats.
Moveable Structures			Transport of organisms on mobile seagoing structures other than ships and boats.
	Drilling Platforms		Transport of organisms associated with the movement of drilling platforms or oil rigs.
	Dry Docks		Transport of organisms associated with the movement of floating dry docks.
	Buoys		Transport of organisms associated with the movement of buoys.
	Other		Transport of organisms associated with other moveable structures.
Aquaculture and Fisheries			Transport of target species and “hitchhikers” associated with enhancement of wild fisheries stocks or aquaculture.
	Intentional Stocking/Release		Intentional release of a nonindigenous species usually a fishery or recreational species.
	Aquaculture Escapees		Target aquaculture species escaping into the wild.
	Aquaculture Associated Species		Nonindigenous species associated with target aquaculture species (hitchhikers) escaping into the wild.

Level 1	Level 2	Level 3	Definition
		Atlantic oysters	Transport of species associated with Atlantic oysters, including <i>Crassostrea virginica</i> .
		Pacific oysters	Transport of species associated with Pacific oysters, including <i>Crassostrea gigas</i> and <i>C. ariakensis</i> .
	Intentional Illegal Release		The intentional illegal release of nonindigenous species by the public, often to establish a game population.
	Other		Other transport mechanisms associated with fisheries and aquaculture.
Infrastructure Development			Transport of organisms associated with activities related to the development and maintenance of water ways, agriculture, transportation, or forms of commerce.
	Canals		Transport associated with construction of a canal between water bodies that were unconnected or had only limited connection.
		Navigation Canals	Transport associated with canals constructed to allow navigation of ships and barges.
		Irrigation Canals	Transport associated with canals constructed to transport irrigation water, more important for freshwater organisms.
	Dredging		Transport associated with either the disposal of dredge materials or on the dredgers and their equipment.
	Other		Other transport mechanisms associated with infrastructure development.
Research and Education			Accidental releases from facilities related to research or education.
	Public Aquaria		Accidental releases from public aquaria.
	Research		Accidental releases from academic, governmental, or private research facilities.
	Other		Accidental releases from other types of research and education facilities.
Aquarium and Plant Trade			Transport of organisms associated with the importation, culture, selling, and personal culture/release of aquarium species or ornamental plants.
	Aquarium Escapees and Hitchhikers		Transport and subsequent escape of aquarium fish/plants or of the flora and fauna associated with the aquarium fish/plants and associated packing material.
	Ornamental Plant Escapees and Hitchhikers		Transport and subsequent escape of ornamental plants or of the flora and fauna associated with ornamental plants and their soil and packing material.
	Other		Other transport mechanisms related to the aquarium or plant trade.
Recreation			Transport associated with outdoor recreational activities (other than gardening).
	Live Bait and Packing		Transport associated with release of live bait or the packing material, including water, used in live bait.
	Other		Other transport mechanisms associated with recreational water activities.
Live Seafood			Transport associated with live seafood trade
	Processing		Transport associated with the processing phase of the live seafood trade.
	Release		Purposeful or accidental release of live seafood.

Level 1	Level 2	Level 3	Definition
	Packing		Transport of “hitchhikers” associated with the packing material used with live seafood.
Habitat Restoration and Mitigation			Transport associated with activities related to the creation or restoration of habitats, including control of invasive pests.
	Habitat Restoration		Transport associated with habitat restoration such as wetland creation. Includes both the species used in habitat restoration and any “hitchhikers” associated species, soil, or packing material.
	Biocontrol		Introduction through non-native biocontrol species becoming established.
Other/Unknown			Vector either not included in above list or unknown.
	Other		Vector not captured in above list.
	Unknown		Unknown vector.

## Regimes

Table 3: Definitions for the regime categories. Regimes are the broad physical and environmental divisions based on a combination of salinity, geomorphology, and depth (see Madden et al., 2005).

Regime Class	Definition
Terrestrial	Land areas not directly impinging upon aquatic ecosystems.
Lakes and Ponds (Lentic)	Body of standing fresh water, including wetlands.
Rivers, Streams, and Creeks (Lotic)	Flowing bodies of freshwater, including riparian zones.
Estuaries and Lagoons	Estuary: A semi-enclosed coastal water body with one or more rivers or streams flowing into it and with a connection to the ocean. Salinities in estuaries are normally below that of the bordering ocean water. Lagoons: Shallow coastal water bodies separated from the ocean by a barrier island or by shallow or exposed sandbanks or coral reefs. Depending upon freshwater inputs and connection to the ocean, salinity in lagoons can range from essentially fresh to hypersaline.
Coastal Fringe	Area between terrestrial and nearshore or estuarine ecosystems with primarily terrestrial characteristics but strongly effected by bordering aquatic ecosystem (e.g., sand dunes, estuarine shrub/scrub wetland, estuarine forest wetland).
Coastal Bay	A semi-enclosed segment of a coastline that has marine salinities or only slightly reduced salinities.
Nearshore	0 – 30m. The outer coast; from the intertidal to 30m bathymetric isopleth.
Shelf	30 – 200m bathymetric isopleths. The benthos and water above that borders the continent and extends out to where there is an increased slope of the seafloor, approximately 200m depth.
Oceanic	> 200m bathymetric isopleths. Includes the benthos and water above the continental slope and ocean floor.

## Ecosystems

Table 4: Definitions for the ecosystem categories. Ecosystems are broad ecosystem types located within the regimes.

Major Habitat Type: Level 1	Ecosystem Class: Level 2	Ecosystem Class: Level 3	Ecosystem Class: Level 4	Definition
Unconsolidated Ecosystems				Ecosystem types associated with sediment.
	Unvegetated Sediment			Sediment environments where plants or algae do not dominate. Exposed sediment.
		Coastal Shore		Sediment environments along the coast that are affected by the tides and water activity (shore waves). i.e. sandy beaches
			Clastic Sediments	A sediment environment (beach) composed of rock fragments.
			Carbonate Sediment	A sediment environment (beach) composed of calcium carbonate, including shells, calcified algae, and coral skeletons.
		Tide Flats		Relatively flat, sediment areas that are submerged or exposed by the changing tides. Includes mud flats.
			Burrowing Shrimp	Sediment environments that are composed of shrimp burrows. These environments are usually dominated by one species of shrimp (e.g., <i>Neotrypaea</i> sp.).
			Clastic Sediments	A tidal flat where the sediment is composed of rock fragments.
			Carbonate Sediment	A tidal flat where the sediment is composed of calcium carbonate. Sources include shells, calcified algae, and coral skeletons.
		Subtidal		Sediment that is covered by a body of water at all times, without exposure to air due to tides.
			Clastic Sediments	Sandy subtidal where the sediment is composed of rock fragments.
			Carbonate Sediment	Sandy subtidal where the sediment is composed of calcium carbonate. Sources include shells, calcified algae, and coral skeletons.
	Submerged Aquatic Vegetation (SAV)			Sediment environments that include and are dominated by aquatic plants that are covered by water, i.e. seagrasses.
		<i>Zostera</i>		SAV environments dominated by the seagrass <i>Zostera</i> .
			<i>Zostera marina</i>	SAV environments dominated by the seagrass <i>Zostera marina</i> . <i>Z. marina</i> is native to the Northeast Pacific (NEP).

Major Habitat Type: Level 1	Ecosystem Class: Level 2	Ecosystem Class: Level 3	Ecosystem Class: Level 4	Definition
			<i>Zostera japonica</i>	SAV environments dominated by the seagrass <i>Zostera japonica</i> . <i>Z. japonica</i> is introduced to the NEP and native in the Northwest Pacific (NWP).
		<i>Posidonia</i>		SAV environments dominated by plant species within the genus <i>Posidonia</i> .
		<i>Halodule</i>		SAV environments dominated by plant species within the genus <i>Halodule</i> (specific manatee grasses or seagrasses).
		<i>Cymodocea</i>		SAV environments dominated by plant species within the genus <i>Cymodocea</i> (manatee grasses).
		<i>Syringodium</i>		SAV environments dominated by plant species within the genus <i>Syringodium</i> (manatee grasses).
		<i>Thalassia</i>		SAV environments dominated by plant species within the genus <i>Thalassia</i> (turtle grasses).
		<i>Ruppia</i>		SAV environments dominated by plant species within the genus <i>Ruppia</i> (widgeonweed or widgeon grass).
		<i>Halophila</i>		SAV environments dominated by plant species within the genus <i>Halophila</i> .
		Other		Sediment environments that are dominated by an aquatic plant that is not included in the provided SAV choices.
	Macroalgal Beds			Sediment environments where macroalgae are dominant and shape the habitat characteristics (e.g., algal mats of <i>Ulva</i> , <i>Porphyra</i> ).
	Emergent Marsh			Intertidal sediment environments dominated by vegetation that is rooted in the soil. i.e. marsh grasses and salt tolerant succulents.
		<i>Distichlis</i>		Marshes that are dominated by plant species within the genus <i>Distichlis</i> .
		<i>Spartina</i>		Marshes that are dominated by plant species within the genus <i>Spartina</i> (cord grasses).
		<i>Salicornia/ Sarcocornia</i>		Marshes that are dominated by plant species within the genus <i>Salicornia</i> (glasswort, pickleweed). Note that some species of <i>Salicornia</i> are now referred to <i>Sarcocornia</i> .
		<i>Juncus</i>		Marshes that are dominated by plant species within the genus <i>Juncus</i> .
		Other		Marshes that are dominated by an aquatic plant that is not included in the provided marsh plant choices.

Major Habitat Type: Level 1	Ecosystem Class: Level 2	Ecosystem Class: Level 3	Ecosystem Class: Level 4	Definition
	Mangrove			Intertidal sediment environments dominated by salt-tolerant trees and shrubs. Found in tropical and subtropical areas.
		<i>Rhizophora</i>		Mangrove forests that are dominated by plant species within the genus <i>Rhizophora</i> .
		<i>Avicennia</i>		Mangrove forests that are dominated by plant species within the genus <i>Avicennia</i> (includes black mangroves).
		<i>Languncularia</i>		Mangrove forests that are dominated by plant species within the genus <i>Languncularia</i> .
		Other		Mangrove forests that are dominated by an aquatic plant that is not included in the provided marsh plant choices.
	Dune			Sand hills or ridges on land that are be created by wind.
	Wrack			Dried vegetation and associated debris usually left behind by the receding tide.
	Other			Sediment habitats not previously mentioned.
Consolidated Ecosystem				Ecosystem types associated with hard substrate.
	Rocky Intertidal			Rocky environments on the coastal shore that are periodically exposed to both air and water. The zone between the high and low tide marks.
		Tide Pool		A pool of water left behind by the receding tide. Commonly found in the rocky intertidal.
		<i>Phyllospadix</i>		Rocky habitats dominated by species of surfgrass within the genus <i>Phyllospadix</i> .
		Caves		A chamber formed by rocks or another hard substrate (i.e. lava tubes) in the intertidal zone.
	Subtidal Rocky			Rocky environments below low tide mark that are always submerged by water.
	Coral Reef			Areas where the rocky substrate is dominated by reef forming coral animals.
	Oyster/ Mussel Reef			Hard substrate that is covered or formed by bivalve shells.
	Worm Reef			Hard substrate that is predominantly composed of worm tubes.
	Coralline Algae Reef or Habitat			Hard substrate that is predominantly composed of calcified algae. The algae can either be the encrusting form or the unattached rhodolith form.

<b>Major Habitat Type: Level 1</b>	<b>Ecosystem Class: Level 2</b>	<b>Ecosystem Class: Level 3</b>	<b>Ecosystem Class: Level 4</b>	<b>Definition</b>
	Kelp forest			Hard substrate that supports the growth of very large brown algae (Laminariales and/or Fucales). These habitats tend to be subtidal and occur in mid and high latitudes.
	Fouling			Hard substrate such as a boat hull that supports a community of organisms.
	Other			Habitats associated with hard substrates that were not previously mentioned.
Pelagic Ecosystem				The ocean water column and unobstructed surface. Open water.
	Water Column			Open water habitat where organisms are completely surrounded by water (no surfaces, sides, or floors); within the pelagic zone.
	Floating Vascular Plants or Macroalgae			Large mats/rafts of plants or algae that float unattached on the water's surface in the open ocean.
	Flotsam			Aggregated floating debris in the open ocean.

## Depth

Table 5: Definitions for the depth categories for benthic and pelagic habitats.

Benthic/Pelagic	Depth Class: Level 1	Depth Class: Level 2	Definition
Benthic			Associated with the seafloor.
	Coastal Fringe		The terrestrial area immediately surrounding estuaries and oceans. It is the location of habitats such as coastal dunes and certain types of intermittently flooded wetlands (e.g., forested wetlands).
	Supralittoral		Area above the high water level that is periodically wetted by breaking waves or during extreme storms. The splash zone.
	Intertidal (MLLW-MHHW)		The zone between the average daily highest high tide and the average daily lowest low tide. This zone is periodically submerged by water or exposed to air. Also referred to as the littoral zone, though some publications use littoral to include the shallow subtidal.
		Upper Intertidal	Highest intertidal zone, predominantly exposed to the air.
		Mid Intertidal	Between the highest and lowest intertidal zone.
		Lower Intertidal	Lowest intertidal zone, predominantly submerged by water.
	Neritic		> 0 – 200m. Subtidal zone extending from the low water mark to the approximate edge of the continental shelf. Also referred to as the sublittoral zone.
		Shallow Subtidal	> 0 – 30m
		Deep Subtidal	>30 – 200m
	Bathyal		>200 – 2000m. This benthic zone is below the euphotic zone and extends down the continental slope.
	Abyssal		>2000 – 6000m. This zone has a temperature of 4°C or less. It is the largest benthic ocean zone.
	Hadal		> 6000m. The deepest areas of the sea, including ocean trenches.
Pelagic			The estuary or ocean water column and unobstructed surface. Open water.
	Epipelagic		0 – 200m
		Surface	0 – 1m
		Shallow	> 1 - 30m
		Deep	> 30 – 200m
	Mesopelagic		>200 – 1000m
	Bathypelagic		> 1000 – 2000m
	Abyssopelagic		> 2000 – 6000m
	Hadopelagic		> 6000m



## Substrate

Table 6: Definitions for substrate categories.

Level 1	Level 2	Level 3	Definition
Unconsolidated			Substrate composed of individual particles $\leq 256$ mm that are not cemented together. Substrate that can be moved by tidal or ocean currents or moved by larger organisms.
	Mud		Unconsolidated sediment composed of $\geq 75\%$ , by weight, particles $< 0.063$ mm in size. The combination of clay and silt is referred to as “fines”.
		Clay	Unconsolidated sediment composed of $\geq 75\%$ , by weight, particles in the size range of 0.001-0.004 mm.
		Silt	Unconsolidated sediment composed of $\geq 75\%$ , by weight, particles in the size range of 0.004-0.063 mm.
		Mineral	Mud primarily composed of rock fragments.
		Carbonate	Mud primarily composed of carbonate sediments, such as muds derived from corals.
		Siliceous ooze	Mud composed of $> 30\%$ siliceous remains from diatoms, radiolarians, siliceous sponges, and silicoflagellates.
	Sand		Unconsolidated sediment composed of $\geq 75\%$ , by weight, particles in the size range of 0.063 - 2 mm.
		Fine sand	Unconsolidated sediment composed of $\geq 75\%$ , by weight, particles in the size range of 0.063 - 0.25 mm.
		Medium sand	Unconsolidated sediment composed of $\geq 75\%$ , by weight, particles in the size range of 0.25 - 0.5 mm.
		Coarse sand	Unconsolidated sediment composed of $\geq 75\%$ , by weight, particles in the size range of 0.5 - 2 mm.
		Mineral	Sand primarily composed of rock fragments.
		Carbonate	Sand primarily composed of carbonate sediments, such as maerl.
		Siliceous ooze	Sand composed of $> 30\%$ siliceous remains from diatoms, radiolarians, siliceous sponges, and silicoflagellates.
	Mixed fines		Combination of mud and sand, where the two classes constitute $> 95\%$ of the weight. Do not confuse with “mixed sediments”, a mixture of mud/sand and cobble/gravel/rock.
		Sandy mud	Unconsolidated substrate where mud constitutes 25-50% and sand 50-75% of the weight.
		Muddy sand	Unconsolidated substrate where mud constitutes $< 50$ to 75% and sand 25-50% of the weight.
		Mineral	Mixed fines primarily composed of rock fragments.

Level 1	Level 2	Level 3	Definition
		Carbonate	Mixed fines primarily composed of carbonate sediments.
		Siliceous ooze	Mixed fines composed of > 30% siliceous remains from diatoms, radiolarians, siliceous sponges, and silicoflagellates.
	Gravel		Unconsolidated sediment composed of $\geq 75\%$ , by weight, of particles in the range of 2 - 64 mm.
		Clean gravel	Gravel substrate with <5% mud and sand intermixed.
		Gravel w/mud	Gravel substrate with $\geq 5\%$ mud intermixed.
		Gravel w/sand	Gravel substrate with $\geq 5\%$ sand intermixed.
		Mineral	Gravel primarily composed of rock fragments.
		Carbonate	Gravel primarily composed of carbonate sediments, such as maerl.
	Cobble		Unconsolidated sediment composed of $\geq 75\%$ by weight of particles in the size range of 64–256 mm. In some classifications, cobble is considered a consolidated sediment.
		Clean cobble	Cobble sediment with <5% sand and mud intermixed.
		Cobble w/mud	Cobble sediment with $\geq 5\%$ mud intermixed.
		Cobble w/sand	Cobble sediment with $\geq 5\%$ sand intermixed.
		Mineral	Cobble composed primarily of rock fragments.
		Carbonate	Cobble composed primarily of carbonate.
	Mixed sediments		Unconsolidated sediment composed of both sand and mud with gravel or cobble, where gravel and cobble constitute $\geq 5\%$ but $\leq 75\%$ of the sediment weight. Do not confuse with “mixed fines”.
		Gravelly mud	Unconsolidated sediment where gravel >5% but <30% of the weight and the percentage of mud exceeds the percentage of sand.
		Muddy gravel	Unconsolidated sediment where gravel $\geq 30\%$ but $\leq 75\%$ of the weight and the percentage of mud exceeds the percentage of sand.
		Gravelly sand	Unconsolidated sediment where gravel >5% but <30% of the weight and the percentage of sand exceeds the percentage of mud.
		Sandy gravel	Unconsolidated sediment where gravel $\geq 30\%$ but $\leq 75\%$ of the weight and the percentage of sand exceeds the percentage of mud.
	Organic Sediment		Sediment with high proportion of vegetative detritus. $\geq 30\%$ organic matter ( $\geq 17\%$ organic carbon) according to Howes and Kenik (1997).
Consolidated			Substrates composed of particles >256 mm or of unbroken rock. Substrate not moved by organisms or tidal or ocean currents except in extreme storms.
	Rock		

Level 1	Level 2	Level 3	Definition
		Boulder	Substrates composed of particles >256 mm but not forming a single unbroken surface.
		Bedrock	Unbroken rock. Includes both hard rocks and softer rocks, such as chalk.
	Hardpan		Sand, silt, or clay particles that are slightly cemented to well cemented together to form a hard, and often flat, consolidated surface.
	Biogenic		Substrate composed of the surface of living or dead organisms.
		Coral	Substrate primarily composed of living or dead corals. Coral broken into silt, clay, sand, or cobble sized particles are classified as unconsolidated carbonate sediments.
		Oyster	Substrate primarily composed of living or dead oyster shells. Shells broken into clay, silt, sand, or cobble sized particles are classified as unconsolidated carbonate sediments.
		Mussel	Substrate primarily composed of living or dead mussel shells. Shells broken into clay, silt, sand, or cobble sized particles are classified as unconsolidated carbonate sediments.
		Worm reef	Substrate provided by worms with hard tubes constructed of sand grains or calcium carbonate (e.g., Sabellariidae).
		Coralline algae	Calcareous substrate provided by algae of the Order Corallinales.
		Kelp	Substrate provided by the fronds and holdfasts of kelp.
		Rooted Aquatic	Substrate provided by the leaves of rooted aquatic vegetation, including emergent vegetation.
		Mangrove	Hard substrate provided by mangroves.
		Drift wood	Natural drift wood.
		Other	Other consolidated substrates not included in the list of biotic substrates.
	Artificial Substrate		Hard substrates placed into estuarine or oceanic environments.
		Rip rap	Hard substrate provided by rocks and concrete used in breakwalls, groins, jetties, and shoreline armoring.
		Piling	Hard substrate provided by concrete and wood piling and piers to support docks, bridges, and other superstructures.
		Hulls & Ballast tanks	Hard substrate on the exterior or interior of ships and boats, including derelict or decommissioned ships.
		Other	Other artificial substrates not listed above.

## Salinity

Table 7: Definitions for the salinity classes.

<b>Salinity Classes: Level 1</b>	<b>Venice System: Level 2</b>	<b>Division of Venice Classes: Level 3</b>	<b>Definition</b>
Fresh water			< 0.5 psu
Brackish			0.5 - < 30 psu
	Oligohaline		0.5 - < 5 psu
		Beta-oligohaline	0.5 - < 3 psu
		Alpha-oligohaline	3 - < 5 psu
	Mesohaline		5 - < 18 psu
		Beta-mesohaline	5 - < 10 psu
		Alpha-mesohaline	10 - < 18 psu
	Polyhaline		18 - < 30 psu
		Beta-polyhaline	18 - < 25 psu
		Alpha-polyhaline	25 - < 30 psu
Marine/Euhaline			30 - < 40 psu
		Beta-euhaline	30 - < 36 psu
		Alpha-euhaline	36 - < 40 psu
Hypersaline			≥ 40 psu

## Trophic Modes

Table 8: Definitions for the trophic modes.

Level 1	Level 2	Level 3	Level 4	Explanation
Primary Producer				Metabolic energy derived from sunlight or chemosynthesis in contrast to consumption of other organisms.
	Photosynthetic			Metabolic energy derived from photosynthesis.
	Chemosynthetic			Metabolic energy derived from oxidation of methane, hydrogen sulfide, or other reduced molecules.
Herbivore				An organism that feeds on plants. Species feeding on phytoplankton via suspension feeding are covered under "Suspension Feeders".
	Grazer			An organism that feeds by rasping benthic algae from sediment, rocks, or leaf surfaces. May consume some smaller benthic organisms, but if animals are dominant food source, the species is classified as a predator.
	Folivore			Feeds on leaves.
	Other			Herbivore feeding mechanism not included in the above list.
Predator				Feeds on animals.
	Secondary Consumer			Predator feeding primarily on herbivores. Also called a Primary predator.
	Tertiary Consumer			Predator feeding primarily on secondary consumers. Also called a Secondary predator.
	Quaternary Consumer			Predator feeding primarily on tertiary consumers. Also called a Tertiary predator.
	Quinary Consumer			Predator feeding primarily on quaternary consumers. Also called a Quaternary predator.
Scavenger				Feeds on dead organic material. Usually used for species feeding on larger particles or animal remains
Detritivore				In contrast to scavengers, feed on small detritus (i.e. plant and animal remains).
Decomposer				Organisms that breakdown and digest dead organisms. Bacteria and fungi are major decomposer groups.
Suspension Feeder				Feeds on phytoplankton, zooplankton, and/or suspended particles in the water column.
	Active			Captures planktonic particles by pumping or sweeping water past a filter.
	Passive			Utilizes ocean currents to transport planktonic particles past a particle-trapping mechanism, such a filter or sticky trap.
	Obligate			Feeds only as a suspension feeder.

Level 1	Level 2	Level 3	Level 4	Explanation
	Facultative			Switches between suspension feeding and other feeding mechanism, such as deposit feeding.
Deposit Feeder				Ingests sediment particles, feeding on the associated detritus, microflora, and microorganisms.
	Surface Deposit Feeder			Ingests particles at the sediment interface.
	Subsurface Deposit Feeder			Ingests subsurface particles.
	Obligate			Feeds only as a deposit feeder.
	Facultative			Switches between deposit feeding and other feeding modes, such as suspension feeding.
Other				Feeding mechanism not included in the above list.
Parasite/ Disease				Organisms that feed on host and are physiologically / metabolically dependent upon host. Usually smaller than host.
	Ectoparasite			External parasite, including gill parasites.
	Endoparasite			Internal parasite.
	Disease			Species deriving nutrition from symbiotic microflora, such as many corals. This classification is for the host species; the microflora would be classified as a primary producer.
Symbiotic Algae				Species deriving nutrition from symbiotic microflora, such as many corals. This classification is for the host species; the microflora would be classified as a primary producer.

## Reproductive Strategies

Table 9: Definitions for the terms describing various reproductive strategies.

Level 1	Level 2	Level 3	Level 4	Explanation
Asexual reproduction				Reproduction without the fusion of gametes.
	Binary fission			Splitting into two approximately equal parts.
	Budding and fragmentation			Splitting into unequal parts. Buds may form on the body of the "parent".
	Parthenogenesis Agamospermy			In animals, parthenogenesis is the development of an unfertilized egg. In plants, agamospermy (apomixes) is the production of fertile seeds without pollination.
		Heterogamy		Alternation between sexual and asexual reproductive phases.
	Vegetative propagation			Formation of new individuals in plants without the production of spores or seeds by stolons (runners) or formation of bulbs. Forms a plant colony.
	Sporogenesis			Reproduction and dispersal through formation of spores. Spores differ from seeds in having little food reserves. Most spores are haploid and may be part of an alternation of haploid and diploid life history stages. Red algae have both diploid and haploid spores.
Sexual Reproduction				Reproduction through the fusion of gametes (fertilization).
	Hermaphrodite/Monoecious			
		Monoecious (plants)	Self fertilizing: Y/N	Plants having separate male and female flowers on the same individual plant.
		Synchronous Hermaphrodite (animal)	Self fertilizing: Y/N	Animals having both male and female sexual organs at the same time (= simultaneous hermaphrodites).
		Sequential Hermaphrodite (animal)		Animals that change from one sex to the other.
			Protandry	Initially a male and changes to a female.
			Protogyny	Initially a female and changes to a male.
	Gonochoristic / Dioecious			Having separate sexes. In plants, male and female flowers are produced on different individuals.
		Migratory		
			Anadromous	Fish that spend most of their lives in saltwater and migrate to freshwater to breed.

Level 1	Level 2	Level 3	Level 4	Explanation
			Catadromous	Fish that spend most of their lives in freshwater and migrate to saltwater to breed.
	Fertilization / Spawning Type			
		Internal fertilization		Copulation with both eggs and sperm internal.
		Fertilization External Eggs		Female lays egg mass and male fertilizes externally.
		Freecast spawners		In animals, males and/or females discharge gametes directly into the water column.
			Broadcast spawner	Both males and females discharge gametes into the water column.
			Spermcast spawner	Only male discharges gametes into the water column.
		Pollination		In plants, fertilization of female floral structures by pollen.



## Early Development Mechanisms

Table 10: Definitions for early development mechanisms.

Early Development Mechanism		
Level 1	Level 2	Definition
Viviparous		Development takes place within the female and embryo derives nourishment from the mother.
Oviparous		Eggs are laid by the female and develop outside of either parent.
	External eggs	Eggs are laid directly in the environment in an egg case, egg mass, or spawned into the water column.
	Egg mass carried by female	Eggs are carried as an external egg mass by the female, such as by many crabs (e.g., berried crab).
Ovoviviparous (brooder)		Eggs develop within the female, or male in some cases, but the embryo derives no nourishment from the parent. A brooder.

## Juvenile Development and Dispersal

Table 11: Definitions for juvenile development and dispersal.

Juvenile Development/Dispersal				
Level 1	Level 2	Level 3	Level 4	Definition
Direct development				Development without a larval phase.
	Ametabolous			Juvenile development with no major change in body form.
	Hemimetabolous			Juvenile development with incomplete metamorphosis. In insects, consisting of an egg, nymph, and adult stage.
	Holometabolous			Juvenile development with complete metamorphosis. In insects, consisting of an embryo, larvum, pupa, and imago (adult) stage.
Larval phase				Development with a morphologically distinct, free-living dispersive stage. Often occupies a different habitat than the adult.
	Benthic larvae			Larvae that remain on the bottom or within the tubes of adults.
		Lecithotrophy		Benthic larvae that derive nourishment from yolk.
		Planktotrophy		Benthic larvae that derive nourishment by feeding.

<b>Juvenile Development/Dispersal</b>				
<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Definition</b>
		Brooded		The larval phase is brooded within the adult or tube of the adult.
		Free living		The larval phase is totally separated from the adult.
		Duration of larval phase	Units	Maximum duration of larval phase and units (hours, days, months).
	Planktonic larvae			Larvae that spend at least part of the larval phase in the water column.
		Lecithotrophy		Planktonic larvae that derive nourishment from yolk.
		Planktotrophy		Planktonic larvae that derive nourishment by feeding.
		Teleplanic		Larvae with an extended planktonic phase and a corresponding capacity for long-distance dispersal.
		Duration of larval phase	Units	Maximum duration of larval phase and units (hours, days, months).
Fragments				Animals or plants that can disperse through transport of fragments.
Seeds				Plants that can disperse through seeds.
Spores				Animals or plants that can disperse through transport of spores.

## Habitat Types

Table 12: Definitions of habitat types.

Level 1	Level 2	Level 3	Level 4	Definition
Pelagic				Organisms inhabiting the water column exclusive of the layer immediately above the bottom.
	Pleuston			Buoyant organisms with part of the body protruding above the sea surface and often subject to wind drift. Includes both animals, such as the Portuguese Man-of-War and <i>Veleva</i> and plants floating at the surface.
	Neuston			Pelagic organisms that float at the water surface but do not protrude above the sea surface as do pleuston.
	Pelagic submerged			Free-living pelagic organisms that spend all or the vast majority of their time fully submerged under the surface, and are not closely associated with the layer immediately above the bottom.
Benthic				Organisms living in, on, or immediately above a consolidated or unconsolidated substrate.
	Demersal			Mobile animals living on or near the bottom and that swim as a normal part of their routine and not just in response to disturbance.
		Benthopelagic		Animals living all or part of their life in the water column directly above but not on the bottom.
			Permanent benthopelagic	Animals that spends all or most of their adult life living in the water column above the bottom.
			Hyperbenthos	Benthic animals that make periodic forays from the bottom into the water column, such as some of the corophiid amphipods.
		Epibenthic - swimming		Animals living in direct contact with the sediment that are able to swim as part of its normal adult life cycle, such as flatfish.
	Surficial (Epibenthic Non swimming)			Organisms living on the surface of either consolidated or unconsolidated substrate, including both sessile and vagile species but not species that routinely swim.

Level 1	Level 2	Level 3	Level 4	Definition
		Epibenthic unconsolidated		Organisms living on mud (epipelagic) or sand (epipsammic), including mobile non-swimming fauna that primarily live on the surface of the sediment, macrophytes growing in the sediment, and microflora living on mud or sand particles.
			Epifauna unconsolidated	Non-swimming mobile animals living on the surface of unconsolidated substrates. Larger species sampled in trawls, such as sea cucumbers and scallops, are referred to as megabenthos.
			Epiphytes unconsolidated	Plants, including macrophytes, macroalgae, and microflora living in or on the surface of unconsolidated substrates, including diatoms attached to mud or sand particles. Macrophytes (e.g., <i>Zostera</i> ) are included so as to capture the primary producers as well the soft-bottom fauna.
		Epibenthic consolidated		Sessile (e.g., barnacles, algae) and vagile (e.g., snails) organisms living on the surface of rocks (epilithic) or other inorganic hard substrates including man-made structures.
			Epifauna consolidated	Sessile and vagile animals living on the surface of rocks and other inorganic hard substrates.
			Epiphytes consolidated	Plants, including macrophytes, macroalgae and microflora, living on the surface of rocks and other inorganic hard substrates.
			Primary space holder (Y/N)	Facultative mobile or non-mobile organisms directly colonizing the substrate surface and occupying space.
	Under rock			Species that live beneath rock or other hard substrates (e.g., shell rubble, debris).
	Cryptofauna			Sessile and vagile organisms living in the interstices and crevices formed by epibenthic organisms or their structures, such as formed by mussel beds, living corals, and coral rubble.
	Borer			Organisms that bore into living or dead consolidated substrate.
		Rock		Organisms that bore into rocks or artificial hard substrate. The endolithobiont of Taylor and Wilson (2002).
		Clay		Organisms that bore into hard clays.

Level 1	Level 2	Level 3	Level 4	Definition
		Shell & Coral		Organisms that bore into living and dead shells, including corals. The endozoobiont of Taylor and Wilson (2002).
		Wood		Organisms that bore into living or dead wood. The endoxylobiont of Taylor and Wilson (2002).
	Nestler			Bivalve or other animal living within an existing crevice in a consolidated substrate, such as <i>Hiatella</i> . The “WN” class of Todd (2001).
	Semi-infauna			Animals partially buried in mud or sand and partially exposed in the water column, such as the bivalve <i>Modiolus</i> (see Bush et al., 2007).
	Infauna			Animals living within unconsolidated sediment.
		Macrofauna		Animals living within unconsolidated sediment that are large enough to displace sediment particles. Macrofauna can be operationally defined as animals retained on 0.5 mm mesh screen. Macrofauna generally have more direct contact with overlying water than meiofauna.
			Shallow	<5 cm deep
			Deep	>=5 cm deep
		Meiofauna		Animals living within the interstitial spaces in unconsolidated sediments. There is not agreed upon size range, but they can be operationally defined as organisms less than 0.5 mm and greater than 50 microns.
			Shallow	<5 cm deep
			Deep	>=5 cm deep
		Microfauna		Multicellular and single-celled organisms living within interstitial spaces in unconsolidated sediments, and smaller than meiofauna. Can be operationally defined as organisms less than 50 microns.
			Shallow	<5 cm deep
			Deep	>=5 cm deep
Epibiotic				Organisms living on surface of a living or dead organism. Relationship may be mutualistic, parasitic, or commensal. Classified as pelagic or benthic depending upon species it colonizes.

<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Definition</b>
	Epiphytic			Living on surface of living or dead plant.
	Epizoic			Living on surface of a living or dead animal.
	Secondary space holder (Y/N)			Facultative mobile or non-mobile epibiotic organisms colonizing the surface of a primary space holder.
Other				Species living in habitats not captured in those listed above.

Kingdom: Fungi

Phylum: *Ascomycota*

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**Taxon:** Fungi

**Taxonomic Author:** Duncan & White, 2002

**Kingdom:** Fungi

**Subkingdom:**

**Phylum:** Ascomycota

**Subphylum:** Pezizomycotina

**Superclass:**

**Class:** Sordariomycetes

**Subclass:** Hypocreomycetidae

**Infraclass:**

**Superorder:**

**Order:** Hypocreales

**Suborder:**

**Infraorder:**

**Superfamily:**

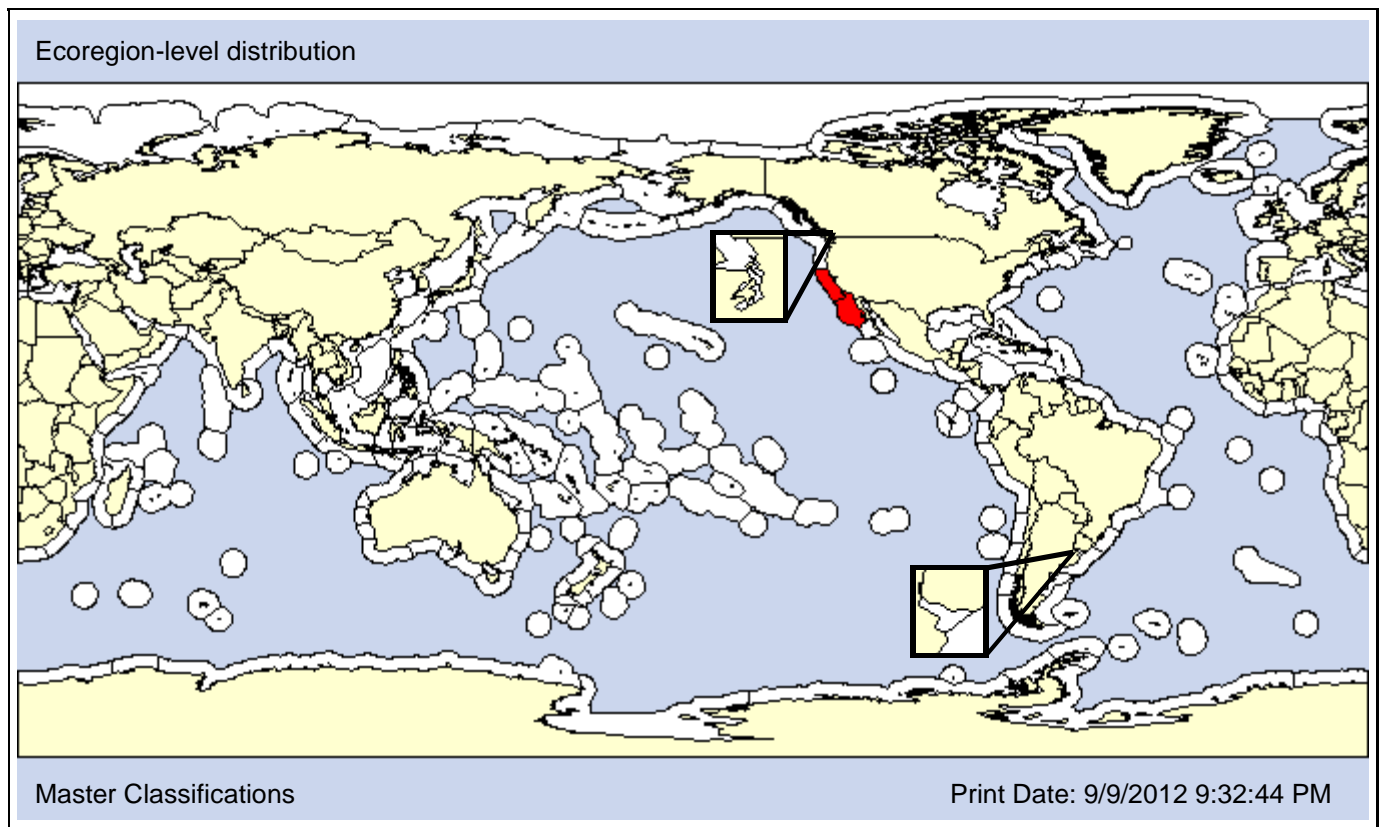
**Family:** Clavicipitaceae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1888

**Loc 1st record:**

San Diego, CA

**Established:**

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P			X	
						AO	PO								

Comments: *Claviceps purpurea* var. *spartinae* is a fungus that infects *Spartina* species. It was apparently present in San Diego since 1888, before the introduction of the East Coast *Spartina* to the NEP. Its native range is unknown but is possibly the North Atlantic.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE** **X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b> <b>P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY**

<b>Fresh</b>	<b>Brackish</b> <b>P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
			<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b> <b>X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>	<b>X</b>		<b>X</b>

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b> <b>X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	

**Taxon:** Fungi **Taxonomic Author:** Kohlmeyer & E. Kohlmeyer, 1971

**Kingdom:** Fungi **Subkingdom:** **Phylum:** Ascomycota

**Subphylum:** Pezizomycotina **Superclass:** **Class:** Sordariomycetes

**Subclass:** Sordariomycetidae **Infraclass:** **Superorder:**

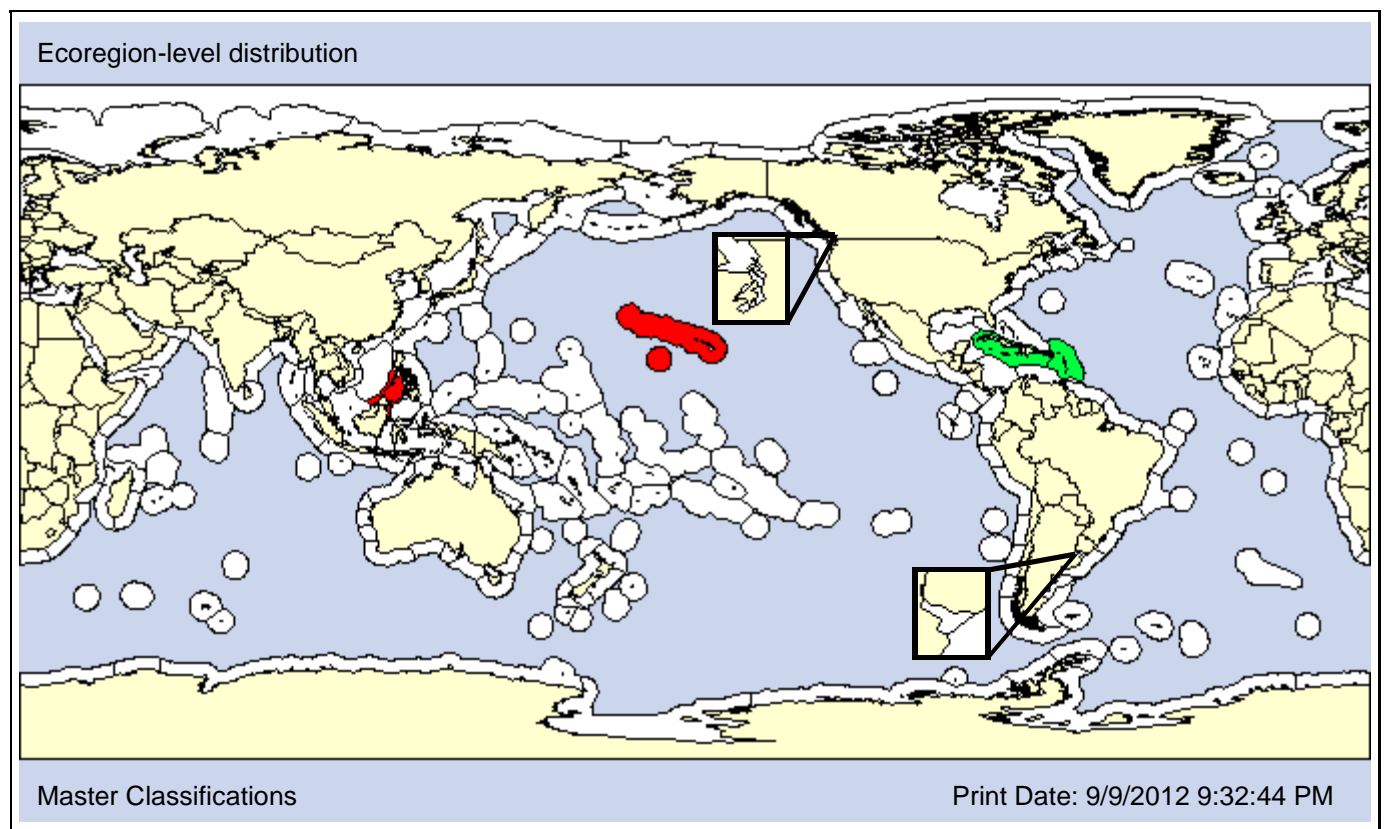
**Order:** Diaporthales **Suborder:** **Infraorder:**

**Superfamily:** **Family:** Valsaceae **Subfamily:**

Also Known As (Name - Type):

Common Names:

Type Locality:



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1902

**Loc 1st record:** Pearl Harbor, Oahu, Hawaii

**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P			X	
						AO	PO								

Comments: *Cytospora rhizophorae* is a fungus on marine mangroves, presumably introduced into Hawaii with the importation of the mangrove *Rhizophora* from Florida in 1902.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE** **X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b> <b>P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>P</b>					

**SALINITY**

<b>Fresh</b>	<b>Brackish</b> <b>P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
			<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>							<b>X</b>		DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b> <b>X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>	<b>X</b>		<b>X</b>

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b> <b>X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	

# *Etheiophora blepharospora*

Species ID: 220560

**Taxon:** Fungi      **Taxonomic Author:** (Kohlm. & E. Kohlm.) Kohlm. & Volkm.-Kohlm., 1989

**Kingdom:** Fungi      **Subkingdom:**      **Phylum:** Ascomycota

**Subphylum:** Pezizomycotina      **Superclass:**      **Class:** Sordariomycetes

**Subclass:** Hypocreomycetidae      **Infraclass:**      **Superorder:**

**Order:** Hypocreomycetidae incertae sed      **Suborder:**      **Infraorder:**

**Superfamily:**      **Family:** Lophiostomataceae      **Subfamily:**

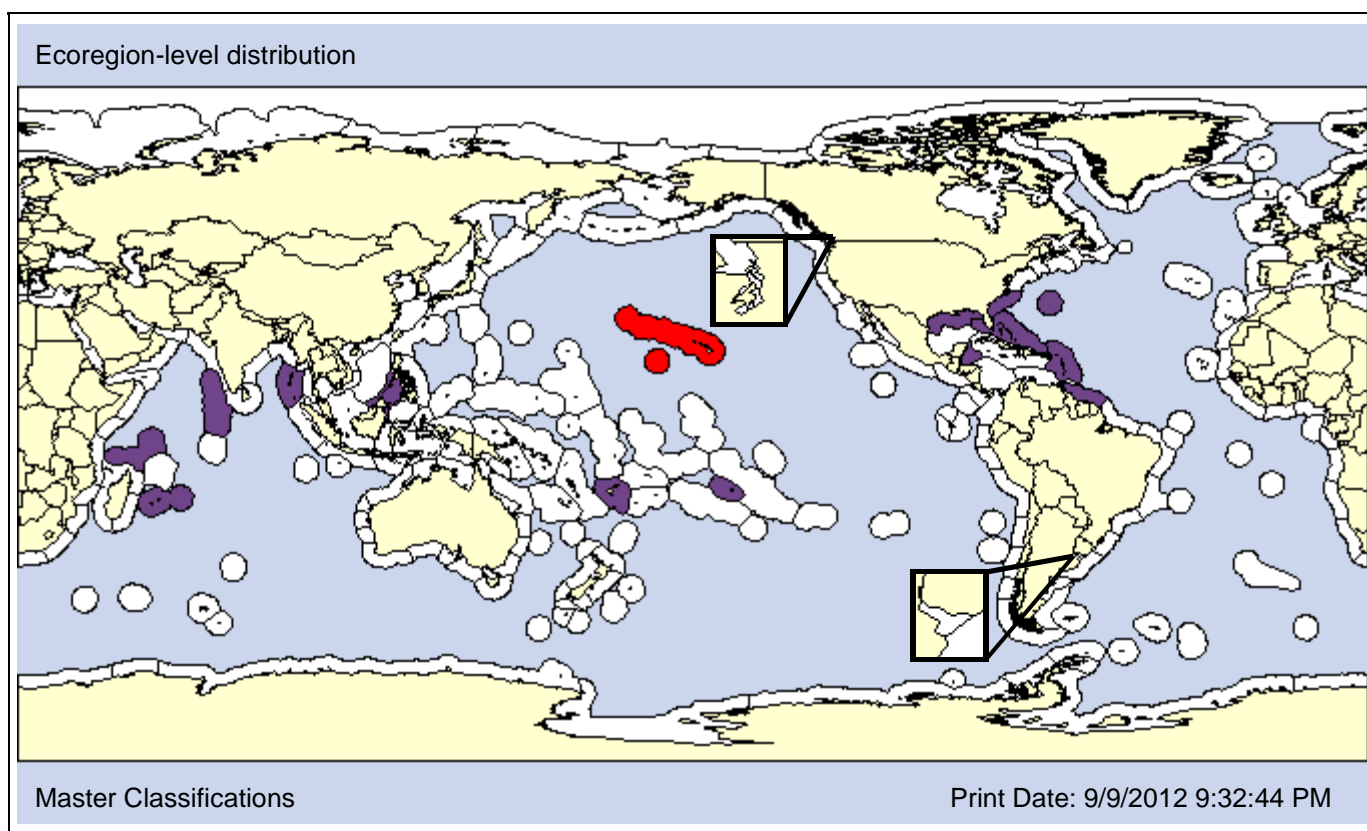
**Also Known As (Name - Type):**

Keissleriella blepharospora	Synonym

**Common Names:**

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**Type Locality:**



**Date 1st record:** 1902

**Loc 1st record:** Hawaii

**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P			X	
						AO	PO								

Comments: *Etheiophora blepharospora* is a fungi on mangroves, including several species of *Rhizophora* and *Ceriops*. Carlton and Eldredge (2009) list it as a Western Atlantic fungi, however, it also occurs throughout the Indo-Pacific and Indian Ocean (Shearer and Raja, 2010). We list it as unclassified except for Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>P</b>	<b>P</b>				

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>	<b>X</b>		<b>X</b>

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	

Kingdom: Chromista

Phylum: Cercozoa

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**Taxon:** Cercozoan

**Taxonomic Author:** Pichot, Comps, Tigé, Grizel & Rabouin, 1980

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Cercozoa

**Subphylum:** Endomyxa

**Superclass:**

**Class:** Ascetosporea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Haplosporida

**Suborder:**

**Infraorder:**

**Superfamily:**

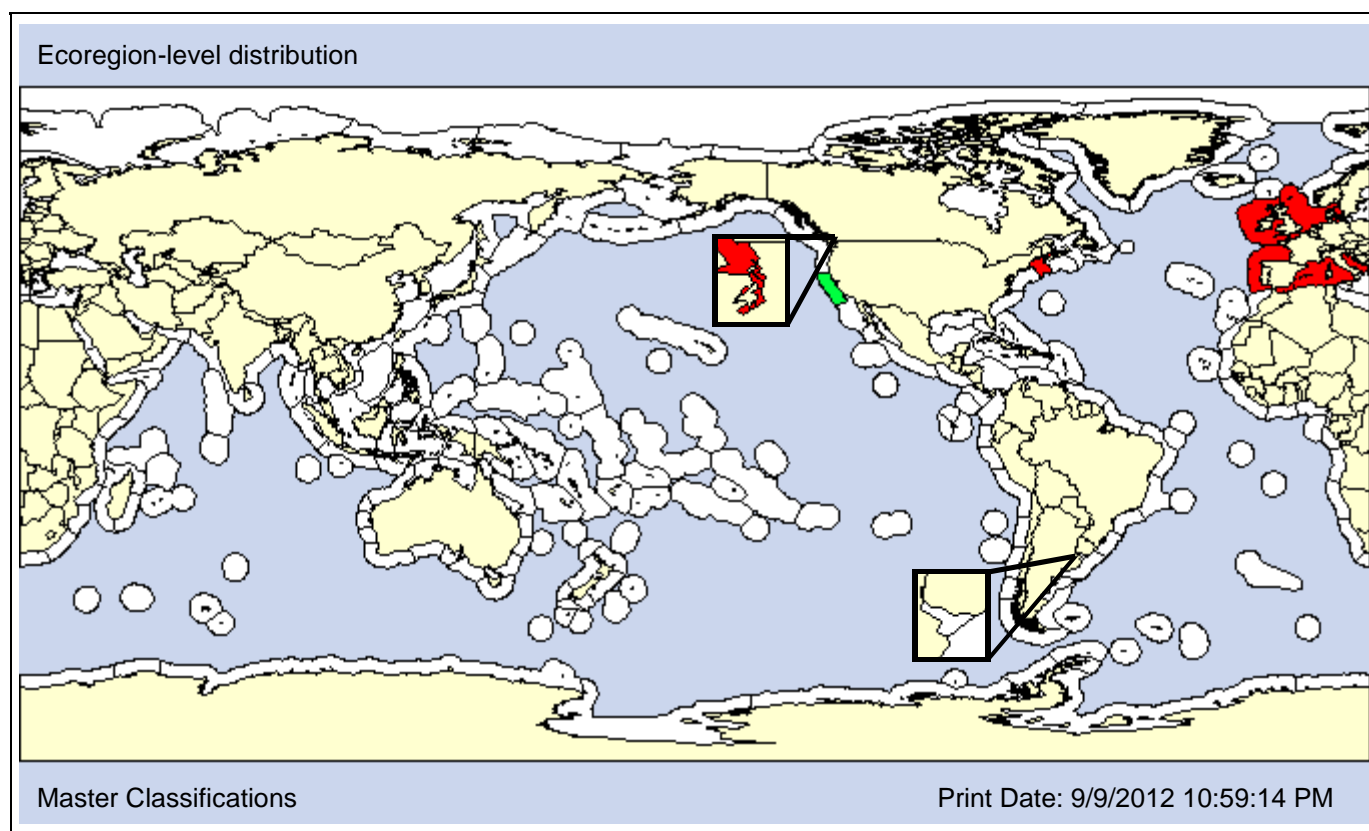
**Family:** Haplosporiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

late 1970s

**Loc 1st record:**

Puget Sound, WA

**Established:**

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
						<b>AO X</b>	PO								

Comments: The origin of the oyster parasite, *Bonamia ostreae*, appears to be a hatchery in central California. Shipments of *Ostrea edulis* spread the parasite to Puget Sound, the eastern United States, and France. We classify Puget Sound as invaded, though it is possible that this parasite was naturally present in low abundances throughout the NEP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated <b>X</b></b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE **X****

<b>R</b>	<b>HP</b>	<b>Biogenic <b>P</b></b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>												

**SALINITY**

<b>Fresh</b>	<b>Brackish <b>P</b></b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual <b>X</b></b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic <b>X</b></b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

**Taxon:** Cercozoan

**Taxonomic Author:** Haskin, Stauber & Mackin, 1966

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Cercozoa

**Subphylum:** Endomyxa

**Superclass:**

**Class:** Ascetosporea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Haplosporida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Haplosporiidae

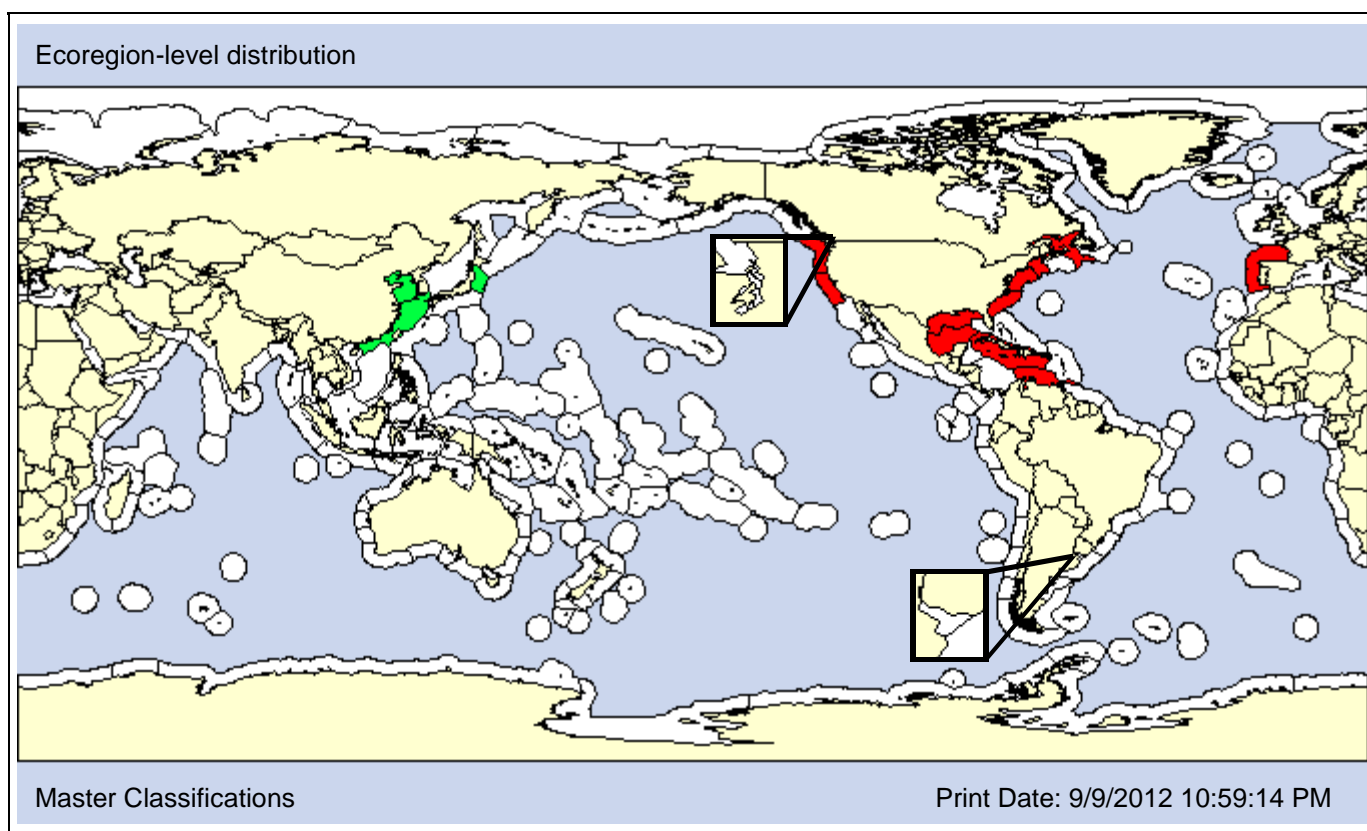
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Haplosporidian nelsoni	Convention	MSX
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**Type Locality:**



**Date 1st record:** Native

1990

**Loc 1st record:** Native

Drakes Estero, CA

**Established:** Yes

Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
						AO	PO X								

Comments: *Haplosporidium nelsoni* (MSX) is a virulent parasite of oysters including *Crassostrea virginica* *C. gigas*. Based on the similarity of *H. nelsoni* and the *Haplosporidium* sp. in Asia, NEMESIS suggests that *C. gigas* from Asia was the likely vector. *H. nelsoni* has been reported from California estuaries but to date has been asymptomatic.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>												

**SALINITY [Pref: 15 - psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
			<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

Kingdom: Chromista

Phylum: Ciliophora

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**Taxon:** Ciliate

**Taxonomic Author:** Chatton & Lwoff, 1926

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ciliophora

**Subphylum:** Intramacronucleata

**Superclass:**

**Class:** Phyllopharyngea

**Subclass:** Rhynchodia

**Infraclass:**

**Superorder:**

**Order:** Rhynchodida

**Suborder:**

**Infraorder:**

**Superfamily:**

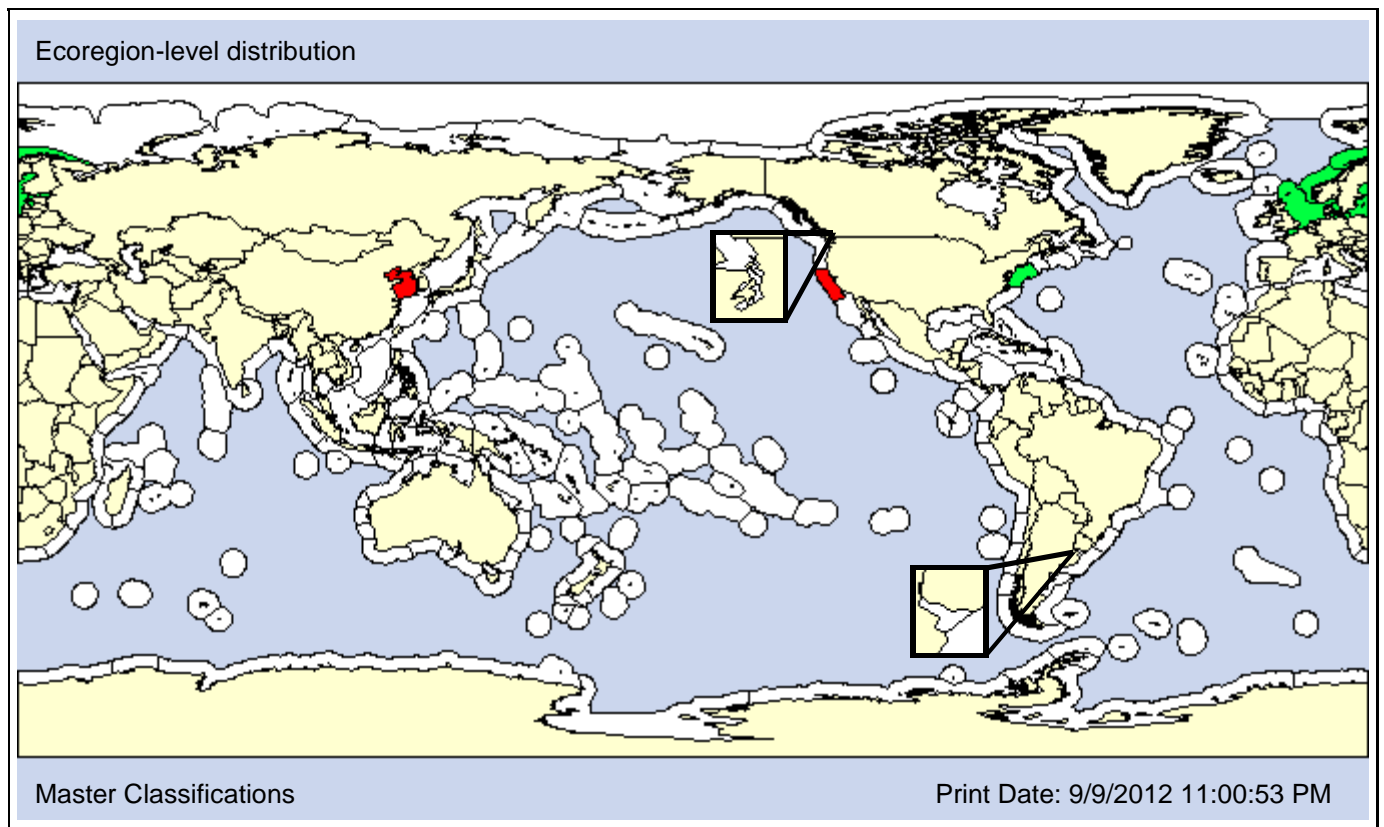
**Family:** Ancistrocomidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		<b>NWP</b>	<b>Hawaii</b>		<b>NEP</b>		

**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Yes

<1936  
 San Francisco Estuary, CA  
 Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				<b>X</b>
						<b>AO X</b>	PO								

Comments: *Ancistrocoma pelseneeri* is an Atlantic species that parasitizes the pericardiums and excurrent siphons of *Mya arenaria*, *Macoma balthica*, and other clams. In the Pacific, it has been reported from central California (San Francisco) and the Yellow Sea.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>											

**SALINITY [Obs: 8 - 25psu] [Pref: - 25psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>



**Taxon:** Ciliate

**Taxonomic Author:** (Issel, 1918)

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ciliophora

**Subphylum:** Intramacronucleata

**Superclass:**

**Class:** Oligohymenophorea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Thigmotrichida

**Suborder:**

**Infraorder:**

**Superfamily:**

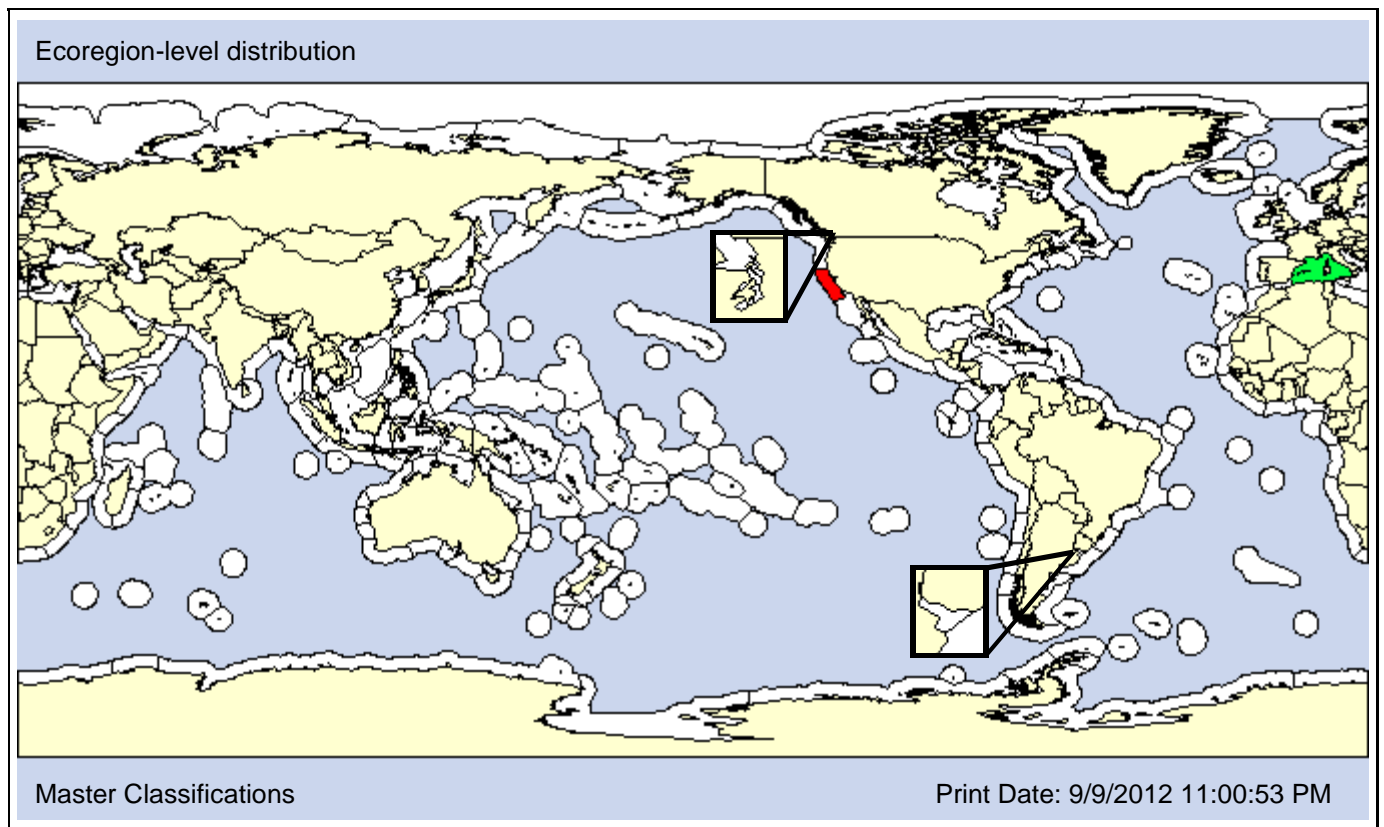
**Family:** Ancistridae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Gulf of Naples, Italy



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:**

<1946

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P				X
						AO X	PO								

Comments: *Ancistrum cyclidioides* is a European ciliate that parasitizes the non-native clam *Mya arenaria* in the San Francisco Estuary and Tomales Bay, California. It is also found in several native clams, including *Cryptomya californica*, *Macoma inconspicua*, *M. nasuta*, *M. irus*, and *M. secta*. In Europe, it is found in *Tellina exigua*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

**Taxon:** Ciliate

**Taxonomic Author:** Nelson, 1923

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ciliophora

**Subphylum:** Intramacronucleata

**Superclass:**

**Class:** Oligohymenophorea

**Subclass:** Scuticociliatia

**Infraclass:**

**Superorder:**

**Order:** Thigmotrichida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Hemispeiridae

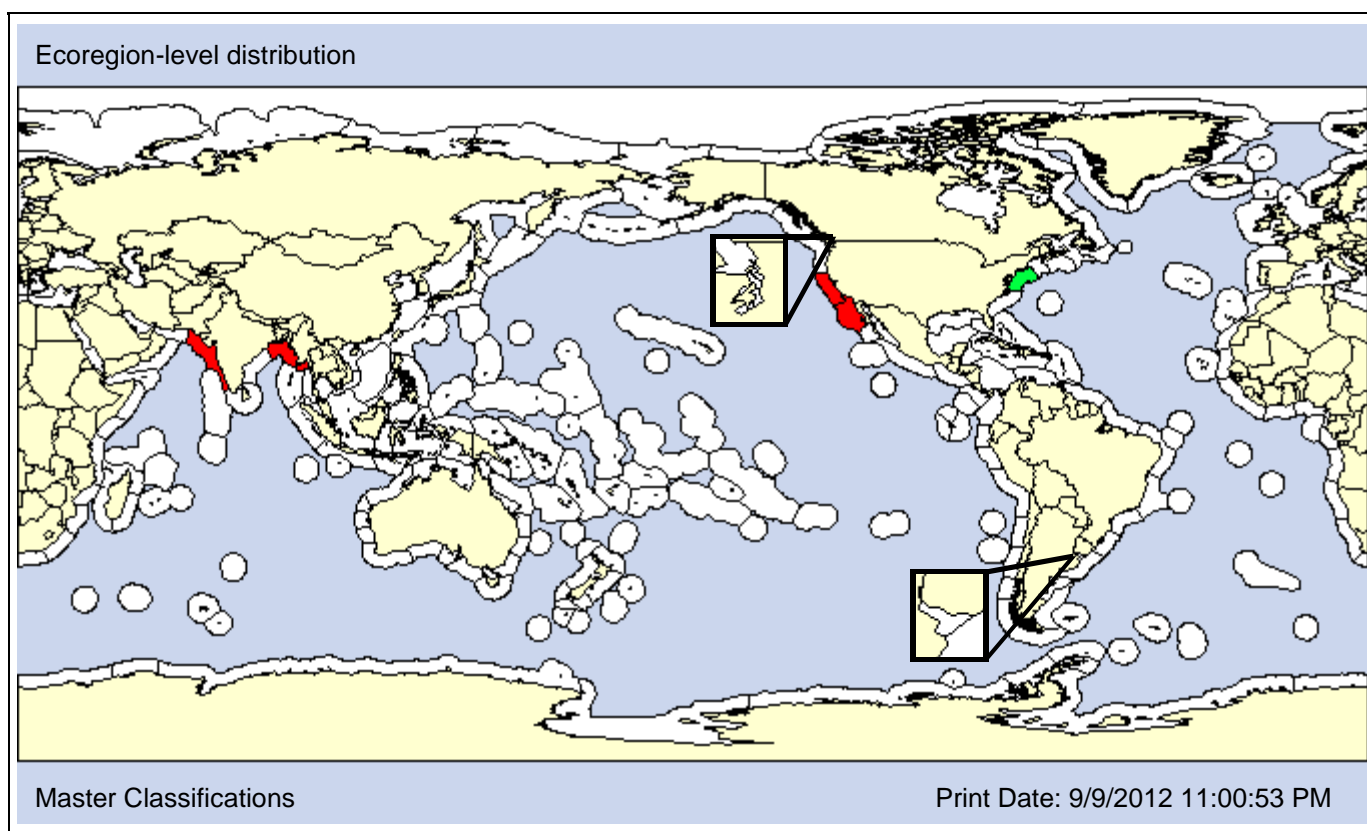
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Boveria xenkewitchi	Synonym	
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**Type Locality:**



**Date 1st record:**

<1927

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF	X	S/R	AE	AA				A	P				
		X				AO	PO								

Comments: According to Cohen and Carlton (1995), *Boveria teredinidi* is an Atlantic parasite found on the gills of the shipworm, *Teredo navalis*. Therefore, we consider occurrences in the Pacific or Indo-Pacific as introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>								<b>Artificial Substrate O</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										O		O	O	

**SALINITY [Obs: - 27psu] [Pref: - 27psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
					O	P			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
X									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X

**Taxon:** Ciliate

**Taxonomic Author:** Chatton & Lwoft, 1934

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ciliophora

**Subphylum:** Intramacronucleata

**Superclass:**

**Class:** Oligohymenophorea

**Subclass:** Apostomatia

**Infraclass:**

**Superorder:**

**Order:** Pilisuctorida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Conidophryidae

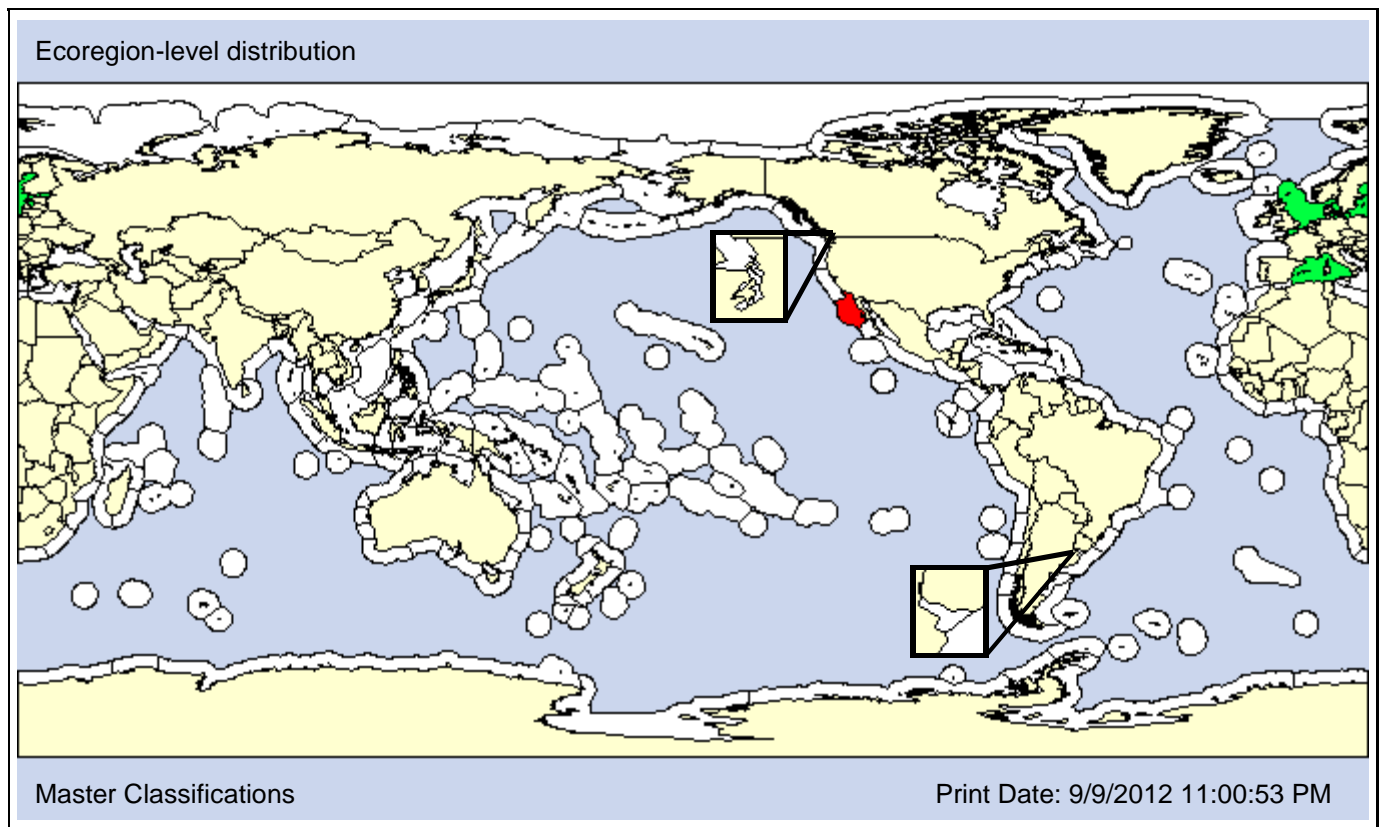
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Mycodinium pilisuctor	Synonym	
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**Type Locality:** Etang de Thau, France



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1948

**Loc 1st record:**

Newport Bay, California

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		X			AO	PO									

Comments: *Conidophrys pilisuctor* is a Northeast Atlantic ectocommensal found on many Malacostraca, including species of *Gammarus*, *Limnoria*, *Corophium*, *Monocorophium*, and *Idothea*, as well as the freshwater *Hyaella azteca*. In the NEP, it is found on the non-native *M. acherusicum* and *L. lignorum*, and thus is considered nonindigenous.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>					<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

**Taxon:** Ciliate

**Taxonomic Author:** Dons, 1927

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ciliophora

**Subphylum:** Intramacronucleata

**Superclass:**

**Class:** Oligohymenophorea

**Subclass:** Peritricha

**Infraclass:**

**Superorder:**

**Order:** Sessilida

**Suborder:**

**Infraorder:**

**Superfamily:**

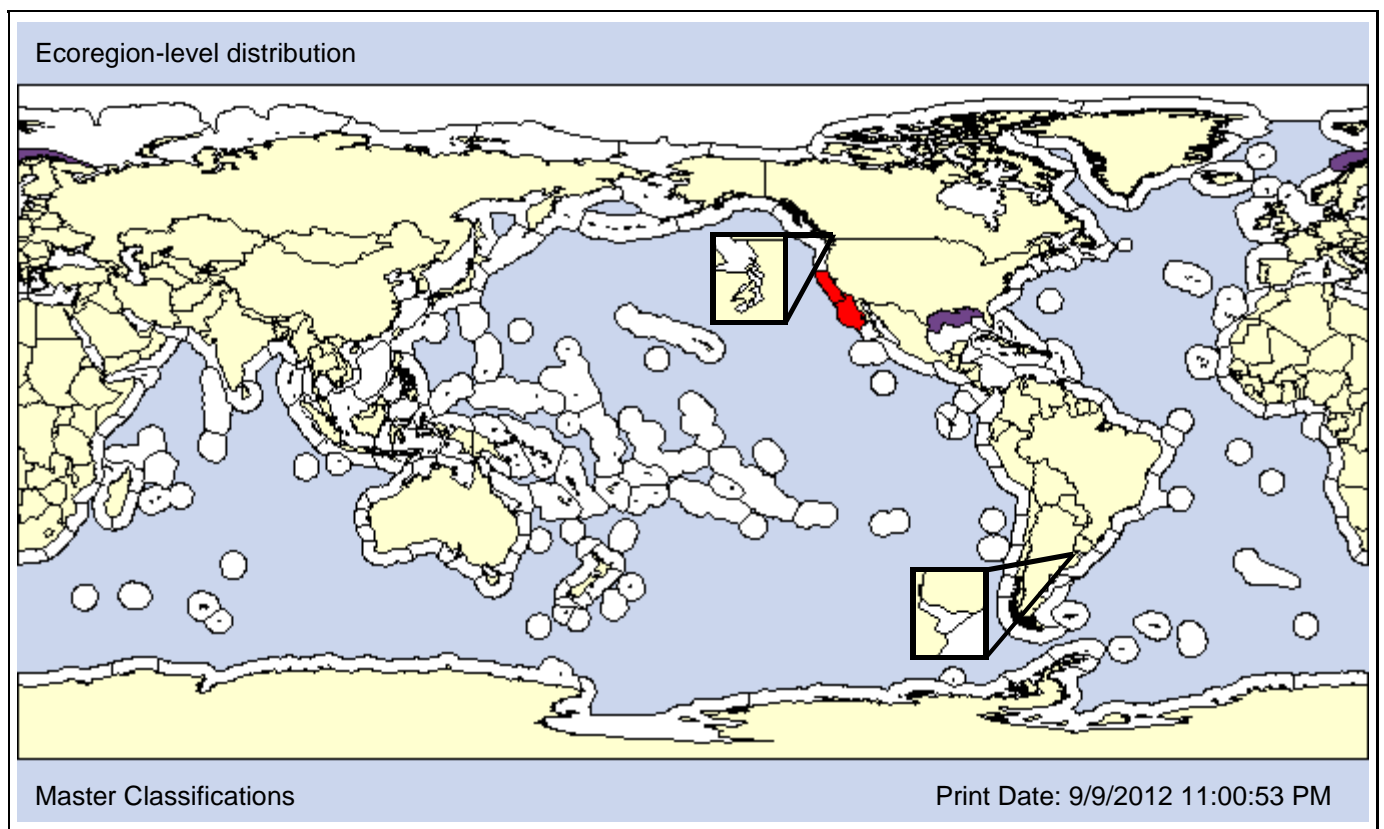
**Family:** Vaginicolidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Europe



**Date 1st record:**

1927 (1870?)

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				X
		X				AO	PO								

Comments: *Cothurnia limnoriae* is an ectoparasite on the legs of the wood-boring isopod, *Limnoria*. The native range of *C. limnoriae* is unknown, but it is considered introduced in regions where it is found on non-native *Limnoria*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										O		O	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
			O	O	O				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
X									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X



**Taxon:** Ciliate

**Taxonomic Author:** (Fauré-Fremiet, 1936)

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ciliophora

**Subphylum:** Postciliodesmatophora

**Superclass:**

**Class:** Heterotrichea

**Subclass:** Spirotricha

**Infraclass:**

**Superorder:**

**Order:** Heterotrichida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Folliculinidae

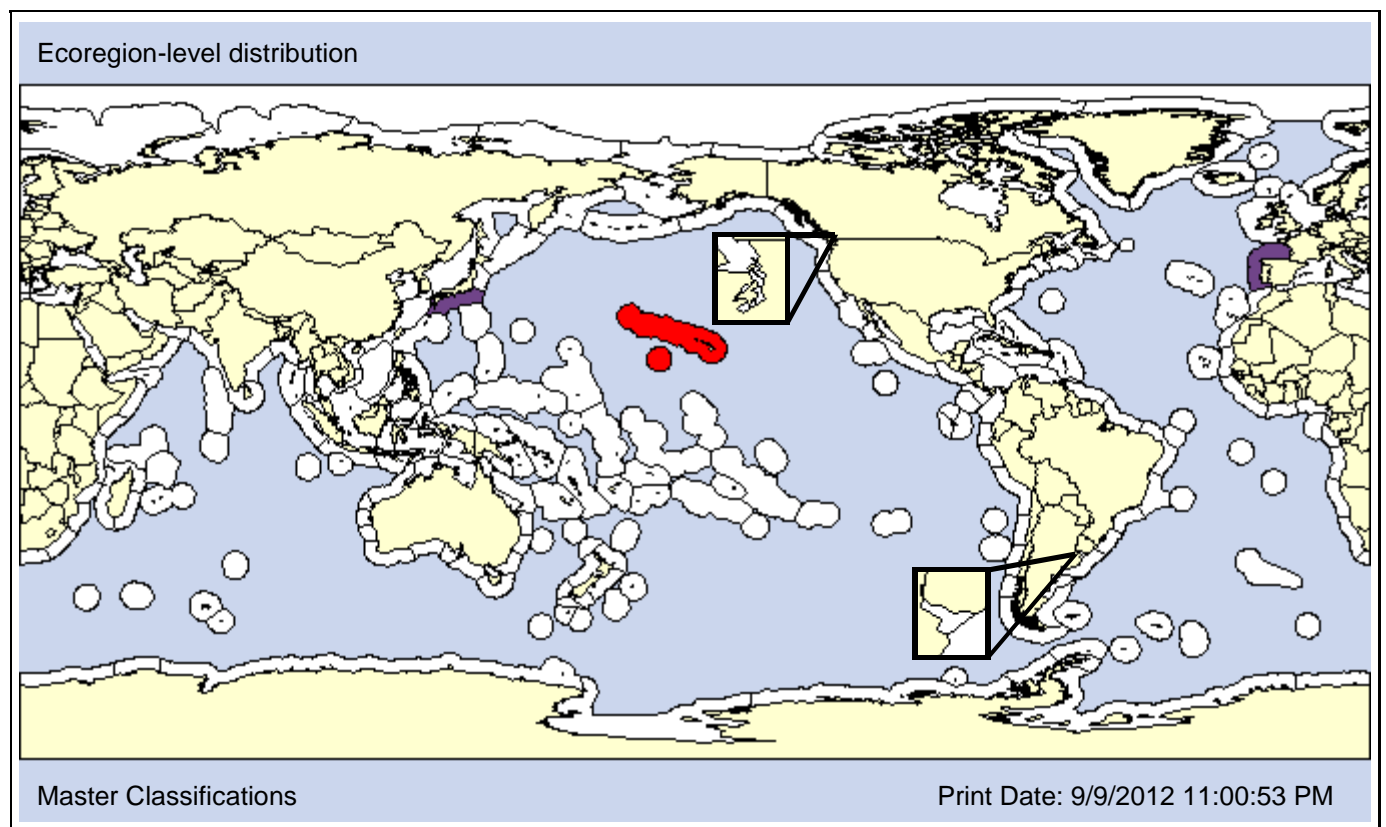
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Folliculinopsis lignicola	Synonym	
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**Type Locality:** Breton Coast of France



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1965

1961

**Loc 1st record:** Tatokushima Is., Japan

Kaneohe Bay, Hawaii

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				X
		X				AO	PO								

Comments: *Eufolliculina lignicola* is associated with the burrows of the wood-boring isopod, *Limnoria*. Its native range is not known, but it is considered introduced in Hawaii because it inhabits the burrows of non-native *Limnoria*. It is listed as unclassified in Japan and Europe because it is not known whether the species of infested *Limnoria* in these areas are native or introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P		O	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
			O	O	O				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					X

# Lagenophrys cochinensis

Species ID: 101846

**Taxon:** Ciliate

**Taxonomic Author:** Santhakumari & Gopalan, 1980

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ciliophora

**Subphylum:** Intramacronucleata

**Superclass:**

**Class:** Oligohymenophorea

**Subclass:** Peritricha

**Infraclass:**

**Superorder:**

**Order:** Sessilida

**Suborder:**

**Infraorder:**

**Superfamily:**

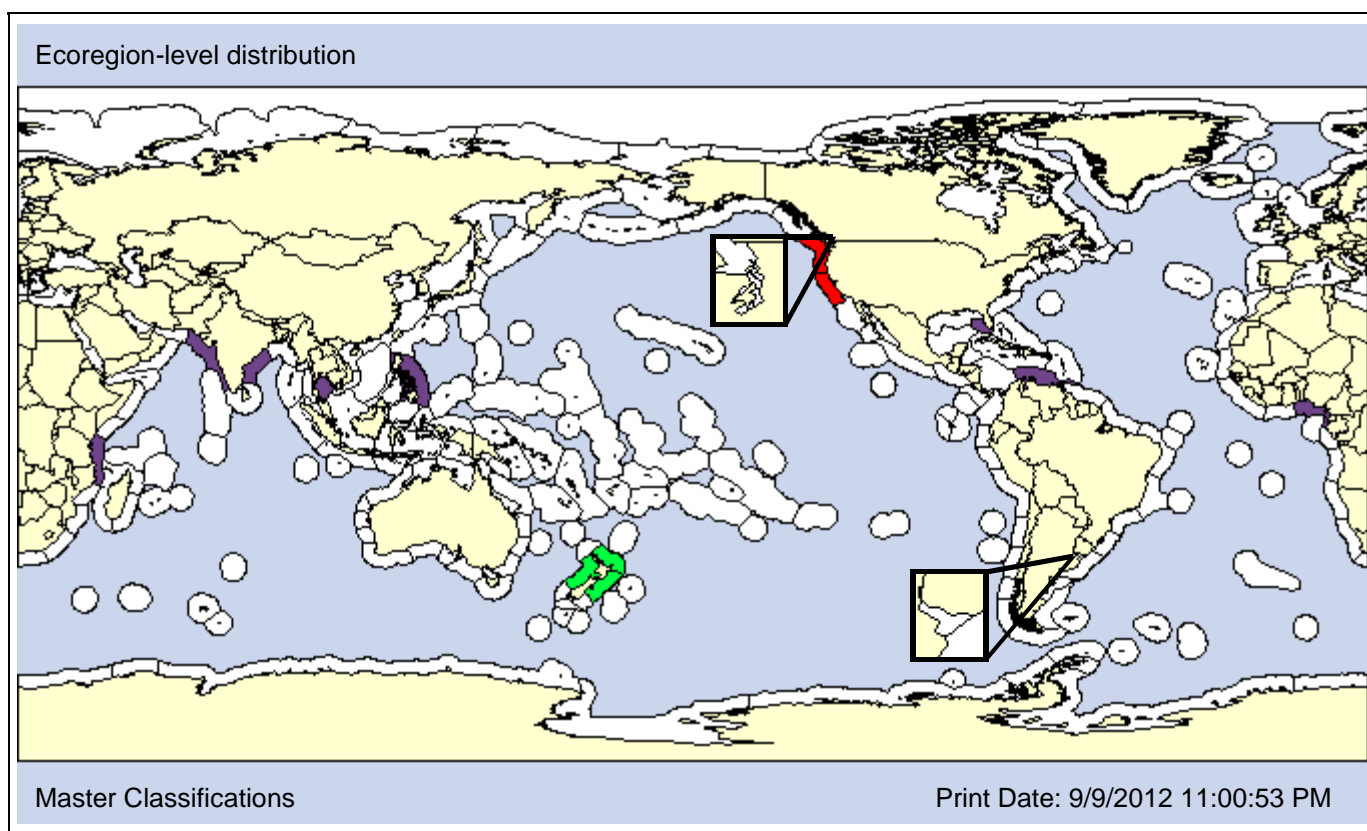
**Family:** Lagenophryidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Cochin, India



**Date 1st record:**

1931

**Loc 1st record:**

Humboldt Bay, CA

**Established:**

Yes

### VECTORS

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
		X				AO	PO								

Comments: Lagenophrys cochinensis is a peritrich ciliate that is an ectocommensal on tanaids and isopods, including the burrowing Sphaeroma quoianum. L. cochinensis is considered a NIS in the NEP, and may be native to New Zealand (Foissner, 2006).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>		<b>O</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

**Taxon:** Ciliate

**Taxonomic Author:** Mohr, Le Veque, & Matsudo, 1963

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ciliophora

**Subphylum:** Intramacronucleata

**Superclass:**

**Class:** Phyllopharyngea

**Subclass:** Chonotrichia

**Infraclass:**

**Superorder:**

**Order:** Exogemmida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Loboconidae

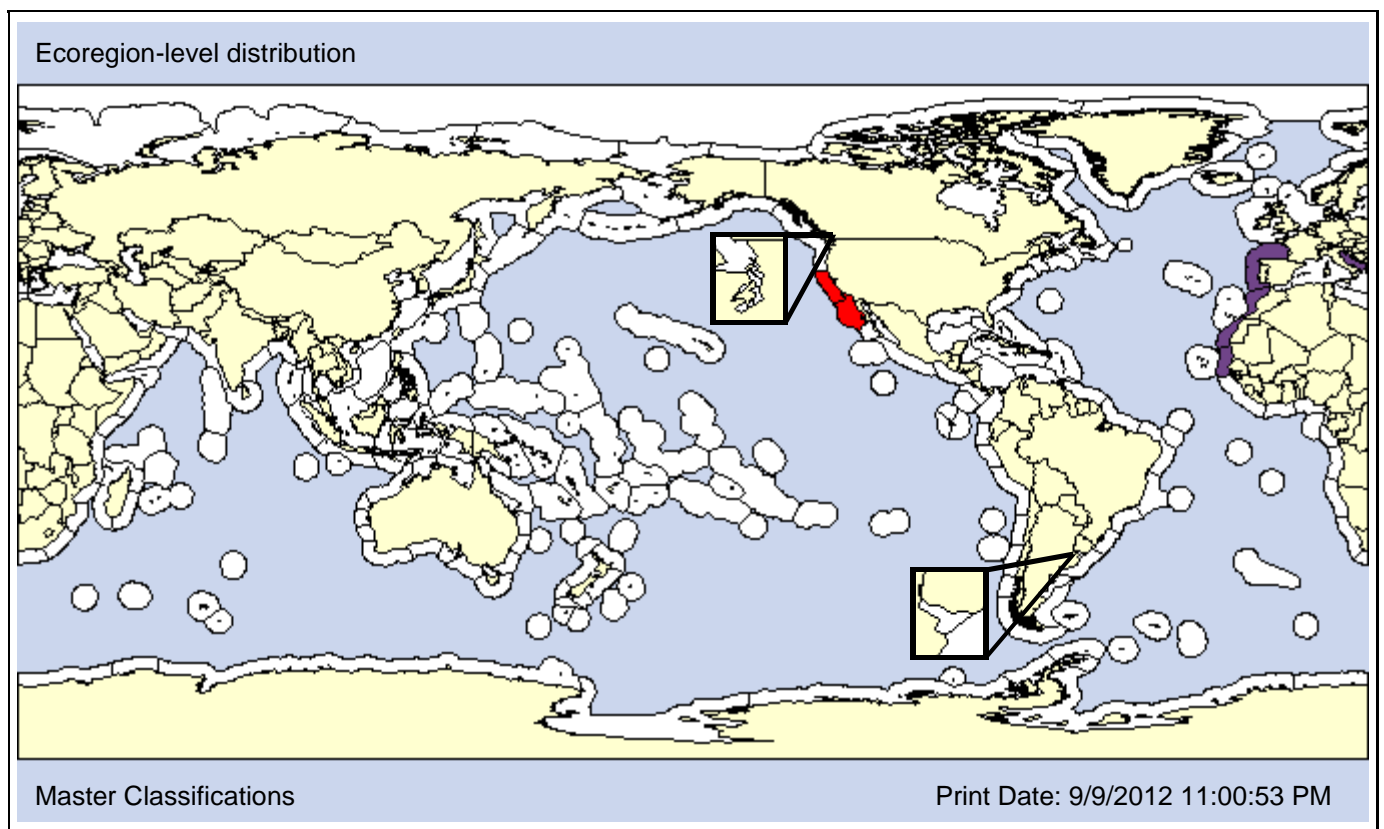
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Spirochona crystallina	Synonym	
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**Type Locality:**



**Date 1st record:**

1870?

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
		X				AO	PO								

Comments: *Lobochona prorates* is a gill parasite of the wood-boring isopod, *Limnoria*. Its native region is unknown, but is assumed to be introduced in areas where it is found on non-native *Limnoria*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										O		O	O	

**SALINITY [Obs: - 32psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
			O	O	O				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
X									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X

**Taxon:** Ciliate

**Taxonomic Author:** (Giard, 1883) Dons, 1928

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ciliophora

**Subphylum:** Postciliodesmatophora

**Superclass:**

**Class:** Heterotrichea

**Subclass:** Spirotricha

**Infraclass:**

**Superorder:**

**Order:** Heterotrichida

**Suborder:**

**Infraorder:**

**Superfamily:**

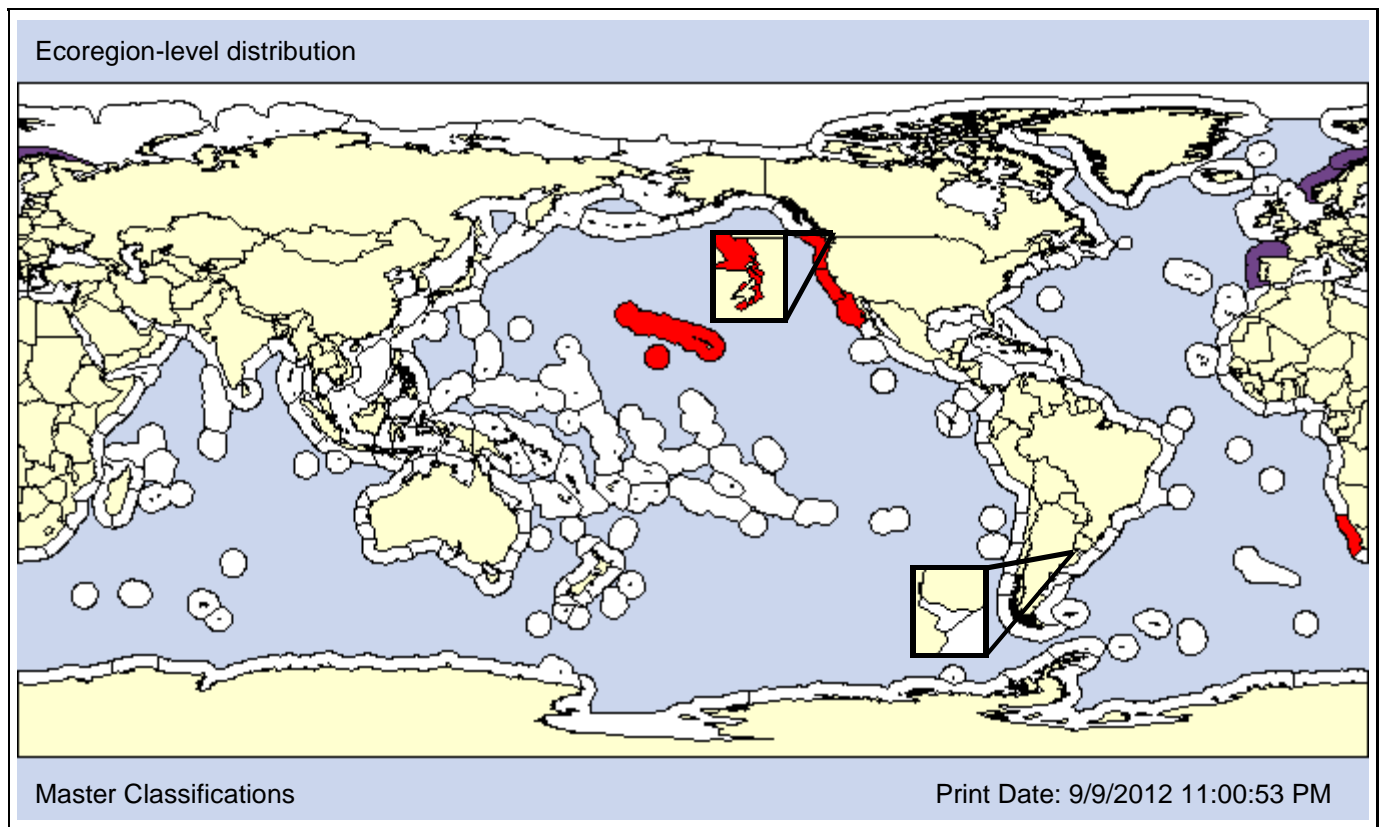
**Family:** Folliculinidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
			<b>NWP</b>	<b>Hawaii</b>	<b>NEP</b>		

<b>Date 1st record:</b>	1961	<1927
<b>Loc 1st record:</b>	Kaneohe Bay, Hawaii	San Francisco Estuary, CA
<b>Established:</b>	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				X
		X				AO	PO								

Comments: *Mirofolliculina limnoriae* is an ectoparasite on the wood-boring isopod *Limnoria*. Its native range is unknown, but is assumed to be introduced in regions where it is found on non-native *Limnoria*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										O		O	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
			O	O	O				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
X									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X



**Taxon:** Ciliate

**Taxonomic Author:** Chatton & Lwoff, 1926

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ciliophora

**Subphylum:** Intramacronucleata

**Superclass:**

**Class:** Oligohymenophorea

**Subclass:** Scuticociliatia

**Infraclass:**

**Superorder:**

**Order:** Thigmotrichida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:**

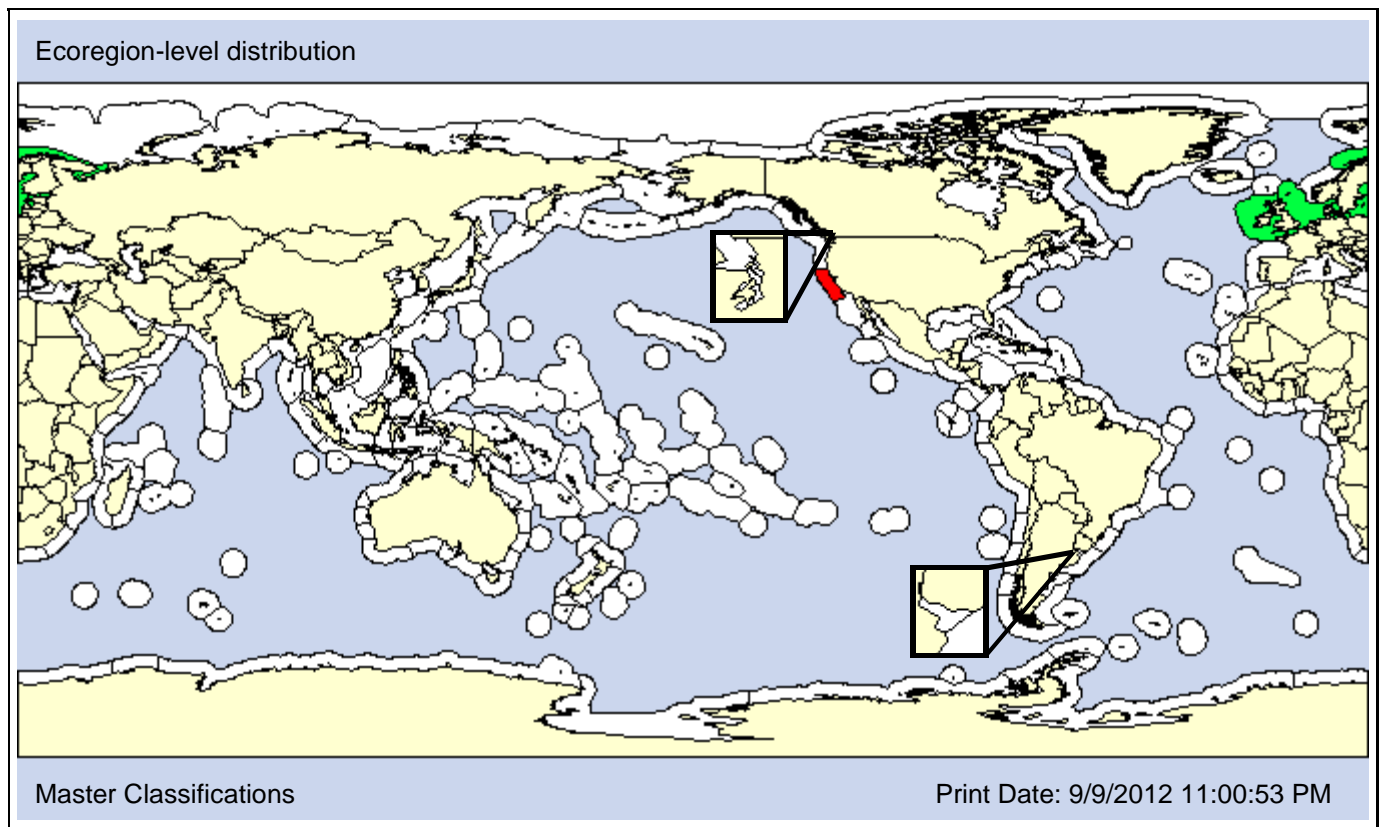
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Sphenophyra myae	Synonym	
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:**

1946

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				<b>X</b>
						AO	PO								

Comments: *Sphenophyra dosiniaie* is a ciliate that infects clams, including *Dosinia exoleta*, *Timoclea ovata*, *Corbula gibba*, *Spisula solidissima*, *Mya truncata* and *M. arenaria* in its native Europe. In the San Francisco Estuary, it infects the introduced *M. arenaria* and the native *Cryptomya californica*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

Kingdom: Chromista

Phylum: Foraminifera

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**Taxon:** Forams

**Taxonomic Author:** (Ehrenberg, 1840)

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Foraminifera

**Subphylum:**

**Superclass:**

**Class:** Polythalamea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Rotaliida

**Suborder:**

**Infraorder:**

**Superfamily:** Nonionoidea

**Family:** Nonionidae

**Subfamily:**

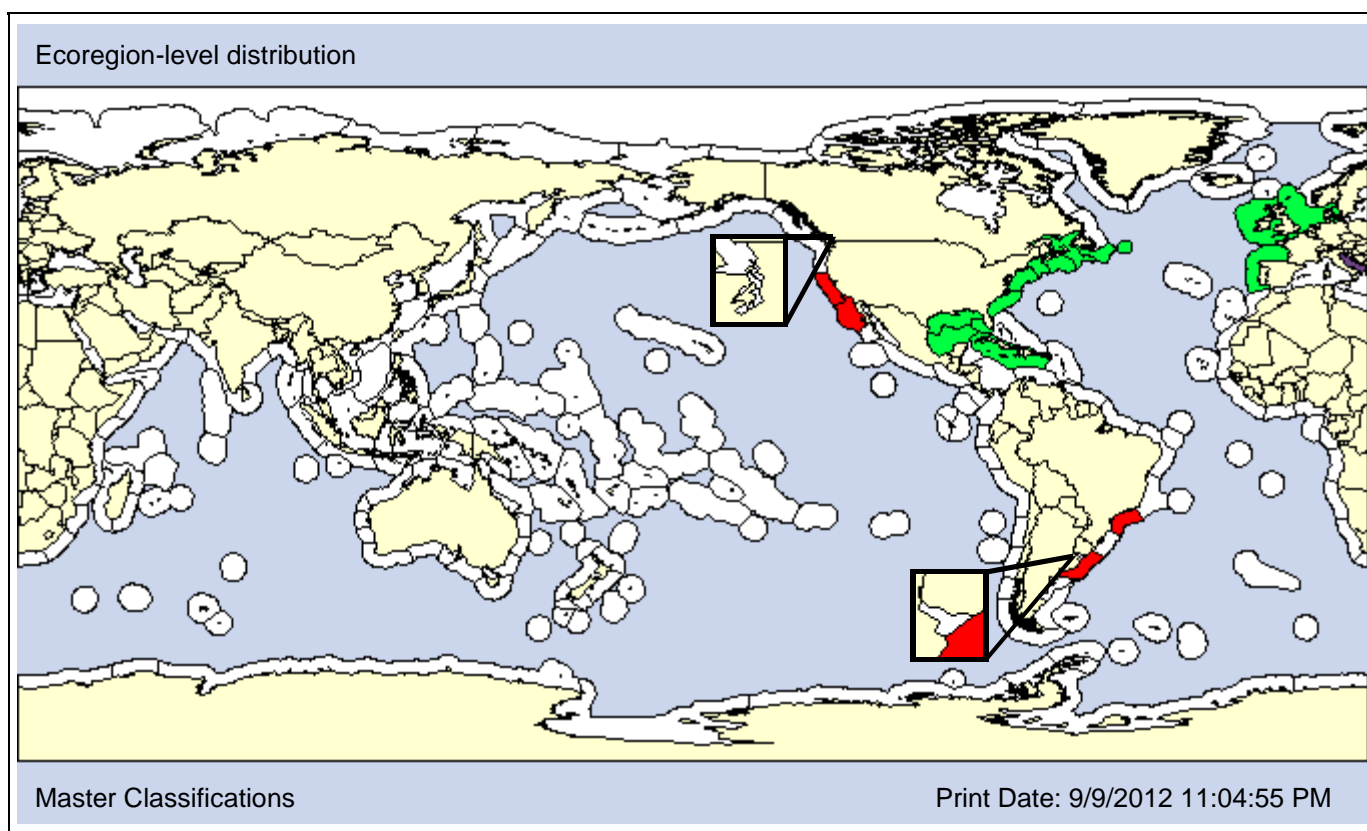
**Also Known As (Name - Type):**

Elphidium incertum obscurum  
Nonion germanicum  
Protoelphidium germanica

Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:**

1978

**Loc 1st record:**

Unknown

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 20m] [Pref: 0 - 20m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 80%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 2 - 35psu] [Pref: 12 - 22psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
	<b>X</b>		<b>X</b>			<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Forams

**Taxonomic Author:** Uchio, 1962

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Foraminifera

**Subphylum:**

**Superclass:**

**Class:** Polythalamea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Trochamminida

**Suborder:**

**Infraorder:**

**Superfamily:** Trochamminoidea

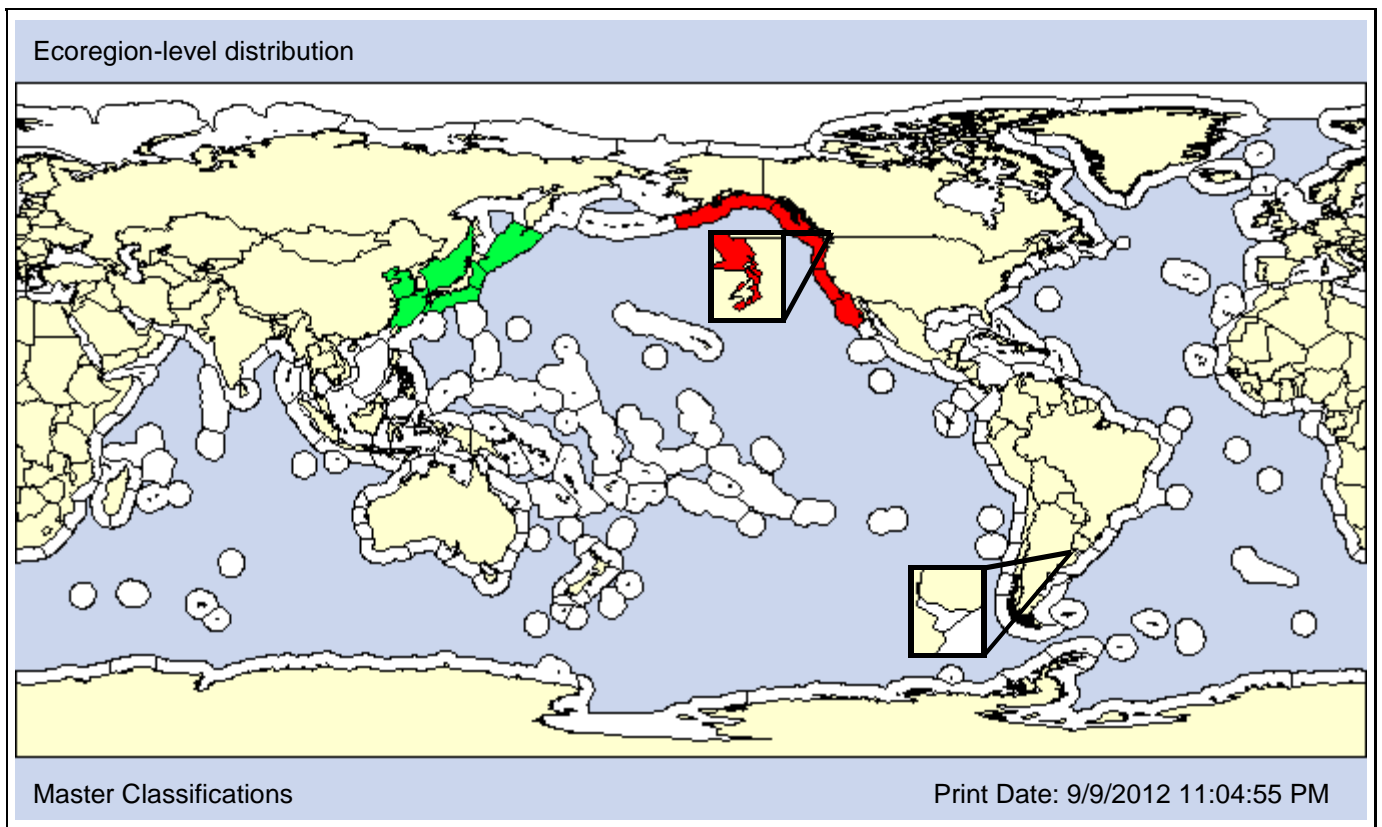
**Family:** Trochamminidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP			Hawaii		
						NEP	

**Date 1st record:** Native

1971

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>						AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 17m] [Pref: 0.05 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 12 - 33psu] [Pref: 28 - 32psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
					<b>X</b>								



**Kingdom: Chromista**

**Phylum: Ochrophyta**

**Class: Bacillariophyceae**

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**Taxon:** Diatom

**Taxonomic Author:** (T. West) R. M. Crawford, 1994

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Khakista

**Superclass:**

**Class:** Bacillariophyceae

**Subclass:** Coscinodiscophycidae

**Infraclass:**

**Superorder:** Chaetocerotanae

**Order:** Chaetocerotanae incertae sedis

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Attheyaceae

**Subfamily:**

**Also Known As (Name - Type):**

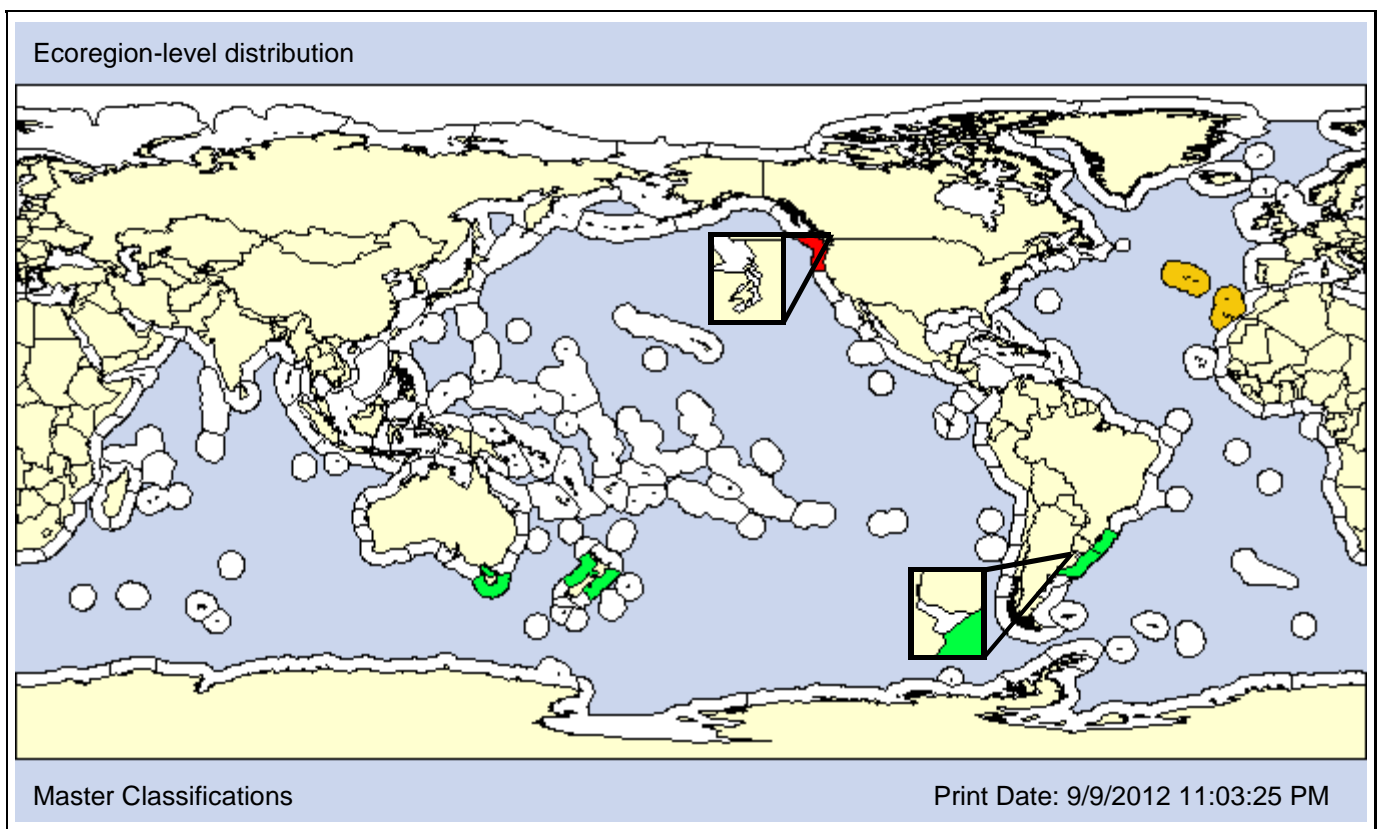
Attheya armatus  
Chaetoceros armatum  
Chaetoceros armatus  
Gonioceros armatum

Convention  
Misspelling  
Synonym  
Synonym

**Common Names:**

surf diatom

**Type Locality:**



**Date 1st record:**

about 1950

**Loc 1st record:**

Oregon, USA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X						AO	PO								

Comments: *Attheya armata*'s origins are in the southern Atlantic and Pacific. High concentrations of the surf diatom, *Attheya armata*, can discolor the surf in Washington and Oregon.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 36psu] [Pref: - 36psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
	<b>X</b>	<b>X</b>	BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Diatom

**Taxonomic Author:** (Hasle) Fryxell, 1993

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Khakista

**Superclass:**

**Class:** Bacillariophyceae

**Subclass:** Bacillariophycidae

**Infraclass:**

**Superorder:** Bacillariophycanae

**Order:** Bacillariales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Bacillariaceae

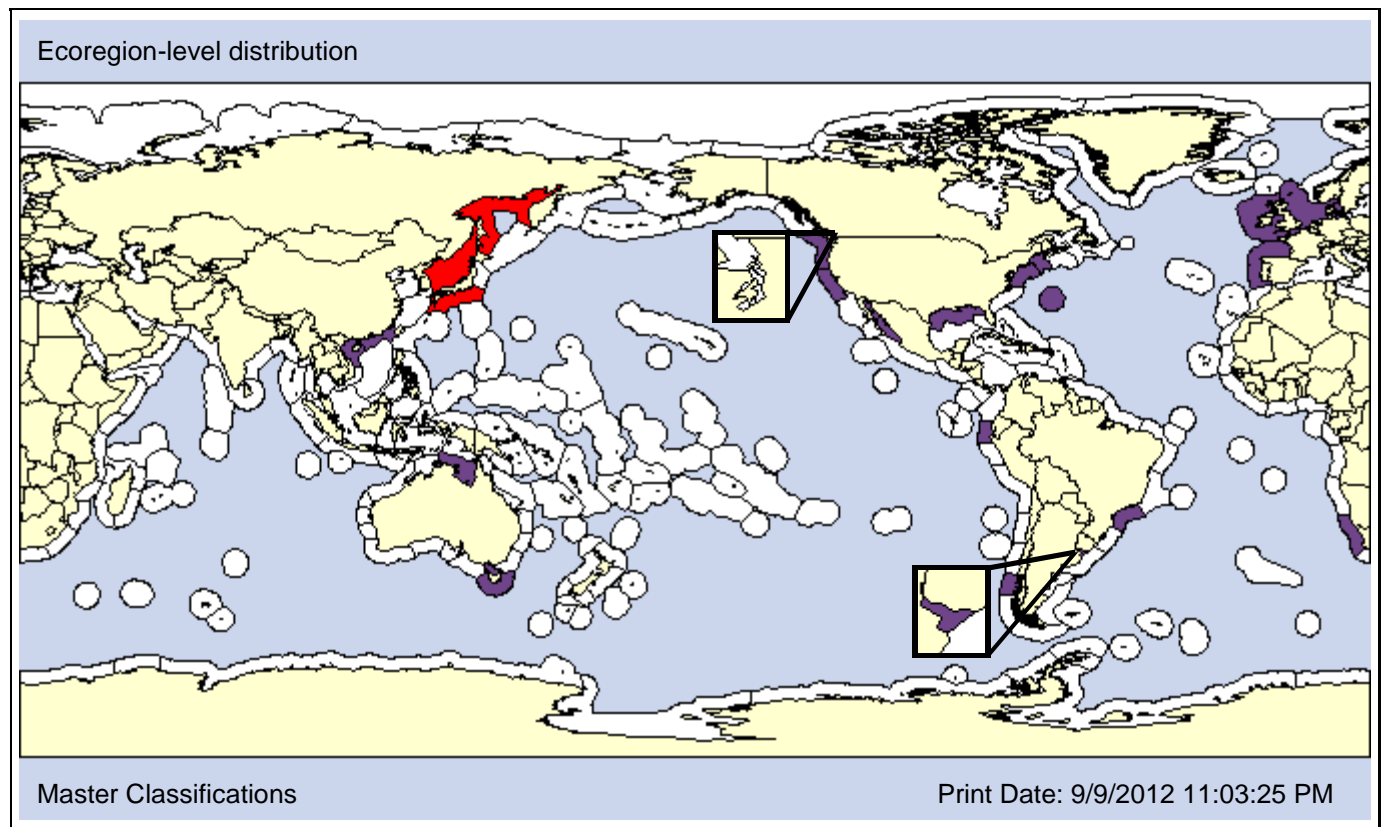
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Nitzschia americana	Synonym	
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**Type Locality:** Atlantida, Uruguay



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1994

Unknown

**Loc 1st record:** Seas of Japan and Okhotsk

Unknown

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>						AO	PO								

Comments: *Pseudo-nitzschia americana* is an epiphyte on diatoms, and has been found in temperate and tropical waters all over the world. Zvyagintsev et al. (2011) classify it as NIS in the Seas of Japan and Okhotsk based on its recent (1994) appearance. We tentatively classify as NIS in the NWP, though additional studies are required.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 11 - 33psu] [Pref: 26 - 32psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	

Kingdom: Chromista

Phylum: Ochrophyta

Class: Phaeophyceae

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**Taxon:** Brown alga

**Taxonomic Author:** (Linnaeus) Le Jolis, 1863

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Fucales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Fucaeeae

**Subfamily:**

**Also Known As (Name - Type):**

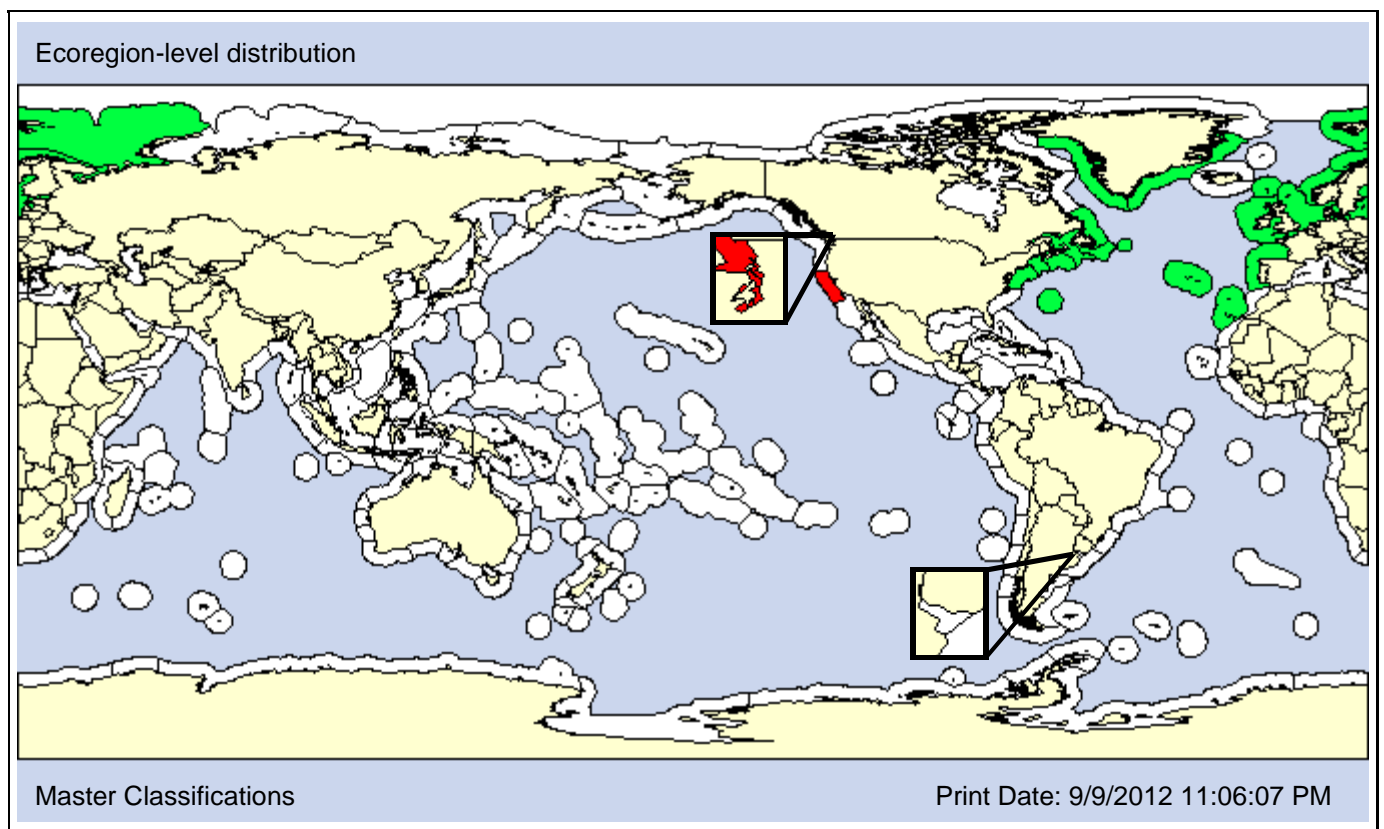
Ascophyllum nodosum var. scorpioides  
 Fucodium nodosum  
 Halicoccus nodosus  
 Ozothallia nodosa

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

knotted wrack

**Type Locality:** Atlantic Ocean



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** before 1979  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P	X	X		
						AO	PO								

Comments: *Ascophyllum nodosum* is used to pack bait worms and lobster from the Atlantic coast. It has been found periodically in San Francisco. It was thought to be eradicated in 2002; however, mats were found in 2008. It appears that this species is regularly introduced "but manages to thrive locally only occasionally" (Miller, 2008).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 4m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic <b>O</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep			
<b>O</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 40psu] [Pref: 15 - 30psu]**

<b>Fresh O</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P O</b>
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Brown alga

**Taxonomic Author:** (Turner) Greville, 1830

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cutleriales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Cutleriaceae

**Subfamily:**

**Also Known As (Name - Type):**

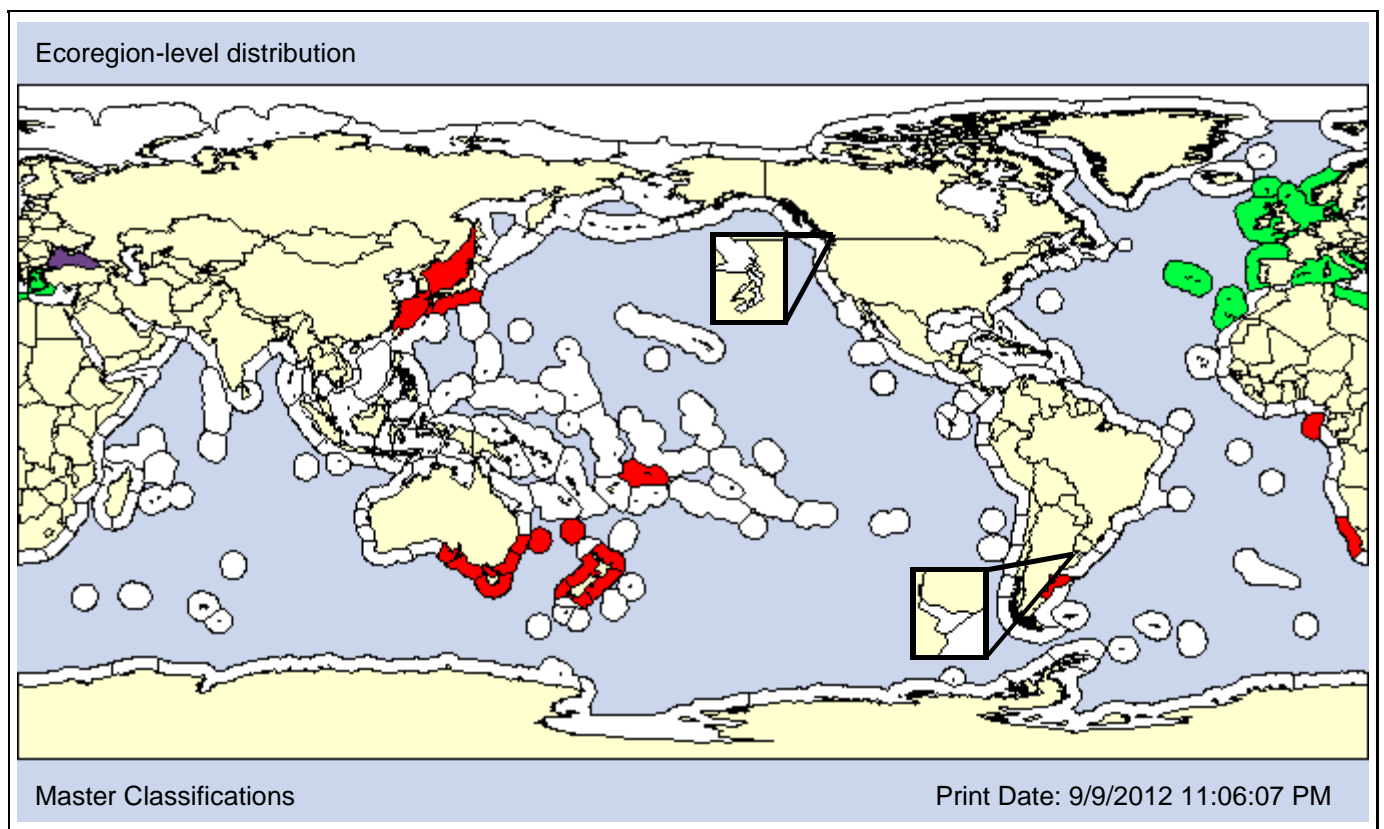
Dictyota penicillata  
 Padinella parvula  
 Ulva multifida  
 Zonaria multifida C.Agardh, 1820

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Hira-muchimo

**Type Locality:** Yarmouth, Norfolk, England



**Date 1st record:** 1957

**Loc 1st record:** Sasebo Bay, Japan

**Established:** Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
		X				AO X	PO							

Comments: Hewitt et al. (2004) classify *Cutleria multifida* as cryptogenic in Port Phillip, Australia. However, we classify it as NIS in Australia based on Inglis et al. (2006e) and Nelson (1999) and its global distribution.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X	X	

**DEPTH [Obs: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O									O	O	

**SALINITY [Obs: 29 - 42psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	O	
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		X							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P		X		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

**Taxon:** Brown alga

**Taxonomic Author:** (Stackhouse) J.V.Lamouroux, 1813

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Desmarestiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Desmarestiaceae

**Subfamily:**

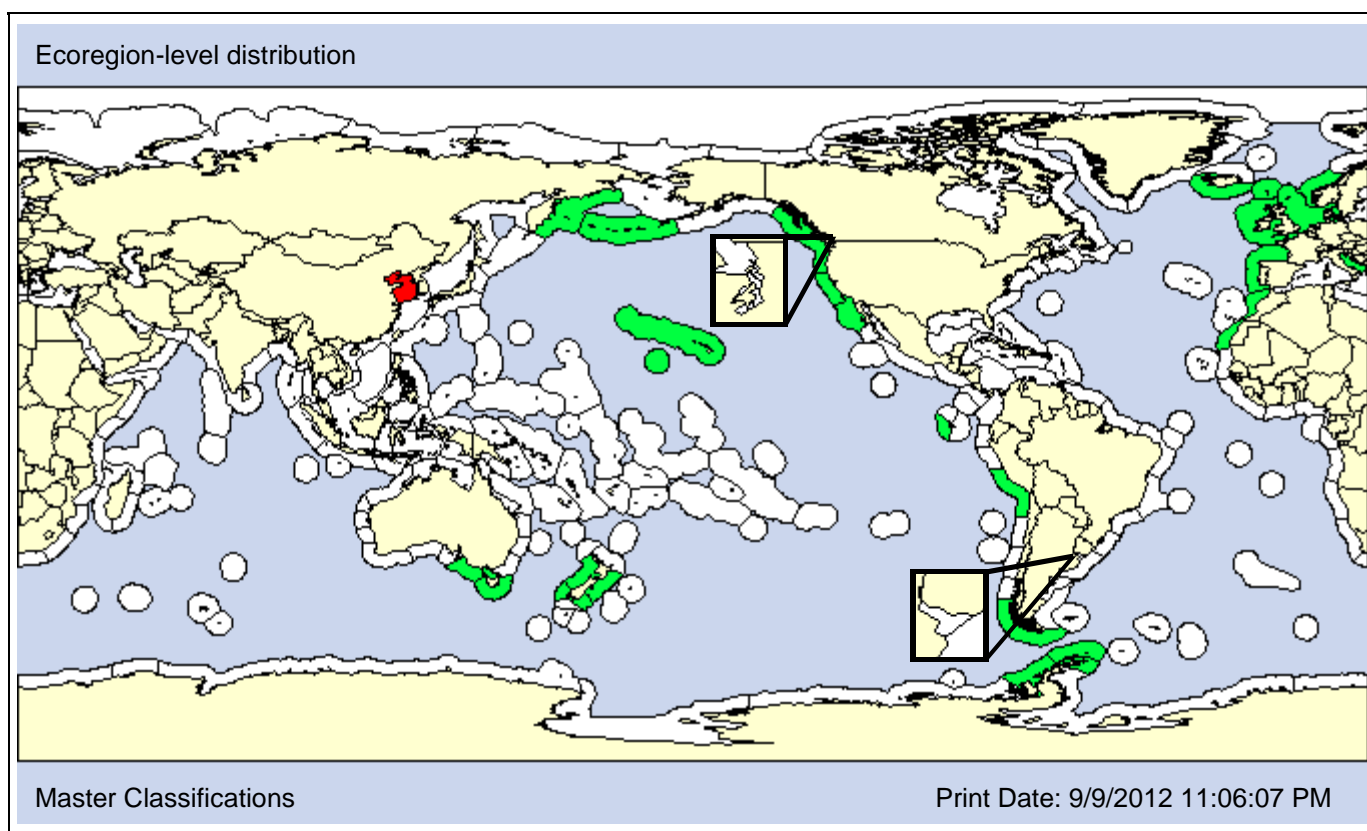
**Also Known As (Name - Type):**

Desmarestia adriatica	Synonym
Desmarestia jordanii	Synonym
Desmarestia ligulata var. angustior	Synonym
Desmarestia ligulata var. dilatata	Synonym

**Common Names:**

acid kelp
color changer
flattened acid kelp
Urushi-gusa

**Type Locality:** Scotland



**Date 1st record:** 2000

Native

Native

**Loc 1st record:** Dalian, China

Native

Native

**Established:** Yes

Yes

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Desmarestia ligulata* was introduced into Dalian, China from Japan (Chen et al., 2006a). Though its classification in Japan is not clear, we tentatively classify it as native on the Pacific Coast of Japan. *D. ligulata* is a cold temperate species with a bipolar distribution that also occurs in deeper waters in warm areas, such as Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X

**DEPTH [Obs: 0 - 56m] [Pref: 0 - 6m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							P							O

**SALINITY [Obs: 0 - 27psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
	O	O	O	O	O	O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		X							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			X

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Brown alga

**Taxonomic Author:** (F.S.Collins) Setchell & N.L.Gardner, 1924

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Dictyotales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Dictyotaceae

**Subfamily:**

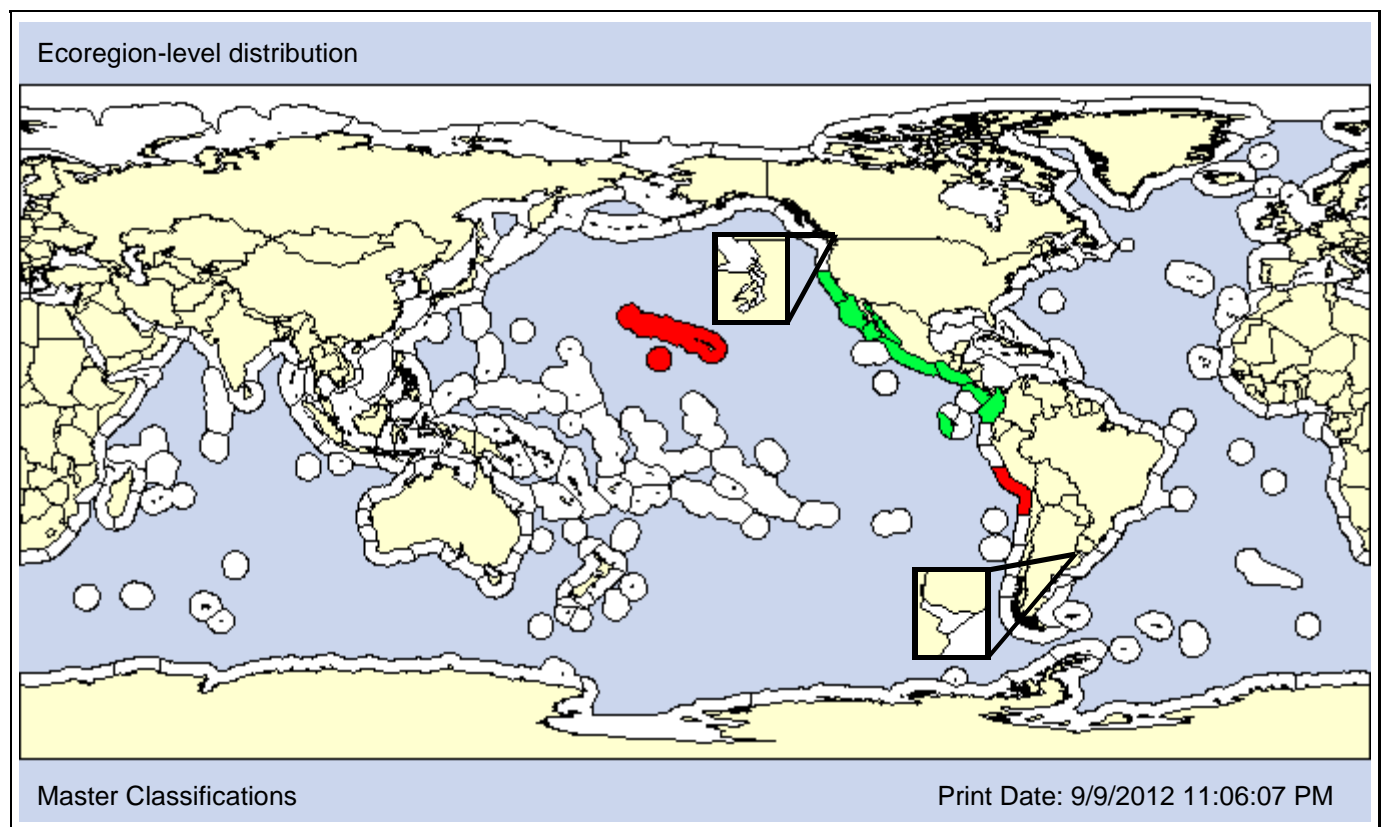
**Also Known As (Name - Type):**

Dictyota hesperia  
 Dictyota johnstonii  
 Dilophus flabellatus

Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** La Jolla, California, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

<b>Date 1st record:</b> <1990	1999	Native
<b>Loc 1st record:</b> Japan	Barbers Point, Oahu, HI	Native
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
		X				AO	PO							

Comments: Assuming the identifications are correct, *Dictyota flabellata* is considered introduced in Japan, Pakistan, and Chile (Carlton and Eldredge, 2009); however, we are unaware of the specific locations invaded in Japan and Pakistan.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>
							<b>X</b>						

**DEPTH [Obs: 0 - 26m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>					<b>O</b>						<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Brown alga

**Taxonomic Author:** Takamatsu, 1938

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ectocarpales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Chordariaceae

**Subfamily:**

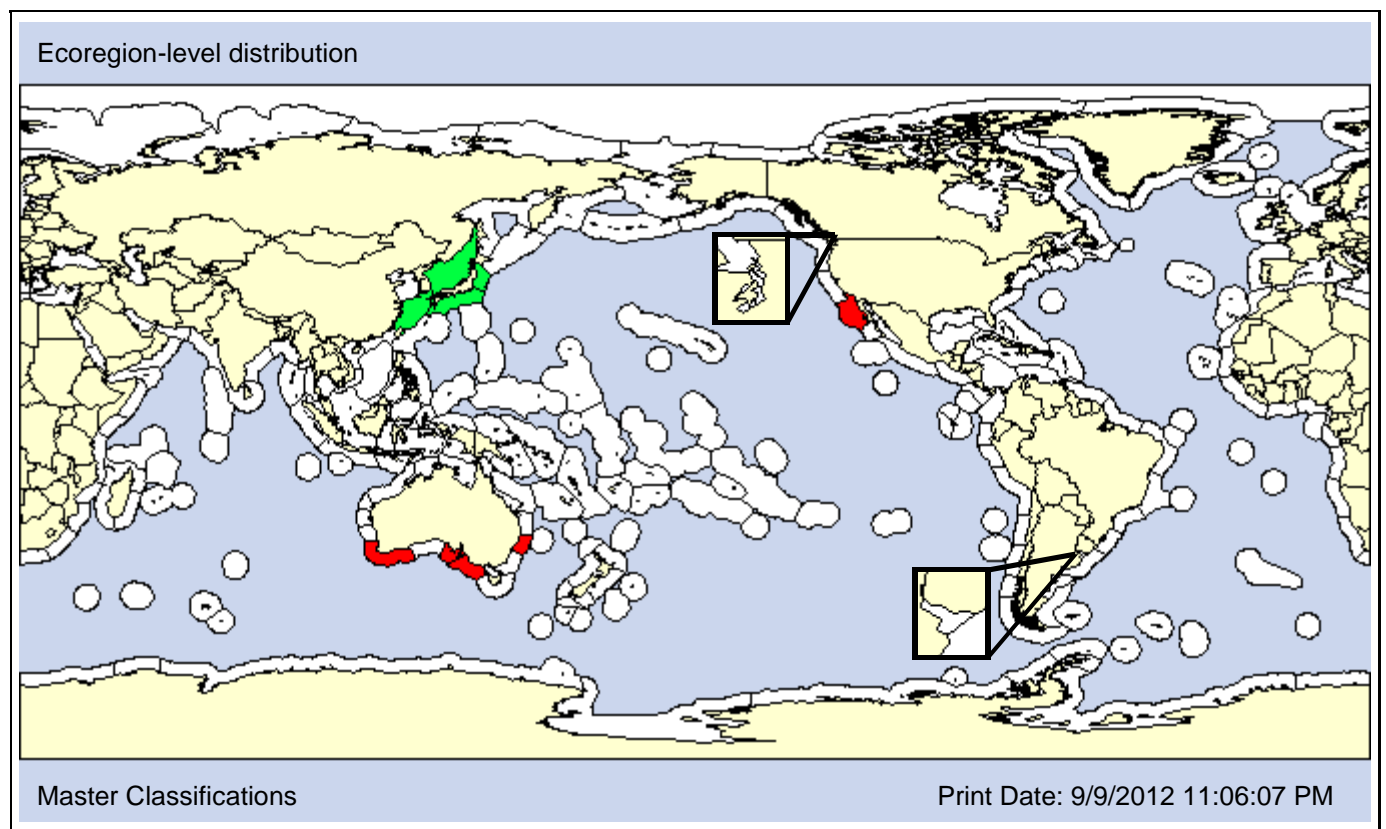
**Also Known As (Name - Type):**

Elachista orbicularis  
Gonodia orbicularis

Synonym  
Synonym

**Common Names:**

**Type Locality:** Japan



**Date 1st record:** Native

1984

**Loc 1st record:** Native

Channel Islands, CA

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Elachista nigra* is an epiphyte on the kelp *Eisenia arborea*. In the NEP, it has only been found in the Channel Islands, California.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					<b>X</b>

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>P</b>							

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	

**Taxon:** Brown alga

**Taxonomic Author:** Wynne & Magne, 1991

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Fucales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Fuaceae

**Subfamily:**

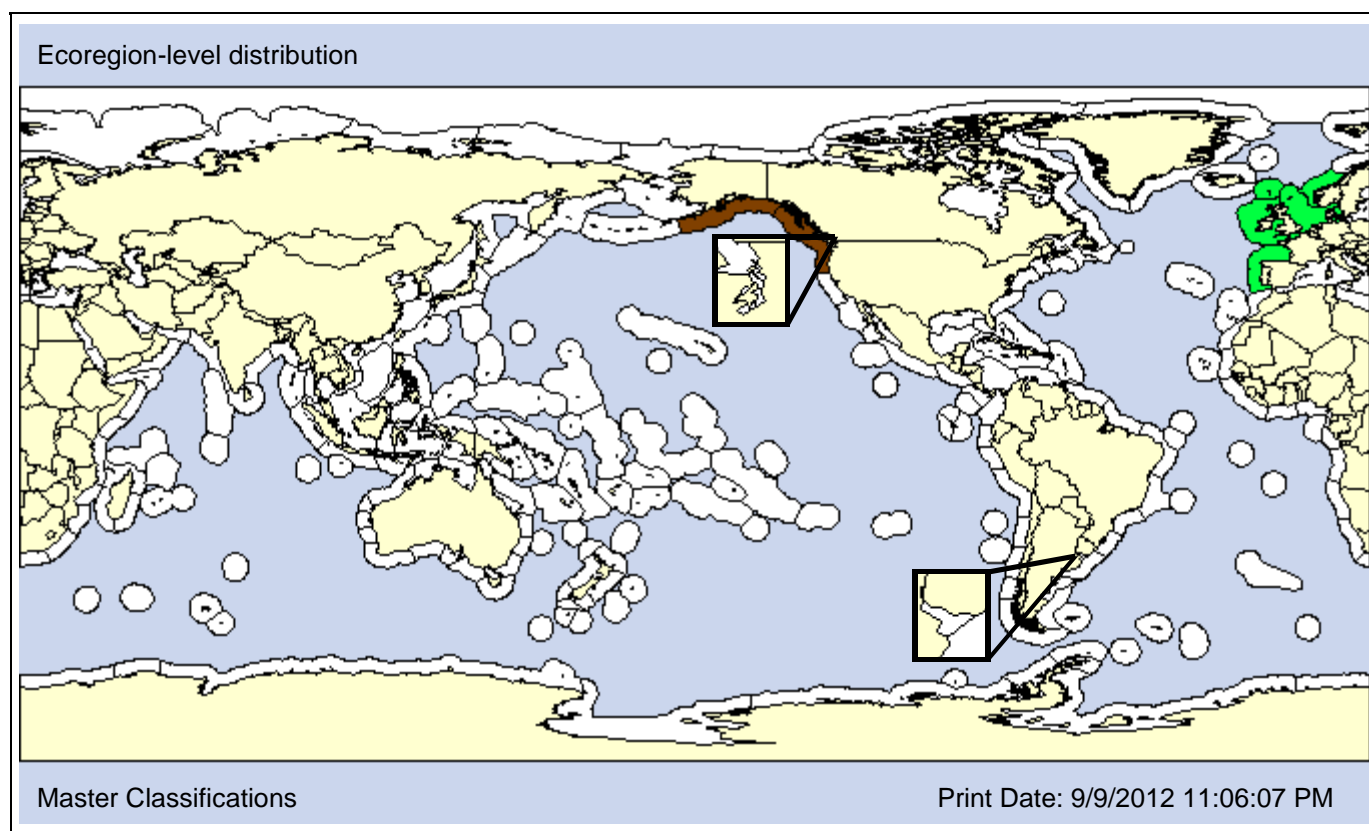
**Also Known As (Name - Type):**

Fucus cottoni	Misspelling
Fucus muscoides	Synonym
Fucus vesiculosus var. muscoides	Synonym

**Common Names:**

moss wrack
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1981

**Loc 1st record:**

Vancouver Island, Canada

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
						AO	PO								

Comments: Genetics on *Fucus cottonii* in Oregon indicate that it is a different species than the one described from Ireland (Serrão et al., 2006), possibly the native *F. distichus* subsp. *evanescens* or *Fucus gardneri*. We list *F. cottonii* with a conflicting classification for the NEP, recognizing that it may be native.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					
	<b>X</b>												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	<b>P</b>	<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>			<b>O</b>	<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>	<b>X</b>							

# Macrocystis pyrifera

Species ID: 4908

**Taxon:** Brown alga

**Taxonomic Author:** (Linnaeus) C.Agardh, 1820

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Laminariales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Laminariaceae

**Subfamily:**

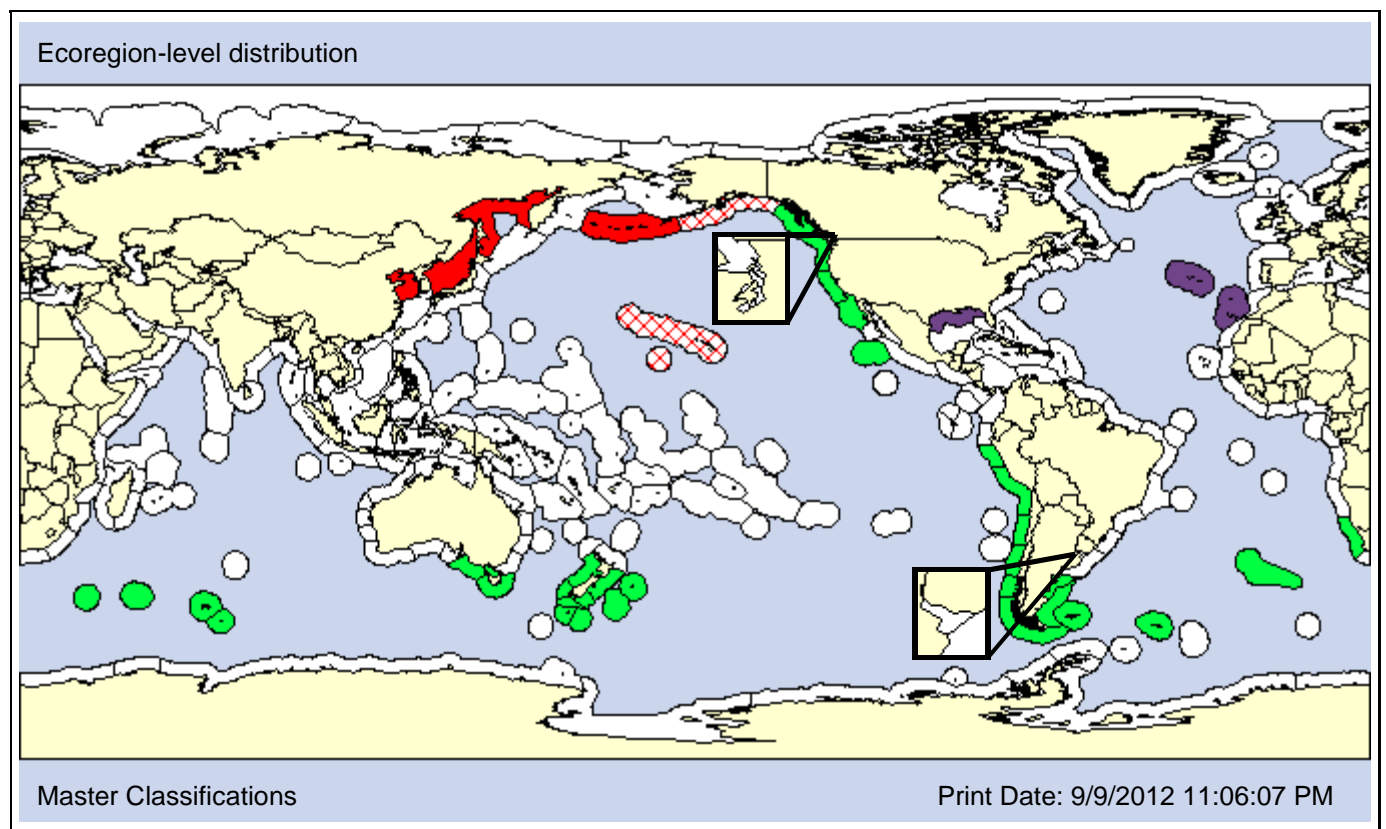
**Also Known As (Name - Type):**

Fucus giganteus	Synonym
Fucus pyrifera	Synonym
Laminaria pyrifera	Synonym
Macrocystis communis	Synonym

**Common Names:**

bladder kelp  
giant bladder kelp  
giant kelp

**Type Locality:** South Atlantic Ocean



**Date 1st record:** 1978

1972

Unknown

**Loc 1st record:** China

Makapuu, Oahu, Hawaii

Prince William Sound, Alaska

**Established:** Yes

No

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				X
				X	X	AO	PO								

Comments: Recently all four species of *Macrocystis* were "collapsed" into a single species, *M. pyrifera* (Demes et al., 2009). *M. integrifolia* [*M. pyrifera*] has been transported from its native range in southeast Alaska to Prince William Sound for use in the herring fishery. However, it is apparently not established in the Gulf of Alaska.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH <b>X</b>				<b>X</b>

**DEPTH [Obs: 0 - 55m] [Pref: 5 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 22 - 34psu] [Pref: 27 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Brown alga

**Taxonomic Author:** Reinke, 1888

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ectocarpales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Chordariaceae

**Subfamily:**

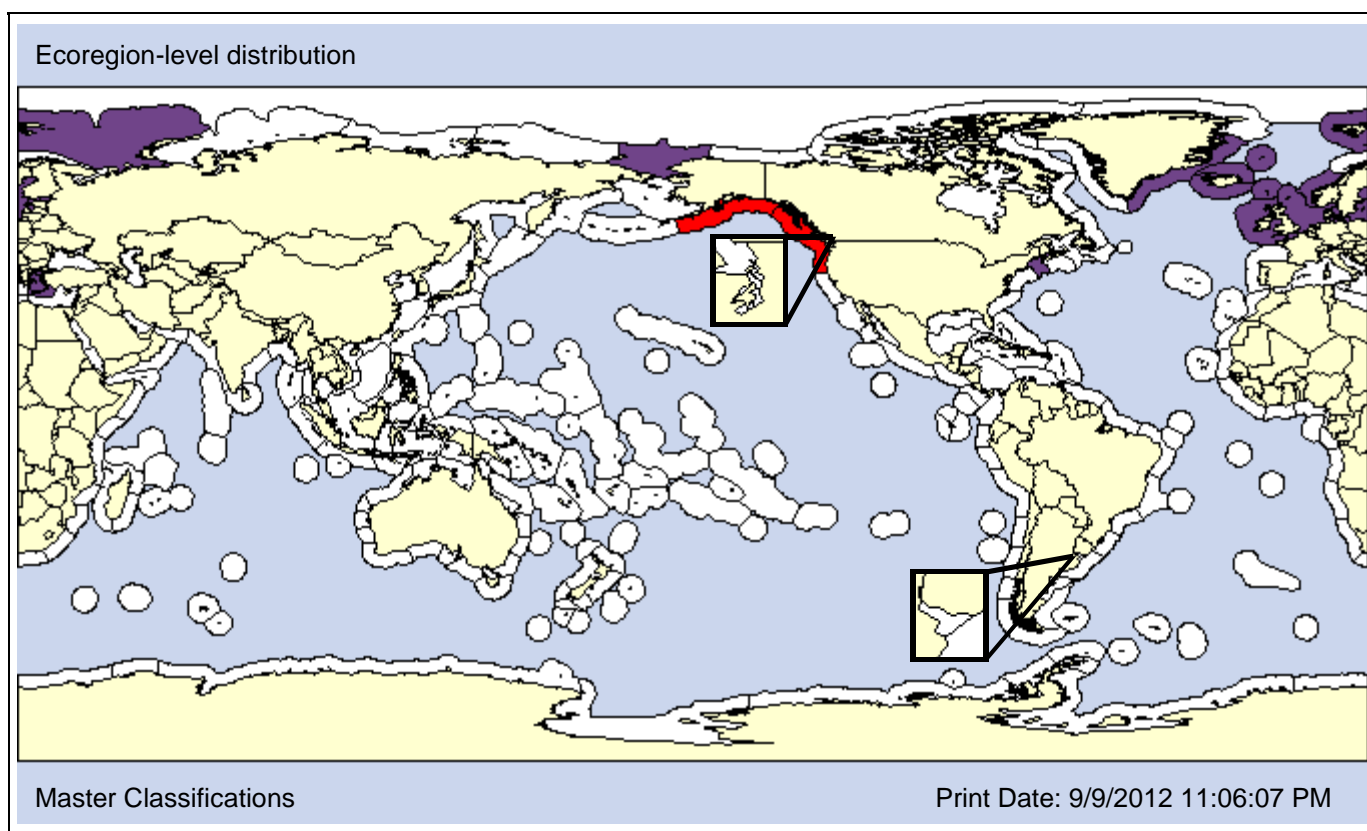
**Also Known As (Name - Type):**

Ascocyclus globosus	Synonym
Ectocarpus pulvinatus	Synonym
Myrionema globosum	Synonym
Phycocelis alariae	Synonym

**Common Names:**

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**Type Locality:** Germany



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1998

**Loc 1st record:**

Prince William Sound, Alaska

**Established:**

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P		X		
	X					AO	PO X								

Comments: *Microspongium globosum* is a very small species (1-2 mm tall) that is epiphytic on the brown alga, *Delamaraea attenuata*. It is possible that this species was overlooked rather than being a true introduction in the NEP (Gayle Hansen, pers. comm. 9/21/2010).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					X

**DEPTH [Obs: 0 - 18m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							P							

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	



**Taxon:** Brown alga

**Taxonomic Author:** (Suringar, 1872) Kuckuck, 1929

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ectocarpales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Chordariaceae

**Subfamily:**

**Also Known As (Name - Type):**

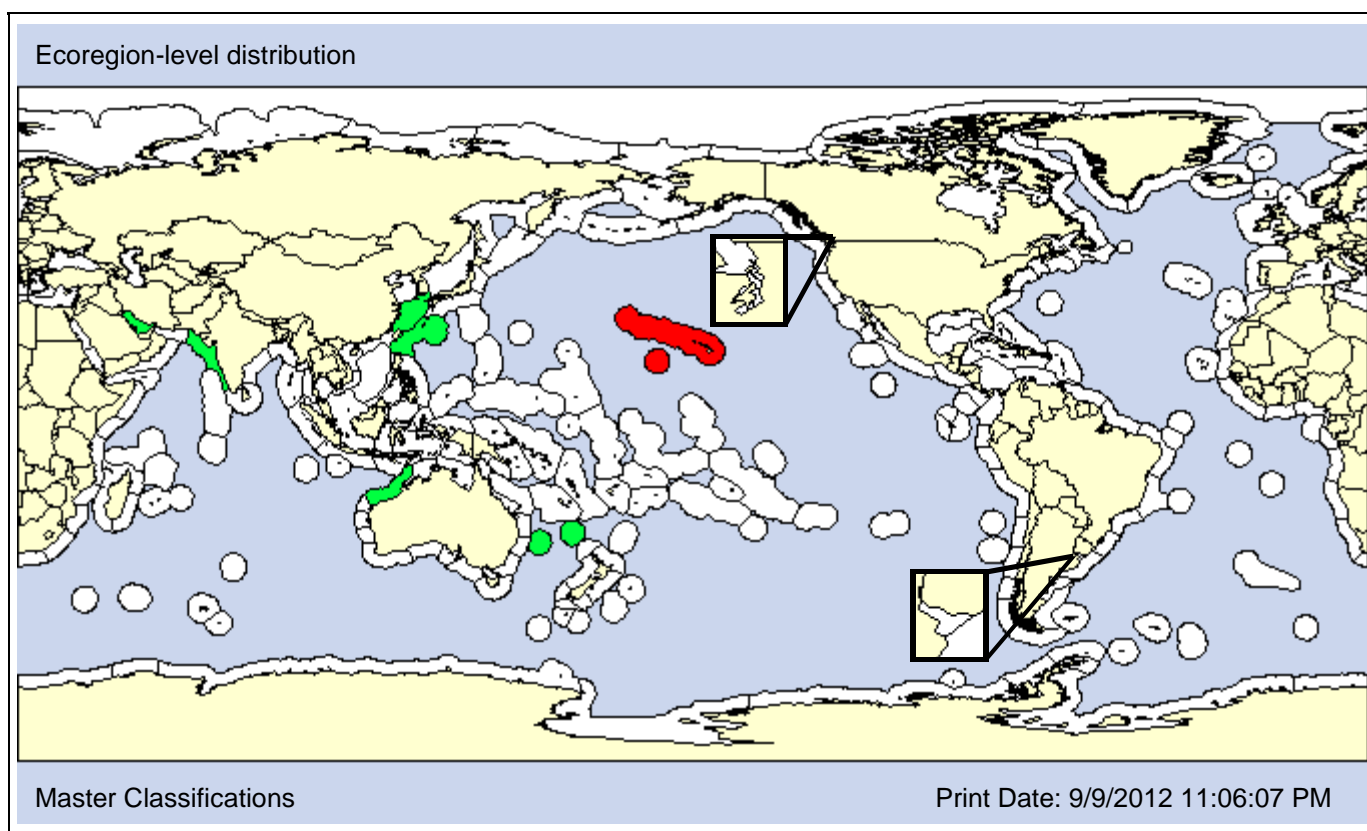
Cladosiphon decipiens  
Mesogloia decipiens

Synonym  
Synonym

**Common Names:**

mozuka  
mozuku

**Type Locality:** Japan (syntype)



**Date 1st record:** Native 1963  
**Loc 1st record:** Native Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				X
						AO	PO							

Comments: Abbott and Huisman (2004) consider *Nemacystus decipiens* indigenous to Hawaii, while Carlton and Eldredge (2009) list it as introduced from Western and South Pacific.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Brown alga

**Taxonomic Author:** (Linnaeus) Kjellman, 1872

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ectocarpales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Pilayellaceae

**Subfamily:**

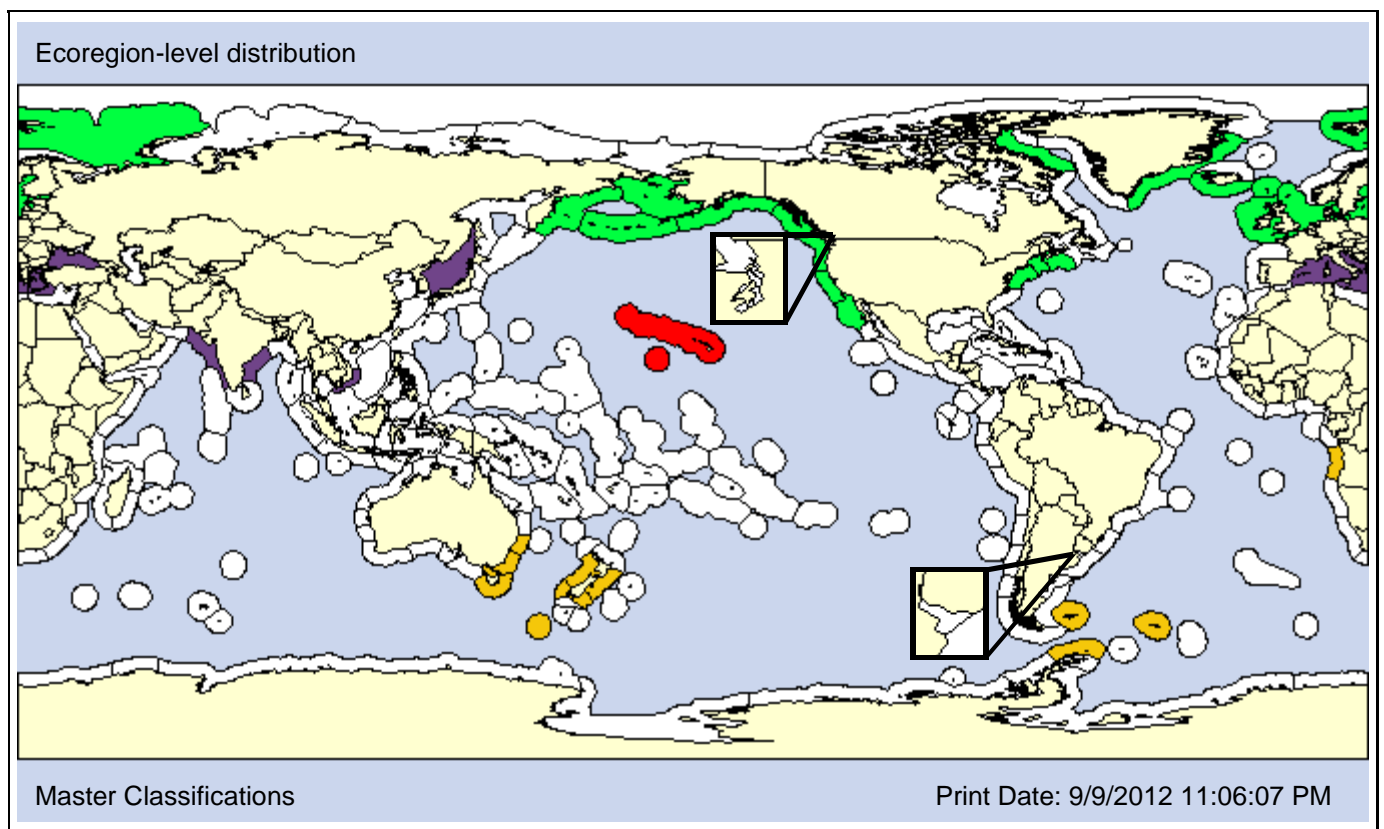
**Also Known As (Name - Type):**

Ceramium littorale	Synonym
Conferva littoralis	Synonym
Ectocarpus littoralis	Synonym
Lyngbya littoralis (Linnaeus) Dillwyn ex Gaillon	Synonym

**Common Names:**

piraera
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**Type Locality:** Europe



Master Classifications: Native (Green), Nonindigenous (Red), NIS Not Established (Cross-hatched), Cryptogenic (Yellow), Transient (Cyan), Unclassified (Purple), Conflicting Classification (Brown), Unidentified (White).  
 NWP: Hawaii, NEP

**Date 1st record:** Native 1990s Native  
**Loc 1st record:** Native Honolulu Harbor, Hawaii Native  
**Established:** Yes Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: Based on its distribution, we tentatively classify *Pylaiella littoralis* as native in northern boreal and Arctic regions and the NEP, introduced in Hawaii (Carlton and Eldredge, 2009), cryptogenic in the southern hemisphere, and unclassified elsewhere. *P. littoralis* is often found as an epiphyte on brown algae, such as *Fucus*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>			<b>X</b>	<b>X</b>
							<b>X</b>						

**DEPTH [Obs: 0 - 6m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>O</b>	<b>P</b>		<b>O</b>		<b>O</b>	<b>O</b>	

**SALINITY [Obs: 5.7 - 34psu] [Pref: 11.3 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Brown alga

**Taxonomic Author:** Kuckuck, 1894

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ralfsiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ralfsiaceae

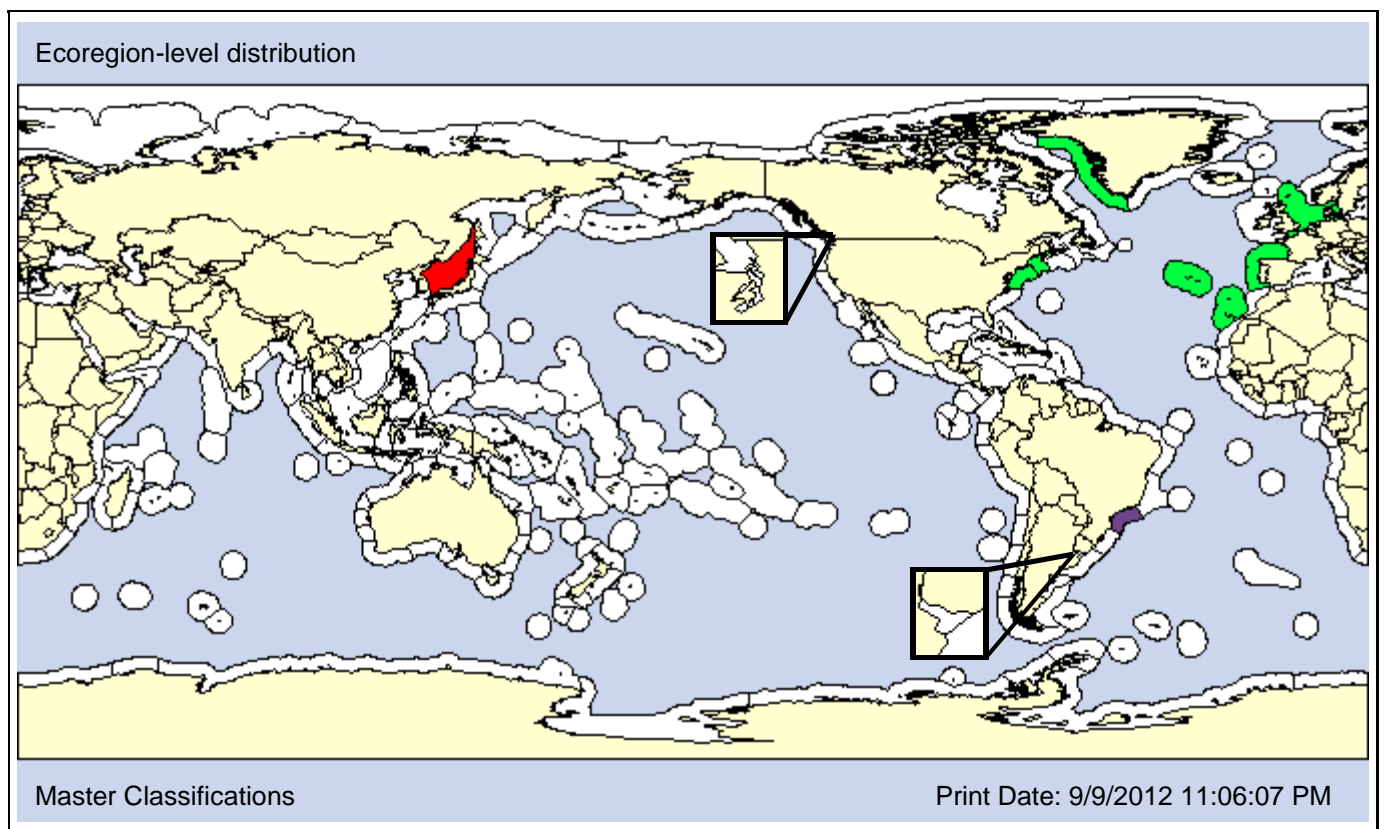
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Ralfsia bornetti	Misspelling	
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**Type Locality:** Helgoland, Germany



**Date 1st record:** 1987

**Loc 1st record:** Vladivostok, Russia

**Established:** Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: The distribution of *Ralfsia bornettii* is confounded by several authors believing it is a life-history stage of *Stragularia clavata*. Following Zvyagintsev et al. (2011), we treat it as a separate species and as introduced into the Sea of Japan. Based on its distribution, we assume it is native to the North Atlantic.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>		<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					<b>X</b>

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>O</b>							

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Brown alga

**Taxonomic Author:** (Areschoug) Lane, Mayes, Druehl & Saunders 2006

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Laminariales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Laminariaceae

**Subfamily:**

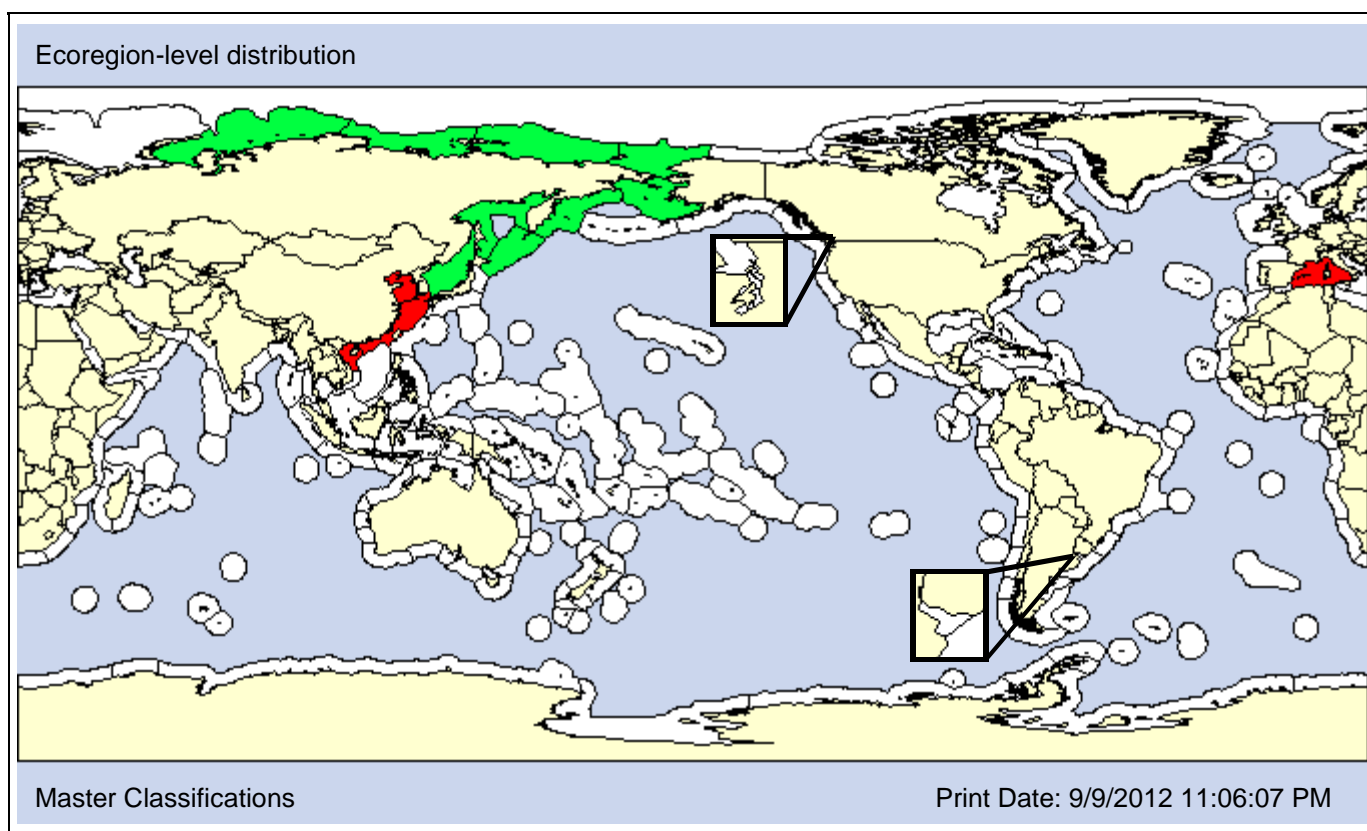
**Also Known As (Name - Type):**

Laminaria fragilis	Synonym
Laminaria japonica	Synonym
Laminaria ochotensis	Synonym

**Common Names:**

Japanese kelp ( <i>Saccharina japonica</i> )
ma-konbu
sea tangle

**Type Locality:**



**Date 1st record:** late 1920s

**Loc 1st record:** China

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
		<b>X</b>		<b>X</b>		AO	PO <b>X</b>								

Comments: The kelp *Saccharina japonica* is cultivated in Japan, China, and Korea. China is the largest producer, introduced from Japan in 1927.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: 0.8 - 4.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			X

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							



**Taxon:** Brown alga

**Taxonomic Author:** (Miyabe) Lane, Mayes, Druehl & Saunders, 2006

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Laminariales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Laminariaceae

**Subfamily:**

**Also Known As (Name - Type):**

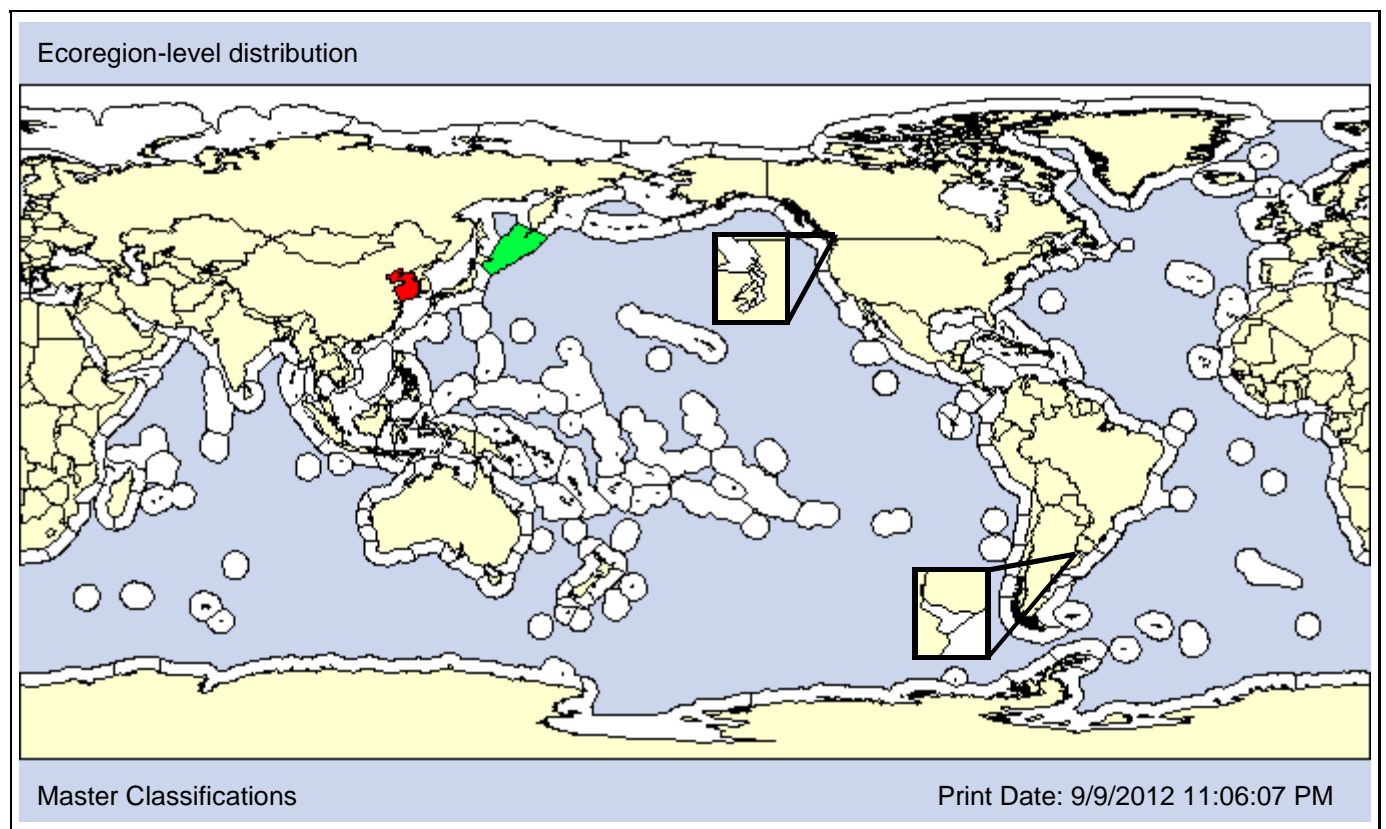
Laminaria angustata var. longissima  
Laminaria longissima

Synonym  
Synonym

**Common Names:**

Gimberi  
Naga-konbu

**Type Locality:** Japan



**Date 1st record:** Unknown

**Loc 1st record:** Unknown

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: The kelp *Saccharina longissima* [= *Laminaria longissima*] was introduced from Japan into China for aquaculture (Wang, 2008). It is reported to be widely cultured in China but we are not aware of specific locations, however we list the Yellow Sea as one likely ecoregion.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X

**DEPTH [Obs: - 4m] [Pref: - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			X

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Brown alga

**Taxonomic Author:** (Turner) C.Agardh, 1820

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Fucales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Sargassaceae

**Subfamily:**

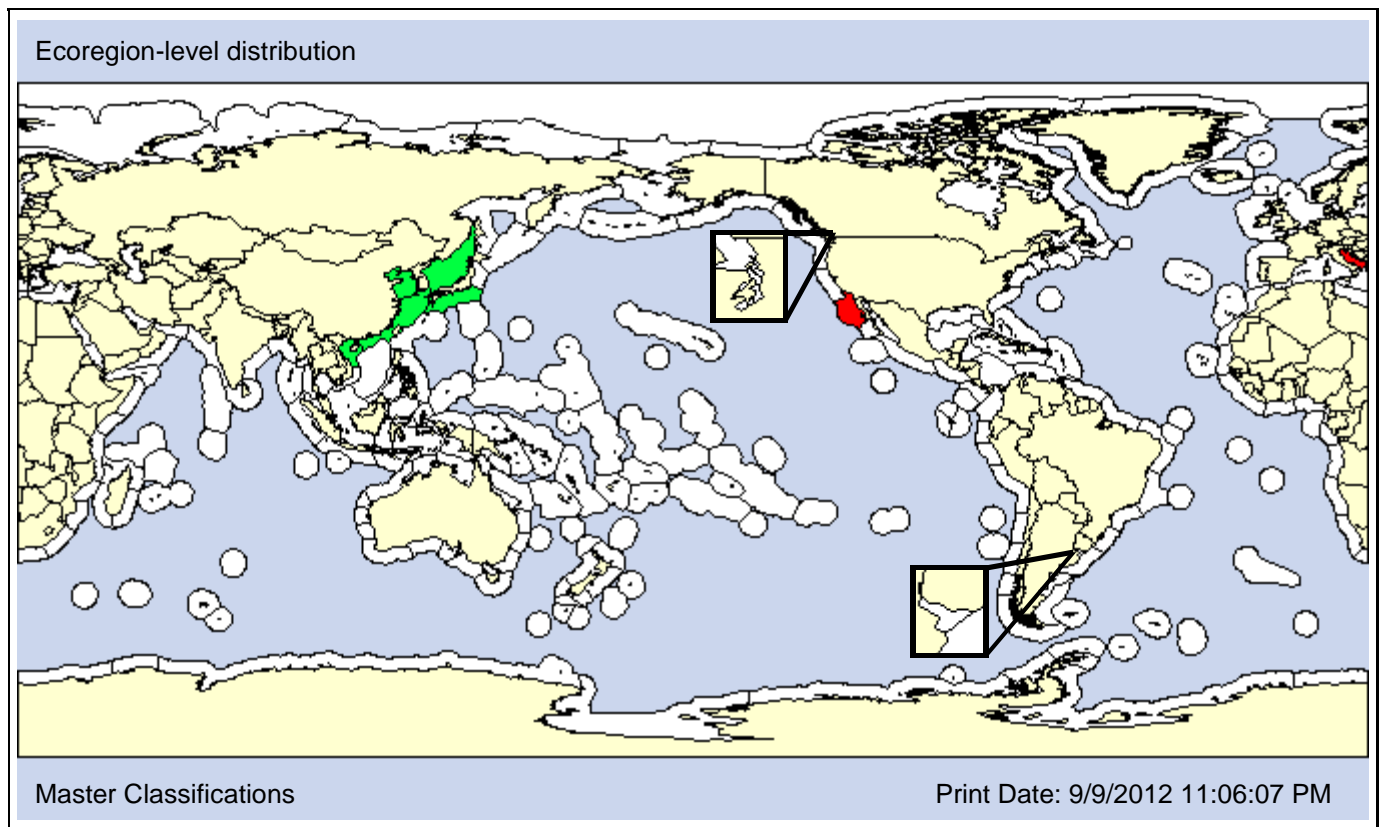
**Also Known As (Name - Type):**

Fucus horneri	Synonym
Sargassum (Bactrophyucus) horneri	Synonym
Sargassum fengeri	Synonym
Sargassum filicinum	Synonym

**Common Names:**

--

**Type Locality:** Korea Strait



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 2003  
**Loc 1st record:** Native Long Beach Harbor, CA  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: *Sargassum horneri* attaches to hard substrates or is epiphytic on other algae, such as *Sargassum muticum*. It is native to Asia and was first found in Long Beach Harbor, California in 2003.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 19m] [Pref: 5 - 6m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: - 38psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Brown alga

**Taxonomic Author:** (Yendo) Fensholt, 1955

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Fucales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Sargassaceae

**Subfamily:**

**Also Known As (Name - Type):**

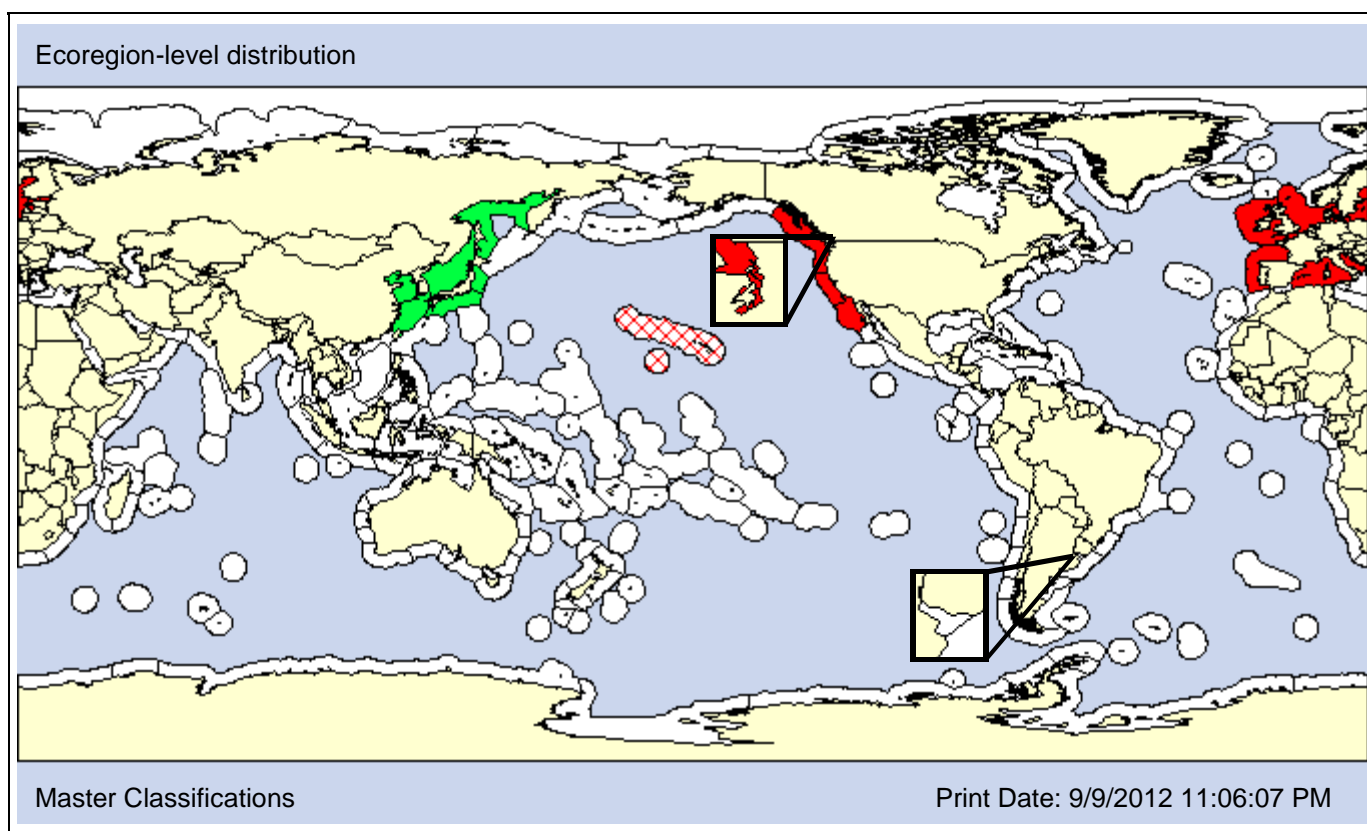
Sargassum (Bactrophyucus) muticum  
Sargassum kjellmanianum f. muticum

Convention  
Synonym

**Common Names:**

strangle weed  
wireweed  
wire-weed

**Type Locality:** Hokkaido, Japan (lectotype)



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

**NWP**

**Hawaii**

**NEP**

**Date 1st record:** Native

1999

1944

**Loc 1st record:** Native

Barge in Pearl Harbor, HI

British Columbia, Canada

**Established:** Yes

No

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 24m] [Pref: 0 - 8m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>	<b>O</b>							<b>P</b>		<b>O</b>	<b>O</b>

**SALINITY [Obs: 6 - 34psu] [Pref: 16 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
	<b>X</b>		BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Brown alga

**Taxonomic Author:** (Agardh) Greville, 1828

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ectocarpales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Chordariaceae

**Subfamily:**

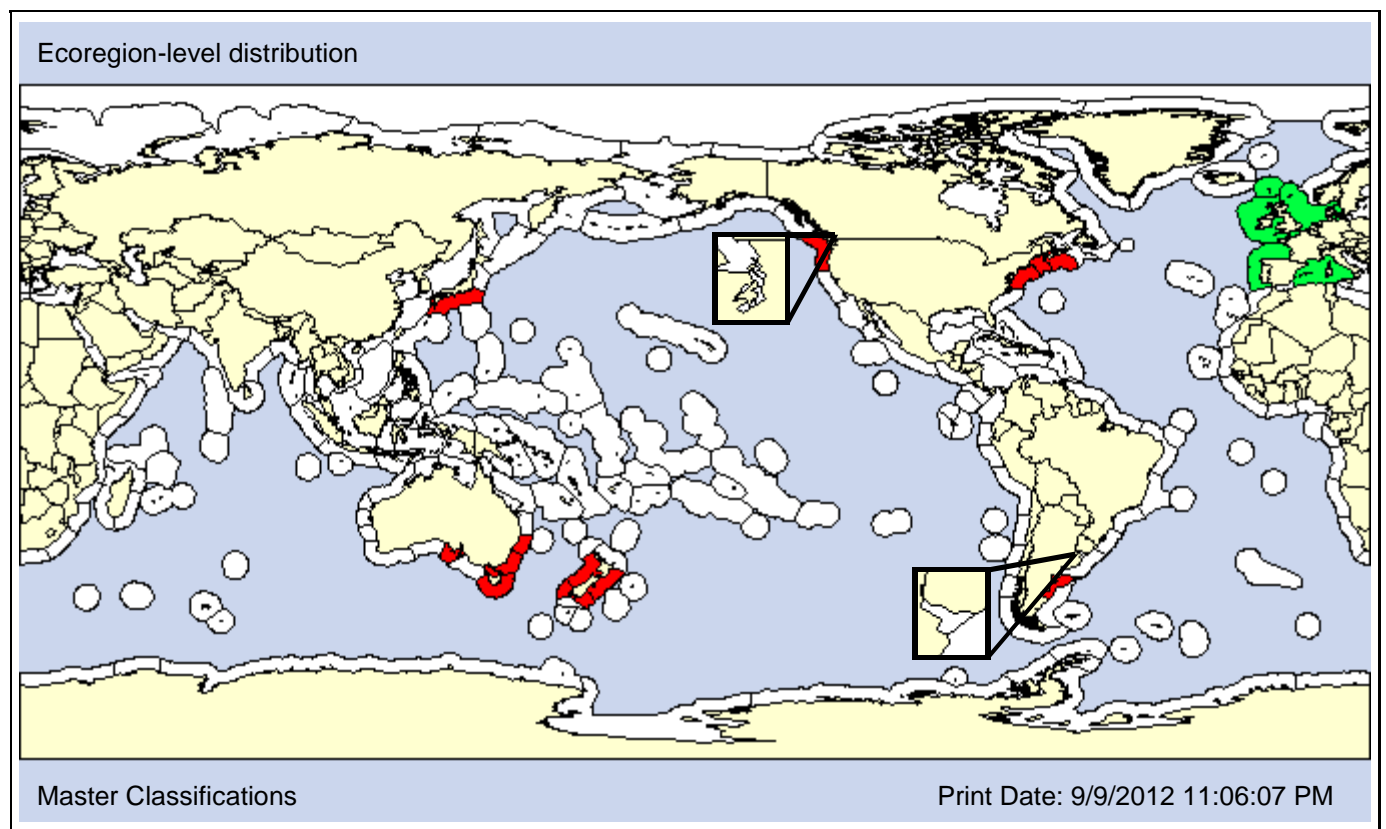
**Also Known As (Name - Type):**

Dictyota lineolata  
Zonaria lineolata

Synonym  
Synonym

**Common Names:**

**Type Locality:** Isle of Bute, Scotland



**Date 1st record:** <1932

<2008

**Loc 1st record:** Japan

Willapa Bay, Washington

**Established:** Yes

Unknown

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>O</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Brown alga

**Taxonomic Author:** (Harvey) Suringar, 1873

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Ochrophyta

**Subphylum:** Phaeista

**Superclass:** Fucistia

**Class:** Phaeophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Laminariales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Alariaceae

**Subfamily:**

**Also Known As (Name - Type):**

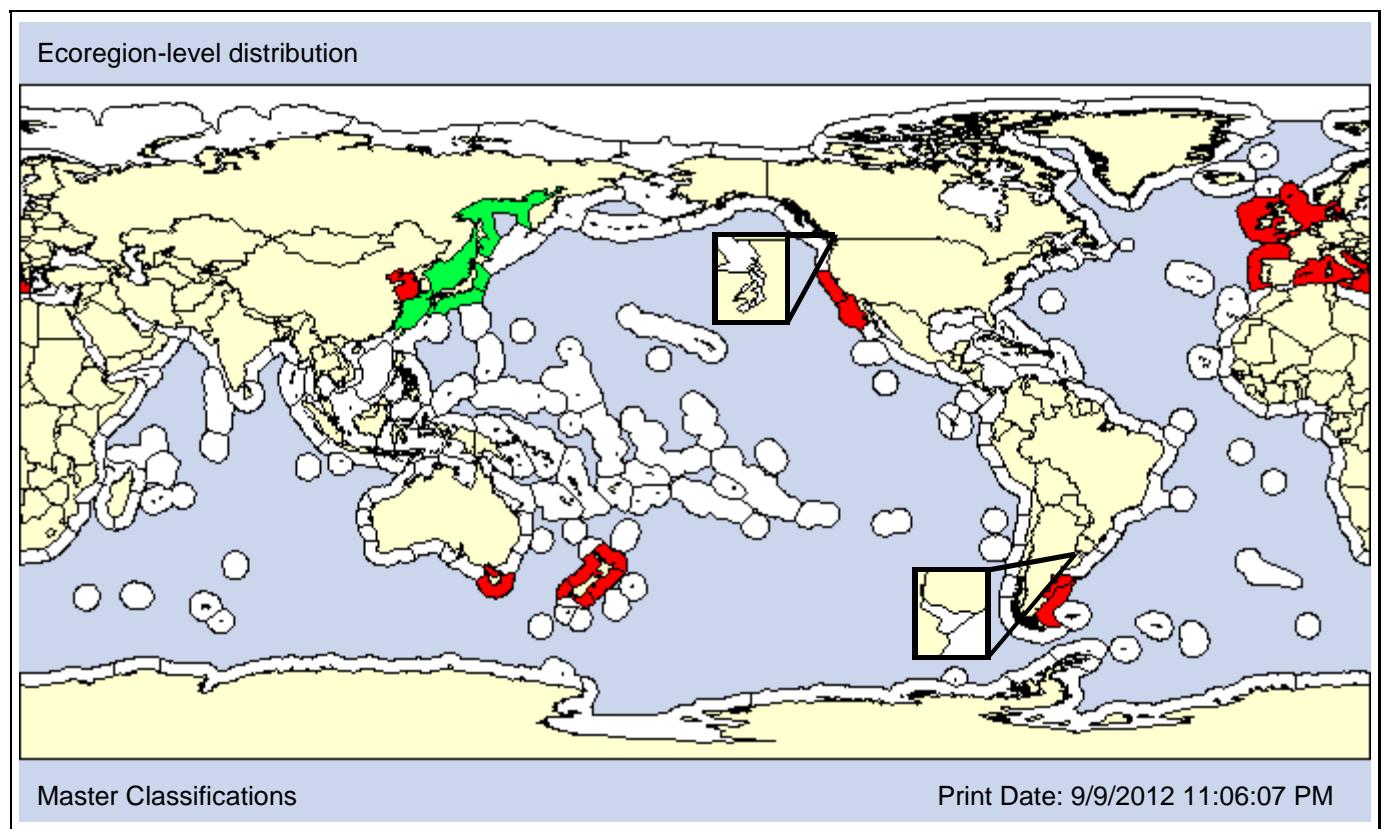
Alaria amplexicaulis  
Alaria pinnatifida  
Ulopteryx pinnatifida

Synonym  
Synonym  
Synonym

**Common Names:**

Asian kelp  
Japanese kelp (*Undaria pinnatifida*)  
miyeuk  
wakame

**Type Locality:** Simoda, Japan



**Date 1st record:** 1984

2000

**Loc 1st record:** Yellow Sea

Los Angeles Harbor, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X		X		AO	PO								

Comments: According to Chen et al. 2006a, *Undaria pinnatifida* was introduced to Liaoning, Shandong, and Zhejiang Provinces in China for mariculture.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 25m] [Pref: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>					<b>O</b>			<b>P</b>	<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 18 - 40psu] [Pref: 23 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							

Kingdom: Chromista

Phylum: Myzozoa

Subphylum: Apicomplexa

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**Taxon:** Apicomplexa

**Taxonomic Author:** Mavrodiadi, 1908

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Myzozoa

**Subphylum:** Apicomplexa

**Superclass:**

**Class:** Conoidasida

**Subclass:** Gregarinasina

**Infraclass:**

**Superorder:**

**Order:** Eugregarinorida

**Suborder:** Septatorina

**Infraorder:**

**Superfamily:**

**Family:** Cephaloidophoridae

**Subfamily:**

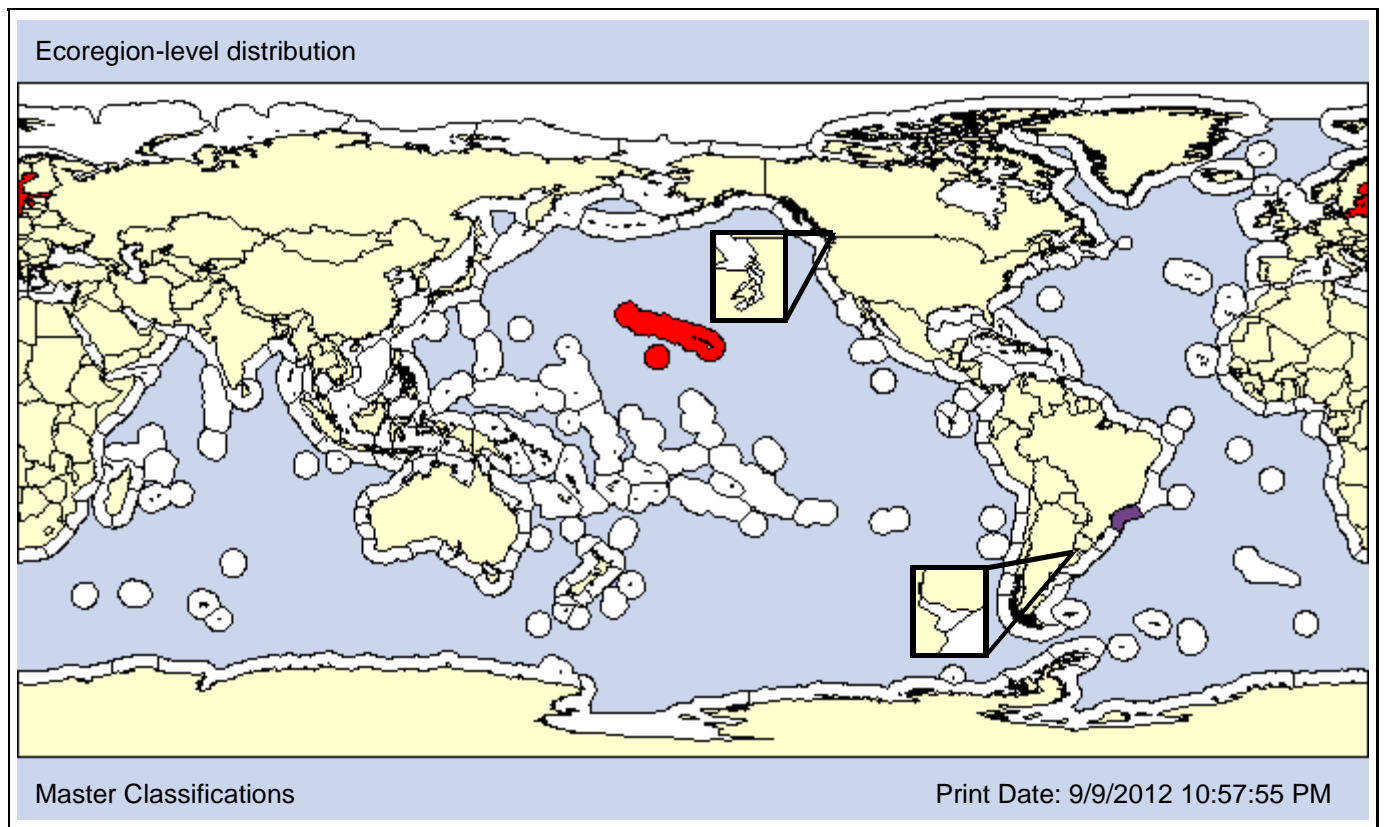
**Also Known As (Name - Type):**

Cephaloidophora chthamali  
Pyxinioides chthamali of Tuzet and Ormières, 1956

Synonym  
Misidentified

**Common Names:**

**Type Locality:**



**Date 1st record:** 1949  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: *Cephaloidophora communis* is an endoparasitic gregarine protozoan found in barnacles including *Amphibalanus amphitrite*, *A. eburneus*, *Balanus crenatus*, *Megabalanus tintinnabulum*, and, in Brazil, *Euraphia rhyzophorae*. Its native range is unknown, however it is assumed to be introduced when found in non-native barnacles.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			X		TP	RI-PH	X			X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
			O	O	O				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
X									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

Kingdom: Chromista

Phylum: Myzozoa

Subphylum: Dinozoa

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**Taxon:** Dinoflagellate

**Taxonomic Author:** Balech, 1994

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Myzozoa

**Subphylum:** Dinozoa

**Superclass:**

**Class:** Dinophyceae

**Subclass:** Dinophycidae

**Infraclass:**

**Superorder:**

**Order:** Gonyaulacales

**Suborder:**

**Infraorder:**

**Superfamily:**

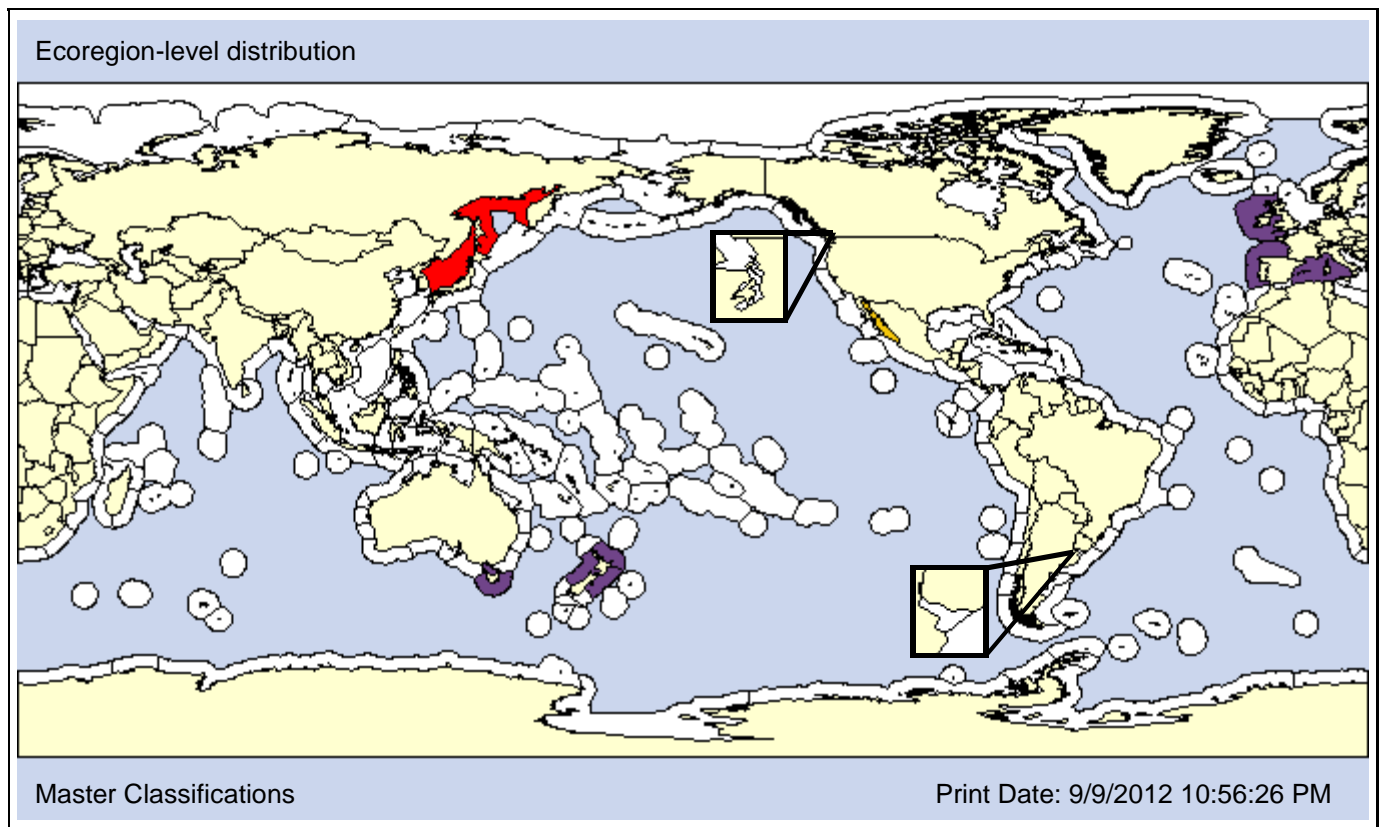
**Family:** Goniodomataceae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



**Date 1st record:** 1999

2000

**Loc 1st record:** Minonosok Bay, Russia

Bahia Concepcion, Mexico

**Established:** Unknown

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X						AO	PO							

Comments: We tentatively classify *Alexandrium margalefi* as NIS in the NWP based on Zvyagintsev's et al. (2011) classification as introduced in Peter the Great Bay in the Sea of Japan. We classify it as cryptogenic in the NEP based on its recent observation in North America in the Gulf of California (Band-Schmidt et al., 2003).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>P</b>						

**ECOSYSTEM**

Unconsolidated						Consolidated						Pelagic <b>X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep					
	<b>P</b>						

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

R	HP	Biogenic							Artificial Substrate					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 35.3psu]**

Fresh	Brackish						Marine <b>P</b>		Hyper
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

Sexual <b>X</b>						Asexual <b>X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
				LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic <b>X</b>			Benthic							Epibiotic			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Dinoflagellate

**Taxonomic Author:** Montresor, Beran, & John, 2004

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Myzozoa

**Subphylum:** Dinozoa

**Superclass:**

**Class:** Dinophyceae

**Subclass:** Dinophycidae

**Infraclass:**

**Superorder:**

**Order:** Gonyaulacales

**Suborder:**

**Infraorder:**

**Superfamily:**

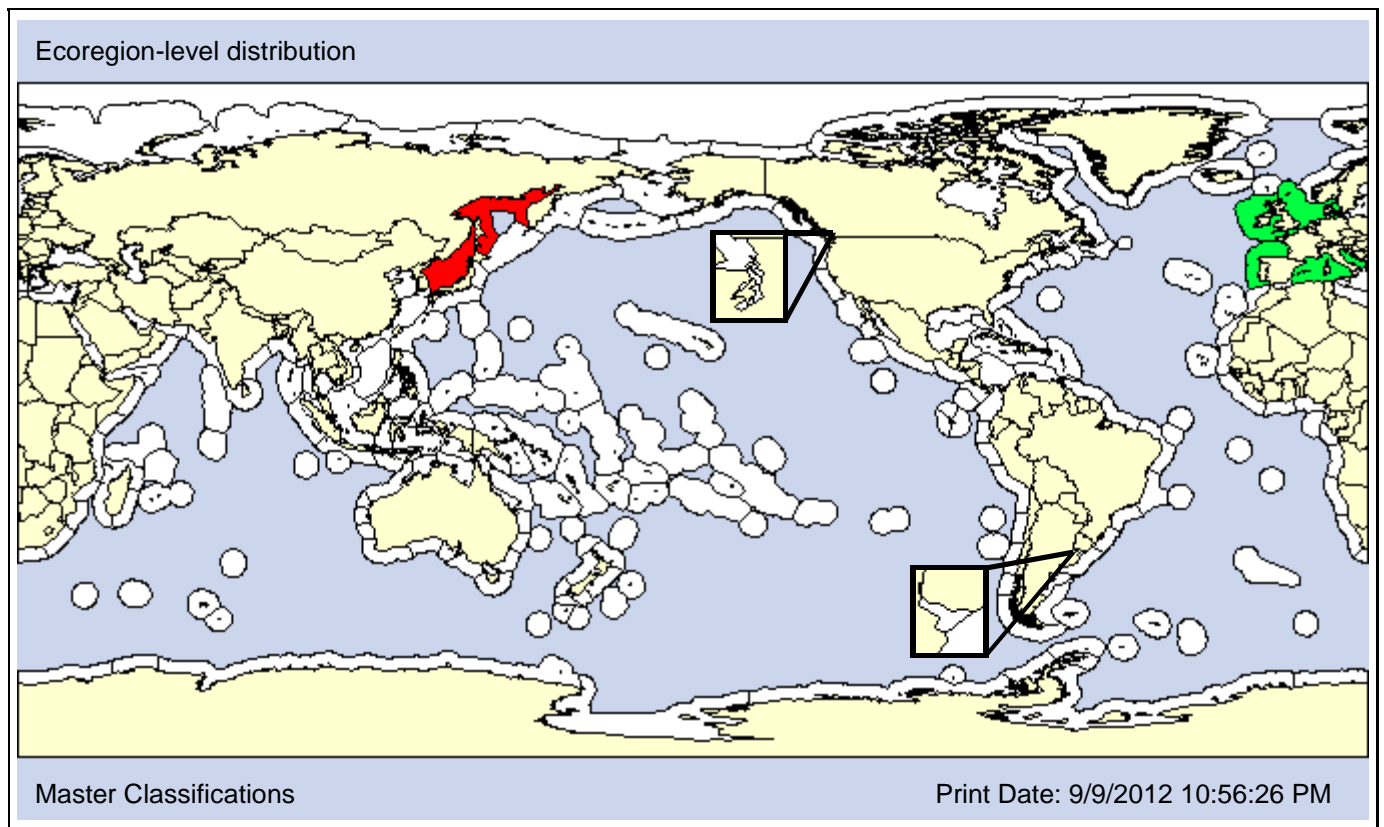
**Family:** Goniodomataceae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Gulf of Naples, Italy



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 2002

**Loc 1st record:** Sea of Okhotsk

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>						AO	PO								

Comments: *Alexandrium tamutum* was described from the Mediterranean and Zvyagintsev et al. (2011) classify it as NIS in the Sea of Okhotsk. We tentatively classify it as NIS in the NWP but note that it occurs in oceanic waters in the Pacific (Selina and Morozova, 2005), which is not characteristic of a coastal invader.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>O</b>	<b>O</b>	<b>P</b>				

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 31.8 - 35psu]**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Dinoflagellate

**Taxonomic Author:** Saville-Kent, 1881

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Myzozoa

**Subphylum:** Dinozoa

**Superclass:**

**Class:** Dinophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Dinophysiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Dinophysiaceae

**Subfamily:**

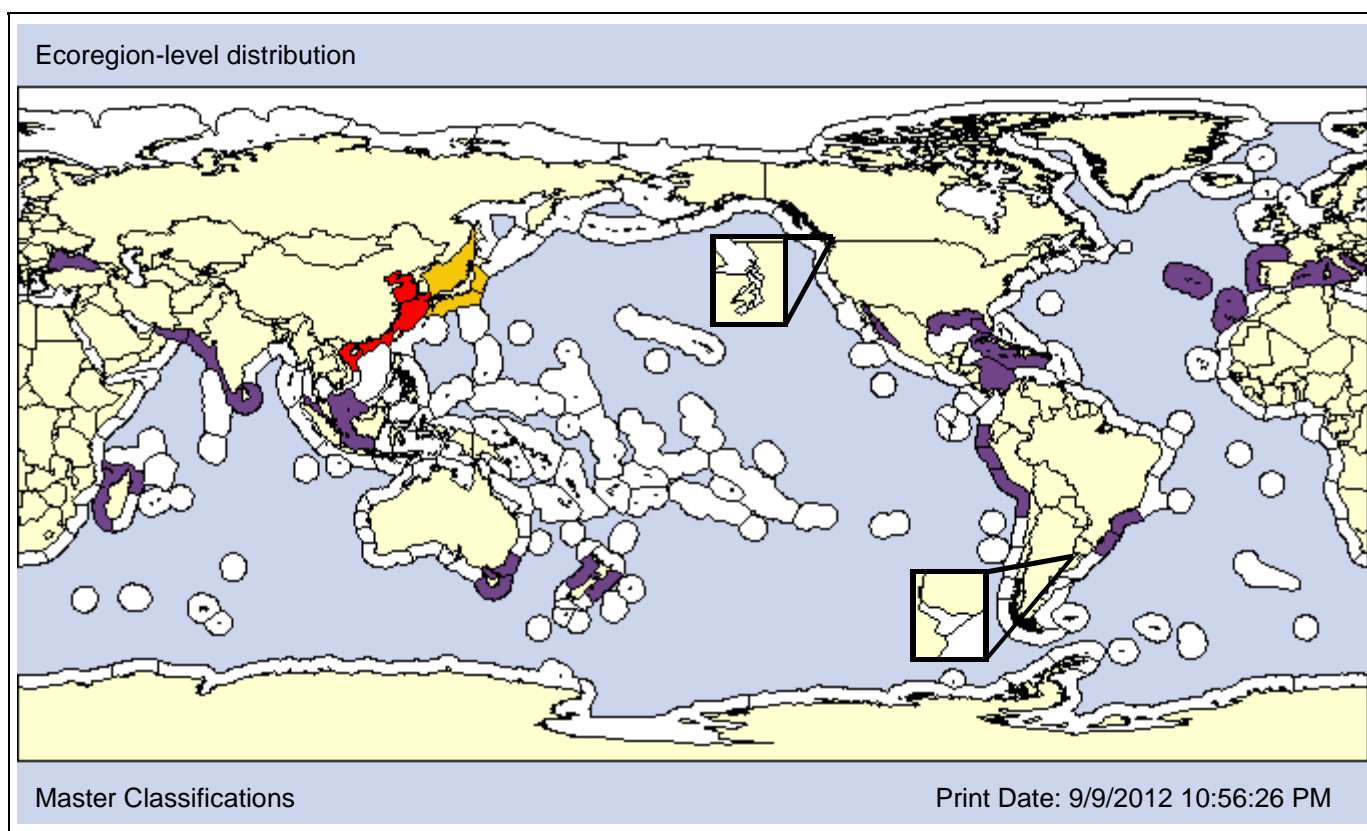
**Also Known As (Name - Type):**

Dinophysis diegens	Misspelling
Dinophysis diegensis	Synonym
Dinophysis homunculus	Synonym

**Common Names:**

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**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1967

Unknown

**Loc 1st record:** Seto Inland Sea, Japan

Gulf of California, Mexico

**Established:** Yes

Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>						AO	PO								

Comments: We tentatively classify *Dinophysis caudata* as introduced in the Yellow Sea, East China Sea and South China Sea (Chavanich et al., 2010; Seo and Lee, 2008). However, it was reported at least as early as 1967 in Japan and 1900 in the Arabian Sea. Thus, we list it as cryptogenic in Japan and unclassified in other areas.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>		<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Dinoflagellate

**Taxonomic Author:** Horiguchi, 1995

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Myzozoa

**Subphylum:** Dinozoa

**Superclass:**

**Class:** Dinophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Peridinales

**Suborder:**

**Infraorder:**

**Superfamily:**

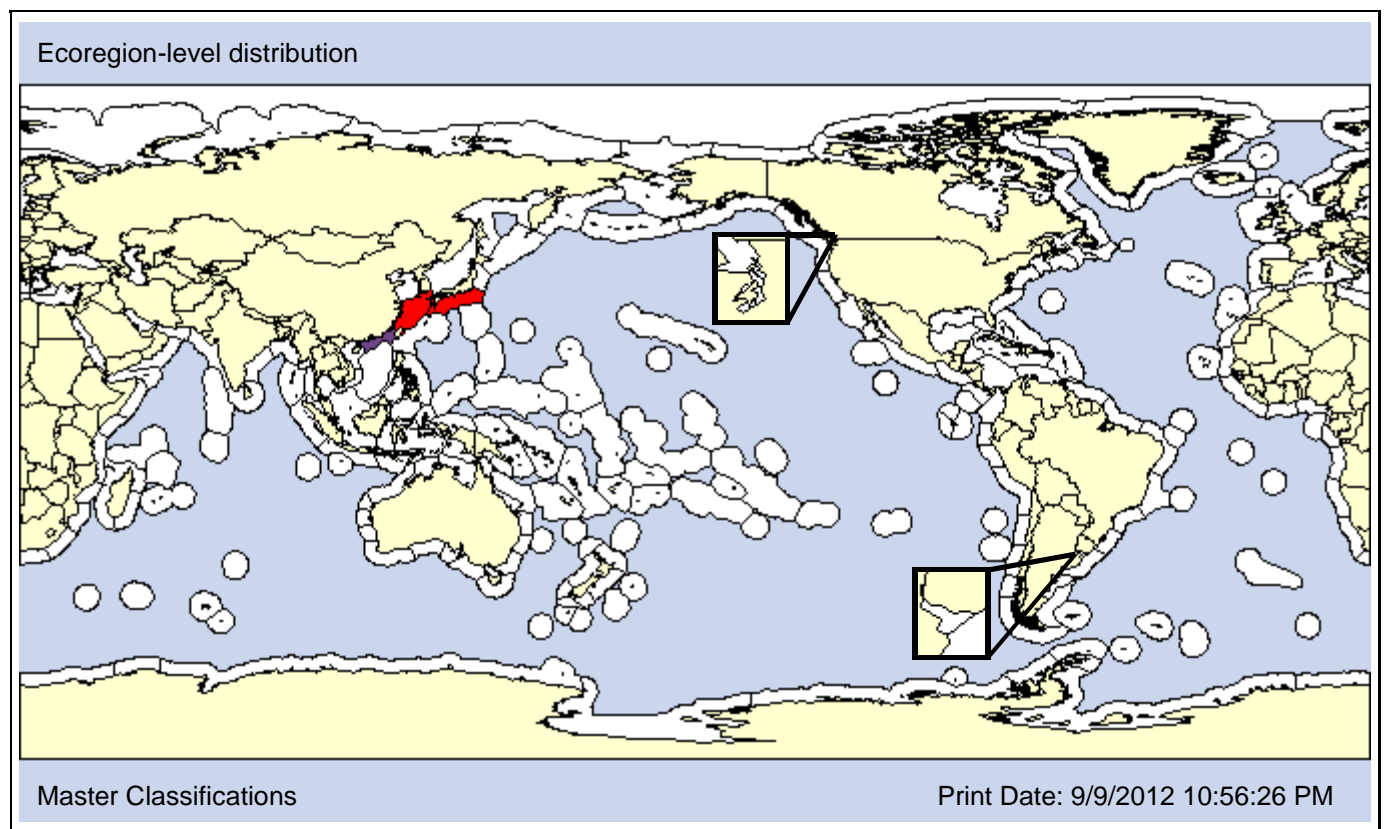
**Family:** Peridinales incertae sedis

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Fukuoka Bay and Ago Bay, Japan



**Date 1st record:** 1988

**Loc 1st record:** Western Japan

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>						AO	<b>PO X</b>								

Comments: The red tide dinoflagellate, *Heterocapsa circularisquama* is considered introduced into Japan based on its recent discovery. Possible vectors include transplanting of oysters or clams from southeast Asia or ballast water. However, genetic work revealed six additional *Heterocapsa* species in Japan, indicating the need for further studies.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			X		

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic P			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
O	O					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O											

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		X							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		X	BP	EPS	EPU	EPC							



# Peridiniopsis penardiforme

Species ID: 110022

**Taxon:** Dinoflagellate

**Taxonomic Author:** (Lindemann) Bourrelly, 1968

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Myzozoa

**Subphylum:** Dinozoa

**Superclass:**

**Class:** Dinophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Peridinales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Peridiniaceae

**Subfamily:**

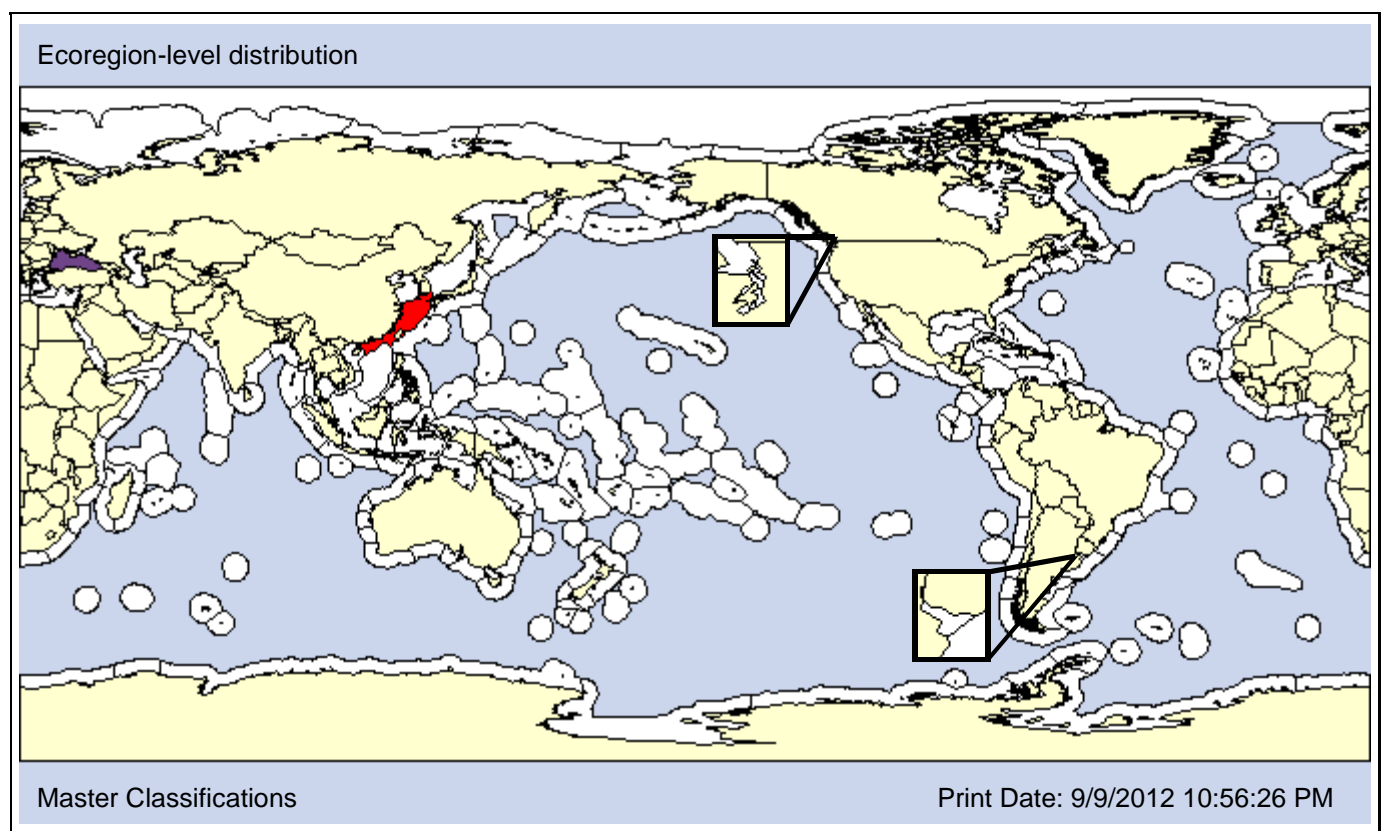
**Also Known As (Name - Type):**

Glenodinium penardiforme	Synonym
Peridiniopsis penardiforme	Misspelling
Peridinium penardiforme	Synonym
Peridinium perardiforme	Misspelling

**Common Names:**

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**Type Locality:**



**Date 1st record:** 1994

**Loc 1st record:** JinHae Bay, Korea

**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X						AO	PO								

Comments: Algaebase classifies *Peridiniopsis penardiforme* as a freshwater species, but WoRMS classifies it as a marine species, and it has been found in coastal waters off Korea, and in ballast water tanks with salinities >33 ppt. Its native range is unknown.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>O</b>					<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep					
	<b>O</b>						

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Dinoflagellate

**Taxonomic Author:** (Mackin, Owen & Collier, 1950) Levine, 1978

**Kingdom:** Chromista

**Subkingdom:** Harosa

**Phylum:** Myzozoa

**Subphylum:** Dinozoa

**Superclass:**

**Class:** Perkinsea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Perkinsorida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Perkinsidae

**Subfamily:**

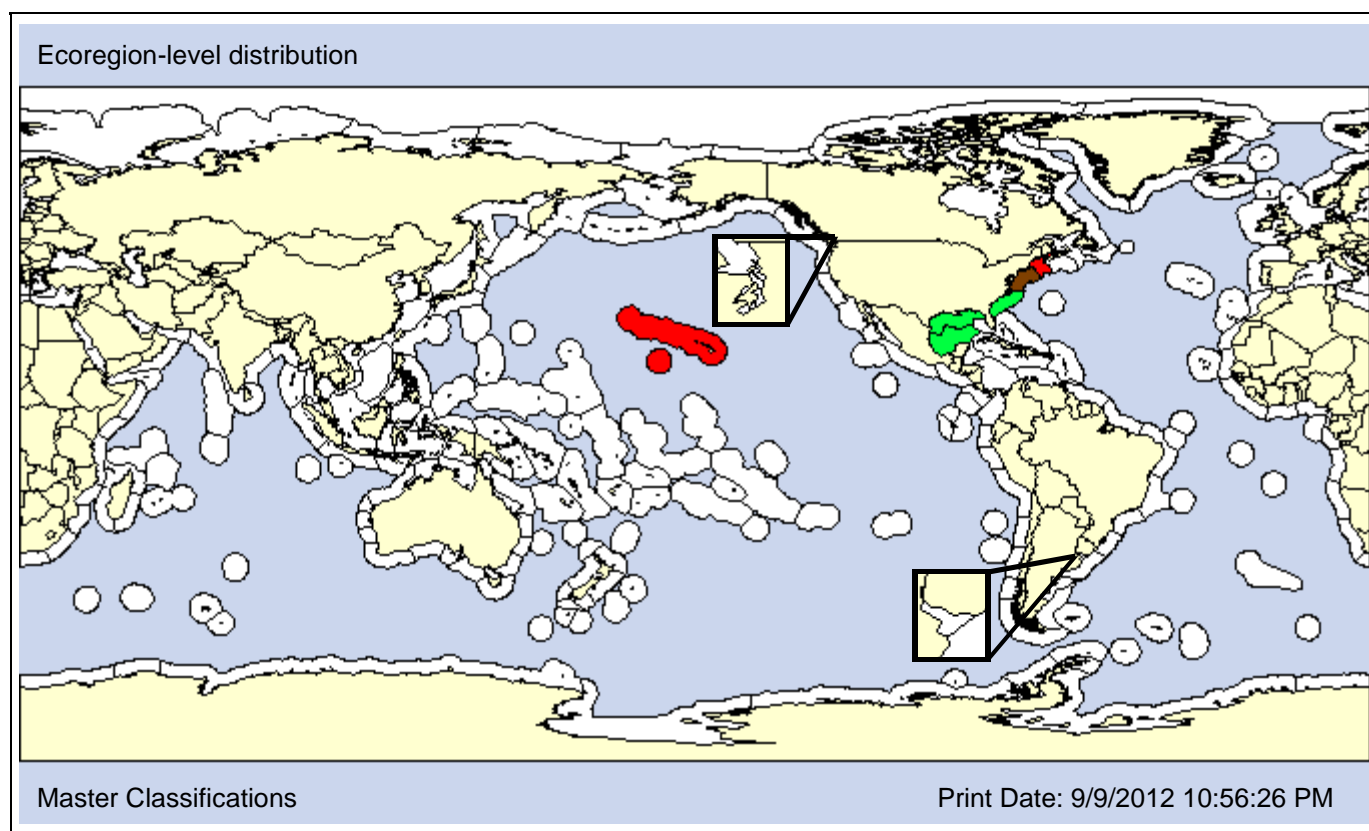
**Also Known As (Name - Type):**

Dermocystidium marinum	Synonym
Labyrinthomyxa marina	Synonym
Labyrinthula marina	Synonym

**Common Names:**

Dermo
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1972

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
						<b>AO X</b>	PO								

Comments: *Perkinsus marinus* ("Dermo") is an endoparasite of the Atlantic oyster, *Crassostrea virginica*. It is native to the Gulf of Mexico and the southern Northwest Atlantic. Expansion in the 1990s into Delaware Bay and up to Maine, USA is thought to be due to a combination of repeated introductions and an increase in water temperature.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>		

**DEPTH [Obs: 0 - 1.4m] [Pref: 0 - 1m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>												

**SALINITY [Obs: 10 - 32psu] [Pref: 22 - 27psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
			<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

Kingdom: Plantae

Subkingdom: Biliphyta

Phylum: Rhodophyta

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**Taxon:** Red alga

**Taxonomic Author:** (M.Vahl) Børgesen, 1910

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Ceramiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Rhodomelaceae

**Subfamily:**

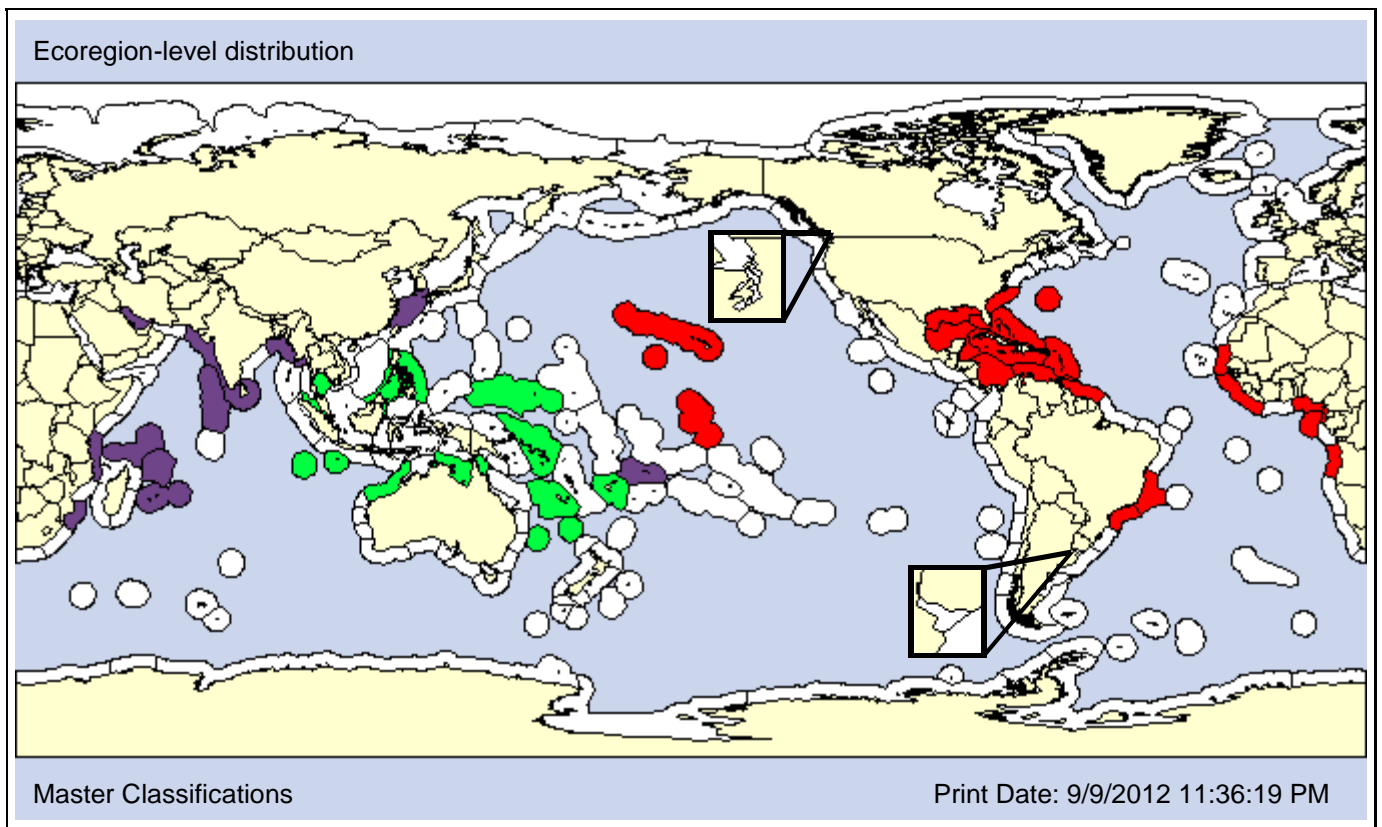
**Also Known As (Name - Type):**

Acanthophora antillarum	Synonym
Acanthophora intermedia	Synonym
Acanthophora orientalis	Synonym
Acanthophora orientalis var. wightii	Convention

**Common Names:**

spiny seaweed
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**Type Locality:** St. Croix, Virgin Islands



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** Unknown 1952  
**Loc 1st record:** Unknown Pearl Harbor, Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				X
		X		X		AO	PO								

Comments: *Acanthophora spicifera* was described from the Caribbean, and is considered native to the Caribbean by many sources. However, Carlton and Eldredge (2009) list it as native to the Indo-Pacific. Based on the assumption that it is native to the Central Indo-Pacific, the Atlantic populations are classified as NIS, as are the Line Islands (Knapp et al., 2011).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 22m] [Pref: 1 - 8m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>										<b>P</b>	

**SALINITY [Obs: 32 - 35psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Red alga  
**Kingdom:** Plantae  
**Subphylum:** Eurhodophytina  
**Subclass:** Rhodymeniophycidae  
**Order:** Ceramiales  
**Superfamily:**

**Taxonomic Author:** (Bonnemaison) Feldmann-Mazoyer, 1941  
**Subkingdom:** Biliphyta  
**Superclass:**  
**Infraclass:**  
**Suborder:**  
**Family:** Callithamniaceae

**Phylum:** Rhodophyta  
**Class:** Florideophyceae  
**Superorder:**  
**Infraorder:**  
**Subfamily:**

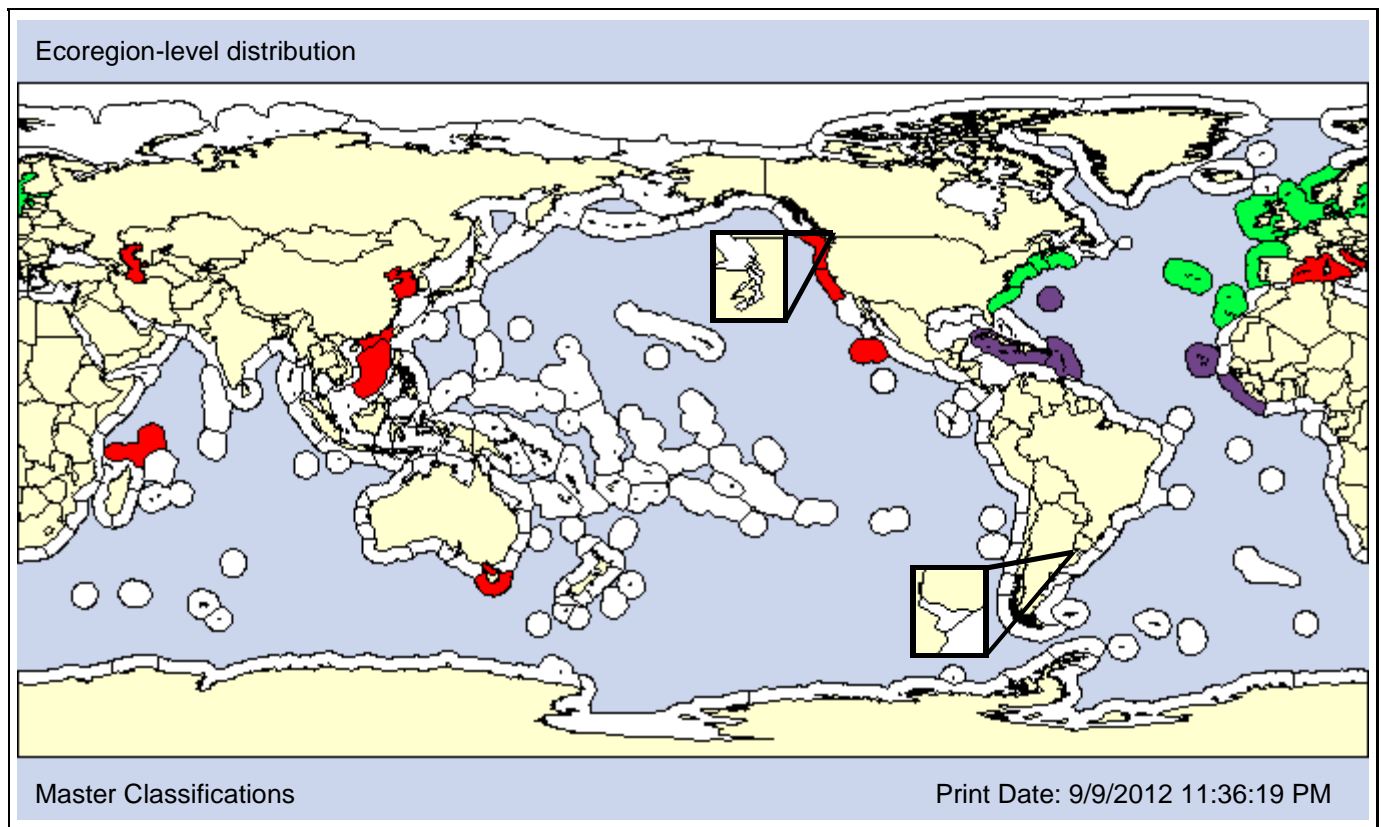
**Also Known As (Name - Type):**

Aglaothamnion furcellariae	Synonym
Callithamnion arachnoideum C.Agardh, 1828	Synonym
Callithamnion byssoides	Synonym
Callithamnion tenuissimum	Synonym

**Common Names:**

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**Type Locality:** Saint-Pol-de-Leon and Brest, Finistère, France (syntypes)



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Yes

1978-1983  
 San Francisco Estuary, CA  
 Yes

**VECTORS**

SH <b>X</b>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P		<b>X</b>		
<b>X</b>		<b>X</b>				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: - 38psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				<b>X</b>

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** Harvey, 1855

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Bonnemaisoniales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Bonnemaisoniaceae

**Subfamily:**

**Also Known As (Name - Type):**

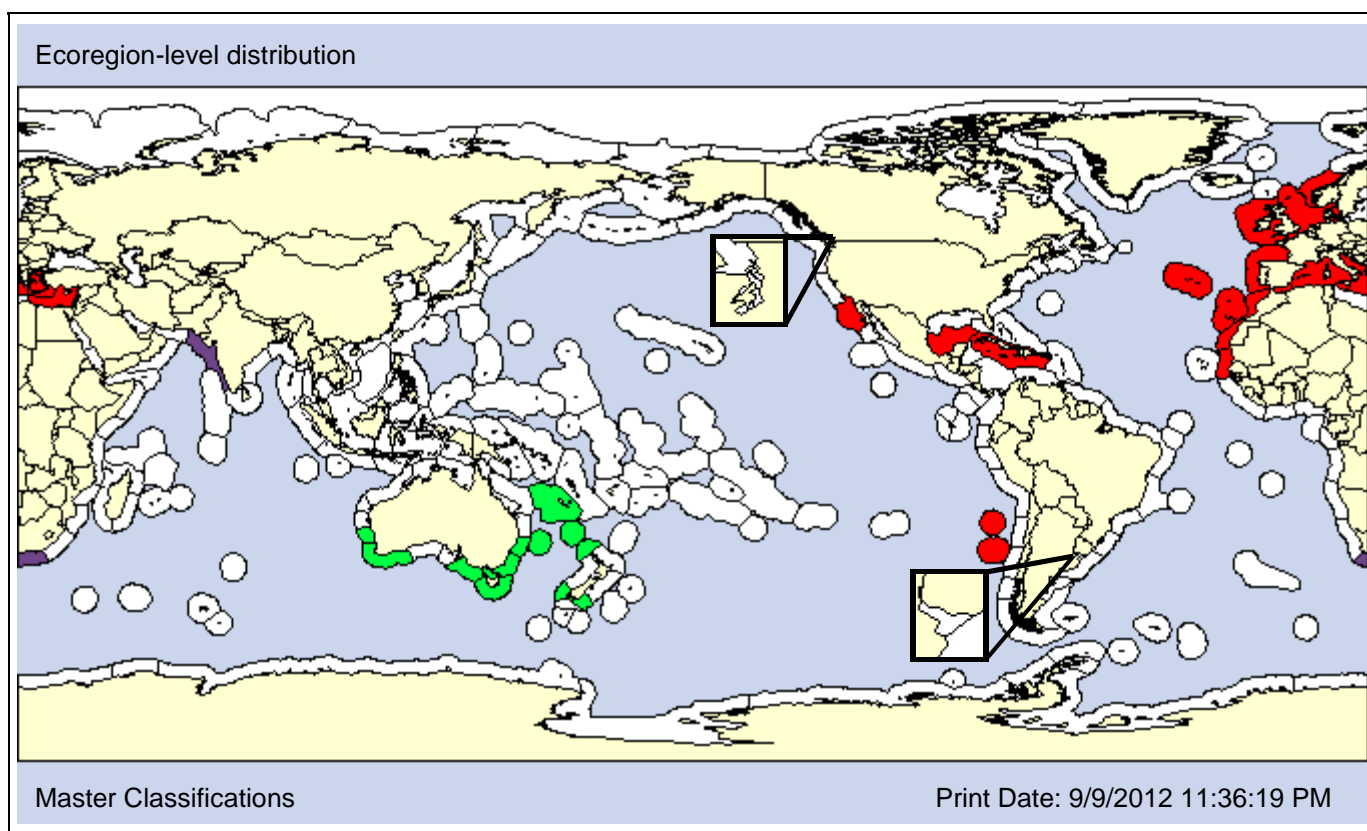
Falkenbergia olens  
 Falkenbergia rufolanosa  
 Falkenbergia vagabunda  
 Polysiphonia rufolanosa

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Harpoon weed

**Type Locality:** Garden Island; Western Australia



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1972

**Loc 1st record:**

San Diego Bay, CA

**Established:**

Unknown

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** (Delile) Trevisan de Saint-Léon, 1845

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Bonnemaisoniales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Bonnemaisoniaceae

**Subfamily:**

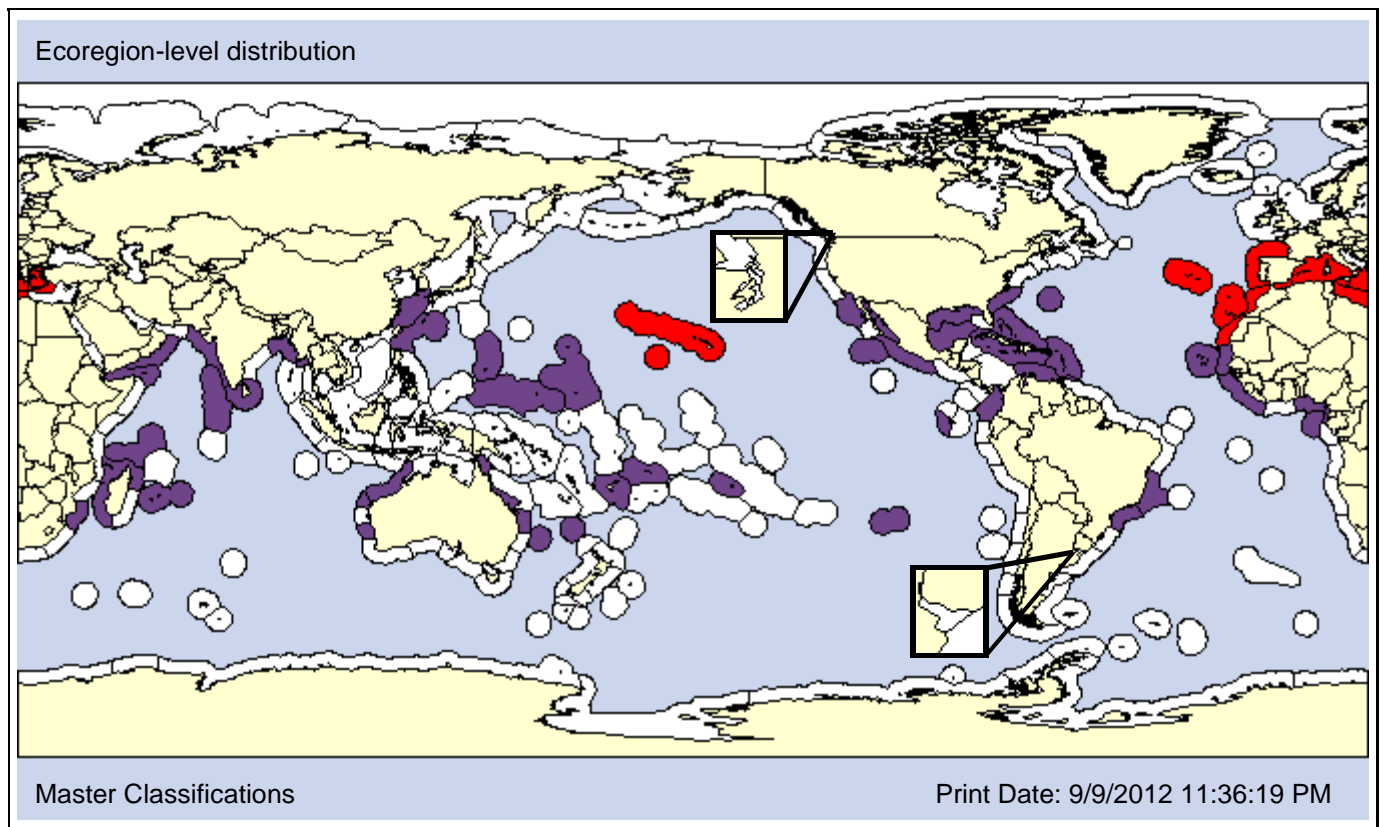
**Also Known As (Name - Type):**

Asparagopsis delilei	Synonym
Asparagopsis sandfordiana	Synonym
Asparagopsis taxiformis Lineage 4, Carlton & Eldredge, 200	Convention
Dasya delilei	Synonym

**Common Names:**

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**Type Locality:** Alexandria, Egypt



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1991 (NWP), Unknown (Hawaii), Unknown (NEP)  
**Loc 1st record:** Oahu, Hawaii (NWP), Unknown (Hawaii), Unknown (NEP)  
**Established:** Yes (NWP), Yes (Hawaii), Yes (NEP)

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR	X		A	P			X
		X				AO	PO							

Comments: *Asparagopsis taxiformis* consists of several "lineages" with three of them occurring in Hawaii (Sherwood, 2008). While recognizing this complexity, we follow Carlton and Eldredge (2009) and Olenis and Didžiulis (2009) and classify it as NIS in Hawaii and Europe, respectively, and unclassified elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0.5 - 17m] [Pref: - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>							<b>O</b>				<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** Hariot, 1891

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Bonnemaisoniales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Bonnemaisoniaceae

**Subfamily:**

**Also Known As (Name - Type):**

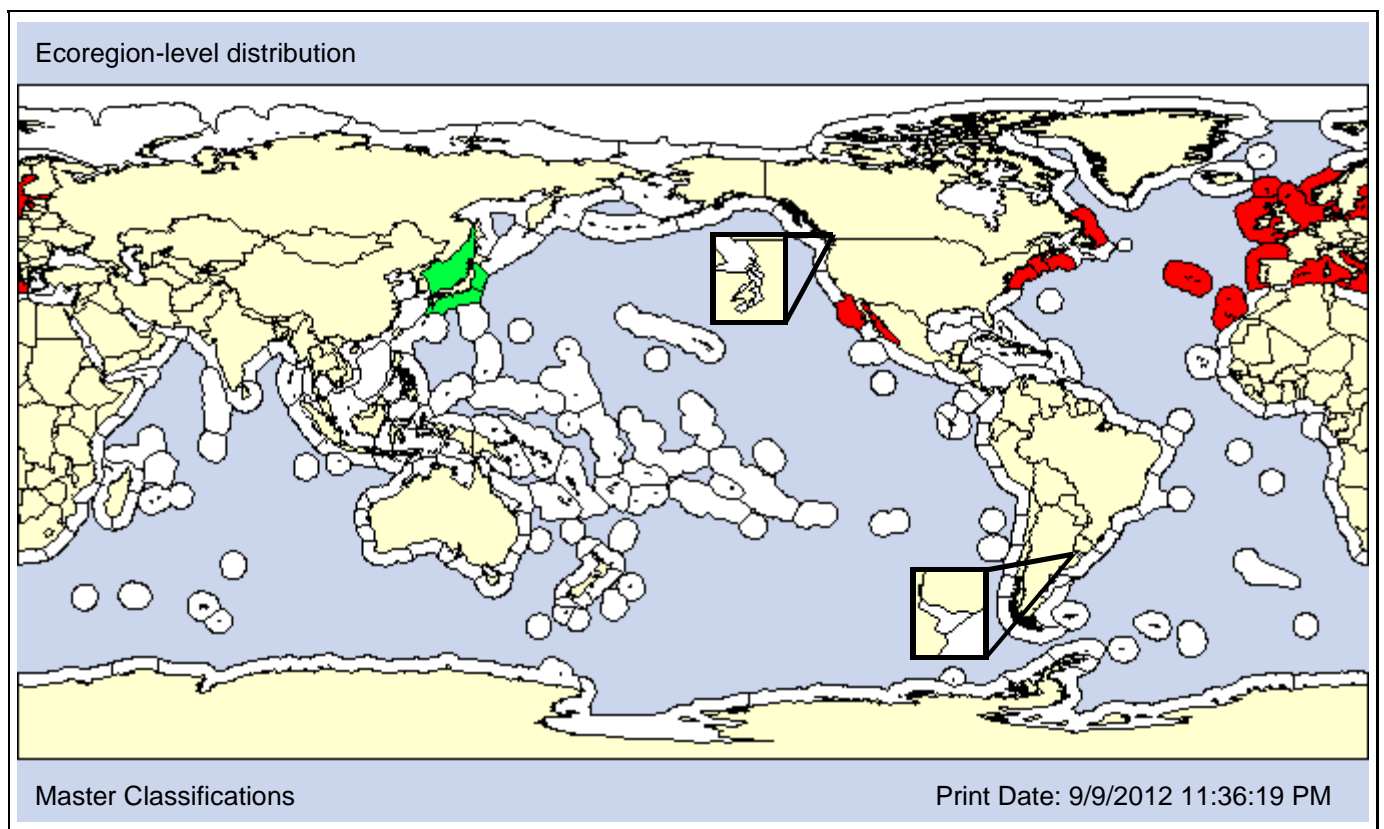
Asparagopsis hamifera  
 Bonnemaisonia intricata  
 Boryna intricata  
 Ceramium intricatum

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Bonnemaisonia's hook weed  
 Japanese red algae  
 pink cotton wool

**Type Locality:** Yokosuka, Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Native 1974  
**Loc 1st record:** Native Gulf of California, Mexico  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	PO								

Comments: *Bonnemaisonia hamifera* life history involves an alternation of generations between gametophyte and tetrasporophyte stages. It occurs on hard substrates as well as being epiphytic on other algae, such as *Corallina* and *Cystoseira*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 24.6m] [Pref: 0 - 9m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
						<b>P</b>							<b>O</b>	

**SALINITY [Obs: 10 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							



**Taxon:** Red alga

**Taxonomic Author:** (Smith) Lyngbye, 1819

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Ceramiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Callithamniaceae

**Subfamily:**

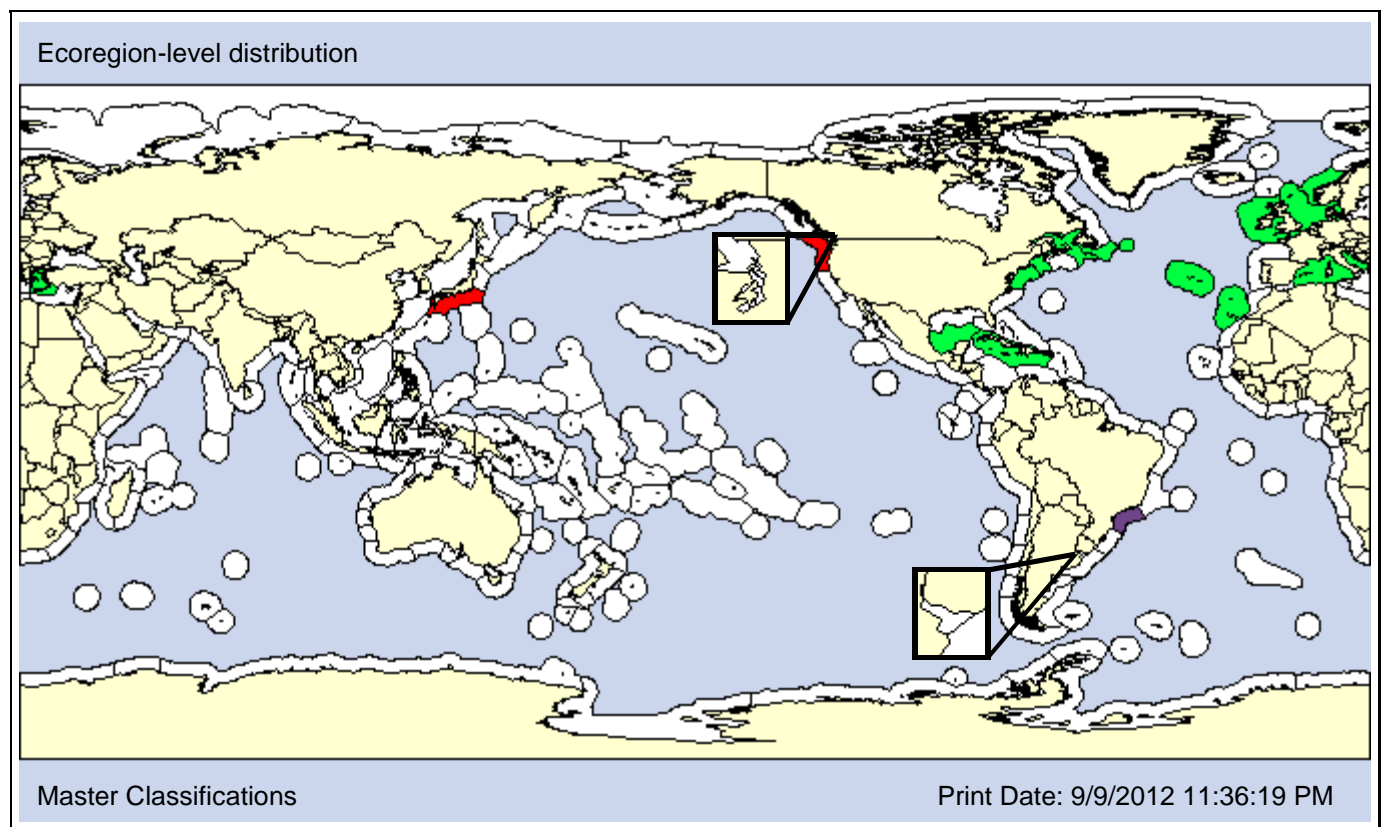
**Also Known As (Name - Type):**

Callithamnion versicolor	Synonym
Ceramium pedicellatum	Synonym
Ceramium versicolor	Synonym
Conferva corymbosa	Synonym

**Common Names:**

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**Type Locality:** Sussex, England



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1990

<2008

**Loc 1st record:** Unknown

Willapa Bay, Washington

**Established:** Yes

Unknown

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
		<b>X</b>				<b>AO X</b>	PO								

Comments: *Callithamnion corymbosum* was classified as NIS in Willapa Bay, WA by Hansen (2008). It has been reported from Japan, Korea, and China, and assuming a native range of the North Atlantic and Caribbean, we classify it as NIS in the NWP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>		<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P		<b>X</b>		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>								

**Taxon:** Red alga

**Taxonomic Author:** (Mertens ex Turner) Kützing, 1843

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Gigartinales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Caulacanthaceae

**Subfamily:**

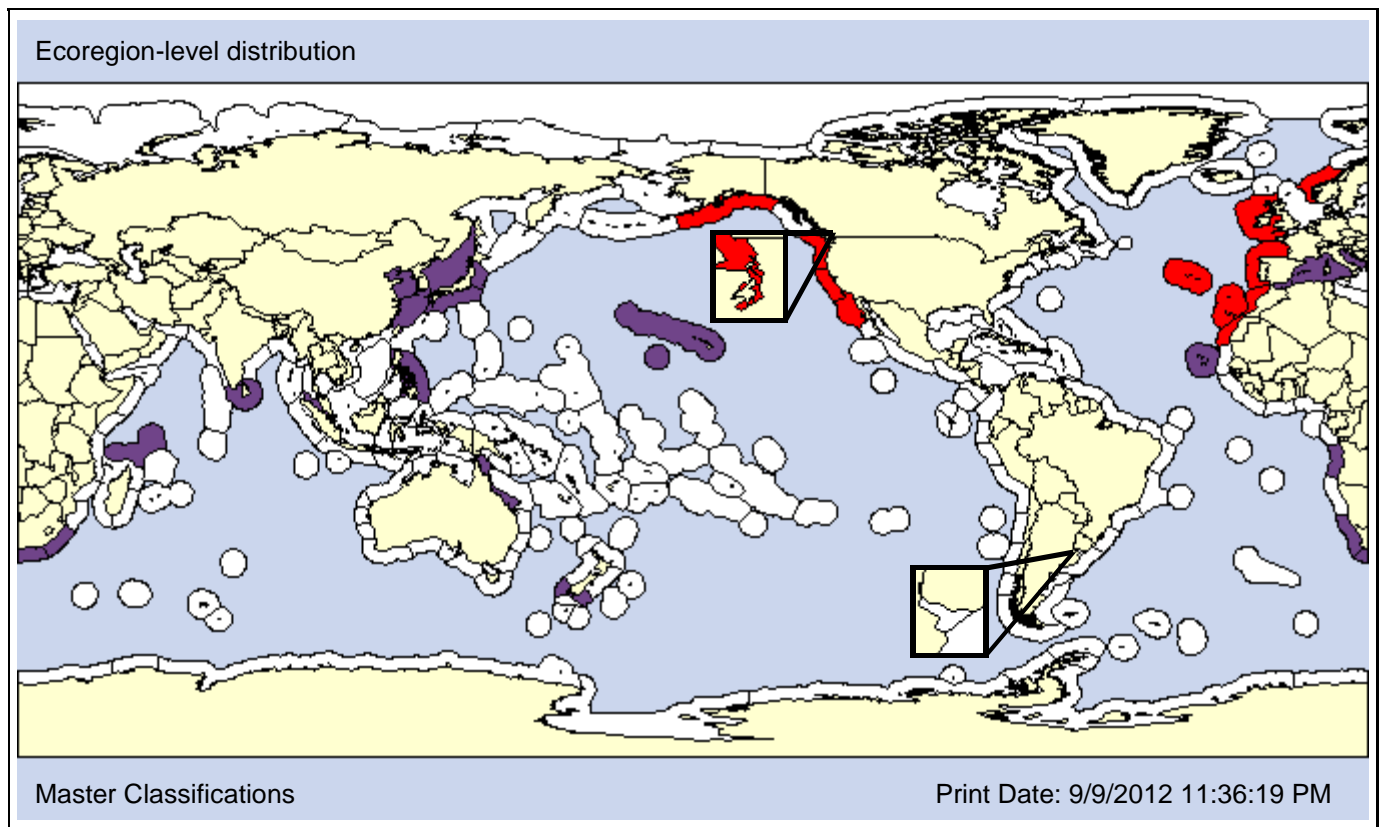
**Also Known As (Name - Type):**

Gelidium ustulatum	Synonym
Gigartina ustulata	Synonym
Laurencia divaricata	Synonym
Laurencia divaricata Suhr, 1840	Synonym

**Common Names:**

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**Type Locality:** Cádiz, Spain



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		<b>NWP</b>		<b>Hawaii</b>			<b>NEP</b>

<b>Date 1st record:</b> Unknown	Unknown	1961
<b>Loc 1st record:</b> Unknown	Unknown	Baja California, Mexico
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	<b>PO X</b>								

Comments: We follow Williams and Smith (2007) and Streftaris et al. (2005) and classify *Caulacanthus ustulatus* as introduced in the NEP and NWA, respectively. Because there is uncertainty of the existence of Atlantic and Pacific forms (Zuccarello et al., 2002), we consider it unclassified in other areas.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>				<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** Petersen in Rosenvinge 1924

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Ceramiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ceramiaceae

**Subfamily:** Ceramioideae

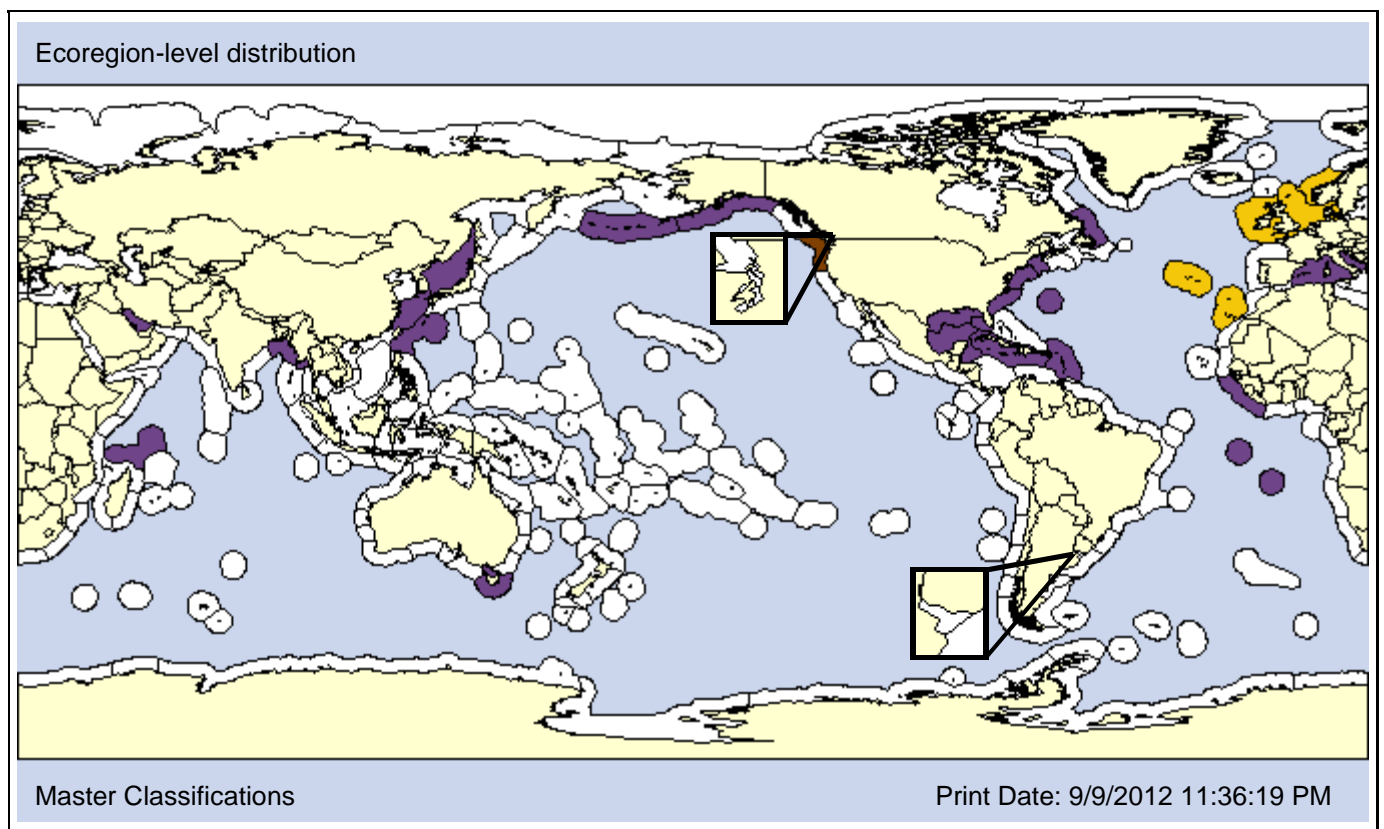
**Also Known As (Name - Type):**

Ceramium elegans var. fastigiatum  
 Ceramium fastigiatum  
 Ceramium fastigiramosum

Convention  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** Limfjord, Denmark (lectotype)



Master Classifications Print Date: 9/9/2012 11:36:19 PM

<span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></span> Native	<span style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></span> Nonindigenous	<span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></span> Cryptogenic	<span style="display: inline-block; width: 15px; height: 15px; background-color: cyan; border: 1px solid black;"></span> Transient	<span style="display: inline-block; width: 15px; height: 15px; background-color: purple; border: 1px solid black;"></span> Unclassified	<span style="display: inline-block; width: 15px; height: 15px; background-color: brown; border: 1px solid black;"></span> Conflicting Classification	<span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** <1965

1949

**Loc 1st record:** Japan

Winchester Bay, Oregon

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
						AO X	PO X								

Comments: Hansen and Hanyuda (in Chapman and Therriault, 2010) reported *Ceramium cimbricum* as introduced in Oregon. However, the recent discovery of wide-spread subtidal coastal populations off Oregon suggests a cryptogenic classification (Hansen, pers. comm. 12/6/11). We consider this a conflict.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 26m] [Pref: 3 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>O</b>	

**SALINITY [Obs: - 32psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Red alga

**Taxonomic Author:** Cormaci & Furnari, 1991

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Ceramiales

**Suborder:**

**Infraorder:**

**Superfamily:**

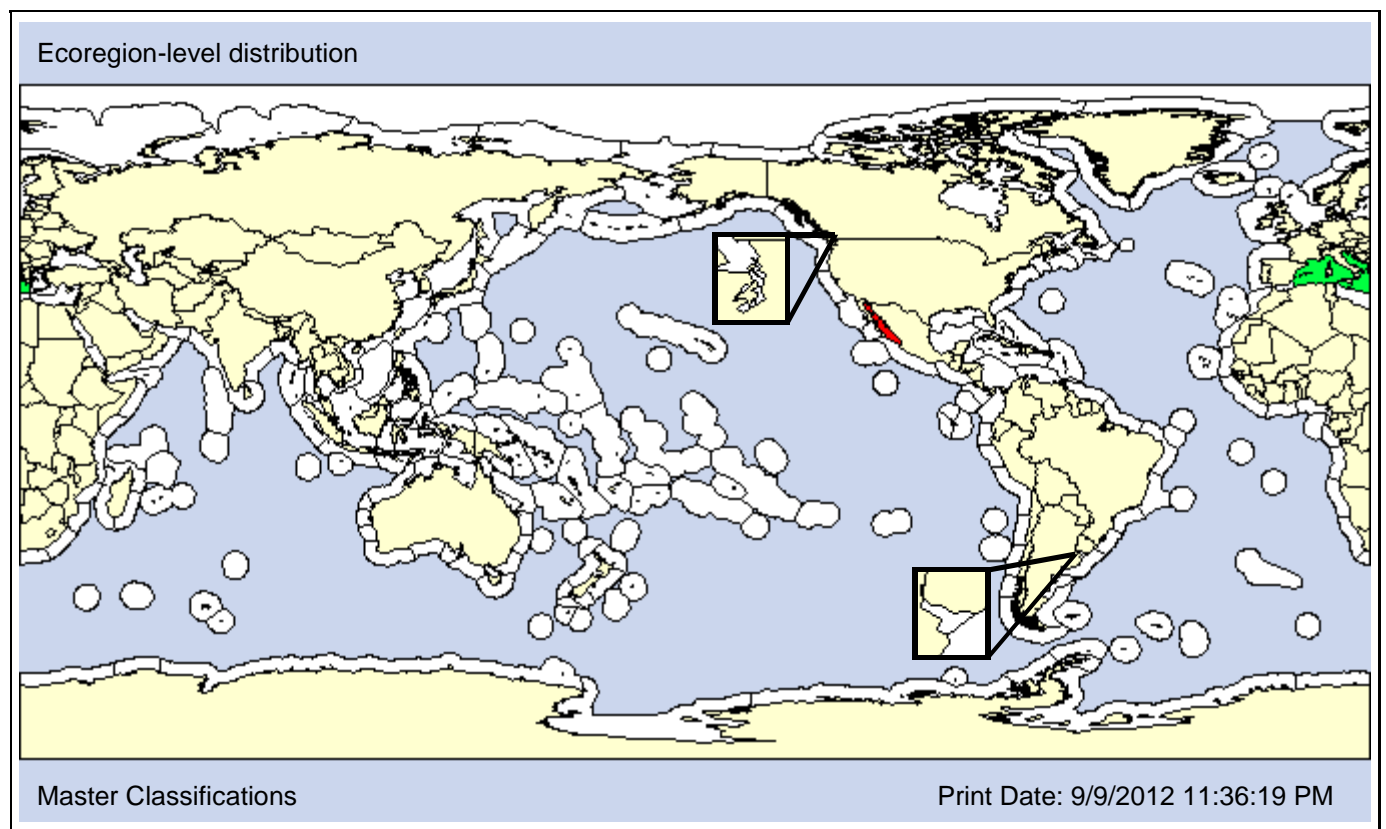
**Family:** Ceramiaceae

**Subfamily:** Ceramioideae

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Mediterranean Sea



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

<2003

**Loc 1st record:**

Punta Perico, Mexico

**Established:**

Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Ceramium giacconeii* is a Mediterranean algae that has been found in the Gulf of California epiphytic on *Halymenia* sp. and *Scinaia* sp. and in a rhodolith bed (Cho et al., 2003).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: - 2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							



**Taxon:** Red alga

**Taxonomic Author:** Yendo, 1920

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Ceramiales

**Suborder:**

**Infraorder:**

**Superfamily:**

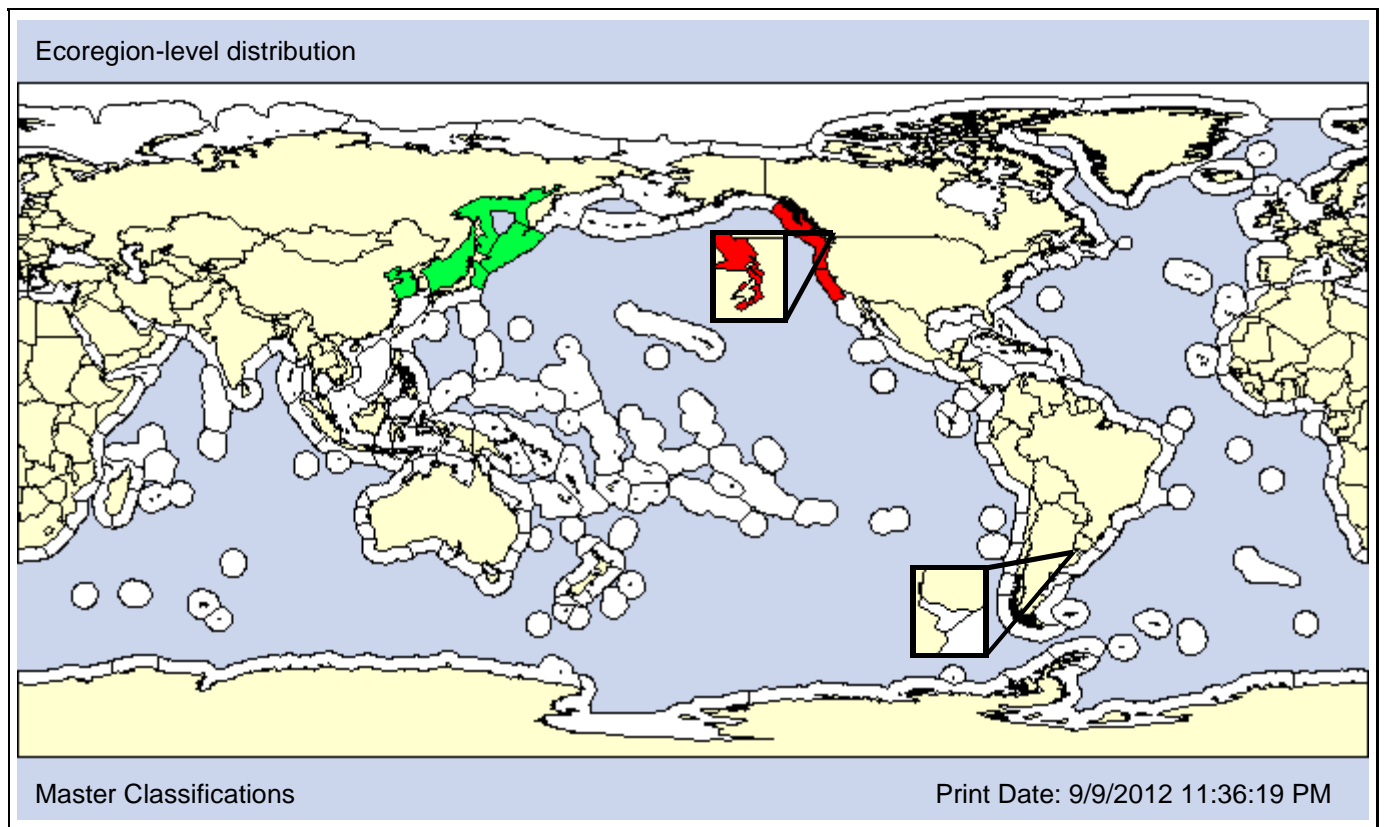
**Family:** Ceramiaceae

**Subfamily:** Ceramioideae

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Harius, Hokkaido, Japan.



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;">■</span> NIS Not Established	<span style="color: yellow;">■</span> Cryptogenic	<span style="color: cyan;">■</span> Transient	<span style="color: purple;">■</span> Unclassified	<span style="color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;">■</span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** Native 1995

**Loc 1st record:** Native Bamfield, Canada

**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	<b>PO X</b>								

Comments: A genetic analysis by Yang et al. (2008) showed that *Ceramium kondoi* was introduced from Asia to the NEP, perhaps with Japanese oysters. This study indicated the presence of a “southern lineage” from Korea, southern Japan, far-eastern Russia and the USA, and a “northern lineage” from northern Japan and far-eastern Russia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			X	X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O		O			

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O										O	P

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	X
						X							

**Taxon:** Red alga

**Taxonomic Author:** Setchell & Gardner, 1924

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Ceramiales

**Suborder:**

**Infraorder:**

**Superfamily:**

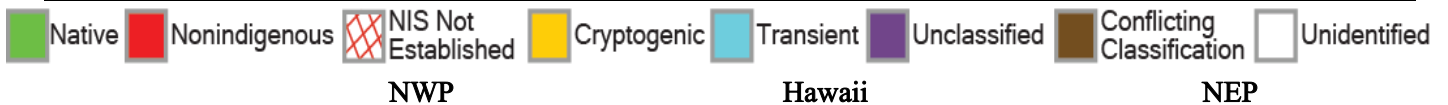
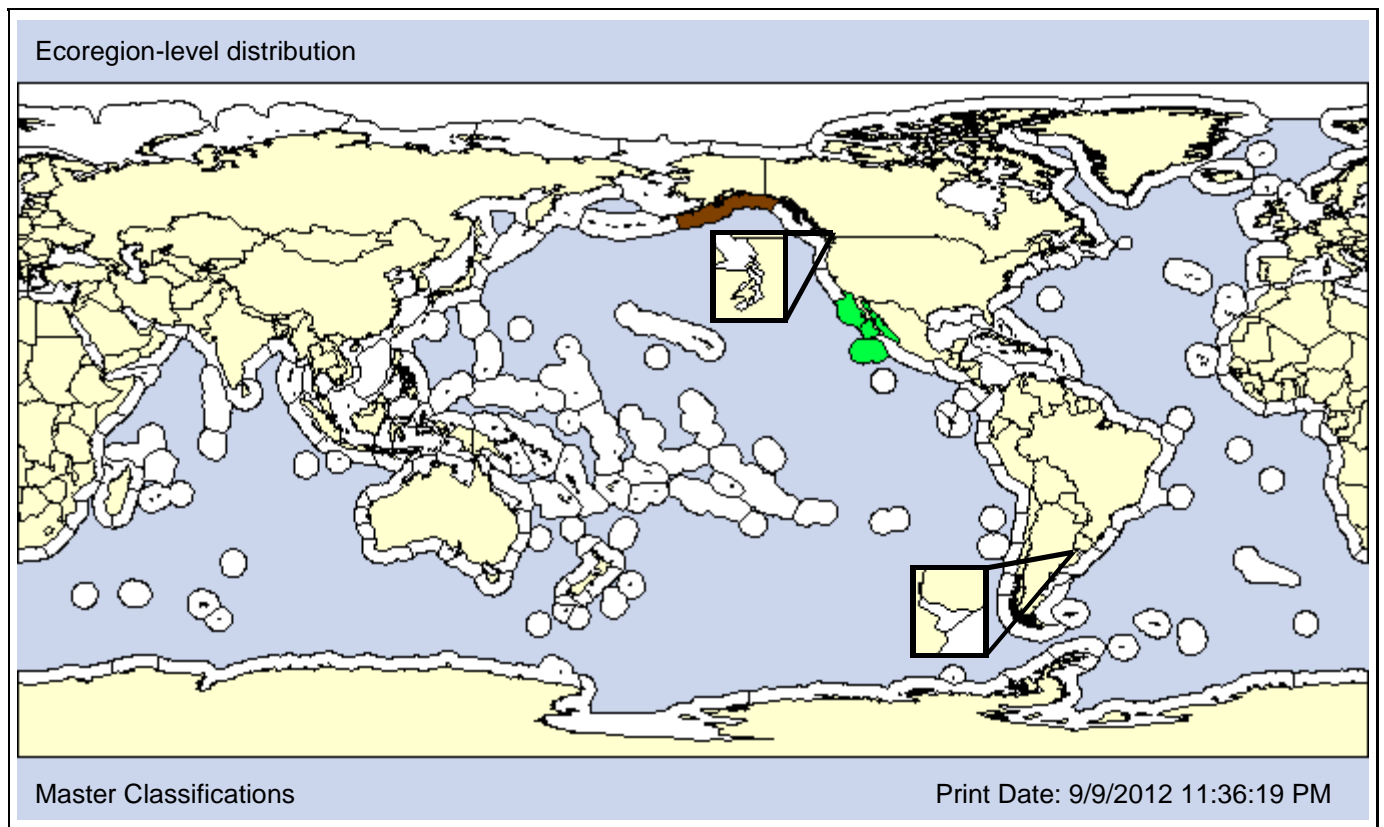
**Family:** Ceramiaceae

**Subfamily:** Ceramioideae

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Todos Santos Bay, Gulf of California, Mexico



**Date 1st record:**

Unknown

**Loc 1st record:**

Unknown

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
X		X			AO	PO									

Comments: The previously reported *Ceramium sinicola* in Alaska (Hines et al., 2000b) is misidentified according to Tae Oh Cho (Gayle Hansen, pers. comm. 9/21/2010). Because of this taxonomic uncertainty, we list this species with a conflicting classification in Alaska. In Alaska, this species was found as an epiphyte of *Codium fragile*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 8m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** (C.Agardh) Basson, 1979

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Rhodophytina

**Superclass:**

**Class:** Stylonematophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stylonematales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Stylonemataceae

**Subfamily:**

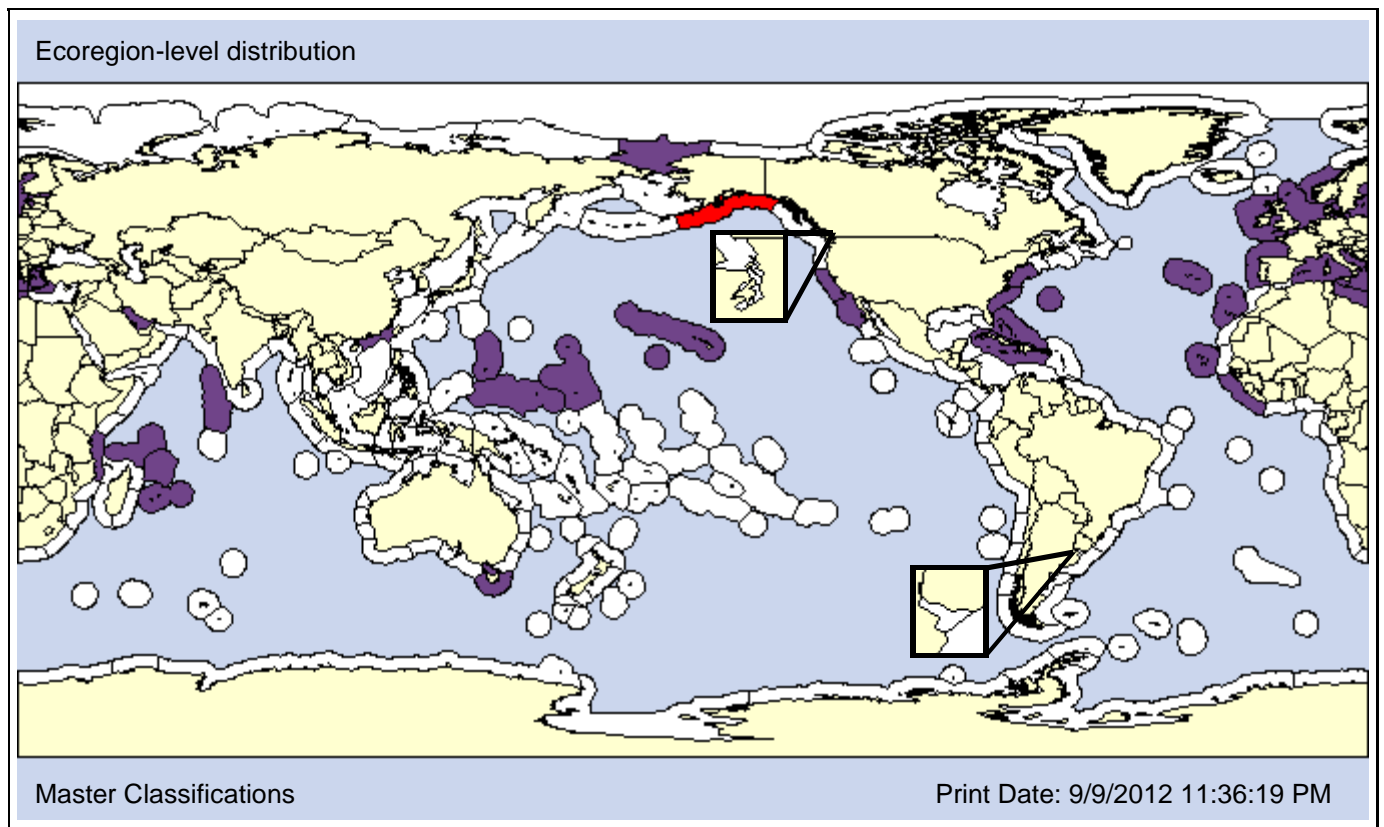
**Also Known As (Name - Type):**

Asterocytis ornata	Synonym
Asterocytis ramosa	Synonym
Chroodactylon ornata	Convention
Chroodactylon ramosum	Synonym

**Common Names:**

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**Type Locality:** Lake Mälaren, near Stockholm, Sweden



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b> Unknown	<b>Unknown</b>	<b>1998</b>
<b>Loc 1st record:</b> Unknown	<b>Unknown</b>	<b>Prince William Sound, Alaska</b>
<b>Established:</b> Yes	<b>Yes</b>	<b>Yes</b>

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	PO								

Comments: *Chroodactylon ornatum* [*C. ramosum*] was considered introduced to Prince Williams Sound, Alaska based on its disjunct distribution (Hines et al., 2000b). However, it is a very small species and may have been overlooked previously (G. Hansen, pers. comm. 9/21/2010). We tentatively leave it as NIS in Alaska and unclassified in other areas.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>				<b>O</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>						<b>P</b>					<b>O</b>	<b>O</b>

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				<b>X</b>

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** (J.Agardh) J.Agardh, 1876

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Halymeniales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Halymeniaceae

**Subfamily:**

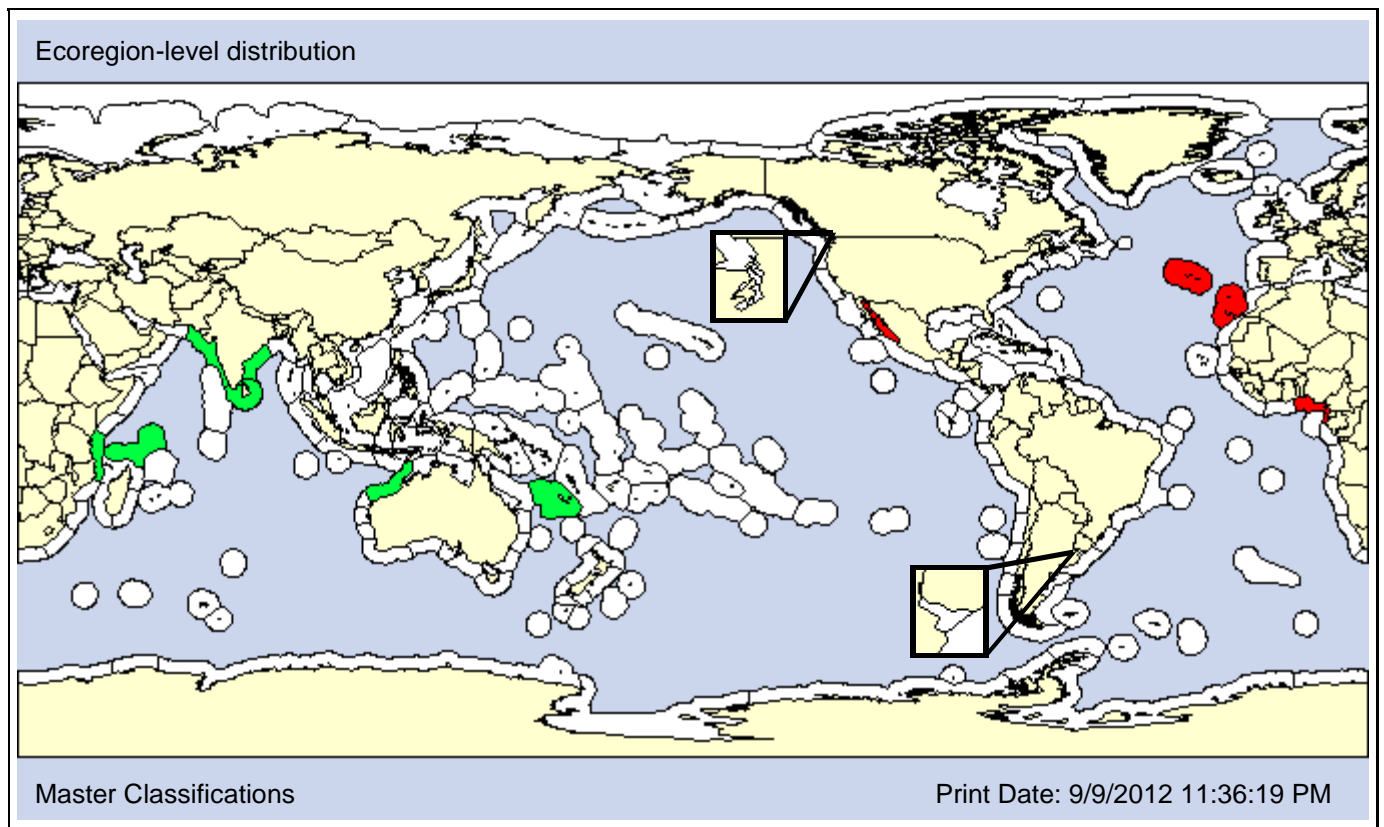
**Also Known As (Name - Type):**

Acrotylus prismaticus  
Dumontia prismatica  
Gymnophlaea prismatica

Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:** India



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

Unknown

**Loc 1st record:**

Gulf of California, Mexico

**Established:**

Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
						AO	PO								

Comments: Siguan (2002) and Williams and Smith (2007) list *Corynomorpha prismatica* as a NIS in the Gulf of California. However, they do not provide a citation for its occurrence or the date of its first record. We list this species as introduced in the eastern Atlantic though that this needs to be checked due to taxonomic uncertainties.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial

**ECOSYSTEM**

Unconsolidated						Consolidated <b>X</b>						Pelagic	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE **X****

R <b>P</b>	HP	Biogenic							Artificial Substrate					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 35.5 - 37.2psu]**

Fresh	Brackish						Marine <b>P</b>		Hyper
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

Sexual						Asexual				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
				LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic							Epibiotic			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							



**Taxon:** Red alga

**Taxonomic Author:** Yamada, 1928

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Ceramiales

**Suborder:**

**Infraorder:**

**Superfamily:**

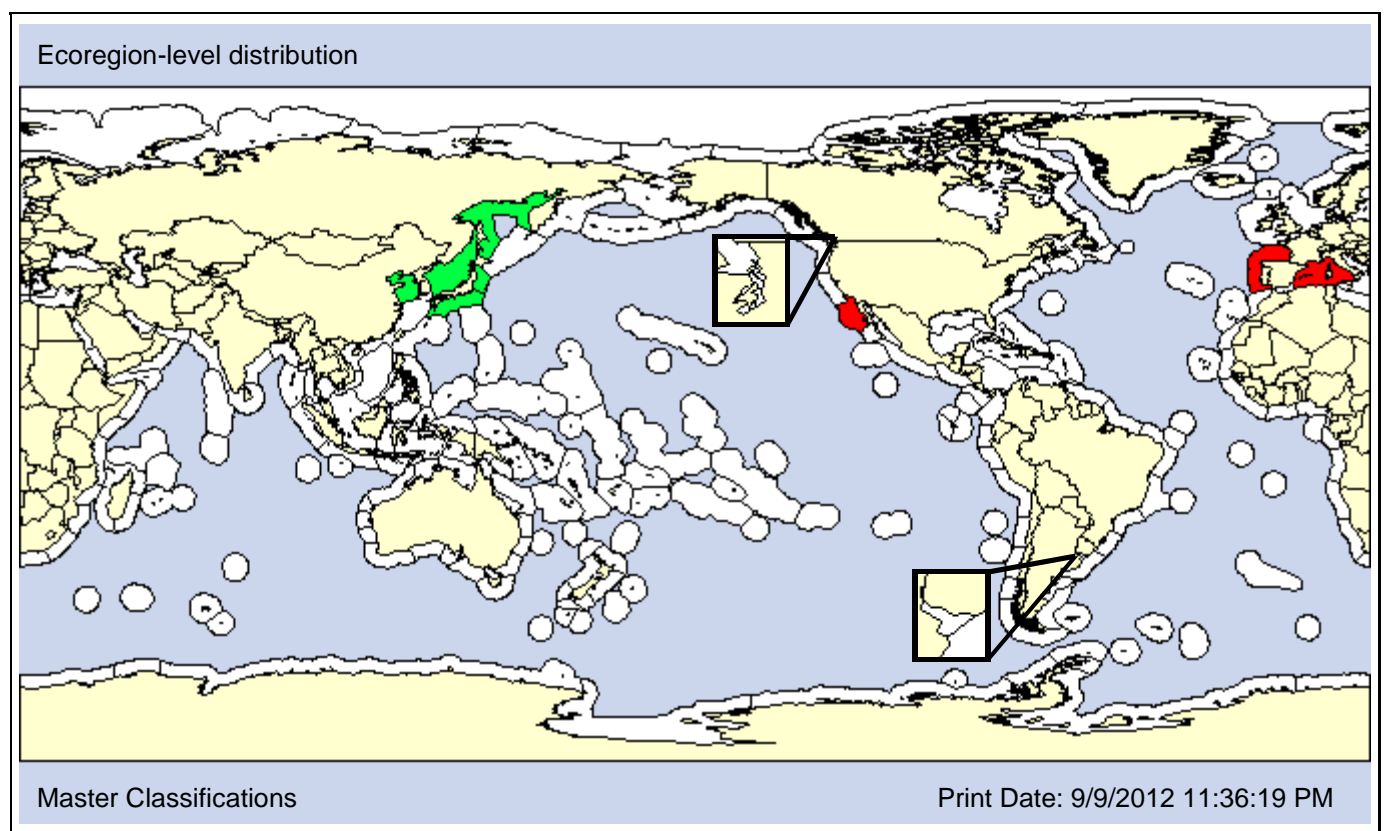
**Family:** Dasyaceae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Asamushi, Japan



<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-style:dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:lightgrey; border:1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; background-color:white; border:1px solid black;"></span> Unidentified
		<b>NWP</b>		<b>Hawaii</b>		<b>NEP</b>	

**Date 1st record:** Native

2006

**Loc 1st record:** Native

Long Beach Harbor, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
		<b>X</b>				AO	<b>PO X</b>								

Comments: Hughey et al. (2009) reported *Dasya sessilis* from southern California in 2006. Hansen (2008) reported *D. sessilis* from Willapa Bay, Washington. However, additional research suggests that this may be a different species (G. Hansen pers. comm. to Henry Lee; 12/06/11), and so is not reported here.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 8m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>		<b>O</b>			

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>									<b>P</b>	<b>O</b>	

**SALINITY [Obs: 18 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** (N.L.Burman) F.S.Collins & Hervey, 1917

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Gigartinales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Areschougiaceae

**Subfamily:**

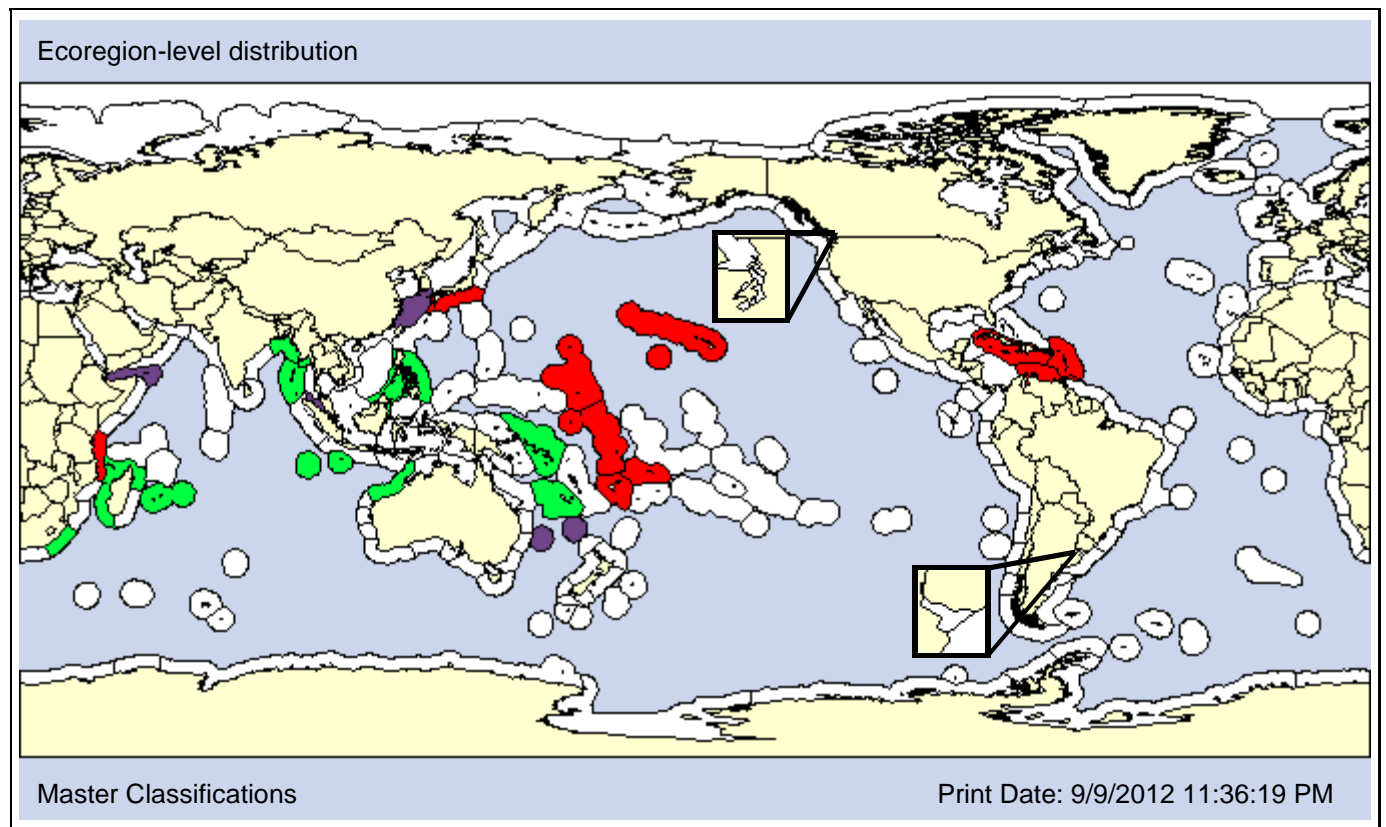
**Also Known As (Name - Type):**

Eucheuma muricatum	Synonym
Eucheuma spinosum	Synonym
Fucus denticulatus N.L.Burman, 1768	Synonym
Fucus muricatus S.G.Gmelin, 1768	Synonym

**Common Names:**

East Indian carrageen
macassar

**Type Locality:** Indian Ocean



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Unknown 1970  
**Loc 1st record:** Unknown Kaneohe Bay, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
				X		AO	PO								

Comments: *Eucheuma denticulatum* appears to be native to India and the western Pacific, however, its widespread introduction for aquaculture confuses the distribution. We classify ecoregions as invaded if there is a record of a purposeful introduction or it lies outside *E. denticulatum* apparent natural range.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>			
		<b>X</b>											

**DEPTH [Obs: 0 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>				<b>P</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>												

**SALINITY [Obs: 12 - 36psu] [Pref: 12 - 24psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** Okamura, 1934

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Gelidiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Gelidiaceae

**Subfamily:**

**Also Known As (Name - Type):**

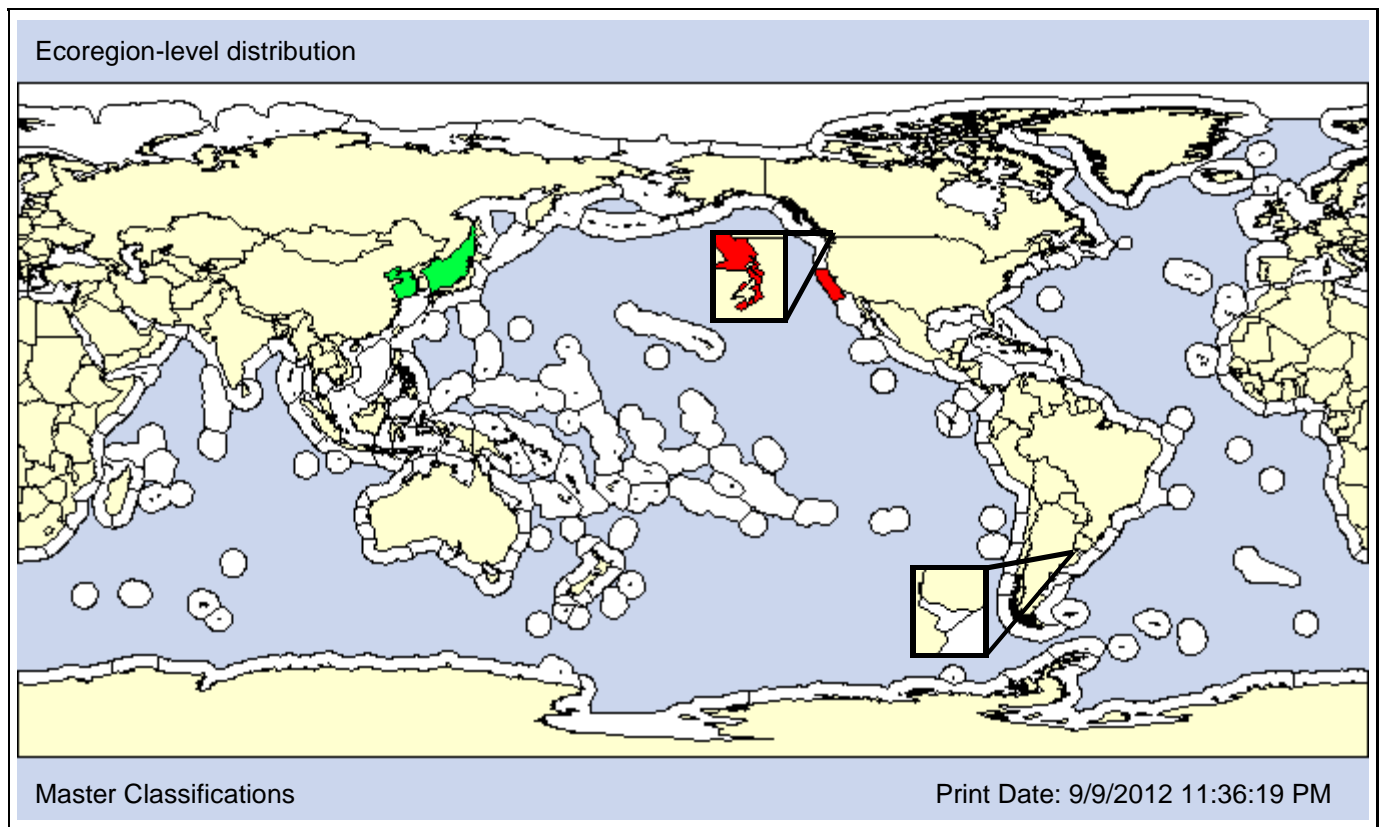
Gelidium chungii  
Gelidium grubbae

Synonym  
Synonym

**Common Names:**

agar weed

**Type Locality:** Japan



**Date 1st record:** Native

1980s

**Loc 1st record:** Native

Strait of Georgia, Puget Sound

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
						AO	PO X							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O								O			P

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		X							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

**Taxon:** Red alga

**Taxonomic Author:** (C.Agardh) E.Y.Dawson, 1954

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Gigartinales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Gigartinaceae

**Subfamily:**

**Also Known As (Name - Type):**

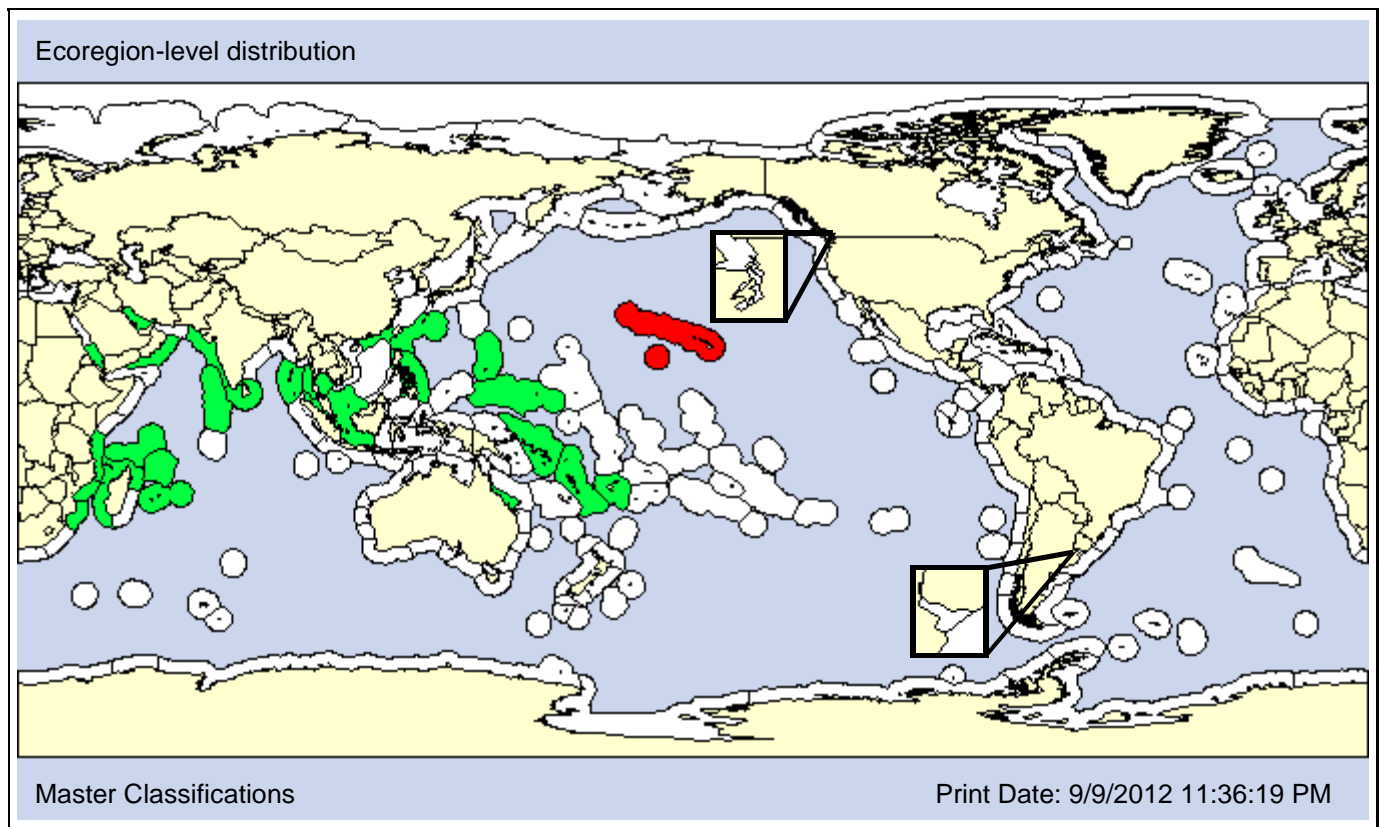
Gracilaria cacalia  
Sphaerococcus salicornia

Synonym  
Synonym

**Common Names:**

gorilla ogo  
gorilla seaweed

**Type Locality:** Mariana Islands



**Date 1st record:** <1950  
**Loc 1st record:** Hawaii (Big Island)  
**Established:** Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X	X	X		X		AO	PO								

Comments: *Gracilaria salicornia* was intentionally introduced into Hawaii for agar production in the 1970s, though it may have been introduced earlier via ballast water or hull fouling. It has become abundant on fringing reefs in Hawaii and can form extensive wrack after storms.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
		<b>X</b>					<b>X</b>						

**DEPTH [Obs: 0 - 13m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>			<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>						<b>O</b>					<b>O</b>	

**SALINITY [Obs: 0 - 50psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P		<b>X</b>		<b>X</b>

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Red alga

**Taxonomic Author:** McLachlan, 1979

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Gigartinales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Gigartinaceae

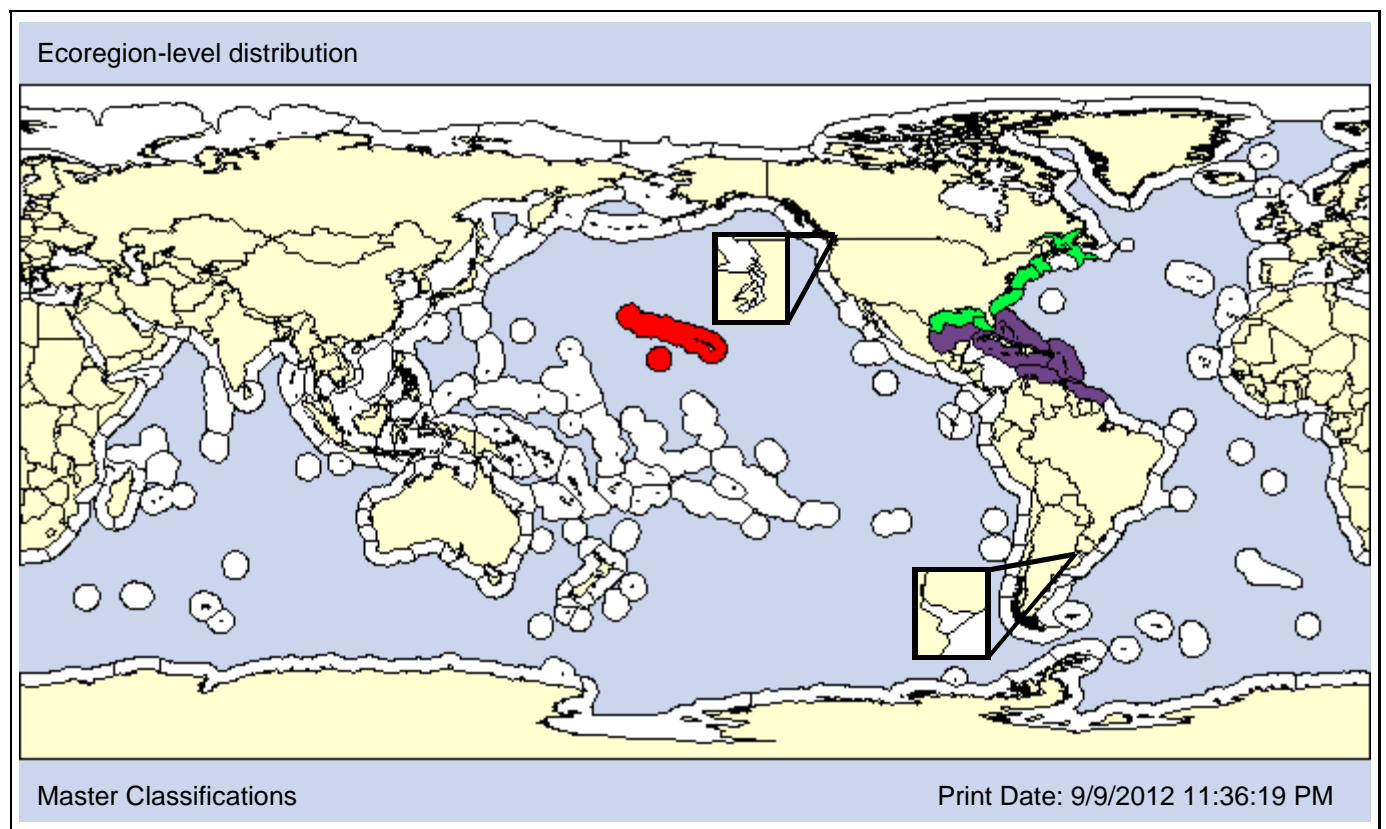
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Gracilaria foliifera var. angustissima	Synonym	graceful red weed
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**Type Locality:** Nova Scotia, Canada



**Date 1st record:**

1970s

**Loc 1st record:**

Oahu, Hawaii

**Established:**

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X		AO	PO								

Comments: Gurgel et al. (2004) found four lineages of *Gracilaria tikvahiae*; 1) Canadian-NE U.S., 2) S.E. Florida, 3) eastern Gulf of Mexico, and 4) western Gulf of Mexico. There was no evidence for the occurrence of *G. tikvahiae* in the Caribbean Sea. For the time being, we list the Caribbean reports as unclassified and unknown population status.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 10m] [Pref: 0 - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>O</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep			

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>												

**SALINITY [Obs: 17 - 35psu] [Pref: 25 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			<b>X</b>

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
	<b>X</b>		BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** (Ohmi) Papenfuss, 1967

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Gigartinales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Gigartinaceae

**Subfamily:**

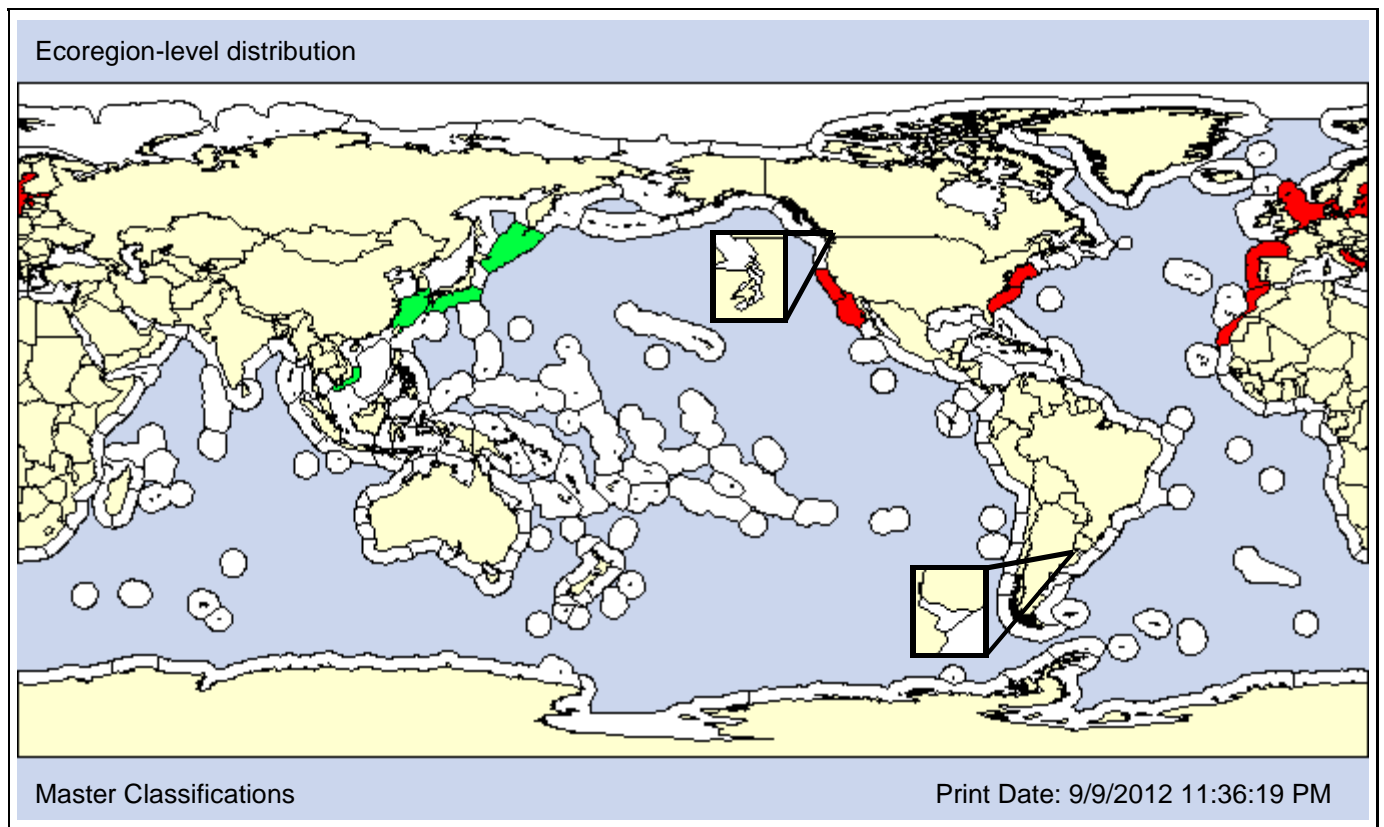
**Also Known As (Name - Type):**

Gracilaria asiatica  
Gracilaria vermiculophylla  
Gracilariopsis vermiculophylla

Synonym  
Misspelling  
Synonym

**Common Names:**

**Type Locality:** Akkeshi Bay, Japan



**Date 1st record:** Native

1994

**Loc 1st record:** Native

Elkhorn Slough, California

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
	X	X											

**DEPTH [Obs: 0 - 5m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
		O		P		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O										O	

**SALINITY [Obs: 1 - 35psu] [Pref: 10 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline P		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
	O	O	O	P	P	P			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		X							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Red alga

**Taxonomic Author:** (Okamura, 1934) Kawaguchi, 1997

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Halymeniales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Halymeniaceae

**Subfamily:**

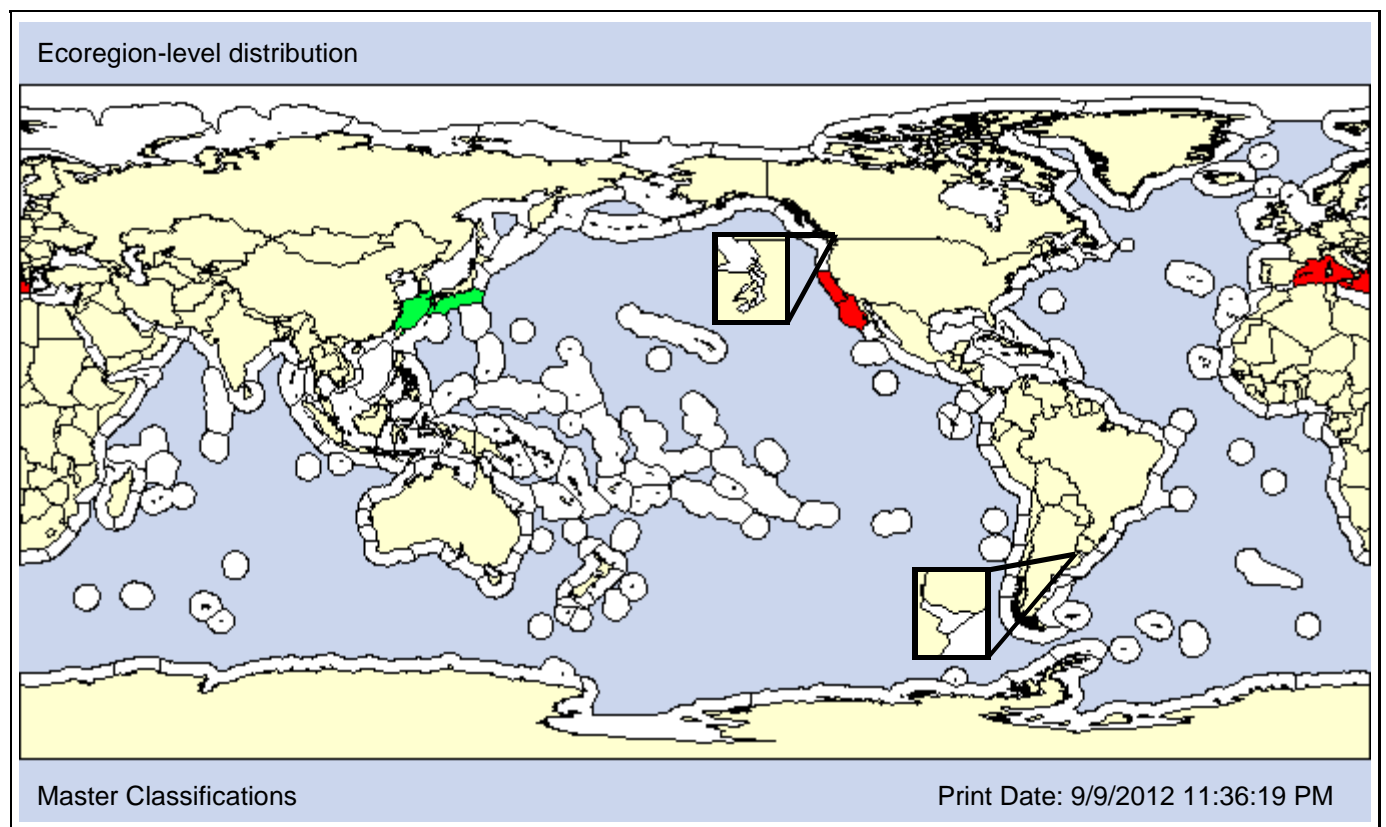
**Also Known As (Name - Type):**

Aeodes lanceolata  
Pachymeniopsis lanceolata

Synonym  
Synonym

**Common Names:**

**Type Locality:** Japan



**Date 1st record:** Native

2003

**Loc 1st record:** Native

Santa Catalina Island, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			X
X		X				AO	PO X							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>									<b>O</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** Yamada, 1941

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Halymeniales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Halymeniaceae

**Subfamily:**

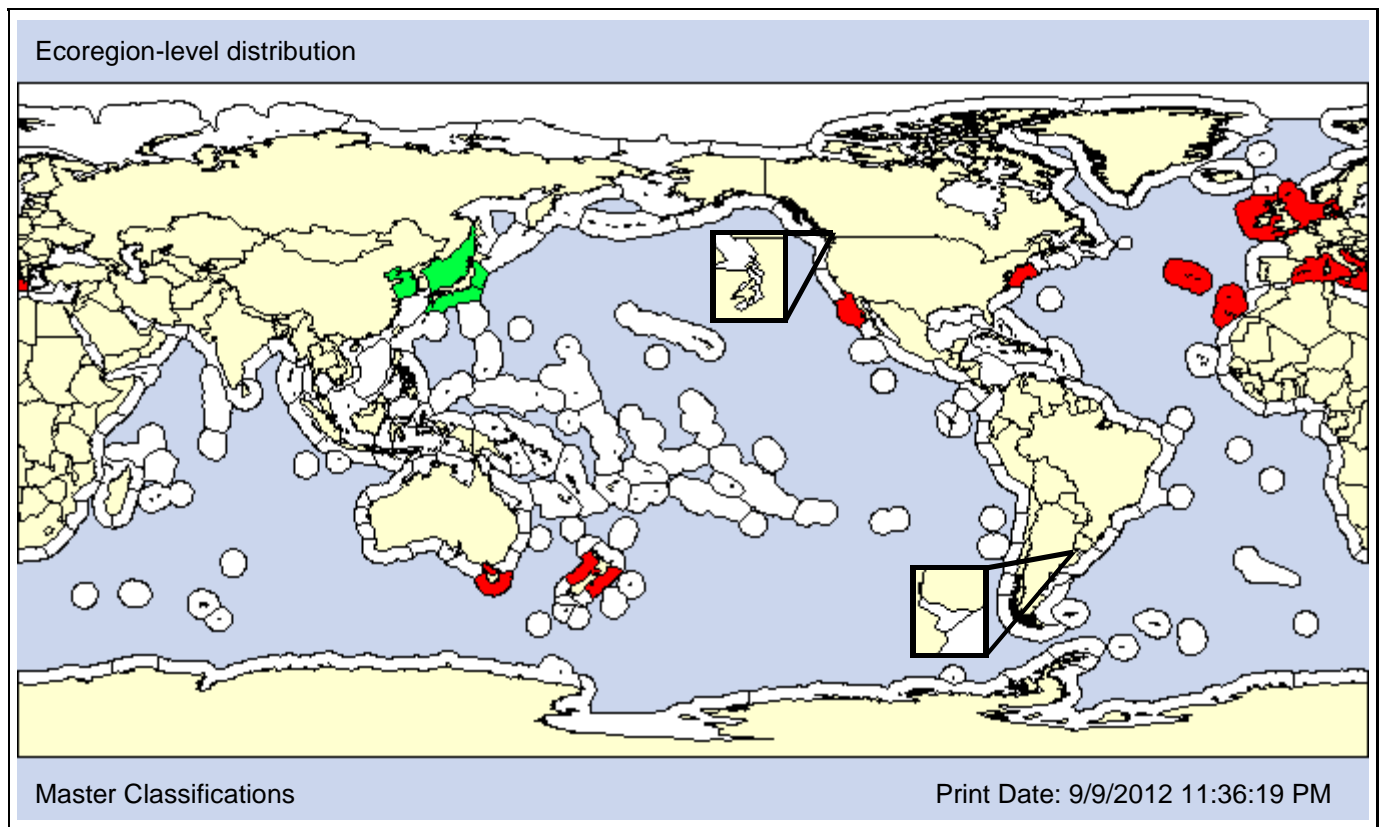
**Also Known As (Name - Type):**

Grateloupia doryphora of authors in part

Misidentified

**Common Names:**

**Type Locality:** Muroran, Hokkaido, Japan



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		<b>NWP</b>	<b>Hawaii</b>		<b>NEP</b>		

**Date 1st record:** Native

2009

**Loc 1st record:** Native

Santa Barbara Harbor, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO <b>X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 2m] [Pref: 0 - 2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>			<b>P</b>							<b>O</b>	

**SALINITY [Obs: 15 - 37psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
				<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Red alga

**Taxonomic Author:** (Wulfen) Lamouroux, 1813

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Gigartinales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Cystocloniaceae

**Subfamily:**

**Also Known As (Name - Type):**

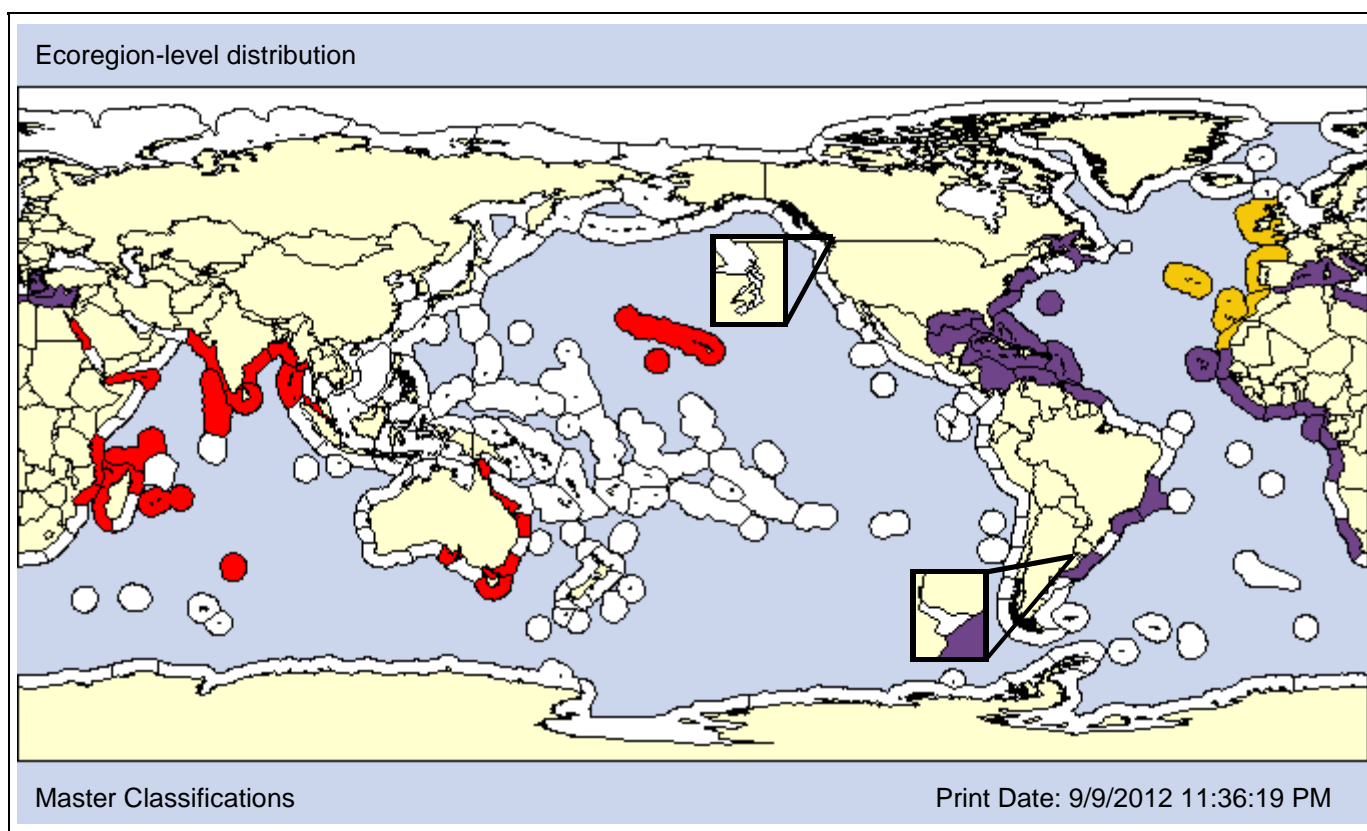
Fucus musciformis  
 Hypnea rissoana  
 Sphaerococcus divaricatus  
 Sphaerococcus divaricatus C.Agardh, 1827

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

hookweed

**Type Locality:** Trieste, Italy



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1974  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA</b>		IR		A	P				<b>X</b>
		<b>X</b>		<b>X</b>		AO	PO								

Comments: *Hypnea musciformis* has been widely distributed for aquaculture. Olenin and Didžiulis (2009) list it as cryptogenic in Europe though Zenetos et al. (2009) do not list it as introduced in the Mediterranean. We consider it unclassified in the western Atlantic and Mediterranean and introduced in the Pacific.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 90m] [Pref: 0 - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>O</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>						<b>P</b>					<b>P</b>	

**SALINITY [Obs: 22 - 39psu] [Pref: 24 - 31psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
	<b>X</b>		BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** (Doty) Doty ex Silva, 1996

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Gigartinales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Areschougiaceae

**Subfamily:**

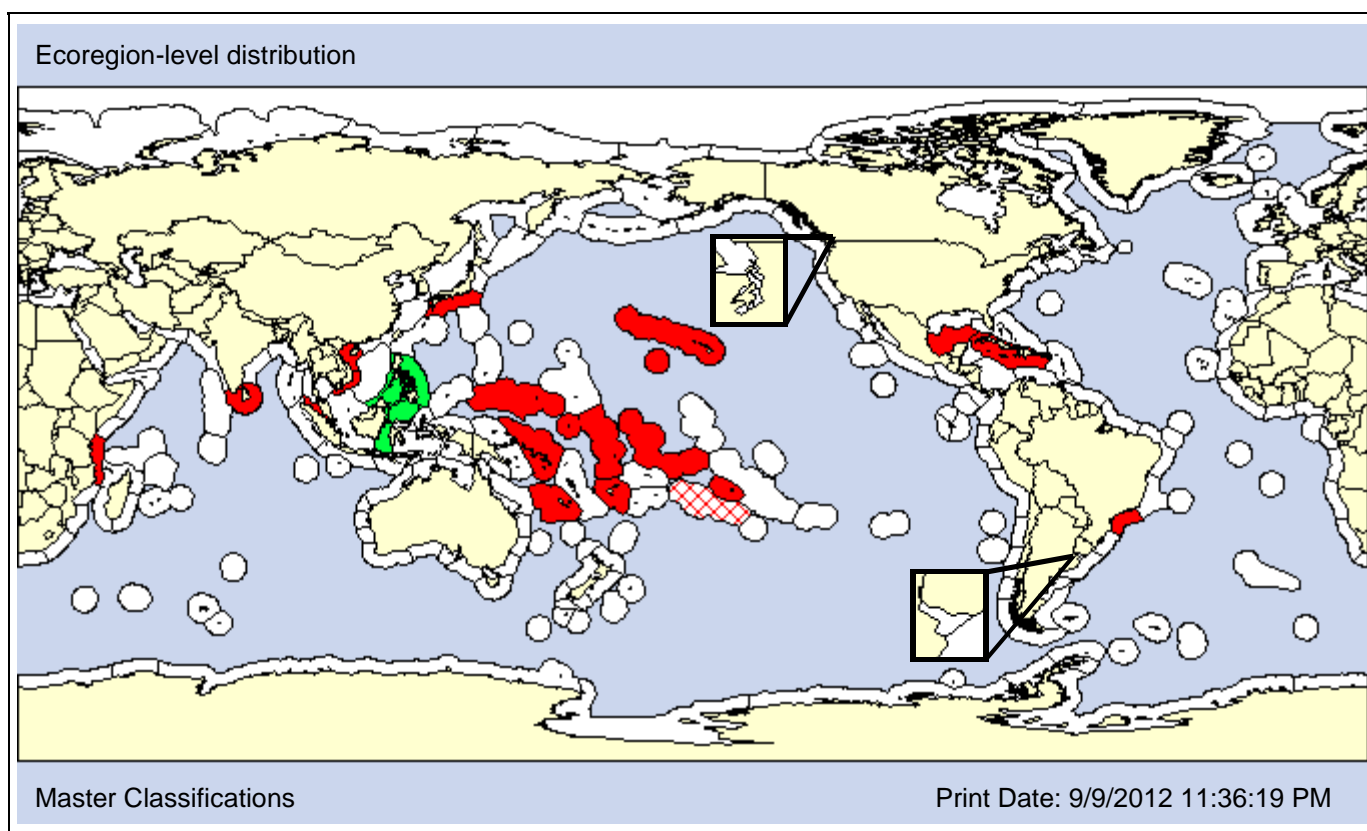
**Also Known As (Name - Type):**

Euchema striatum tambalang var. of Russell 1983	Synonym
Euchema alvarezii	Synonym
Euchema cottonii var. erecta	Synonym
Euchema cottonii Weber-van Bosse 1913	Synonym

**Common Names:**

tambalang
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**Type Locality:** Malaysia



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

**Date 1st record:** 1991 (NWP)      1974 (Hawaii)  
**Loc 1st record:** Tosa Bay, Japan      Kaneohe Bay, Hawaii  
**Established:** Unknown      Yes (NEP)

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
				X		AO	PO								

Comments: "Kappaphycus alvarezii seems to have been narrowly restricted to the southernmost Sulu Archipelago, the Celebes Sea and Biak na Belau north of the equator until after 1974 it became widely distributed by man [for carrageenan production]" (Neish, 2003). Based on this native distribution, we classify it introduced in other areas.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>			
		<b>X</b>											

**DEPTH [Obs: 1 - 50m] [Pref: 1 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>O</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep			

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>						<b>O</b>						

**SALINITY [Obs: 30 - 35psu] [Pref: 30 - 35psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** (Schmitz) Doty ex Silva, 1996

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Gigartinales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Areschougiaceae

**Subfamily:**

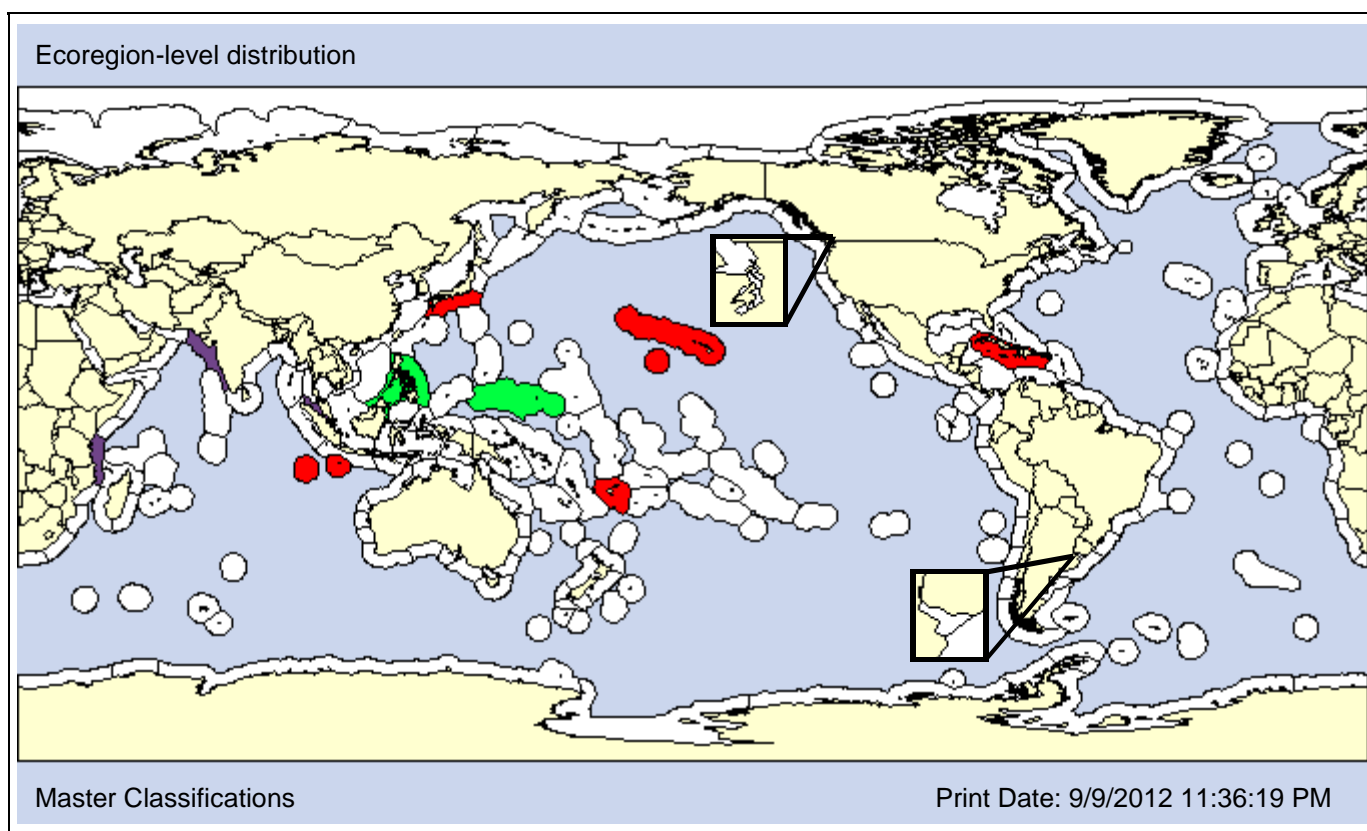
**Also Known As (Name - Type):**

Eucheuma cottonii	Synonym
Eucheuma striatum	Synonym
Kappaphycus striatum	Convention

**Common Names:**

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**Type Locality:** Zanzibar, Tanzania



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1996 (NWP)      1970 (Hawaii)  
**Loc 1st record:** Tosa Bay, Japan (NWP)      Kaneohe and Honolulu, Hawaii (Hawaii)  
**Established:** Unknown (NWP)      Yes (Hawaii)

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
				X		AO	PO								

Comments: Although AlgaeBase lists Zanzibar, Tanzania as the type locality of *Kappaphycus striatus*, it has also been introduced into Tanzania for mariculture.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>			
		<b>X</b>											

**DEPTH [Obs: 1 - 50m] [Pref: 1 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>			<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>												

**SALINITY [Obs: 27 - 35psu] [Pref: - 35psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual X</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P		<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** Yendo, 1920

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Rhodymeniales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Lomentariaceae

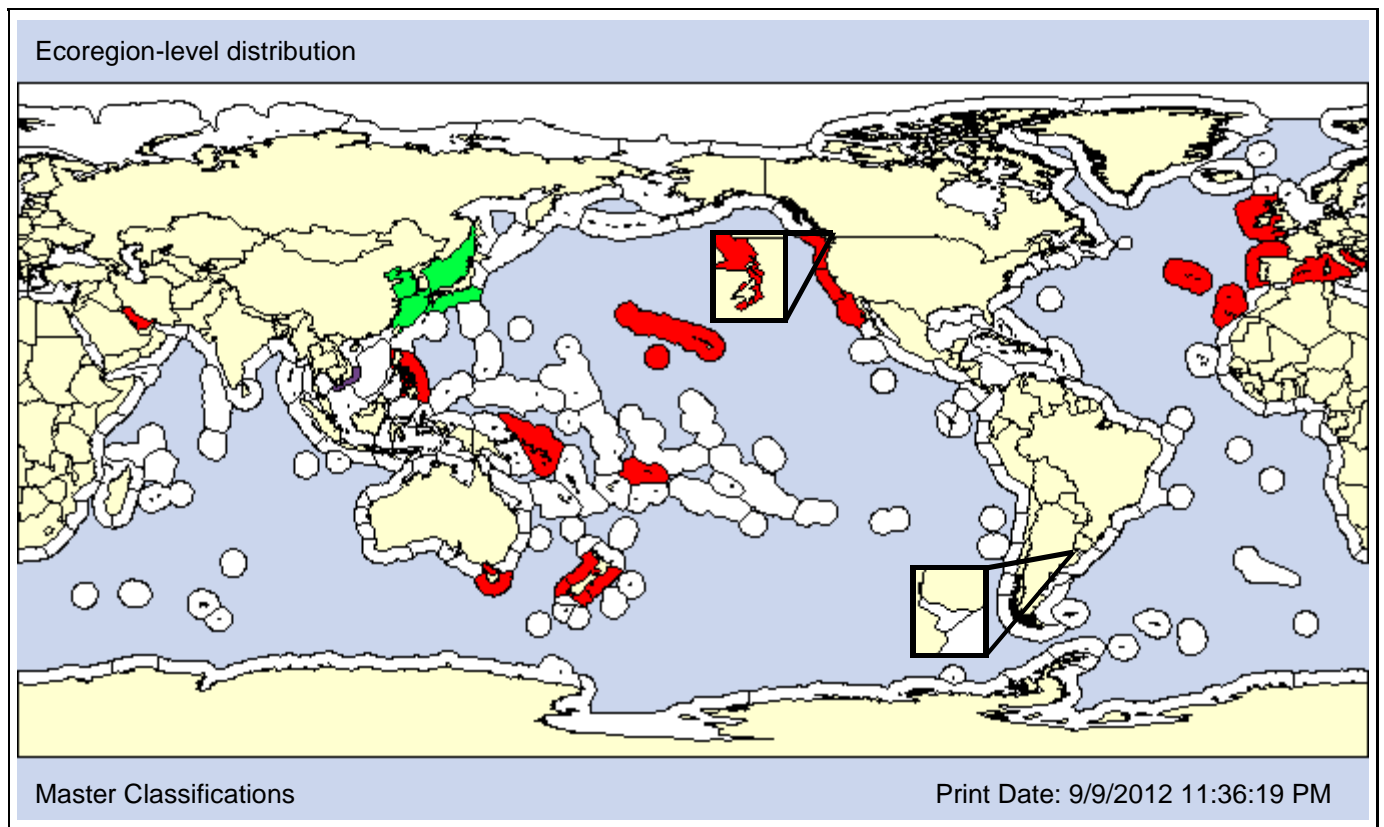
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Lomentaria sinensis	Synonym	
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**Type Locality:** Hakodate, Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native Unknown 1944  
**Loc 1st record:** Native Unknown Ensenada, Mexico  
**Established:** Yes Unknown Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO <b>X</b>									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 1m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	<b>O</b>

**SALINITY [Obs: - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				<b>X</b>

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Red alga

**Taxonomic Author:** (Bailey) Kim, Choi, Guiry & Saunders, 2001

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Ceramiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Rhodomelaceae

**Subfamily:**

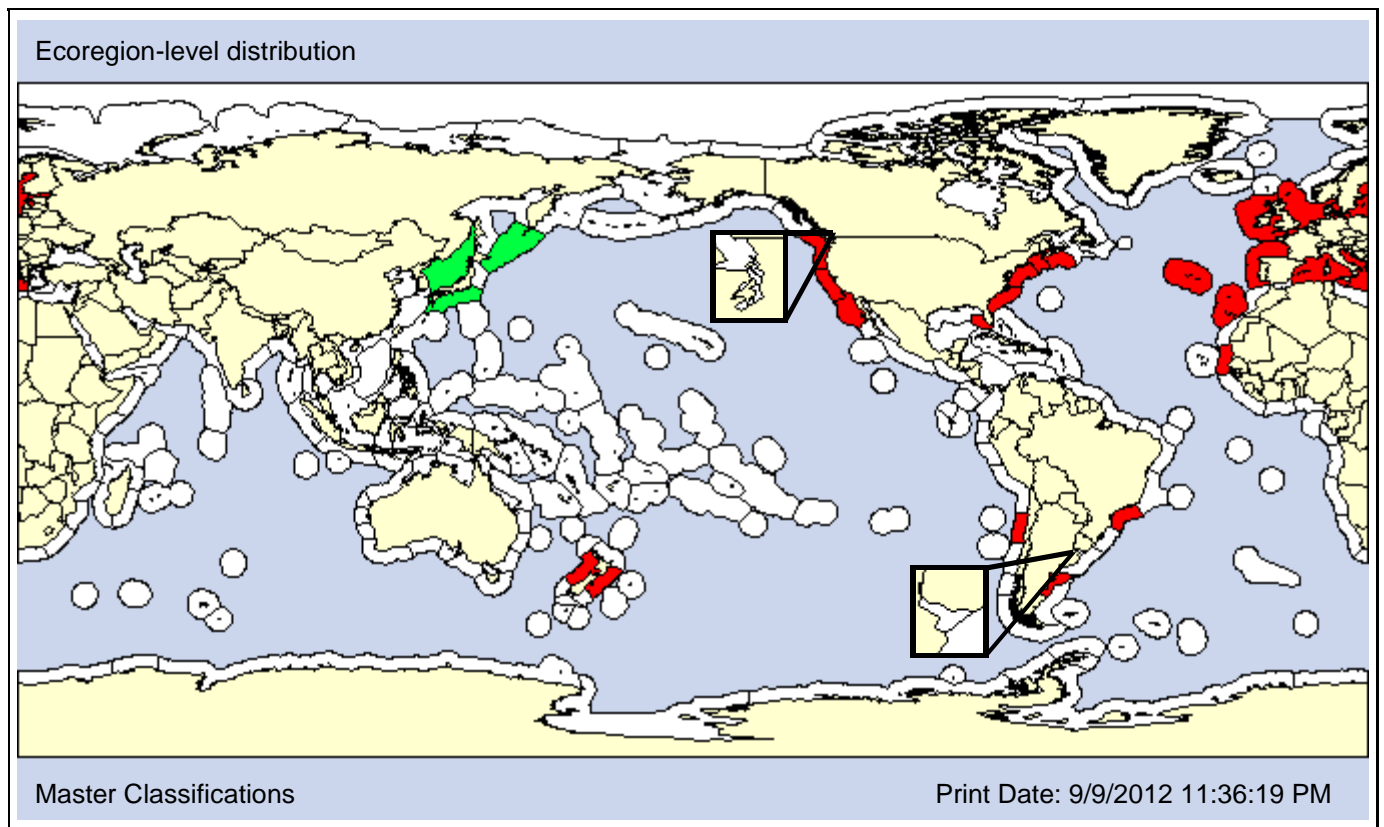
**Also Known As (Name - Type):**

Polysiphonia argentinica	Synonym
Polysiphonia harveyi	Synonym
Polysiphonia havanensis var. insidiosa	Synonym
Polysiphonia insidiosa	Synonym

**Common Names:**

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**Type Locality:** Connecticut, USA (lectotype)



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii			NEP	

**Date 1st record:** Native

ca. 1927

**Loc 1st record:** Native

San Pedro, California

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO <b>X</b>								

Comments: *Neosiphonia harveyi*, occurs both in fouling communities and as an epiphyte on *Codium* sp. It was originally thought to be a North Atlantic species but genetic analysis showed that Japan was its center of origin (McIvor et al., 2001).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 6m] [Pref: 0 - 6m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>										<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** (Dillwyn) Sprengel, 1827

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Ceramiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Rhodomelaceae

**Subfamily:**

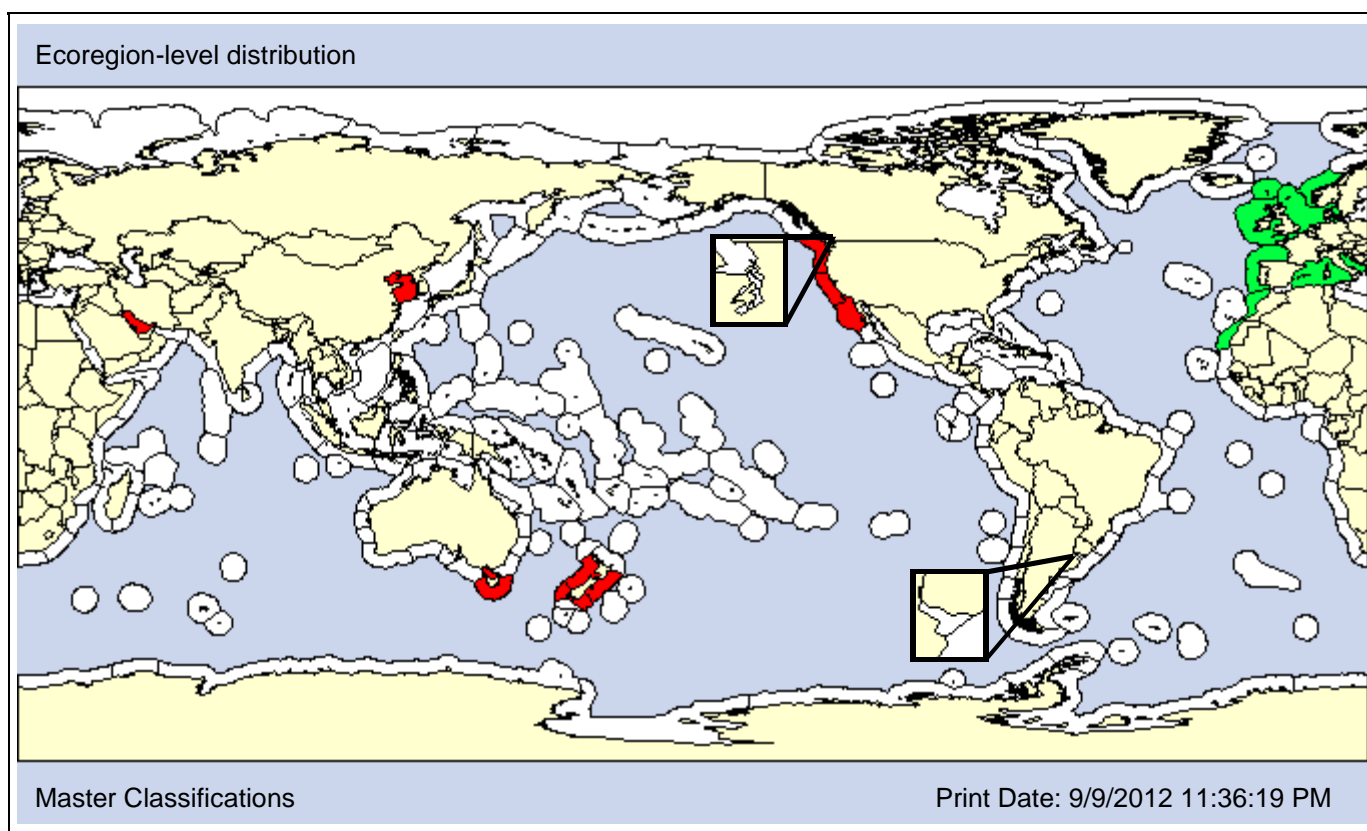
**Also Known As (Name - Type):**

Ceramium brodiei  
 Conferva brodiei  
 Hutchinsia brodiei  
 Hutchinsia penicillata

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** Scotland



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown

Unknown

**Loc 1st record:** Unknown

Unknown

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 60m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>		<b>O</b>						<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Red alga

**Taxonomic Author:** (Dillwyn) Greville ex Harvey, 1833

**Kingdom:** Plantae

**Subkingdom:** Biliphyta

**Phylum:** Rhodophyta

**Subphylum:** Eurhodophytina

**Superclass:**

**Class:** Florideophyceae

**Subclass:** Rhodymeniophycidae

**Infraclass:**

**Superorder:**

**Order:** Ceramiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Rhodomelaceae

**Subfamily:**

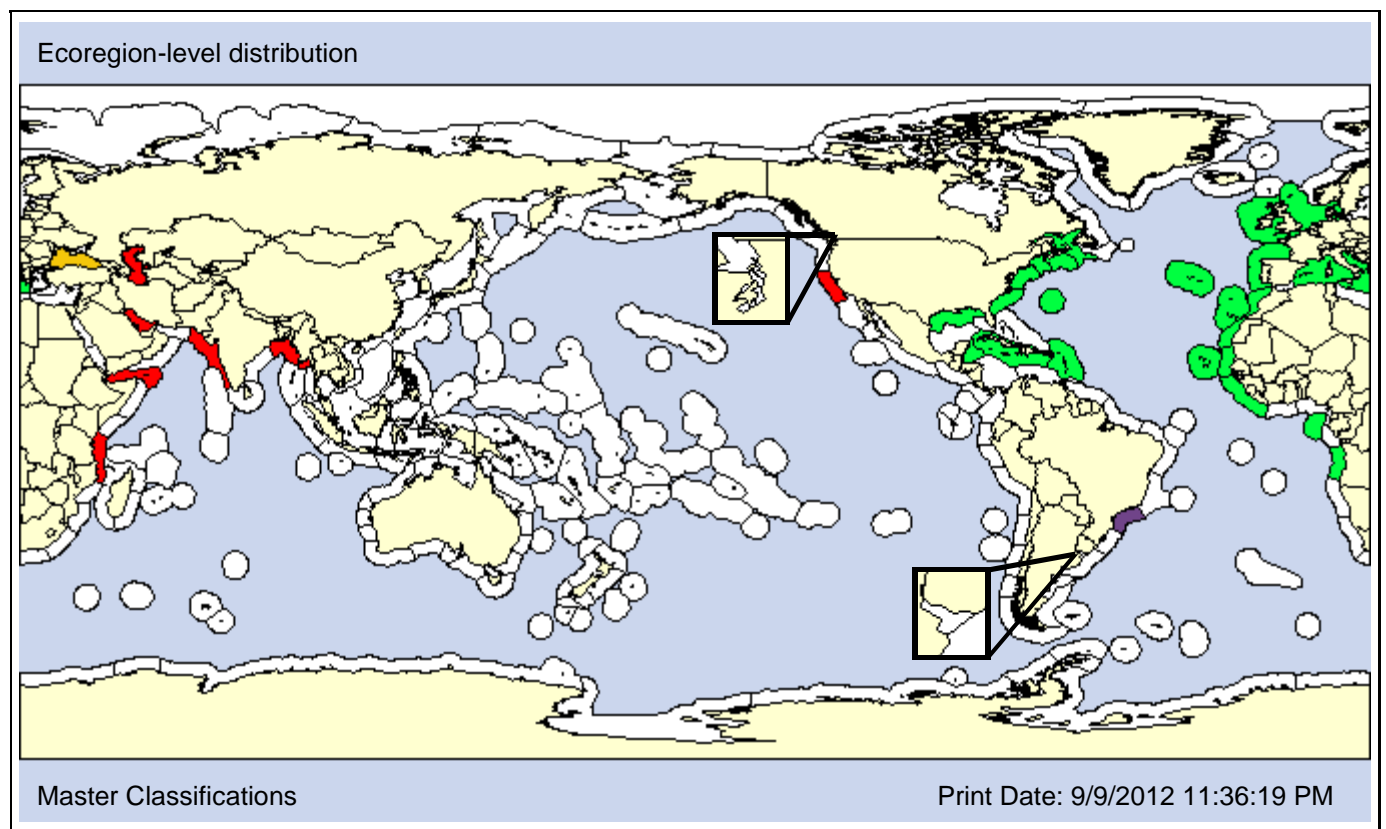
**Also Known As (Name - Type):**

Conferva denudata  
Hutchinsia variegata  
Polysiphonia variegata

Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:** Southampton, England



**Date 1st record:**

1978-1983

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments: *Polysiphonia denudata* is a north Atlantic/Caribbean species. It has been found in the San Francisco Estuary but has not been reported from other NEP estuaries. We classify it as introduced in the Indian Ocean but note that it was not listed among the nonindigenous species for the Indian Seas (Rao, 2005).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>	<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 31m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>O</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>O</b>				<b>O</b>	<b>P</b>	<b>O</b>

**SALINITY [Obs: 25 - 40psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			<b>X</b>

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			<b>X</b>

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
	<b>X</b>	<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

Kingdom: Plantae

Subkingdom: Viridaeplantae

Phylum: Chlorophyta

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**Taxon:** Green alga

**Taxonomic Author:** (Montagne) A. Gepp & E. Gepp, 1908

**Kingdom:** Plantae

**Subkingdom:** Viridiaeplantae

**Phylum:** Chlorophyta

**Subphylum:**

**Superclass:**

**Class:** Bryopsidophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Bryopsidales

**Suborder:**

**Infraorder:**

**Superfamily:**

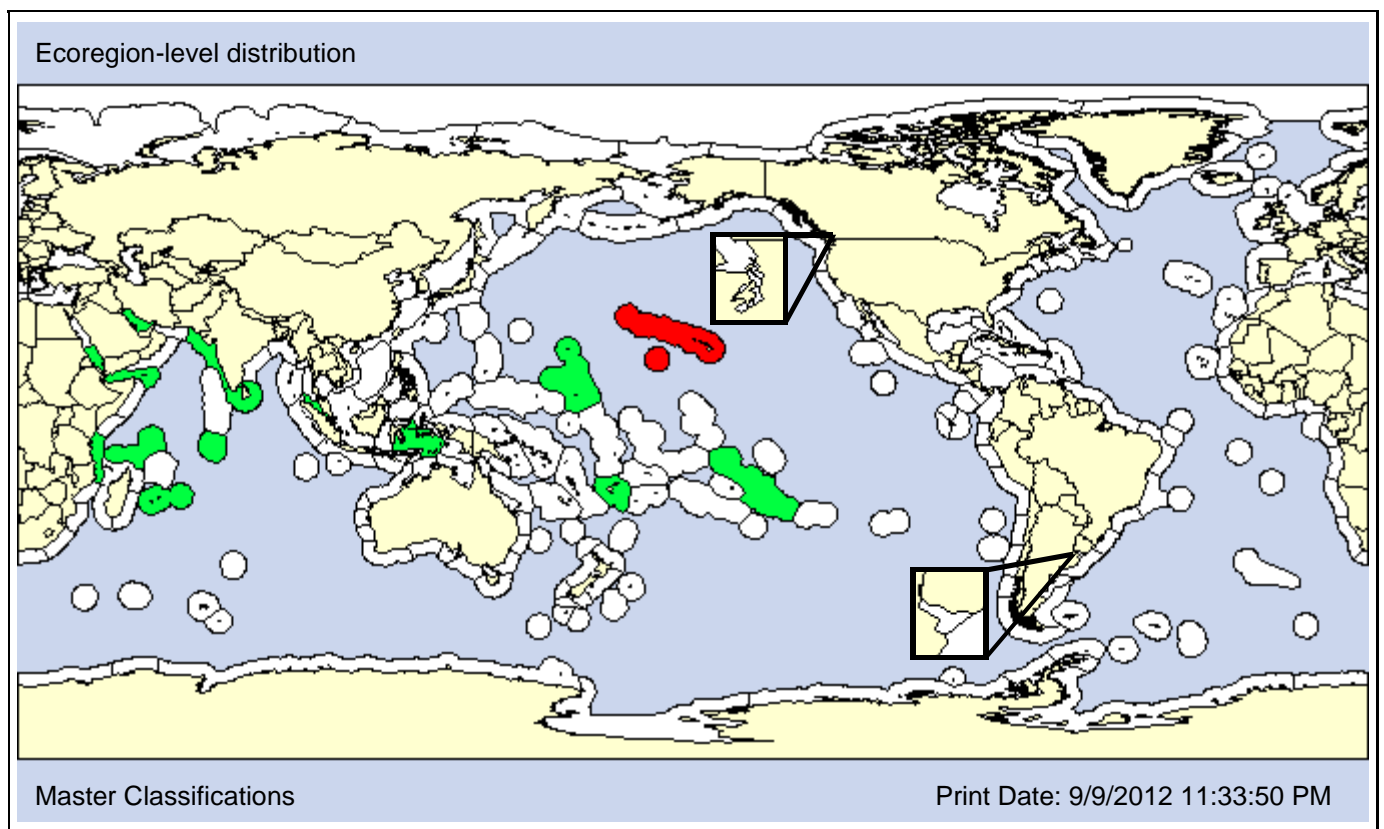
**Family:** Udoteaceae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Agalega Islands, NE of Madagascar



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1981  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X						AO	PO								

Comments: Carlton and Eldredge (2009) report that this Indo-Pacific macroalgae was introduced into Hawaii in 1981. Possible vectors include ballast water and entanglement on anchor chains.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>			
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 90m] [Pref: 1 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>		<b>O</b>	<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>						

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>	<b>X</b>							

**Taxon:** Green alga

**Taxonomic Author:** Silva, 1979

**Kingdom:** Plantae

**Subkingdom:** Viridiaeplantae

**Phylum:** Chlorophyta

**Subphylum:**

**Superclass:**

**Class:** Bryopsidophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Bryopsidales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Bryopsidaceae

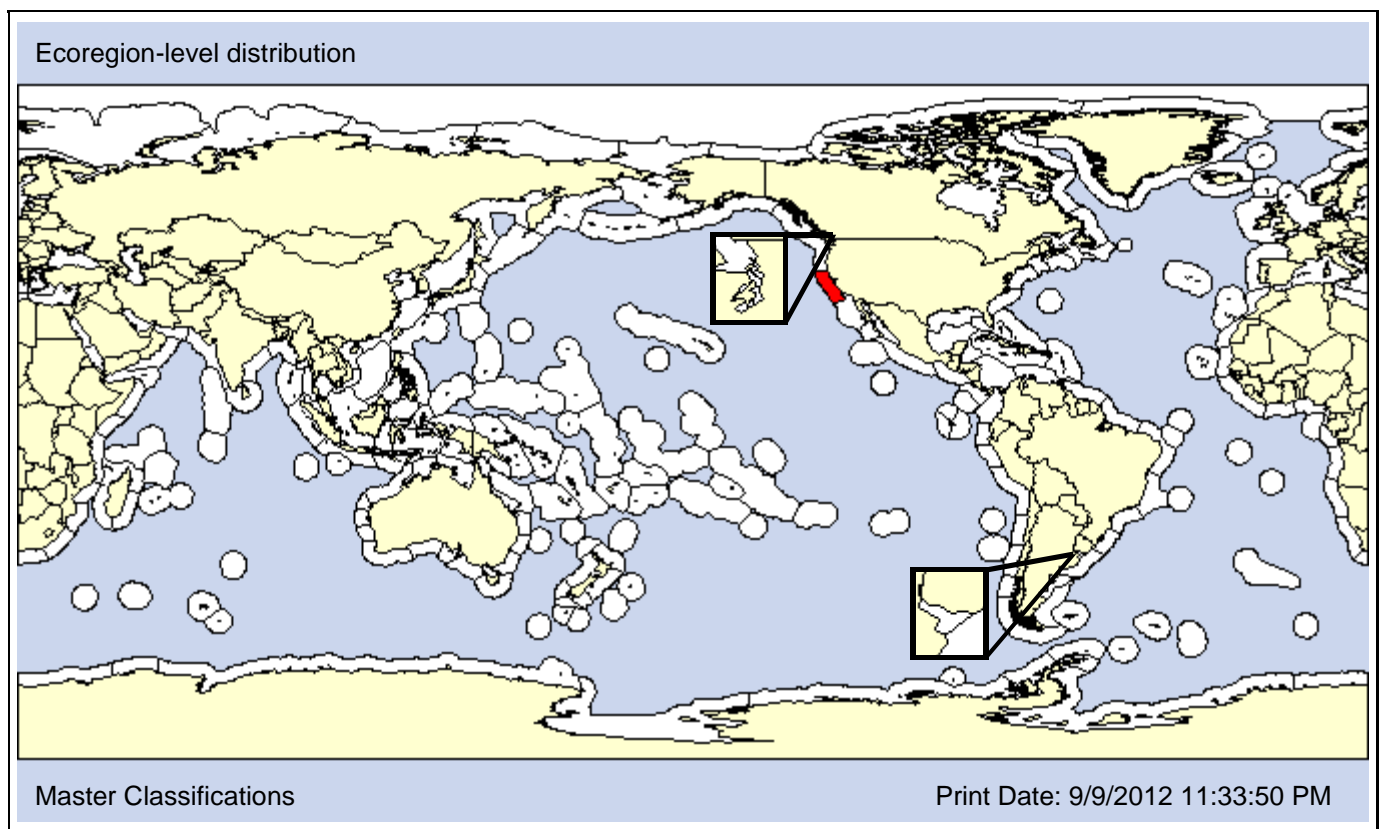
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Bryopsis sp. 1 Miller	Synonym	
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**Type Locality:** California, USA



**Date 1st record:**

1951

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: Cohen and Carlton (1995) classified this species as NIS based on Silva's (1979) report of a Bryopsis that only reproduced asexually in San Francisco Bay and that exhibited "weedy behavior." However, Silva (1979) stated that the "original home and identity of this plant is undeterminable", suggesting a cryptogenic classification.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 5m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Green alga

**Taxonomic Author:** (Vahl) Agardh, 1817

**Kingdom:** Plantae

**Subkingdom:** Viridiaeplantae

**Phylum:** Chlorophyta

**Subphylum:**

**Superclass:**

**Class:** Bryopsidophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Bryopsidales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Caulerpaceae

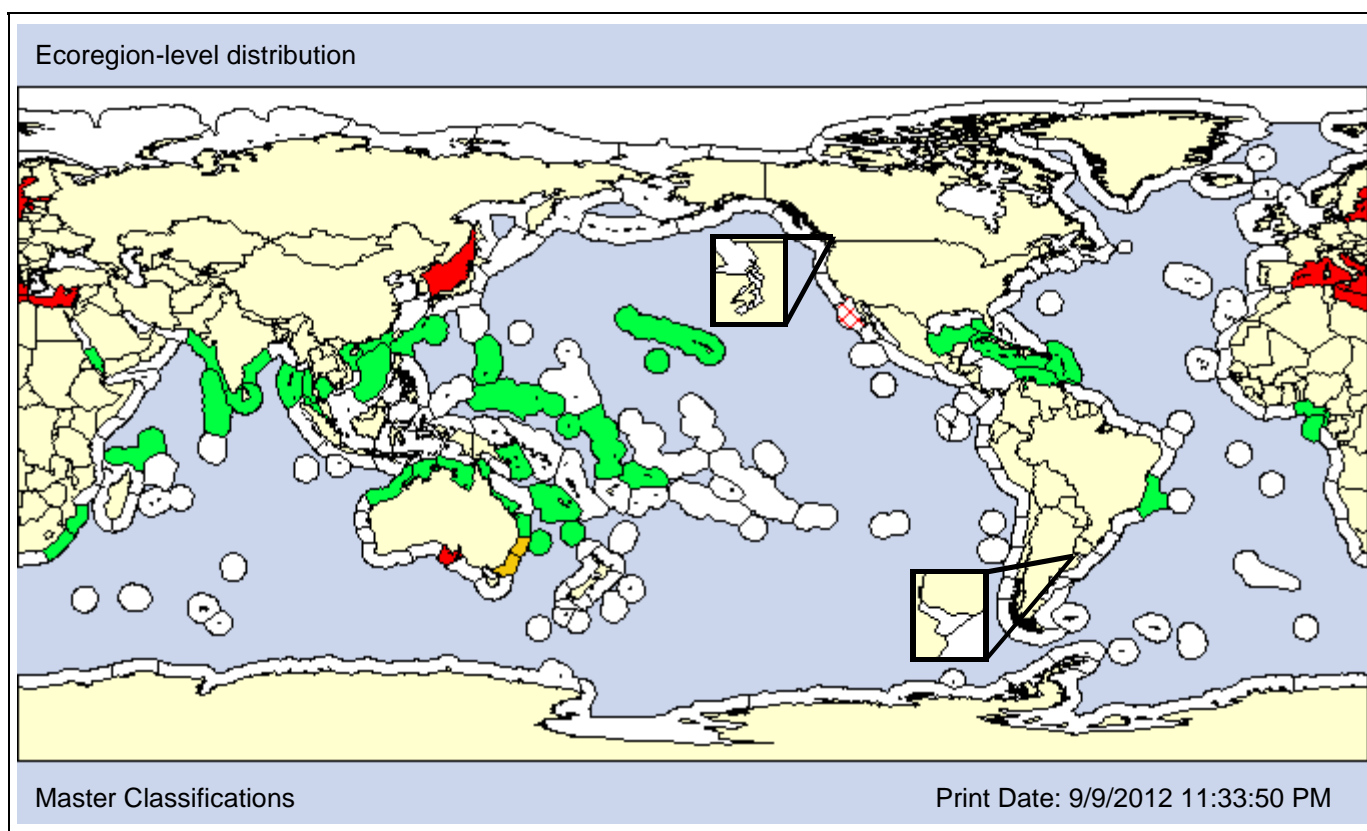
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Fucus taxifolius	Synonym	Ichii-duta killer algae
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**Type Locality:** St. Croix, Virgin Islands



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;">■</span> NIS Not Established	<span style="color: yellow;">■</span> Cryptogenic	<span style="color: lightblue;">■</span> Transient	<span style="color: purple;">■</span> Unclassified	<span style="color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;">■</span> Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

**Date 1st record:** 1992

Native

2000

**Loc 1st record:** Sea of Japan

Native

Agua Hedionda Lagoon, CA

**Established:** Unknown

Yes

No

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			X	A	P				X
						AO	PO			X					

Comments: The nonindigenous classification for *Caulerpa taxifolia* in temperate Japan is based on the occurrence of the Mediterranean clone. It is not known if this non-native clone is established in Japan. *C. taxifolia* was introduced into Southern California, but was eradicated through a control program.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>				
		<b>X</b>					<b>X</b>						

**DEPTH [Obs: 0 - 150m] [Pref: 3 - 35m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>						

**SALINITY [Obs: 15 - 40psu] [Pref: 20 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
			<b>O</b>	<b>P</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P			<b>X</b>	

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>	<b>X</b>							

# Codium fragile fragile

Species ID: 3250

**Taxon:** Green alga

**Taxonomic Author:** (Suringar) Hariot, 1889

**Kingdom:** Plantae

**Subkingdom:** Viridiaeplantae

**Phylum:** Chlorophyta

**Subphylum:**

**Superclass:**

**Class:** Bryopsidophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Bryopsidales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Codiaceae

**Subfamily:**

**Also Known As (Name - Type):**

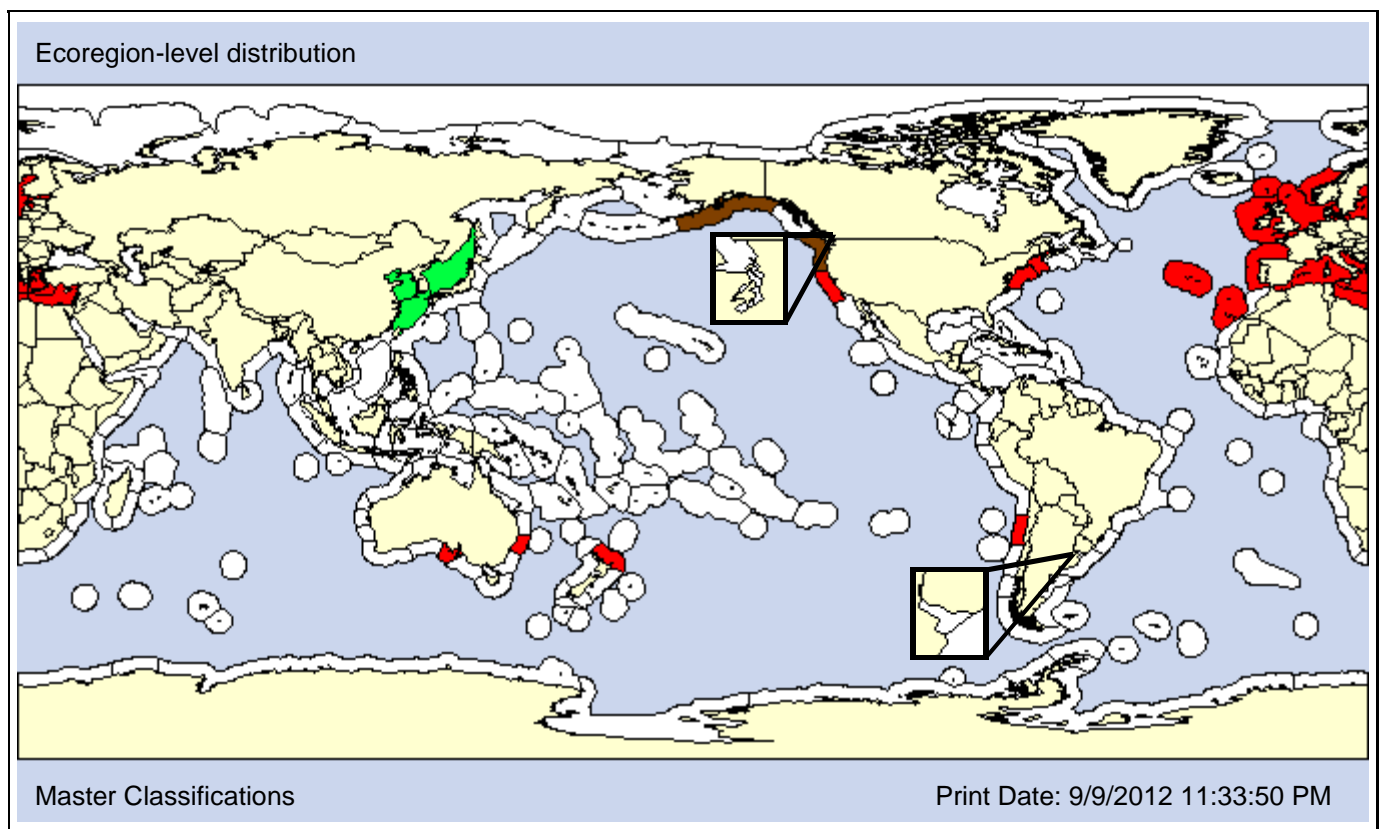
Codium fragile in part  
 Codium fragile subsp. capense P.C.Silva 1959  
 Codium fragile subsp. fragile  
 Codium fragile subsp. tomentosoides

Partial synonym  
 Synonym  
 Convention  
 Synonym

**Common Names:**

dead man's fingers  
 oyster thief  
 sputnik weed

**Type Locality:** Japan



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1977

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
X		X				AO	PO X								

Comments: Genetic analysis suggests that the *Codium fragile* in Alaska and Oregon is the native form, with the introduced form occurring in Tomales Bay, California and Willapa Bay, Washington (G. Hansen, pers. comm. 9/21/2010). Thus, we list the areas north of central California as a conflict.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>					<b>X</b>						

**DEPTH [Obs: 0 - 22m] [Pref: 0 - 9m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>									<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 12 - 40psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>	<b>X</b>		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Green alga

**Taxonomic Author:** Zanardini, 1858

**Kingdom:** Plantae

**Subkingdom:** Viridiaeplantae

**Phylum:** Chlorophyta

**Subphylum:**

**Superclass:**

**Class:** Bryopsidophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Bryopsidales

**Suborder:**

**Infraorder:**

**Superfamily:**

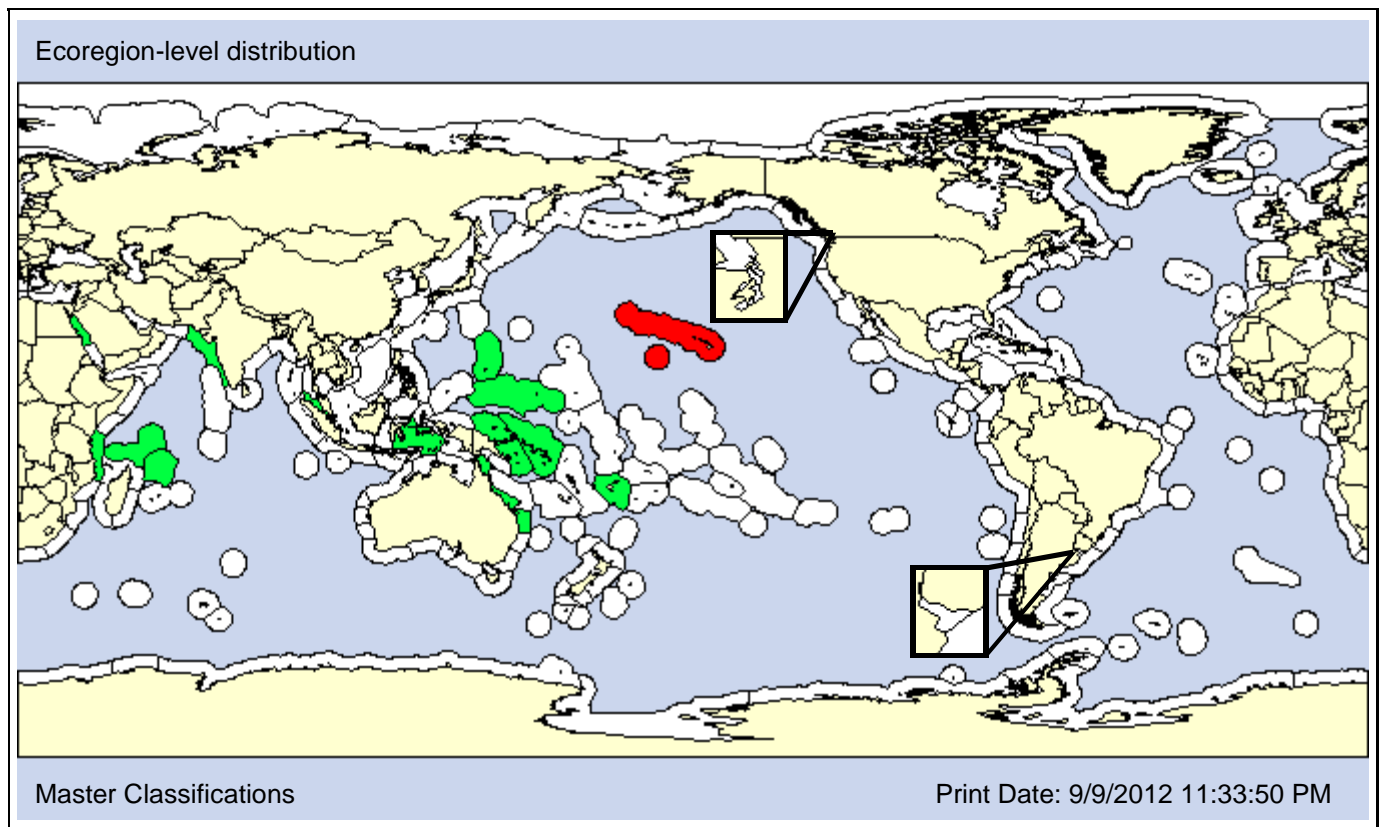
**Family:** Udoteaceae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Suez, Egypt



	Native		Nonindigenous		NIS Not Established		Cryptogenic		Transient		Unclassified		Conflicting Classification		Unidentified
					NWP				Hawaii						NEP

**Date 1st record:** 2007  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
						AO	PO								

Comments: The Indo-Pacific seaweed, *Udotea argentea*, was first recorded in Hawaii in 2007 in a sandy habitat at depths of 30 to 60 meters.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>P</b>	<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 20 - 60m] [Pref: 20 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Green alga

**Taxonomic Author:** Wille, 1899

**Kingdom:** Plantae

**Subkingdom:** Viridiaeplantae

**Phylum:** Chlorophyta

**Subphylum:**

**Superclass:**

**Class:** Ulvophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ulvales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ulvaceae

**Subfamily:**

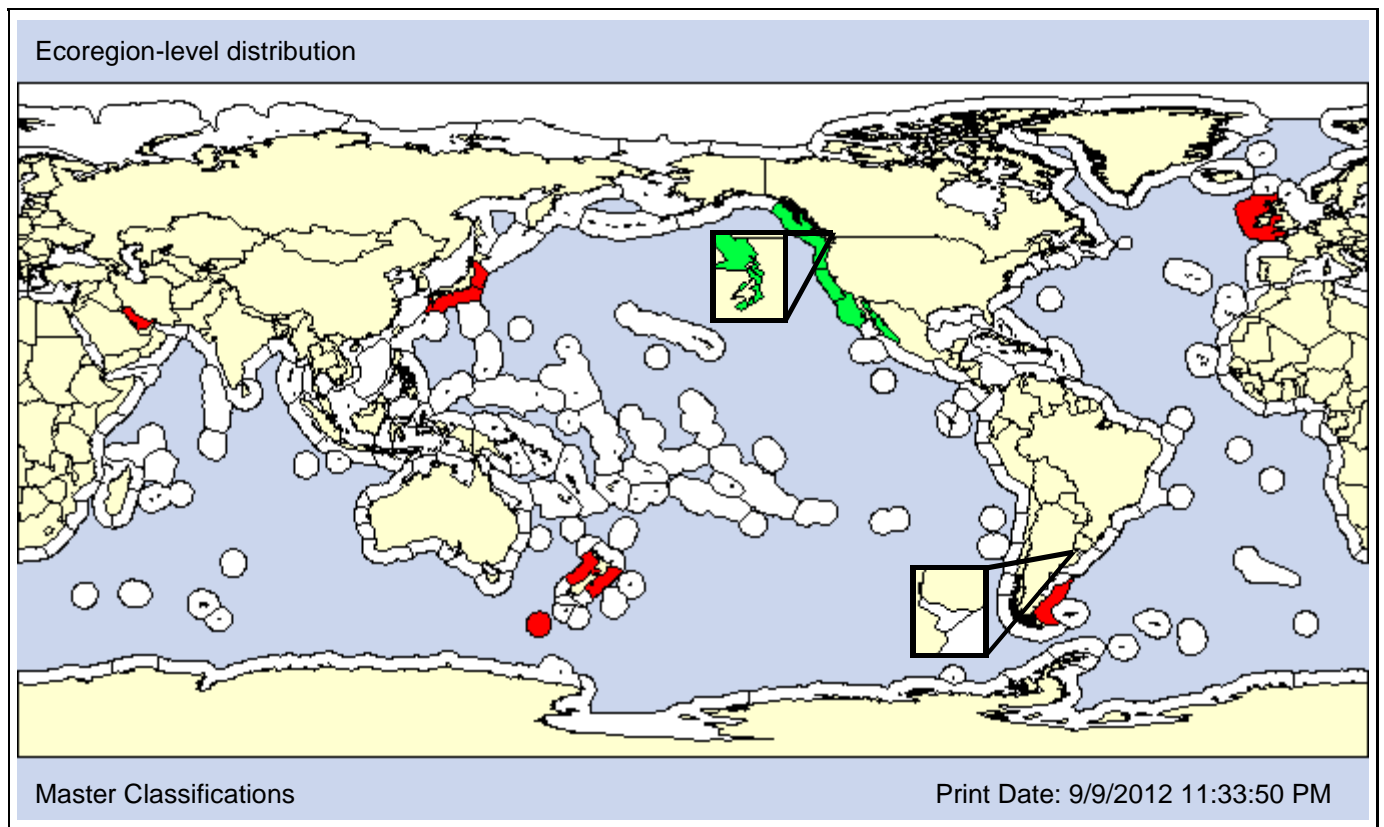
**Also Known As (Name - Type):**

Enteromorpha angusta	Synonym
Ulva angusta	Synonym
Ulva scagelii	Synonym

**Common Names:**

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**Type Locality:** La Jolla, California



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 2003

Native

**Loc 1st record:** Mikawa and Osaka, Japan

Native

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: *Ulva californica* is considered introduced in Japan (Kawai et al., 2007) and New Zealand (Heesch et al., 2009). Assuming it is native to the NEP, we tentatively classify it as a NIS in Europe, Argentina, Iran, and the subantarctic islands, though additional genetic analysis is required to confirm these classifications.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Green alga      **Taxonomic Author:** (Setchell) Setchell & N.L.Gardner 1920

**Kingdom:** Plantae      **Subkingdom:** Viridiaeplantae      **Phylum:** Chlorophyta

**Subphylum:**      **Superclass:**      **Class:** Ulvophyceae

**Subclass:**      **Infraclass:**      **Superorder:**

**Order:** Ulvales      **Suborder:**      **Infraorder:**

**Superfamily:**      **Family:** Ulvaceae      **Subfamily:**

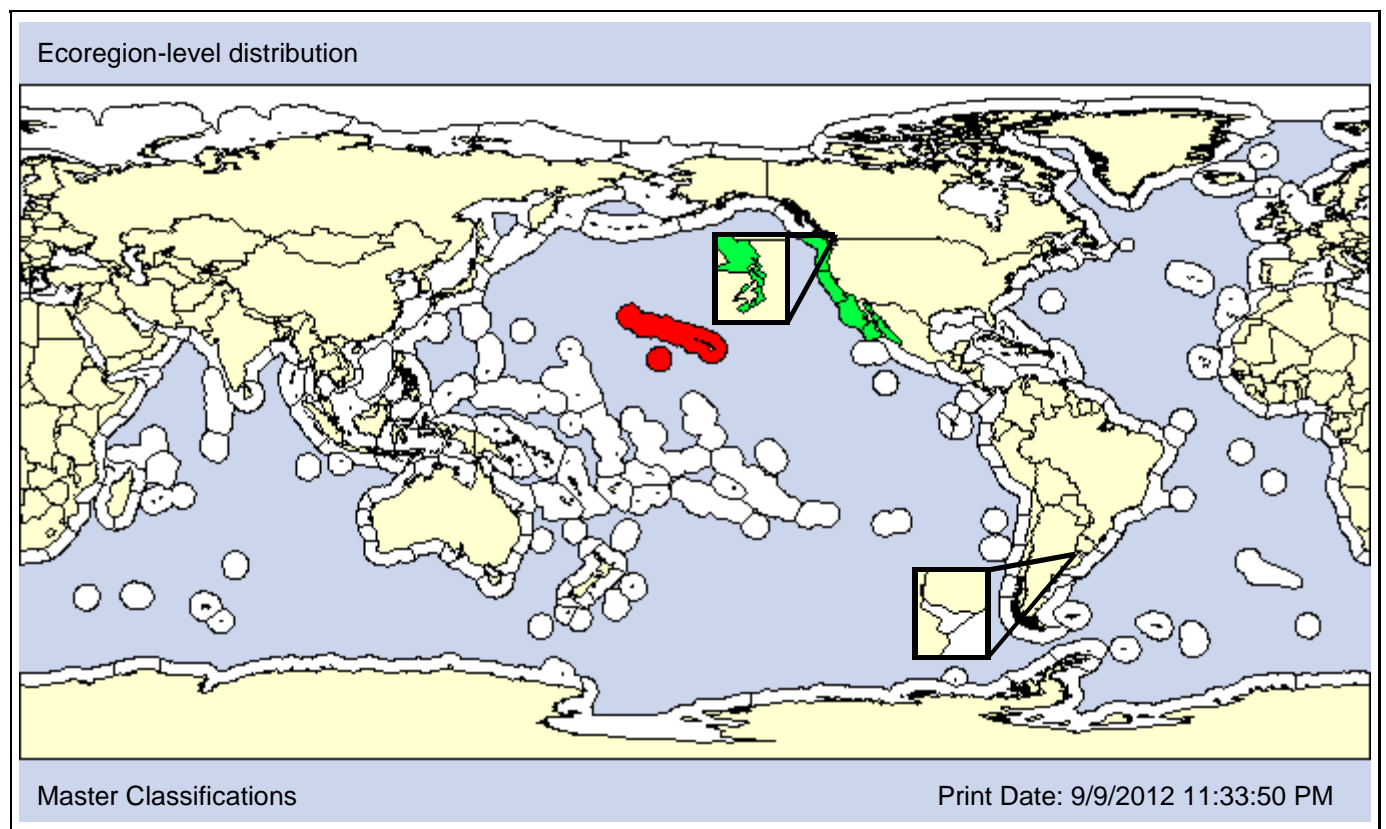
**Also Known As (Name - Type):**

Ulva fasciata f. expansa	Synonym

**Common Names:**

limu pakaiea sea lettuce ( <i>Ulva expansa</i> )

**Type Locality:** Monterey, California



Native   
  Nonindigenous   
  NIS Not Established   
  Cryptogenic   
  Transient   
  Unclassified   
  Conflicting Classification   
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1900      Native

**Loc 1st record:** Oahu, Hawaii      Native

**Established:** Yes      Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: *Ulva expansa* breaks free and forms drifting mats, though Carlton and Eldredge (2009) argue that drift is insufficient to explain its appearance in Hawaii. The deep records for this species are for mats that have sunk.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
	<b>X</b>												

**DEPTH [Obs: 0 - 200m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>				<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 15 - 35psu] [Pref: 25 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
	<b>X</b>		BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Green alga

**Taxonomic Author:** Linnaeus, 1753

**Kingdom:** Plantae

**Subkingdom:** Viridiaeplantae

**Phylum:** Chlorophyta

**Subphylum:**

**Superclass:**

**Class:** Ulvophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ulvales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ulvaceae

**Subfamily:**

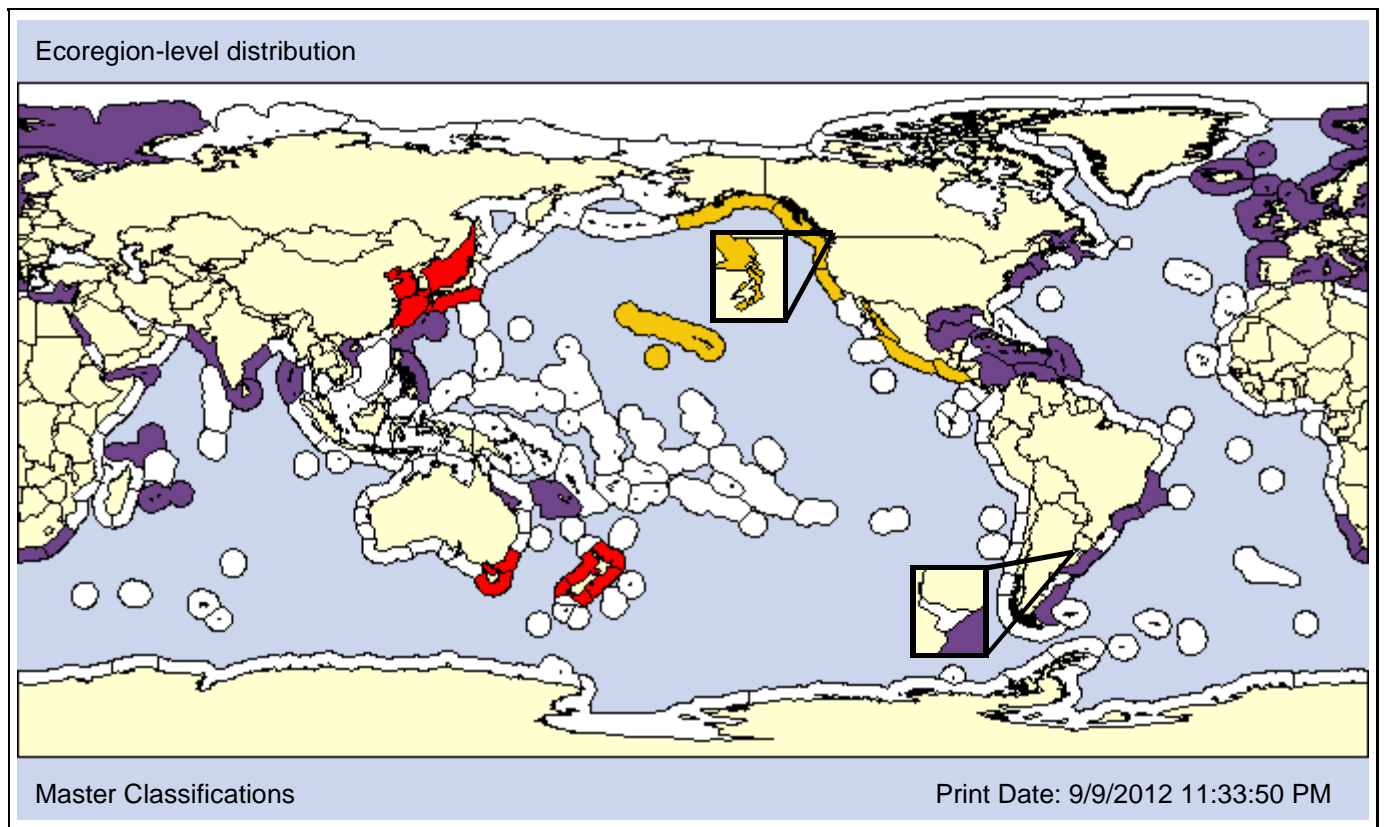
**Also Known As (Name - Type):**

Ulva crassa	Synonym
Ulva fasciata	Synonym
Ulva fenestrata	Synonym
Ulva stipitata	Synonym

**Common Names:**

limu palahalaha  
lipahapaha  
sea lettuce (*Ulva lactuca*)

**Type Locality:** Atlantic Ocean, west of Sweden, Northern Europe



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>		<b>NEP</b>		

**Date 1st record:** 1970s

1819

Unknown

**Loc 1st record:** Seto Island Sea, Japan

Hawaii

Unknown

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
X		X				AO	PO							

Comments: We classify *Ulva lactuca* (=U. fasciata) as introduced in the NWP and New Zealand / S. Australia and cryptogenic in the NEP and Hawaii based on Furota and Nakayama (2010), Heesch et al. (2009), CANOD (2009), and Carlton and Eldredge (2009), respectively. Because of taxonomic uncertainties, we list it as unclassified in other areas.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			<b>O</b>			

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>									<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>	<b>X</b>							



**Taxon:** Green alga

**Taxonomic Author:** Kjellman, 1897

**Kingdom:** Plantae

**Subkingdom:** Viridiaeplantae

**Phylum:** Chlorophyta

**Subphylum:**

**Superclass:**

**Class:** Ulvophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ulvales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ulvaceae

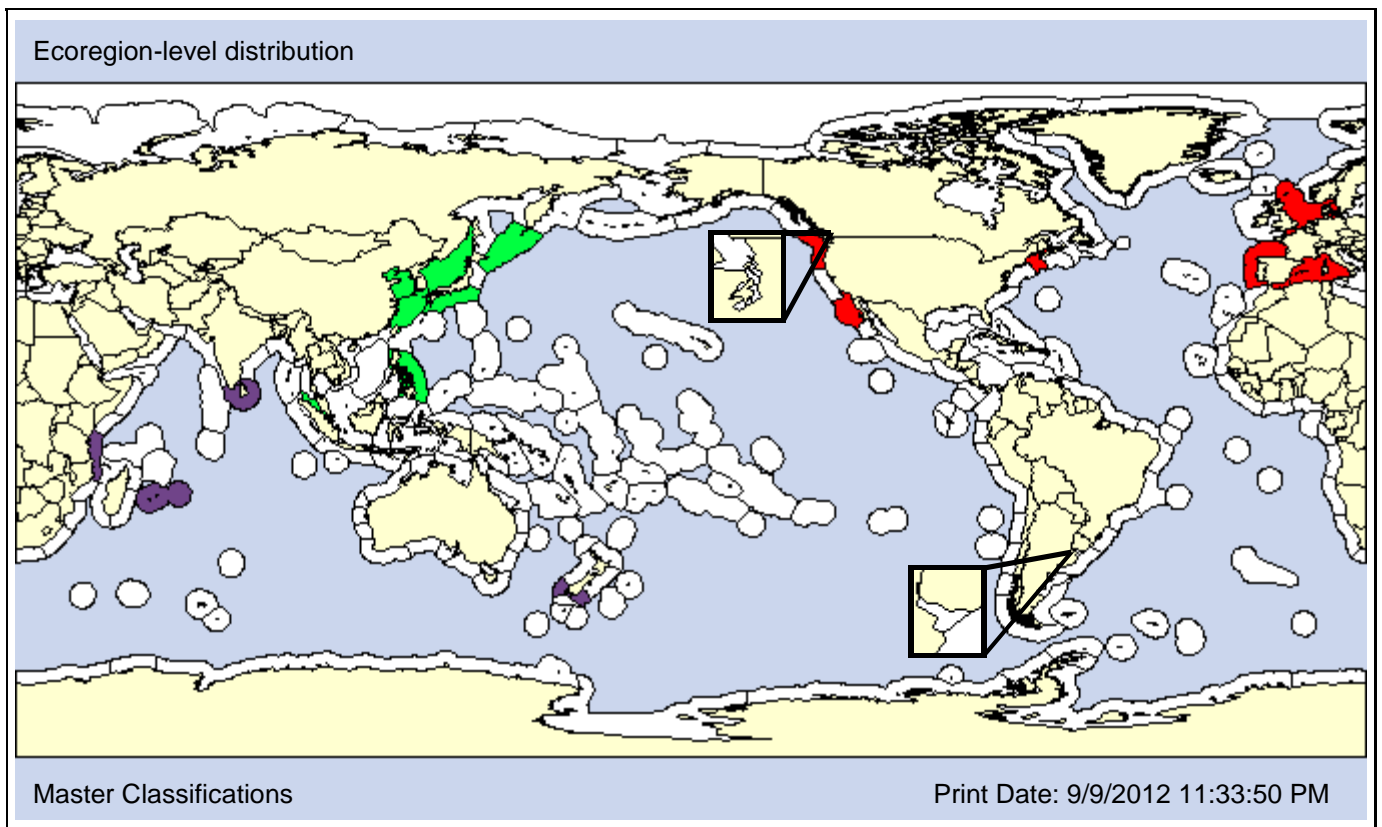
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Ana-awosa  
lacy sea lettuce

**Type Locality:** Hakodate, Yenoshima and Yokohama, Japan (syntype)



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1999

**Loc 1st record:** Native

Southern California

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 4m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>								<b>O</b>		<b>O</b>	

**SALINITY [Obs: 17 - 33psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP X</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Green alga

**Taxonomic Author:** Agardh, 1823

**Kingdom:** Plantae

**Subkingdom:** Viridiaeplantae

**Phylum:** Chlorophyta

**Subphylum:**

**Superclass:**

**Class:** Ulvophyceae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ulvales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ulvaceae

**Subfamily:**

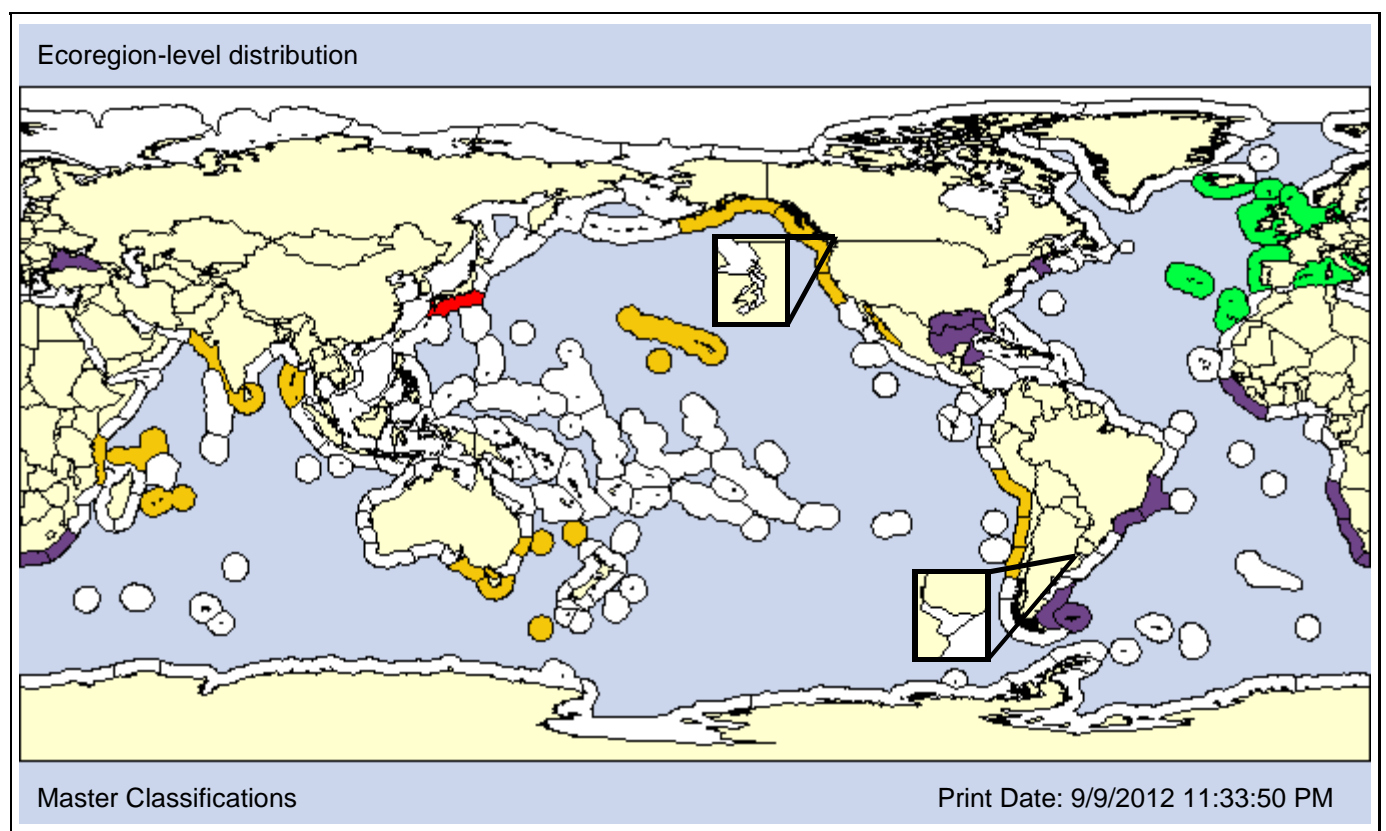
**Also Known As (Name - Type):**

Ulva armoricana	Synonym
Ulva australis	Synonym
Ulva petiolata	Synonym
Ulva scandinavica	Synonym

**Common Names:**

sea lettuce ( <i>Ulva rigida</i> )
------------------------------------

**Type Locality:** Cádiz, Spain



**Date 1st record:** 2003

**Loc 1st record:** Mikawa and Osaka, Japan

**Established:** Yes Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
X		X				AO	PO							

Comments: We assign the NEA as the native region for *Ulva rigida* (= *U. armoricana*; *U. scandinavica*). Furota and Nakayama (2010) classify it as NIS in the NWP; while it is considered cryptogenic in Tasmania (Tasmanian Planning Comm., 2009) and Hawaii (Carlton and Eldredge, 2009). We classify it as cryptogenic in the rest of the Pacific.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
	<b>X</b>		BP	EPS	EPU	EPC							
						<b>X</b>							

Kingdom: Plantae

Subkingdom: Viridaeplantae

Phylum: Magnoliophyta

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**Taxon:** Angiosperms

**Taxonomic Author:** (L.) Link

**Kingdom:** Plantae

**Subkingdom:** Viridaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Liliaanae

**Order:** Poales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Poaceae

**Subfamily:**

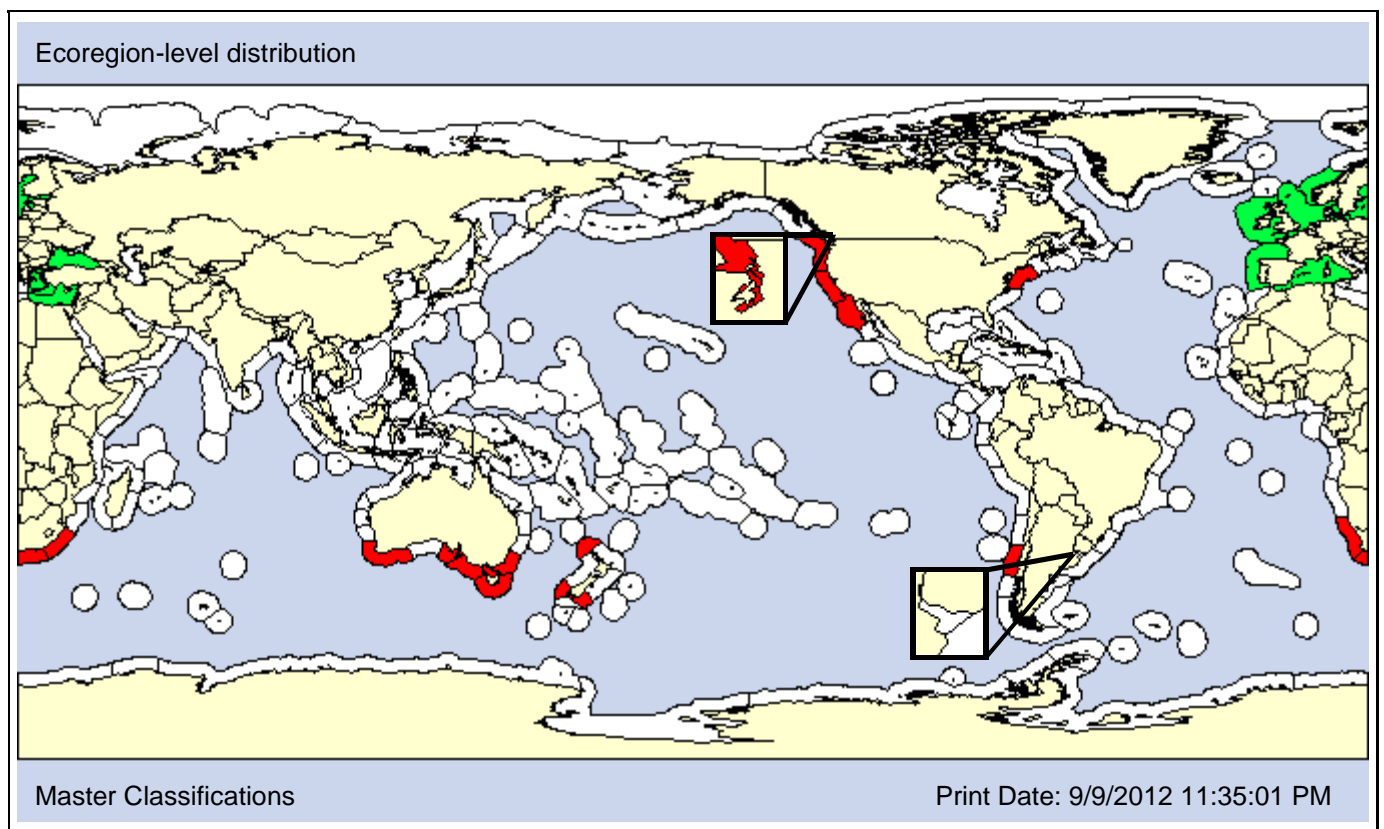
**Also Known As (Name - Type):**

Ammannia coccinea purpurea	Synonym
Ammannia teres	Synonym
Arundo arenaria	Synonym
Calamagrostis arenaria	Synonym

**Common Names:**

European beachgrass

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

late 1800s

**Loc 1st record:**

San Fransico Estuary, CA

**Established:**

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P			X	X
						AO	PO								

Comments: *Ammophila arenaria*, the European dune grass, was introduced into California to stabilize coastal dunes in the 1800s. It has now spread from southern California up to British Columbia, outcompeting native plants and reducing habitat for the threatened Western Snowy Plover.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
					<b>P</b>			

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB				<b>X</b>	TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>P</b>			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE** **X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 1 - psu]**

<b>Fresh</b>	<b>Brackish</b> <b>O</b>						<b>Marine</b> <b>O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b> <b>X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P			<b>X</b>	
						<b>X</b>				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P		<b>X</b>	

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b> <b>X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								



**Taxon:** Angiosperms

**Taxonomic Author:** (Loureiro, 1790) Poiret, 1816

**Kingdom:** Plantae

**Subkingdom:** Viridaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Rosanae

**Order:** Malpighiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Rhizophoraceae

**Subfamily:**

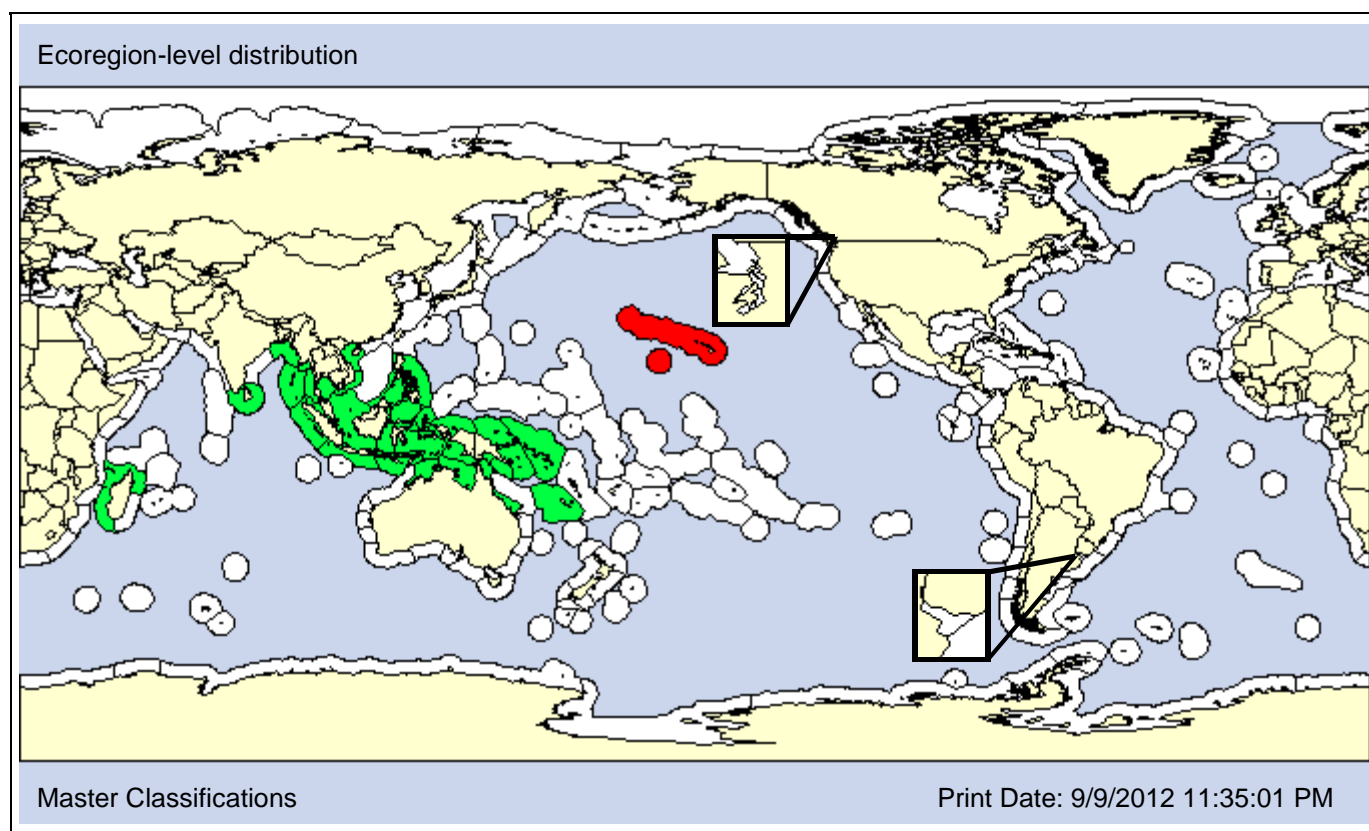
**Also Known As (Name - Type):**

Bruguiera gymnorrhiza of Hawaiian authors	Misidentified
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**Common Names:**

Oriental mangrove upriver orange mangrove
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1922  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P			X	
						AO	PO								

Comments: The mangrove, *Bruguiera sexangula*, was introduced into Hawaii from the Philippines in 1922 in an effort to reclaim mudflats (Carlton and Eldredge, 2009). In China, it is limited to the Hainan Island, where it is uncommon (IUCN, 2010).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

Unconsolidated <b>X</b>						Consolidated						Pelagic	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE **X****

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

R	HP	Biogenic								Artificial Substrate				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 3.26 - 35psu] [Pref: - 15psu]**

Fresh	Brackish <b>P</b>						Marine <b>O</b>		Hyper
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
		<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

Sexual <b>X</b>						Asexual				
H <b>X</b>		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
						<b>X</b>				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
<b>X</b>			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic <b>X</b>							Epibiotic			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Angiosperms

**Taxonomic Author:** Linnaeus, 1753

**Kingdom:** Plantae

**Subkingdom:** Viridaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Rosanae

**Order:** Myrtales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Combretaceae

**Subfamily:**

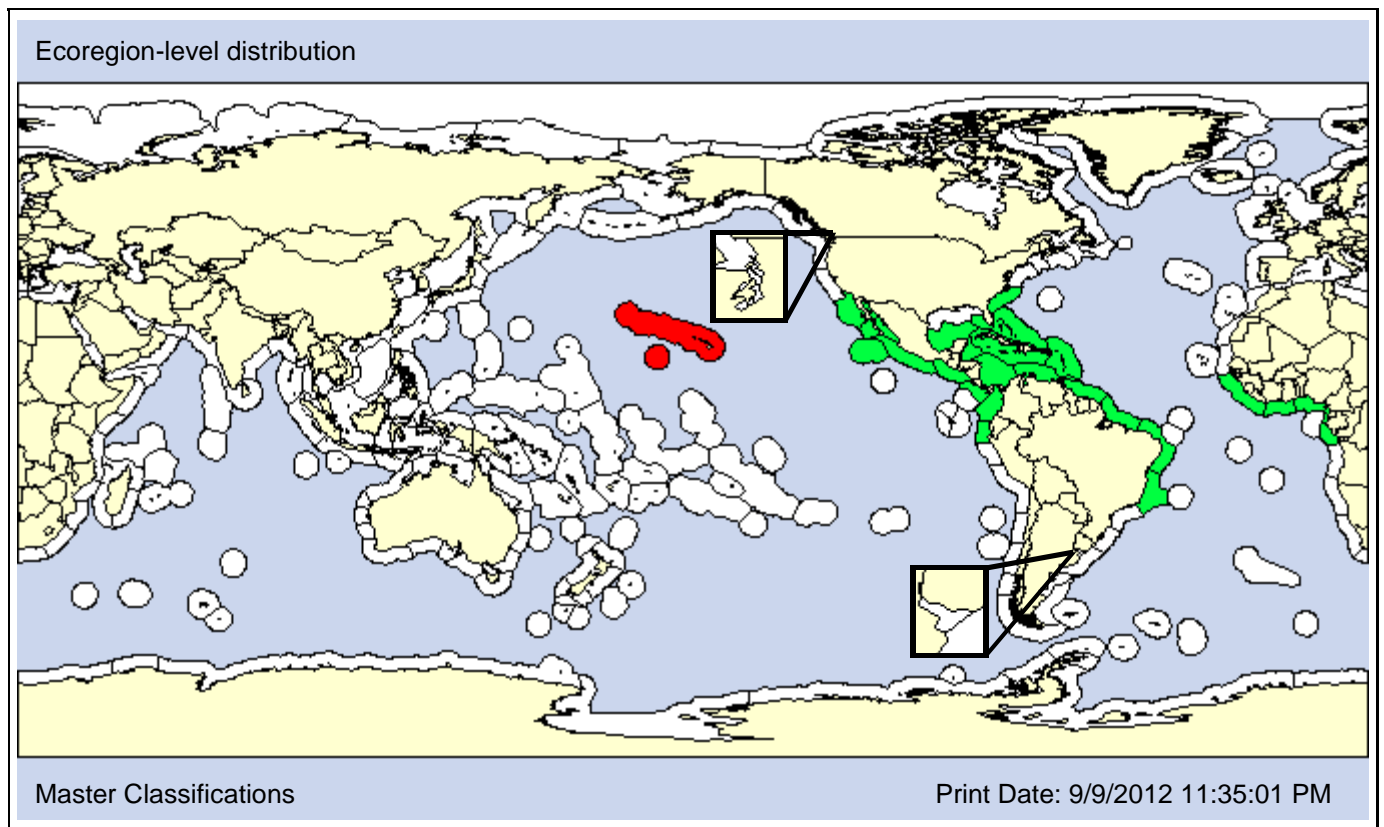
**Also Known As (Name - Type):**

Conocarpus erectus sericeus	Convention
Conocarpus procumbens	Synonym
Conocarpus sericeus	Synonym
Conocarpus supinus	Synonym

**Common Names:**

buttonwood
sea mulberry

**Type Locality:**



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

<1910

Native

**Loc 1st record:**

Oahu, Hawaii

Native

**Established:**

Yes

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				
						AO	PO			X				

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O				O			

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			X		TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
O	O	P	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline P		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
				P	P				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		X							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
						X				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
X			X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Angiosperms

**Taxonomic Author:** Ostenfeld, 1902

**Kingdom:** Plantae

**Subkingdom:** Viridaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Liliaanae

**Order:** Alismatales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Hydrocharitaceae

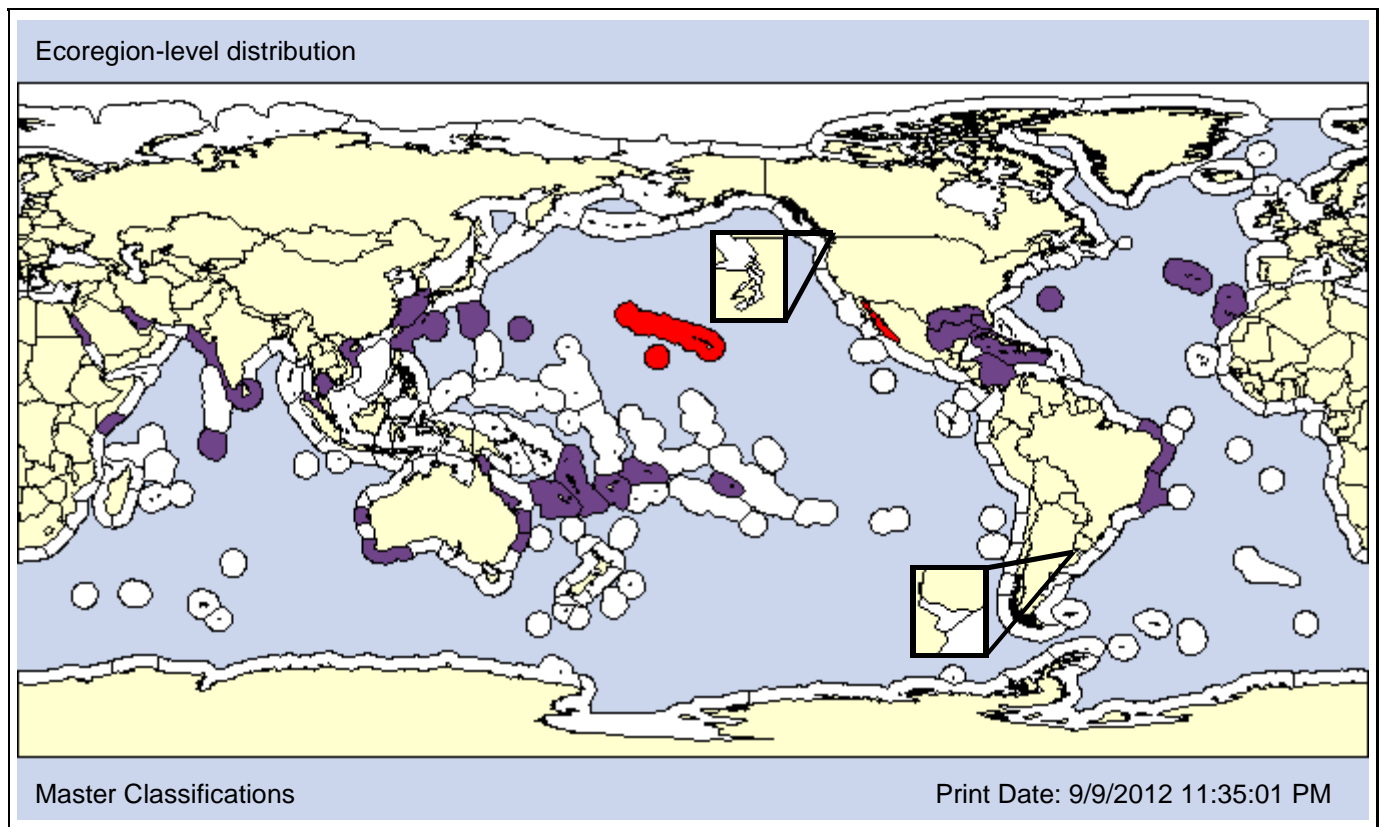
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Caribbean seagrass  
paddle grass

**Type Locality:** Koh Kahdat, Gulf of Thailand, Thailand



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b>	1979	1999
<b>Loc 1st record:</b>	Kaneohe Bay, Hawaii	Costa Baja, Mexico
<b>Established:</b>	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>	<b>X</b>					AO	PO								

Comments: The native range of *Halophila decipiens* appears to be the Indo-Pacific and/or the Caribbean. It has recently been found in the Gulf of California (Santamaría-Gallegos et al., 2006), which we tentatively classify as introduced. It appears that this species may be expanding its range due to climate change or human transport.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					

**DEPTH [Obs: 0 - 100m] [Pref: 5 - 30m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 24 - 39psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
						<b>X</b>				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P		<b>X</b>	

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Angiosperms

**Taxonomic Author:** R. Br.

**Kingdom:** Plantae

**Subkingdom:** Viridaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Asteranae

**Order:** Lamiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Scrophulariaceae

**Subfamily:**

**Also Known As (Name - Type):**

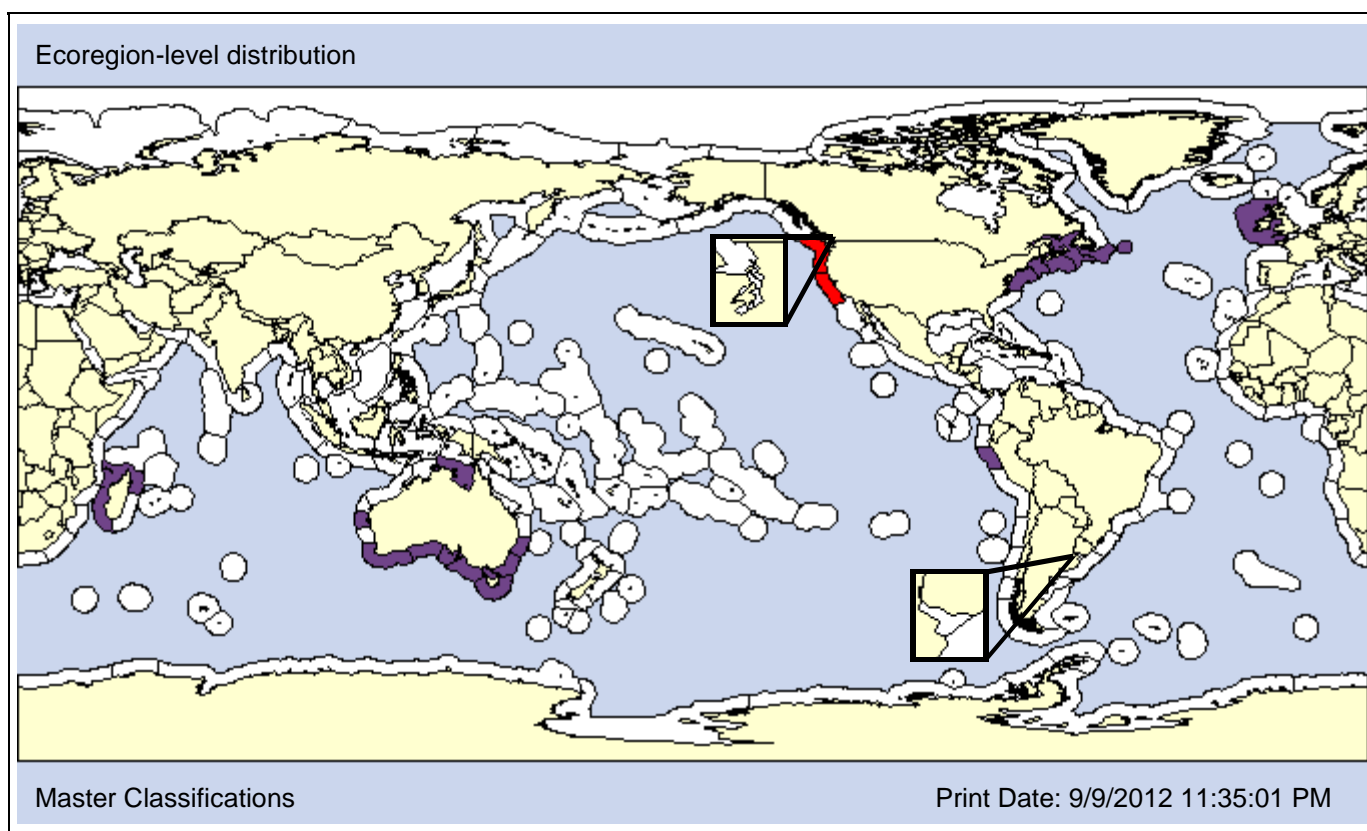
Limosella aquatica var. tenuifolia  
Limosella subulata

Synonym  
Synonym

**Common Names:**

awl-leaved mudwort  
delta mudwort  
Welsh mudwort

**Type Locality:**



**Date 1st record:**

<1944

**Loc 1st record:**

Unknown

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				X
	X					AO	PO								

Comments: The herbaceous *Limosella australis* occurs in the mid to lower intertidal zone of freshwater and brackish tide flats. As *L. subulata* it was considered native in the NWA and/or NEA; however *L. australis* is considered native to Australia and/or the east and west coasts of the U.S. We classify as introduced in the NEP and unclassified elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>												

**DEPTH [Obs: 0 - 0.03m] [Pref: 0 - 0.05m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>						

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
						<b>X</b>				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P		<b>X</b>	

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								



**Taxon:** Angiosperms

**Taxonomic Author:** (Linnaeus 1753)

**Kingdom:** Plantae

**Subkingdom:** Viridaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Rosanae

**Order:** Malpighiales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Rhizophoraceae

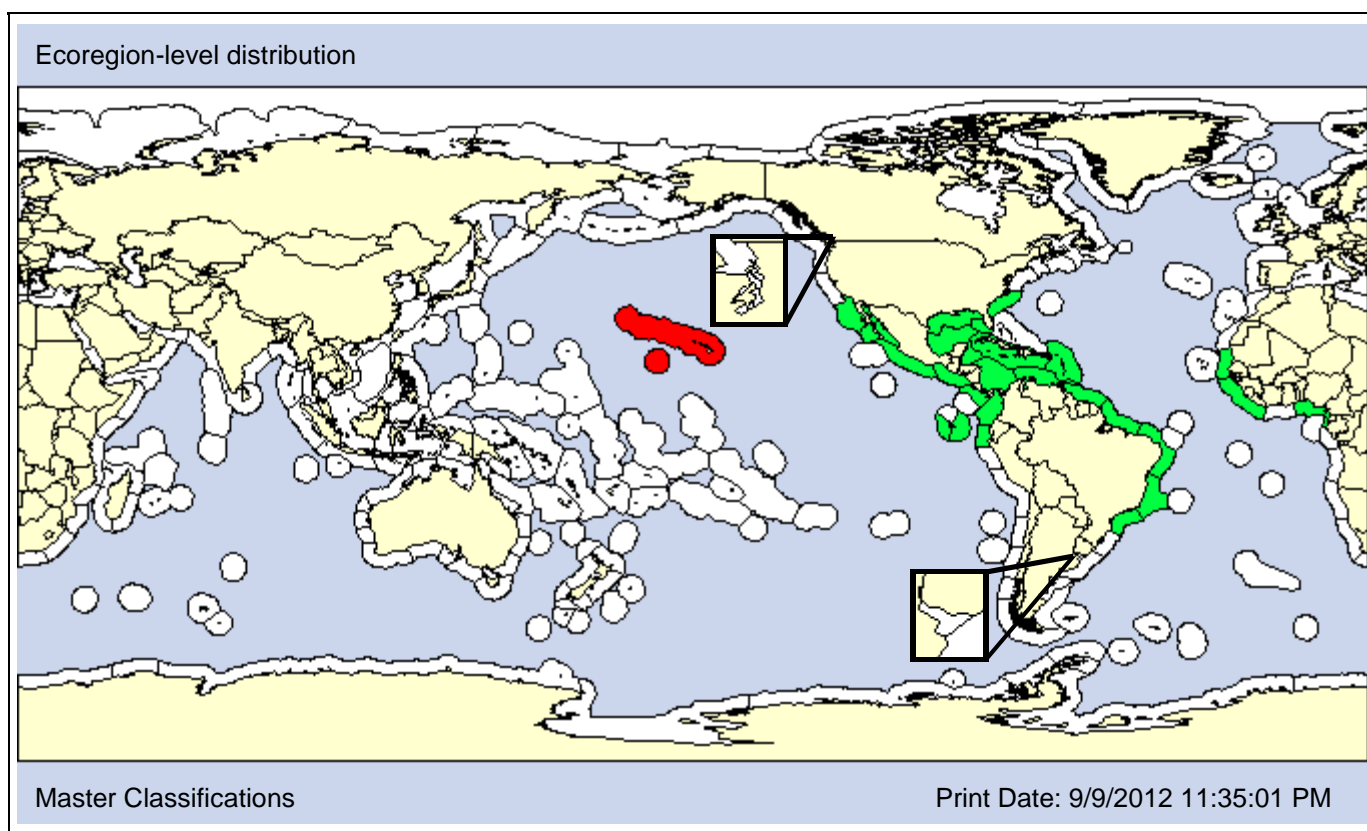
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

American mangrove  
red mangrove

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1902  
**Loc 1st record:** Molokai and Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P			X	X
						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 90psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
						<b>X</b>				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
<b>X</b>			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Angiosperms

**Taxonomic Author:** Loiseleur-Deslongchamps, 1807

**Kingdom:** Plantae

**Subkingdom:** Viridaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Lilianae

**Order:** Poales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Poaceae

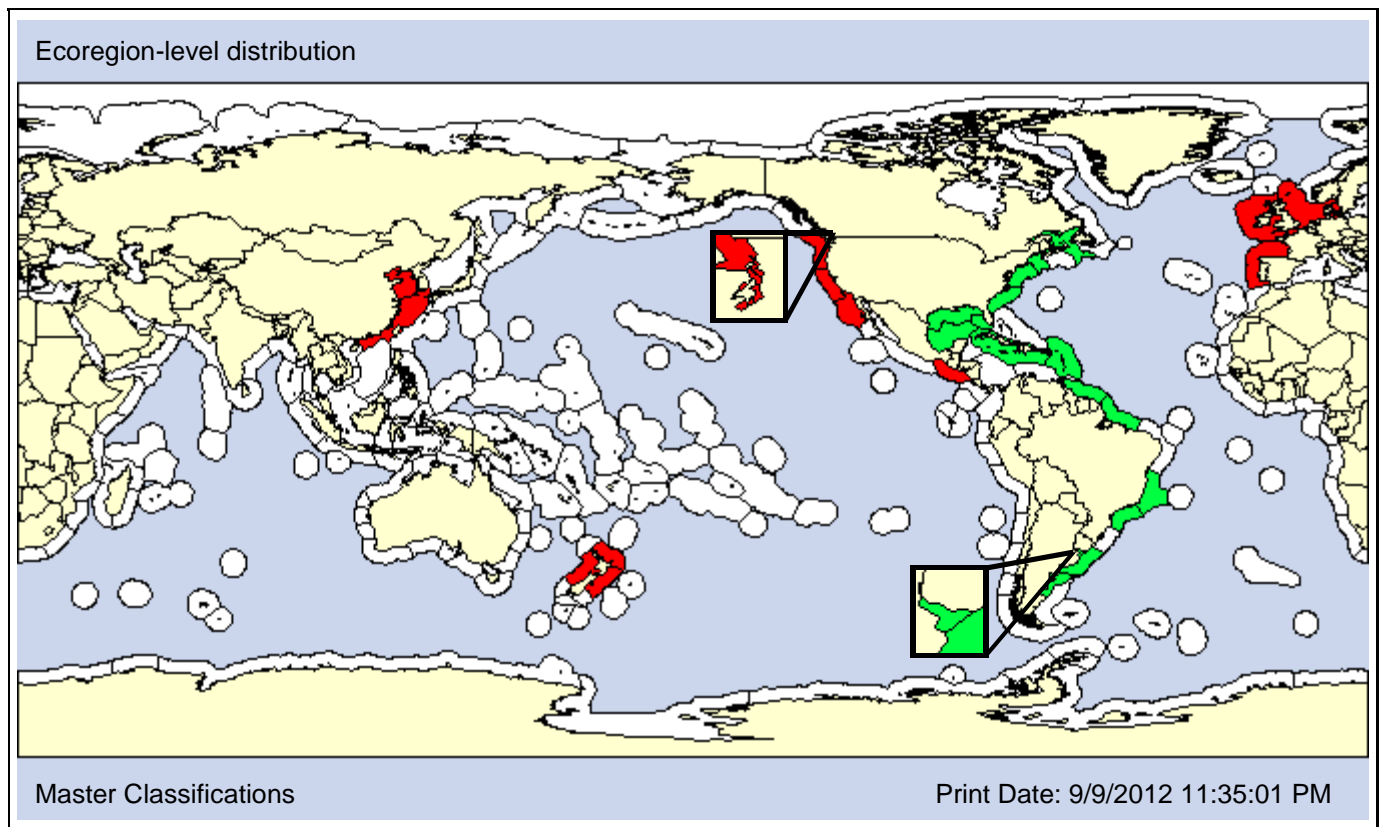
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

salt-water cordgrass  
smooth cordgrass

**Type Locality:** Bayonne, France



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1979

1941

**Loc 1st record:** Jiangsu, China

Willapa Bay, Washington

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			IR	A				
	<b>X</b>				AO	PO	<b>X</b>							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 10 - 50psu] [Pref: 10 - 20psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline P		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>P</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P			<b>X</b>	
						<b>X</b>				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P		<b>X</b>	

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Angiosperms

**Taxonomic Author:** Hubbard, 1968

**Kingdom:** Plantae

**Subkingdom:** Viridaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Liliales

**Order:** Poales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Poaceae

**Subfamily:**

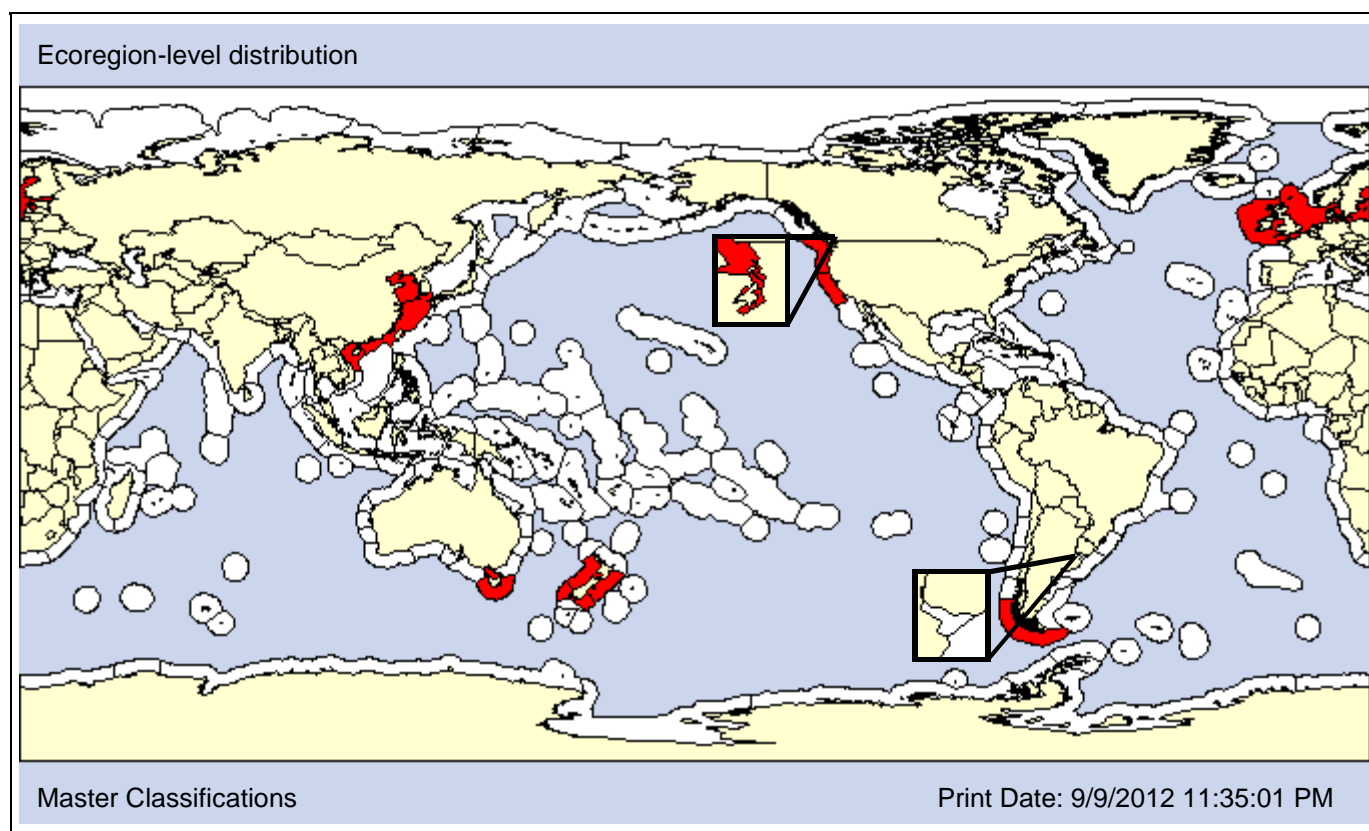
**Also Known As (Name - Type):**

Spartina anglica	Synonym
Spartina townsendii var. anglica	Synonym

**Common Names:**

English cordgrass (hybrid)
----------------------------

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1963

1961-1962

**Loc 1st record:** Jiangsu, China

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P			X	
						AO	PO	X						

Comments: *Spartina anglica* is a fertile hybrid from England where it resulted from the inter-breeding of the native *S. maritima* and introduced *Spartina alterniflora*. It is considered as a NIS everywhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>		<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 5 - 40psu] [Pref: 5 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline P		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P			<b>X</b>	
						<b>X</b>				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P		<b>X</b>	

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Angiosperms

**Taxonomic Author:** Brongniart, 1829

**Kingdom:** Plantae

**Subkingdom:** Viridaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Liliales

**Order:** Poales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Poaceae

**Subfamily:**

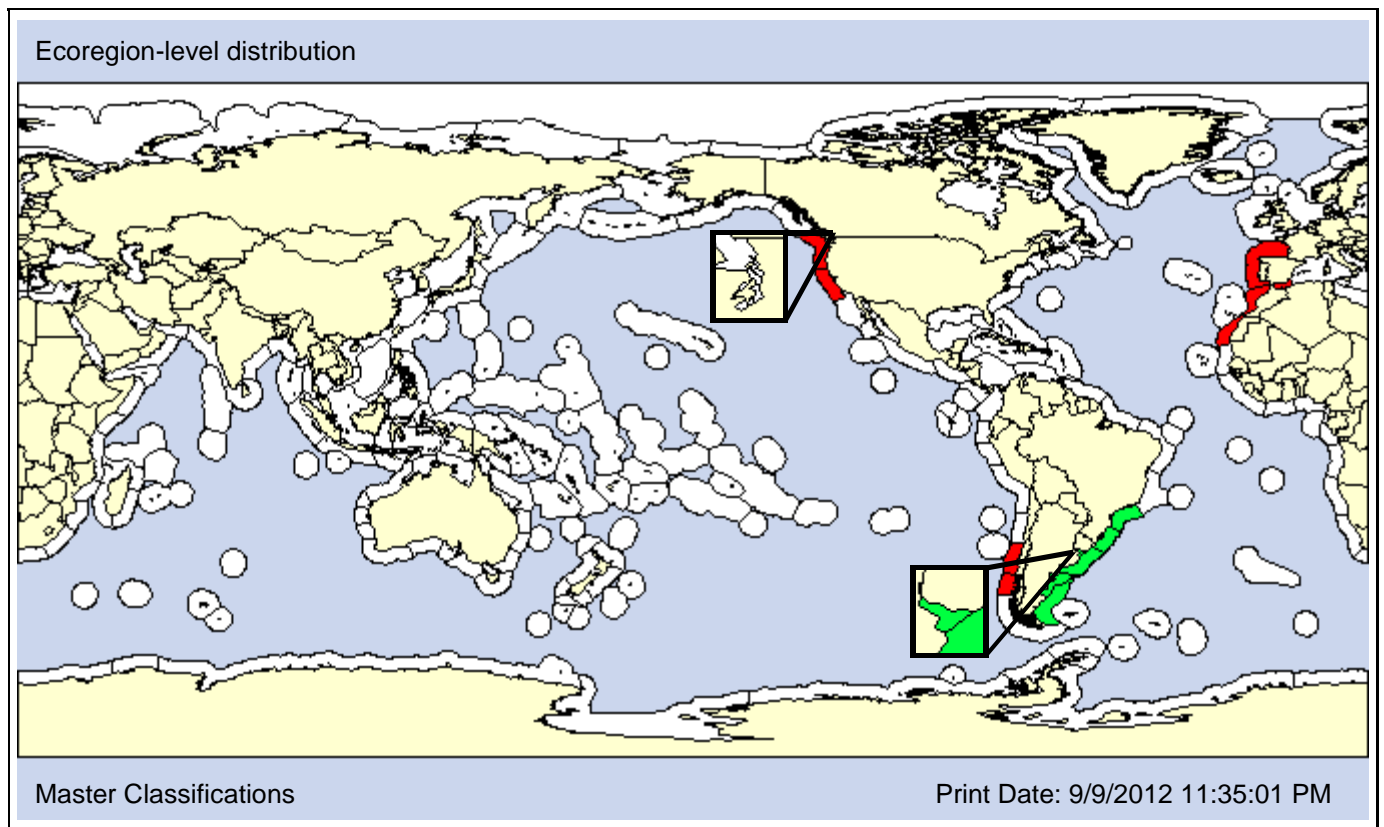
**Also Known As (Name - Type):**

Chauvinia chilensis	Synonym
Spartina montevidensis	Synonym
Spartina patagonica	Synonym

**Common Names:**

dense-flowered cordgrass
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**Type Locality:** Concepcion, Chile



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed black; padding: 2px;"> </span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: cyan;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;"> </span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:**

1850s

**Loc 1st record:**

Humboldt Bay, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			IR	A				
	<b>X</b>				AO	PO	<b>X</b>							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>	<b>O</b>		<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0.5 - 40psu] [Pref: 0.5 - 20psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P			<b>X</b>	

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P		<b>X</b>	

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							



**Taxon:** Angiosperms

**Taxonomic Author:** (Aiton, 1789) Muhlenberg

**Kingdom:** Plantae

**Subkingdom:** Viridiaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Liliales

**Order:** Poales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Poaceae

**Subfamily:**

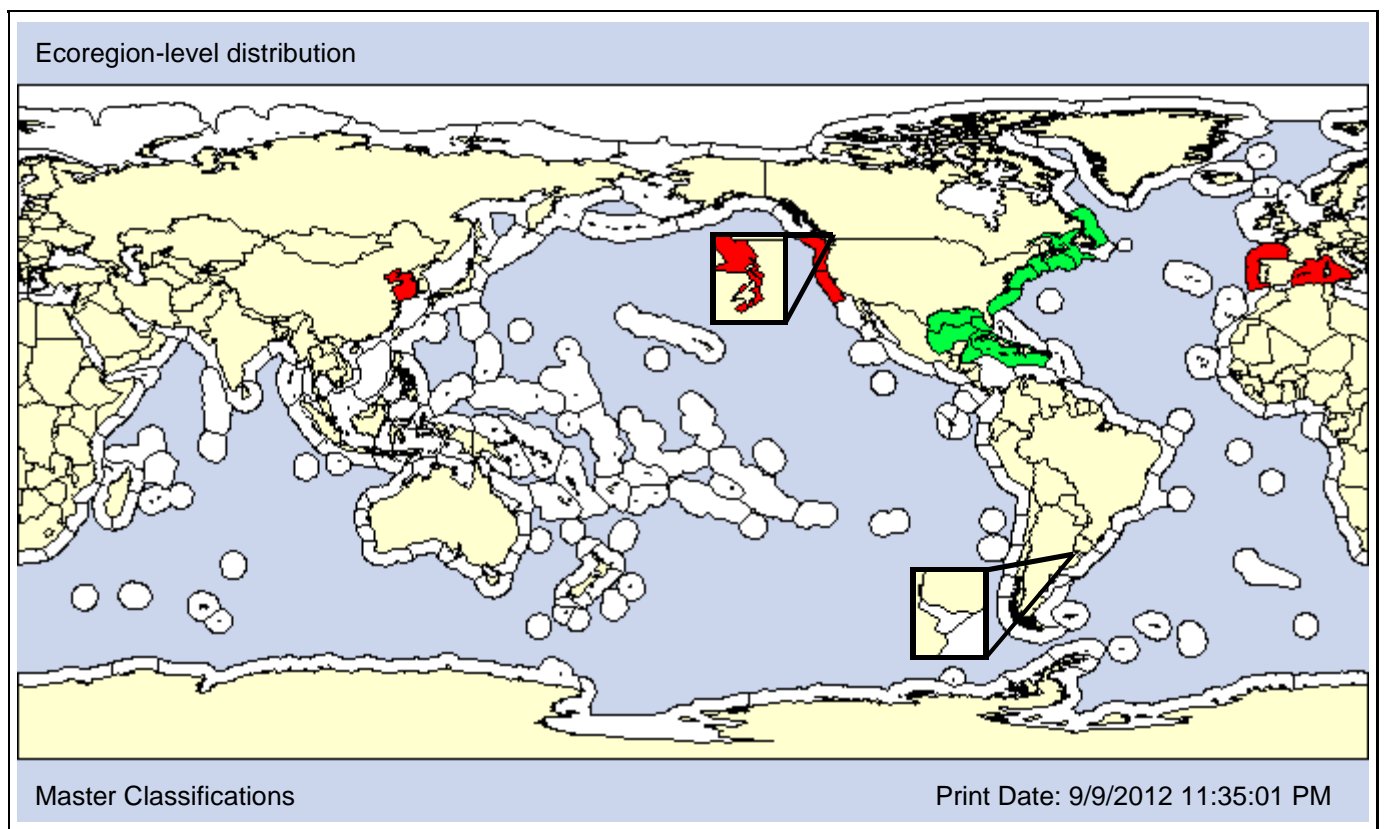
**Also Known As (Name - Type):**

Dactylis patens	Synonym

**Common Names:**

salt grass
salt hay
saltmeadow cordgrass
yerba de sal

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1977

1930

**Loc 1st record:** China

Siuslaw River, Oregon

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P		X	X	
						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>		<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 93psu] [Pref: 0 - 27psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P			<b>X</b>	

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P		<b>X</b>	

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Angiosperms

**Taxonomic Author:** Ascherson & Graebner, 1907

**Kingdom:** Plantae

**Subkingdom:** Viridaeplantae

**Phylum:** Magnoliophyta

**Subphylum:**

**Superclass:**

**Class:** Equisetopsida

**Subclass:** Magnoliidae

**Infraclass:**

**Superorder:** Liliales

**Order:** Alismatales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Zosteraceae

**Subfamily:**

**Also Known As (Name - Type):**

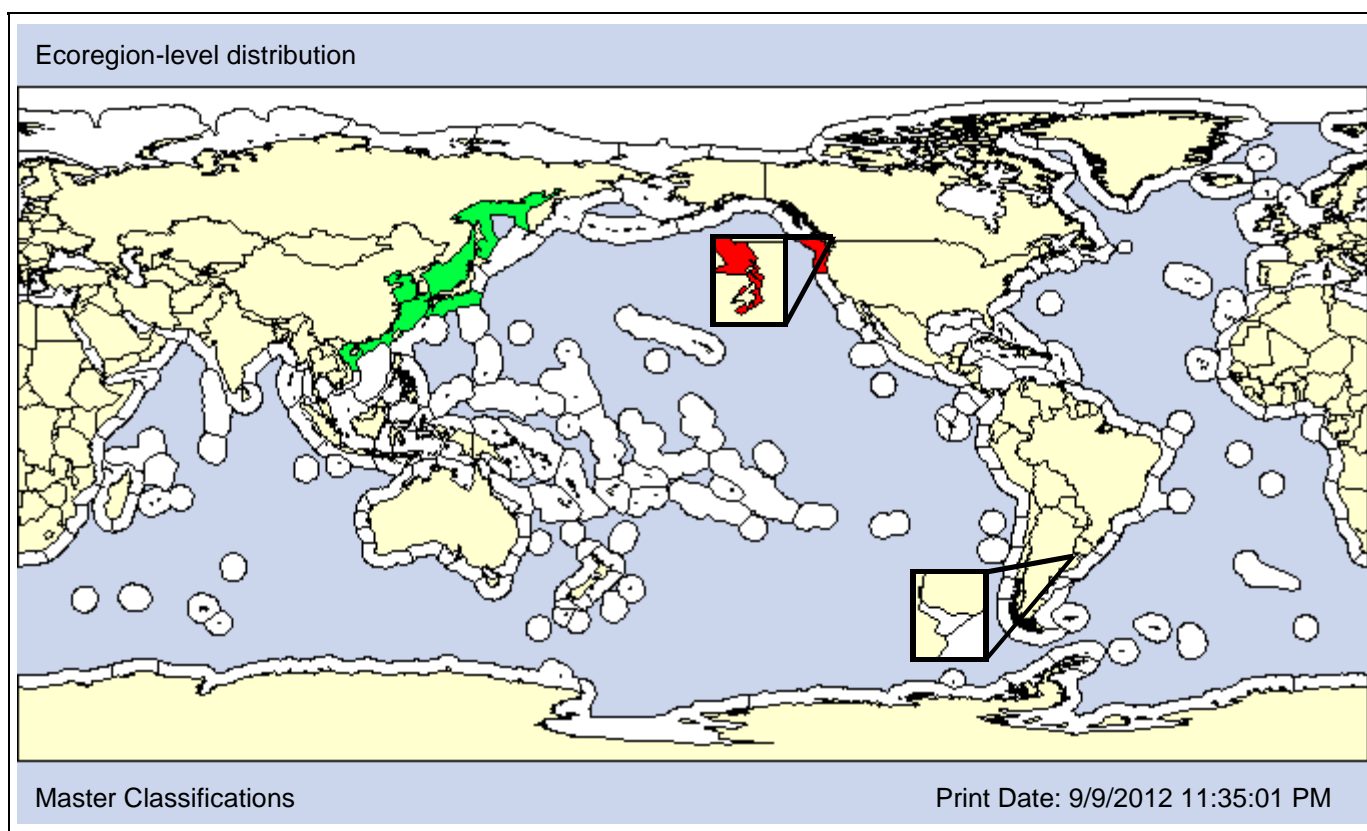
Nanozostera japonica  
 Zostera americana  
 Zostera nana of NEP authors  
 Zyapowca

Synonym  
 Synonym  
 Synonym  
 Misspelling

**Common Names:**

Asian eelgrass  
 duck grass  
 dwarf eelgrass  
 Japanese eelgrass

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Native 1957  
**Loc 1st record:** Native Washington  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X			A	P		X		
						AO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					

**DEPTH [Obs: 0 - 10m] [Pref: 0 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>	<b>O</b>			<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 5 - 33psu] [Pref: 8.2 - 20psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine O</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
			<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
		<b>X</b>							DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P			<b>X</b>	
						<b>X</b>				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P		<b>X</b>	

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

Kingdom: Animalia

Subkingdom: Parazoa

Phylum: Porifera

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**Taxon:** Sponge

**Taxonomic Author:** (Hartman, 1958)

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Haplosclerida

**Suborder:** Haplosclerina

**Infraorder:**

**Superfamily:**

**Family:** Chalinidae

**Subfamily:**

**Also Known As (Name - Type):**

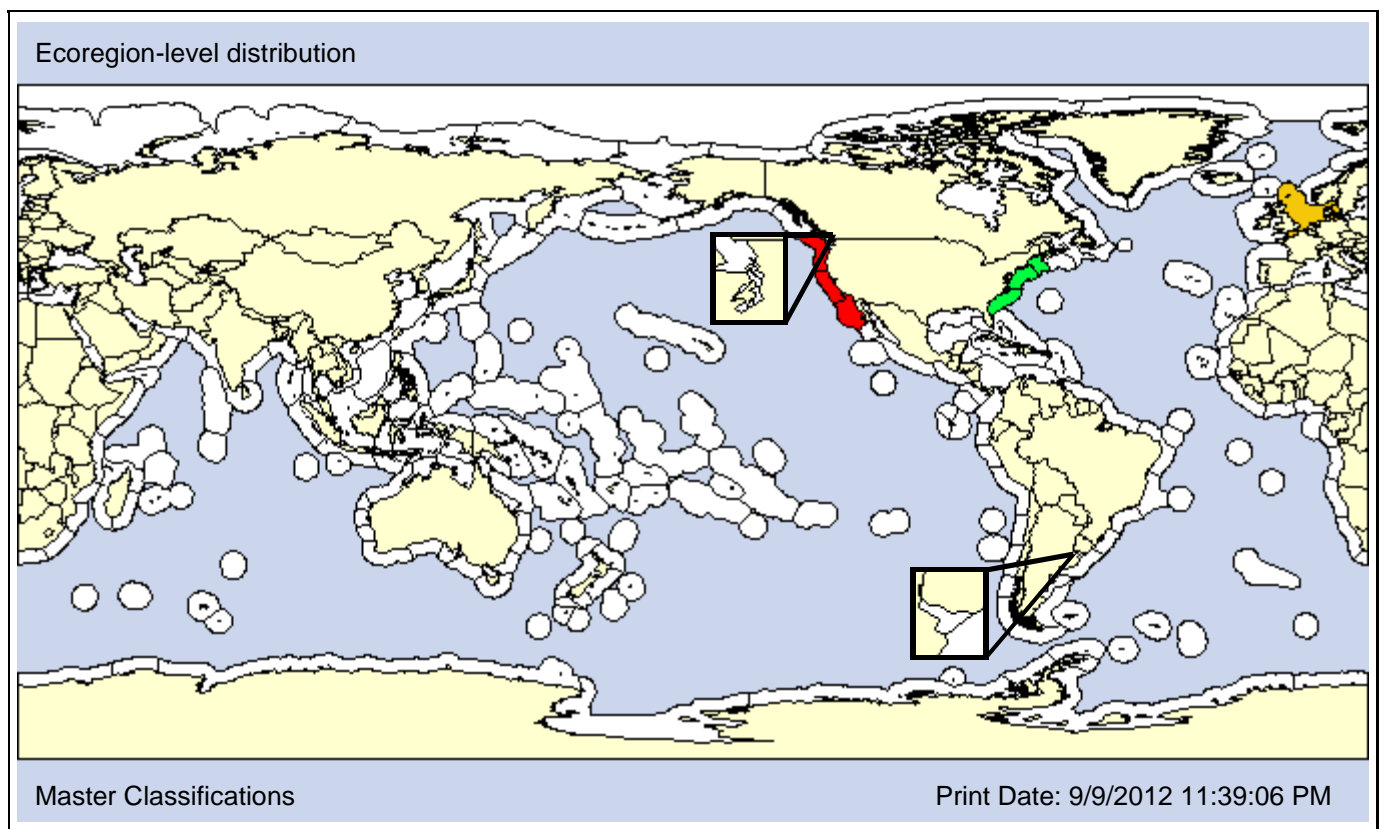
Acervochalina loosanoffi  
 Haliclona ecbasis of Fell, 1970  
 Haliclona loosanoffi  
 Haliclona sp. B of Hartman, 1975

Synonym  
 Misidentified  
 Synonym  
 Synonym

**Common Names:**

Loosanoff's haliclona

**Type Locality:** New England, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1950  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
		<b>X</b>			<b>AO X</b>	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH <b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 4m] [Pref: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>	<b>P</b>								<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 20 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Sponge

**Taxonomic Author:** (Ellis & Solander, 1786)

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Poecilosclerida

**Suborder:** Microcionina

**Infraorder:**

**Superfamily:**

**Family:** Microcionidae

**Subfamily:** Microcioninae

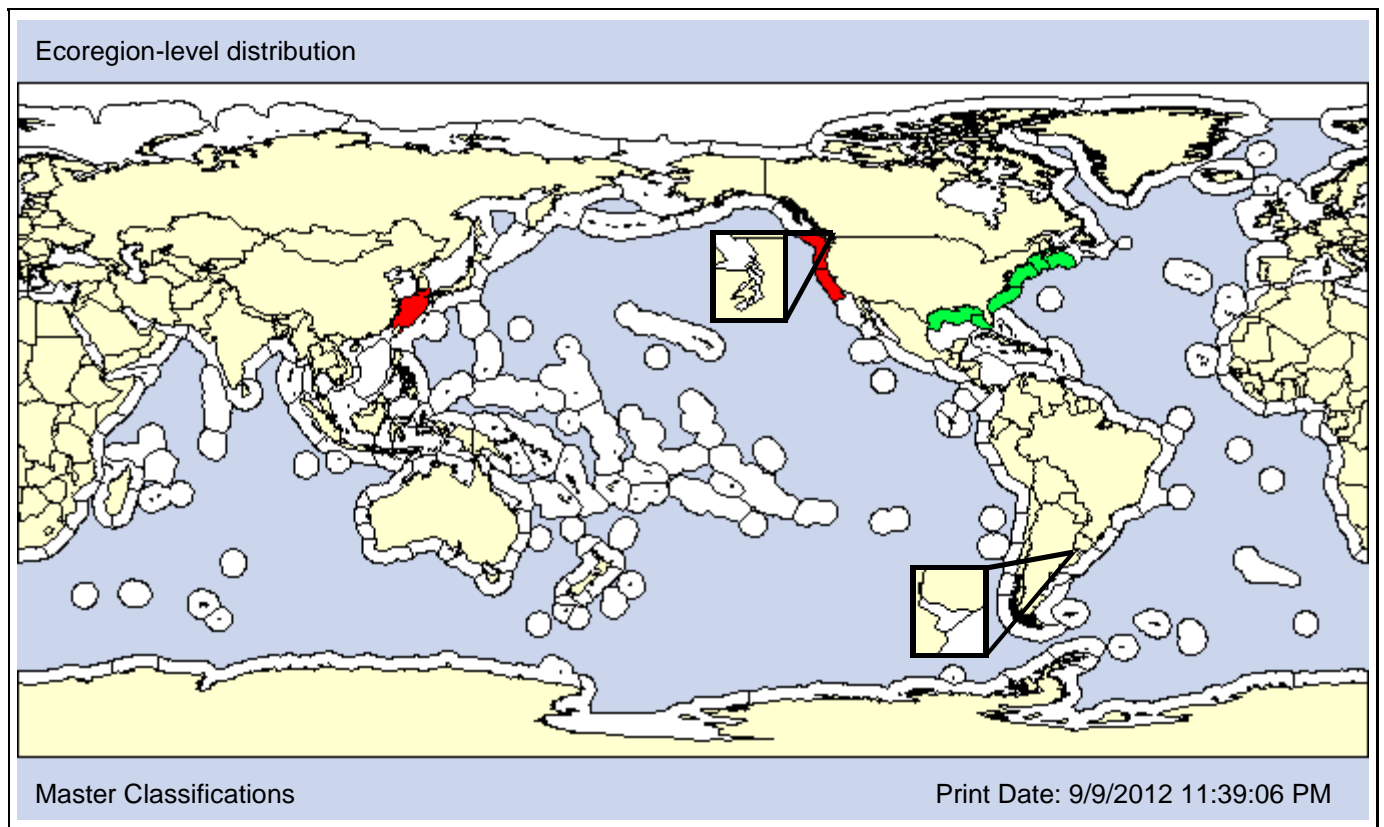
**Also Known As (Name - Type):**

Clathria delicata	Synonym
Microciona prolifera	Synonym
Spongia ostracina	Synonym
Spongia prolifera	Synonym

**Common Names:**

red beard sponge
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**Type Locality:** New Jersey, USA



■ Native  
 ■ Nonindigenous  
   NIS Not Established  
 ■ Cryptogenic  
 ■ Transient  
 ■ Unclassified  
 ■ Conflicting Classification  
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Unknown

1960s  
 San Francisco Estuary, CA  
 Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P				
		<b>X</b>				<b>AO X</b>	PO									

Comments: Zongguo (2001) reported the Atlantic sponge, *Clathria prolifera*, from the East China Sea but no specific locations or dates were given.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 26m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>									<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 15 - 29psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
			<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Sponge

**Taxonomic Author:** Topsent, 1888

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Hadromerida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Clionidae

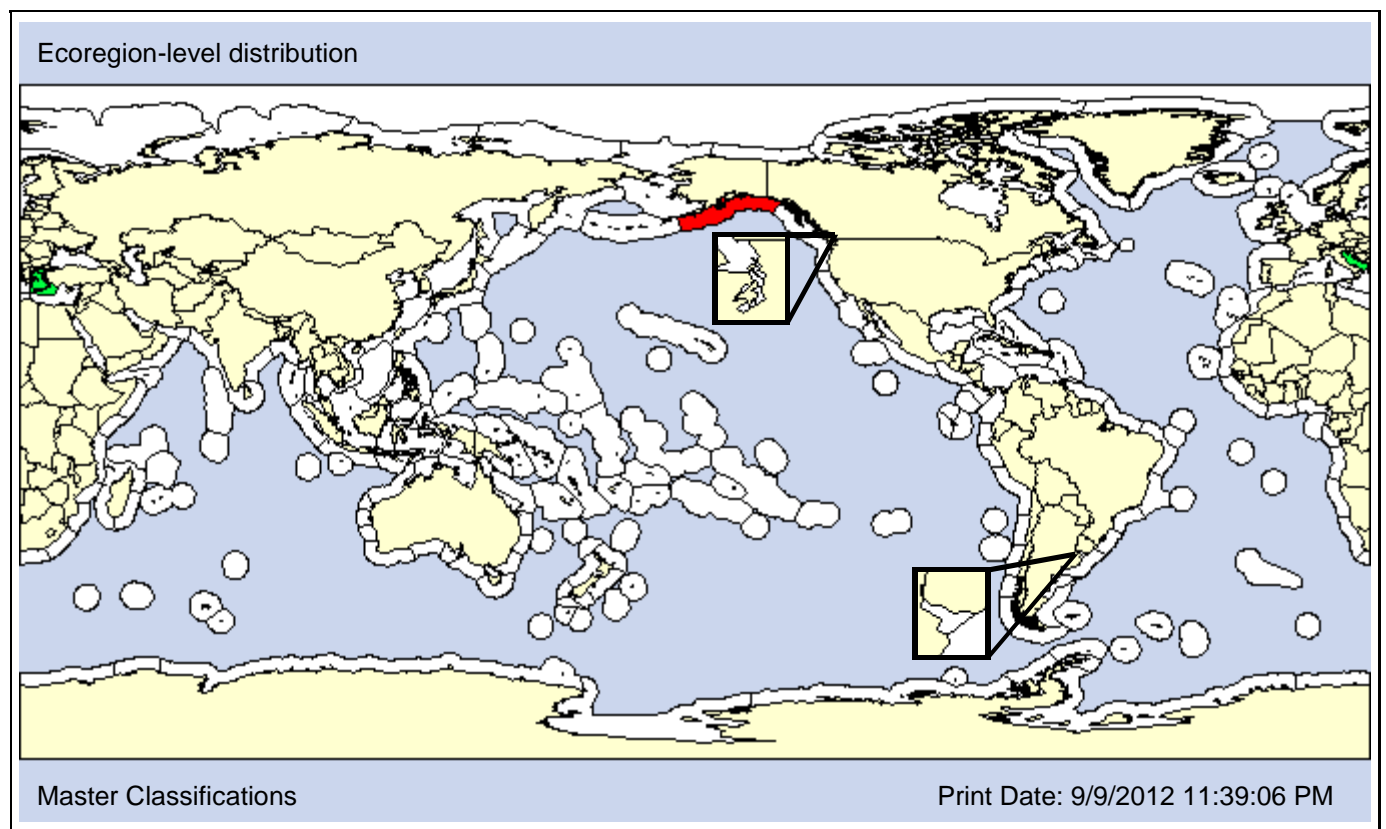
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Cliona cretensis	Synonym	
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**Type Locality:** Mediterranean Sea



**Date 1st record:**

1998

**Loc 1st record:**

Prince William Sound, Alaska

**Established:**

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
						<b>AO X</b>	PO								

Comments: Cliona thoosina is a Mediterranean boring sponge, infesting oysters and other bivalves.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>		<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated <b>X</b></b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		

**DEPTH [Obs: - 20m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE **X****

<b>R</b>	<b>HP</b>	<b>Biogenic <b>P</b></b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>	<b>P</b>										

**SALINITY [Obs: - 37psu] [Pref: - 37psu]**

<b>Fresh</b>	<b>Brackish <b>O</b></b>					<b>Marine <b>O</b></b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>
						<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual <b>X</b></b>						<b>Asexual <b>X</b></b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		
					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP <b>X</b></b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic <b>X</b></b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					

**Taxon:** Sponge

**Taxonomic Author:** (Wilson, 1925)

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Haplosclerida

**Suborder:** Haplosclerina

**Infraorder:**

**Superfamily:**

**Family:** Niphatidae

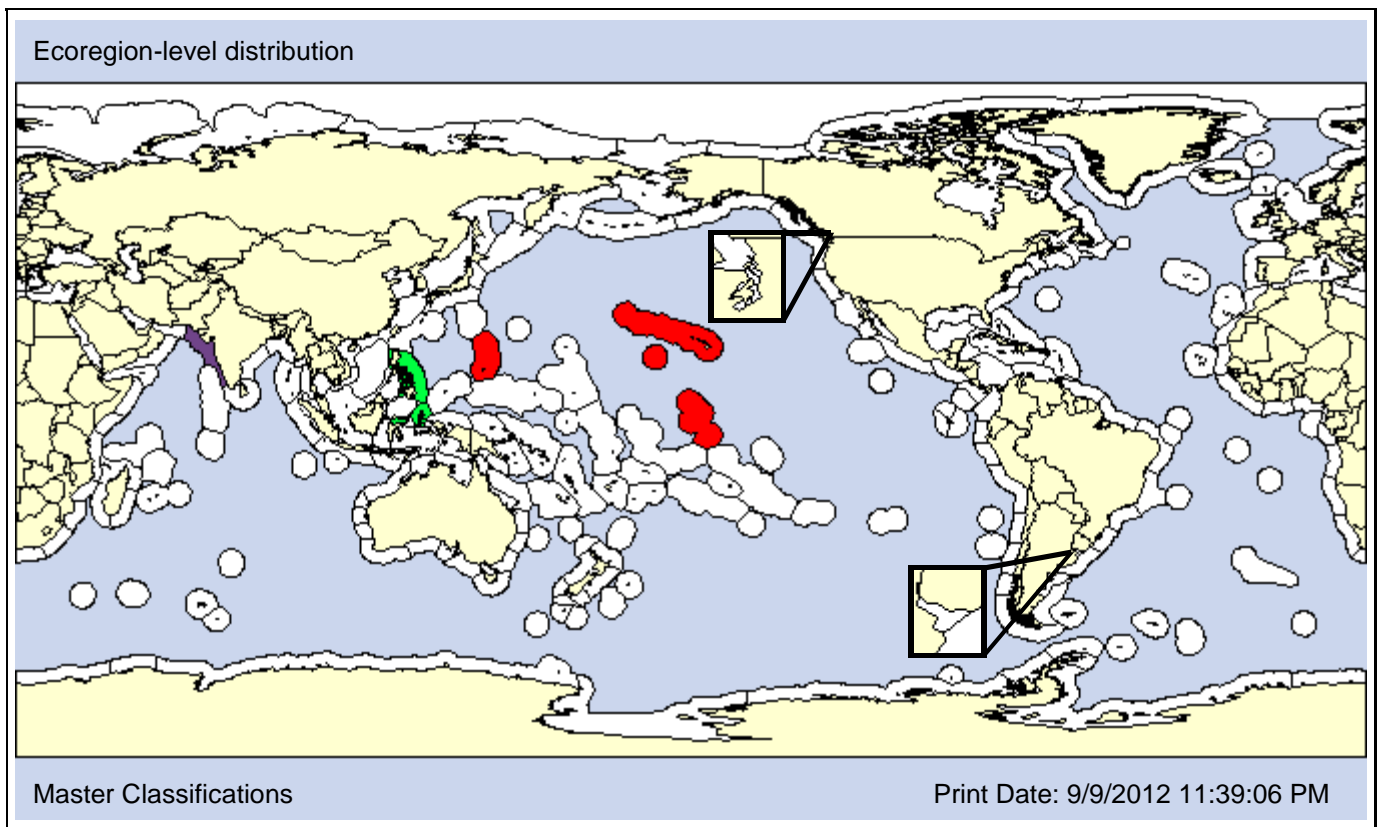
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Gellius fibrosus	Synonym	gray encrusting sponge
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1996  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF	<b>X</b>	S/R	AE	<b>AA</b>		IR		A	P				
		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		<b>X</b>		<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>										<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Sponge

**Taxonomic Author:** Burton, 1930

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Halichondrida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Halichondriidae

**Subfamily:**

**Also Known As (Name - Type):**

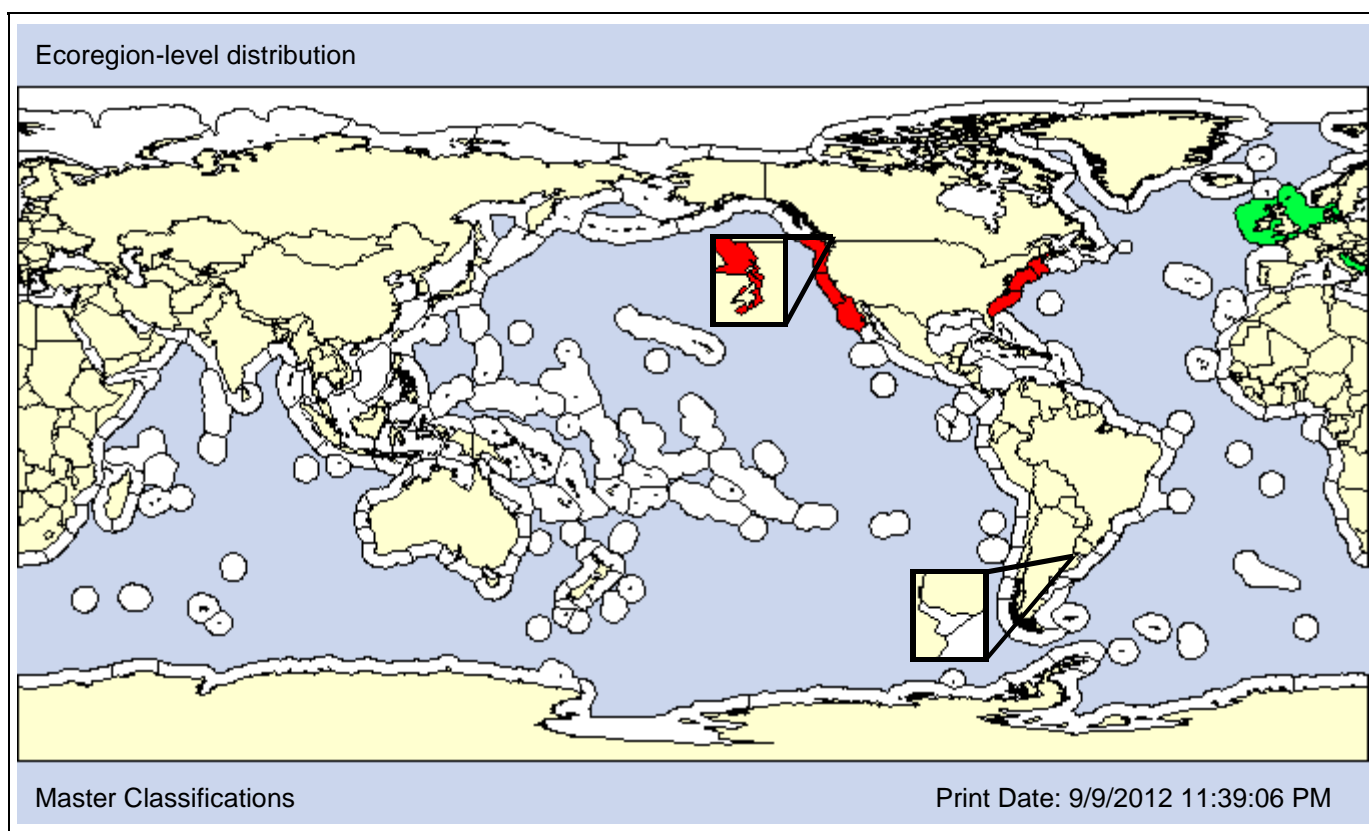
Halichondria (Halichondria) bowerbanki  
 Halichondria bowerbanki var. stellifera  
 Halichondria bowerbankia  
 Halichondria coalita

Convention  
 Synonym  
 Convention  
 Synonym

**Common Names:**

Bowerbank's halichondria  
 bread of crumb sponge  
 crumb-of-bread sponge (Halichondria bowerbanki)

**Type Locality:** Plymouth, England



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

**Date 1st record:** 1950s  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
		<b>X</b>				<b>AO X</b>	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 90m] [Pref: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>									<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: - 25psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Sponge

**Taxonomic Author:** Berquist, 1967

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Halichondrida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Halichondriidae

**Subfamily:**

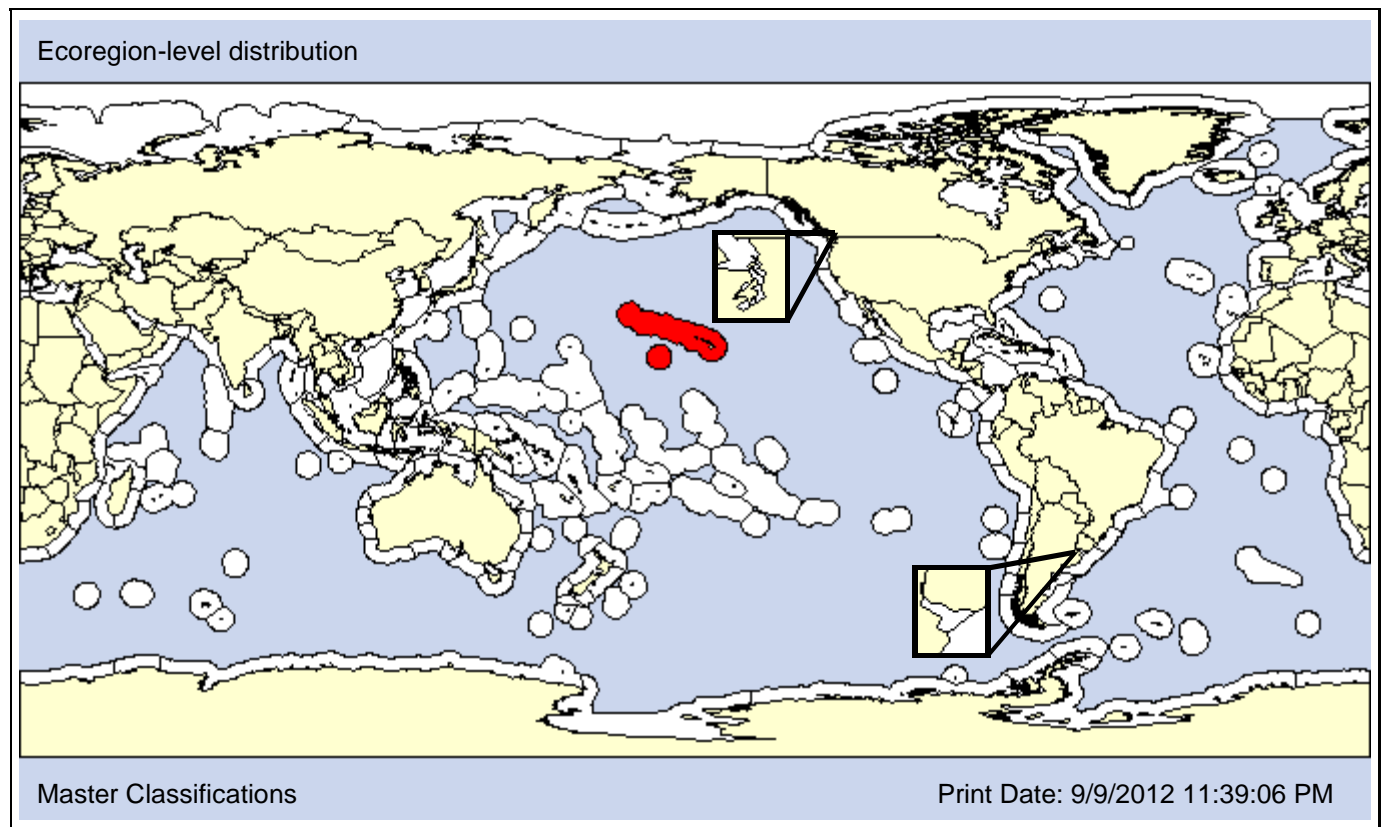
**Also Known As (Name - Type):**

Halichondria (Halichondria) coerulea

Convention

**Common Names:**

**Type Locality:** Kaneohe Bay, Oahu, Hawaii, USA



**Date 1st record:**

1965

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: *Halichondria coerulea* was originally described from Hawaii, but Carlton and Eldredge (2009) consider it introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											P	P	P	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Sponge

**Taxonomic Author:** de Laubenfels, 1936

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Halichondrida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Halichondriidae

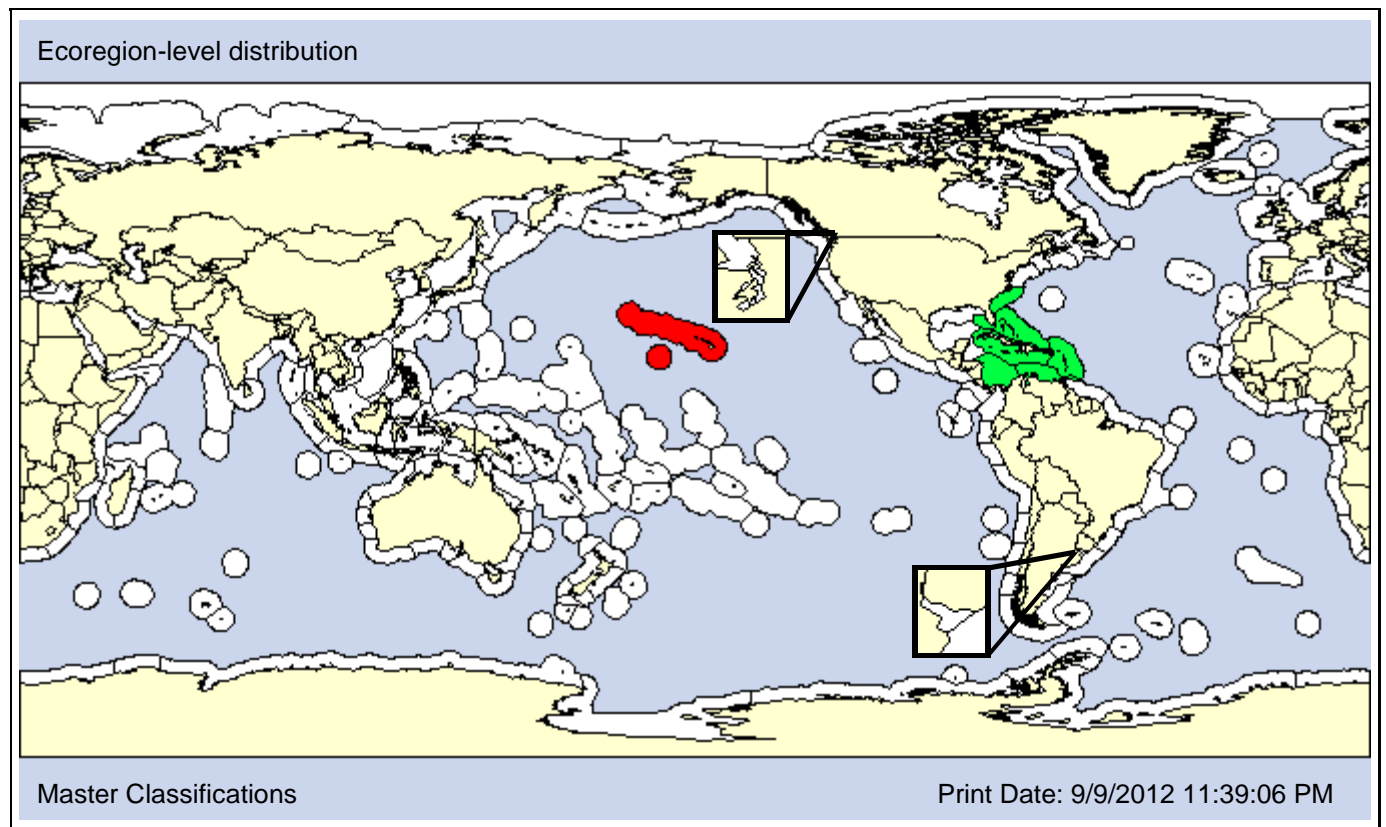
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Halichondria (Halichondria) melanodocia	Convention	
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**Type Locality:** Caribbean



**Date 1st record:**

<1967

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR			A	P			
		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH				<b>X</b>	

**DEPTH****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>P</b>			<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Sponge

**Taxonomic Author:** (Hechtel, 1965)

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Haplosclerida

**Suborder:** Haplosclerina

**Infraorder:**

**Superfamily:**

**Family:** Chalinidae

**Subfamily:**

**Also Known As (Name - Type):**

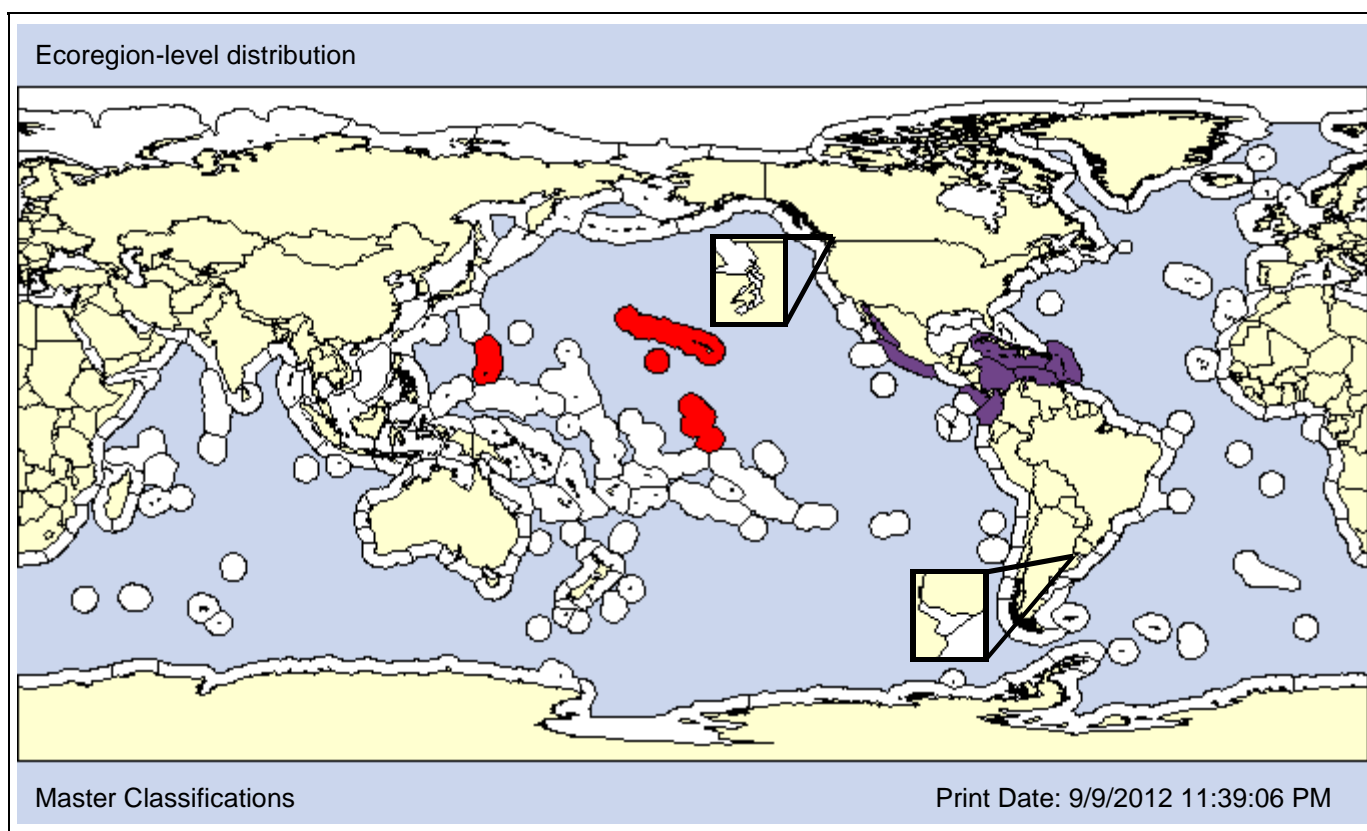
Haliclona (Sigmadocia) caerulea  
 Haliclona (Soestella) caerulea  
 Haliclona coerulea  
 Sigmadocia caerulea

Synonym  
 Convention  
 Misspelling  
 Synonym

**Common Names:**

blue Caribbean sponge

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:**

1996

Unknown

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

Gulf of California, Mexico

**Established:**

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF	X	S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: It is unclear whether *Haliclona caerulea* is native to the Caribbean or to the Tropical Eastern Pacific (Gulf of Panama).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>							<b>P</b>			<b>O</b>	<b>P</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Sponge

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Poecilosclerida

**Suborder:** Myxillina

**Infraorder:**

**Superfamily:**

**Family:** Crambeidae

**Subfamily:**

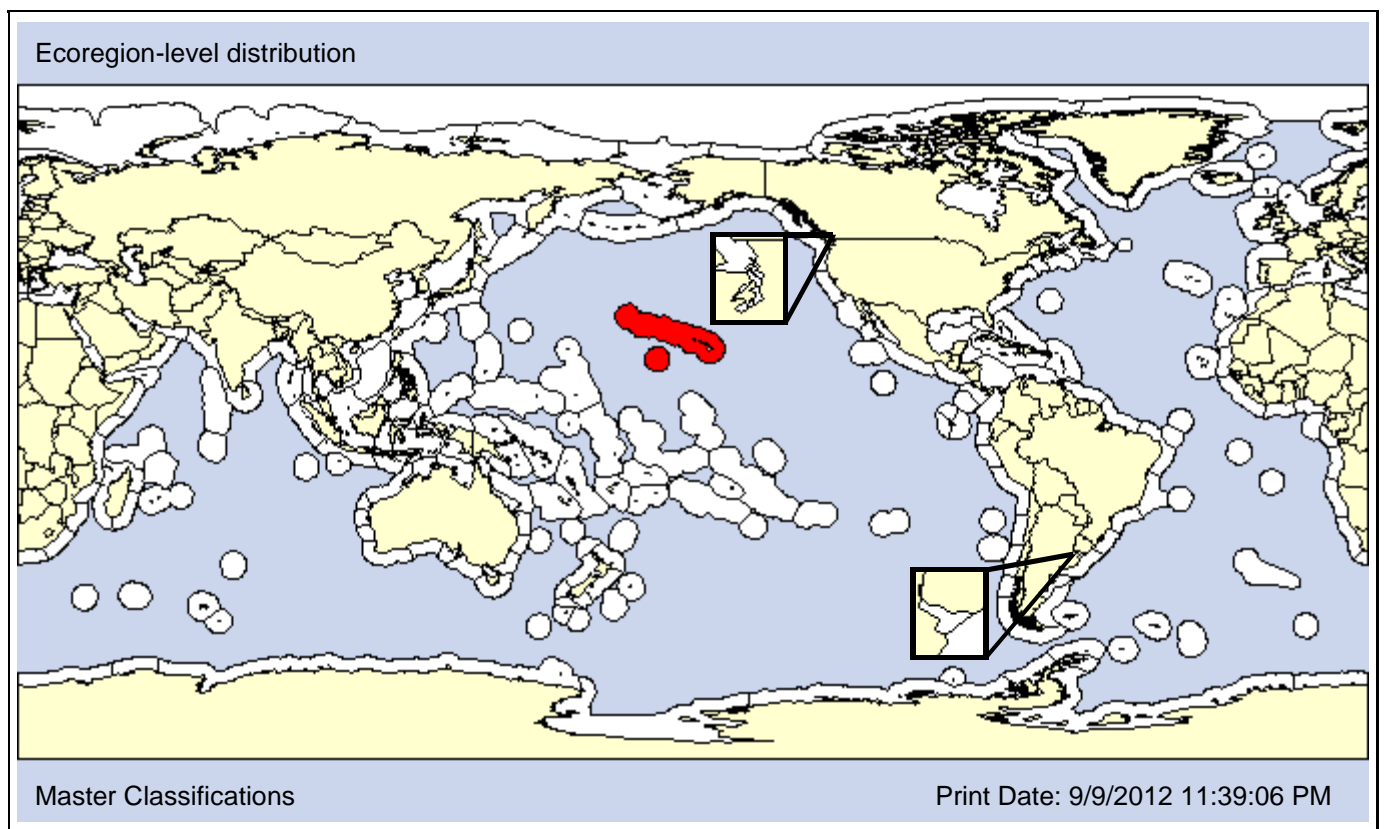
**Also Known As (Name - Type):**

**Common Names:**

Neofolitispa unguiculata of Coles at al. 1999

Misidentified

**Type Locality:** Hawaii, USA



**Date 1st record:**

1997

**Loc 1st record:**

Honolulu Harbor, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												O	P	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							



**Taxon:** Sponge

**Taxonomic Author:** de Laubenfels, 1936

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Poecilosclerida

**Suborder:** Mycalina

**Infraorder:**

**Superfamily:**

**Family:** Mycalidae

**Subfamily:**

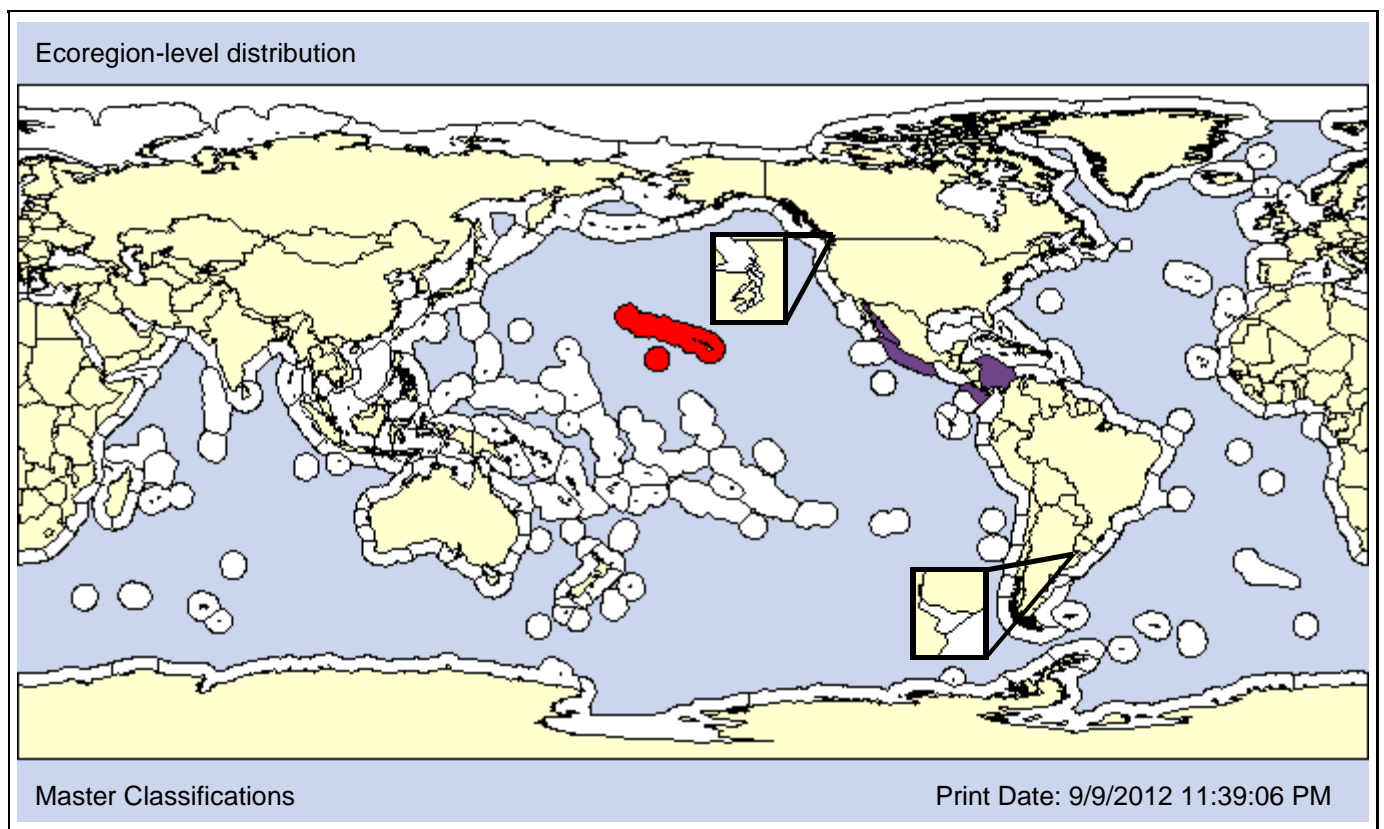
**Also Known As (Name - Type):**

Mycale (Camia) cecilia  
 Mycale (Carmia) cecilia  
 Mycale maunakea

Misspelling  
 Convention  
 Synonym

**Common Names:**

**Type Locality:** Panama Bight, Panama



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1947 (NWP)      Unknown (NEP)  
**Loc 1st record:** Kaneohe Bay, Hawaii (NWP)      Gulf of California, Mexico (NEP)  
**Established:** Yes (NWP)      Yes (NEP)

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: Carlton and Eldredge (2009) consider *Mycale cecilia* native to the Caribbean. However, it was described from Pacific Panama and is wide-spread in the Tropical Eastern Pacific. Thus, we list it as unclassified in the NEP and Caribbean.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>

**DEPTH [Obs: 0 - 17m] [Pref: - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>										<b>O</b>	<b>P</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Sponge

**Taxonomic Author:** Gray, 1867

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Poecilosclerida

**Suborder:** Mycalina

**Infraorder:**

**Superfamily:**

**Family:** Mycalidae

**Subfamily:**

**Also Known As (Name - Type):**

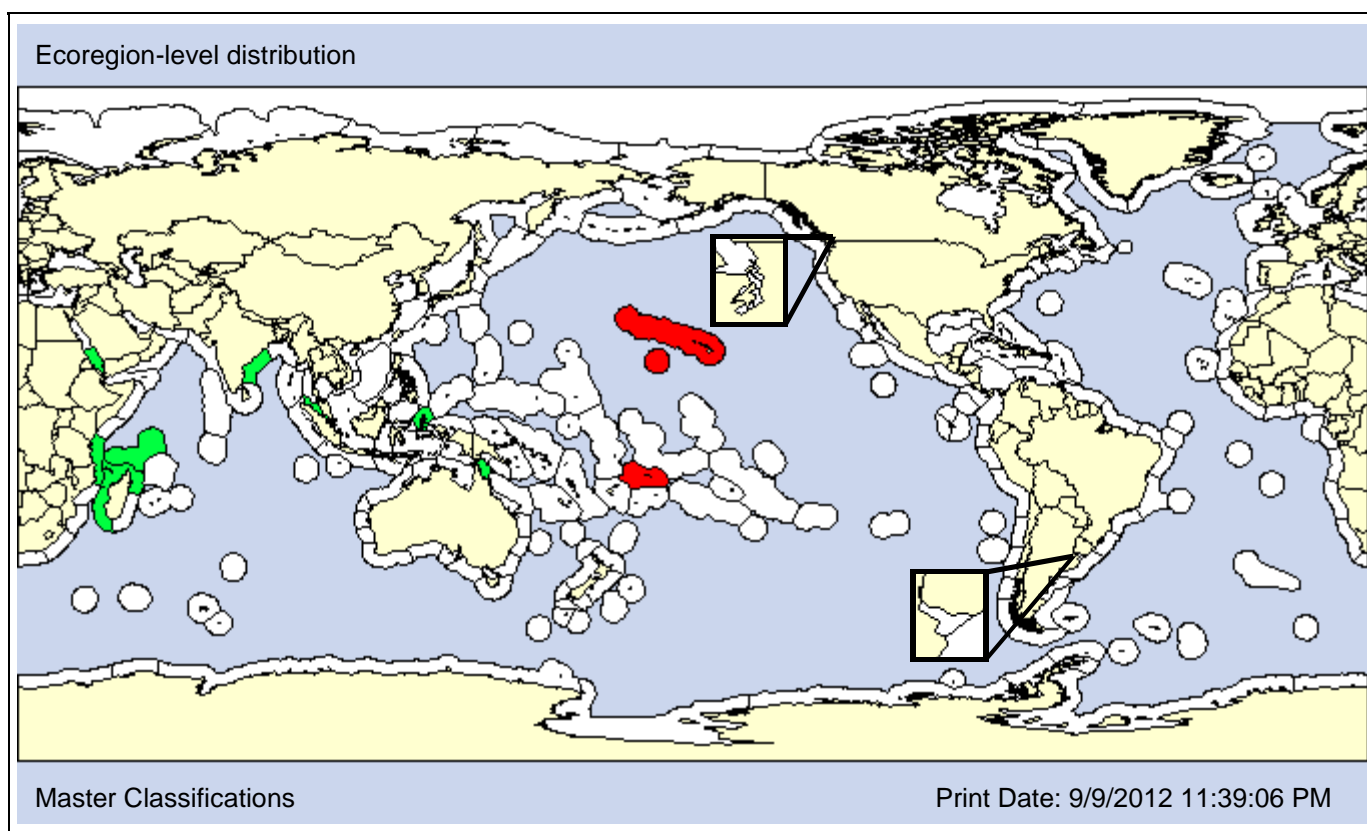
Mycale (Mycale) grandis  
Mycale armata of Coles et al., 1999; not Thiele, 1903

Convention  
Misidentified

**Common Names:**

orange keyhole sponge  
orange sponge

**Type Locality:** Ternate, Indonesia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1996  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: Mycale grandis overgrows reef corals.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		<b>X</b>		<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>										<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Sponge

**Taxonomic Author:** (Bowerbank, 1875)

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Poecilosclerida

**Suborder:** Mycalina

**Infraorder:**

**Superfamily:**

**Family:** Mycalidae

**Subfamily:**

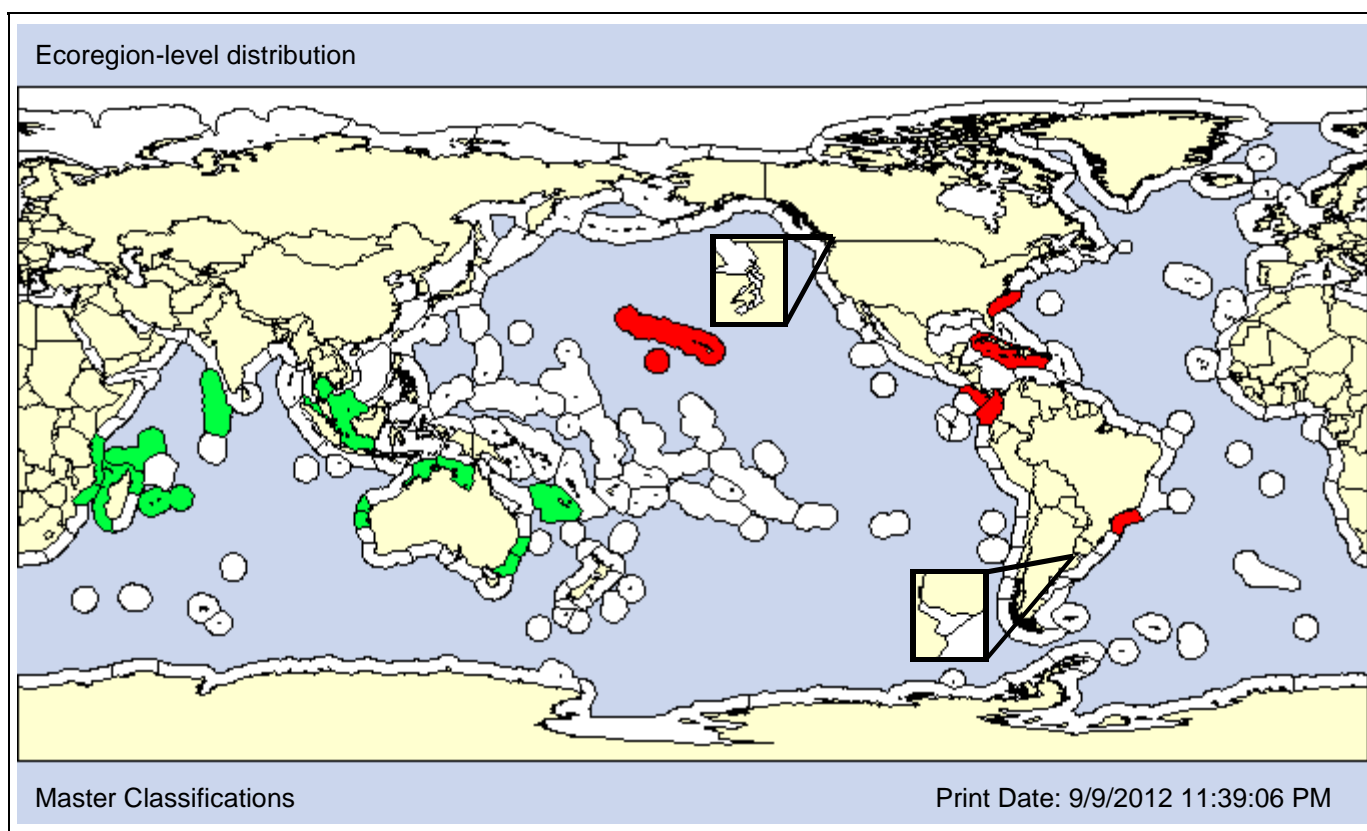
**Also Known As (Name - Type):**

Esperella ridleyi	Synonym
Esperella ridleyi var. intermedia	Synonym
Esperella ridleyi var. robusta	Synonym
Esperia plumosa	Synonym

**Common Names:**

red-brown branching sponge
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1947

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
		X				AO	PO							

Comments: Eldredge and Smith (2001) consider *Mycale parishii* native to the Caribbean while Carlton and Eldredge (2009) consider it native to the Indo-Pacific, which we follow here.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 16m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>										<b>P</b>	<b>P</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Sponge

**Taxonomic Author:** Hartman, 1975

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Hadromerida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Suberitidae

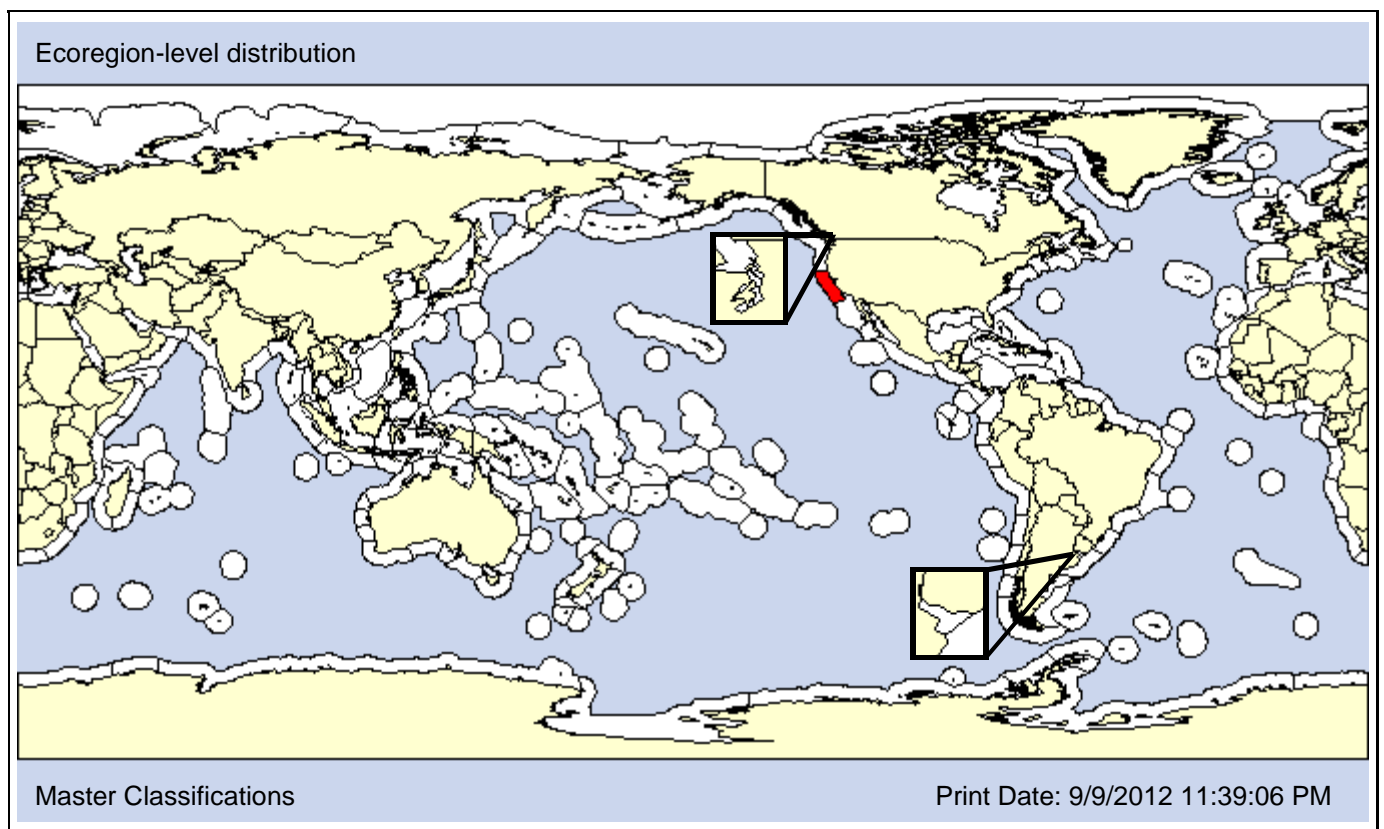
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Prosuberites sp. of Cohen and Carlton, 1995	Synonym	
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**Type Locality:** California, USA



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

**Date 1st record:**

1953

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
		X				AO X	PO								

Comments: According to Lee et al. (2007a), *Prosuberites* sp. of Hartman, 1975 is locally common in the San Francisco Estuary and may represent a complex of more than one species. It probably was introduced into the NEP with Atlantic oysters or hull fouling (Lee et al., 2007a).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH <b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 8m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>											<b>O</b>	

**SALINITY [Obs: - 20psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
					<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Sponge

**Taxonomic Author:** (Duchassaing & Michelotti, 1864)

**Kingdom:** Animalia

**Subkingdom:** Parazoa

**Phylum:** Porifera

**Subphylum:**

**Superclass:**

**Class:** Demospongiae

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Hadromerida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Suberitidae

**Subfamily:**

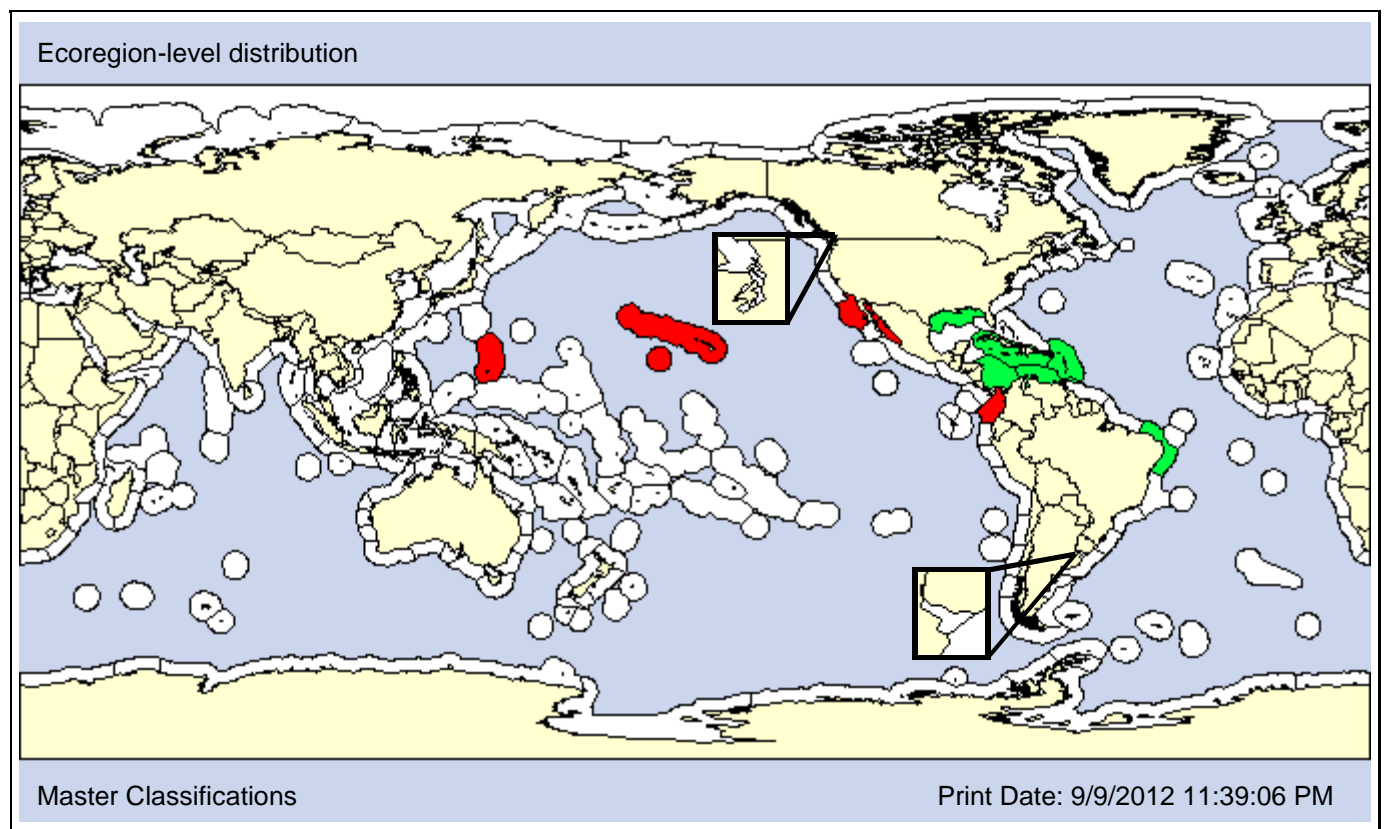
**Also Known As (Name - Type):**

Laxosuberites zeteki	Synonym
Suberites zeteki	Synonym
Terpios aurantiaca	Synonym
Terpios zeteki	Synonym

**Common Names:**

lobate sponge
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**Type Locality:** Virgin Islands



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:**

1902

1991

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

Sinaloa, Mexico

**Established:**

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Carlton and Eldredge (2009) state that the origin of *Suberites aurantiacus* is unknown. However, we tentatively classify the tropical Western Atlantic as the native range based on it being initially described from the Virgin Islands and its extensive distribution in this region.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH		<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>							<b>P</b>			<b>O</b>	<b>P</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Kingdom: Animalia**

**Phylum: Cnidaria**

**Class: Anthozoa**

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**Taxon:** Anthozoan

**Taxonomic Author:** Carlgren, 1941

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Anthozoa

**Subclass:** Hexacorallia

**Infraclass:**

**Superorder:**

**Order:** Actiniaria

**Suborder:** Nyantheae

**Infraorder:** Thenaria

**Superfamily:** Acontiaria

**Family:** Aiptasiidae

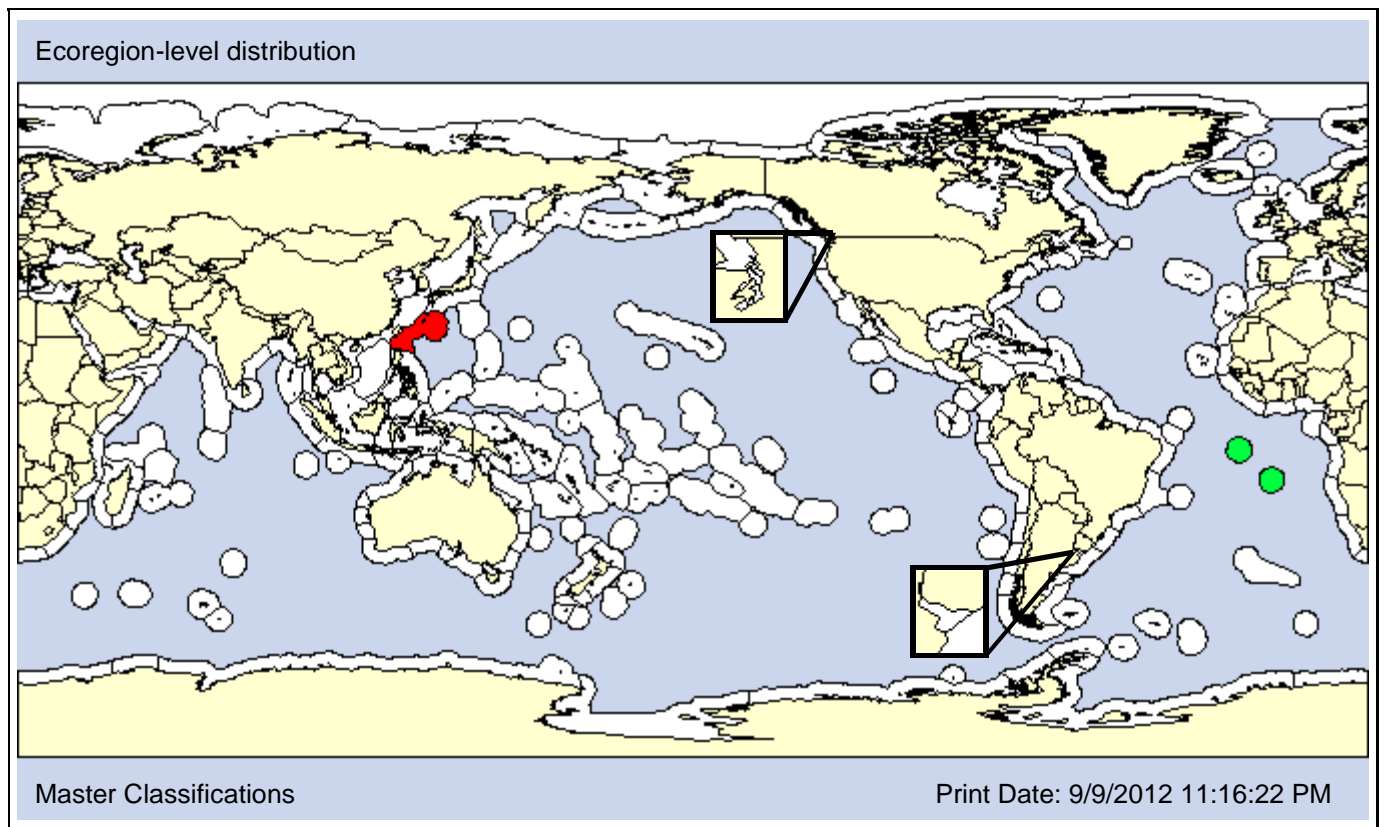
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Aiptasia insignis	Ambiguous syn.	
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**Type Locality:** Japan



**Date 1st record:** Unknown

**Loc 1st record:** Unknown

**Established:** Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: Mito and Uesugi (2004) listed "Aiptasia cf. insignis" as introduced into Japan, though no sites were given. Belda-Baillie et al. (2002) list Aiptasia cf. insignis from Okinawa (Central Indo-Pacific Region), which we assume is the same species. The base species, Aiptasia insignis, shown in the southern Atlantic may be a different species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		X			

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O			Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep				
			O					

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
	X			X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Anthozoan

**Taxonomic Author:** (Stephenson, 1918)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Anthozoa

**Subclass:** Hexacorallia

**Infraclass:**

**Superorder:**

**Order:** Actiniaria

**Suborder:** Nyantheae

**Infraorder:** Thenaria

**Superfamily:** Acontiaria

**Family:** Diadumenidae

**Subfamily:**

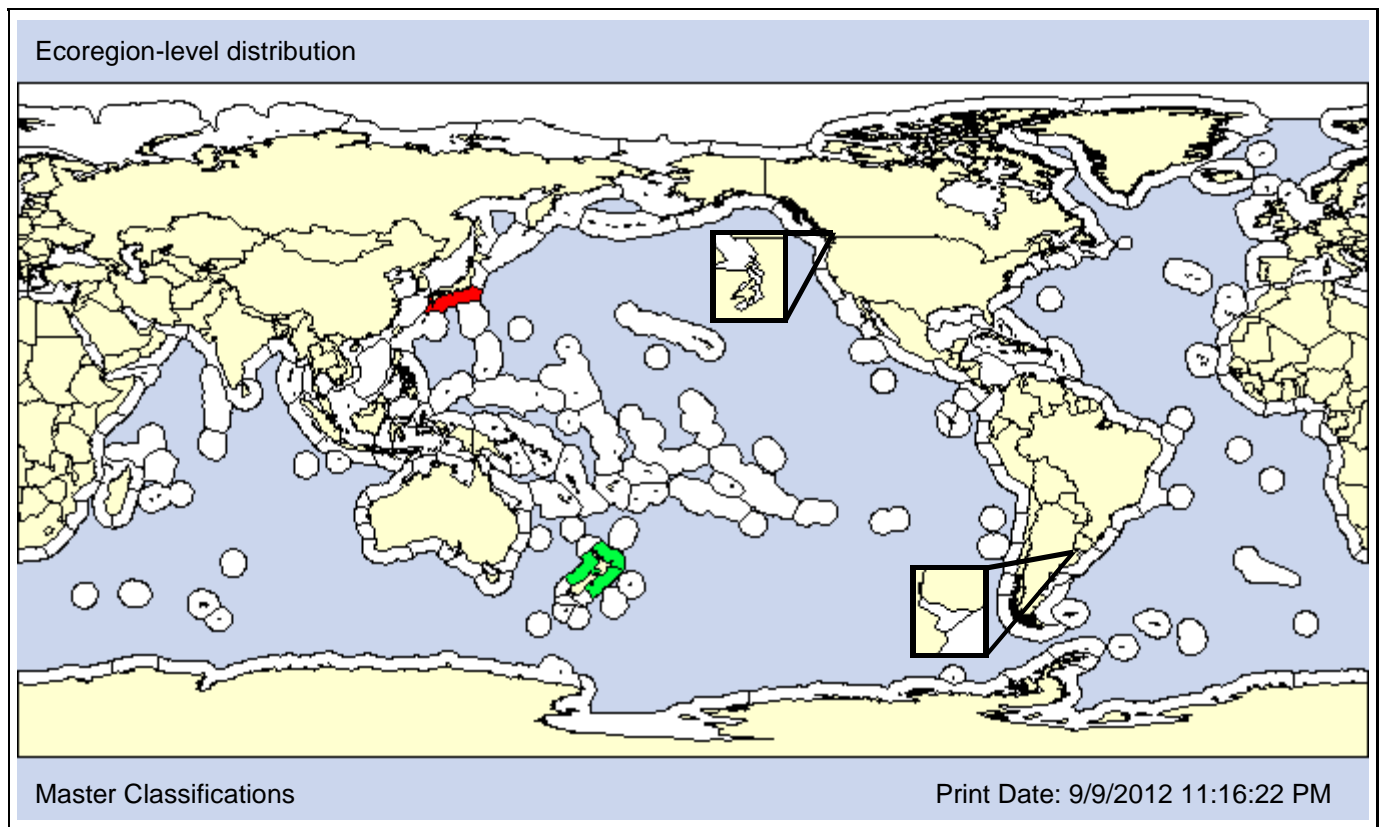
**Also Known As (Name - Type):**

Aiptasia minima	Synonym
Aiptasiomorpha minuta	Synonym
Diadumene minima	Synonym

**Common Names:**

--

**Type Locality:** New Zealand



**Date 1st record:** <2004

**Loc 1st record:** Japan

**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Mito and Uesugi (2004) listed *Aiptasiomorpha minima* as introduced in Japan though no specific sites were identified. However, it was found in Tokyo Bay during a recent invasive species rapid assessment (Furota et al., 2008).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Anthozoan

**Taxonomic Author:** Ljubenkov, 1998

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Anthozoa

**Subclass:** Hexacorallia

**Infraclass:**

**Superorder:**

**Order:** Actiniaria

**Suborder:** Nyantheae

**Infraorder:** Boloceroidaria

**Superfamily:**

**Family:** Boloceroididae

**Subfamily:**

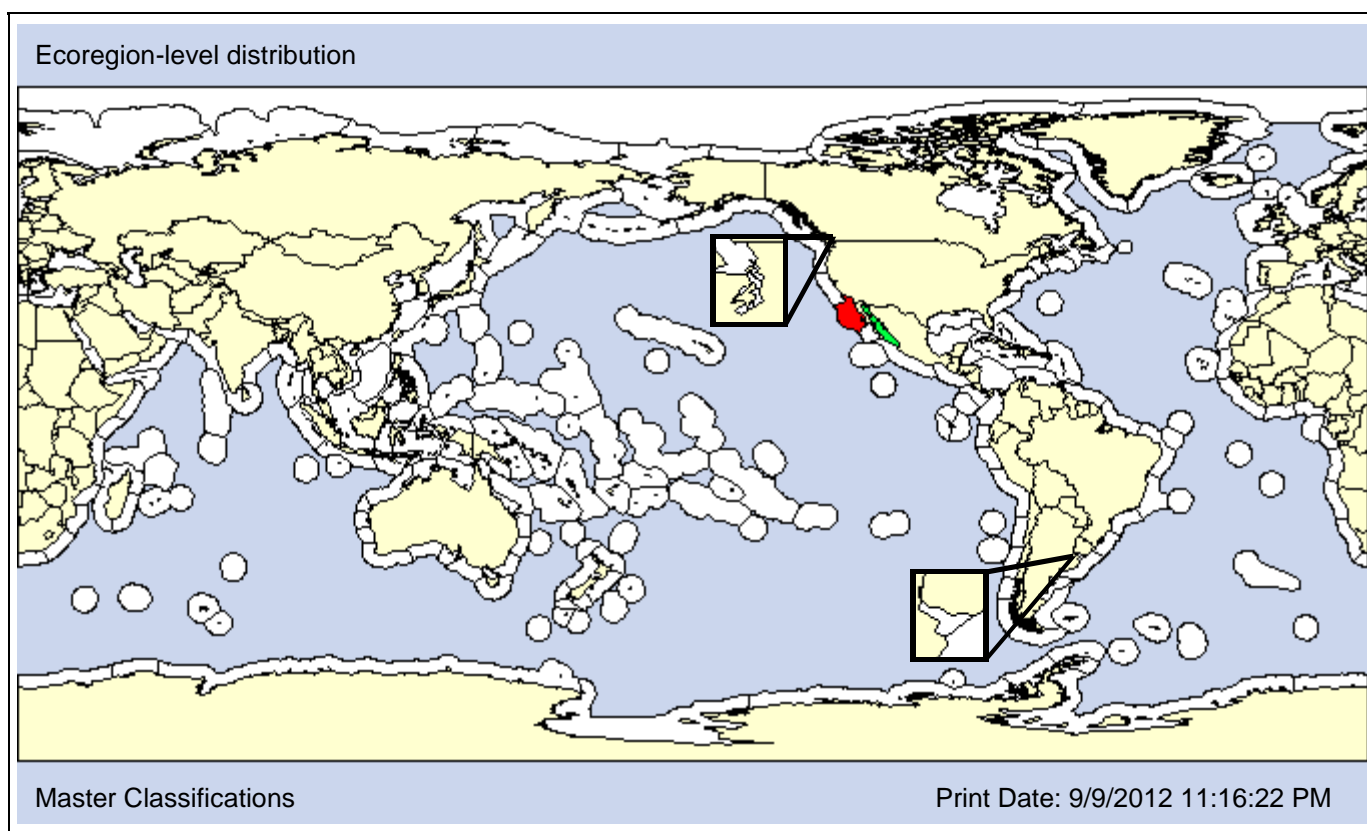
**Also Known As (Name - Type):**

Bunodeopsis sp. A (SCAMIT)  
 Bunodeopsis sp. A Ljubenkov  
 Bunodeopsis sp. A of Cohen et al. 2002  
 Bunodeopsis sp. of NEP authors

Convention  
 Synonym  
 Convention  
 Convention

**Common Names:**

**Type Locality:** California, USA and Pacific Mexico



**Date 1st record:**

1995

**Loc 1st record:**

Mission Bay, California

**Established:**

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			X
X		X				AO	PO							

Comments: We classify *Bunodeopsis sp. A* as NIS in Southern California though it may represent a climate transient from the Gulf of California (see Engle and Richards, 2001). *Bunodeopsis sp. A* grows on seagrasses, resulting in reduced growth or death (Williams, 2007c), as well as on surfgrass (*Phyllospadix*) and various brown algae.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>			<b>X</b>	<b>X</b>
		<b>X</b>						<b>X</b>					

**DEPTH [Obs: 3 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 7 - 45%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>P</b>	<b>P</b>					<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Anthozoan

**Taxonomic Author:** (Duchassaing & Michelotti, 1860)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Anthozoa

**Subclass:** Octocorallia

**Infraclass:**

**Superorder:**

**Order:** Alcyonacea

**Suborder:** Stolonifera

**Infraorder:**

**Superfamily:**

**Family:** Clavulariidae

**Subfamily:**

**Also Known As (Name - Type):**

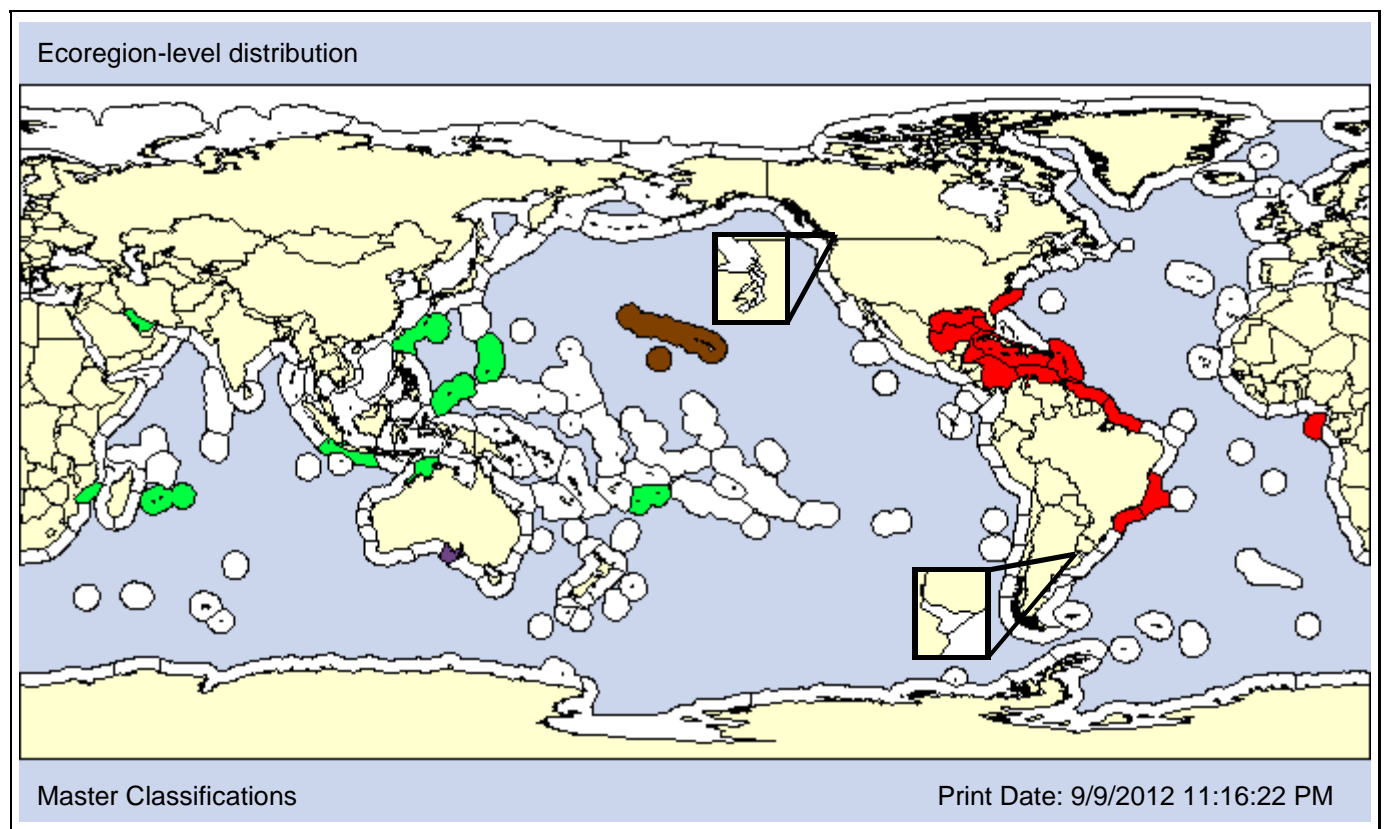
Carijoa (Telesto) riisei  
Clavularia riisei  
Clavularia rusei  
Telesto riisei

Convention  
Synonym  
Synonym  
Synonym

**Common Names:**

branched pipe coral  
orange soft coral  
snowflake coral  
white telesto

**Type Locality:** U.S. Virgin Islands



**Date 1st record:**

1972

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: *Carijoa riisei* was considered a Western Atlantic species but is now considered to be from the "Indo-West Pacific" and to have invaded the Caribbean in the 19th century. In Hawaii, Carlton and Eldredge (2009) classify it as a NIS while Concepcion et al. (2010) consider that it could be native or nonindigenous, thus we list it as a conflict.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 3.5 - 120m] [Pref: 10 - 105m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>										<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

# *Culicia rachelfitzhardingeae*

Species ID: 220589

<b>Taxon:</b> Anthozoan	<b>Taxonomic Author:</b> Cairns, 2006	
<b>Kingdom:</b> Animalia	<b>Subkingdom:</b> Eumetazoa	<b>Phylum:</b> Cnidaria
<b>Subphylum:</b>	<b>Superclass:</b>	<b>Class:</b> Anthozoa
<b>Subclass:</b> Hexacorallia	<b>Infraclass:</b>	<b>Superorder:</b>
<b>Order:</b> Scleractinia	<b>Suborder:</b>	<b>Infraorder:</b>
<b>Superfamily:</b>	<b>Family:</b> Rhizangiidae	<b>Subfamily:</b>

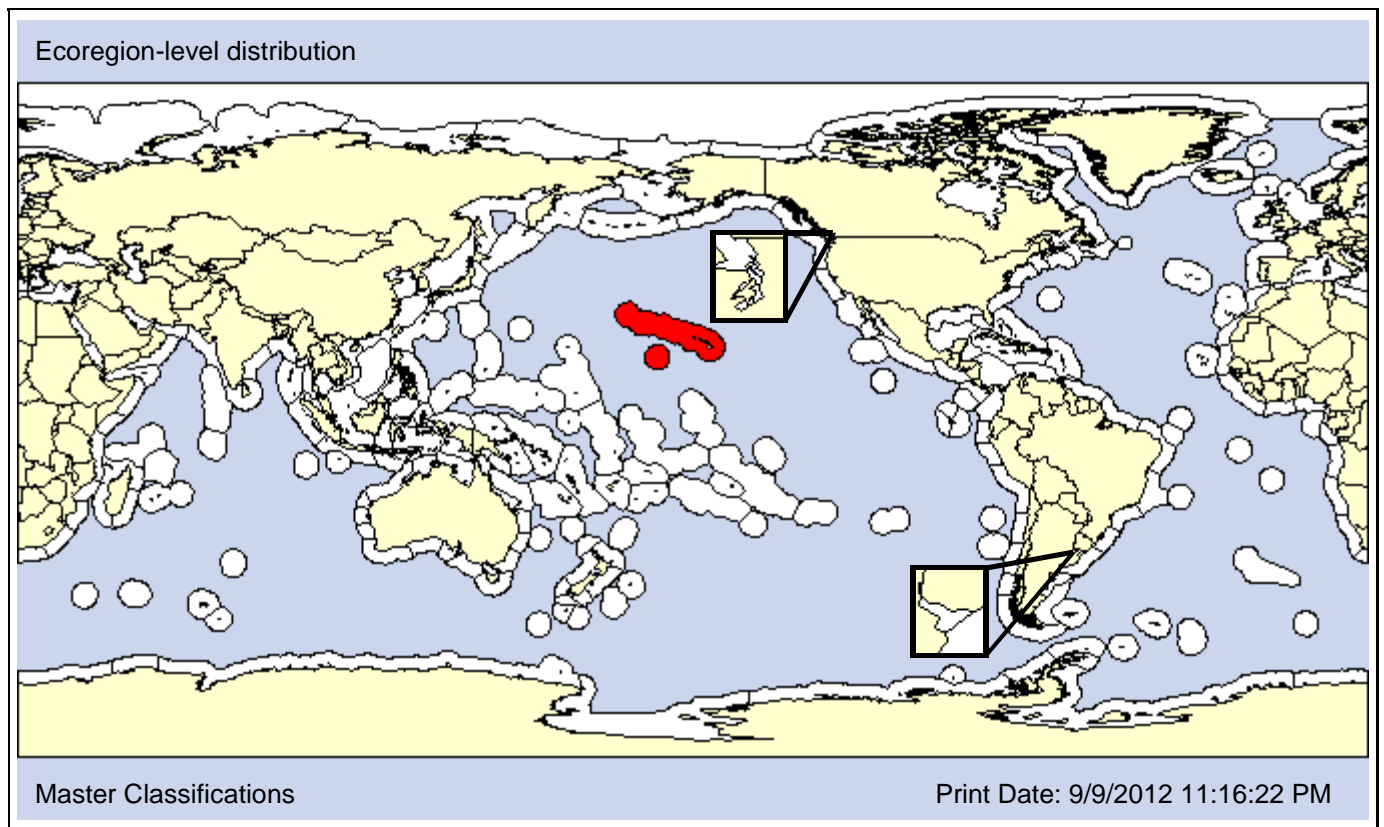
**Also Known As (Name - Type):**

Culicia sp., cf. C. tenella of Fitzhardinge (1985, 1993)	Synonym

**Common Names:**

--

**Type Locality:** Oahu, Hawaii, USA



**Date 1st record:** 1983  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
X		X				AO	PO							

Comments: *Culicia rachelfitzhardingeae* was described from Hawaii but is considered to be an Indo-Pacific introduction.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		X		X	
		X											

**DEPTH [Obs: 2 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		

**CONSOLIDATED SUBSTRATE X**

R	HP	Biogenic						Artificial Substrate O						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												O	O	O

**SALINITY**

Fresh	Brackish O						Marine P		Hyper
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
				X				X	DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual X				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
				LP-B	LP-P				

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X						
						X							

**Taxon:** Anthozoan

**Taxonomic Author:** Stephenson, 1925

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Anthozoa

**Subclass:** Hexacorallia

**Infraclass:**

**Superorder:**

**Order:** Actiniaria

**Suborder:** Nyantheae

**Infraorder:** Thenaria

**Superfamily:** Acontiaria

**Family:** Diadumenidae

**Subfamily:**

**Also Known As (Name - Type):**

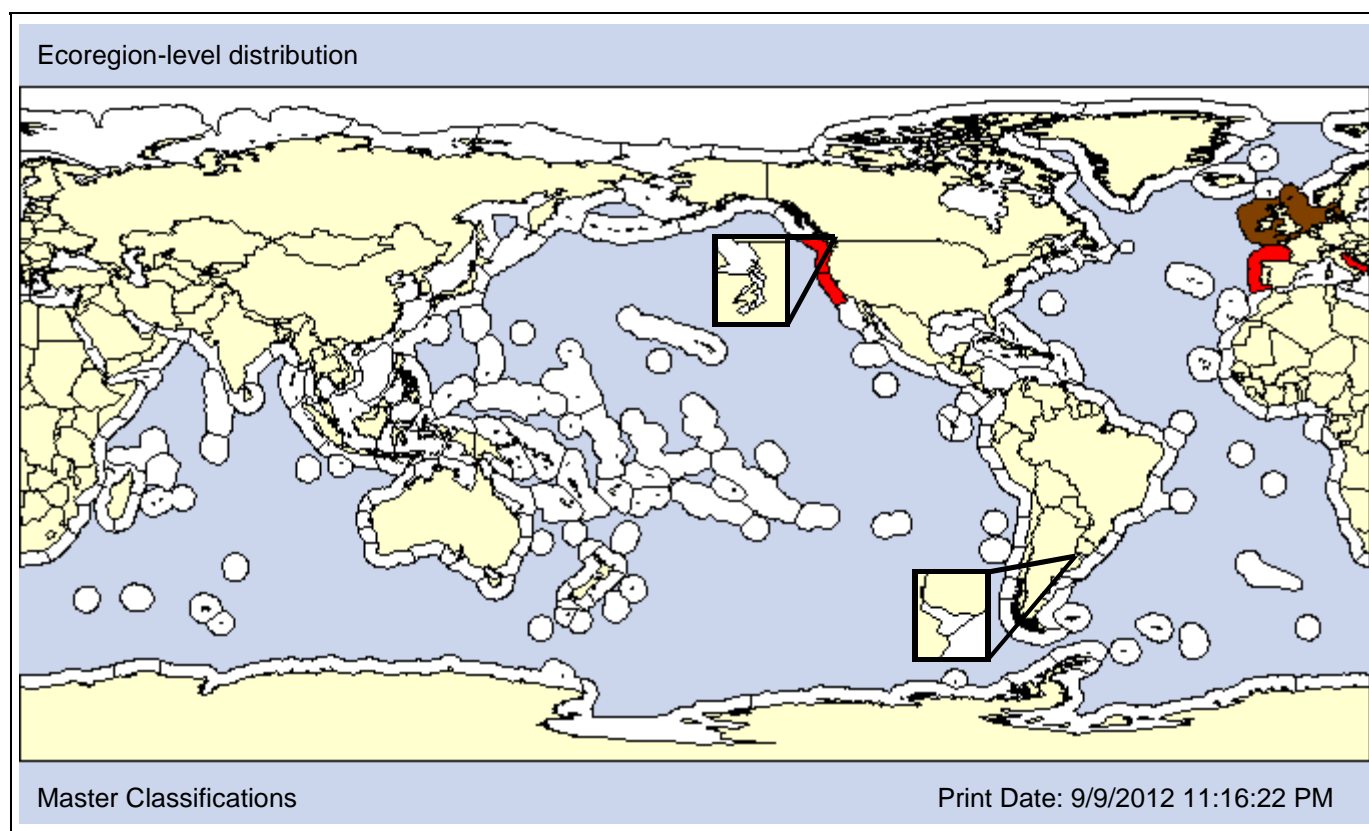
Diadumene ? cincta of Cohen and Carlton, 1995  
 Diadumene sp. of Carlton 1979

Synonym  
 Synonym

**Common Names:**

orange anemone

**Type Locality:**



**Date 1st record:**

1976

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: *Diadumene cincta* is considered introduced into the North Sea, European Atlantic coast, and the Mediterranean by several sources (e.g., Streftaris et al., 2005). However, other sources suggest that it is native to the United Kingdom. We list it as having conflicting classifications in the North Sea and Celtic Seas Ecoregions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 40m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>									<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Anthozoan

**Taxonomic Author:** Hand, 1956

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Anthozoa

**Subclass:** Hexacorallia

**Infraclass:**

**Superorder:**

**Order:** Actiniaria

**Suborder:** Nyantheae

**Infraorder:** Thenaria

**Superfamily:** Acontiaria

**Family:** Diadumenidae

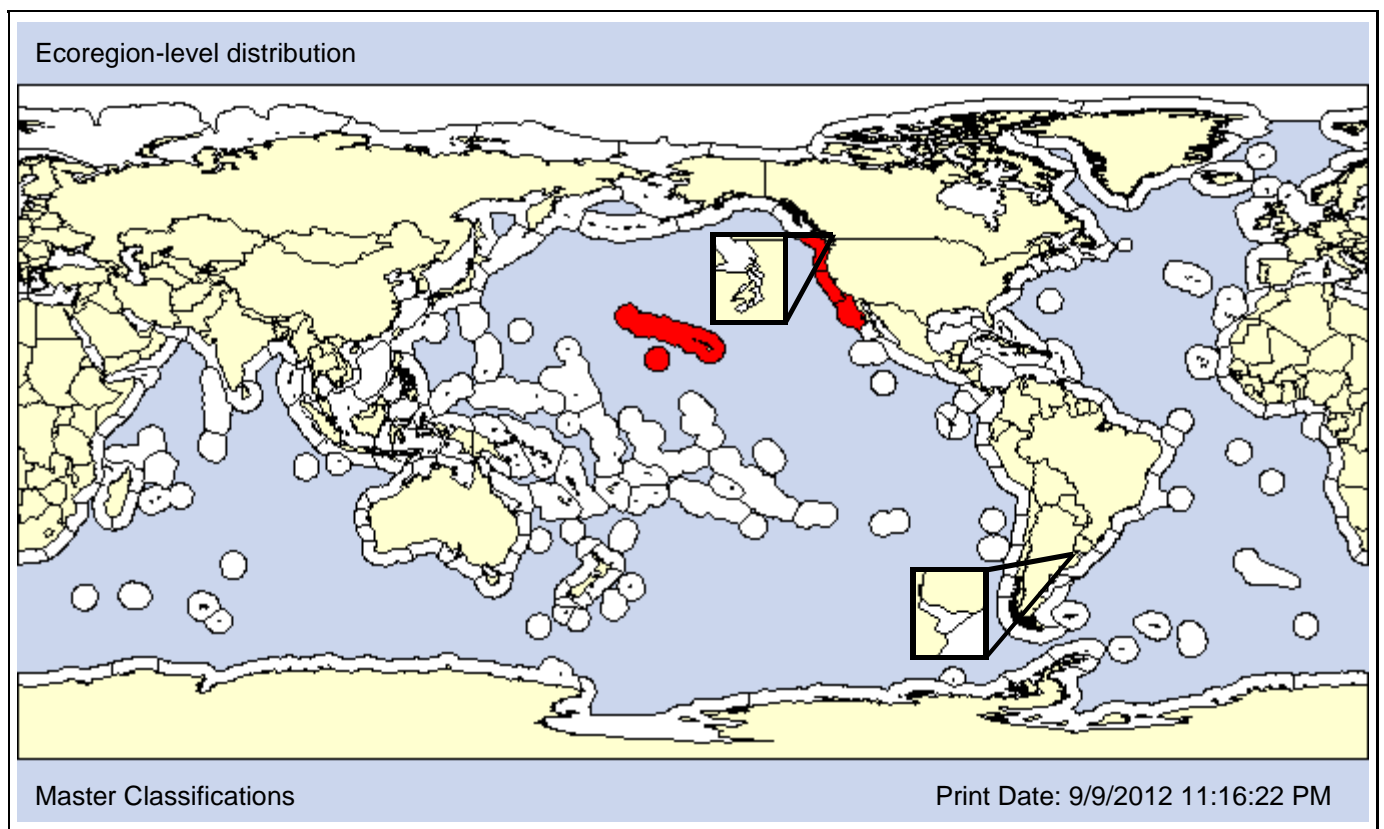
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

double-striped anemone  
San Francisco anemone

**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b>	1998	1941
<b>Loc 1st record:</b>	Oahu, Hawaii	San Francisco Estuary, CA
<b>Established:</b>	Yes	Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments: The native origin of *Diadumene franciscana* is not known, but Carlton and Eldredge (2009) suggest that the western or southwestern Pacific Ocean, Indian Ocean, or Australasia are likely sources.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											<b>P</b>	<b>O</b>	<b>P</b>	

**SALINITY [Obs: - 38.6psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Anthozoan

**Taxonomic Author:** (Verrill, 1866)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Anthozoa

**Subclass:** Hexacorallia

**Infraclass:**

**Superorder:**

**Order:** Actiniaria

**Suborder:** Nyantheae

**Infraorder:** Thenaria

**Superfamily:** Acontiaria

**Family:** Diadumenidae

**Subfamily:**

**Also Known As (Name - Type):**

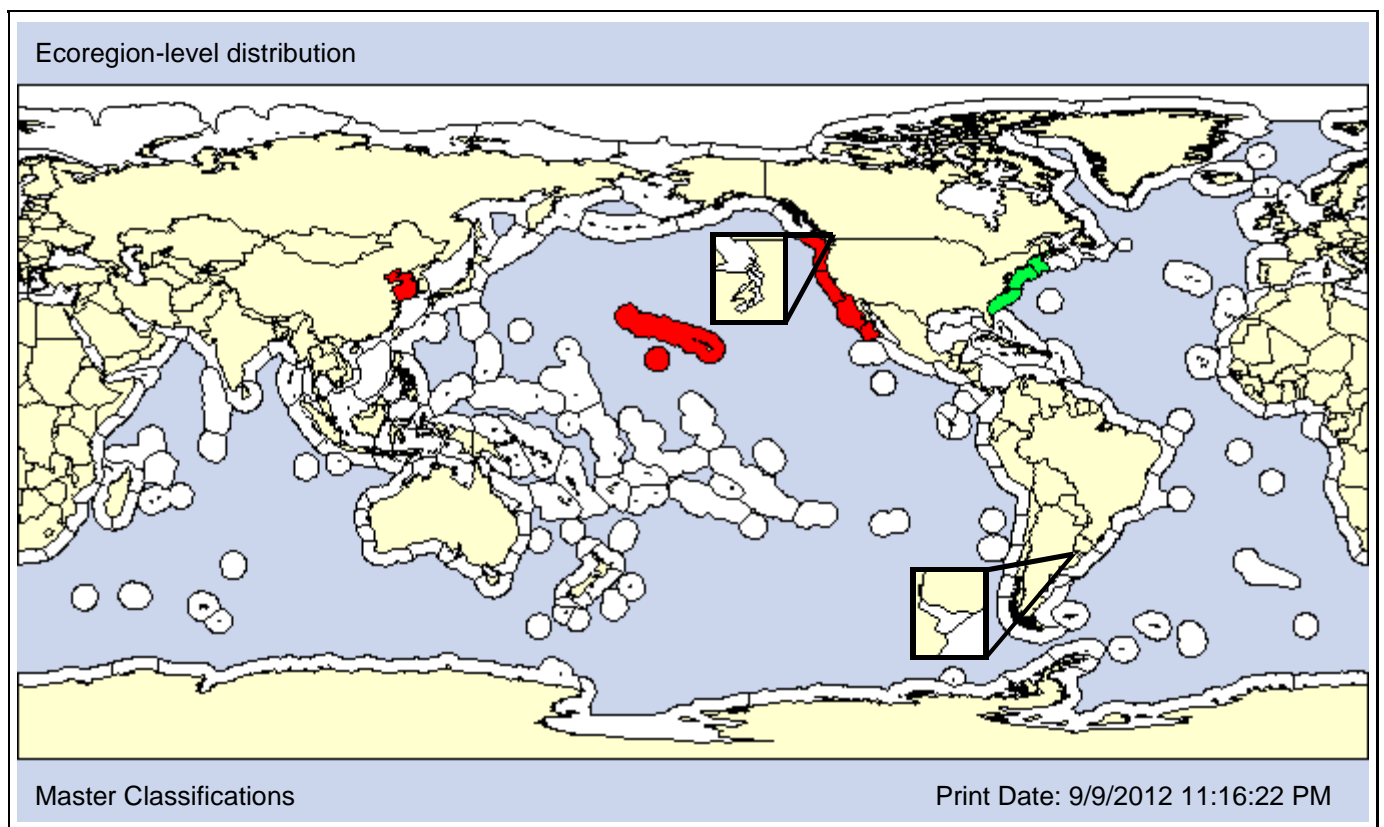
Cylista leucolena  
Sagartia leucolena

Synonym  
Synonym

**Common Names:**

ghost anemone  
white anemone

**Type Locality:**



**Date 1st record:** 2008

1950s

1936

**Loc 1st record:** Dalian, China

Oahu, Hawaii

San Francisco Estuary, CA

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
X		X				AO X	PO							

Comments: The PICES rapid assessment survey ((PICES Working Group 21, 2008)) found *Diadumene leucolena* in Dalian, China in 2008. We assume that it established in the NWP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 10m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>									<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 6 - 33psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>	<b>X</b>		
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Anthozoan

**Taxonomic Author:** (Verrill, 1869)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Anthozoa

**Subclass:** Hexacorallia

**Infraclass:**

**Superorder:**

**Order:** Actiniaria

**Suborder:** Nyantheae

**Infraorder:** Thenaria

**Superfamily:** Acontiaria

**Family:** Diadumenidae

**Subfamily:**

**Also Known As (Name - Type):**

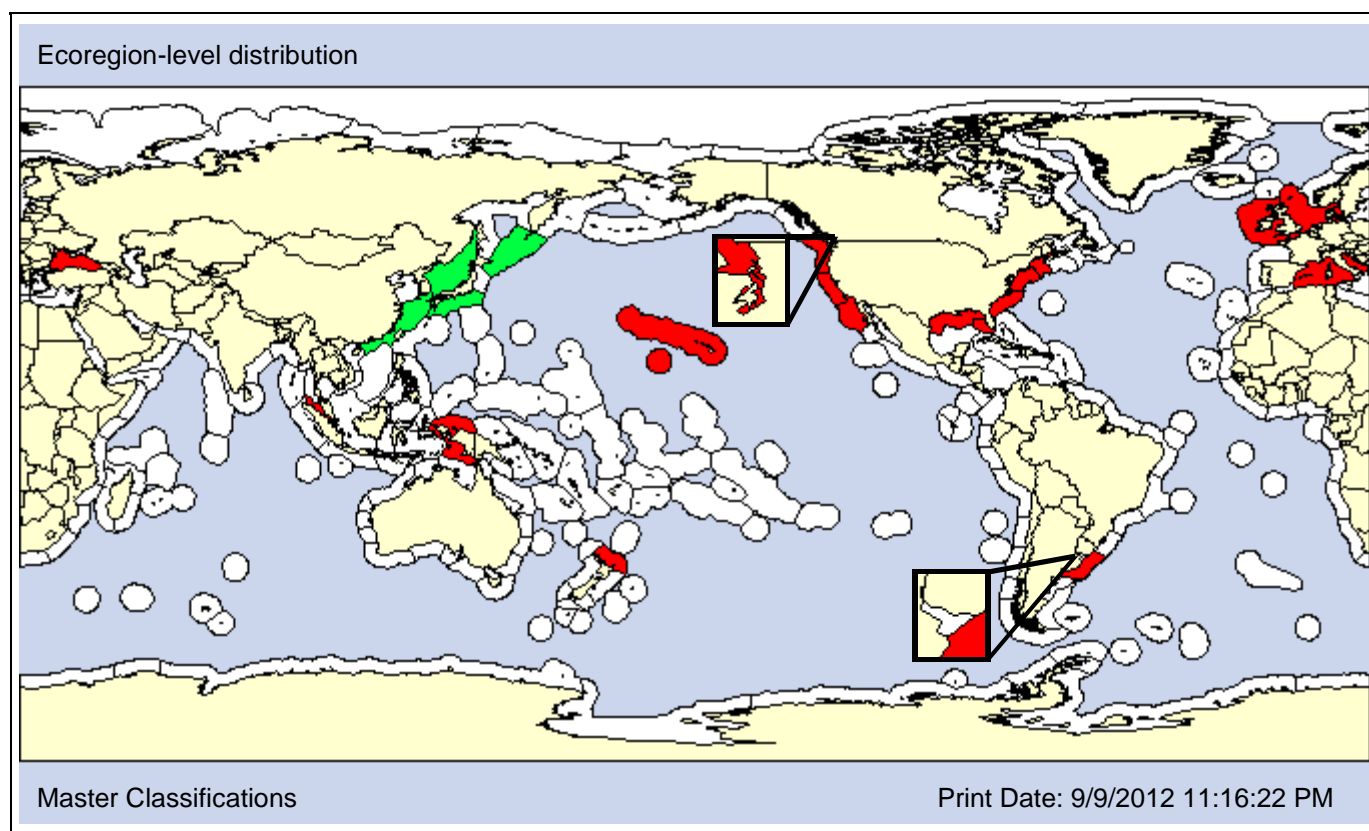
Diadumene luciae  
Haliplanella lineata  
Haliplanella luciae

Synonym  
Synonym  
Synonym

**Common Names:**

orange-striped green anemone  
small piling anemone

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

**Date 1st record:** Native

1999

1906

**Loc 1st record:** Native

Kaneohe Bay, Hawaii

San Francisco Estuary, CA

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			<b>AO X</b>	<b>PO X</b>									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>					<b>X</b>						

**DEPTH [Obs: 0 - 2m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>P</b>					<b>O</b>		<b>P</b>		<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 12 - 34psu] [Pref: 18 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>	<b>X</b>		
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC				<b>X</b>		<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Anthozoan

**Taxonomic Author:** Stephenson, 1935

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Anthozoa

**Subclass:** Hexacorallia

**Infraclass:**

**Superorder:**

**Order:** Actiniaria

**Suborder:** Nyantheae

**Infraorder:** Athenaria

**Superfamily:**

**Family:** Edwardsiidae

**Subfamily:**

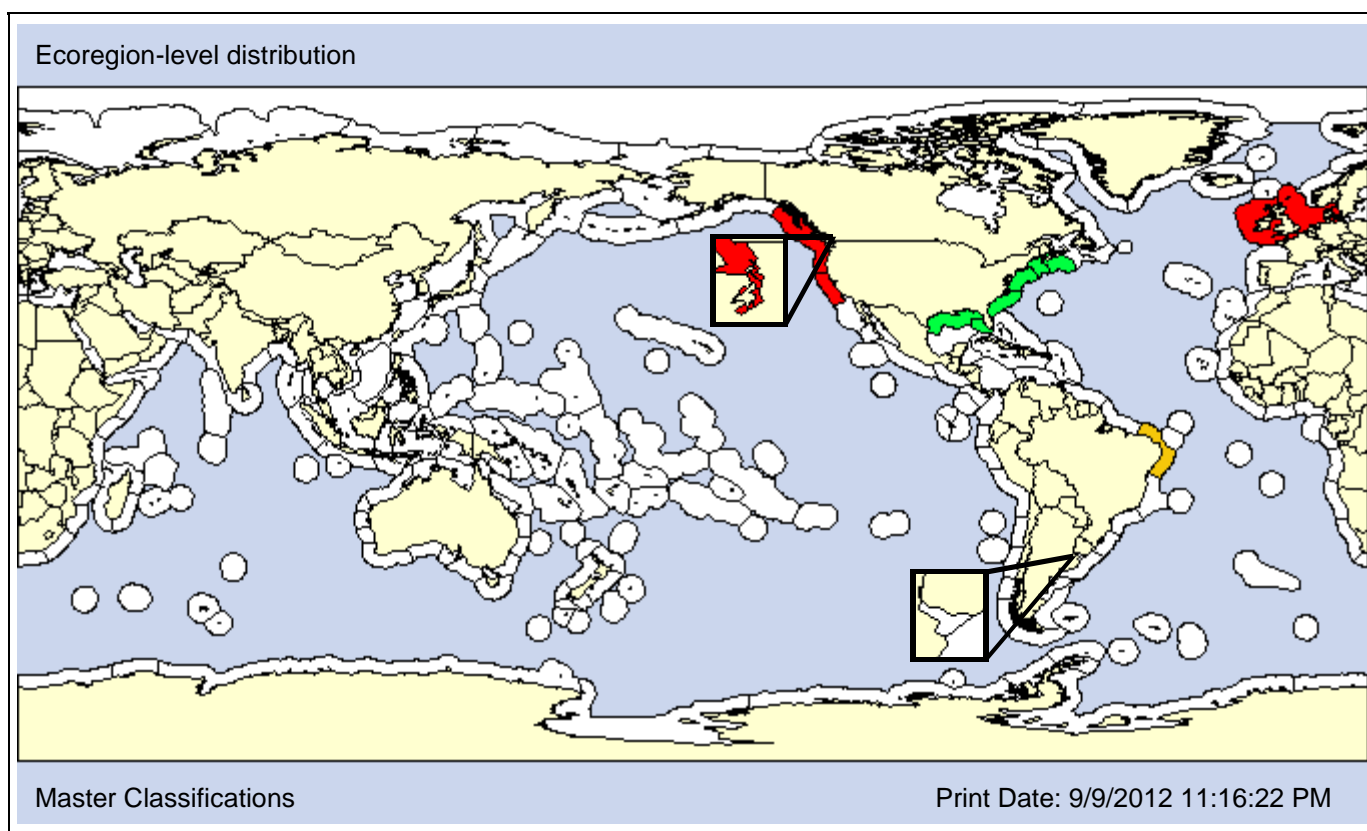
**Also Known As (Name - Type):**

Nematostella pellucida	Synonym

**Common Names:**

solitary marsh anemone
Starlet sea anemone

**Type Locality:** Isle of Wight, England



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1946

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>					<b>AO X</b>	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 3m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 65.81 - 65.81%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					<b>O</b>

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>						

**SALINITY [Obs: 2 - 51.54psu] [Pref: 16 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		



**Taxon:** Anthozoan

**Taxonomic Author:** (Uchida, 1932)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Anthozoa

**Subclass:** Hexacorallia

**Infraclass:**

**Superorder:**

**Order:** Actiniaria

**Suborder:** Nyantheae

**Infraorder:** Athenaria

**Superfamily:**

**Family:** Andvakiidae

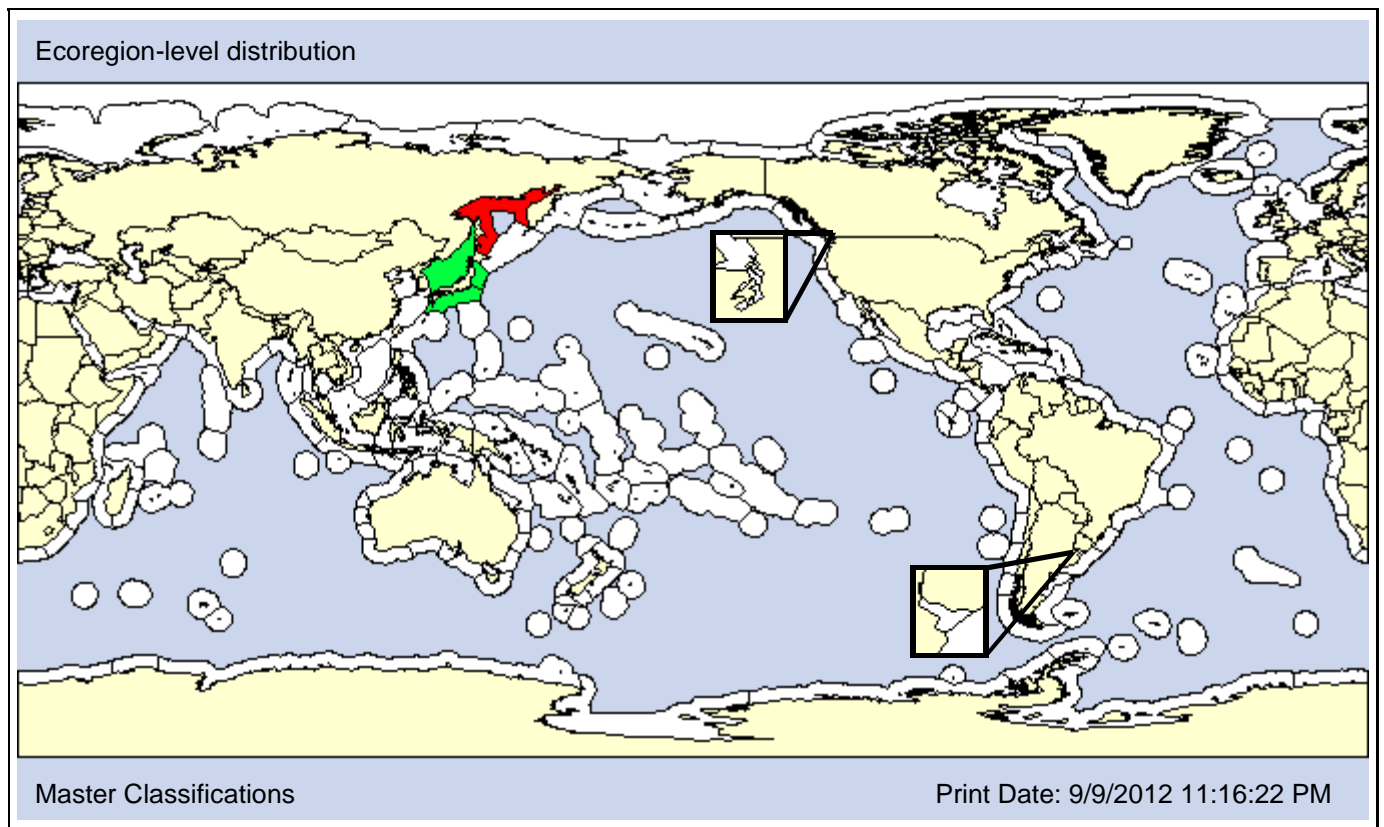
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Andwakia hozawai	Synonym	
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**Type Locality:** Mutsu Bay, Japan



**Date 1st record:** 1998

**Loc 1st record:** Sakhalin, Sea of Okhotsk

**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: We follow Zvyagintsev et al. (2011) and tentatively list the burrowing actinia, *Synandwakia hozawai*, as introduced into the Sea of Okhotsk based on its appearance in 1998. However, given its native distribution to the south, this may represent a natural range extension rather than an anthropogenic introduction.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
			<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 34 - 102m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
				<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>				<b>P</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 32.3 - 32.5psu] [Pref: 32.3 - 32.5psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Kingdom: Animalia**

**Phylum: Cnidaria**

**Class: Cubozoa**

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**Taxon:** Cubozoan

**Taxonomic Author:** (Stiasny, 1926)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Cubozoa

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Carybdeida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Tripedaliidae

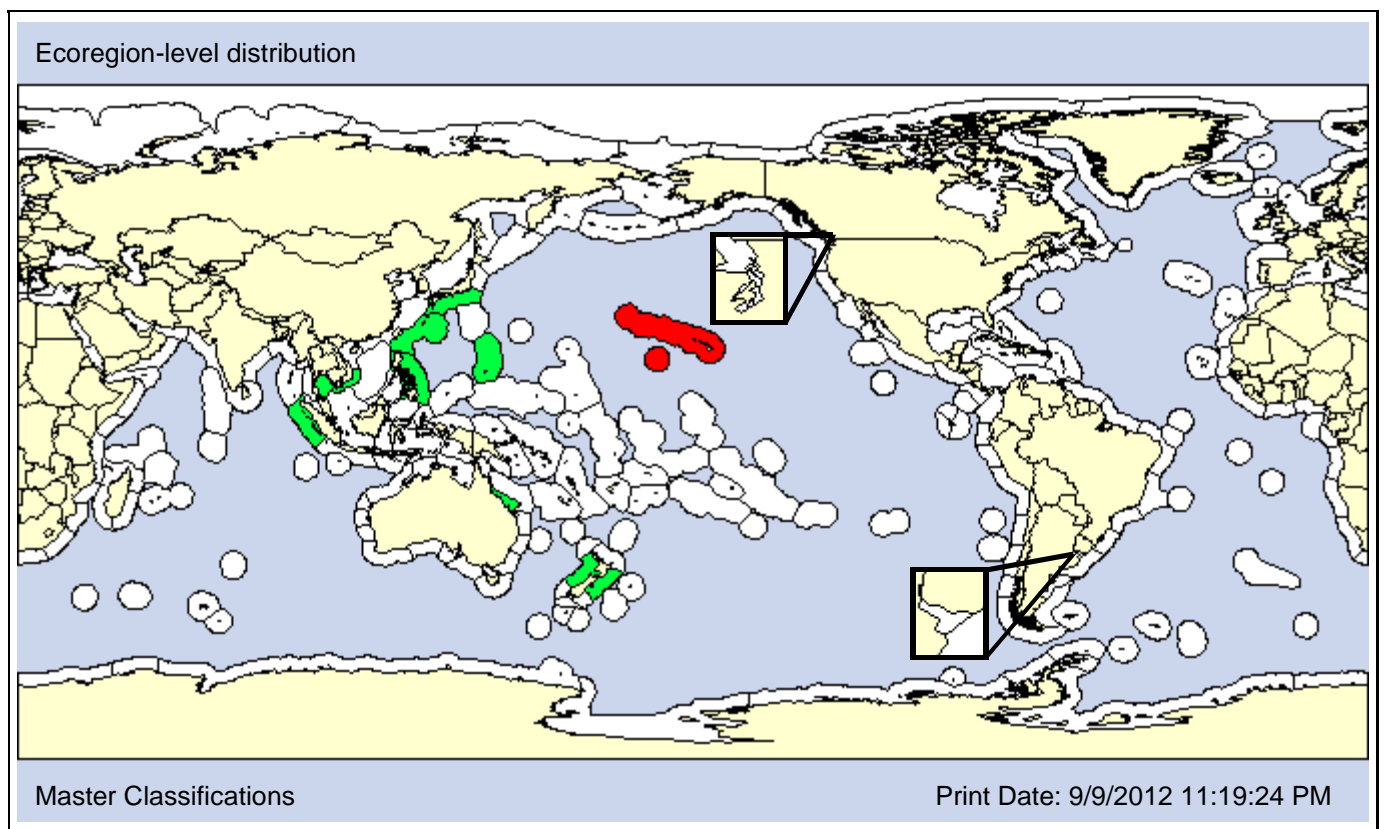
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Carybdea sivickisi	Synonym	
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**Type Locality:** Philippines



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1996  
**Loc 1st record:** Native Waikiki, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments: During the day, the box jellyfish, *Copula sivickisi* (= *Carybdea sivickisi*), attaches to the undersides of rocks or other hard substrates.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>			

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>												

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC	<b>X</b>						
						<b>X</b>							

**Kingdom: Animalia**

**Phylum: Cnidaria**

**Class: Hydrozoa**

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*Amphinema* sp. (Rees, 2000)

Species ID: 12343

**Taxon:** Hydrozoan

**Taxonomic Author:** Rees, 2000

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Filifera

**Infraorder:**

**Superfamily:**

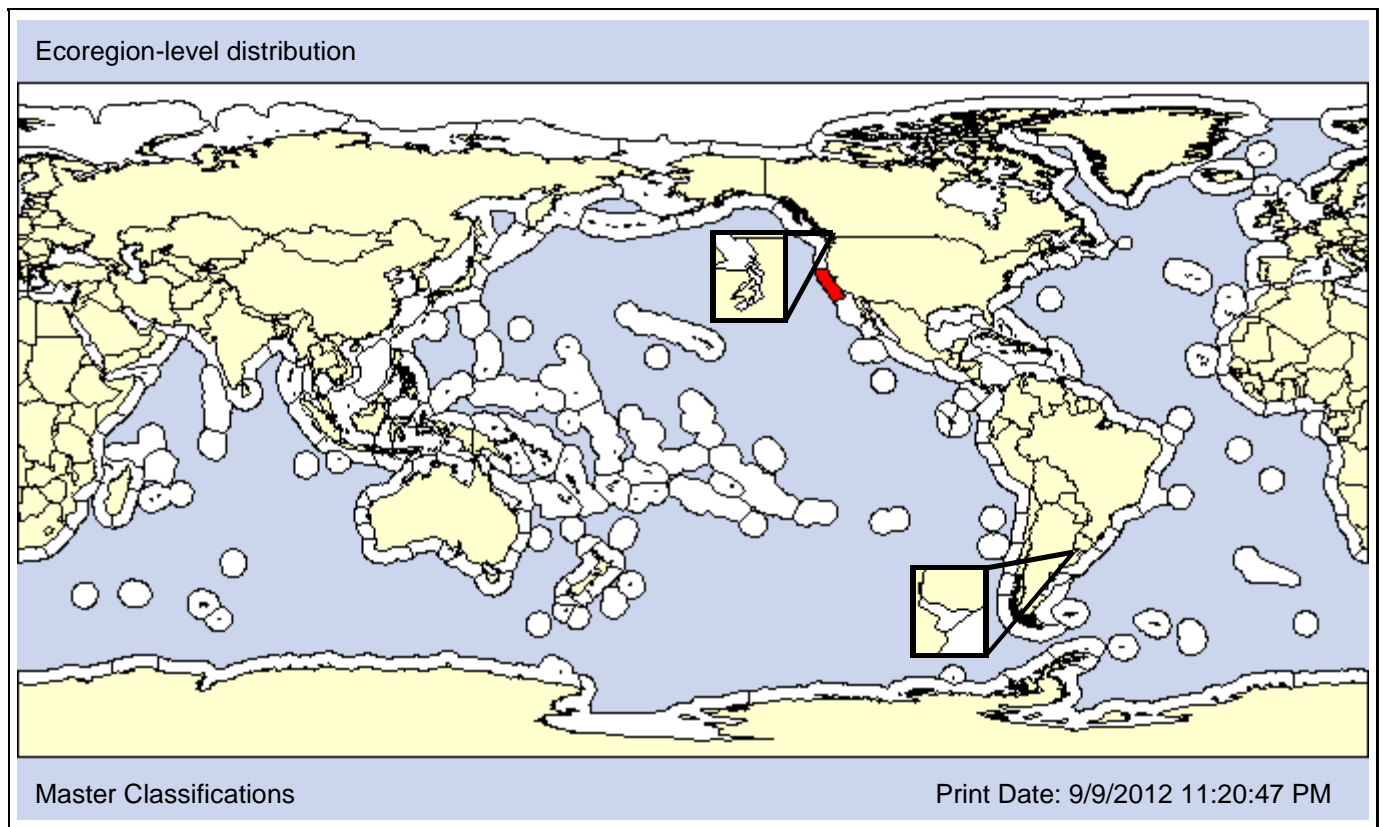
**Family:** Pandeidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1998

**Loc 1st record:**

Bodega Harbor, California

**Established:**

Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: The polyp of *Amphinema* sp. (Rees, 2000) most closely resembles *Amphinema rugosum* while the medusae most closely resembles *A. dinema*. Both of these are widely distributed over the globe but have not been reported from the NEP (Rees, 2000).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** Wright, 1859

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Filifera

**Infraorder:**

**Superfamily:**

**Family:** Bougainvilliidae

**Subfamily:**

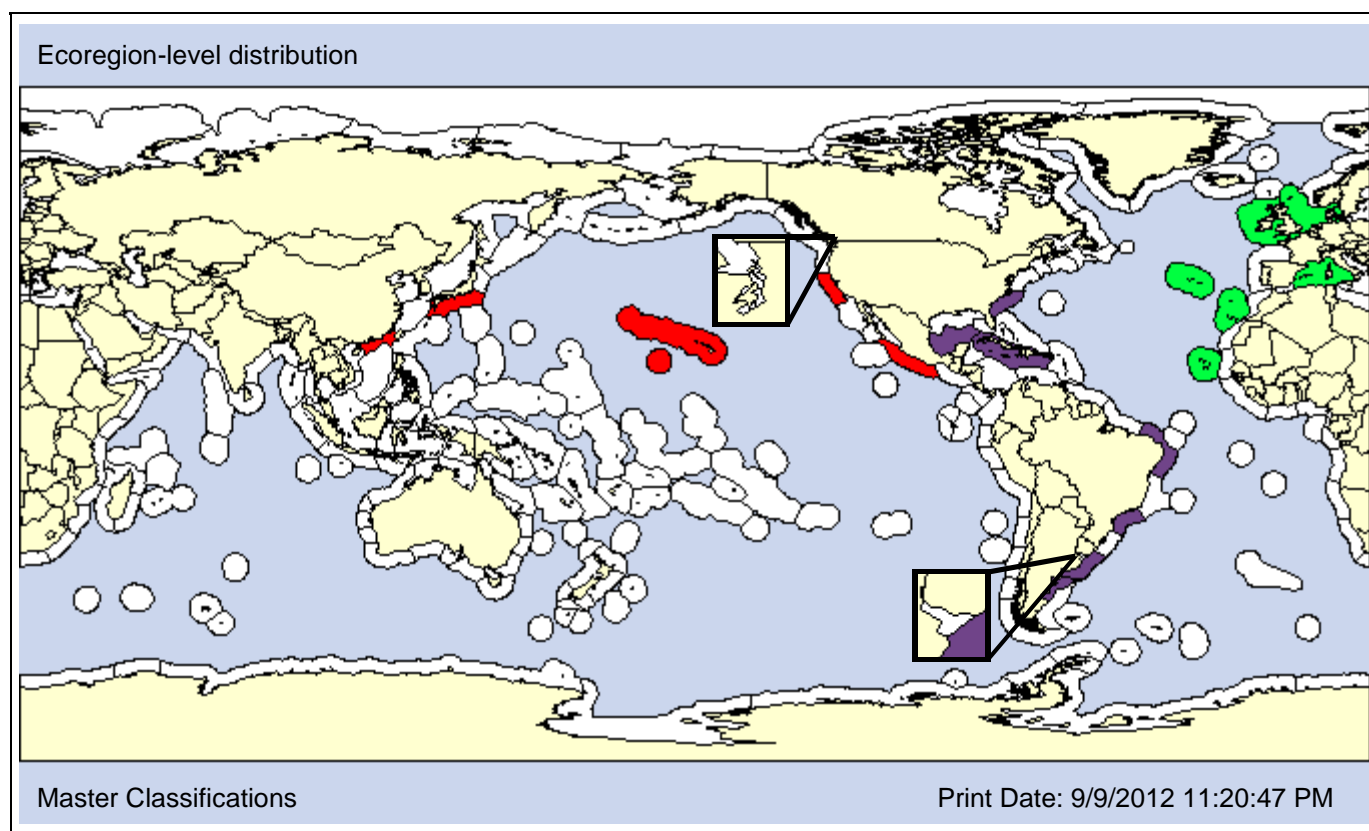
**Also Known As (Name - Type):**

Bimeria amoyensis	Synonym
Bimeria corynopsis	Synonym
Bimeria humilis	Synonym
Eudendrium vestitum	Synonym

**Common Names:**

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**Type Locality:** Firth of Forth, Scotland



■ Native  
 ■ Nonindigenous  
   NIS Not Established  
   Cryptogenic  
   Transient  
   Unclassified  
   Conflicting Classification  
   Unidentified

**NWP**

**Hawaii**

**NEP**

**Date 1st record:** Unknown

2009

1934

**Loc 1st record:** Sagami Bay, Japan

Oahu, Hawaii

San Francisco Estuary, CA

**Established:** Yes

Unknown

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: *Bimeria vestita* is introduced in the San Francisco Estuary and we assume that it is native to the NEA. By extension we classify it as nonindigenous in Hawaii, especially given its recent discovery (Calder, 2010), and in the NWP based on Hargitt's (1927) and Hirohito's (1988) reports from Southern China and Sagami Bay, Japan.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			X	X	

**DEPTH [Obs: 0 - 200m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O									P	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
		X	BP	EPS	EPU	EPC							X
						X							

**Taxon:** Hydrozoan

**Taxonomic Author:** Mayer, 1910

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Leptothecata

**Suborder:** Conica

**Infraorder:**

**Superfamily:**

**Family:** Blackfordiidae

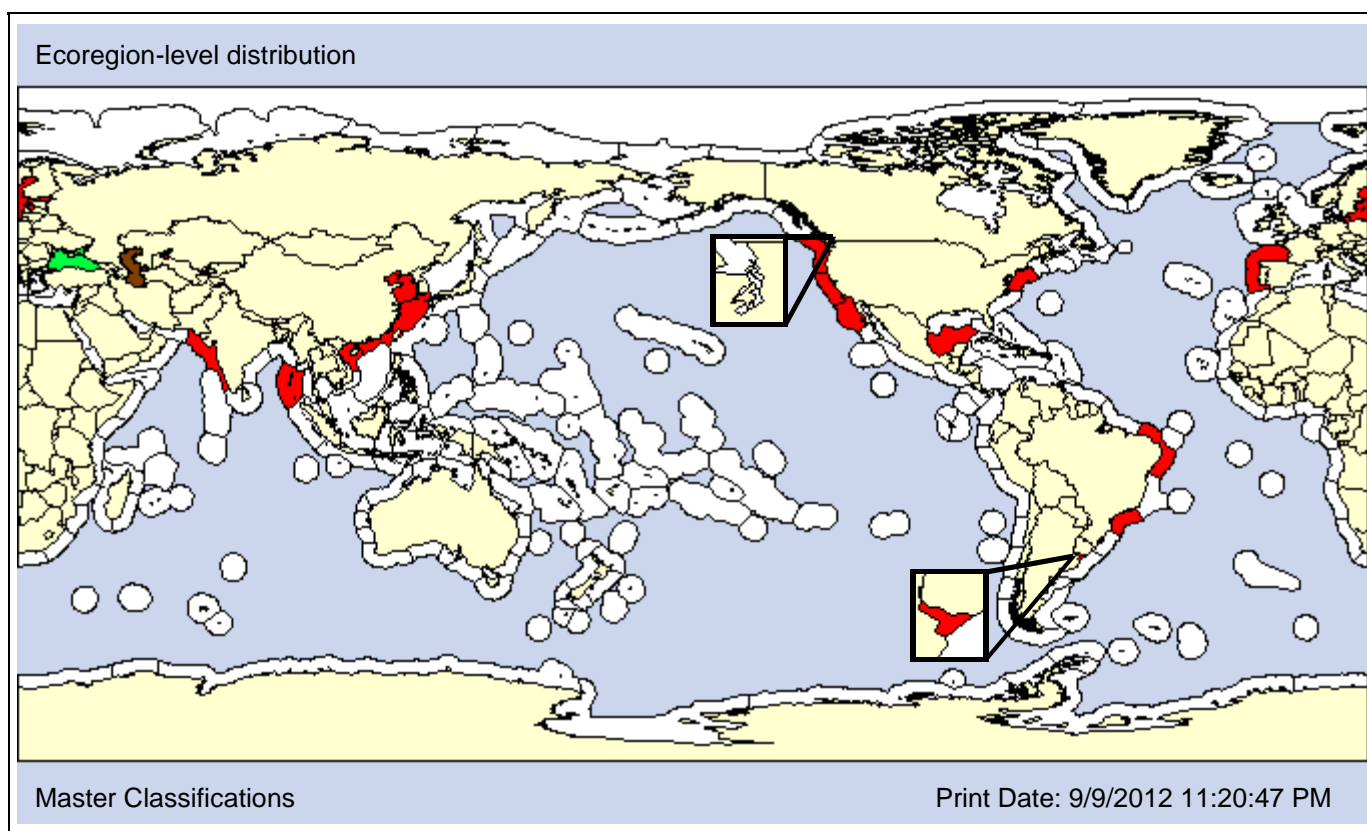
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Black Sea jelly fish

**Type Locality:** Virginia, USA



**Date 1st record:** Unknown

1970

**Loc 1st record:** Unknown

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: Cohen and Carlton (1995) consider *Blackfordia virginica* native to the Black and Caspian seas; however, it is listed as nonindigenous by the Caspian Sea Biodiversity Project (Aladin et al., 2006b). This estuarine hydroid has become widely introduced over the globe, including the NEP and NWP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 30m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>				<b>O</b>	<b>P</b>	<b>O</b>

**SALINITY [Obs: 1 - 35psu] [Pref: 14.9 - 22.2psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>	<b>X</b>		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** (Allman, 1863)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Filifera

**Infraorder:**

**Superfamily:**

**Family:** Bougainvilliidae

**Subfamily:**

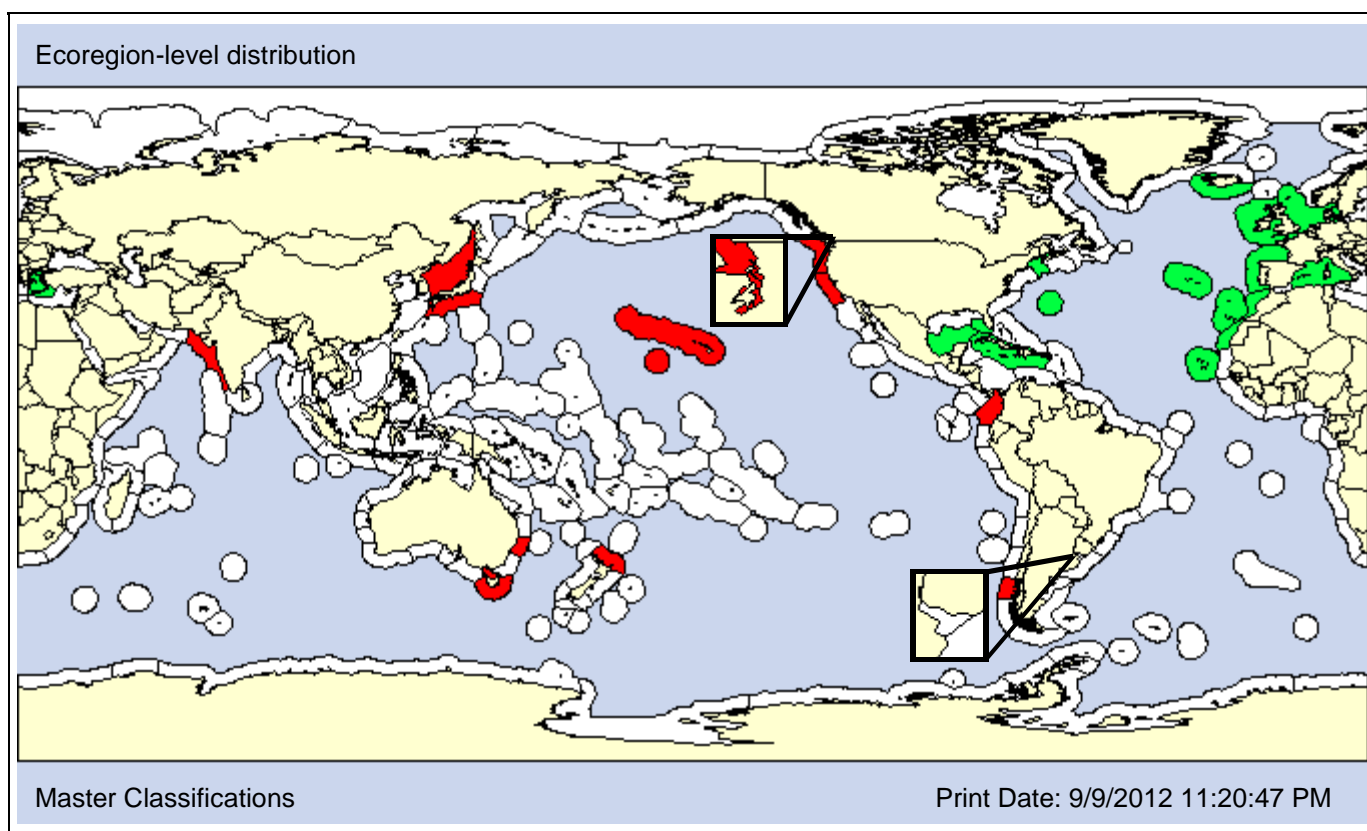
**Also Known As (Name - Type):**

Bougainvillia fruticosa	Synonym
Bougainvillia obscura	Synonym
Bougainvillia ramosa	Synonym
Perigonimus muscus	Synonym

**Common Names:**

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**Type Locality:** Devon, Great Britian



NWP

Hawaii

NEP

**Date 1st record:** Unknown

1967

1978

**Loc 1st record:** Sea of Japan

Kaneohe Bay, Hawaii

Friday Harbor, Washington

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
X		X				AO X	PO							

Comments: *Bougainvillia muscus* is native to the Atlantic and considered introduced in the Pacific (Carlton and Eldredge, 2009) and Mills et al. (2007) considers it "probably introduced in bays and harbors" in the NEP. *B. ramosa* (= *B. muscus*) has been reported from wharfs in the Northwestern Sea of Japan (Chaplygina, 2006).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 1200m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>	<b>P</b>				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>					<b>O</b>				<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Hydrozoan

**Taxonomic Author:** Naumov, 1955

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Capitata

**Infraorder:**

**Superfamily:**

**Family:** Cladonematidae

**Subfamily:**

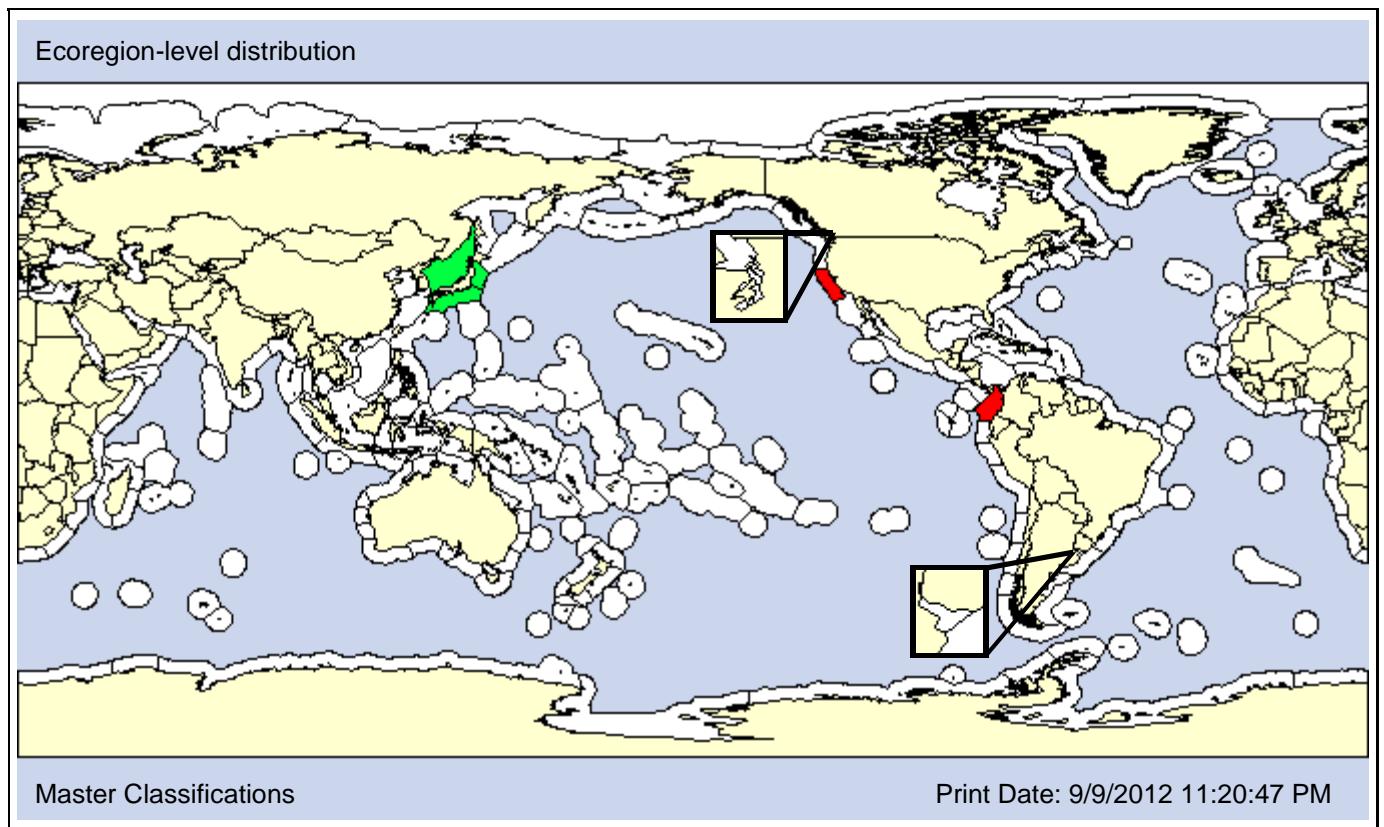
**Also Known As (Name - Type):**

Cladonema radiatum var. mayeri  
Cladonema pacifica  
Cladonema uchidai

Synonym  
Convention  
Synonym

**Common Names:**

**Type Locality:** Sea of Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1979  
**Loc 1st record:** Native San Francisco Estuary, CA  
**Established:** Yes Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: *Cladonema pacificum* (= *C. uchidai*) was found in a display tank at the Univ. of CA Berkeley and is presumed to occur within the San Francisco Estuary (Mills et al., 2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>					<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** Dujardin, 1843

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Capitata

**Infraorder:**

**Superfamily:**

**Family:** Cladonematidae

**Subfamily:**

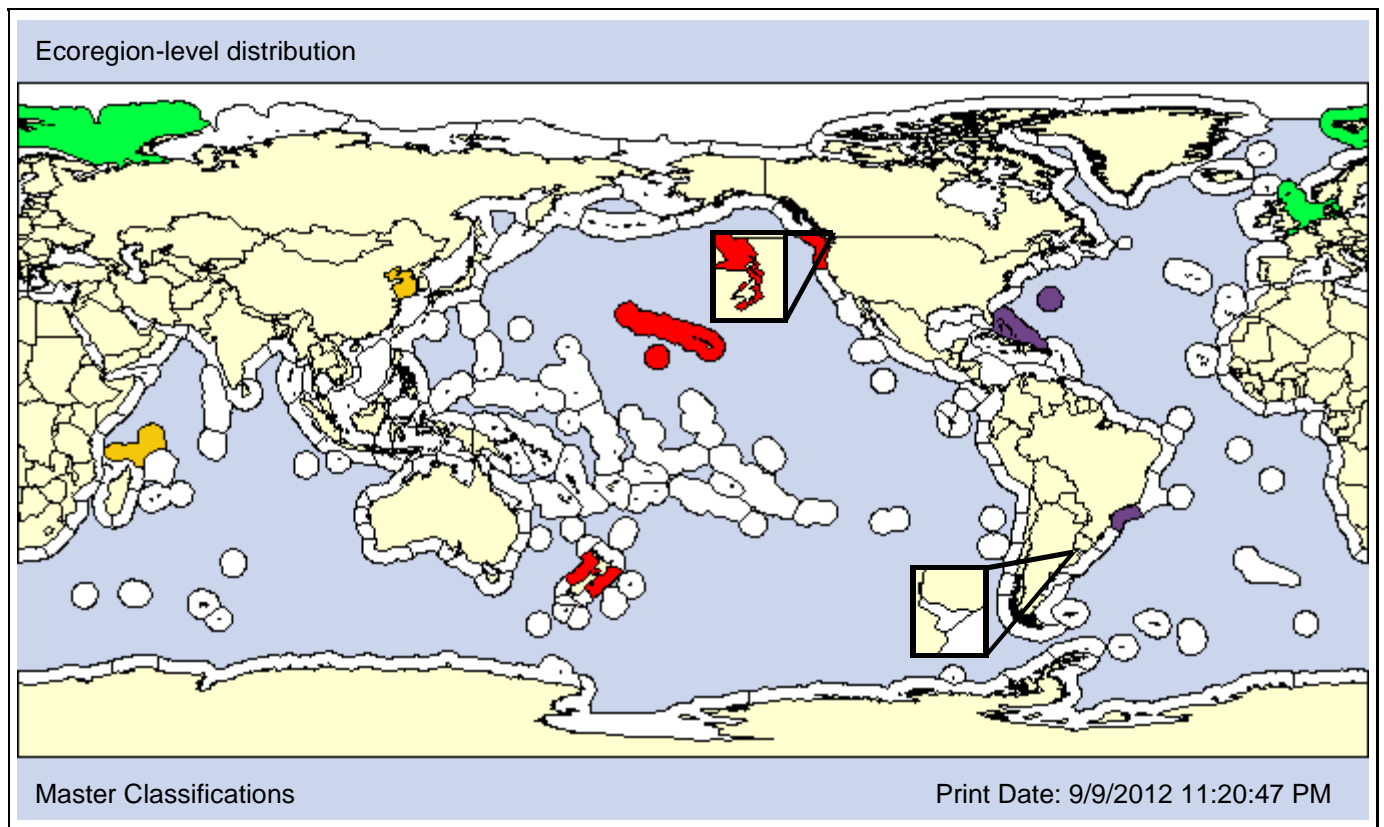
**Also Known As (Name - Type):**

Cladonema mayeri	Synonym
Cladonema perkinsii	Synonym
Stauridium radiatum	Synonym

**Common Names:**

root-arm medusa
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**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** Unknown                      1972                      1988  
**Loc 1st record:** Unknown                      Oahu, Hawaii                      Puget Sound, WA  
**Established:** Yes                      Yes                      Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: Rees (1982) considers that the East Asia records of *Cladonema radiatum* are likely *C. uchida* (= *C. pacificum*). Because of this uncertainty, we classify the NWP and Indian Ocean records as cryptogenic.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>					<b>O</b>	

**SALINITY [Obs: 16.5 - 35psu] [Pref: - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** (Forsskål, 1775)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Filifera

**Infraorder:**

**Superfamily:**

**Family:** Hydractiniidae

**Subfamily:**

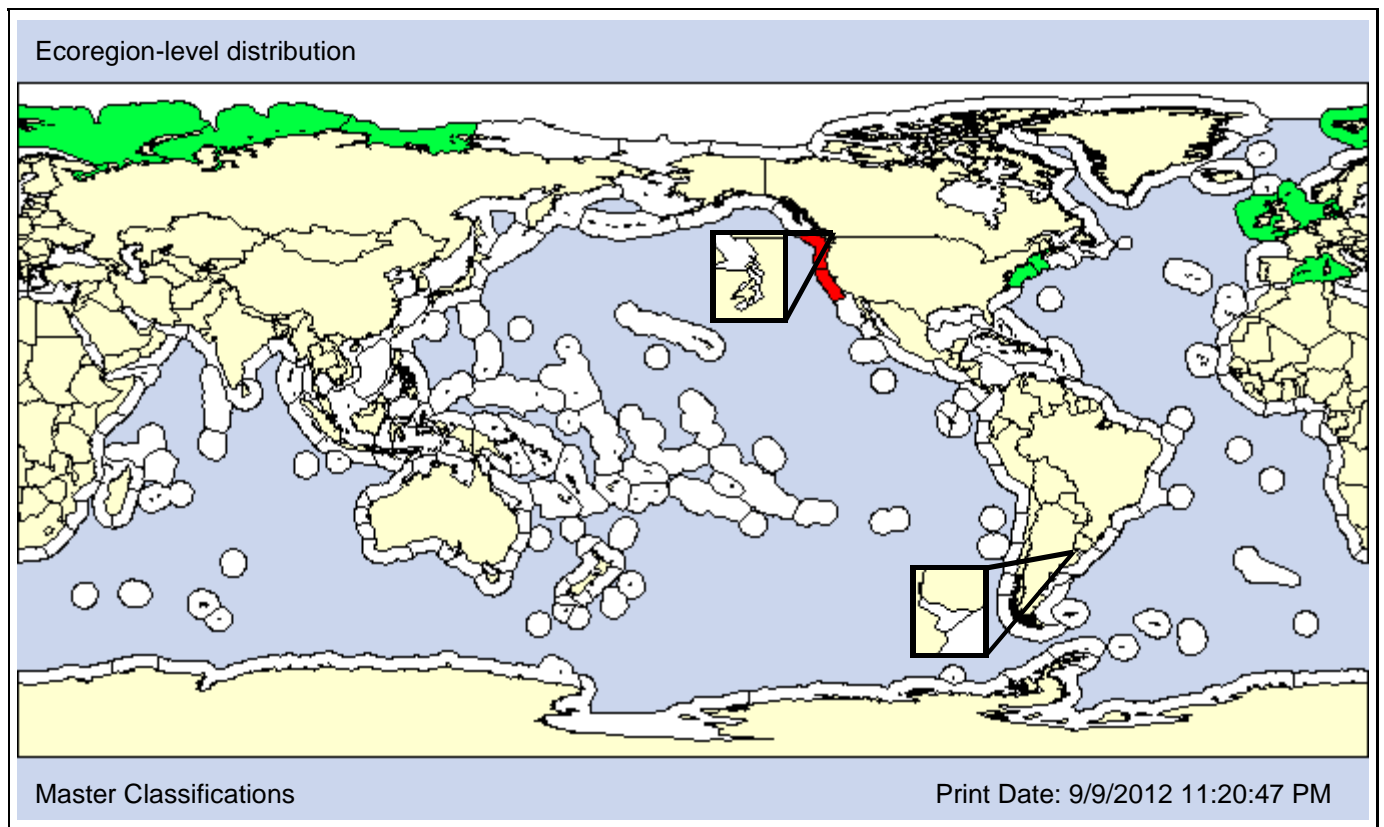
**Also Known As (Name - Type):**

Clava leptostyla	Synonym

**Common Names:**

club headed hydroid
club hydroid

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1895

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Unknown

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
		<b>X</b>			<b>AO X</b>	PO									

Comments: Whether the *Clava multicornis* reported from the San Francisco Estuary is the European species is uncertain (Mills et al., 2007). It is also uncertain whether *C. multicornis* still occurs in the NEP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>P</b>								<b>P</b>	<b>O</b>		

**SALINITY [Obs: 15 - 40psu] [Pref: 16 - 32psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
			<b>P</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** (Linnaeus, 1767)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Leptothecata

**Suborder:** Proboscoida

**Infraorder:**

**Superfamily:**

**Family:** Campanulariidae

**Subfamily:**

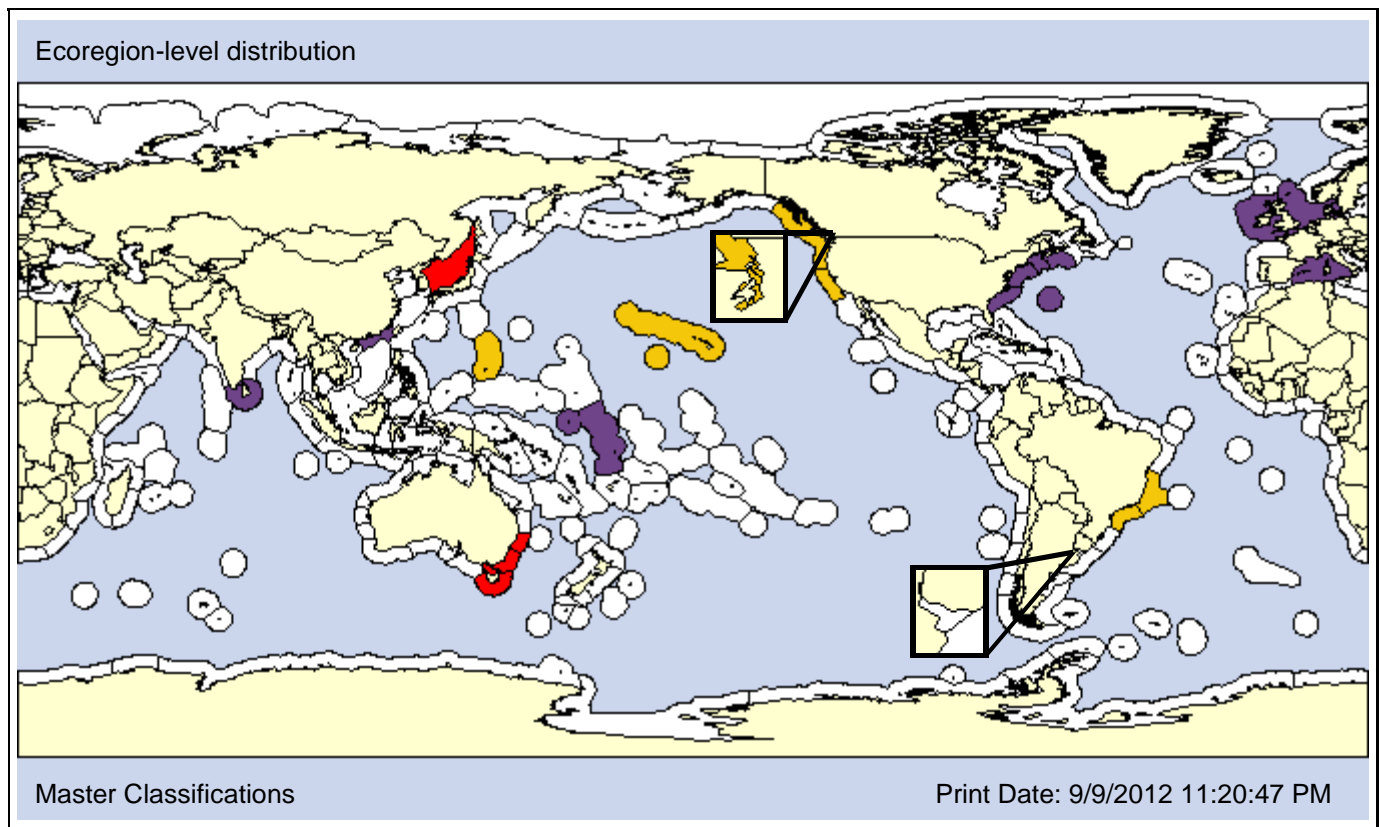
**Also Known As (Name - Type):**

Campanularia gigantea	Synonym
Campanularia johnstoni	Synonym
Campanularia raridentata	Synonym
Clytia bicophora	Synonym

**Common Names:**

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**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>		<b>NEP</b>		

<b>Date 1st record:</b> Unknown	1972	Unknown
<b>Loc 1st record:</b> Unknown	Kaneohe Bay, Hawaii	Unknown
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

SH <b>X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: The native region of *Clytia hemisphaerica* [= *Campanularia johnstoni*] is not known. Regional classifications are used where available, otherwise it is listed as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH				<b>X</b>	
	<b>X</b>												

**DEPTH [Obs: 0 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>				<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 28 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							



**Taxon:** Hydrozoan

**Taxonomic Author:** (Pallas, 1771)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Filifera

**Infraorder:**

**Superfamily:**

**Family:** Cordylophoridae

**Subfamily:**

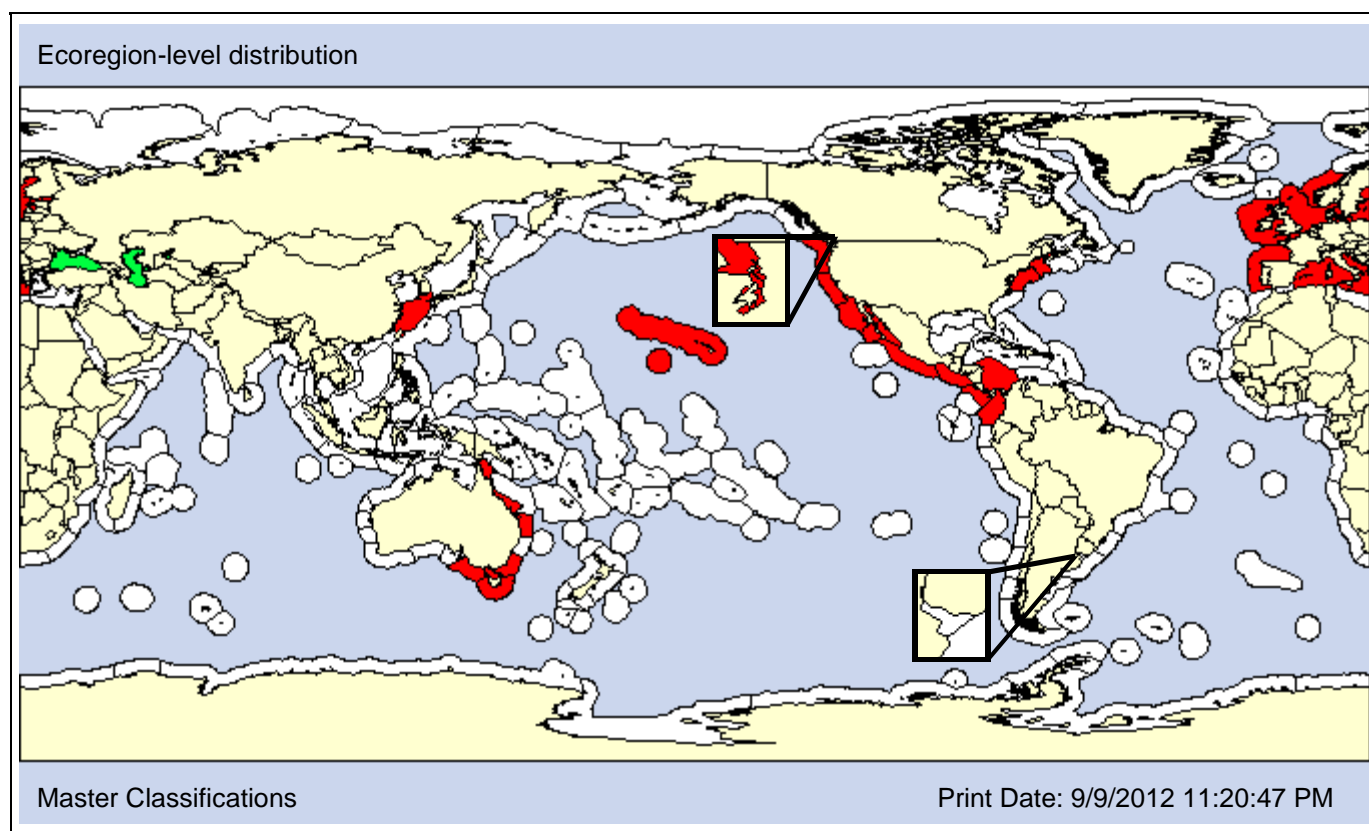
**Also Known As (Name - Type):**

Cordylophora albicola	Synonym
Cordylophora lacustris	Synonym
Cordylophora whiteleggi	Synonym
Tubularia cornea	Synonym

**Common Names:**

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**Type Locality:**



NWP

Hawaii

NEP

**Date 1st record:** Unknown

1974

ca. 1920

**Loc 1st record:** Unknown

Maui, Hawaii

Puget Sound, WA

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR	<b>X</b>		A	P			
<b>X</b>		<b>X</b>				<b>AO X</b>	PO					<b>X</b>			

Comments: *Cordylophora caspia* is a freshwater and low salinity species, while at higher salinities it forms a resistant stage. According to DAISIE, "this hydroid is known in temperate and tropical coastal regions of every continent (except Antarctica), and in many fresh waters." *C. caspia* has a planulae larvae but no medusoid stage.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 15m] [Pref: 0 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>						<b>O</b>				<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 0 - 35psu] [Pref: 0.2 - 15psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		
<b>X</b>					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Capitata

**Infraorder:**

**Superfamily:**

**Family:** Corymorphidae

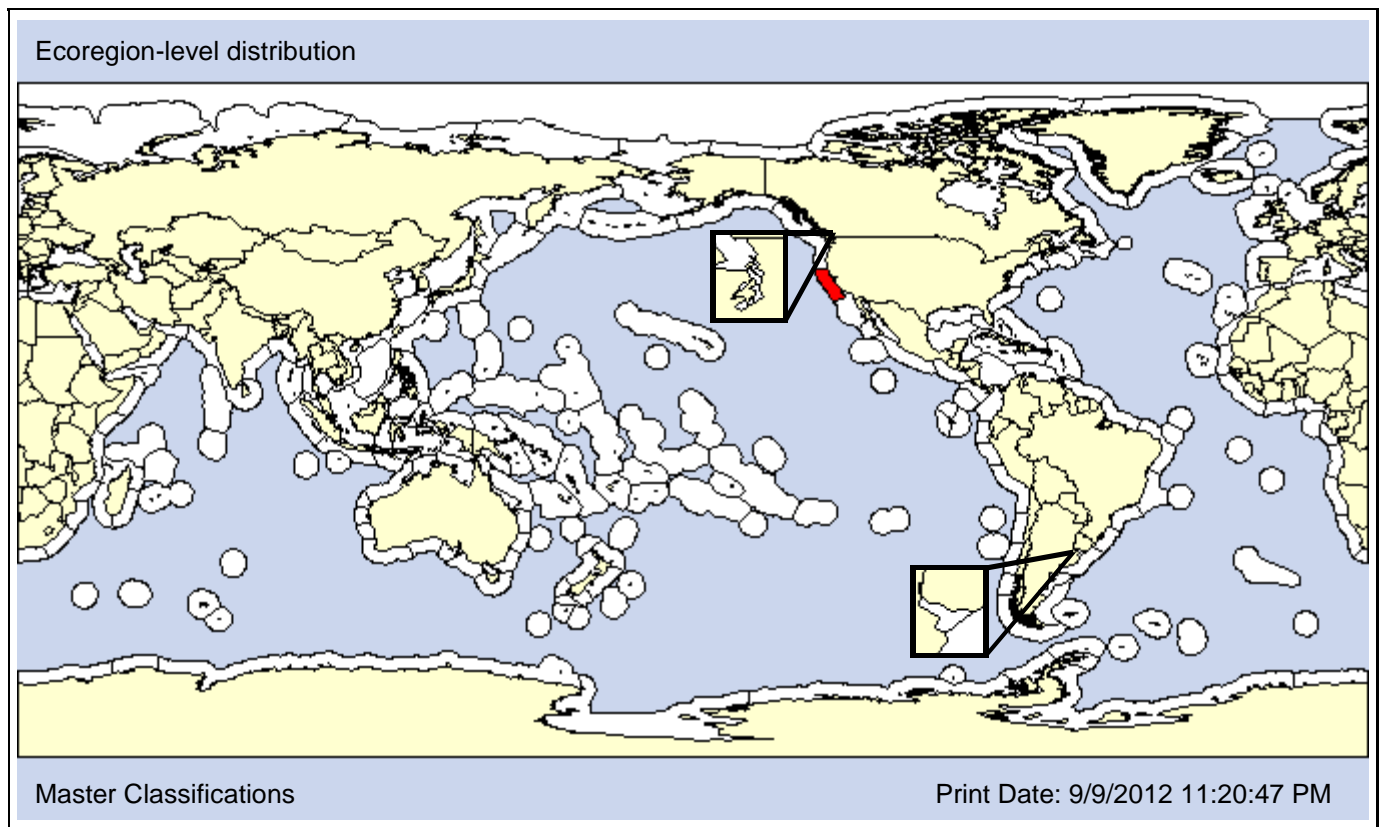
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Corymorpha sp. A LSM4	Synonym	
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**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1955

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
<b>X</b>		<b>X</b>				AO	PO								

Comments: The unidentified *Corymorpha* in the San Francisco Estuary is similar to the European *C. nutans* but the taxonomy is unresolved (CANOD, 2009). It was found on mud bottoms.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>												

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** (Torrey, 1902)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Filifera

**Infraorder:**

**Superfamily:**

**Family:** Bougainvilliidae

**Subfamily:**

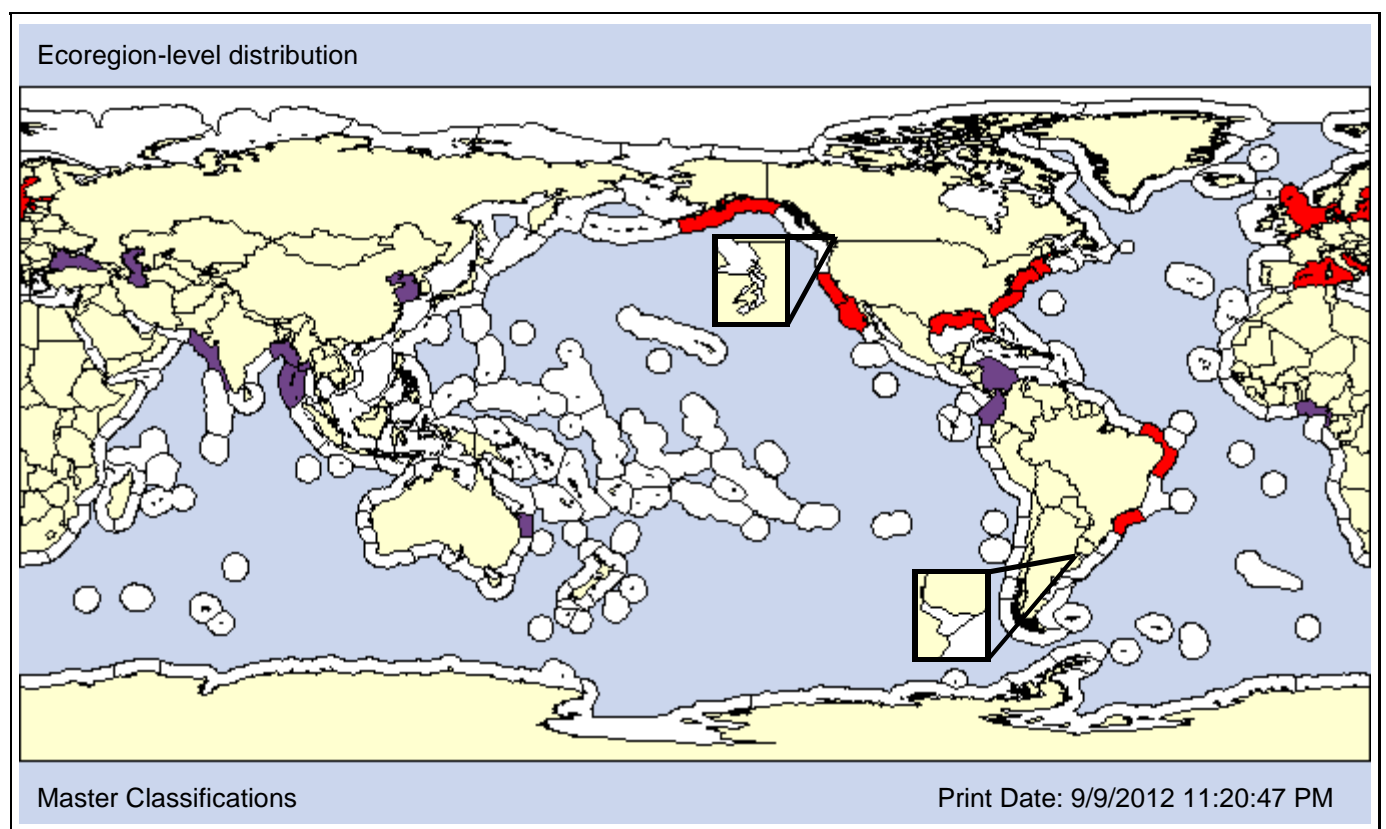
**Also Known As (Name - Type):**

Bimeria franciscana	Synonym
Bimeria monodi	Synonym
Bimeria tunicata	Synonym
Perigonimus megas	Synonym

**Common Names:**

rope grass hydroid
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**Type Locality:** San Francisco Estuary, California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Unknown 1901  
**Loc 1st record:** Unknown San Francisco Estuary, CA  
**Established:** Unknown Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: The native range of *Garveia franciscana* is unknown. Calder (1997) suggested the Black Sea/Caspian Sea may be its origin while Carlton (2009) proposed the South Pacific - Indian Ocean as the native region. We use regional classifications when available; elsewhere we list it as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 55m] [Pref: 0 - 4m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>									<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 1 - 35psu] [Pref: 3 - 10psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Filifera

**Infraorder:**

**Superfamily:**

**Family:** Bougainvilliidae

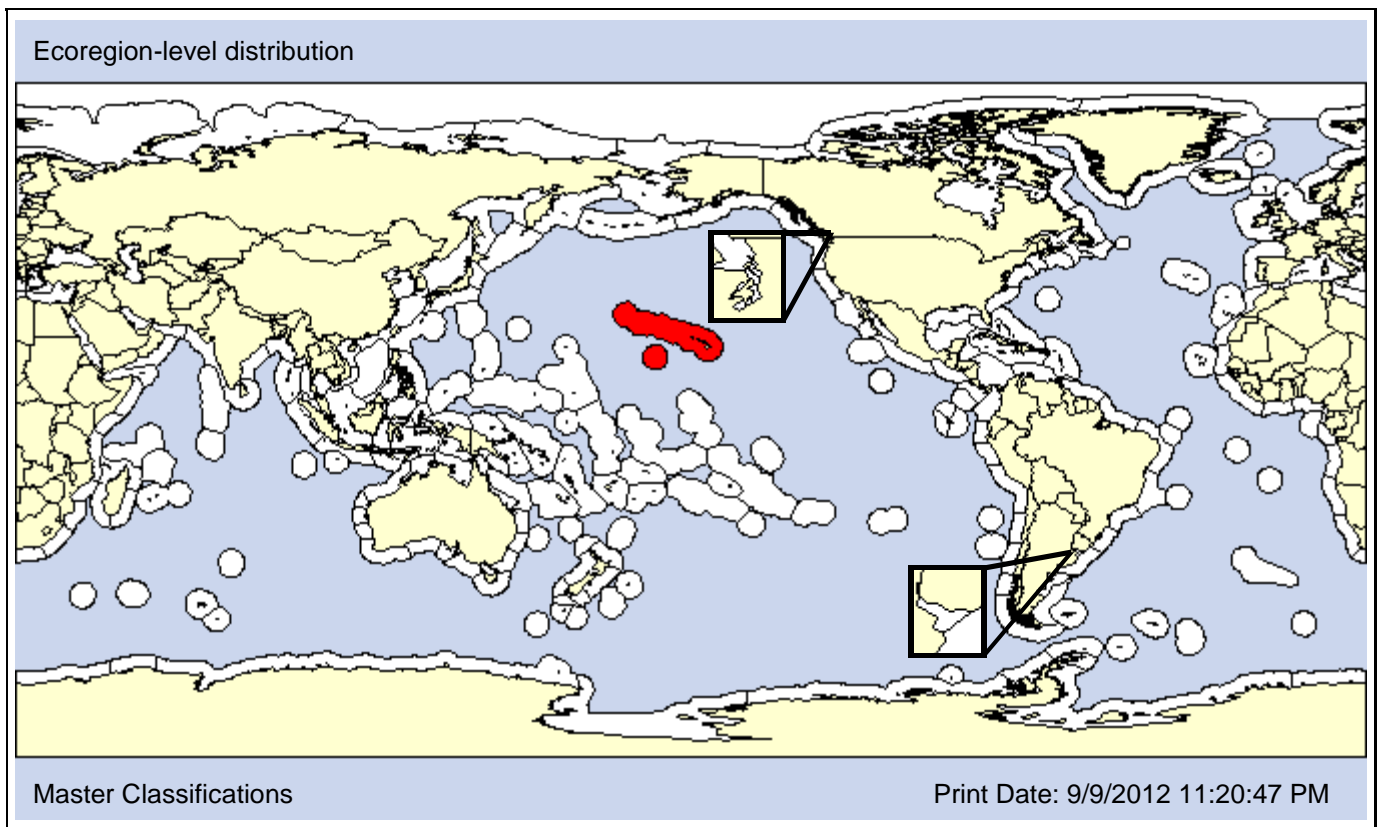
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Garveia humilis of Grovhoug and Rastetter (1980)	Ambiguous syn.	
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**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1972  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: This unidentified *Garveia* was found on the hydroid *Pennaria* in Hawaii in 1972. It has been identified as *G. humilis* but Carlton and Eldredge (2009) consider this identification requires confirmation.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>			Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep				
			<b>O</b>					

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Hydrozoan

**Taxonomic Author:** (Allman, 1859)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Leptothecata

**Suborder:** Proboscoida

**Infraorder:**

**Superfamily:**

**Family:** Campanulariidae

**Subfamily:**

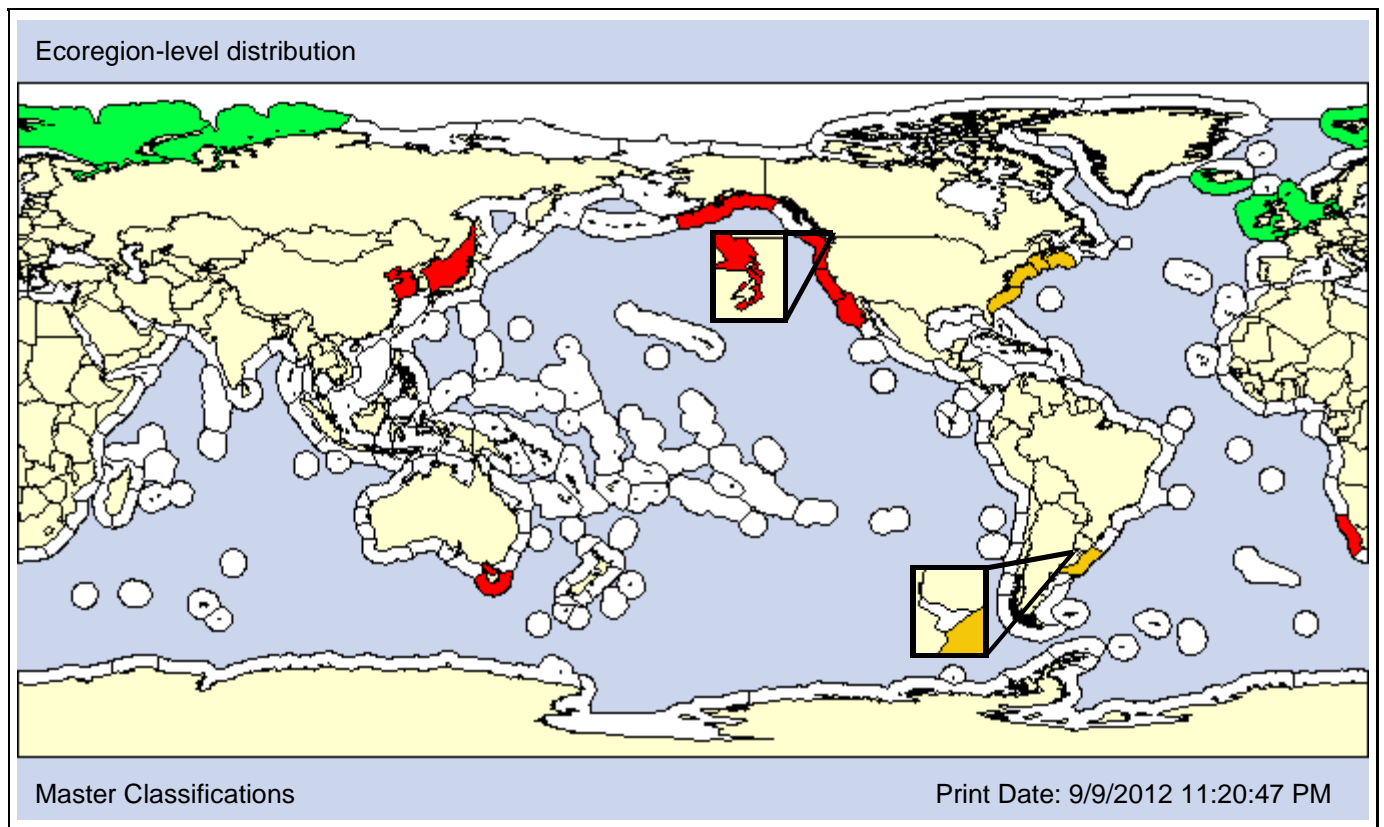
**Also Known As (Name - Type):**

Gonothyraea clarki	Synonym
Gonothyraea hyalina	Synonym
Laomedea loveni	Synonym
Obelia loveni	Synonym

**Common Names:**

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**Type Locality:** Shetland, Scotland



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1980

1895

**Loc 1st record:** Strait of Tartary

San Fransico Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
		<b>X</b>			<b>AO X</b>	PO									

Comments: The synonymy of *Gonothyraea loveni* and *G. clarki* is "generally accepted but requires confirmation" (Mills et al., 2007). Based on its apparent European origin and that *G. loveni* is the only representative of *Gonothyraea* in the Pacific, we classify it as NIS in the Pacific. CANOD (2009) classifies it as cryptogenic in California.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	
		<b>X</b>											

**DEPTH [Obs: 0 - 124m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>O</b>	

**SALINITY [Obs: 7 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						<b>X</b>
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** (Hincks, 1871)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Leptothecata

**Suborder:** Proboscoida

**Infraorder:**

**Superfamily:**

**Family:** Campanulariidae

**Subfamily:**

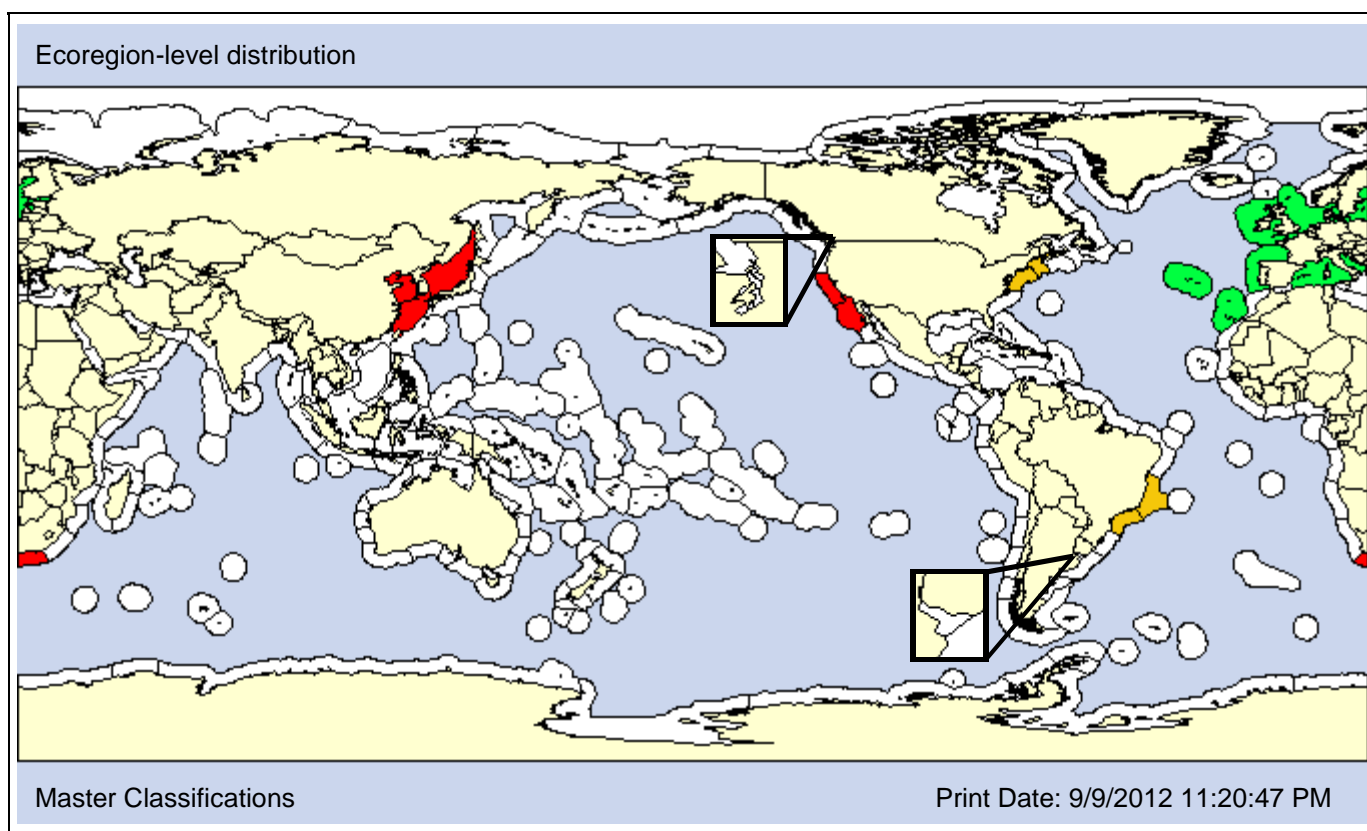
**Also Known As (Name - Type):**

Campanularia calceolifera  
 Eulaomedea calceolifera  
 Laomedea conferta  
 Laomedea calceolifera

Synonym  
 Synonym  
 Synonym  
 Misspelling

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1875

1990

**Loc 1st record:** Yellow Sea

Southern California

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: The status of *Laomedea calceolifera* in the NEP is confused. Cohen et al. (2005) reported its first NEP occurrence in the San Francisco Estuary in 2004, and it is "frequent in harbors and estuaries" (Mills et al., 2007). However, it was reported as common offshore in Southern California since the 1990s (SCAMIT, 2003b).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 3 - 190m] [Pref: - 60m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 76%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>								<b>P</b>	<b>O</b>	

**SALINITY [Obs: 24.5 - 33.17psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** Alder, 1857

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Leptothecata

**Suborder:** Proboscoida

**Infraorder:**

**Superfamily:**

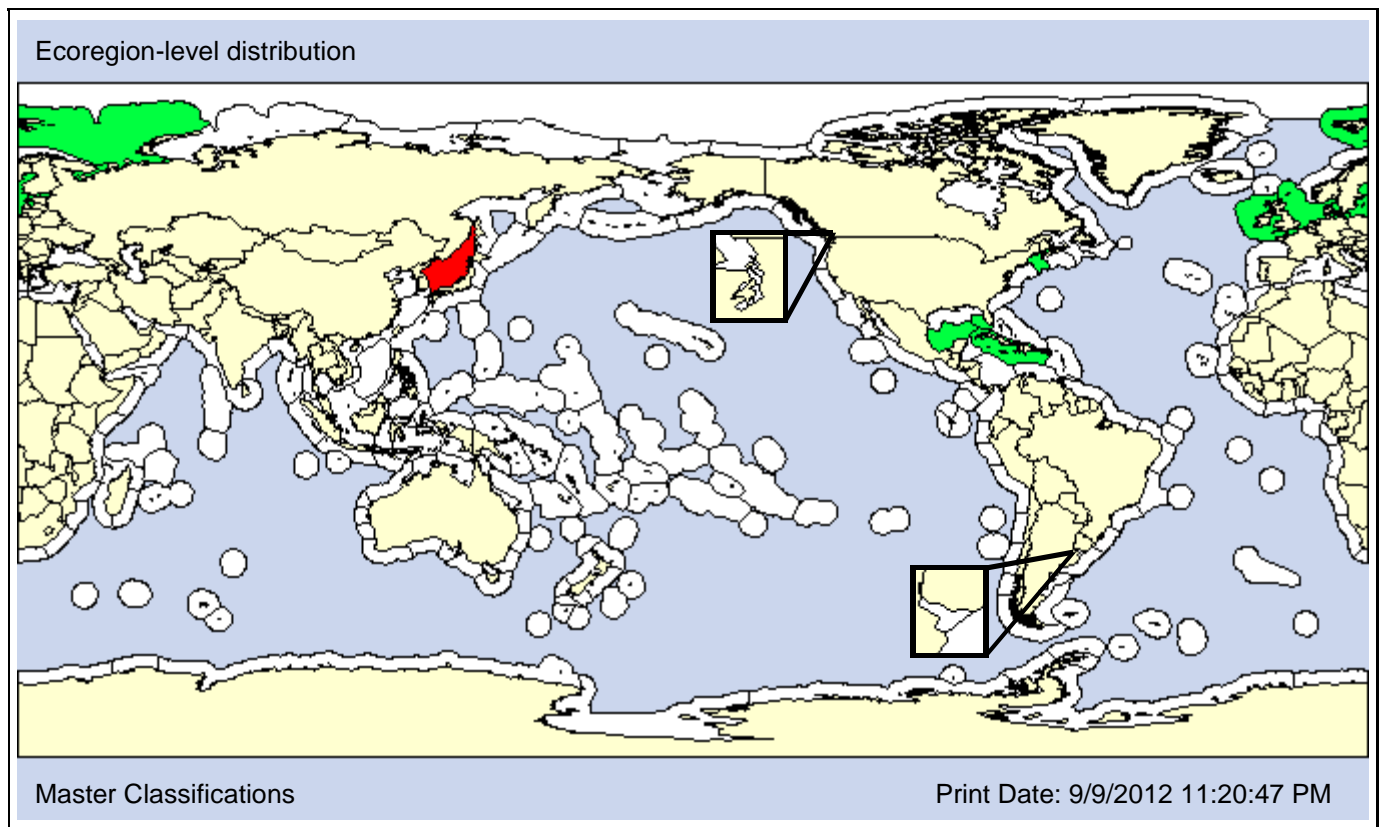
**Family:** Campanulariidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1990s

**Loc 1st record:** Peter the Great Bay, Russia

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>		<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 55m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>								<b>P</b>	<b>P</b>	

**SALINITY [Obs: 6.5 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** (Modeer, 1791)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Trachylinae

**Infraclass:**

**Superorder:**

**Order:** Limnomedusae

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Olindiasidae

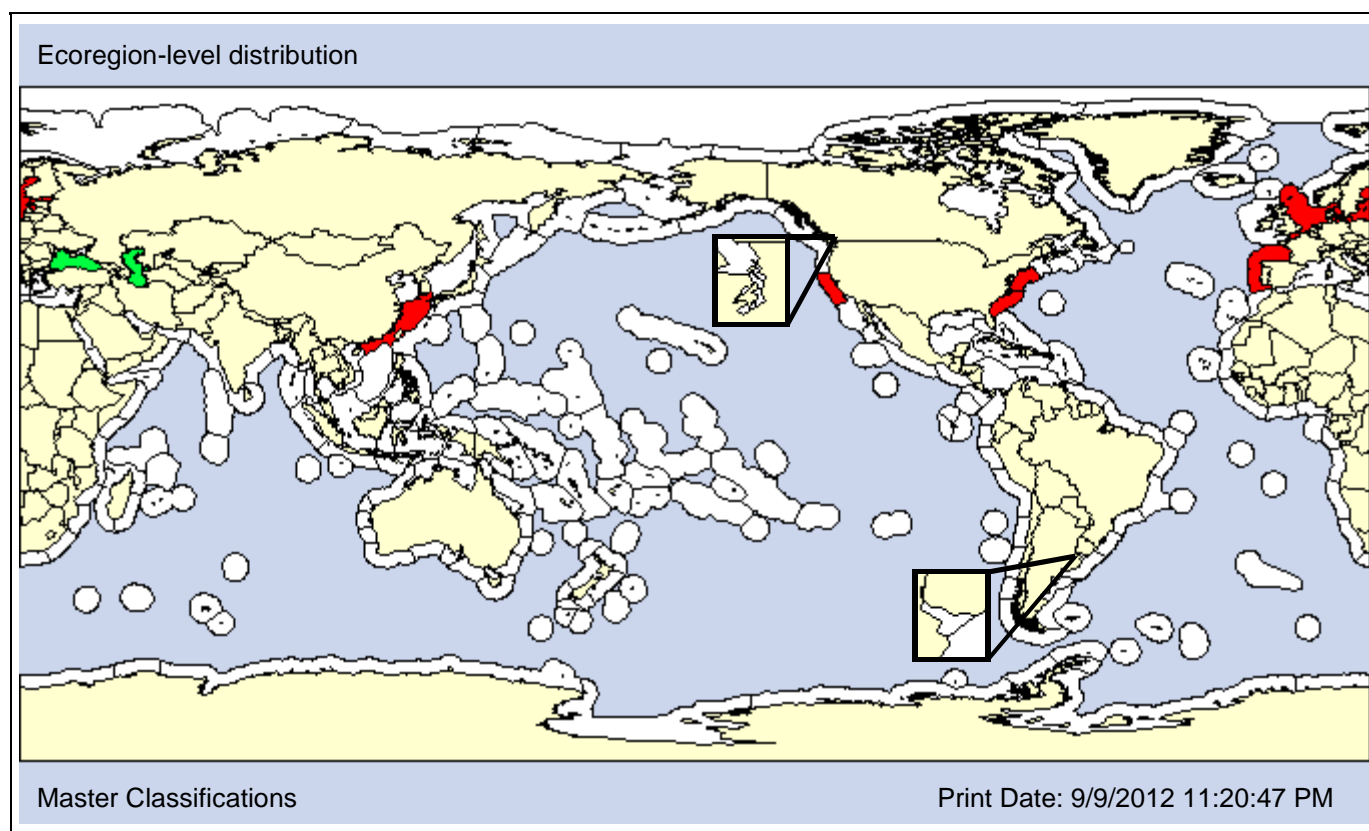
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Maeotias inexpectata	Synonym	Black Sea jellyfish
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown

1959?

**Loc 1st record:** Unknown

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0.5 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>O</b>	

**SALINITY [Obs: 3 - 13psu] [Pref: 5 - 10psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
		<b>P</b>	<b>P</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Hydrozoan

**Taxonomic Author:** Rees & Gershwin, 2000

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Capitata

**Infraorder:**

**Superfamily:**

**Family:** Moerisiidae

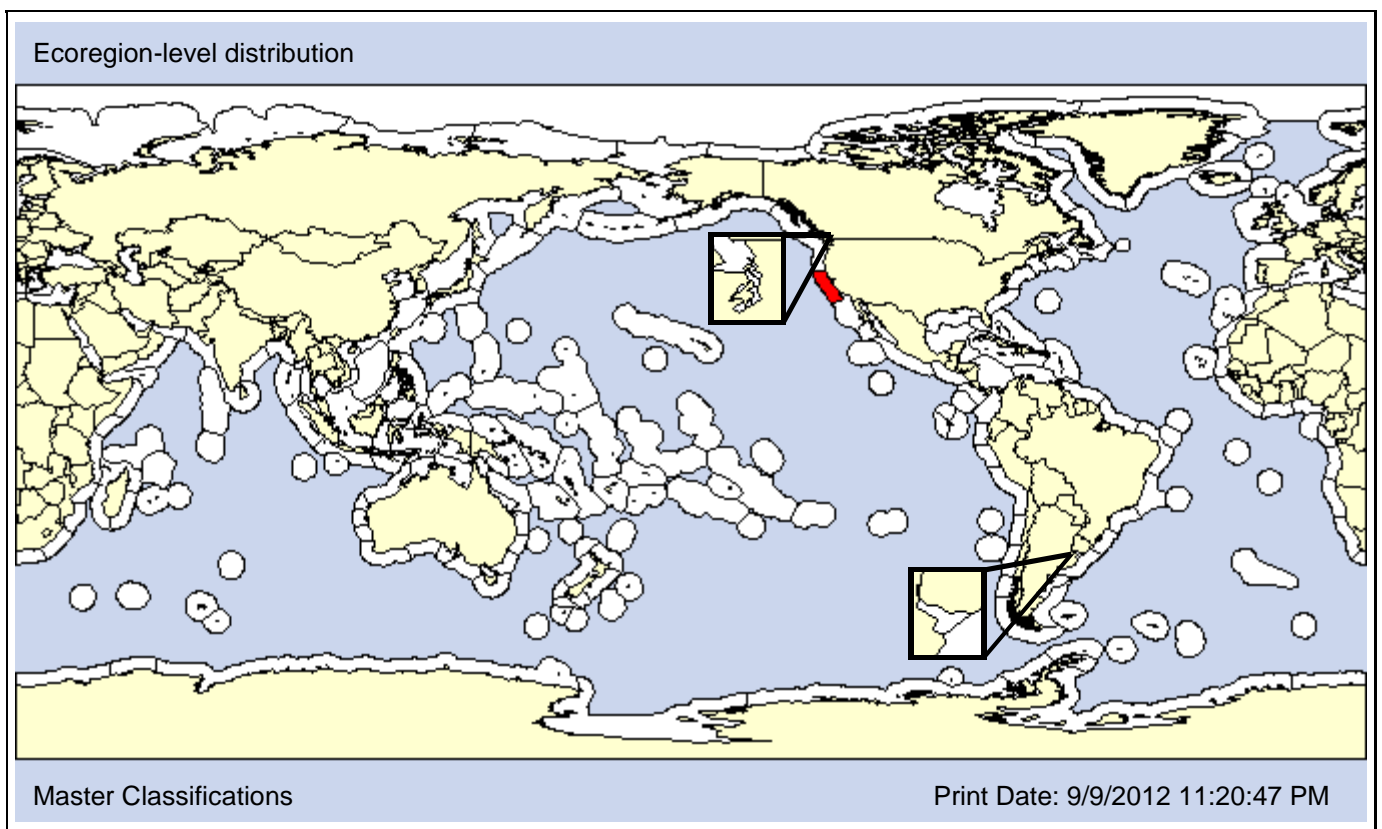
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Moerisia lyonsi of Cairns et al. (2002); not Boulenger, 1908 Misidentified

**Type Locality:** California, USA



**Date 1st record:**

1993

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: According to Rees and Gershwin (2000), the *Moerisia* sp. in the San Francisco Estuary is assumed to be part of the "relict brackish-water Sarmatic fauna native to the Black and Caspian Seas."

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0.5 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>O</b>	

**SALINITY [Obs: 0 - 11psu] [Pref: - 10psu]**

<b>Fresh O</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>P</b>					

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** Clark, 1875

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Leptothecata

**Suborder:** Proboscoida

**Infraorder:**

**Superfamily:**

**Family:** Campanulariidae

**Subfamily:**

**Also Known As (Name - Type):**

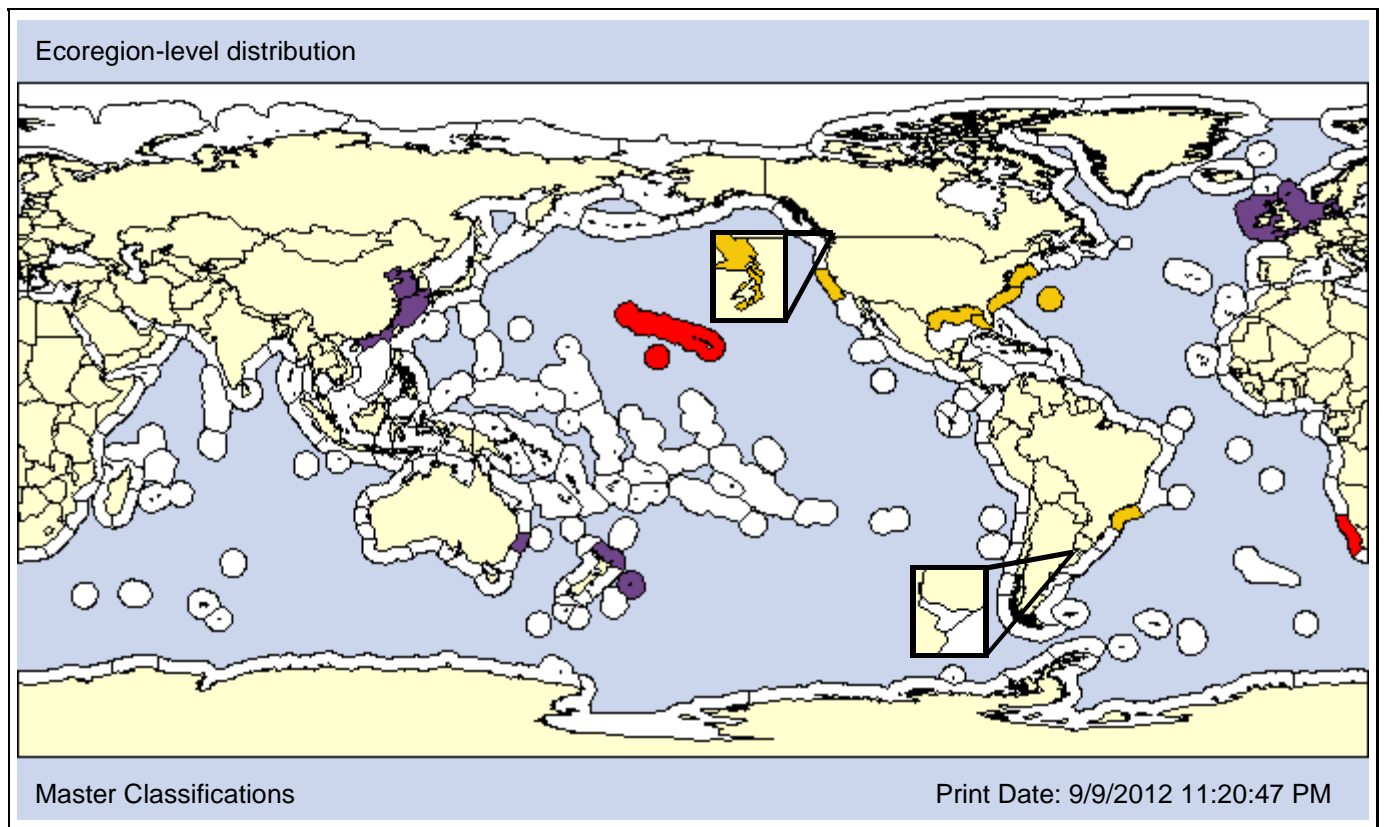
Laomedea bicuspidata  
Obelia bicuspidata  
Obelia corona

Synonym  
Synonym  
Synonym

**Common Names:**

doubletoothed hydroid

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii		NEP	

**Date 1st record:** Unknown                      1946                      1912  
**Loc 1st record:** Unknown                      Hawaii                      San Francisco Estuary, CA  
**Established:**    Yes                      Yes                      Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: The native range of *Obelia bidentata* is unknown, though Carlton and Eldredge (2009) suggested that it might be of Atlantic origin. We use regional classifications when available otherwise we list it as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
		X											

**DEPTH [Obs: 0 - 200m] [Pref: 0 - 22m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic P			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
O	P	O				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 9 - 56%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					O	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O							O		O	O	P

**SALINITY [Obs: 26 - 31psu] [Pref: 26 - 31psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						P			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X				X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
		X	BP	EPS	EPU	EPC							X
						X							

**Taxon:** Hydrozoan

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Leptothecata

**Suborder:** Proboscoida

**Infraorder:**

**Superfamily:**

**Family:** Campanulariidae

**Subfamily:**

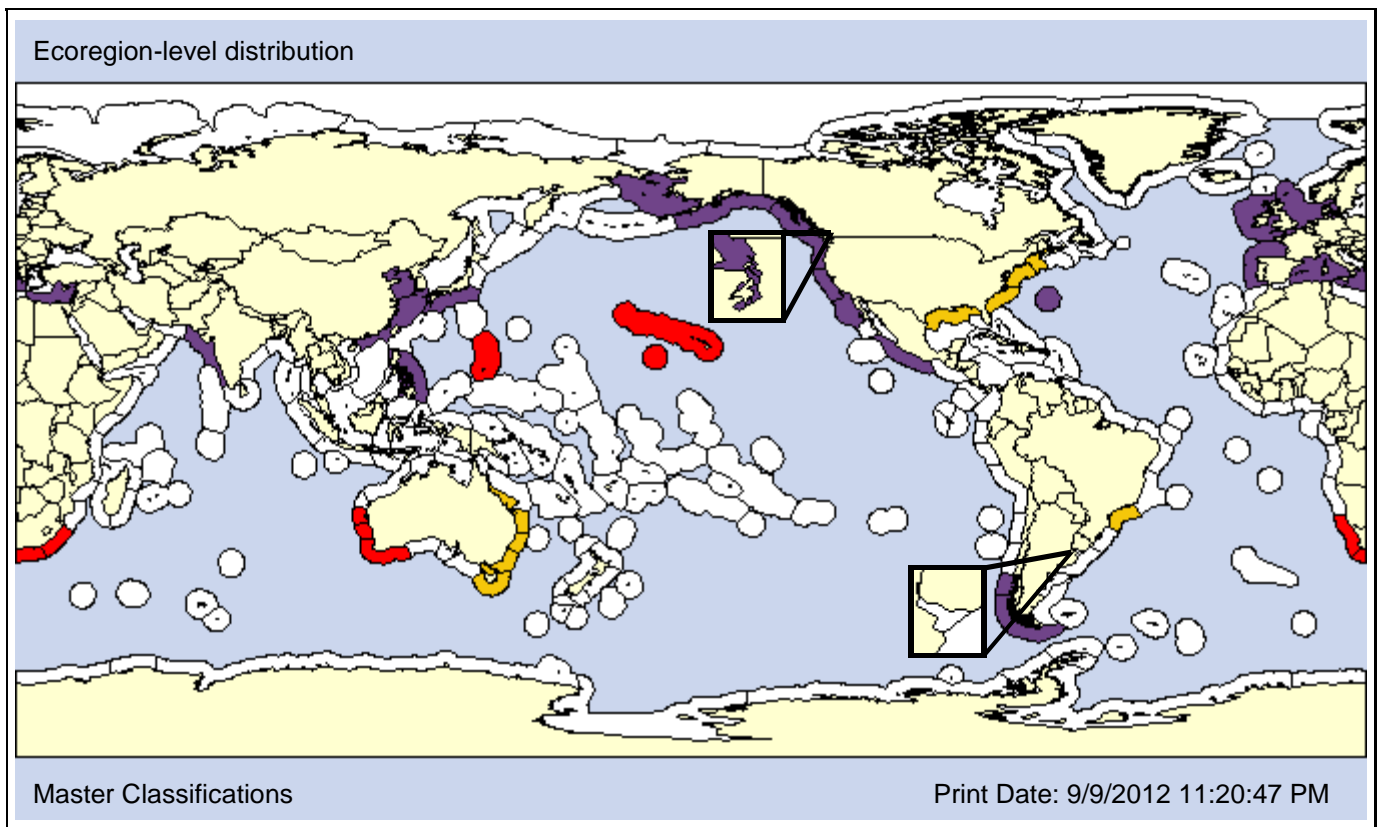
**Also Known As (Name - Type):**

Campanularia dichotoma	Ambiguous syn.
Gonothyrea integra	Ambiguous syn.
Laomedea dichotoma	Ambiguous syn.
Obelia alternata	Ambiguous syn.

**Common Names:**

sea thread hydroid
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**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>		<b>NEP</b>		

<b>Date 1st record:</b> Unknown	1972	1894
<b>Loc 1st record:</b> Unknown	Kaneohe Bay, Hawaii	San Francisco Estuary, CA
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments: Following SCAMIT (2011) and CANOD (2009), we consider *Obelia dichotoma* to represent a species complex. Therefore, it is listed as unclassified in the NEP. In other locations we tentatively use regional classifications when available; otherwise we list it as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 216m] [Pref: 0 - 31m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1 - 88.86%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>		<b>P</b>			<b>O</b>	<b>P</b>				<b>P</b>	<b>O</b>	

**SALINITY [Obs: 5 - 40psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>
		<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P		<b>X</b>		
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** (Goldfuss, 1820)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Capitata

**Infraorder:**

**Superfamily:**

**Family:** Pennariidae

**Subfamily:**

**Also Known As (Name - Type):**

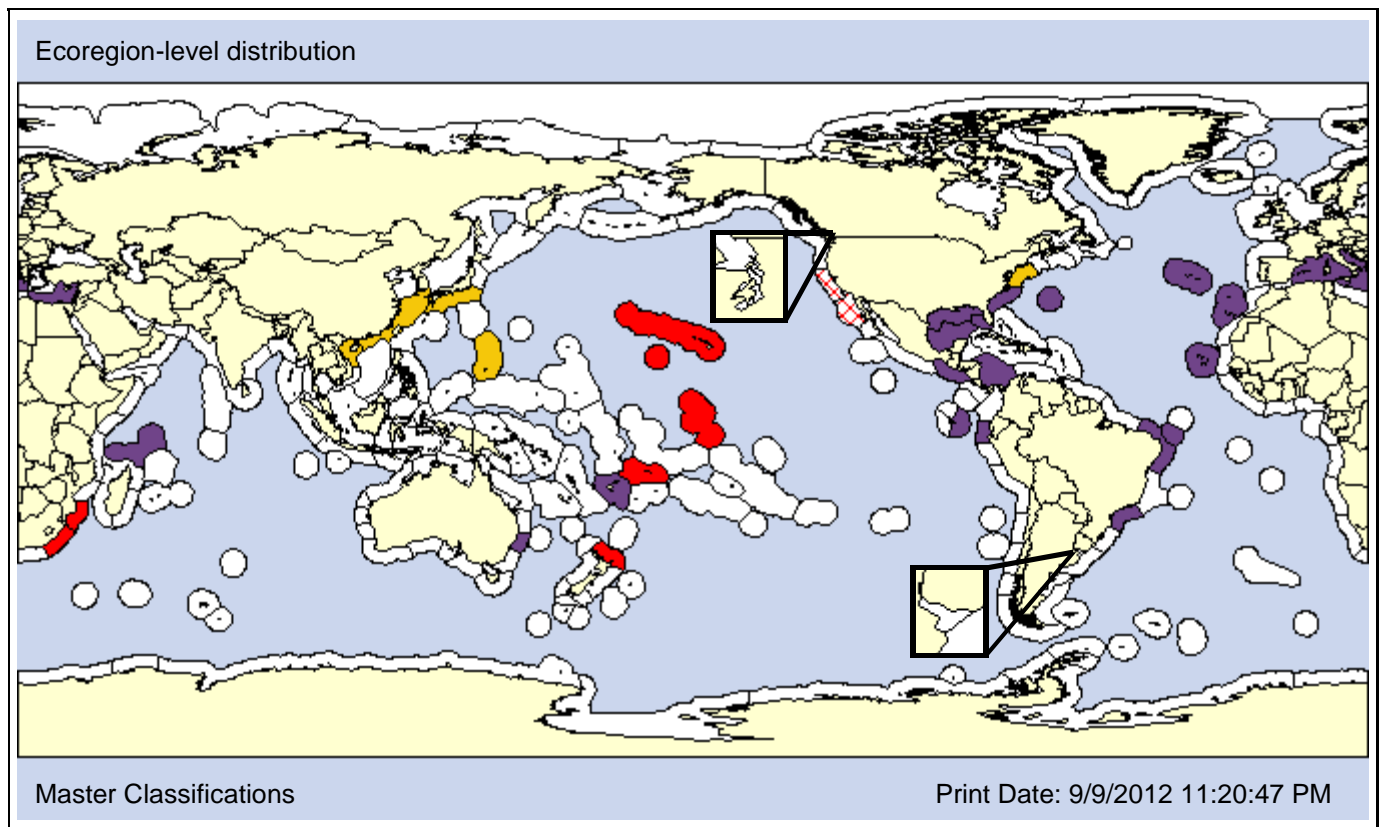
Corydendrium splendidum  
Corydendrium splendium  
Halocordyle disticha  
Pennaria disticha australis

Misspelling  
Synonym  
Synonym  
Convention

**Common Names:**

Christmas tree hydroid  
feather hydroid  
feathered hydroid (*Pennaria disticha*)

**Type Locality:** Gulf of Naples, Italy



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

<b>Date 1st record:</b> Unknown	1929	<1925
<b>Loc 1st record:</b> Unknown	Pearl Harbor, Oahu, Hawaii	San Francisco Estuary, CA
<b>Established:</b> Yes	Yes	No

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: Carlton (2009) states *Pennaria disticha* is native to the North Atlantic while Carlton and Eldredge (2009) state it is introduced in Hawaii and that the native region is unknown. We classify it as cryptogenic in the NWP and NIS in the NEP though it has not been collected in the NEP in over 60 years. We use regional classifications elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>

**DEPTH [Obs: 0 - 50m] [Pref: 2 - 7m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>								<b>O</b>		<b>O</b>	<b>P</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P		<b>X</b>		
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Hydrozoan

**Taxonomic Author:** (Agassiz, 1862)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Capitata

**Infraorder:**

**Superfamily:**

**Family:** Tubulariidae

**Subfamily:**

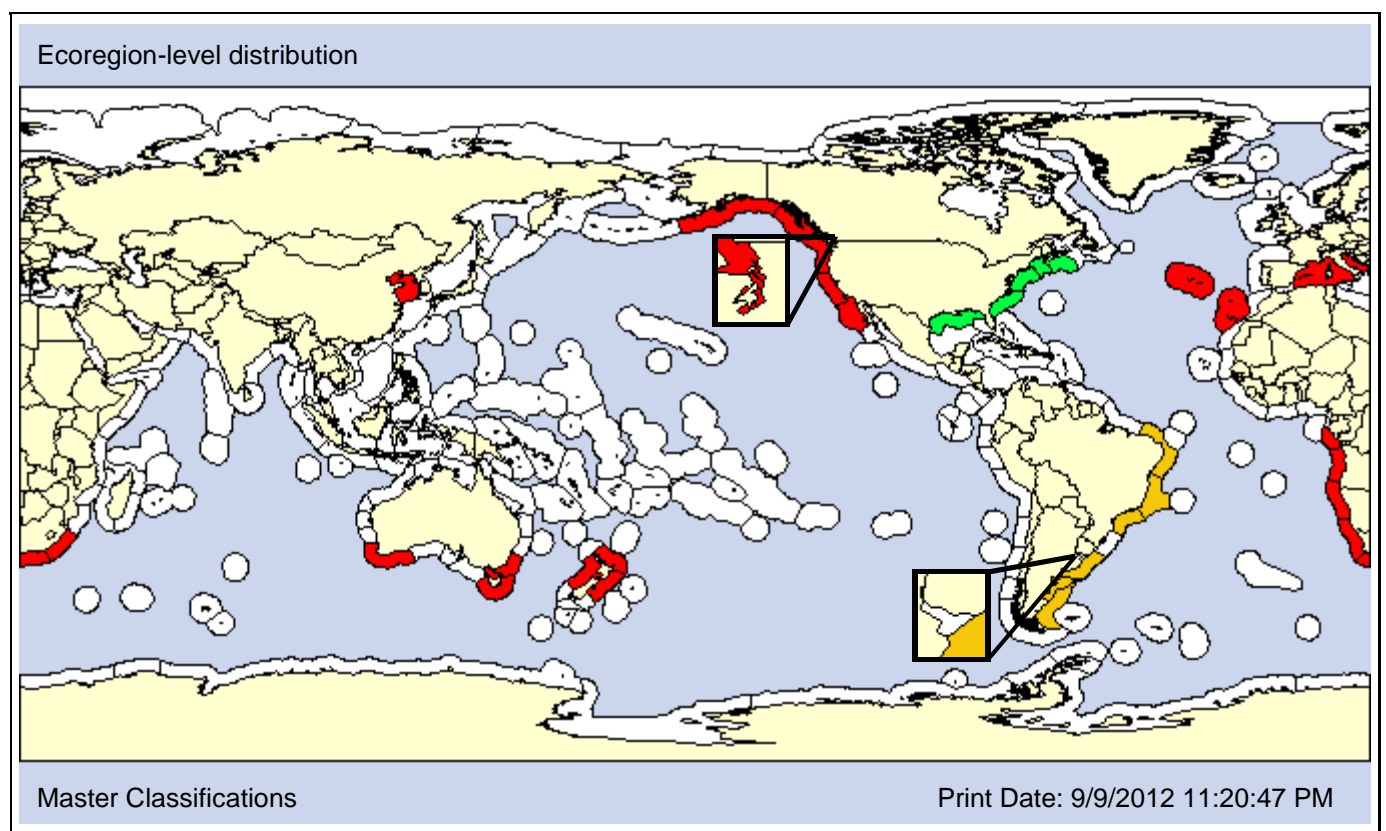
**Also Known As (Name - Type):**

Ectopleura crocea	Synonym
Parypha crocea	Synonym
Tubularia crocea	Synonym

**Common Names:**

pink mouth hydroid
--------------------

**Type Locality:** Boston Harbour, Massachusetts, USA



Master Classifications Print Date: 9/9/2012 11:20:47 PM

<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;"> </span> NIS Not Established	<span style="color: yellow;">■</span> Cryptogenic	<span style="color: cyan;">■</span> Transient	<span style="color: purple;">■</span> Unclassified	<span style="color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;"> </span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** Unknown

1859

**Loc 1st record:** Yellow Sea

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
		<b>X</b>			<b>AO X</b>	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
		X					X						

**DEPTH [Obs: 0 - 57m] [Pref: 0 - 40m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 13 - 15%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>	<b>O</b>						<b>O</b>		<b>P</b>	<b>P</b>	

**SALINITY [Obs: 9 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P		<b>X</b>		
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Hydrozoan

**Taxonomic Author:** (Trinci, 1903)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Filifera

**Infraorder:**

**Superfamily:** Hydractiniidae

**Family:** Rathkeidae

**Subfamily:**

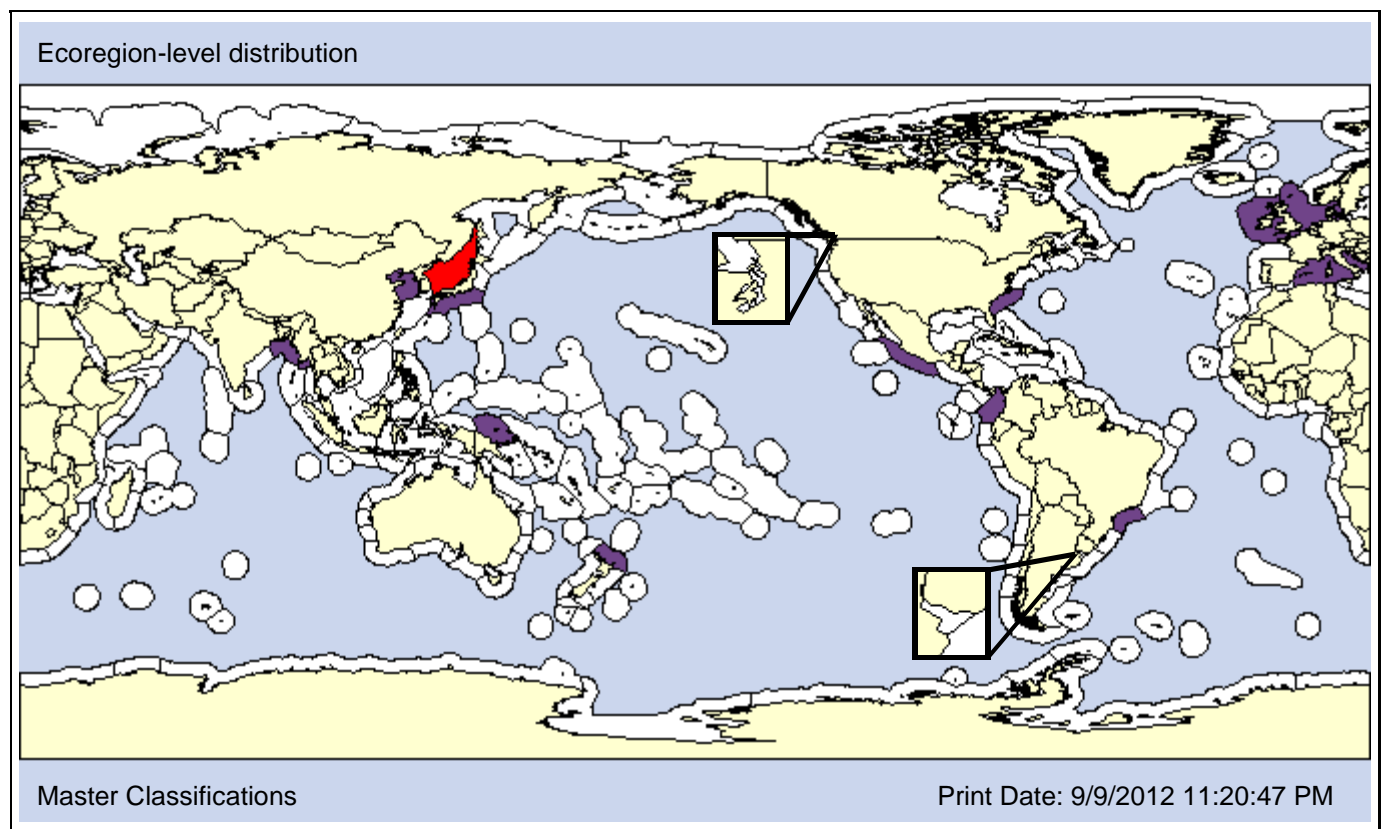
**Also Known As (Name - Type):**

Cytaeis minima	Synonym
Hydractinia minima	Synonym
Podocoryna minima	Synonym
Podocoryne minima	Synonym

**Common Names:**

--

**Type Locality:** Gulf of Naples, Italy



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1986

**Loc 1st record:** Peter the Great Bay, Russia

**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X						AO	PO								

Comments: *Podocorynoides minima* is a widely distributed hydromedusa described from the Mediterranean. First found in Peter the Great Bay in 1986, Zvyagintsev et al. (2011) classified it as introduced. Based on this, we tentatively classify it as NIS in the Sea of Japan, recognizing that its occurrence in the Sea of Japan may represent natural dispersal.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - 70m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep					
<b>O</b>	<b>O</b>	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Hydrozoan

**Taxonomic Author:** (Clark, 1876)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Leptothecata

**Suborder:** Conica

**Infraorder:**

**Superfamily:**

**Family:** Sertulariidae

**Subfamily:**

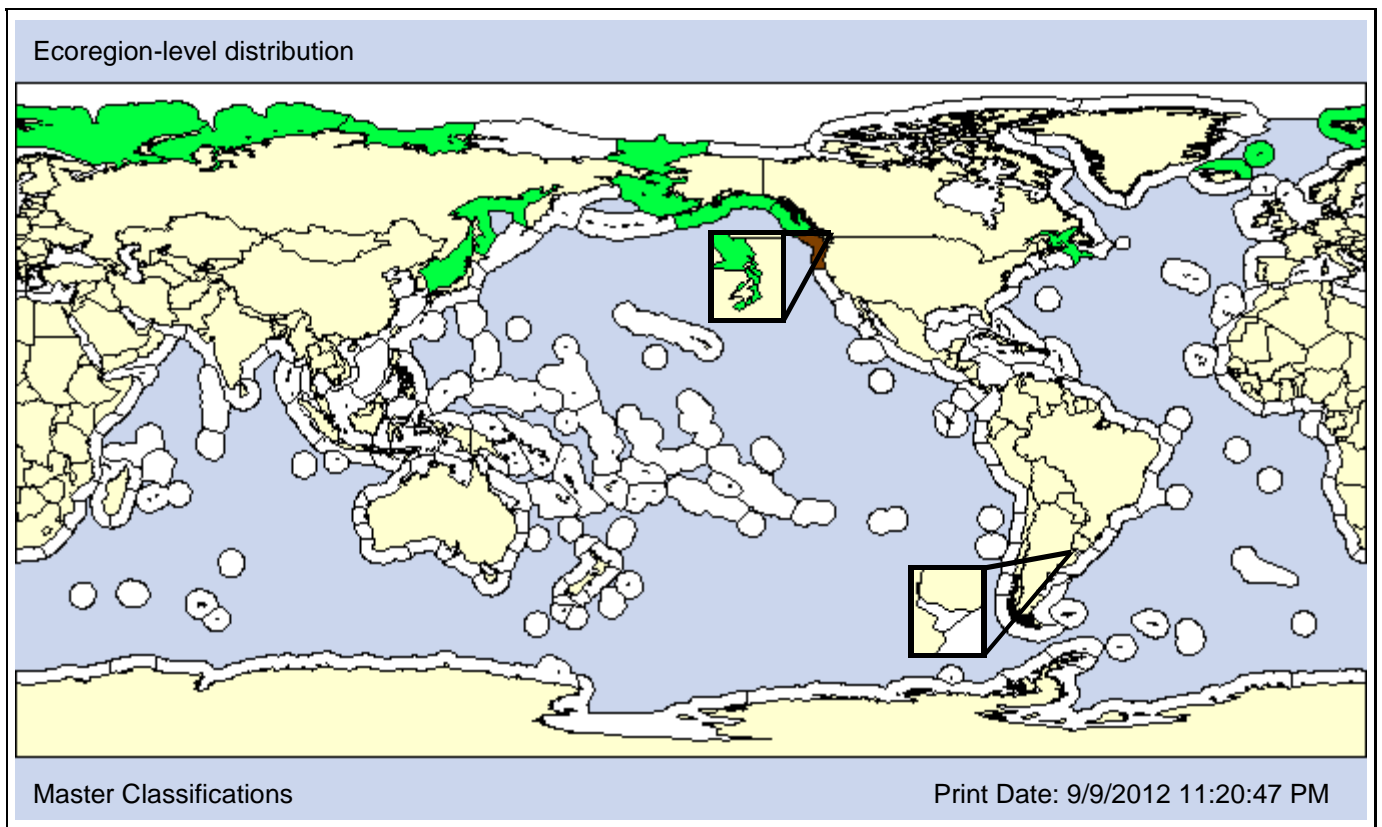
**Also Known As (Name - Type):**

Abietinaria thuiarioides  
Diphasia thuiarioides  
Sertularia thuiarioides  
Thuiaria thuiarioides

Synonym  
Synonym  
Synonym  
Misspelling

**Common Names:**

**Type Locality:** Nunivak Island, Bering Sea, and Chignik Bay, Alaska Peninsula



**Date 1st record:** Native

1911

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: CANOD (2009) classifies *Thuiaria thuiarioides* (= *Abietinaria thuiarioides*) as nonindigenous in Humboldt Bay, California based on a 2006 record. However, it was reported from Alaska to Puget Sound since 1911 and the introduction into Humboldt Bay may represent a temporary southward excursion.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O	O				

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: - 374m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	O		
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Hydrozoan

**Taxonomic Author:** McCrady, 1857

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Hydrozoa

**Subclass:** Hydroidolina

**Infraclass:**

**Superorder:**

**Order:** Anthoathecata

**Suborder:** Anthomedusae

**Infraorder:**

**Superfamily:**

**Family:** Clavidae

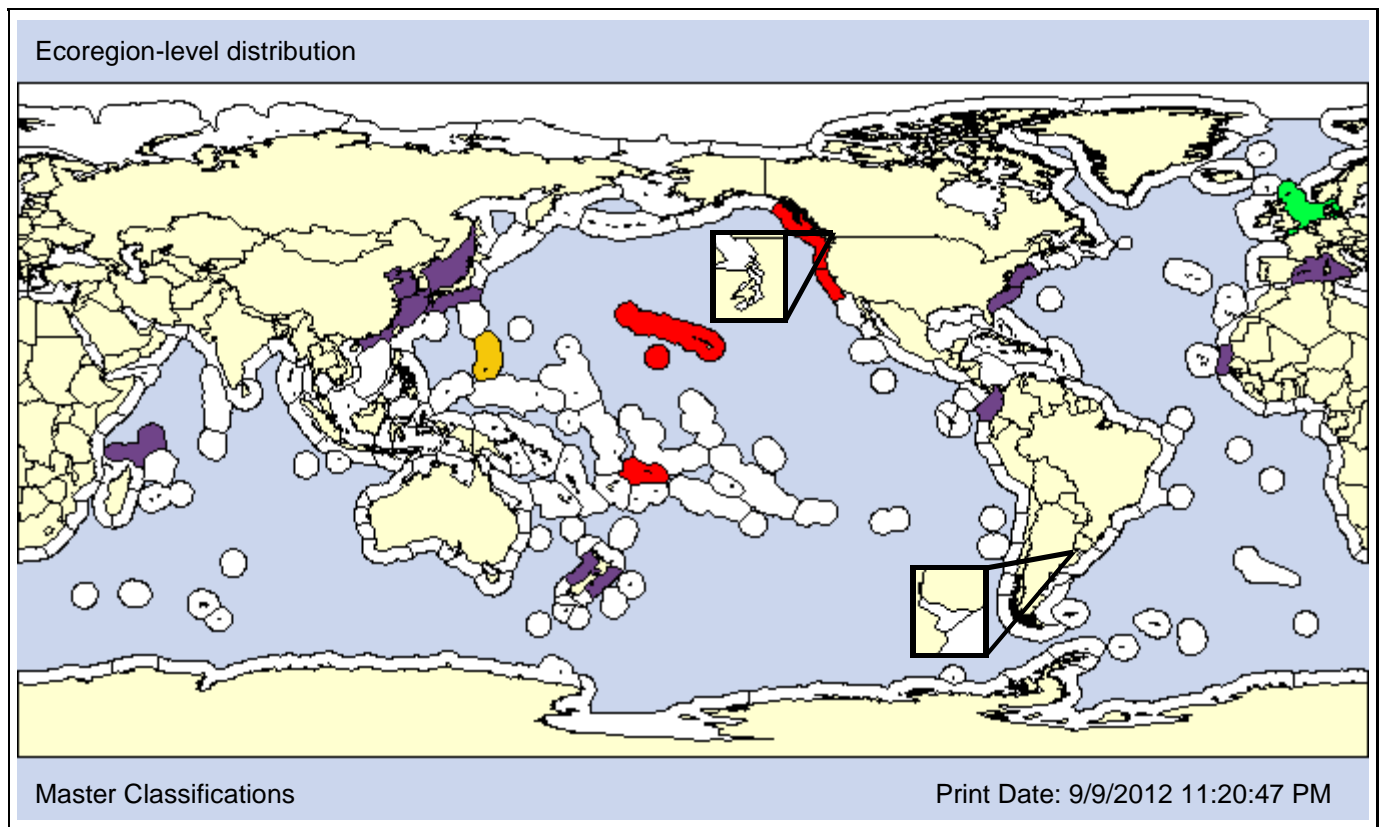
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Turritopsis nutricula	Ambiguous syn.	Immortal jellyfish
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP

Hawaii

NEP

**Date 1st record:** Unknown

1972

<1925

**Loc 1st record:** Unknown

Oahu, Hawaii

San Francisco Estuary, CA

**Established:** Yes

Yes

Unknown

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: According to Schuchert (2004), *Turritopsis nutricula* is an eastern Atlantic species. However, the presence of several very similar *Turritopsis* species makes identification problematic and we consider it a species complex. Nonetheless, the *Turritopsis* in Hawaii, San Francisco Estuary, and Samoa appear to be introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 9m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>											<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Kingdom: Animalia**

**Phylum: Cnidaria**

**Class: Scyphozoa**

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**Taxon:** Scyphozoa

**Taxonomic Author:** Light, 1921

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Scyphozoa

**Subclass:** Discomedusae

**Infraclass:**

**Superorder:**

**Order:** Rhizostomeae

**Suborder:** Daktyliophorae

**Infraorder:**

**Superfamily:**

**Family:** Lychnorhizidae

**Subfamily:**

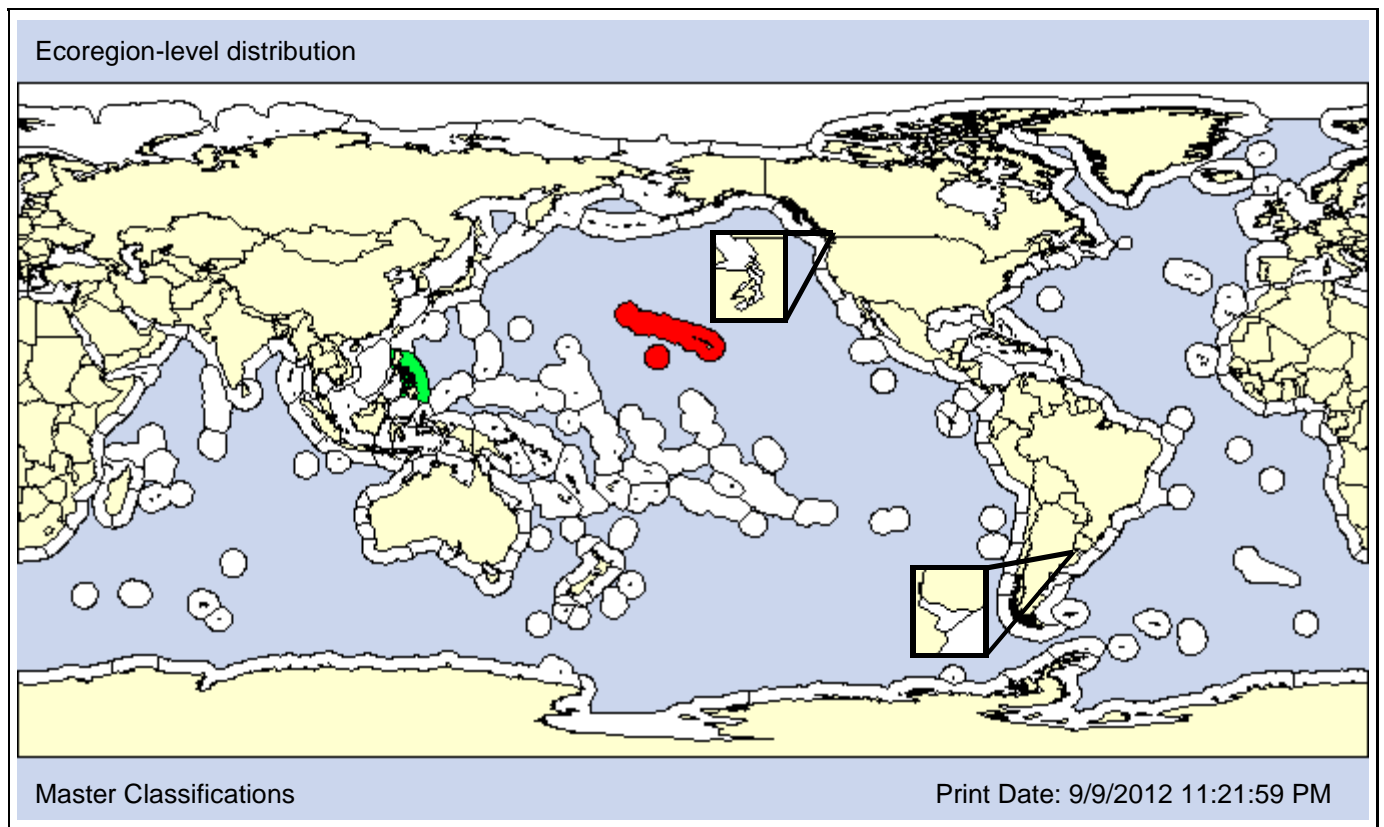
**Also Known As (Name - Type):**

**Common Names:**

[Empty box for 'Also Known As (Name - Type)']

[Empty box for 'Common Names']

**Type Locality:** Philippines



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1983  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Scyphozoa

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Scyphozoa

**Subclass:** Discomedusae

**Infraclass:**

**Superorder:**

**Order:** Semaestomeae

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ulmaridae

**Subfamily:**

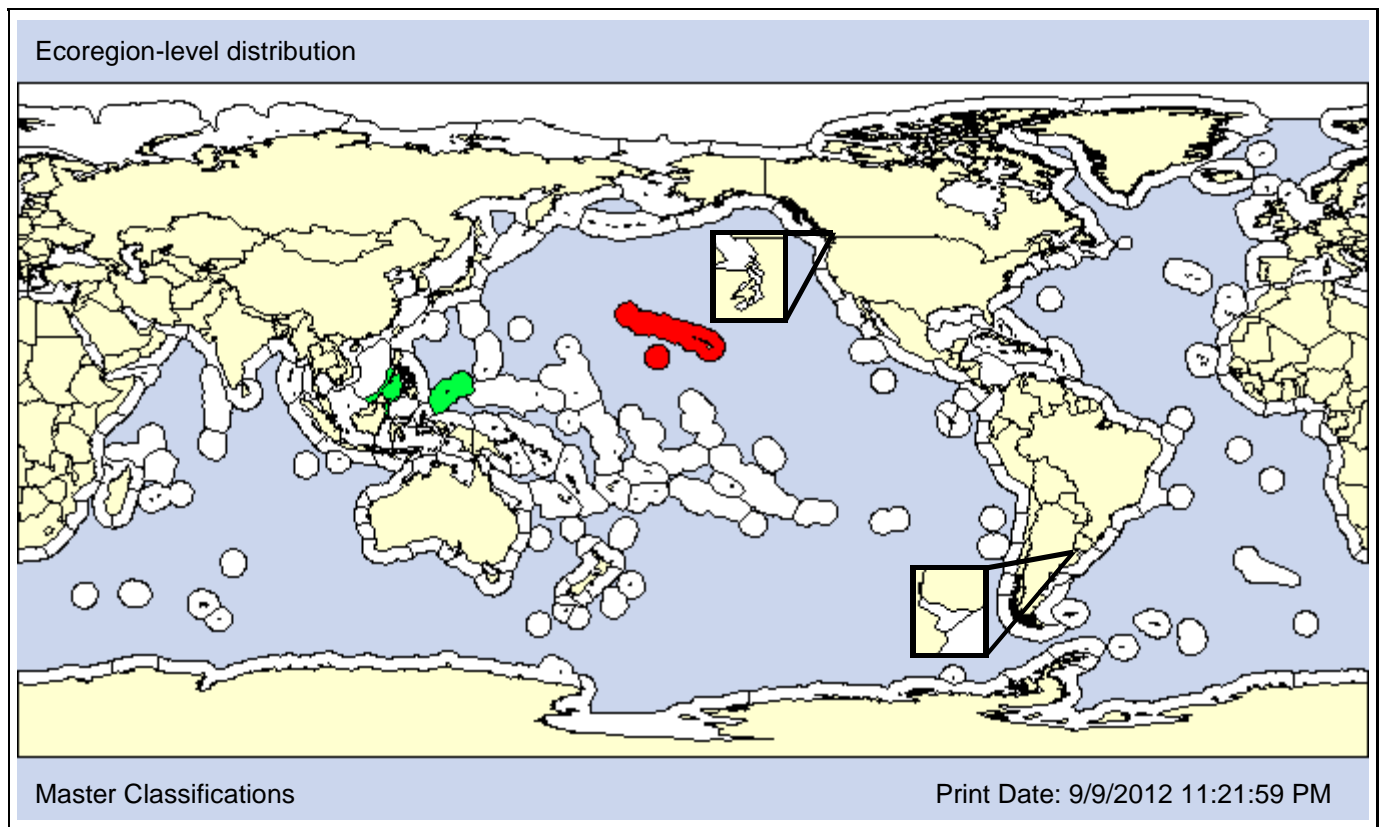
**Also Known As (Name - Type):**

Aurelia labiata of Hawaiian authors  
Aurelia sp. 4 of Dawson et al., 2005

Misidentified  
Synonym

**Common Names:**

**Type Locality:** Hawaii, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1953  
**Loc 1st record:** Hawaii  
**Established:** Yes

**VECTORS**

<b>SH</b> <span style="color: red;">X</span>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				
<span style="color: red;">X</span>		<span style="color: red;">X</span>				AO	PO							

Comments: Based on genetic analysis (Dawson et al., 2005), Hawaiian populations of Aurelia are most likely an unnamed species endemic to the eastern Borneo and Palau regions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Scyphozoa

**Taxonomic Author:** Dawson et al., 2005

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Scyphozoa

**Subclass:** Discomedusae

**Infraclass:**

**Superorder:**

**Order:** Semaestomeae

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ulmaridae

**Subfamily:**

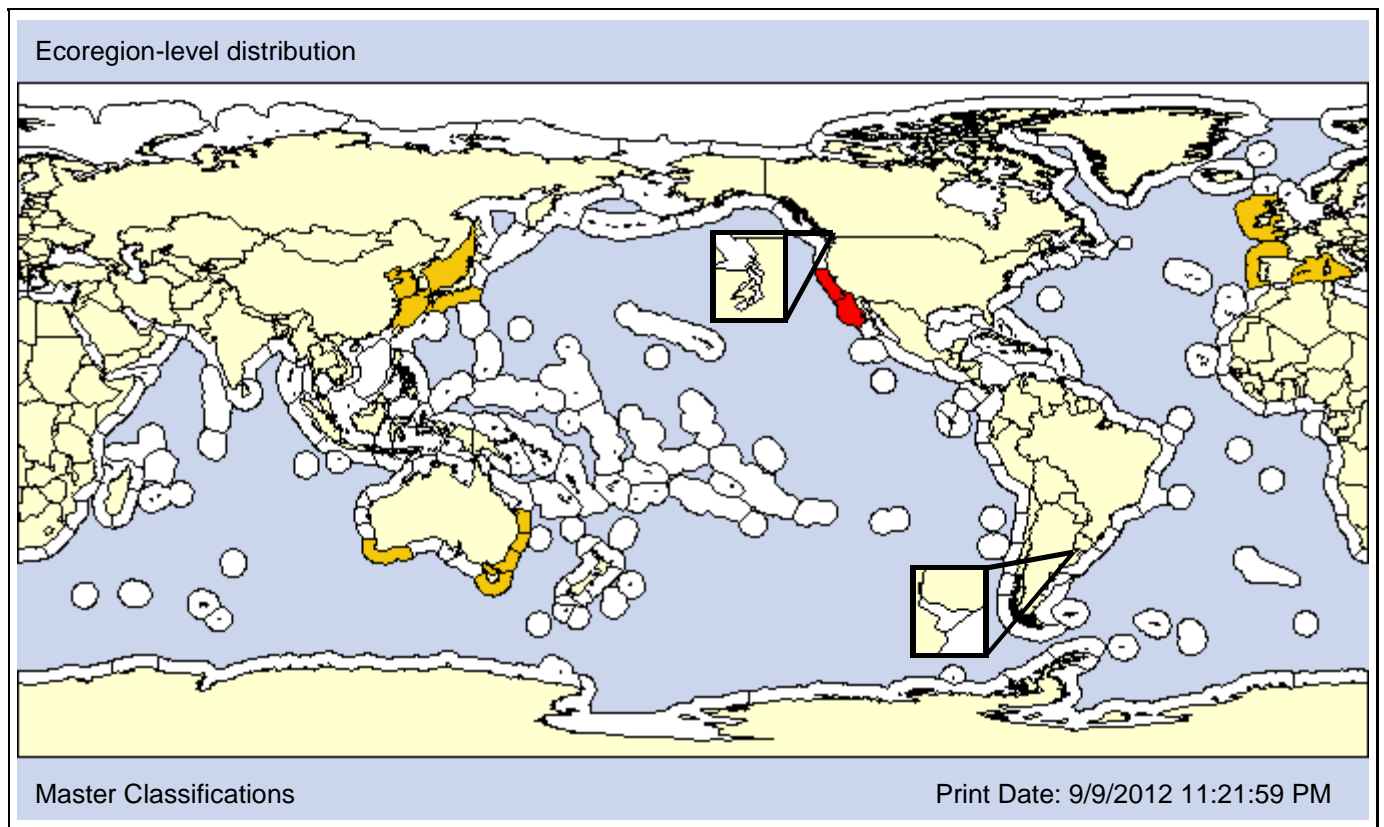
**Also Known As (Name - Type):**

Aurelia aurita of NEP authors in part

Partial synonym

**Common Names:**

**Type Locality:**



**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Yes

1988  
 San Francisco Estuary, CA  
 Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: Dawson et al. (2005) separated Aurelia species based on their genetics. Aurelia sp. 1 had a wide, disjunct distribution with low genetic variation, indicative of anthropogenic transport. While the native region is unknown, CANOD (2009) classifies it as introduced in California. We classify it as NIS in the NEP and cryptogenic elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P		<b>X</b>		
					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Scyphozoa

**Taxonomic Author:** (Forsskål, 1775)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:** Medusozoa

**Superclass:**

**Class:** Scyphozoa

**Subclass:** Discomedusae

**Infraclass:**

**Superorder:**

**Order:** Rhizostomeae

**Suborder:** Kolpophorae

**Infraorder:**

**Superfamily:**

**Family:** Cassiopeidae

**Subfamily:**

**Also Known As (Name - Type):**

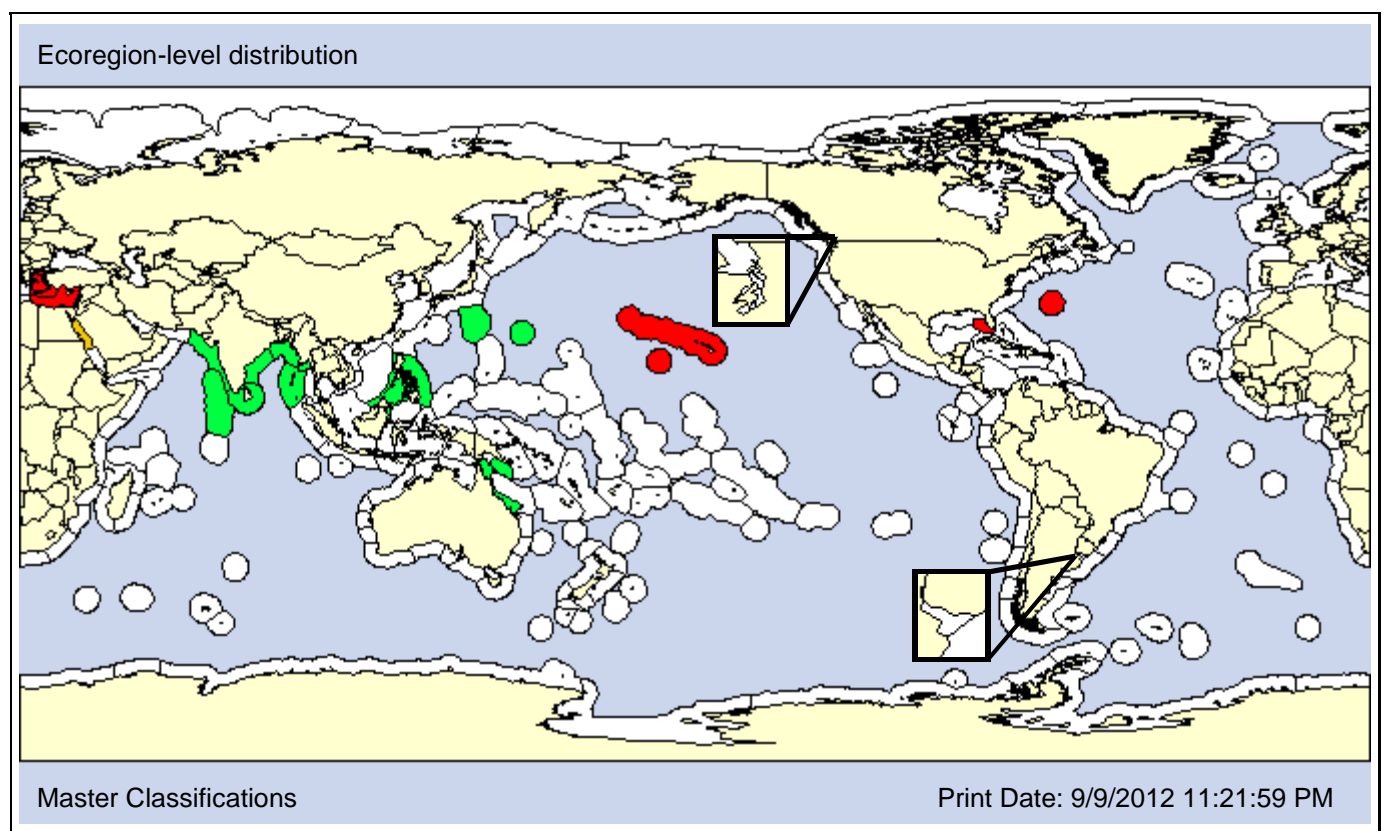
Cassiopea medusa of Hawaiian authors in part  
 Cassiopea mertensi of Hawaiian authors in part  
 Cassiopeia andromeda  
 Medusa andromeda

Partial synonym  
 Partial synonym  
 Misspelling  
 Synonym

**Common Names:**

Upside-down jellyfish

**Type Locality:** Red Sea



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1950  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: Based on molecular evidence, Holland et al. (2004) concluded that *Cassiopea andromeda* is one of two *Cassiopea* to have invaded Hawaii and is native to the Indo-Pacific. It “may be introduced” in the Red Sea (Carlton and Eldredge, 2009) and is introduced in the Mediterranean (Zenetos et al, 2010).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH				<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>O</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep			

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: - 38.5psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
	<b>X</b>			<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Scyphozoa

**Taxonomic Author:** Holland et al., 2004

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Scyphozoa

**Subclass:** Discomedusae

**Infraclass:**

**Superorder:**

**Order:** Rhizostomeae

**Suborder:** Kolpophorae

**Infraorder:**

**Superfamily:**

**Family:** Cassiopeidae

**Subfamily:**

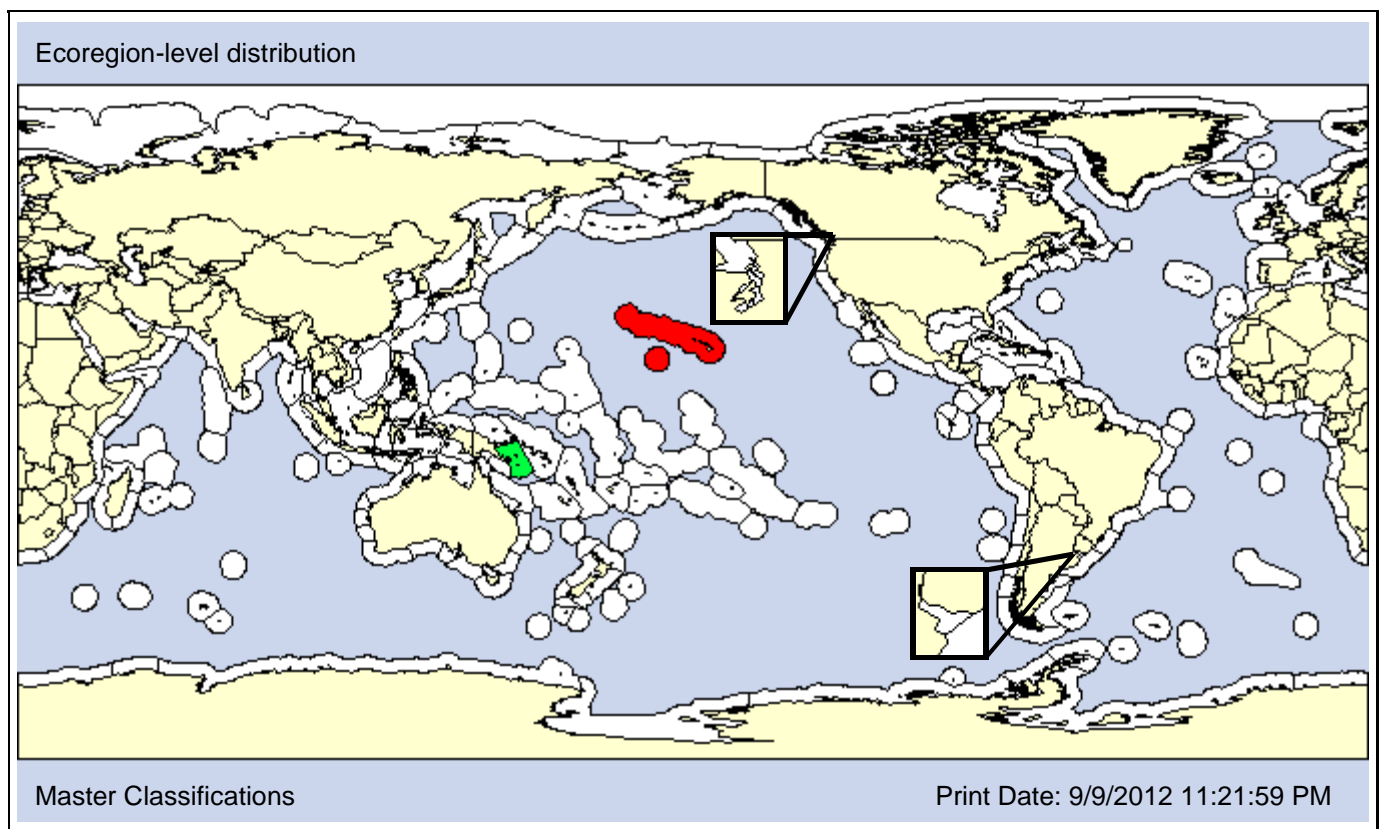
**Also Known As (Name - Type):**

Cassiopea sp. (Carlton and Eldredge, 2009)

Synonym

**Common Names:**

**Type Locality:** Hawaii, USA and Papua New Guinea



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 2000  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: Based on molecular evidence, Holland et al. (2004) concluded that *Cassiopea sp. 3* is one of two *Cassiopea* to have invaded Hawaii. It is also found in Papua New Guinea; and Carlton and Eldredge (2009) consider it native to the Indo-Pacific.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
		X											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P		X		
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					X	X							

**Taxon:** Scyphozoa

**Taxonomic Author:** Lendenfeld, 1884

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Cnidaria

**Subphylum:**

**Superclass:**

**Class:** Scyphozoa

**Subclass:** Discomedusae

**Infraclass:**

**Superorder:**

**Order:** Rhizostomeae

**Suborder:** Kolpophorae

**Infraorder:**

**Superfamily:**

**Family:** Mastigiidae

**Subfamily:**

**Also Known As (Name - Type):**

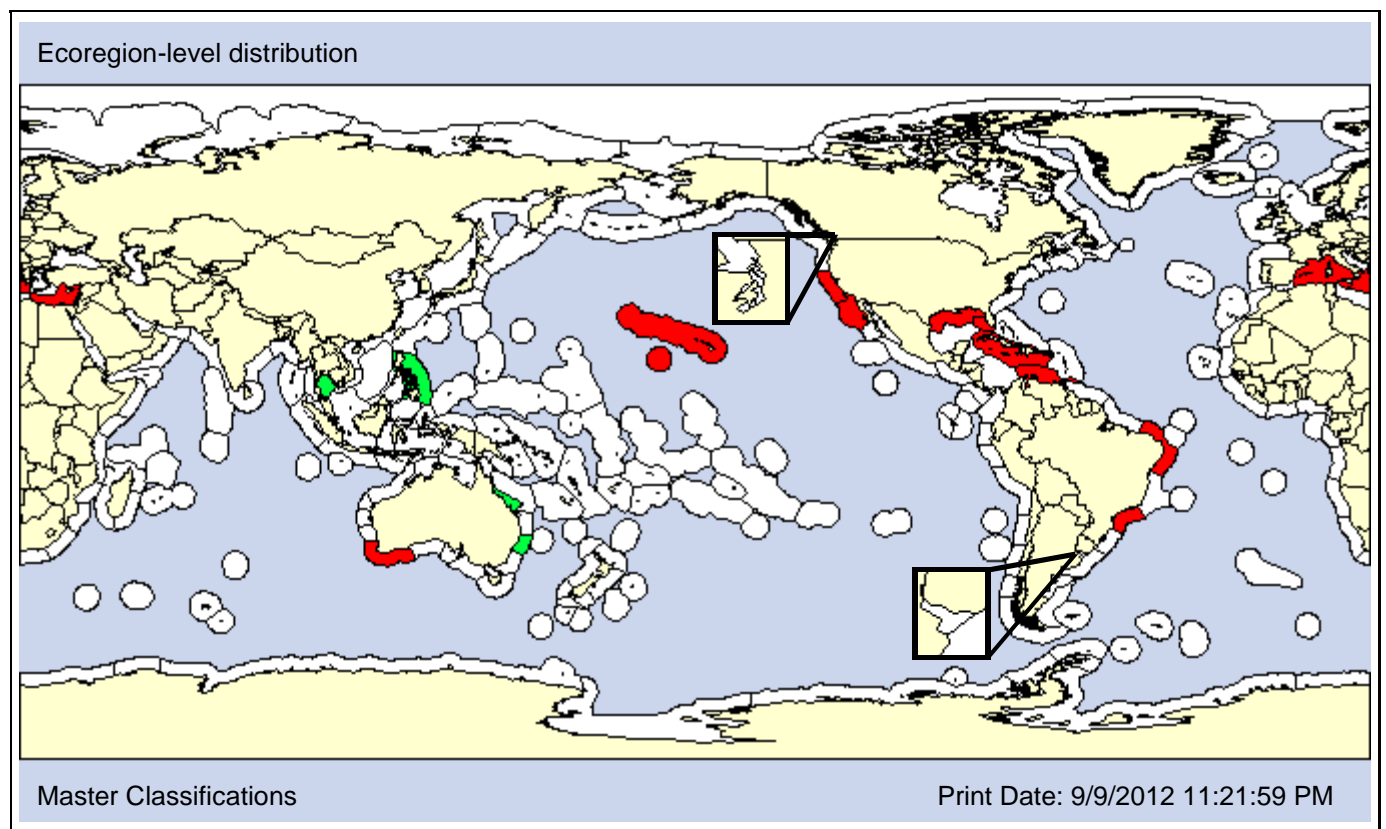
Cotylorhizoides pacificus  
Mastigias scintillae

Synonym  
Synonym

**Common Names:**

Australian spotted jellyfish  
spotted jellyfish  
white spotted jellyfish

**Type Locality:** Port Jackson, Australia



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1933

1981

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

San Diego and Mission Bay, CA

**Established:**

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 10m] [Pref: 0 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: 10 - 38.6psu] [Pref: 19 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
	<b>X</b>			<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
						<b>X</b>							

Kingdom: Animalia

Phylum: Ctenophora

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# Vallicula multiformis

Species ID: 122818

**Taxon:** Ctenophore

**Taxonomic Author:** Rankin, 1956

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Ctenophora

**Subphylum:**

**Superclass:**

**Class:** Tentaculata

**Subclass:** Typhlocoela

**Infraclass:**

**Superorder:**

**Order:** Platyctenida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Coeloplanidae

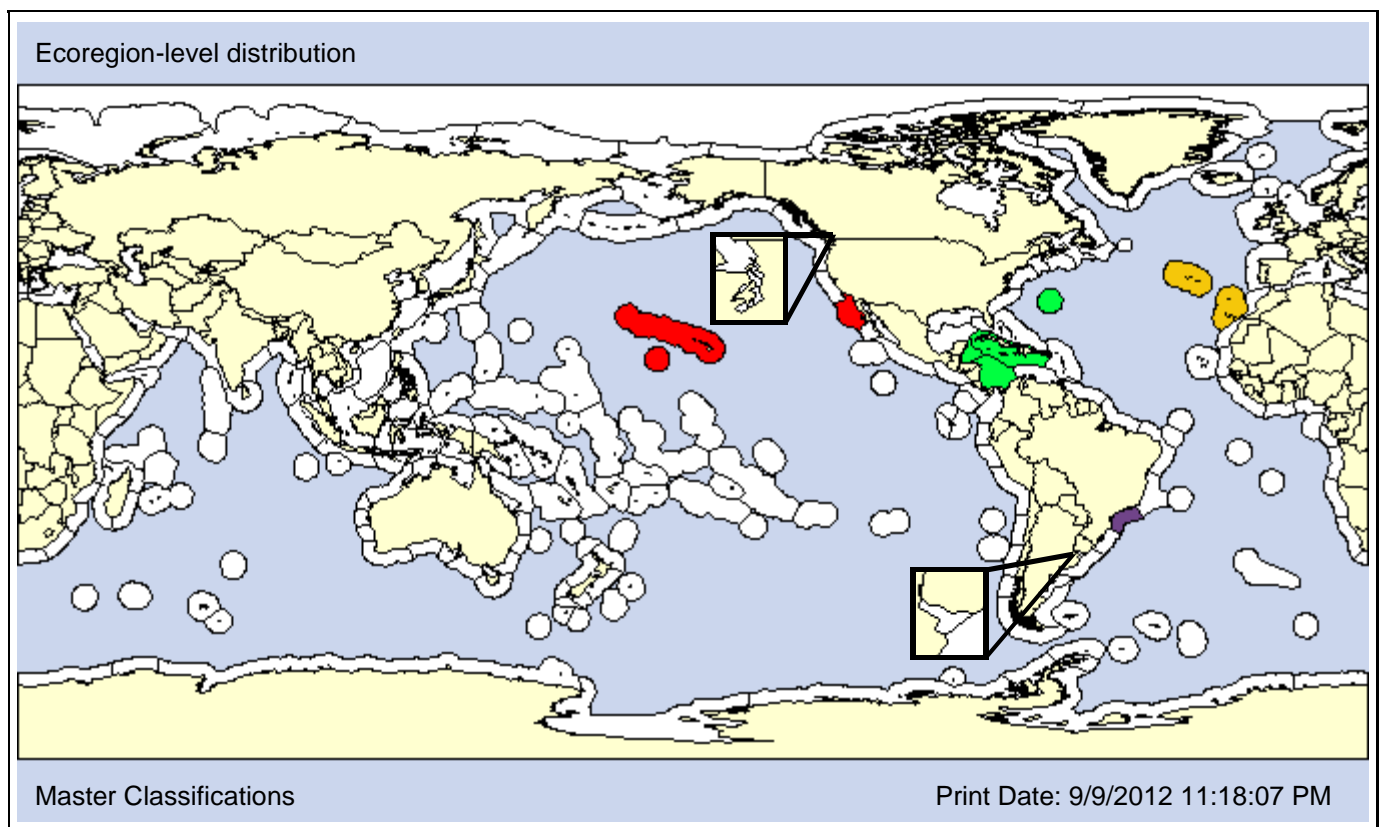
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Vallicula multifrons	Misspelling	
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**Type Locality:** Jamaica



**Date 1st record:**

1992

1997

**Loc 1st record:**

Kaneohe Bay, Hawaii

San Diego Bay, CA

**Established:**

Yes

Unknown

### VECTORS

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO			<b>X</b>						

Comments: Vallicula multiformis is a benthic ctenophore native to the Gulf of Mexico and the Caribbean.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X		X		TP	RI-PH	X			X	

**DEPTH [Obs: -15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

R P	HP	Biogenic P						Artificial Substrate P						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H+B	Oth
						O		O	O			O	O	O

**SALINITY**

Fresh	Brackish						Marine O		Hyper
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual X				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
				LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic							Epibiotic X			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	
						X							

**Kingdom: Animalia**

**Phylum: Nematoda**

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**Taxon:** Nematode

**Taxonomic Author:** Fujita, 1927

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Nematoda

**Subphylum:**

**Superclass:**

**Class:** Secernentea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Spirurida

**Suborder:** Camallanina

**Infraorder:**

**Superfamily:** Camallanoidea

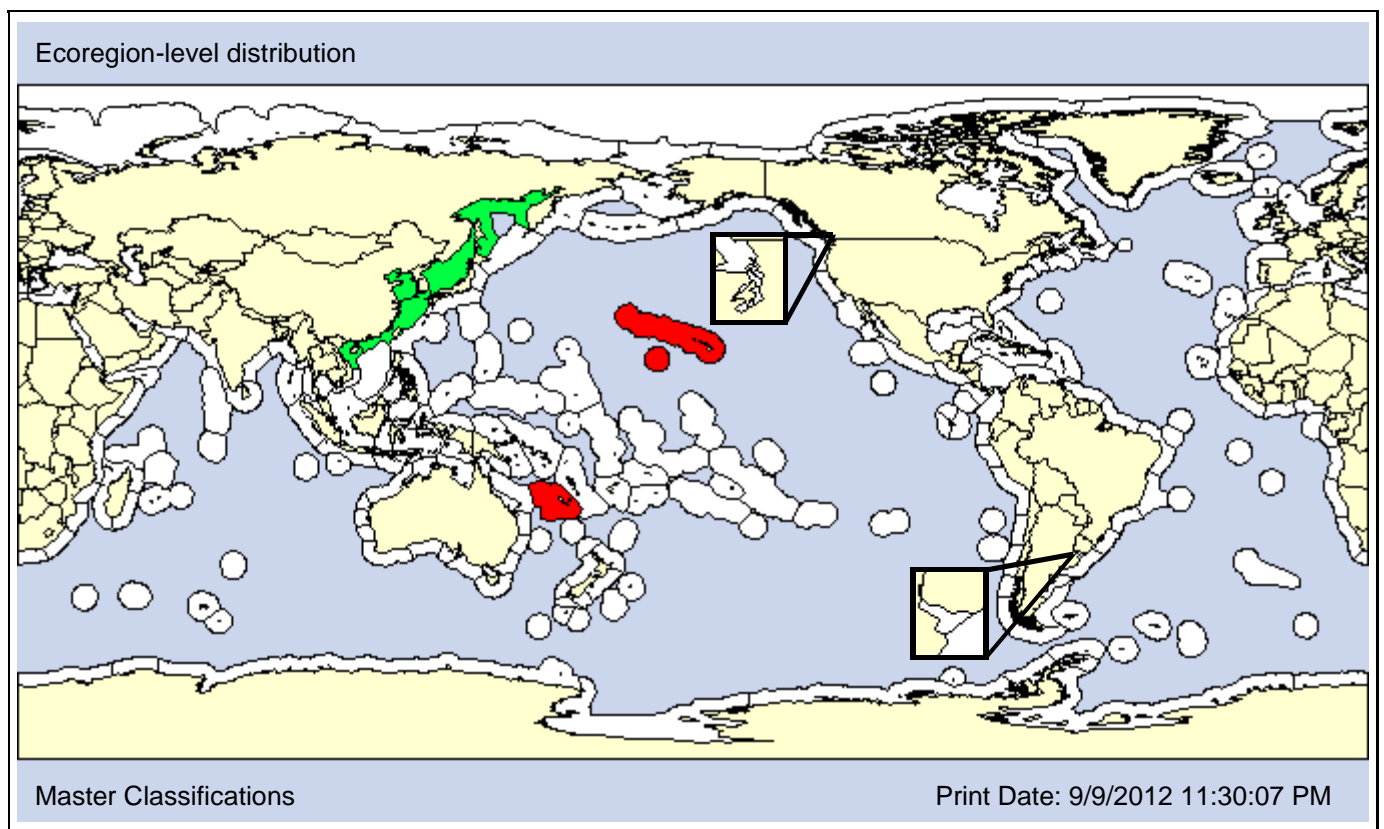
**Family:** Camallanidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Lake Biwa, Japan



<span style="display:inline-block; width:15px; height:15px; background-color: #4CAF50; border: 1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color: #F44336; border: 1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color: #FFEB3B; border: 1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color: #4DD0E1; border: 1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color: #9575CD; border: 1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color: #795548; border: 1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black;"></span> Unidentified	
		<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>

**Date 1st record:** Native 1993  
**Loc 1st record:** Native Hakalau Stream, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
						AO	PO			<b>X</b>					

Comments: *Camallanus cotti* is an intestinal nematode that parasitizes introduced freshwater and brackish water fishes, such as *Gambusia affinis* and *Xiphophorus hellerii*, in Hawaii and New Caledonia. It is native to Asia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>							

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

Kingdom: Animalia

Phylum: Platyhelminthes

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**Taxon:** Fluke

**Taxonomic Author:** Price, 1935

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Platyhelminthes

**Subphylum:**

**Superclass:**

**Class:** Trematoda

**Subclass:** Digenea

**Infraclass:**

**Superorder:**

**Order:** Plagiorchiida

**Suborder:** Opisthorchiata

**Infraorder:**

**Superfamily:** Opisthorchioidea

**Family:** Heterophyidae

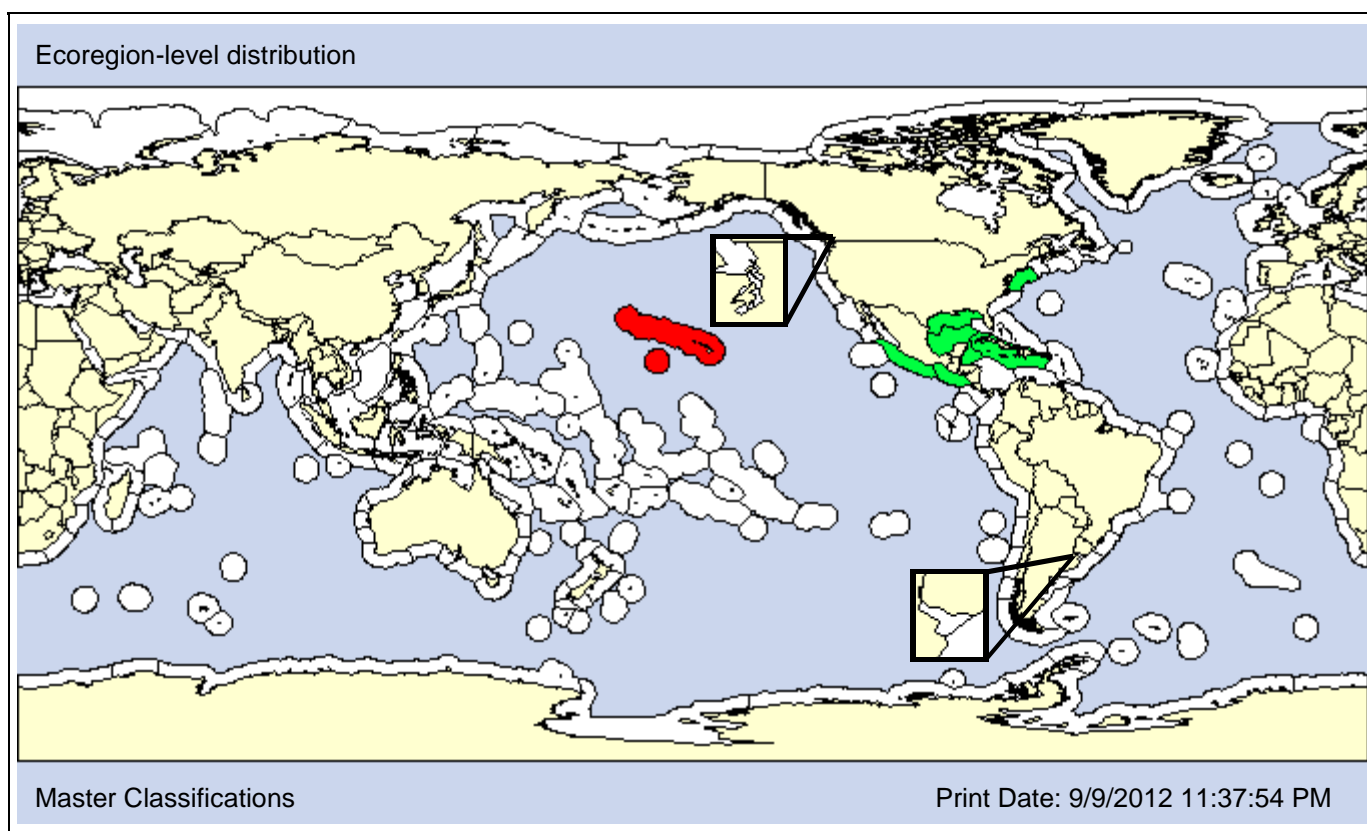
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Ascocotyle (Ascocotyle) tenuicollis	Convention	
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**Type Locality:**



**Date 1st record:**

1993

**Loc 1st record:**

Hilo, Hawaii

**Established:**

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
						AO	PO								

Comments: *Ascocotyle tenuicollis* is a North American parasite of freshwater and brackish water fishes, such as *Gambusia* spp.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 5psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>					

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Tapeworm

**Taxonomic Author:** Yamaguti, 1934

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Platyhelminthes

**Subphylum:**

**Superclass:**

**Class:** Cestoda

**Subclass:** Eucestoda

**Infraclass:**

**Superorder:**

**Order:** Bothriocephalidea

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Bothriocephalidae

**Subfamily:**

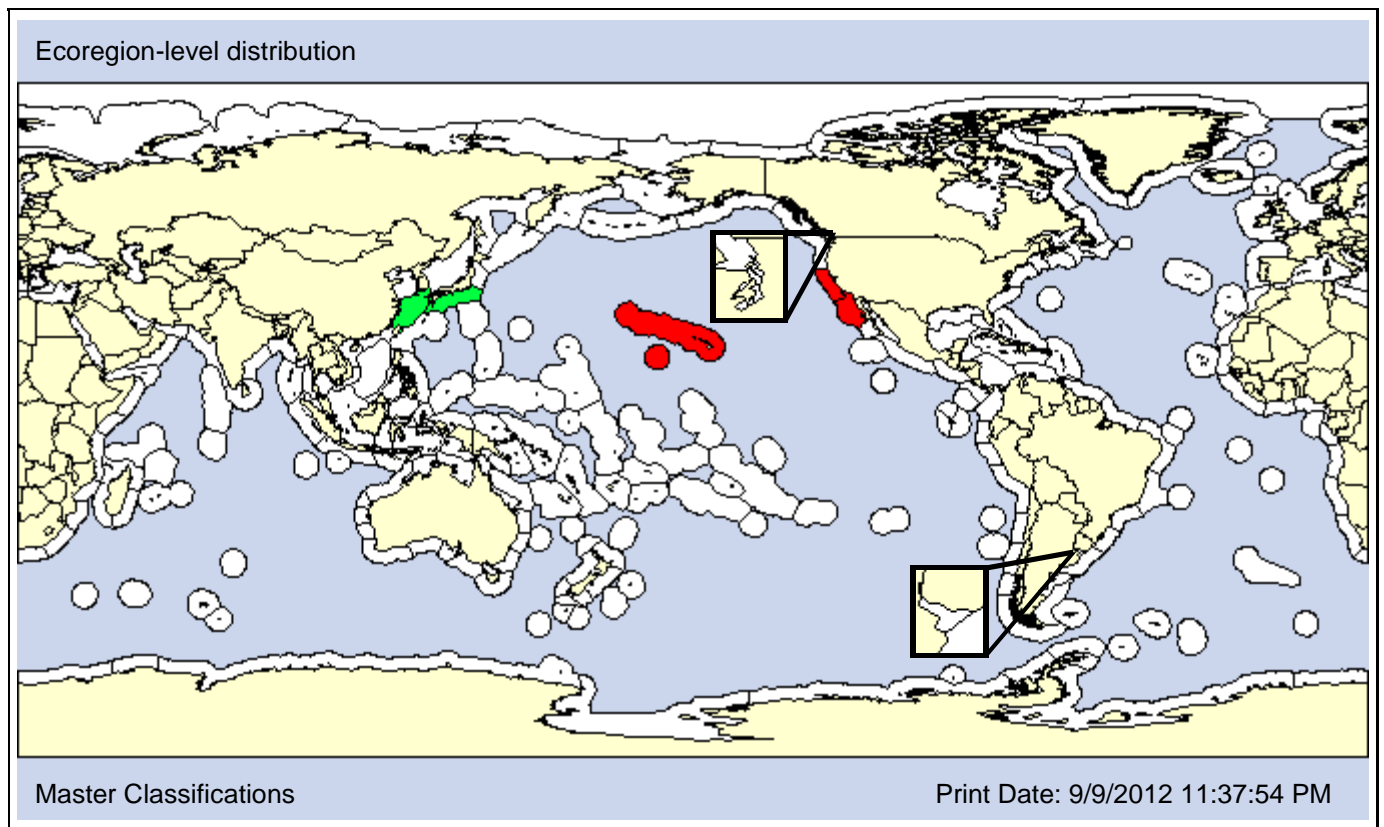
**Also Known As (Name - Type):**

Bothriocephalus aegyptiacus	Synonym
Bothriocephalus gowkongensis	Synonym
Bothriocephalus kivuensis	Synonym
Bothriocephalus opsariichthydis	Synonym

**Common Names:**

Asian tapeworm
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**Type Locality:** Ogura Lake, Japan



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red;">■</span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: cyan;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black;">■</span> Unidentified
NWP			Hawaii			NEP	

<b>Date 1st record:</b> Native	1993	2001
<b>Loc 1st record:</b> Native	Hawaii	Southern California
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
						AO	PO								

Comments: The Asian tapeworm, *Bothriocephalus acheilognathi*, is a widely introduced parasite of several freshwater fishes; it also parasitizes several salt-tolerant species, such as *Gambusia* spp., that occur in brackish waters.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>								

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
<b>X</b>										

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Fluke

**Taxonomic Author:** Shimura & Ito, 1980

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Platyhelminthes

**Subphylum:**

**Superclass:**

**Class:** Trematoda

**Subclass:** Digenea

**Infraclass:**

**Superorder:**

**Order:** Strigeata

**Suborder:**

**Infraorder:**

**Superfamily:**

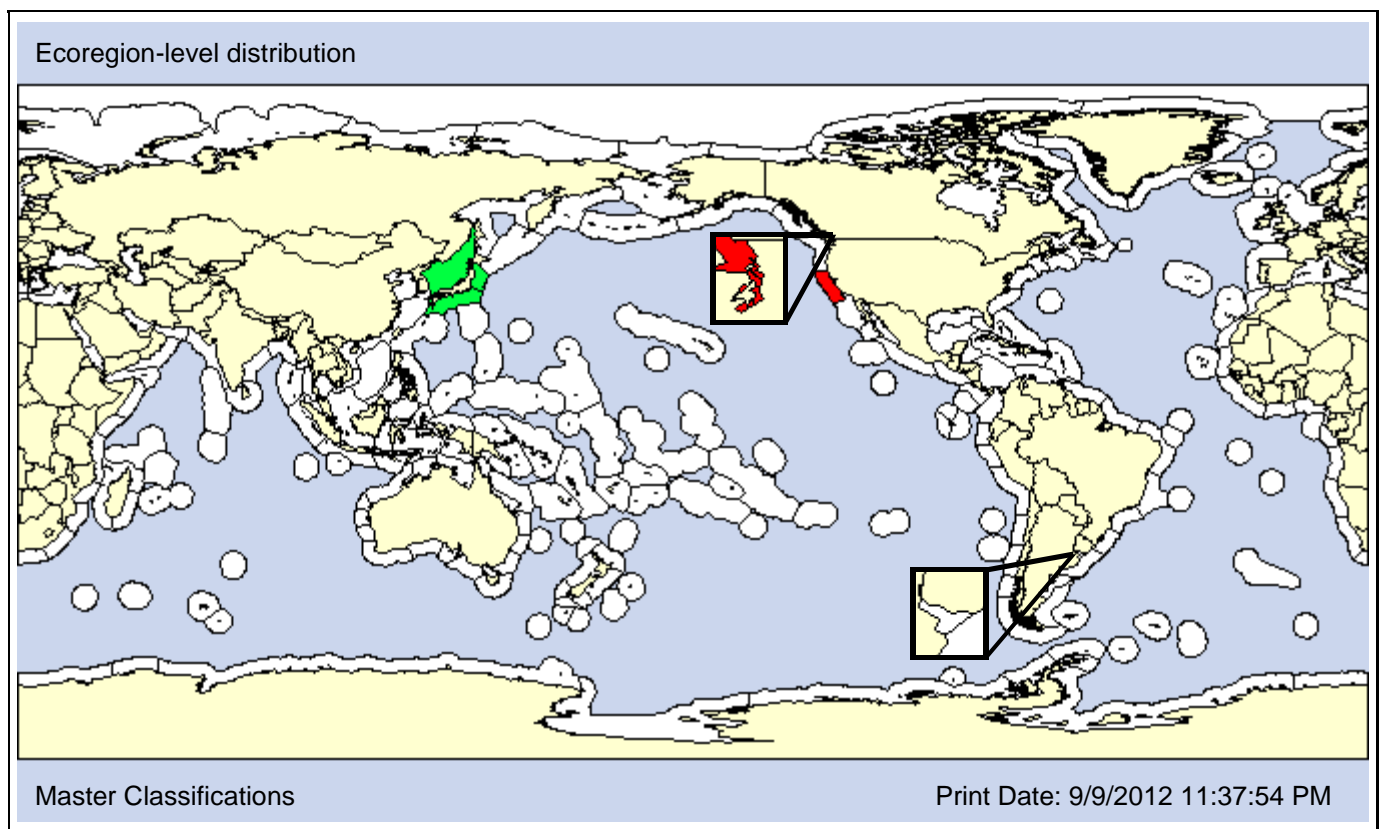
**Family:** Fellodistomatidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Japan



<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-style:dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:lightgrey; border:1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; background-color:white; border:1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** Native

1998

**Loc 1st record:** Native

Elkhorn Slough, California

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P				X
						AO	PO X								

Comments: Miura et al. (2006) identified two distinct haplotypes of *Cercaria batillariae* in the NEP and it was hypothesized that one was transported with its host, the introduced snail *Batillaria attramentaria*, but that the other was transported by migratory shorebirds.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					
	<b>X</b>												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE** **X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b> <b>P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b> <b>P</b>						<b>Marine</b> <b>O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Fluke

**Taxonomic Author:** Ergens, 1960

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Platyhelminthes

**Subphylum:**

**Superclass:**

**Class:** Monogenea

**Subclass:** Monopisthocotylea

**Infraclass:**

**Superorder:**

**Order:** Gyrodactylidea

**Suborder:**

**Infraorder:**

**Superfamily:**

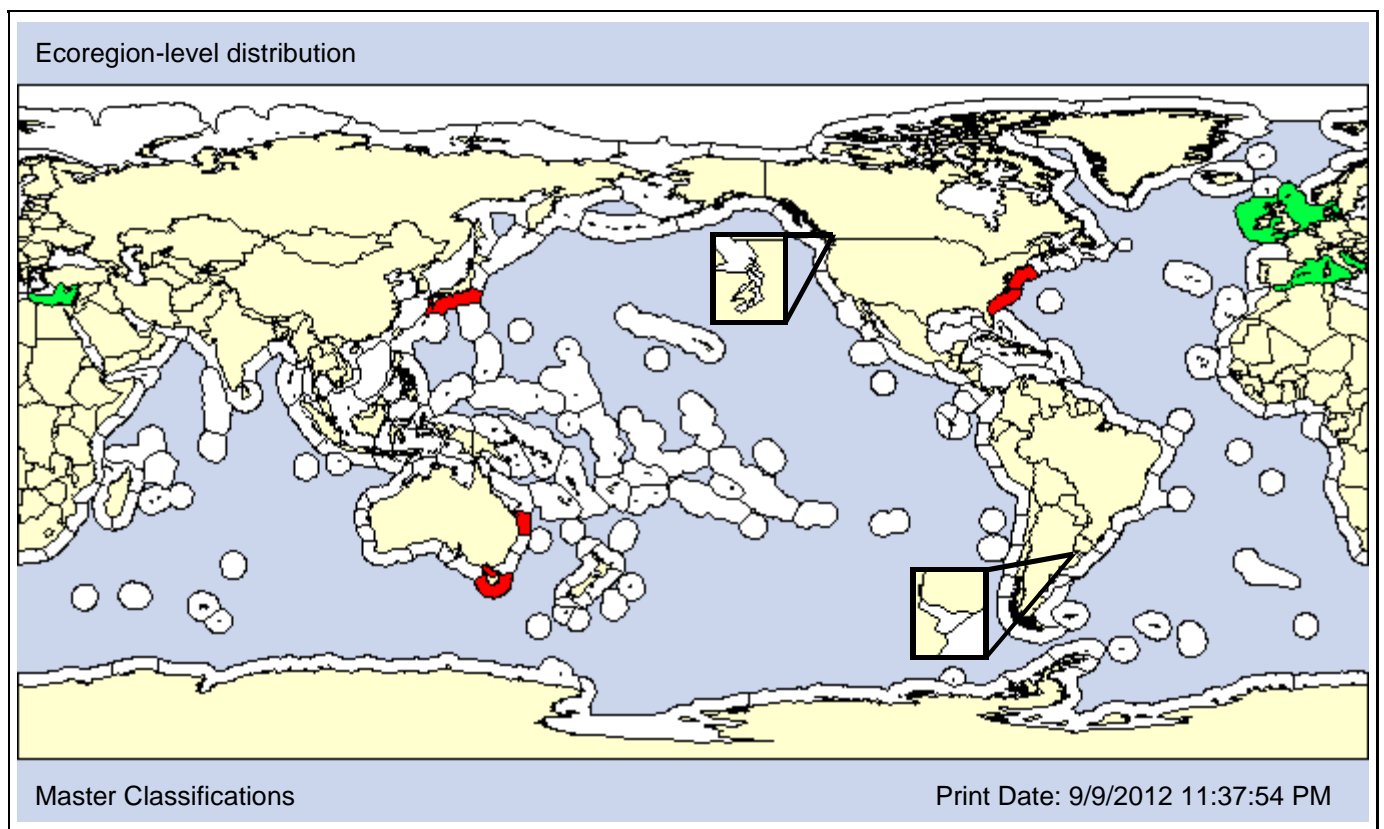
**Family:** Gyrodactylidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



**Date 1st record:** 1976

**Loc 1st record:** Japan

**Established:** Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P		<b>X</b>	
<b>X</b>						AO	PO								

Comments: *Gyrodactylus anguillae* parasitizes the gills of anguillid eels, in particular the European eel (*Anguilla anguilla*). Genetic analysis indicates that it is native to Europe (Hayward et al., 2001). In addition to the translocations of live eels, ballast water may be an important vector.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O	O		O		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		X											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic P			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	P					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
	O	O	O	O	O	O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
X									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							



**Taxon:** Tapeworm

**Taxonomic Author:** Calentine & Ulmer, 1961

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Platyhelminthes

**Subphylum:**

**Superclass:**

**Class:** Cestoda

**Subclass:** Eucestoda

**Infraclass:**

**Superorder:**

**Order:** Caryophyllidea

**Suborder:**

**Infraorder:**

**Superfamily:**

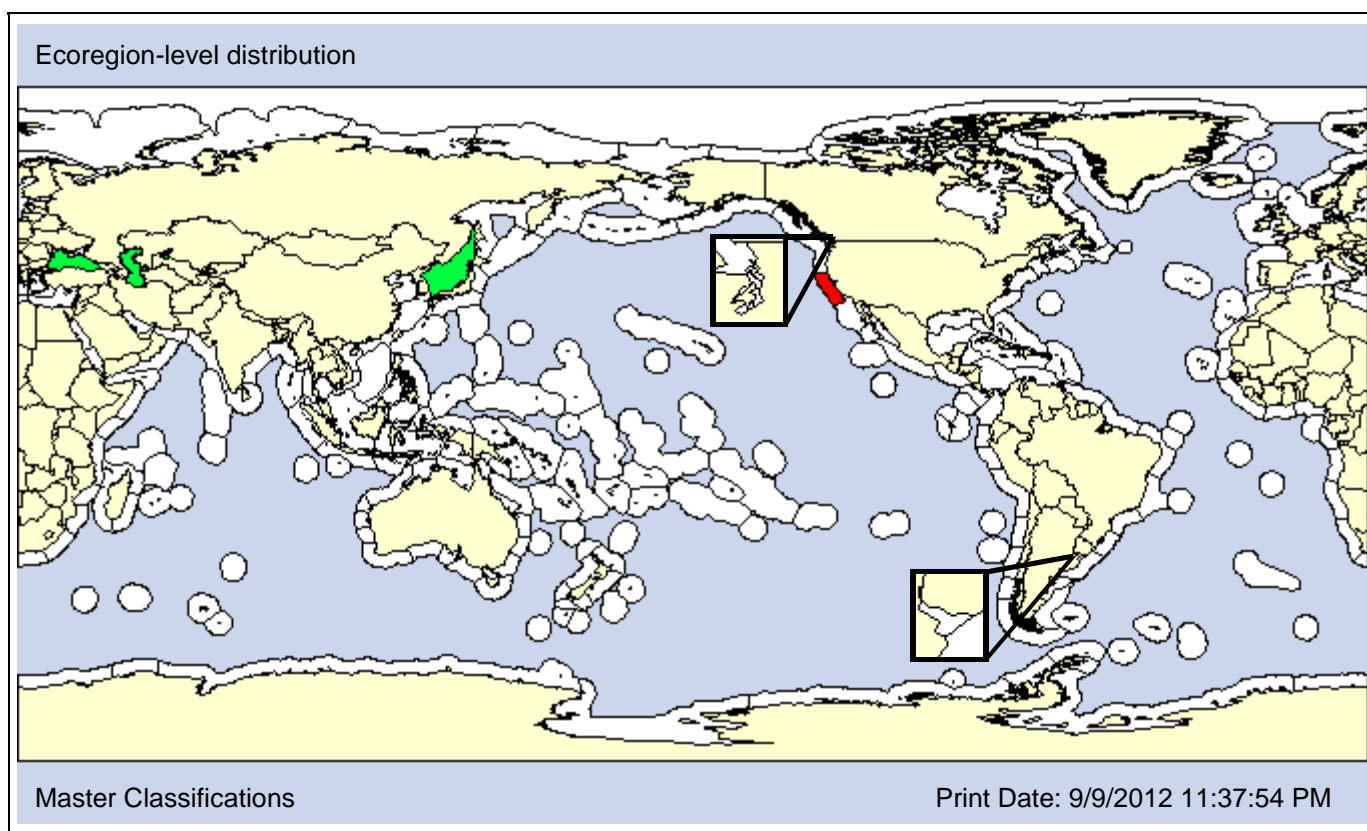
**Family:** Lytocestidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Iowa, USA



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii		NEP	

**Date 1st record:** Native 1972

**Loc 1st record:** Native (Amur Basin) San Francisco Estuary, CA

**Established:** Yes Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P		X		
						AO	PO								

Comments: *Khawia iowensis* is an intestinal parasite of the carp, *Cyprinus carpio*, which is primarily freshwater but can occur in estuaries. Presumably, *K. iowensis* is native to the same range as *C. carpio* - rivers in temperate Eurasia, specifically the Black, Caspian and Aral Sea basins - and introduced in areas where *C. carpio* is not native.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - 0psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>							

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

# *Koinostylochus ostreophagus*

Species ID: 1550

**Taxon:** Flatworm

**Taxonomic Author:** (Hyman, 1955)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Platyhelminthes

**Subphylum:**

**Superclass:**

**Class:** Rhabditophora

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Polycladida

**Suborder:** Acotylea

**Infraorder:**

**Superfamily:** Stylochoidea

**Family:** Callioplanidae

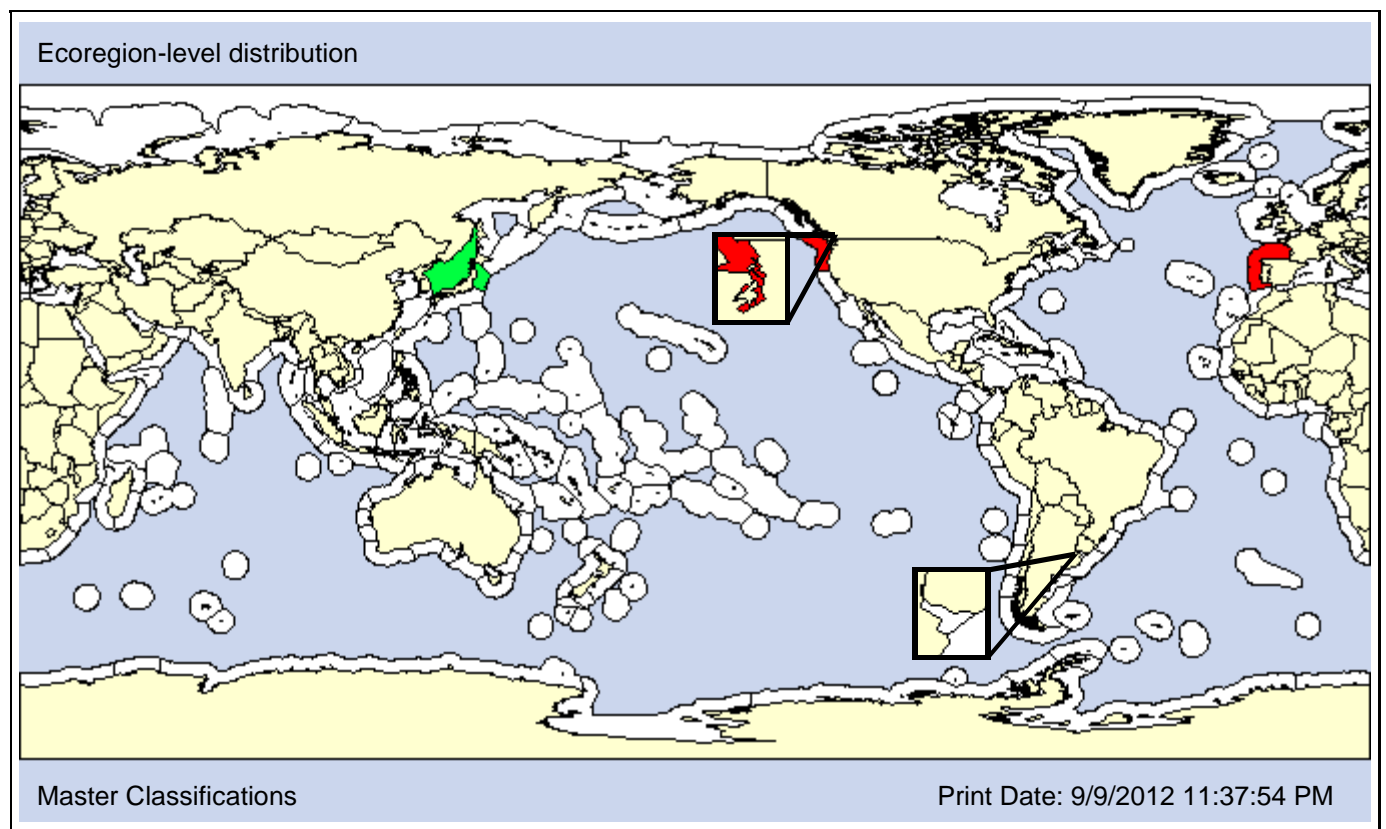
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Pseudostylochus ostreophagus	Synonym	
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**Type Locality:** Miyagi Prefecture, Japan



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red;">■</span> NIS Not Established	<span style="color: yellow;">■</span> Cryptogenic	<span style="color: lightblue;">■</span> Transient	<span style="color: purple;">■</span> Unclassified	<span style="color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black;">■</span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** Native

1953

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

## VECTORS

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
						AO	PO X							

Comments: *Koinostylochus ostreophagus* (= *Pseudostylochus ostreophagus*) is a parasite/predator on oysters.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated <b>X</b></b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		

**DEPTH [Obs: 0 - 71m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE **X****

<b>R</b>	<b>HP</b>	<b>Biogenic <b>P</b></b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>												

**SALINITY [Obs: 10 - 35psu] [Pref: 20 - 25psu]**

<b>Fresh</b>	<b>Brackish <b>P</b></b>						<b>Marine <b>O</b></b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual <b>X</b></b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

**Taxon:** Fluke **Taxonomic Author:** (MacCallum, 1927) Yamaguti, 1963  
**Kingdom:** Animalia **Subkingdom:** Eumetazoa **Phylum:** Platyhelminthes  
**Subphylum:** **Superclass:** **Class:** Monogenea  
**Subclass:** Monopisthocotylea **Infraclass:** **Superorder:**  
**Order:** Capsalidea **Suborder:** **Infraorder:**  
**Superfamily:** **Family:** Capsalidae **Subfamily:**

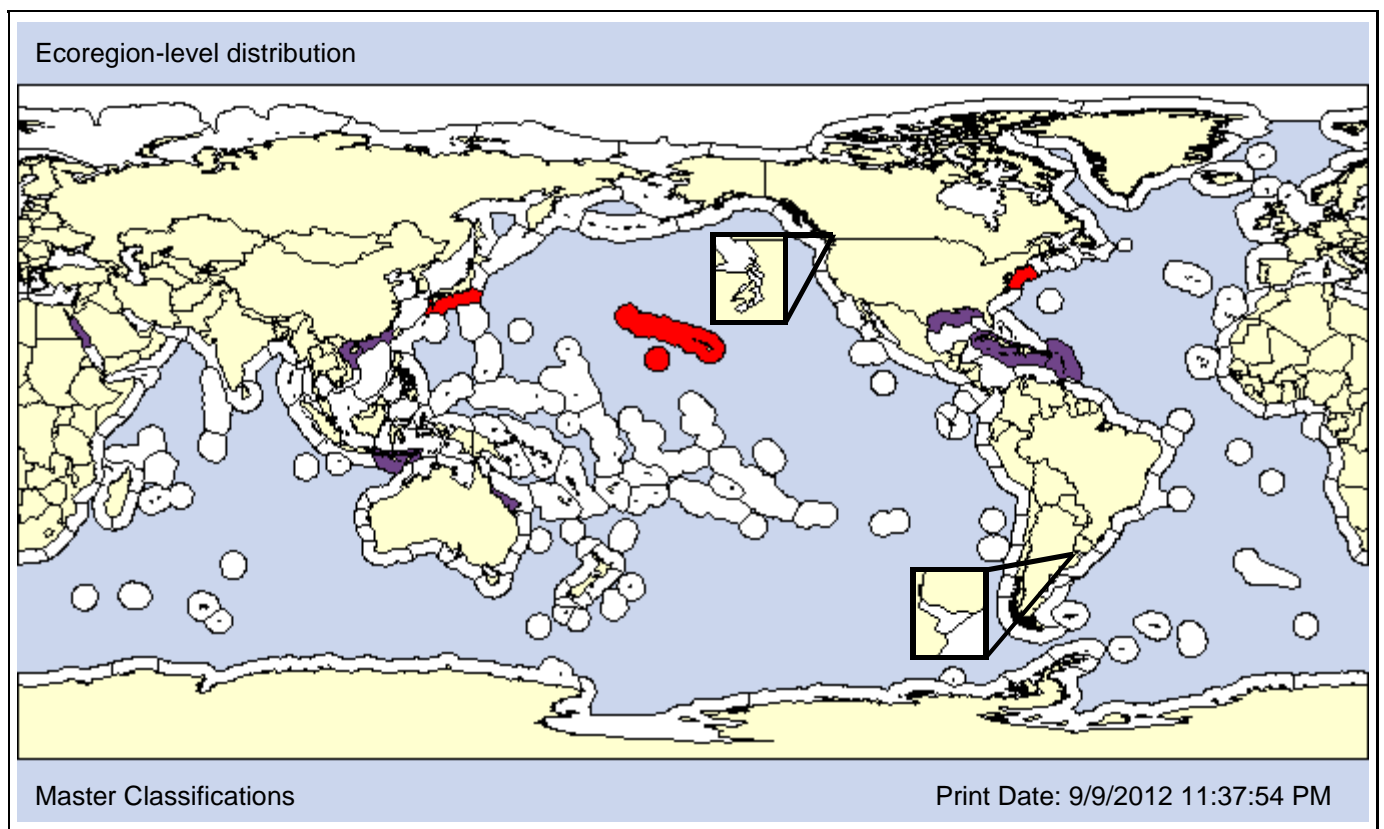
**Also Known As (Name - Type):**

Epibdella melleni	Synonym
Neobenedenia girellae of NWP authors in part; not (MacCal	Misidentified

**Common Names:**

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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1991 (Japan) 1981 (Kaneohe Bay, Hawaii)  
**Loc 1st record:** Japan Kaneohe Bay, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA X	IR			A	P			
						AO	PO			X				

Comments: *Neobenedenia melleni* is unique among monogenean parasites with its broad range of fish hosts, and may be a species complex (Whittington, 2004). Nonetheless, available evidence suggests that it has been introduced into Hawaii, Japan, and New York. We list it as unclassified elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

**Taxon:** Monogenean

**Taxonomic Author:** Ogawa, 1999

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Platyhelminthes

**Subphylum:** Neodermata

**Superclass:**

**Class:** Monogenea

**Subclass:** Polyopisthocotylea

**Infraclass:**

**Superorder:**

**Order:** Mazocraeidea

**Suborder:**

**Infraorder:**

**Superfamily:**

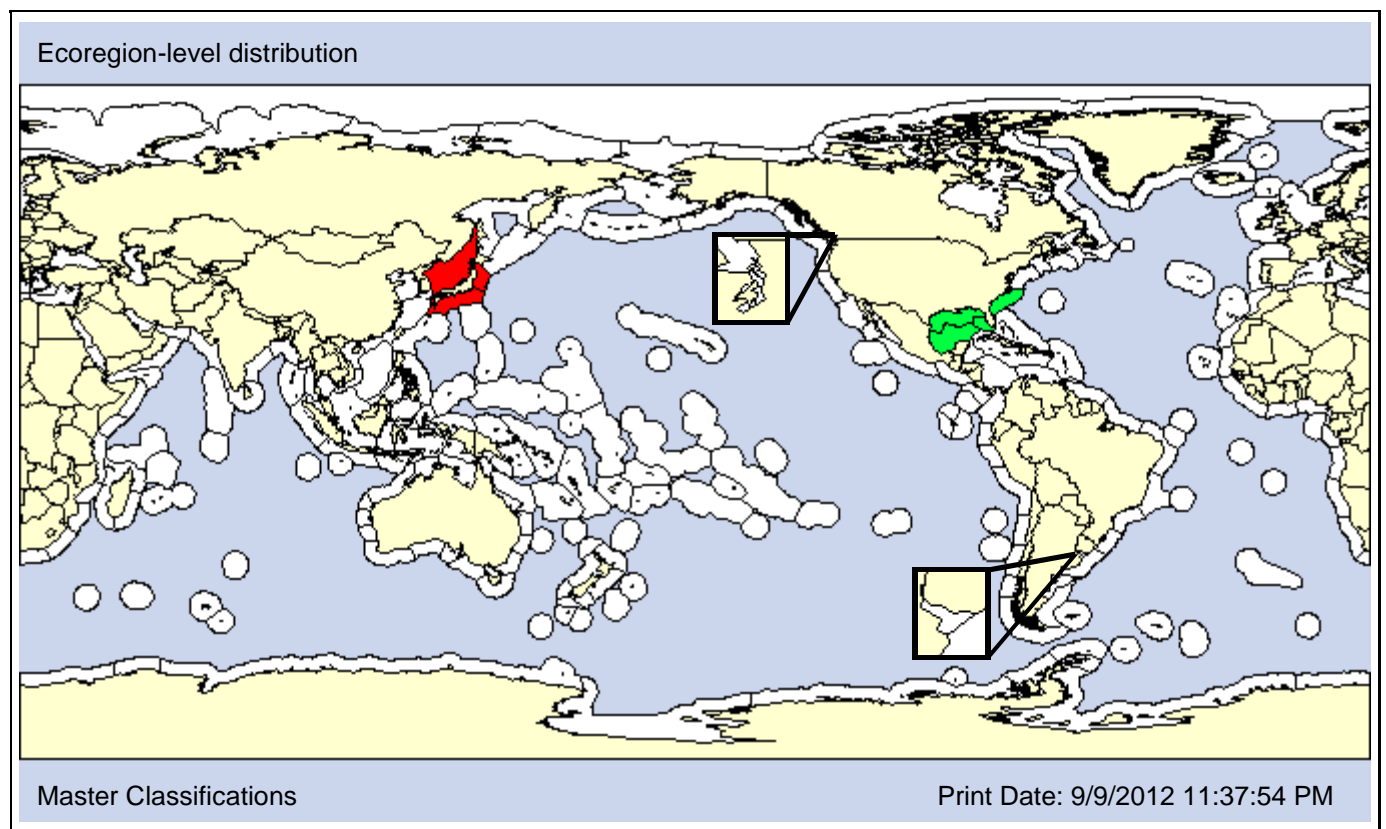
**Family:** Diclidophoridae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Sea of Japan



**Date 1st record:** 1993

**Loc 1st record:** Sea of Japan

**Established:** Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
						AO	PO								

Comments: Although described from the Sea of Japan, molecular studies indicate that *Neoheterobothrium hirame* arrived in Japan by undergoing a “host-switch” from the southern flounder, *Paralichthys lethostigma*, to *P. olivaceus*. The southern flounder is native to the southeast United States, which we assume is the native region for *N. hirame*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O	O				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		X											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	O		
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	O	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
X									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							



**Taxon:** Fluke **Taxonomic Author:** (Mizelle & Arcadi, 1945)

**Kingdom:** Animalia **Subkingdom:** Eumetazoa **Phylum:** Platyhelminthes

**Subphylum:** **Superclass:** **Class:** Monogenea

**Subclass:** Monopisthocotylea **Infraclass:** **Superorder:**

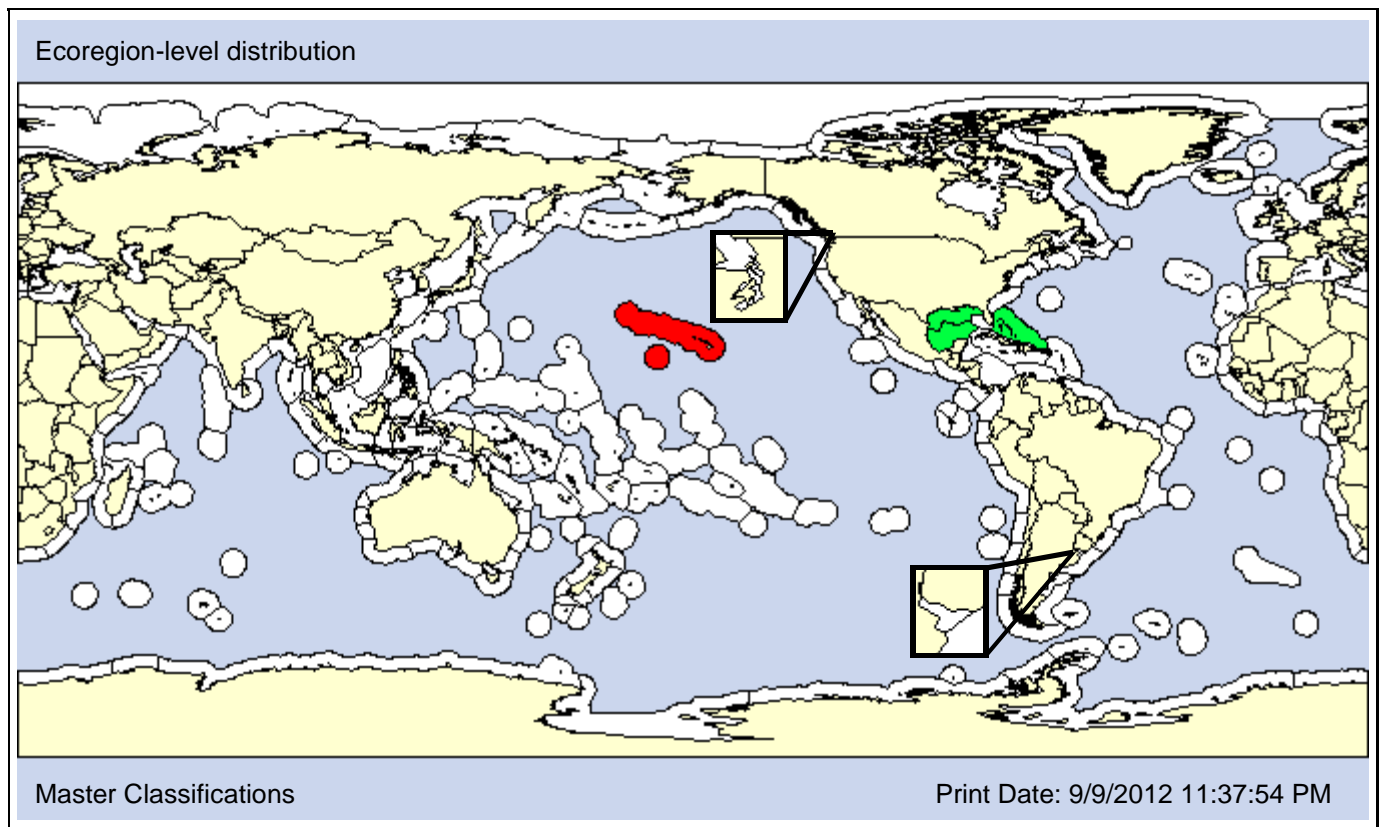
**Order:** Dactylogyridea **Suborder:** **Infraorder:**

**Superfamily:** **Family:** Ancyrocephalidae **Subfamily:**

Also Known As (Name - Type):

Common Names:

Type Locality:



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1997

**Loc 1st record:** Hawaii

**Established:** Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>				A	P			<b>X</b>	
						AO	PO			<b>X</b>					

Comments: *Salsuginus seculus* is a fluke parasite that lives in the gill filaments of the mosquito fish *Gambusia affinis* and *G. yucatana*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>O</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>								

**TROPHIC LEVEL AND FEEDING**

<b>PAR X</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Flatworm  
**Kingdom:** Animalia  
**Subphylum:**  
**Subclass:**  
**Order:** Polycladida  
**Superfamily:** Leptoplanoidea

**Taxonomic Author:** (Hyman, 1953)  
**Subkingdom:** Eumetazoa  
**Superclass:**  
**Infraclass:**  
**Suborder:** Acotylea  
**Family:** Stylochoplanidae

**Phylum:** Platyhelminthes  
**Class:** Rhabditophora  
**Superorder:**  
**Infraorder:**  
**Subfamily:**

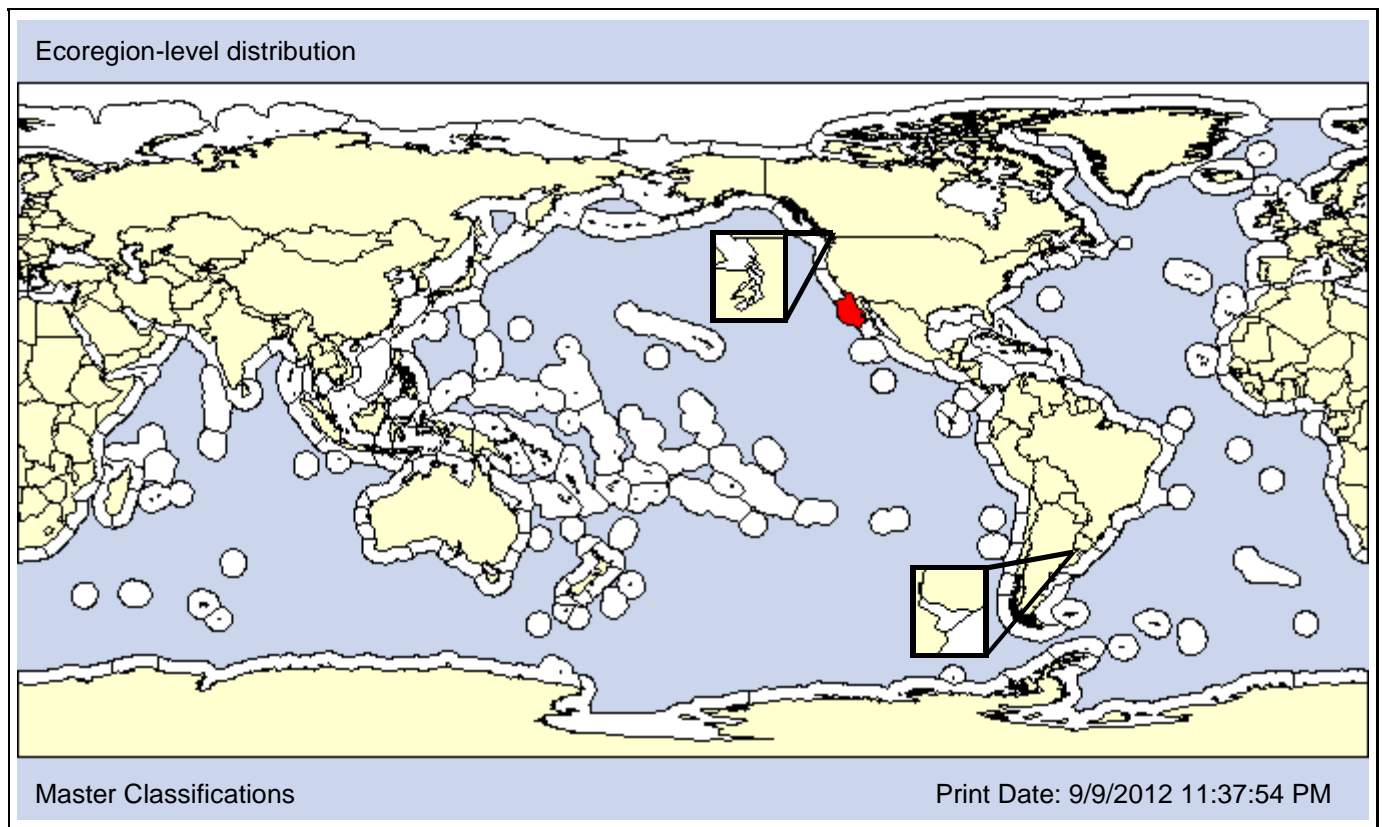
**Also Known As (Name - Type):**

Leptoplana limnoriae	Synonym

**Common Names:**

--

**Type Locality:** Los Angeles Harbor, California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1950  
**Loc 1st record:** Los Angeles Harbor, CA  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: *Stylochoplana limnoriae* (= *Leptoplana limnoriae*) is found in the burrows of the wood-boring isopod *Limnoria* in Los Angeles Harbor. Because of its close association with a non-native species, it is assumed to be introduced in the NEP, though its native range is unknown.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H+B	Oth
										P		O	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
					X				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X	X				X

**Taxon:** Flatworm

**Taxonomic Author:** Hyman, 1944

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Platyhelminthes

**Subphylum:**

**Superclass:**

**Class:** Rhabditophora

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Polycladida

**Suborder:** Acotylea

**Infraorder:**

**Superfamily:** Ilyplanoidea

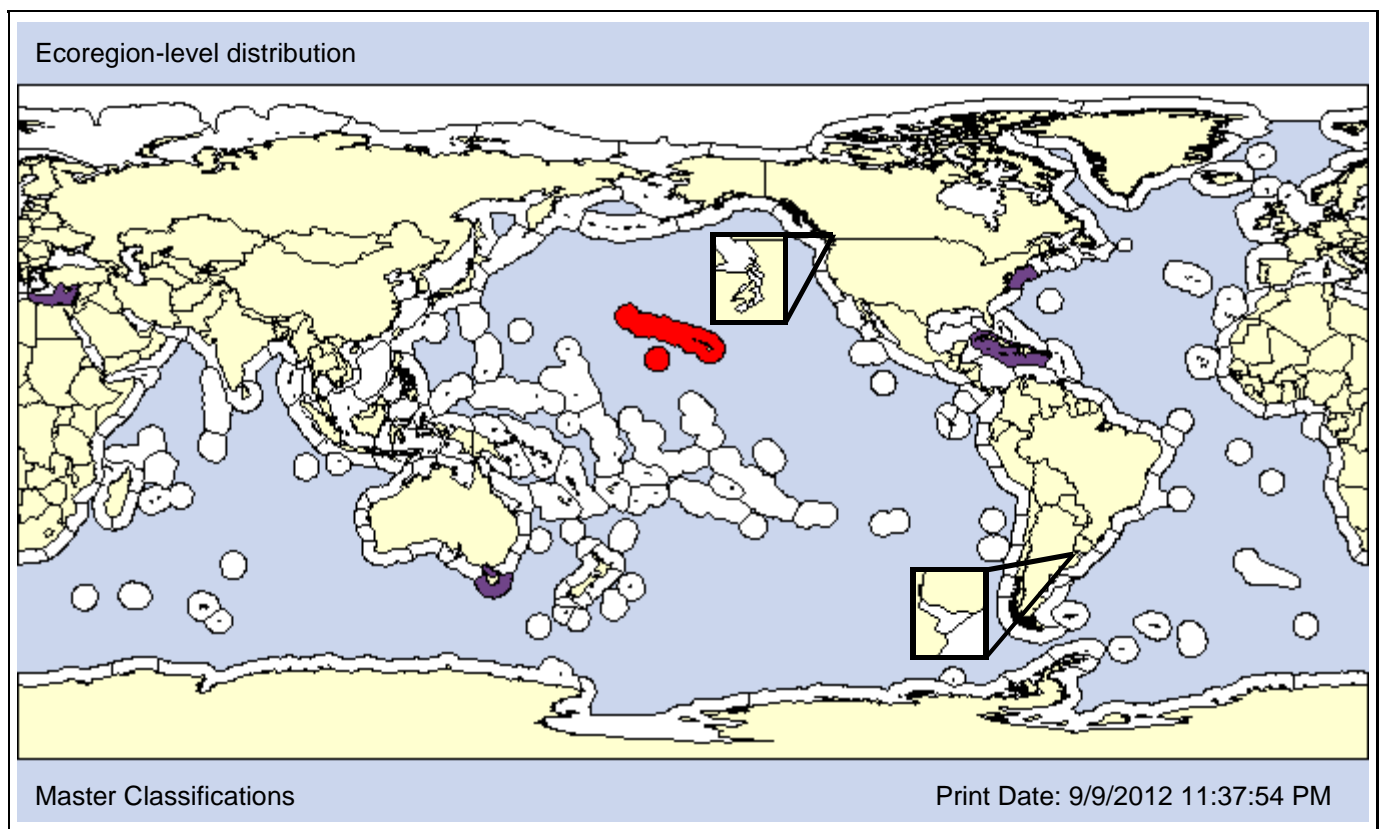
**Family:** Euplanidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1938  
**Loc 1st record:** Honolulu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		<b>X</b>				AO	PO								

Comments: *Taenioplana teredini* is associated with the shipworm *Teredo*. Its native region is unknown, though Carlton (2009) suggested that it might be from the Southern Hemisphere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P			P	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X	X				

**Kingdom: Animalia**

**Phylum: Annelida**

**Class: Clitellata**

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**Taxon:** Oligochaete

**Taxonomic Author:** (Gruithuisen, 1828)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Clitellata

**Subclass:** Oligochaeta

**Infraclass:**

**Superorder:**

**Order:** Haplotaxida

**Suborder:** Tubificina

**Infraorder:**

**Superfamily:**

**Family:** Naididae

**Subfamily:**

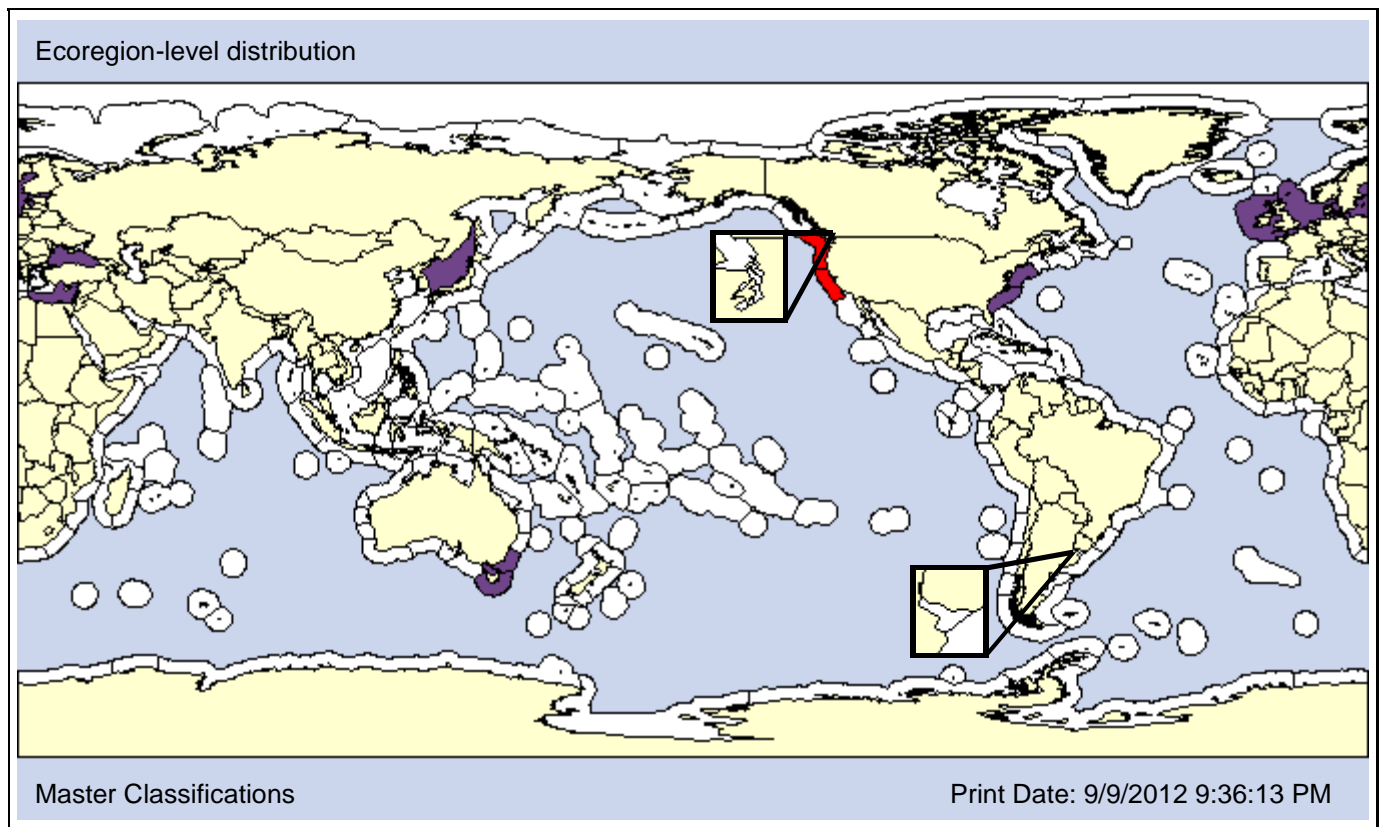
**Also Known As (Name - Type):**

Chaetogaster diaphanus cyclops  
Nais diaphana

Convention  
Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Yes

1986  
San Francisco Estuary, CA  
Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
<b>X</b>	<b>X</b>					AO	PO				<b>X</b>			

Comments: Chaetogaster diaphanus is primarily a freshwater species, though it can tolerate salinities up to about 10 psu. Its native range is unknown, though it has been introduced into the Sacramento-San Joaquin Delta of the San Francisco Estuary and the Columbia River in the NEP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>		<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 10psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
<b>X</b>										

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

# *Limnodriloides monotheucus*

Species ID: 1076

**Taxon:** Oligochaetae

**Taxonomic Author:** Cook, 1974

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Clitellata

**Subclass:** Oligochaeta

**Infraclass:**

**Superorder:**

**Order:** Haplotaxida

**Suborder:** Tubificina

**Infraorder:**

**Superfamily:**

**Family:** Tubificidae

**Subfamily:**

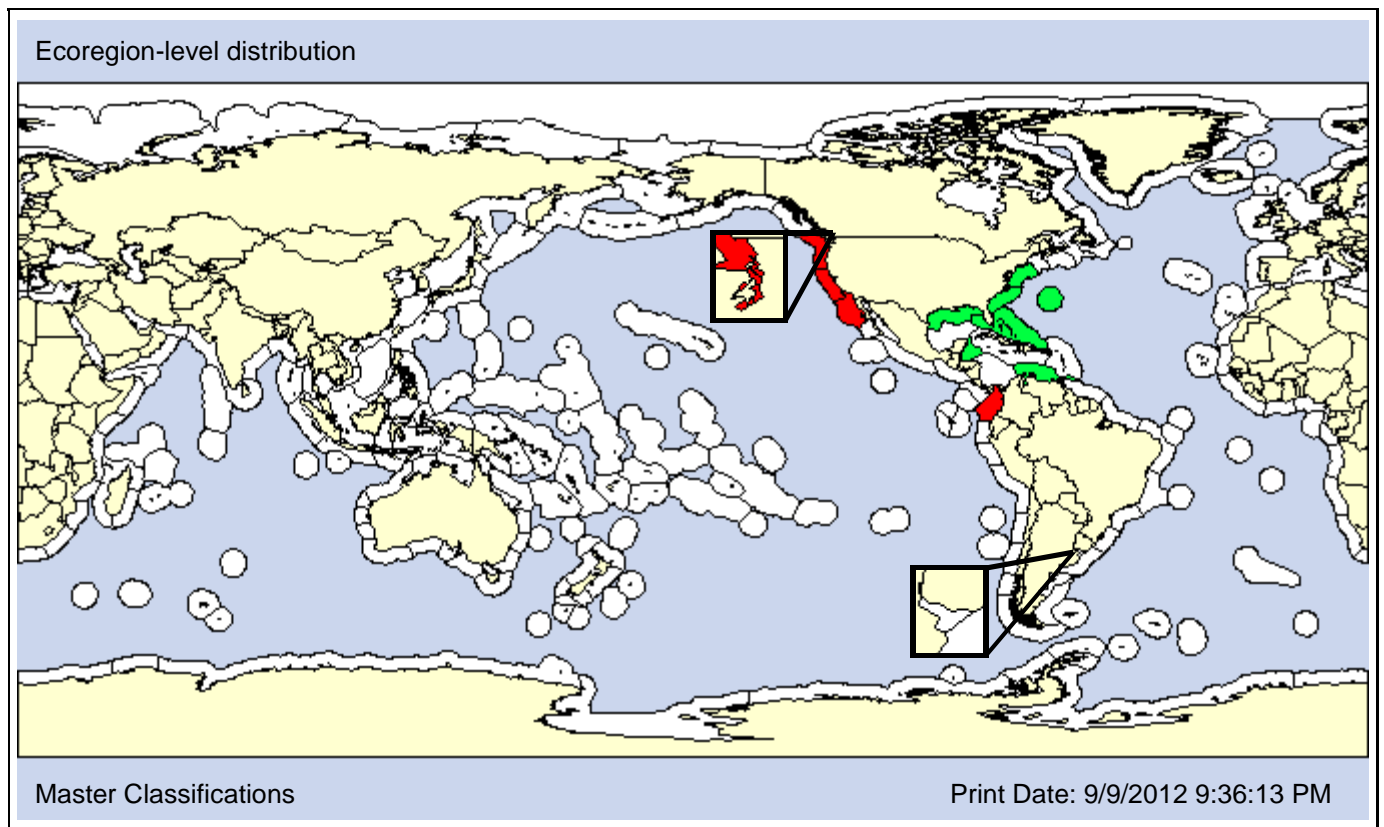
**Also Known As (Name - Type):**

Bohadschia monotheuca  
Limnodrilus monotheucus

Synonym  
Synonym

**Common Names:**

**Type Locality:** Baja California, Mexico



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1970s

**Loc 1st record:**

Baja California, Mexico

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>	<b>X</b>				<b>AO X</b>	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 600m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 21 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>										

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

# Monopylephorus evertus

Species ID: 1071

**Taxon:** Oligochaete

**Taxonomic Author:** Baker & Brinkhurst, 1981

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Clitellata

**Subclass:** Oligochaeta

**Infraclass:**

**Superorder:**

**Order:** Haplotaxida

**Suborder:** Tubificina

**Infraorder:**

**Superfamily:**

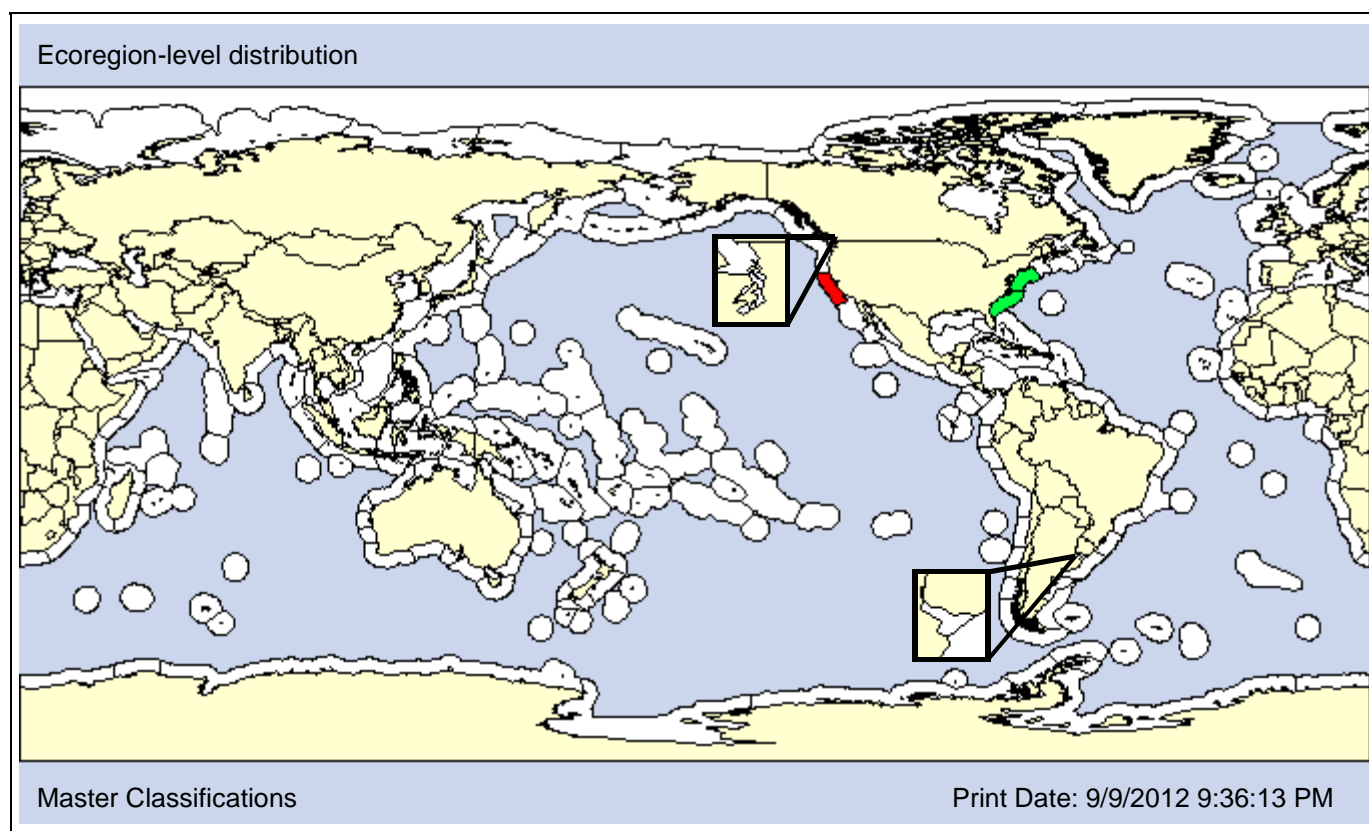
**Family:** Tubificidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** East coast of U.S.



**Date 1st record:**

1994

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

## VECTORS

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: We consider *Monopylephorus evertus* native to the NWA. It was first reported from the San Francisco Estuary, California in the mid-1990s. In San Francisco, it is abundant in areas adjacent to the hybrid *Spartina foliosa* x *alterniflora* and in areas where *Spartina* has died back (Neira et al., 2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 1m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 36.6psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>
		<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR	DF-SUB <b>X</b>

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>										

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Leach

**Taxonomic Author:** Leidy, 1851

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Clitellata

**Subclass:** Hirudinea

**Infraclass:** Euhirudinea

**Superorder:**

**Order:** Rhynchobdellida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Piscicolidae

**Subfamily:**

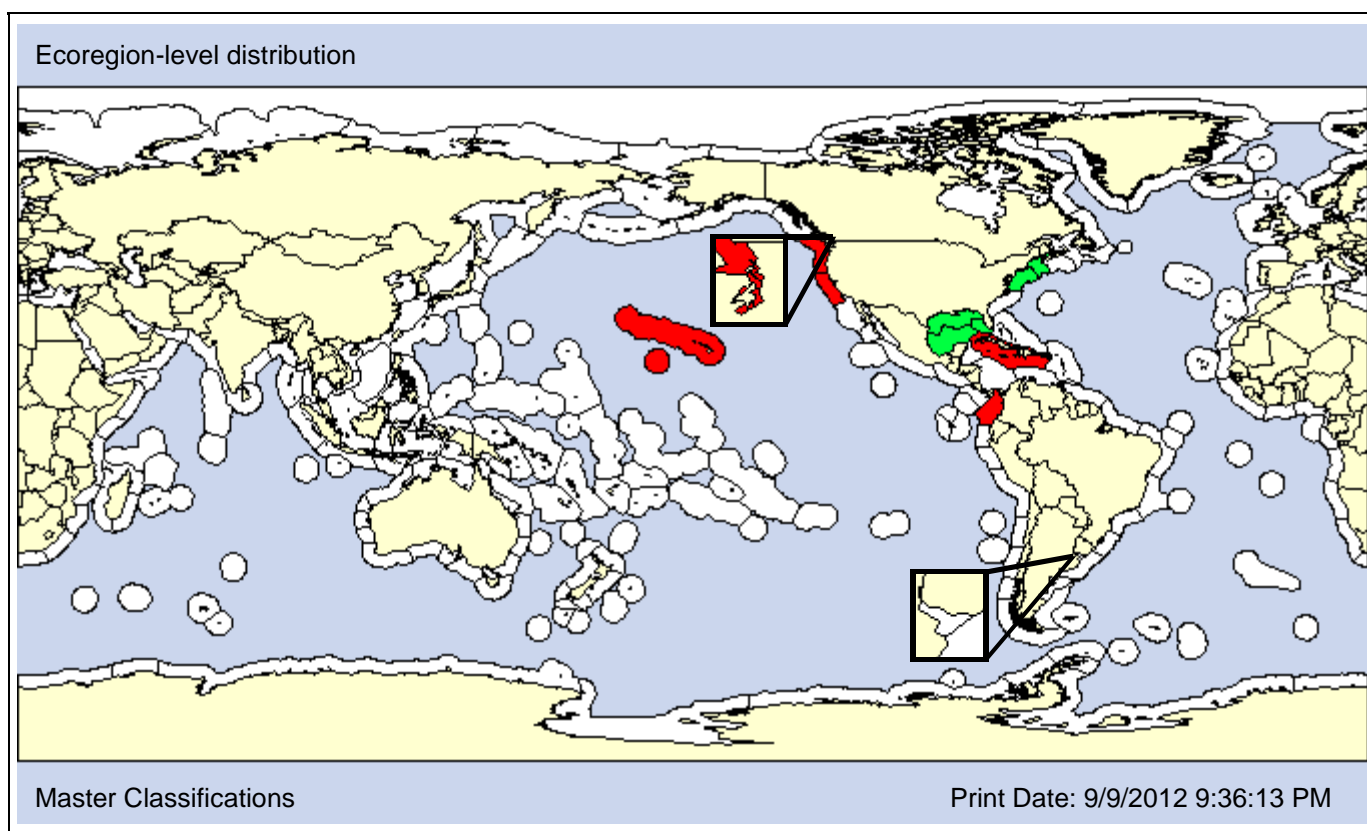
**Also Known As (Name - Type):**

Illinobdella elongata  
 Illinobdella moorei  
 Illinobdella richardsoni  
 Myzobdella moorei

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:**

<1994

1949

**Loc 1st record:**

Hawaii

Clear Lake, California

**Established:**

Yes

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				<b>X</b>
						AO	PO								

Comments: The leach, *Myzobdella lugubris*, infects a variety of freshwater and estuarine species, including the white catfish (*Ictalurus catus*) and the blue crab (*Callinectes sapidus*). *M. lugubris* occurs in Hawaii but appears limited to freshwater fish (Englund et al., 2000b).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 90m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 14psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>



**Taxon:** Oligochaete

**Taxonomic Author:** Hrabe, 1941

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Clitellata

**Subclass:** Oligochaeta

**Infraclass:**

**Superorder:**

**Order:** Haplotaxida

**Suborder:** Tubificina

**Infraorder:**

**Superfamily:**

**Family:** Tubificidae

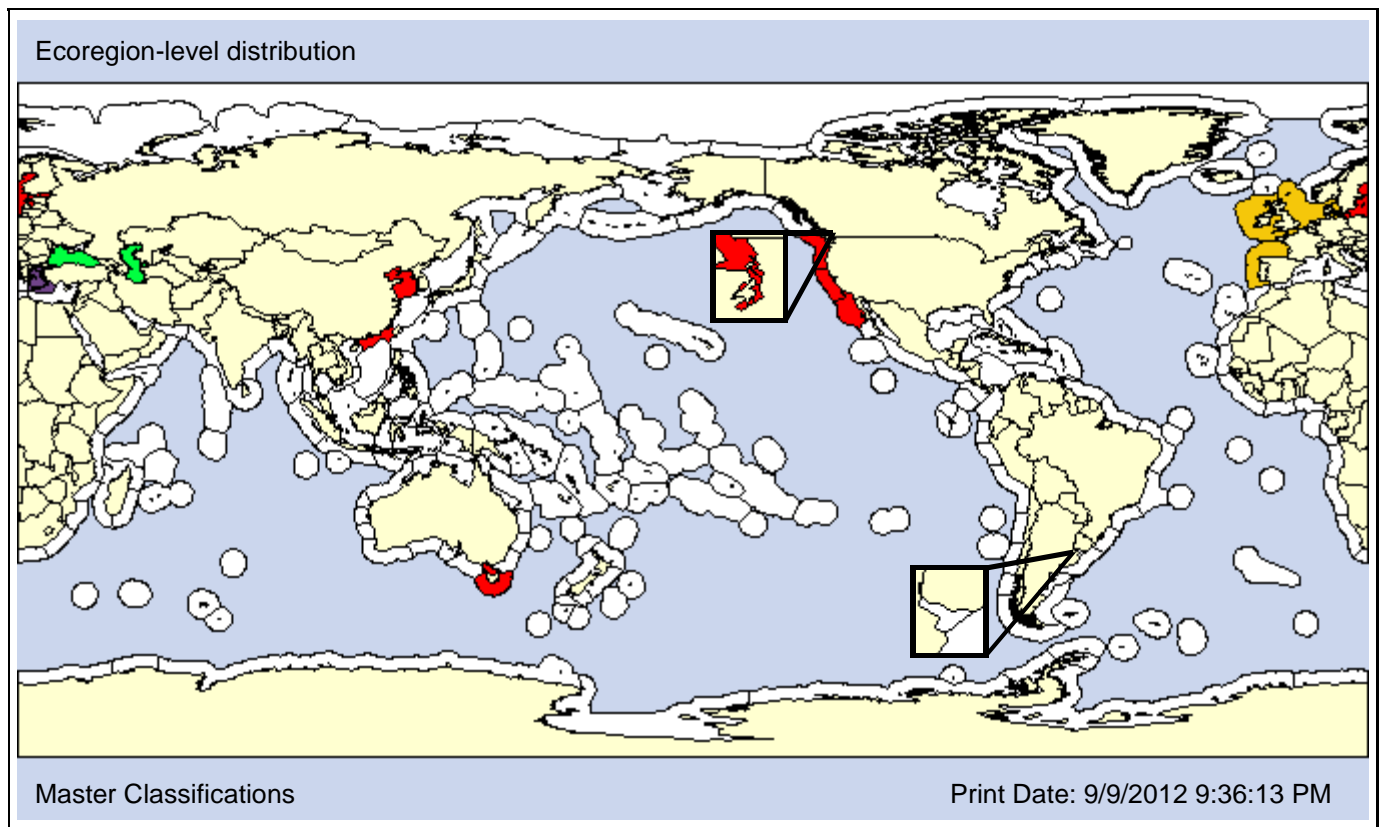
**Subfamily:** Naidinae

**Also Known As (Name - Type):**

**Common Names:**

Wapsa mobilis	Synonym	
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Yes

1961  
 San Francisco Estuary, CA  
 Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>	<b>X</b>				AO	PO				<b>X</b>					

Comments: Our global classification of *Paranais frici* is based on the assumption that it is native to the Ponto-Caspian (e.g., Olenin et al., 2008). However, it is possible that it constitutes a species complex and CANOD (2009) classifies it as cryptogenic in California. It has also been reported from Africa and Japan.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 6m] [Pref: 0 - 4m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 30psu] [Pref: 0 - 10psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>			<b>X</b>							

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Oligochaete

**Taxonomic Author:** Brinkhurst & Baker, 1979

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Clitellata

**Subclass:** Oligochaeta

**Infraclass:**

**Superorder:**

**Order:** Haplotaxida

**Suborder:** Tubificina

**Infraorder:**

**Superfamily:**

**Family:** Tubificidae

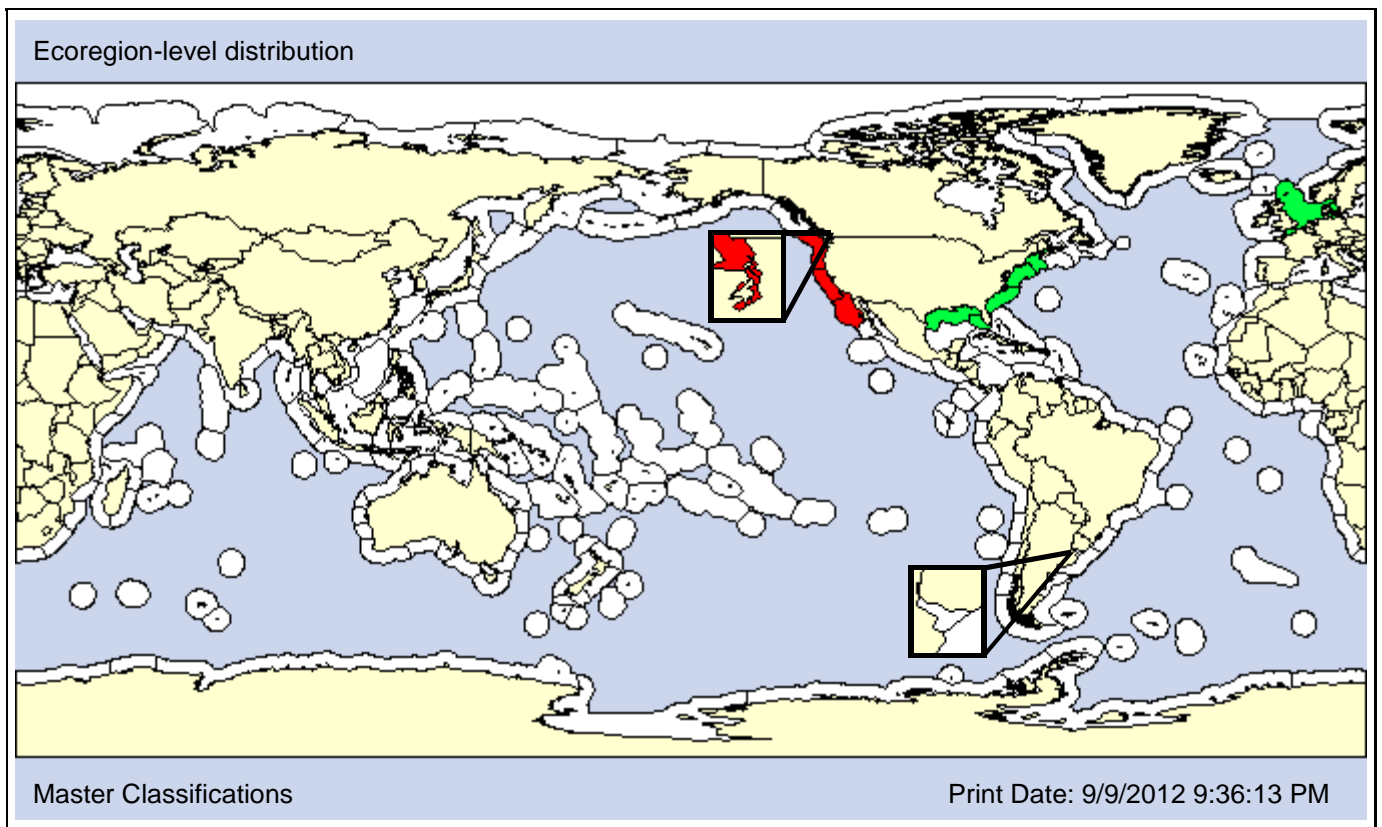
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Peloscolex gabriellae of 3rd Ed. Lights Manual	Misidentified	
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**Type Locality:** Delaware, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1961

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>	<b>X</b>				<b>AO X</b>	PO									

Comments: *Tubificoides brownae* is an Atlantic oligochaete that has been introduced into the NEP. It has also been reported from Saudi Arabia (Cook et al., 2007b) though no specific locations are known.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 10m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 77 - 92%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>		<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>		<b>O</b>									

**SALINITY [Obs: 14 - 32psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>										

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Oligochaete

**Taxonomic Author:** Brinkhurst & Baker, 1979

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Clitellata

**Subclass:** Oligochaeta

**Infraclass:**

**Superorder:**

**Order:** Haplotaxida

**Suborder:** Tubificina

**Infraorder:**

**Superfamily:**

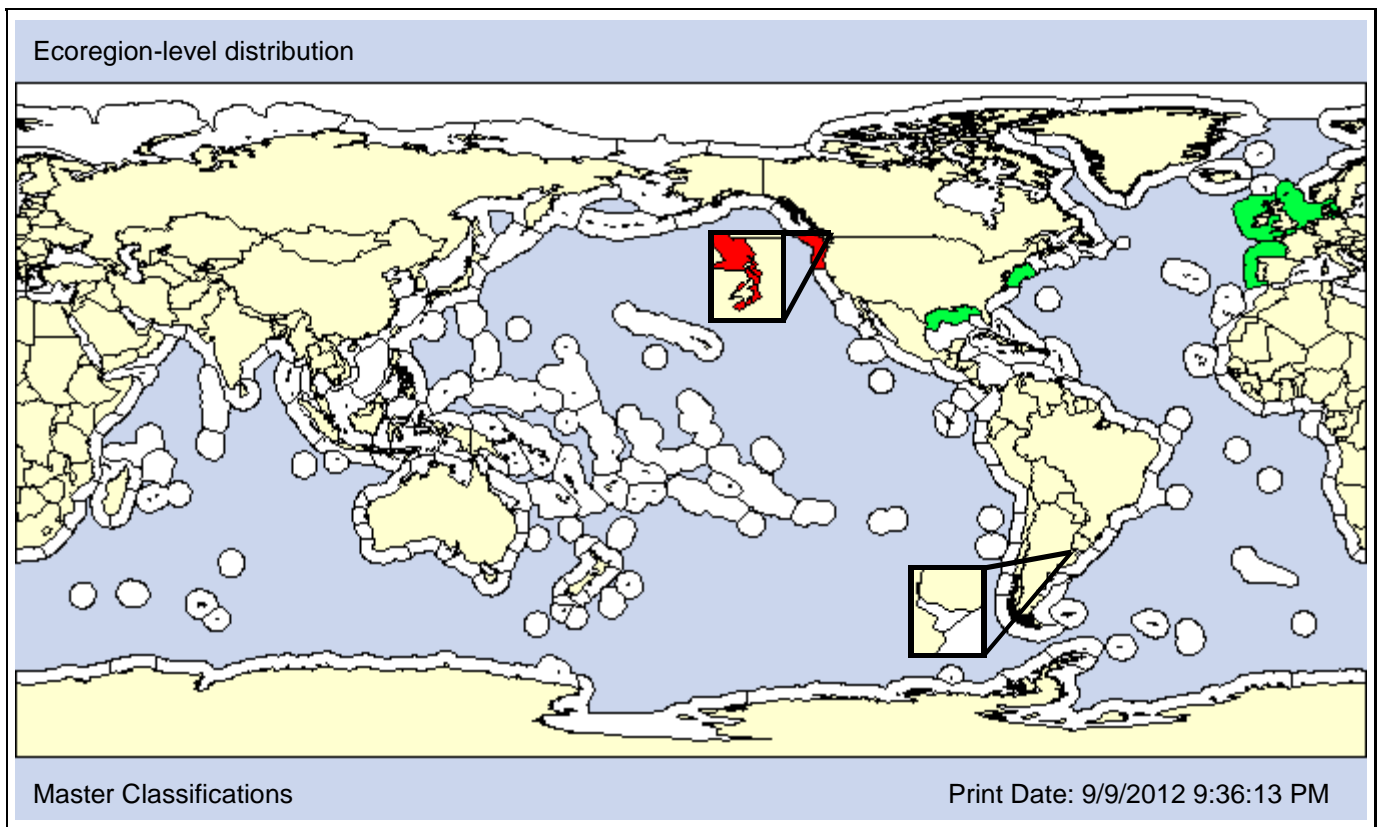
**Family:** Tubificidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1970s

**Loc 1st record:**

Unknown

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>						<b>AO X</b>	PO								

Comments: The Atlantic oligochaete, *Tubificoides diazi*, was introduced into Oregon and Washington, USA in the 1970s.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 87m] [Pref: 0 - 87m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR	DF-SUB <b>X</b>

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>										

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Oligochaete

**Taxonomic Author:** Brinkhurst & Baker, 1979

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Clitellata

**Subclass:** Oligochaeta

**Infraclass:**

**Superorder:**

**Order:** Haplotaxida

**Suborder:** Tubificina

**Infraorder:**

**Superfamily:**

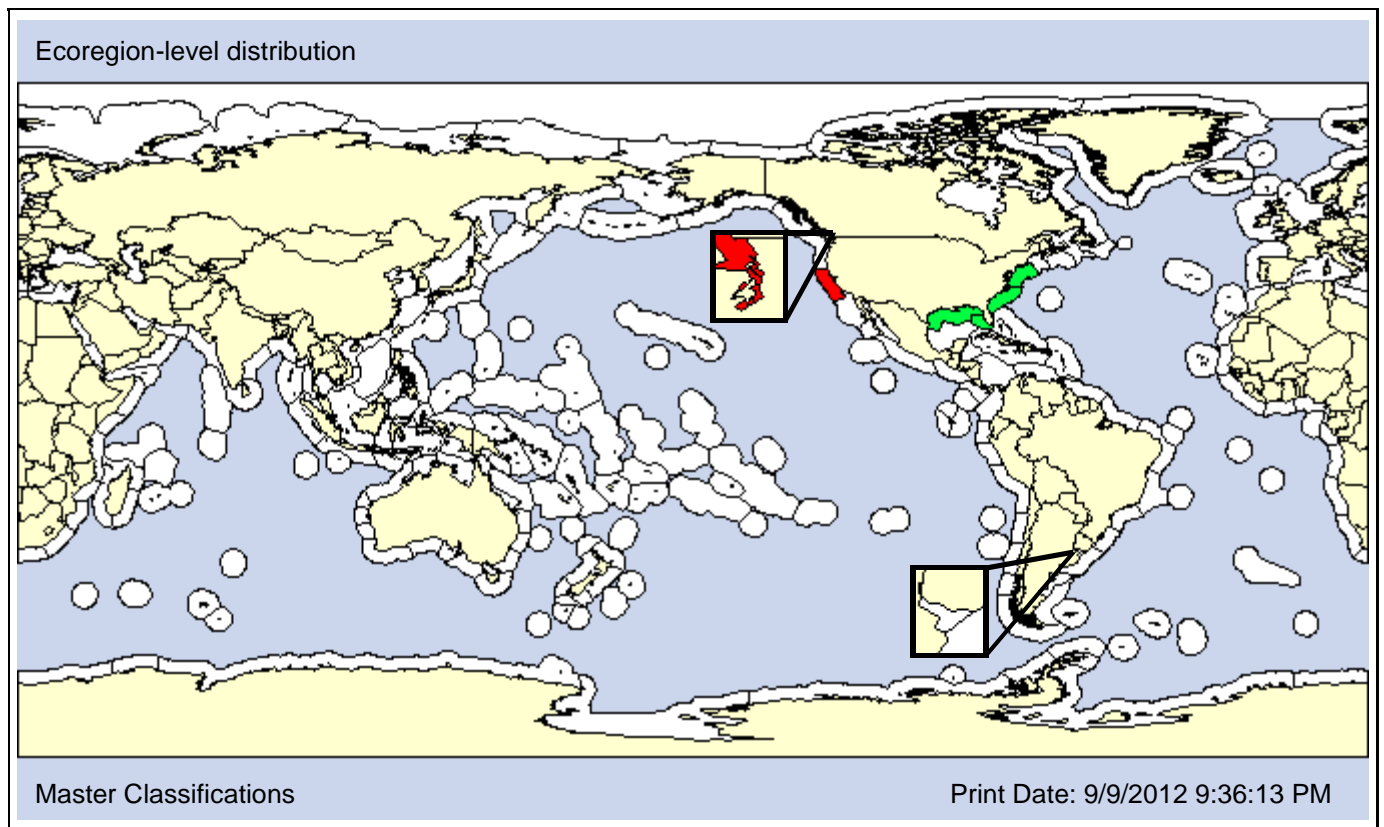
**Family:** Tubificidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



<span style="display:inline-block; width:15px; height:15px; background-color:blue;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px dashed red;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:lightgrey;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; border:1px solid black;"></span> Unidentified
NWP			Hawaii			NEP	

**Date 1st record:**

1961

**Loc 1st record:**

San Fransico Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>	<b>X</b>					<b>AO X</b>	PO								

Comments: The Atlantic oligochaete, *Tubificoides wasselli*, has been introduced into Victoria, British Columbia, Canada and the San Francisco Estuary, California (Cook et al., 2007b).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH			<b>X</b>		
<b>X</b>	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 60m] [Pref: 0 - 43m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 5 - 30psu] [Pref: 5 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
		<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR	DF-SUB <b>X</b>

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>										

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		



**Kingdom: Animalia**

**Phylum: Annelida**

**Class: Polychaeta**

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**Taxon:** Polychaete

**Taxonomic Author:** (Leuckart, 1847)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Nereidiformia

**Infraorder:**

**Superfamily:**

**Family:** Nereididae

**Subfamily:**

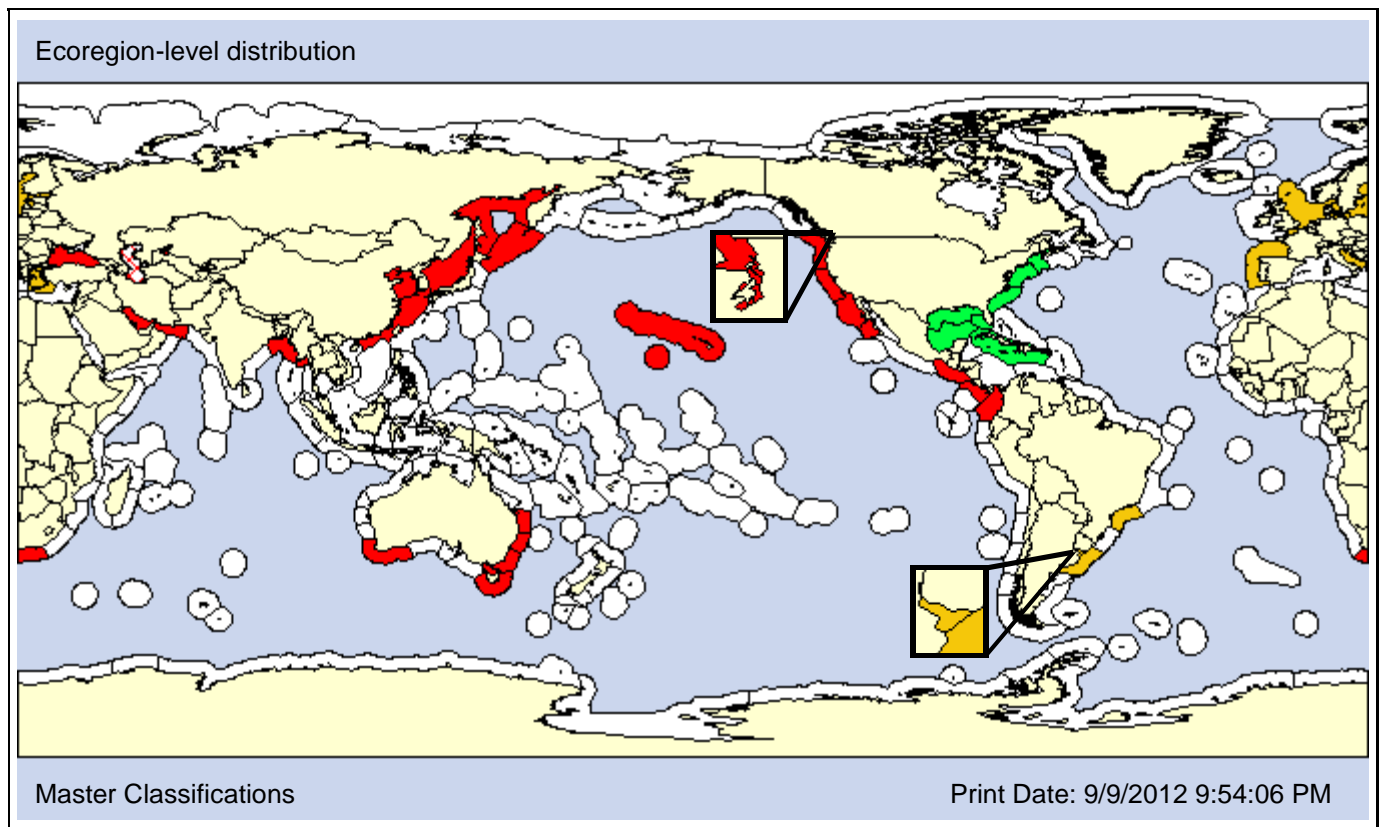
**Also Known As (Name - Type):**

Neanthes succinea	Synonym
Nereis (Neanthes) succinea	Synonym
Nereis limbata	Synonym
Nereis succinea	Synonym

**Common Names:**

clam worm
pile worm
rag worm

**Type Locality:** Helgoland, Germany



Master Classifications Print Date: 9/9/2012 9:54:06 PM

<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;"> </span> NIS Not Established	<span style="color: yellow;">■</span> Cryptogenic	<span style="color: lightblue;">■</span> Transient	<span style="color: purple;">■</span> Unclassified	<span style="color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid gray; padding: 2px;"> </span> Unidentified
		NWP		Hawaii		NEP	

<b>Date 1st record:</b> Unknown	1941	1896
<b>Loc 1st record:</b> Unknown	Oahu, Hawaii	San Francisco Estuary, CA
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P				<b>X</b>
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 50m] [Pref: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 13 - 100%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>			

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>									<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 5 - 67.5psu] [Pref: 5 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
		<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
			<b>X</b>	<b>X</b>					DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF <b>X</b>				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					
					<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>				<b>X</b>		<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** Harris, 2004

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Terebellida

**Suborder:** Terebellida

**Infraorder:**

**Superfamily:**

**Family:** Terebellidae

**Subfamily:**

**Also Known As (Name - Type):**

Amaeana sp. A (Harris)

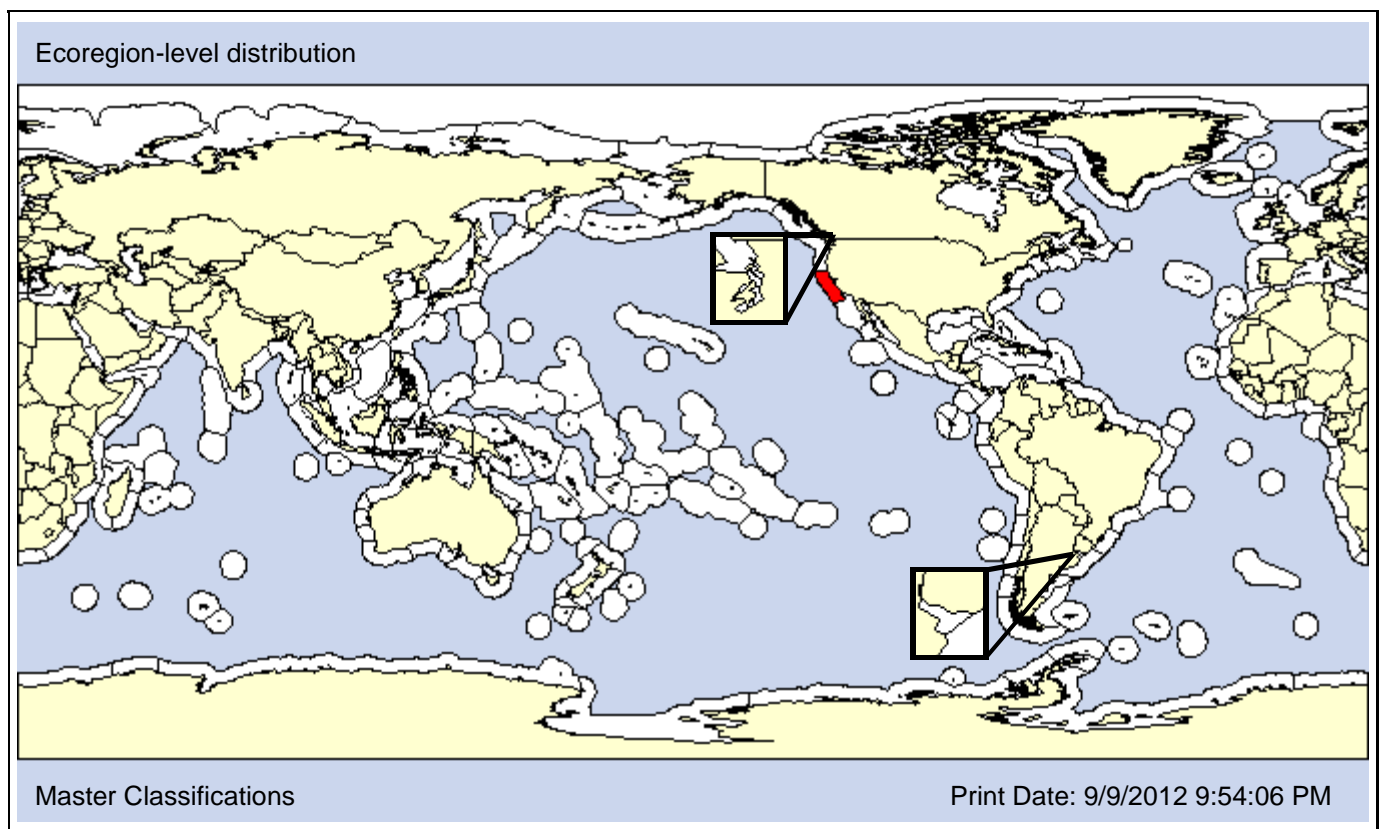
Convention

Amaeana sp. A Harris

Convention

**Common Names:**

**Type Locality:** California, USA



**Date 1st record:**

2004

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Unknown

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	<b>O</b>

**SALINITY [Obs: - 29.4psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** Izuka, 1912

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

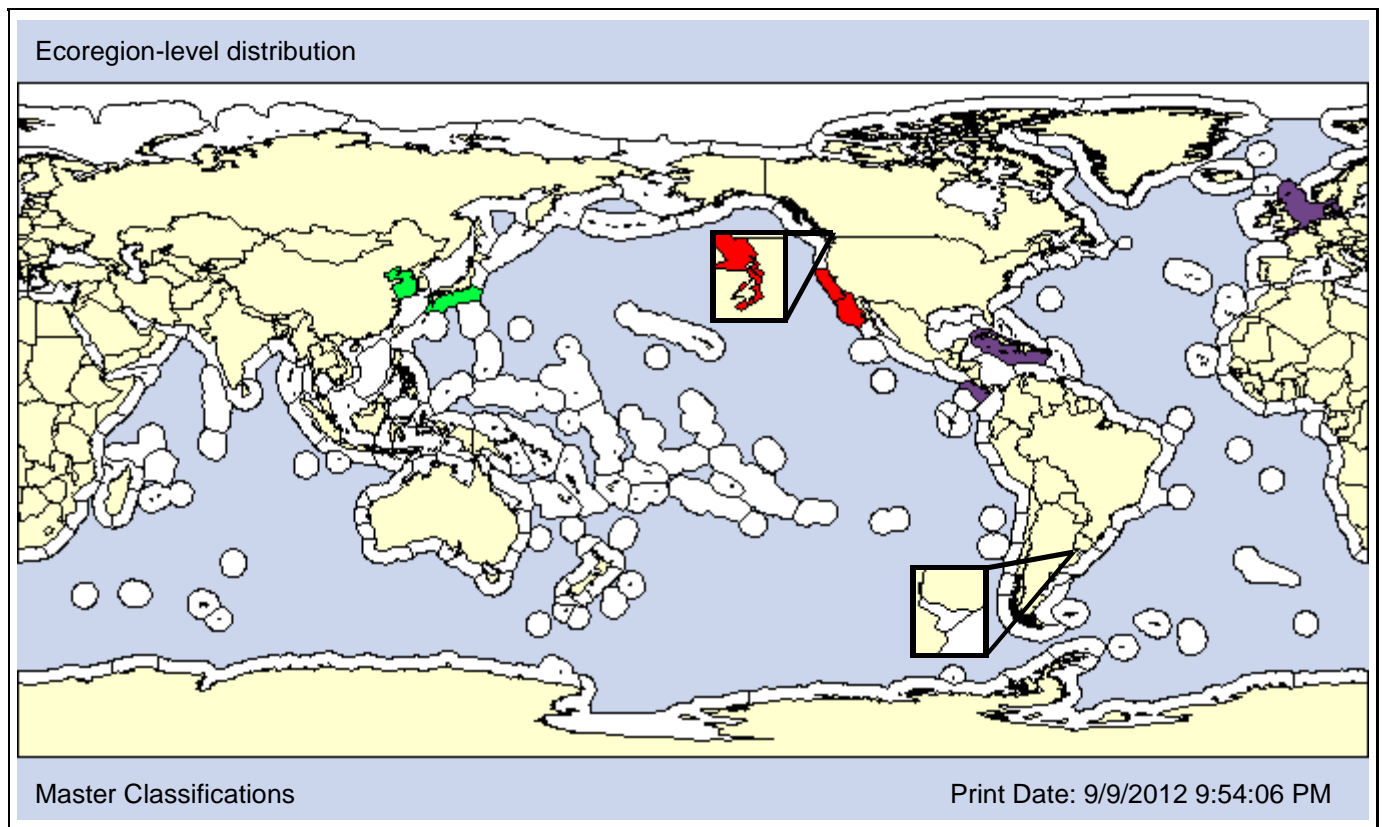
**Subfamily:** Syllinae

**Also Known As (Name - Type):**

**Common Names:**

Amblyosyllis nigrolineata	Synonym	
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**Type Locality:** Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native <1978  
**Loc 1st record:** Native San Clemente Island, CA  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Amblyosyllis speciosa* is possibly a species complex; however, it is likely that the species found in Southern California was introduced from Japan (Cohen et al., 2002; CANOD, 2009). Because of the taxonomic uncertainty, we list it as unclassified in other areas.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 60m] [Pref: 0 - 2.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>											

**SALINITY [Obs: 25 - 36psu] [Pref: - 35psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B <b>X</b>	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



# Amphiglena mediterranea

Species ID: 101839

**Taxon:** Polychaeta

**Taxonomic Author:** (Leydig, 1851)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Sabellidae

**Subfamily:**

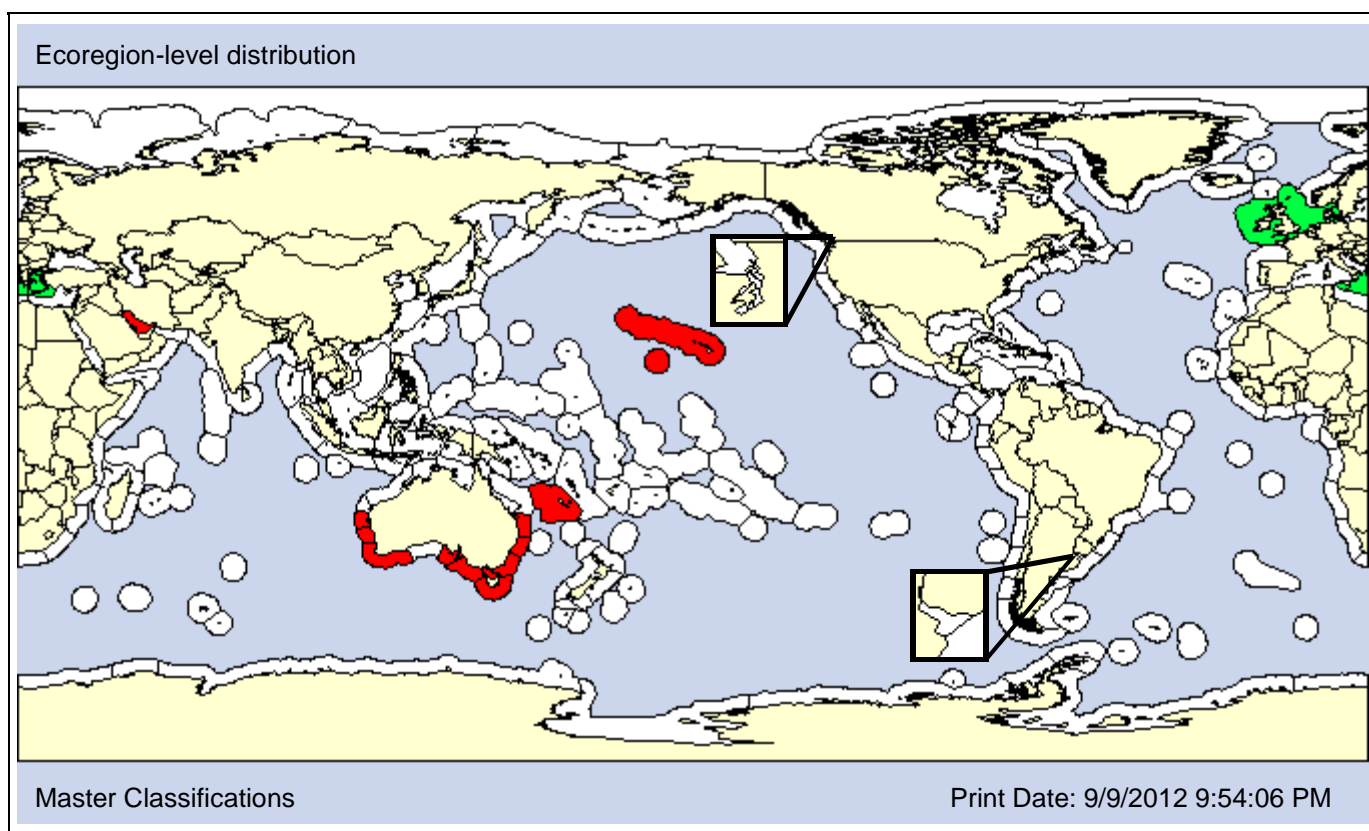
**Also Known As (Name - Type):**

Amphicora mediterranea  
Amphicorina desiderata

Synonym  
Synonym

**Common Names:**

**Type Locality:** Nice, France



**Date 1st record:**

<1998

**Loc 1st record:**

Oahu, Hawaii

**Established:**

Yes

### VECTORS

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 14m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2.16 - 85.9%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 27.3 - 36.29psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

# *Axiiothella quadrimaculata*

Species ID: 11800

**Taxon:** Polychaeta

**Taxonomic Author:** Augener, 1914

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Scolecida

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:**

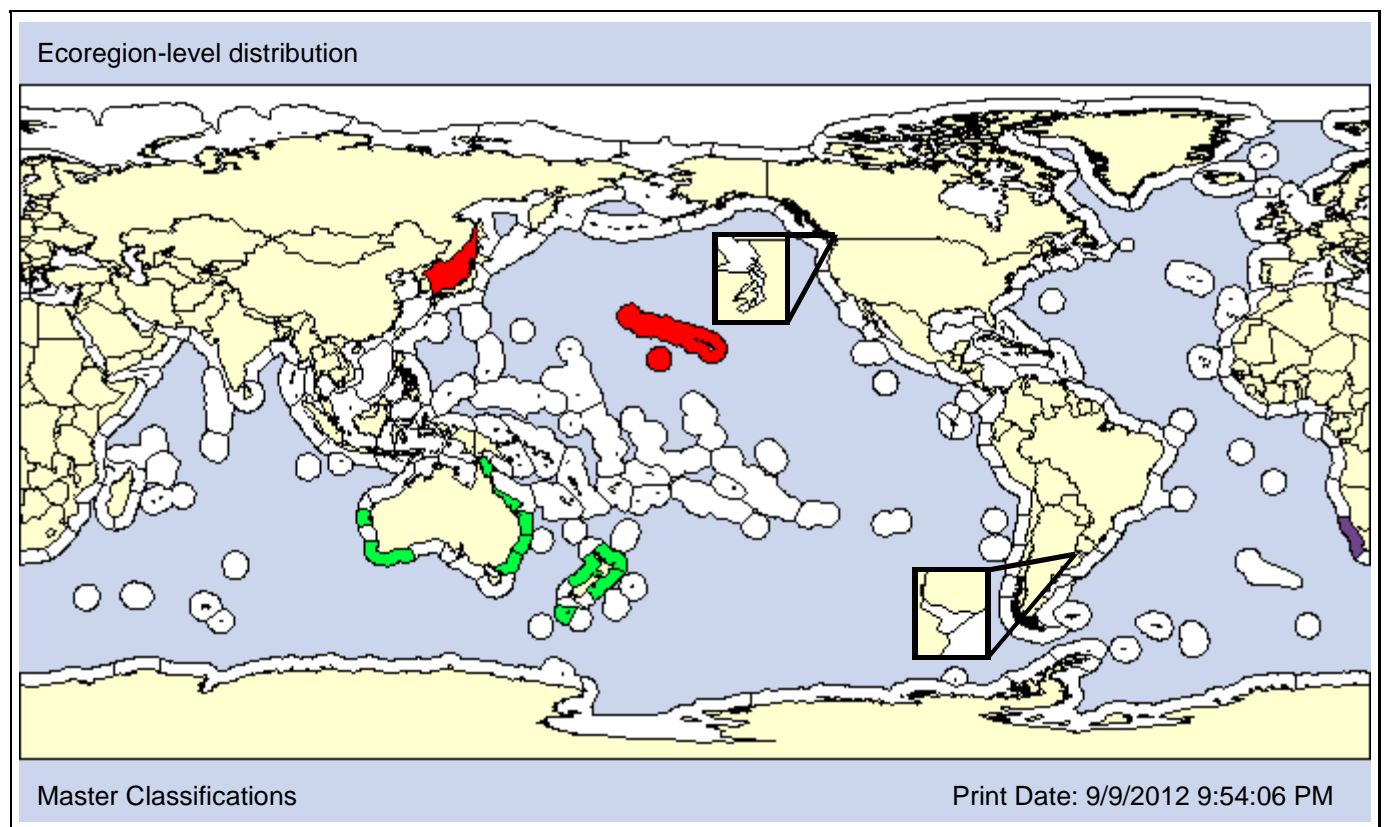
**Family:** Maldanidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Western Australia



**Date 1st record:** <1999

<1998

**Loc 1st record:** Tokdo (Dokdo) Is., Korea

Oahu, Hawaii

**Established:** Unknown

Yes

### VECTORS

SH <b>X</b>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
<b>X</b>						AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>				<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 35psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR	DF-SUB X

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		



**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 35psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** (Webster, 1879)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

**Family:** Spionidae

**Subfamily:**

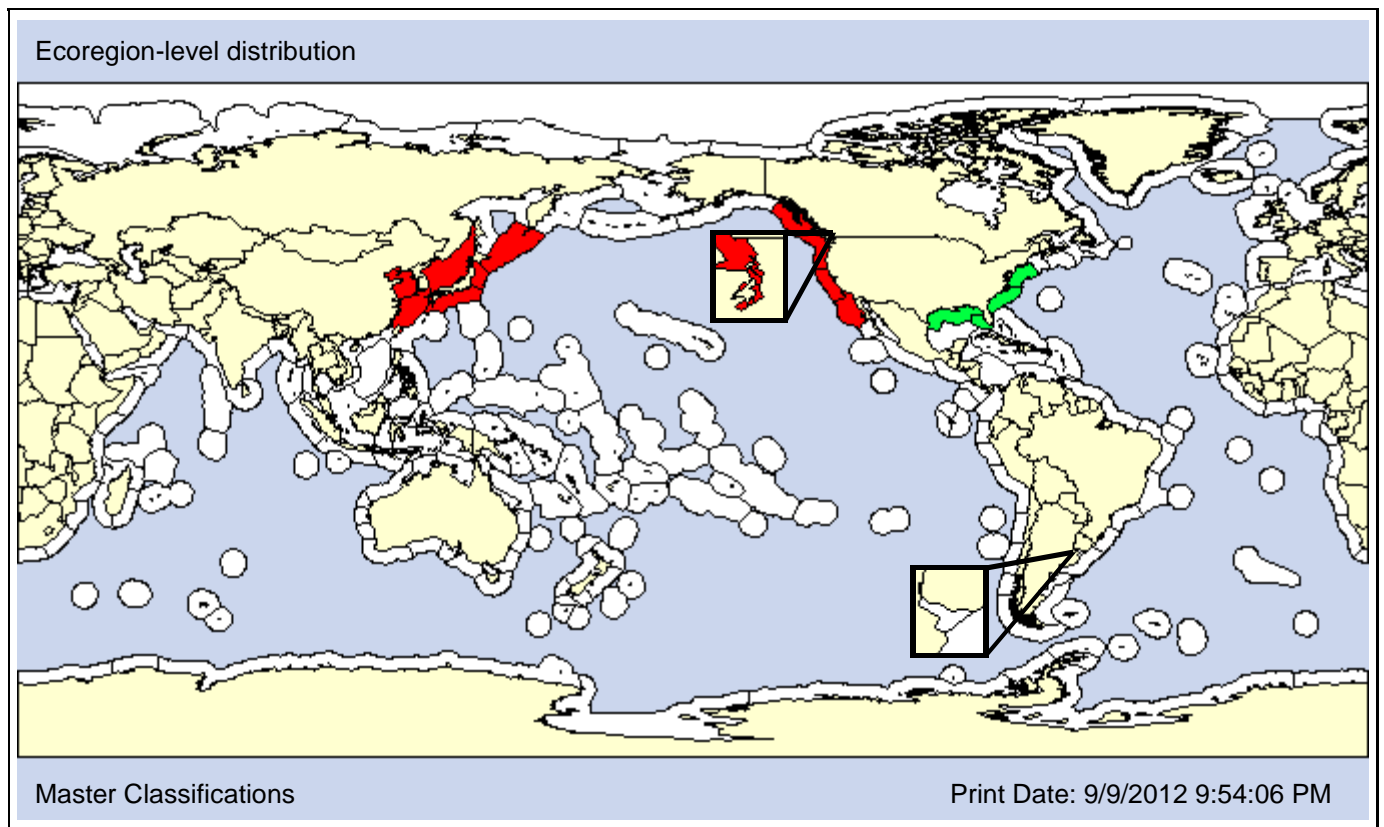
**Also Known As (Name - Type):**

Boccardia hamata	Synonym
Boccardia uncata	Synonym
Polydora hamata	Synonym
Polydora uncata	Synonym

**Common Names:**

--

**Type Locality:** Virginia & New Jersey, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1937

1927

**Loc 1st record:** Japan

Nanaimo, British Columbia

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P				
		<b>X</b>				<b>AO X</b>	PO									

Comments: We follow Welch and Ruff (2009) and consider *Boccardiella hamata* introduced from the NWA into the Pacific, though CANOD (2009) classifies it as “cryptogenic - likely introduced” in the NEP. The likely vector is through transplantation of the Atlantic oyster, *Crassostrea virginica*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 168m] [Pref: 0 - 6m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 6.22 - 98%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>				<b>O</b>						<b>O</b>	

**SALINITY [Obs: 0.5 - 35.06psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>			<b>X</b>		



**Taxon:** Polychaete

**Taxonomic Author:** (Ferronière, 1898)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

**Family:** Spionidae

**Subfamily:**

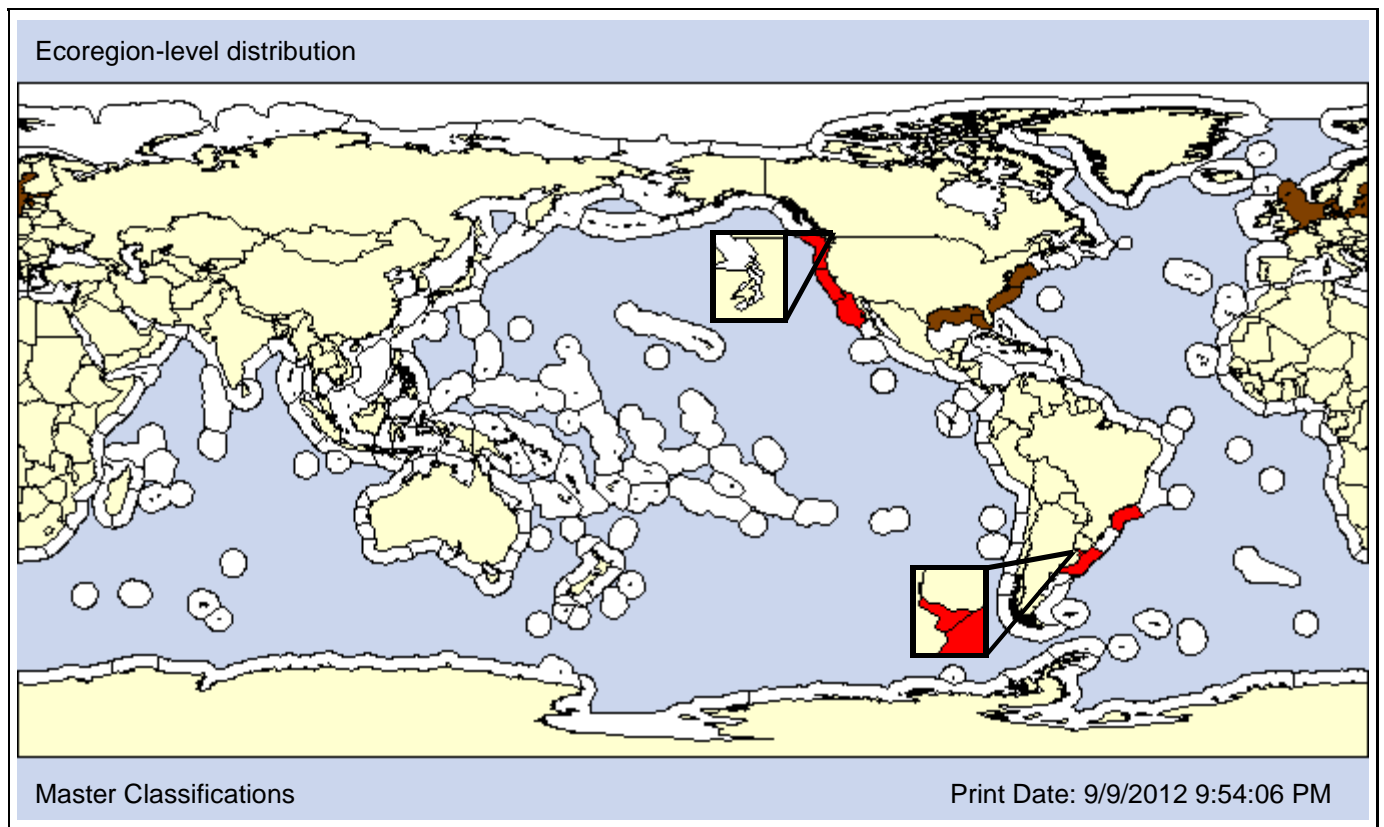
**Also Known As (Name - Type):**

Boccardia ligERICA	Synonym
Boccardia reDEKI	Synonym
Polydora ligERICA	Synonym
Polydora reDEKI	Synonym

**Common Names:**

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**Type Locality:** Loire, France



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<span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></span> Native	<span style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></span> Nonindigenous	<span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></span> Cryptogenic	<span style="display: inline-block; width: 15px; height: 15px; background-color: lightblue; border: 1px solid black;"></span> Transient	<span style="display: inline-block; width: 15px; height: 15px; background-color: purple; border: 1px solid black;"></span> Unclassified	<span style="display: inline-block; width: 15px; height: 15px; background-color: brown; border: 1px solid black;"></span> Conflicting Classification	<span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1935  
**Loc 1st record:** Newport Bay, California  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	AA	IR			A	P				
<b>X</b>						AO	PO								

Comments: USGS-NAS classifies *Boccardiella ligERICA* as NIS in the southeastern United States; however NEMESIS classifies it as cryptogenic along the U.S. East Coast and Gulf of Mexico due to taxonomic difficulties. NEMESIS lists the NEA as the native region; however Olenin and Didžiulis (2009) classify it as cryptogenic in Europe.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 12.8m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>O</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep			

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 24 - 99.5%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>		<b>O</b>		<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>O</b>			<b>O</b>	

**SALINITY [Obs: 0 - 30psu] [Pref: 0.5 - 4.8psu]**

<b>Fresh O</b>	<b>Brackish P</b>				<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>
	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (McIntosh, 1885)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Sabellidae

**Subfamily:**

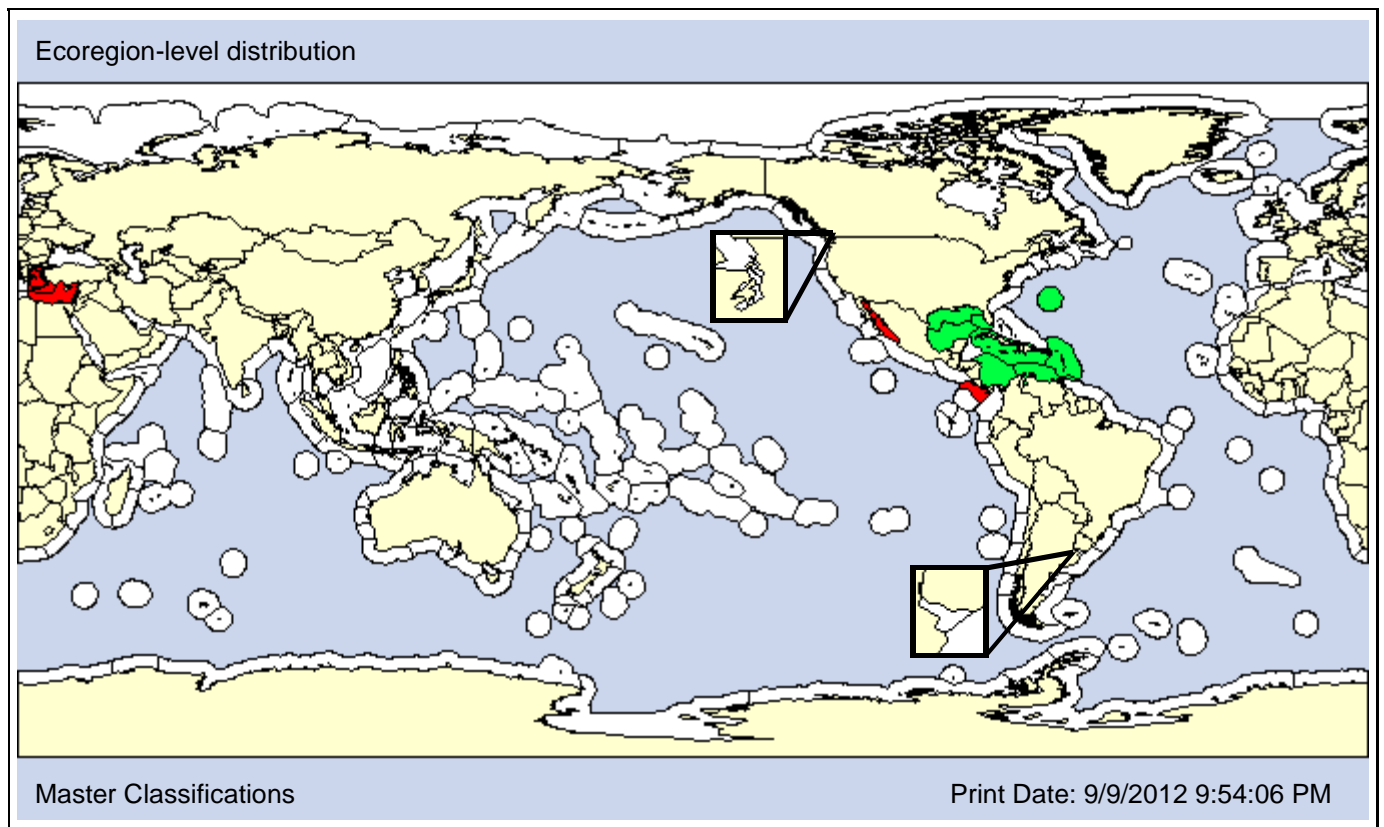
**Also Known As (Name - Type):**

Branchiomma nigromaculatum of authors, in part  
Dasychone bairdi

Partial synonym  
Synonym

**Common Names:**

**Type Locality:** Bermuda



**Date 1st record:**

2008

**Loc 1st record:**

Gulf of California, Mexico

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0.1 - 30m] [Pref: - 1m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>	<b>P</b>			<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: - 37psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		
<b>X</b>					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (Baird, 1865)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Sabellidae

**Subfamily:**

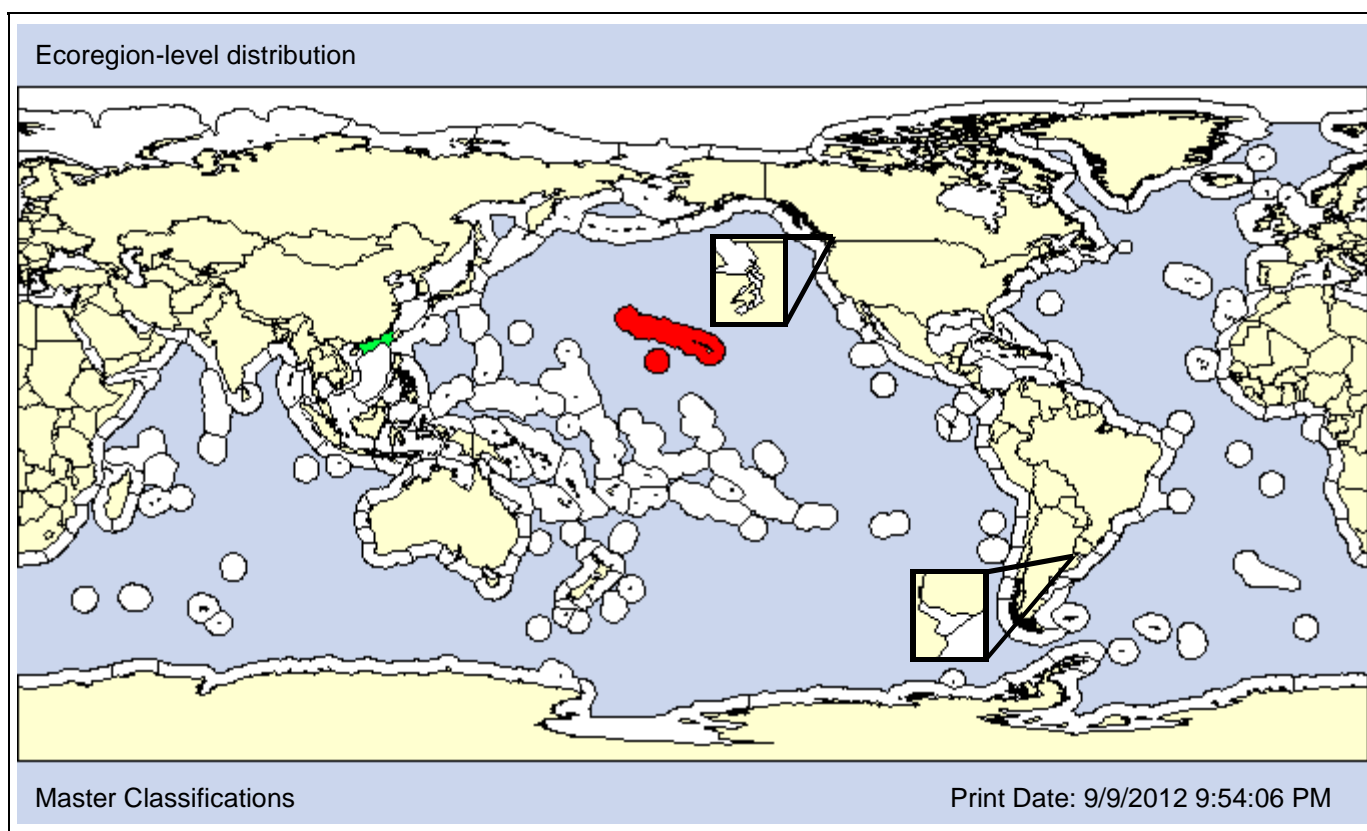
**Also Known As (Name - Type):**

Branchiomma cingulata of Hartman, 1966; not (Grube, 1870)	Misidentified
Branchiomma nigromaculata of Bailey-Brock and Hartman,	Misidentified
Sabella havaica of Hawaiian authors; not Kinberg, 1867	Misidentified

**Common Names:**

--

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1946

**Loc 1st record:** Native Halape, Hawaii

**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P				
X		X				AO	PO								

Comments: Carlton and Eldredge (2009) report that Branchiomma japonica is native to in Japan, though no specific locations were given.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											<b>P</b>	<b>P</b>	<b>P</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Polychaeta

**Taxonomic Author:** (Langerhans, 1879)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

**Subfamily:** Eusyllinae

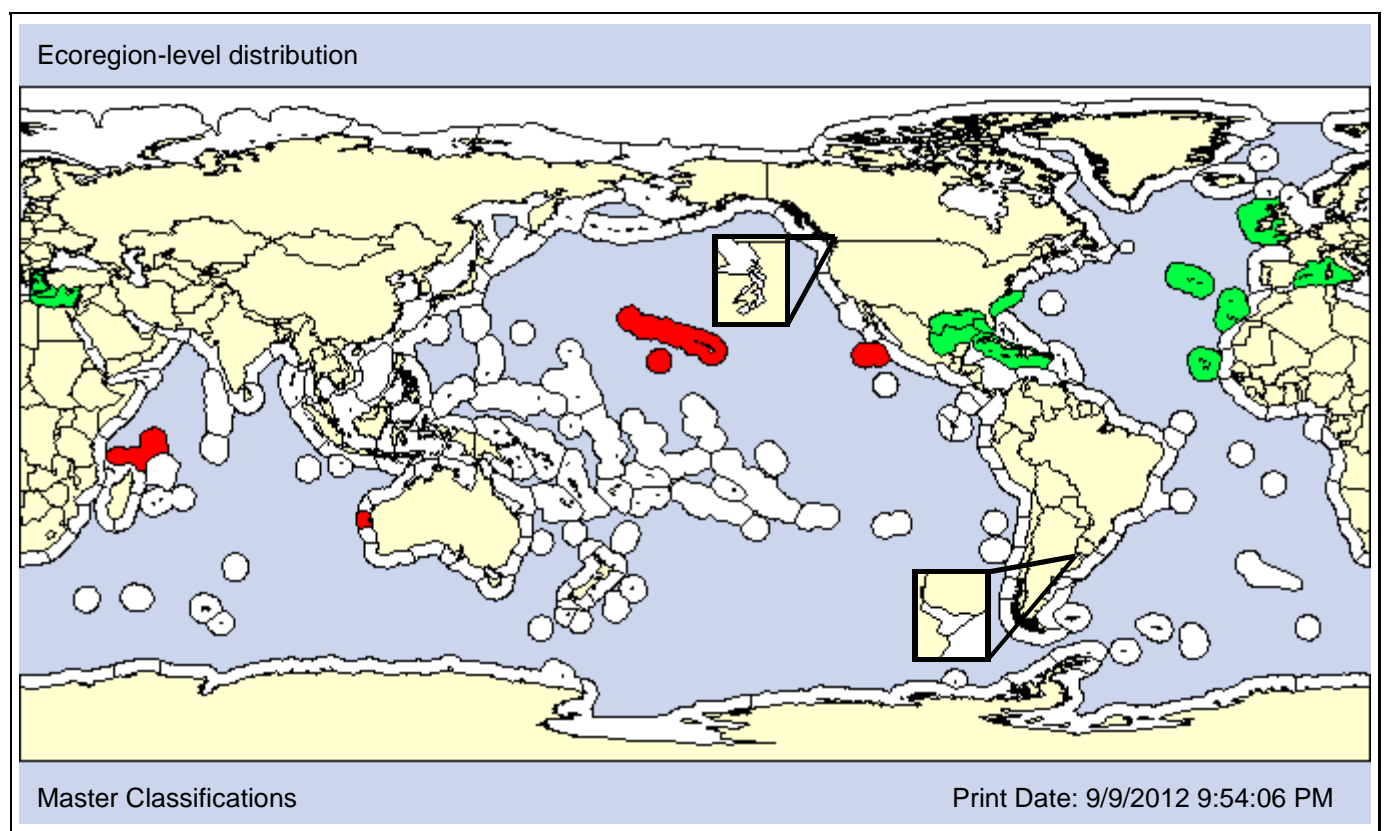
**Also Known As (Name - Type):**

Pionosyllis pierantoni	Synonym
Pionosyllis pierantonii	Misspelling
Pionosyllis weismanni	Synonym
Pionosyllis weissmanni	Misspelling

**Common Names:**

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**Type Locality:** Madeira Islands, Portugal



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<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;"> </span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: cyan;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;"> </span> Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 2001  
**Loc 1st record:** Mamala Bay, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X						AO	PO								

Comments: Our classifications are based on the assumption that *Brevicirrosyllis weismanni* is native to the North Atlantic/Mediterranean/Caribbean. However, *B. weismanni* is very variable and may constitute a species complex (San Martin et al., 2009). Thus, more detailed analyses are needed to verify that this species is introduced into the Pacific.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		X			
	X	X											

**DEPTH [Obs: 0 - 200m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	P				O	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		P												

**SALINITY [Obs: 30.9 - 35.2psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		X



**Taxon:** Polychaete

**Taxonomic Author:** Day, 1961

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Terebellida

**Suborder:** Terebellida

**Infraorder:**

**Superfamily:**

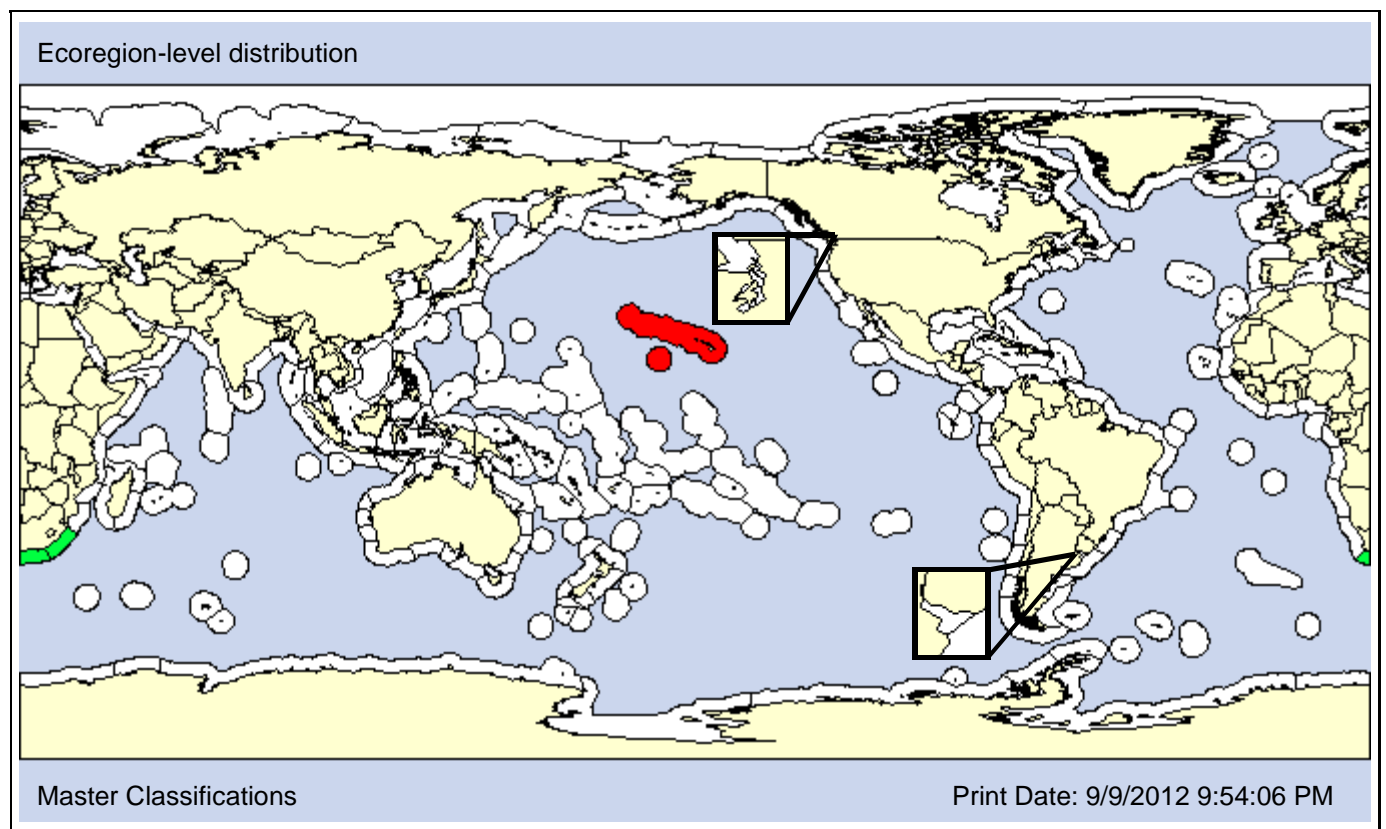
**Family:** Cirratulidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** South Africa



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** <1999  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
X					AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 12 - 13m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 33.18 - 35.27psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		



**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 3 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.2 - 78.9%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>O</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

# *Clymenella torquata*

Species ID: 7395

**Taxon:** Polychaete

**Taxonomic Author:** (Leidy, 1855)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Scolecida

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Maldanidae

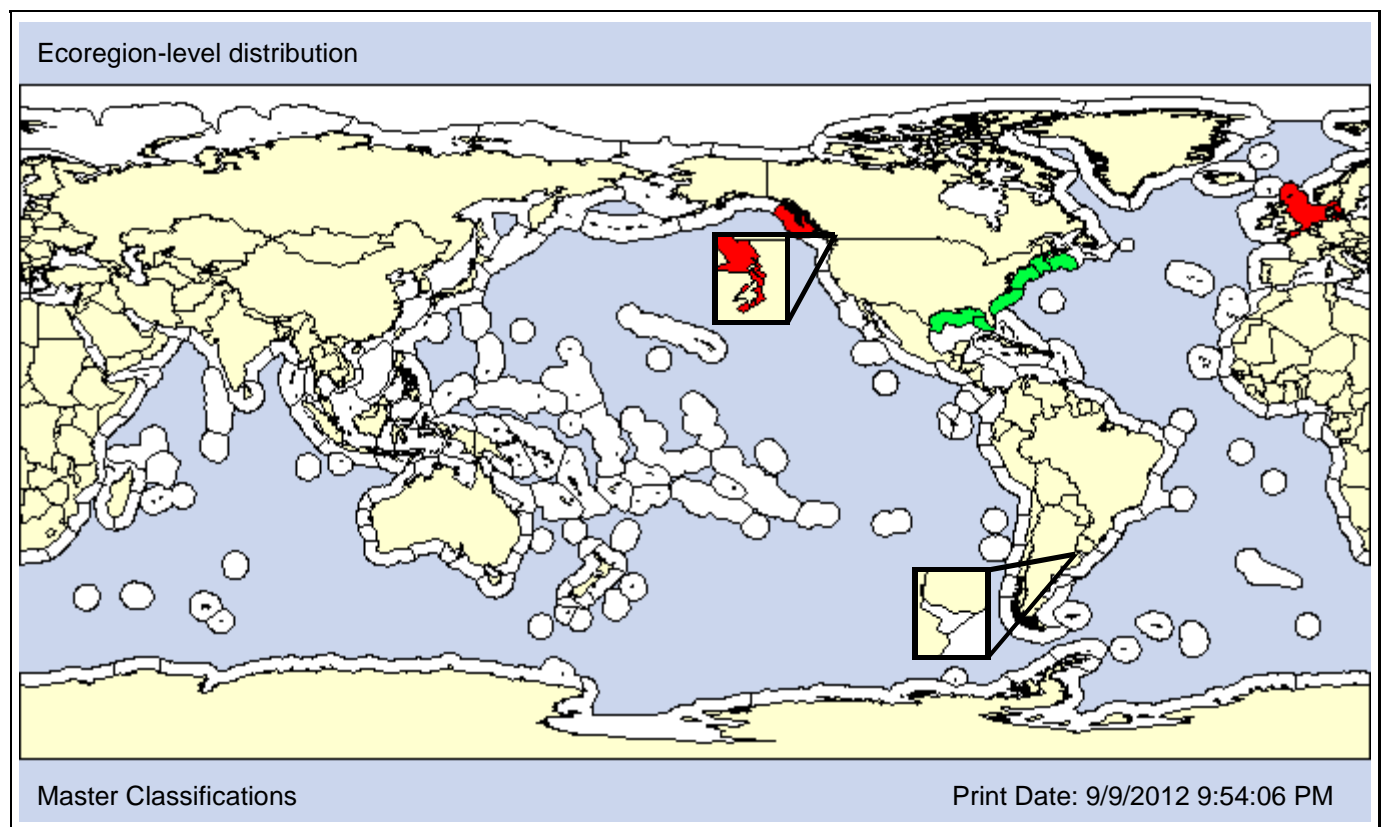
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

bamboo worm (*Clymenella torquata*)

**Type Locality:**



**Date 1st record:**

1973

**Loc 1st record:**

Block Is., British Columbia

**Established:**

Yes

## VECTORS

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P				
X						AO X	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 62m] [Pref: - 22m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 5.8 - 5.8%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>											

**SALINITY [Obs: 15 - 35psu] [Pref: 25 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR	DF-SUB <b>X</b>

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** Benedict, 1887

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

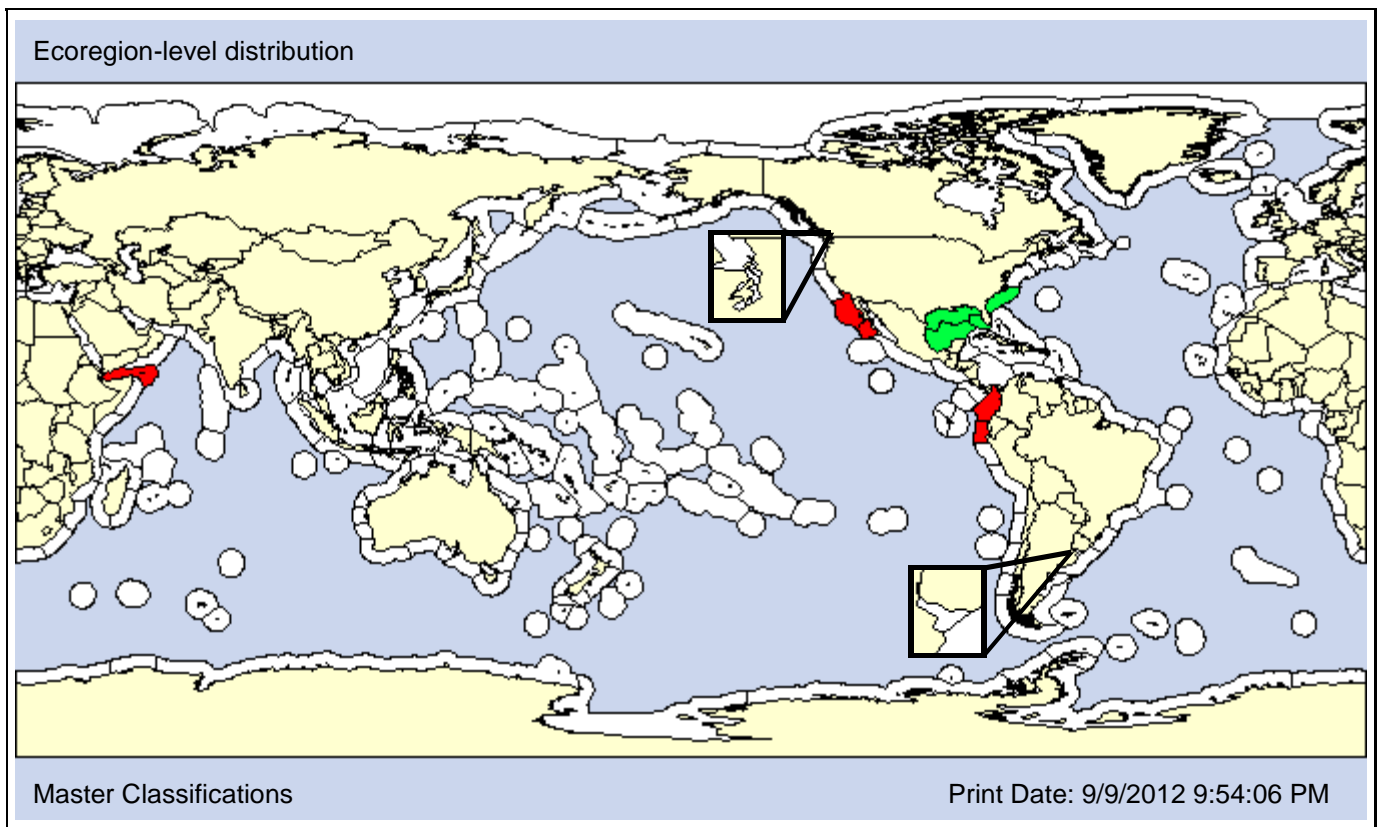
**Family:** Serpulidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Gulf of Mexico



**Date 1st record:**

1910

**Loc 1st record:**

San Pedro, California

**Established:**

Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH X			X	

**DEPTH [Obs: 0 - 86m] [Pref: 2 - 86m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	P			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							



**Taxon:** Polychaete

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

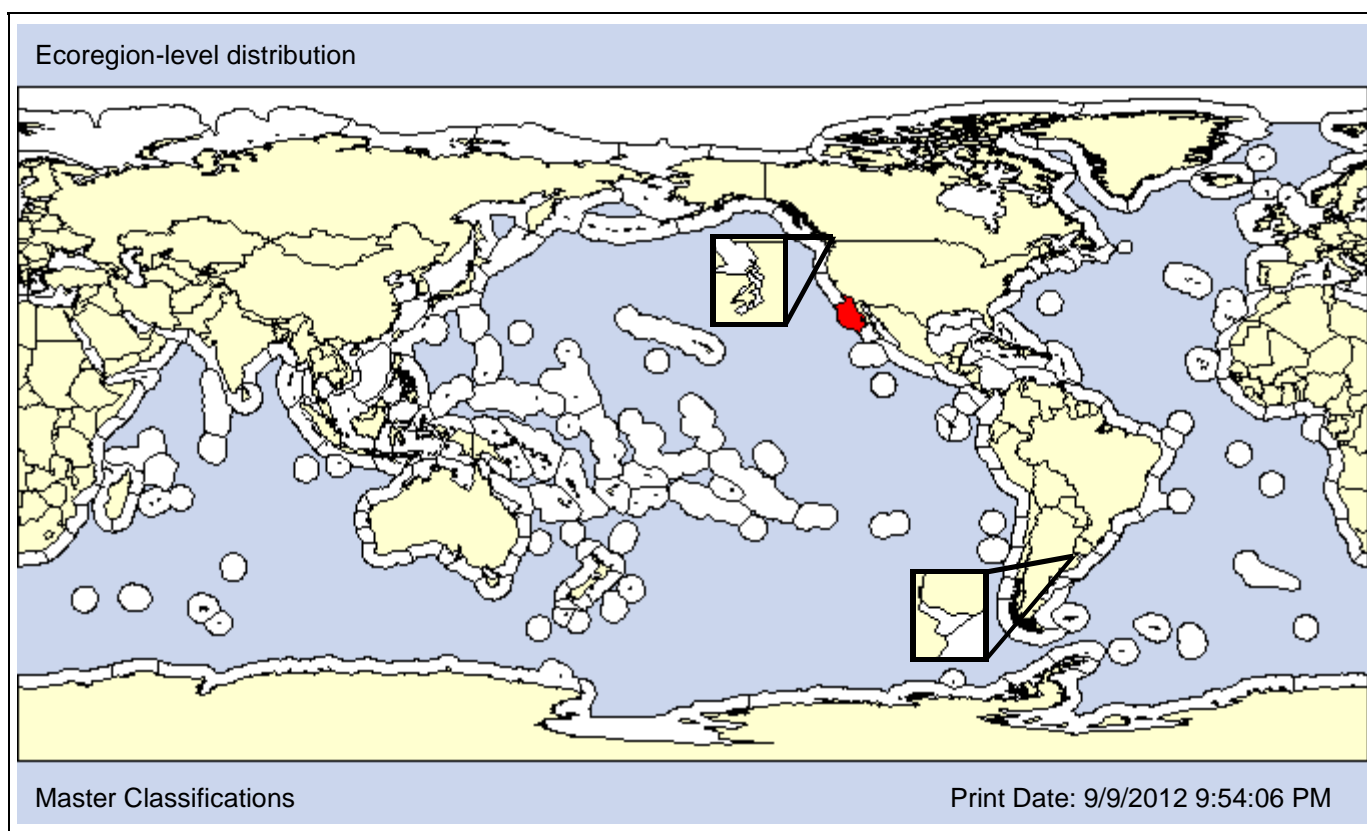
**Family:** Sabellidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP

Hawaii

NEP

**Date 1st record:**

2000?

**Loc 1st record:**

Southern California

**Established:**

Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: A new species of *Demonax* was discovered in estuaries in Southern California in 2000, which was classified as introduced by Cohen et al., (2002).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 3 - 6.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 34 - 36.5psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (Andrews, 1891)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

**Family:** Spionidae

**Subfamily:**

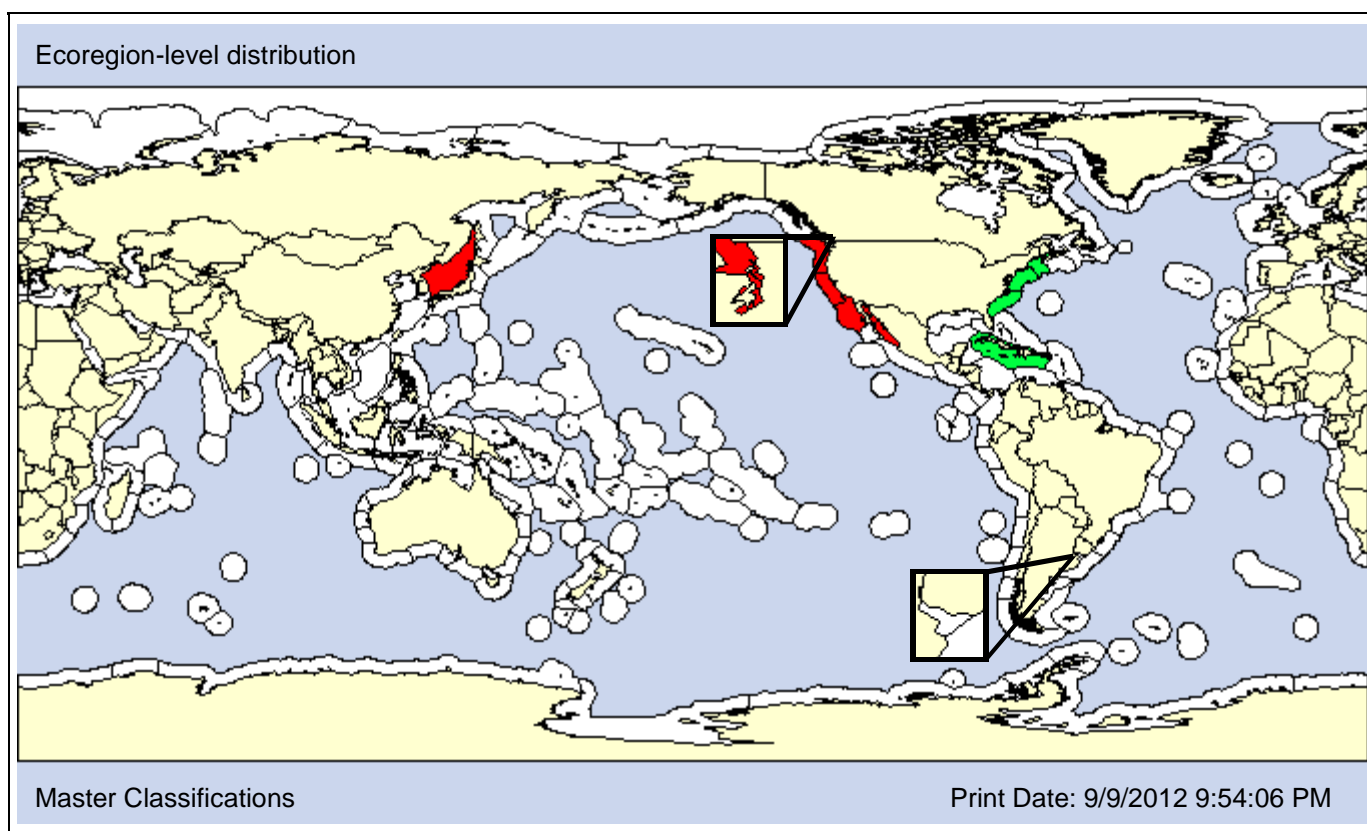
**Also Known As (Name - Type):**

Polydora ciliata brevipalpa  
Polydora commensalis

Synonym  
Synonym

**Common Names:**

**Type Locality:** Beaufort, North Carolina, USA



**Date 1st record:** 1934

about 1927

**Loc 1st record:** north Japan Sea

British Columbia, Canada

**Established:** Unknown

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
						AO X	PO								

Comments: *Dipolydora commensalis* is an obligate borer into hermit crab shells. We tentatively classify the Northwest Atlantic as the native region. Assuming the NWA origin, it has been introduced into the NEP and the NWP, presumably with the transport of Atlantic oysters.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 30m] [Pref: 0.9 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 15 - 35.5psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
					<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					

**Taxon:** Polychaete

**Taxonomic Author:** (Day, 1957)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

**Family:** Spionidae

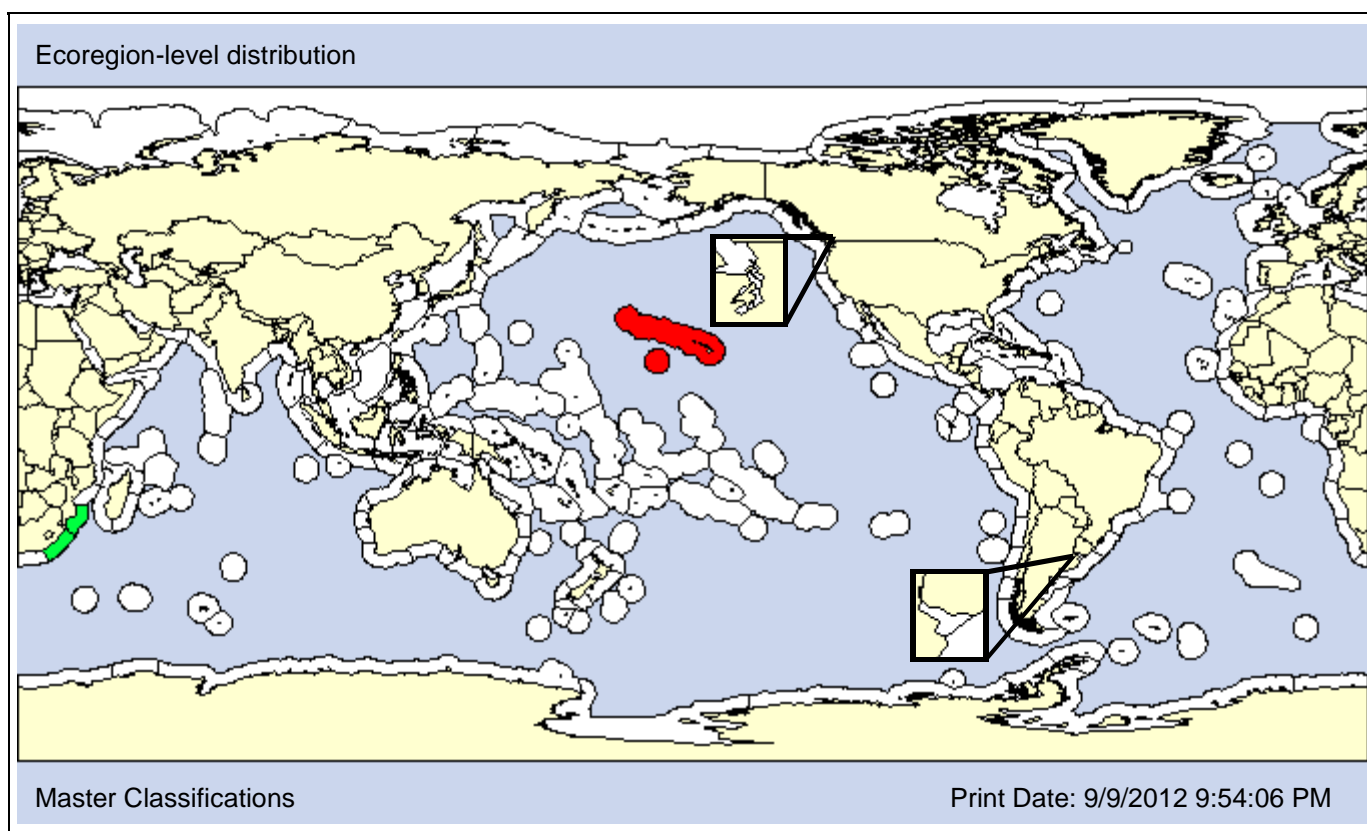
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Polydora normalis	Synonym	
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**Type Locality:** Inhaca Island, Mozambique



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1999  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
<b>X</b>						AO	PO								

Comments: *Dipolydora normalis* occurs in soft sediments, though it was found in tubes on the surface of farmed *Haliotis midae* shells in South Africa.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 0.65m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>				<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 23.9 - 37.2psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>
					<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		<b>X</b>

**Taxon:** Polychaete

**Taxonomic Author:** (Örsted, 1843)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Phyllodocidae

**Subfamily:**

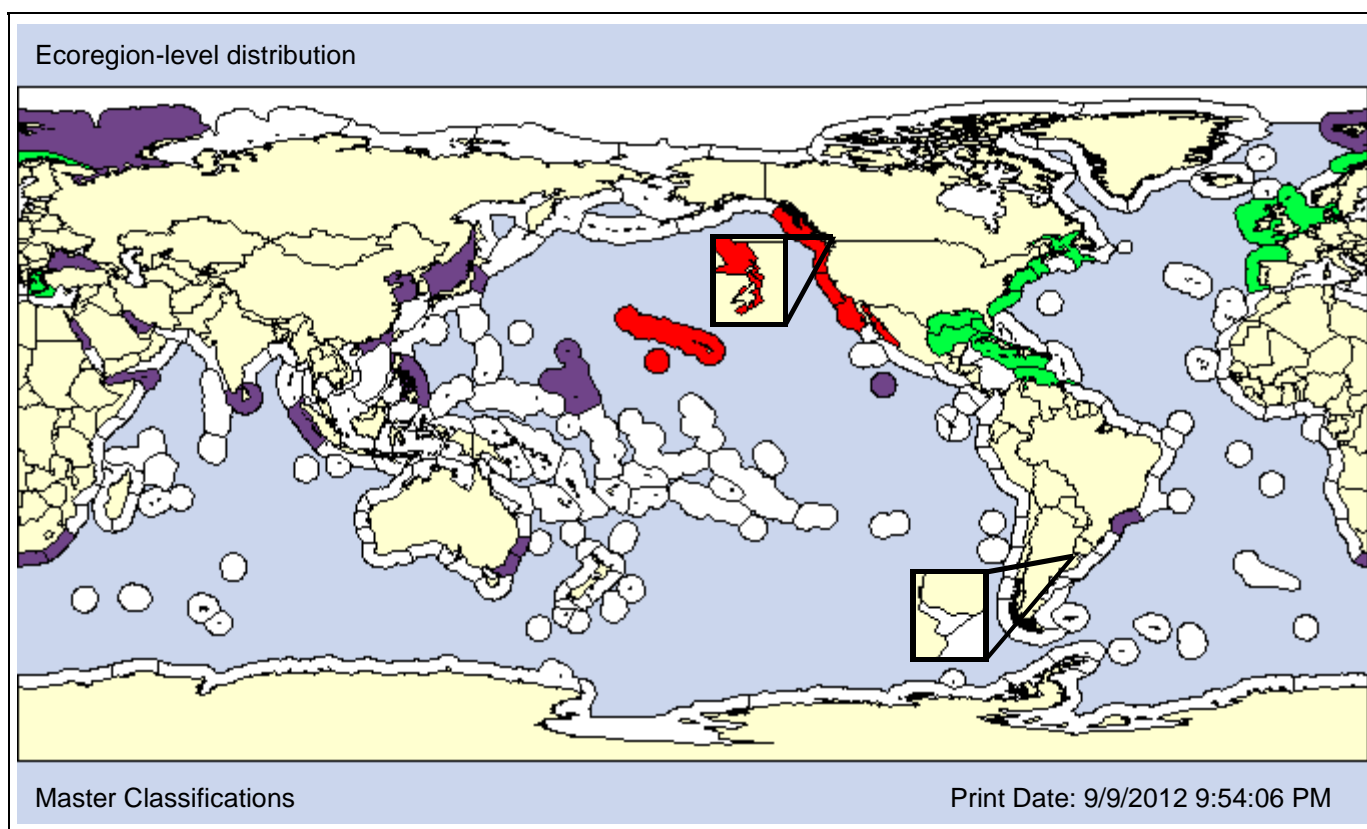
**Also Known As (Name - Type):**

Eulalia flavescens	Synonym
Eulalia granulosa	Synonym
Eulalia pallida	Synonym
Eulalia sanguinea	Synonym

**Common Names:**

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**Type Locality:** Denmark



**Date 1st record:** Unknown

1966

Unknown

**Loc 1st record:** Unknown

Pearl Harbor, Oahu, Hawaii

Unknown

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O	
BW	SB	HF		S/R	AE	AA X	IR			A	P				X
X		X				AO X	PO								

Comments: *Eumida sanguinea* is classified as NIS in the NEP (Blake and Ruff, 2007) and Hawaii (Carlton and Eldredge, 2009), assuming it is from the North Atlantic. However, the European “*E. sanguinea*” is a species complex (Nygren and Pleijel, 2011) and it is not clear which lineage was introduced or its classification in other regions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 2100m] [Pref: 0 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Pref % Fines: 10 - 40%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>				<b>P</b>					<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 23 - 39psu] [Pref: - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>
					<b>O</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Polychaete

**Taxonomic Author:** Imajima & Hartman, 1964

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

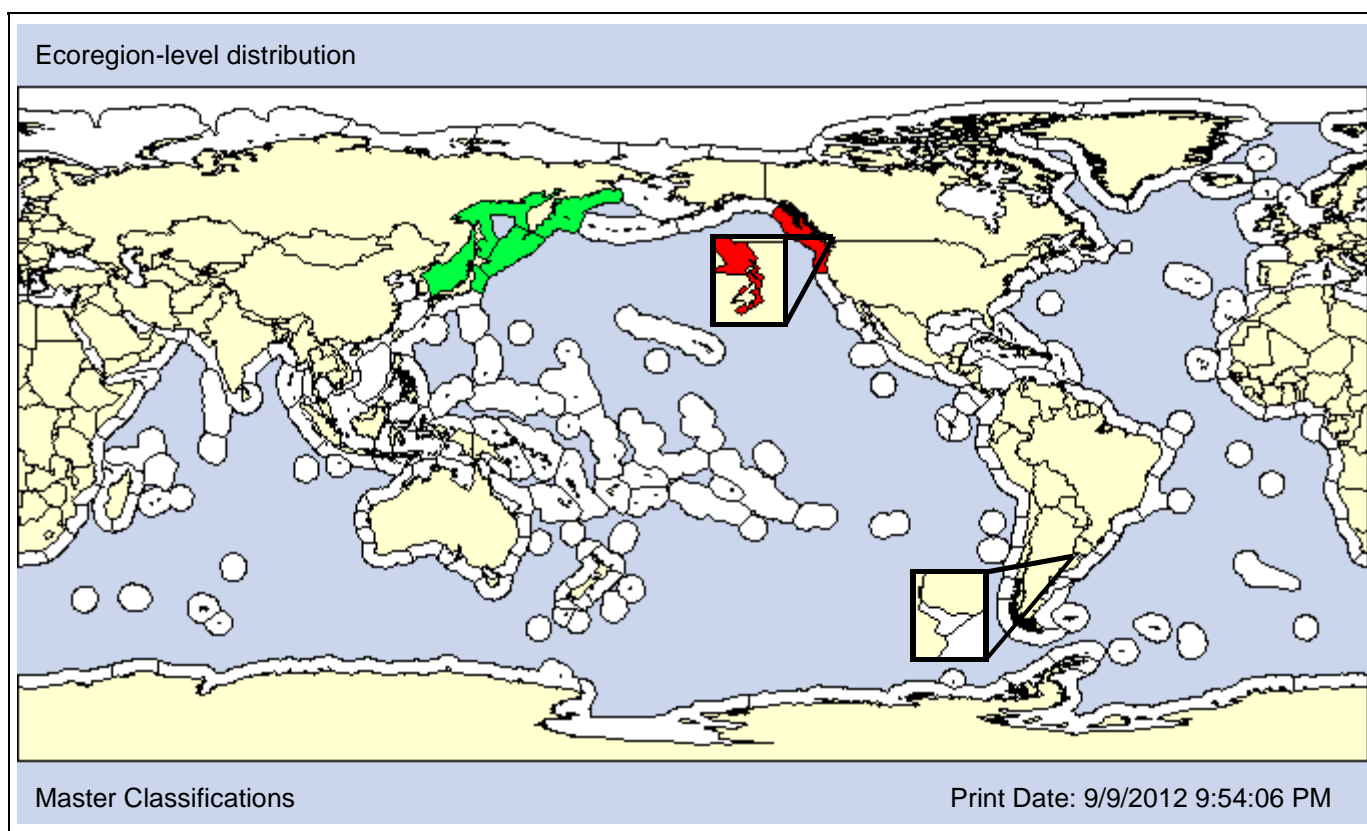
**Subfamily:** Eusyllinae

**Also Known As (Name - Type):**

**Common Names:**

Eusyllis blomstrandii of Berkeley and Berkeley, 1945 in part	Misidentified	
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**Type Locality:** Shirikishinai, Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

<1945

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: -140m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			<b>P</b>		<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** Westheide, 1974

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

**Subfamily:** Exogoninae

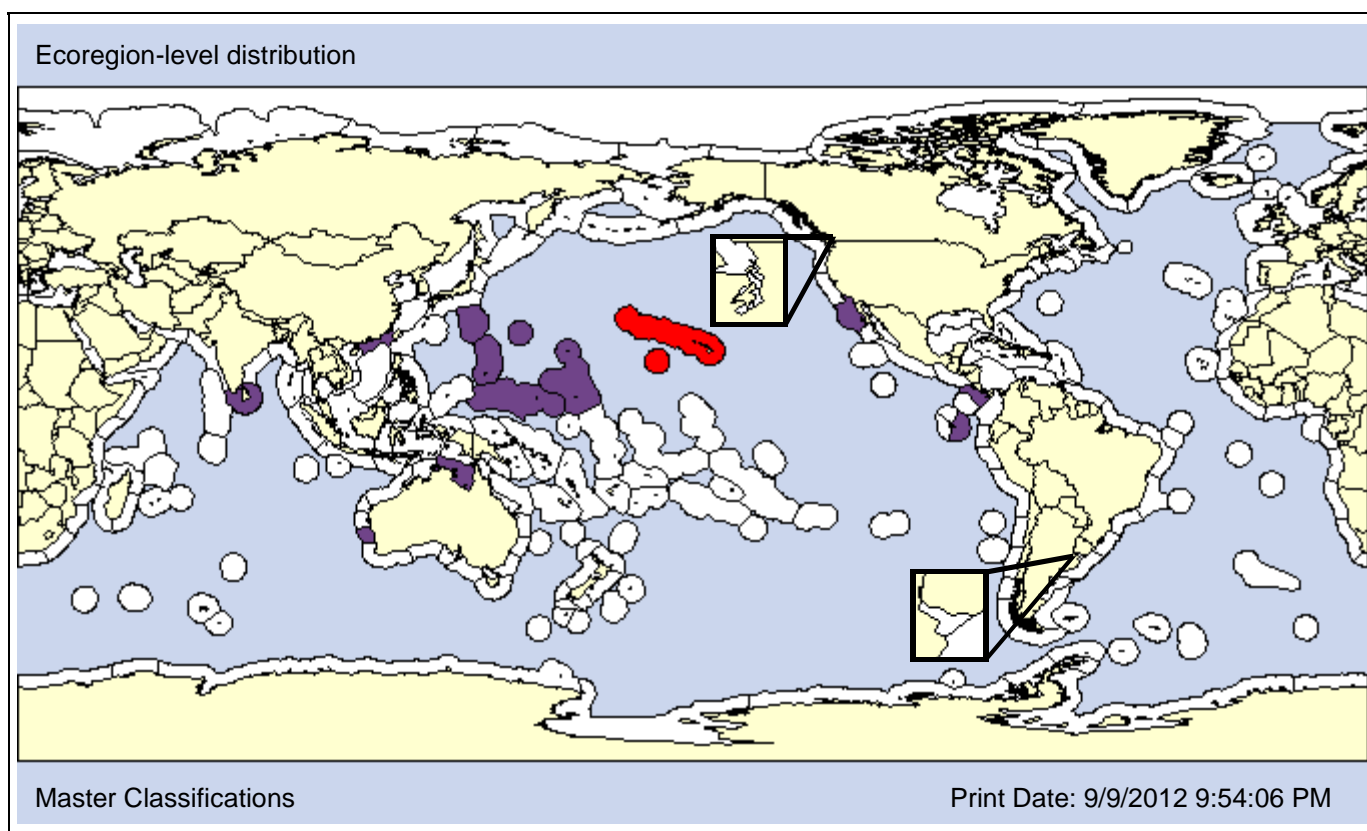
**Also Known As (Name - Type):**

Exogone (Exogone) longicornis	Convention
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**Common Names:**

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**Type Locality:** Galapagos Islands, Ecuador



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:**

2001

Unknown

**Loc 1st record:**

Mamala Bay, Oahu, Hawaii

Unknown

**Established:**

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: *Exogone longicornis* was described from the Galápagos, however San Martín (2005) suggests it may be a species complex. Accordingly, we list it as unclassified except for Hawaii where Nelson et al. (2007) classify it as introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH		<b>X</b>		<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 12m] [Pref: 0 - 12m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											<b>O</b>		<b>P</b>	

**SALINITY [Obs: 23.9 - 36.5psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (Fauvel, 1923)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

**Also Known As (Name - Type):**

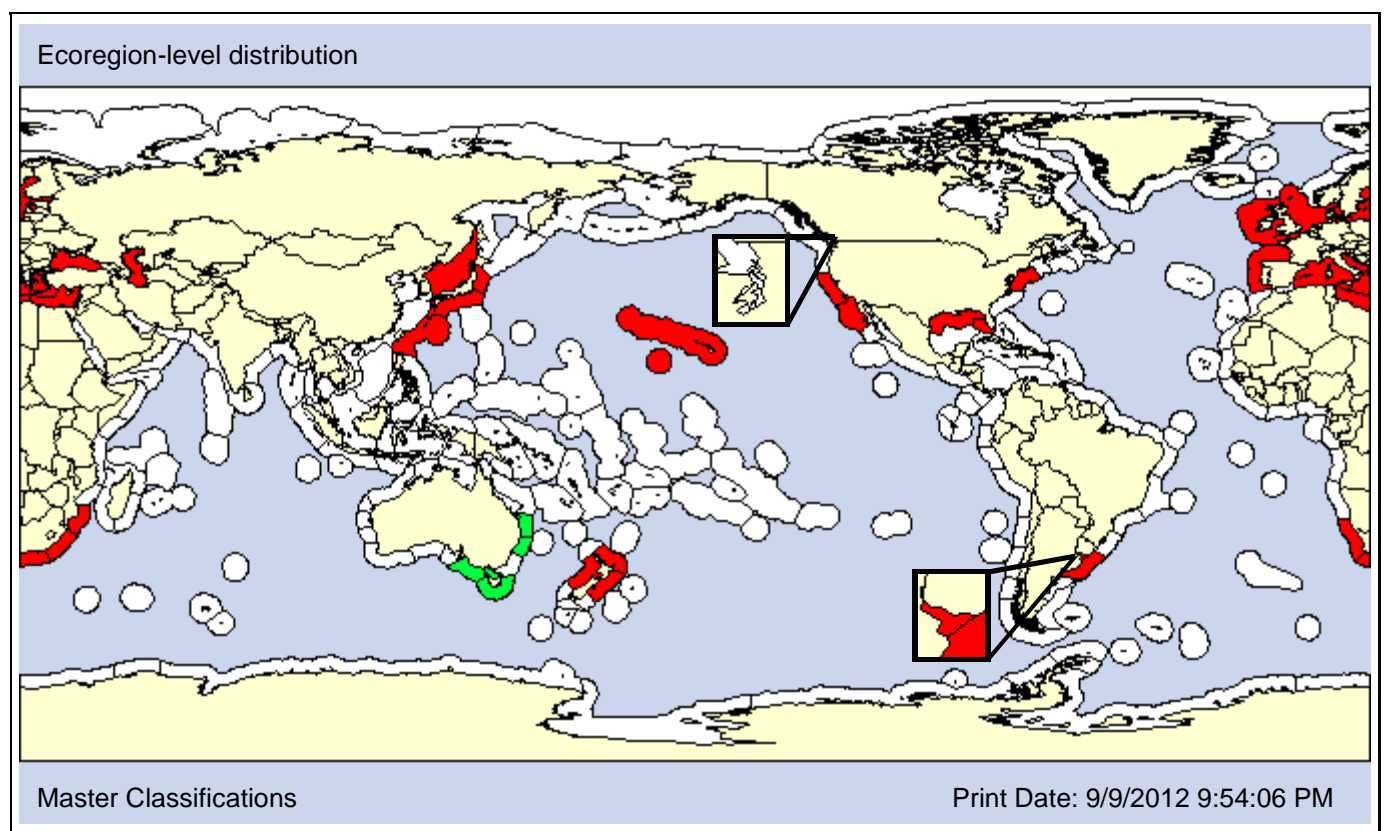
Ficopomarus enigmaticus  
Ficopomatus uschakovi of authors  
Mercierella enigmatica

Misspelling  
Misidentified  
Synonym

**Common Names:**

Australian tubeworm  
Kaniyadori-kanzashi  
serpulid tubeworm

**Type Locality:** Canal de Caen, France



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

**Date 1st record:** 1966

1937

1921

**Loc 1st record:** Seto Inland Sea, Japan

Pearl Harbor, Oahu, Hawaii

San Francisco Estuary, CA

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: The region of origin for *Ficopomatus enigmaticus* is uncertain but we follow the Global Invasive Species Database (GISD) and Carlton and Eldredge (2009) and list Australia as the native region. This serpulid polychaete can form reefs and has been a major fouler in some areas.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 19.1m] [Pref: 0 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>	<b>P</b>							<b>O</b>	<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 1.3 - 55psu] [Pref: 10 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (Treadwell, 1934)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

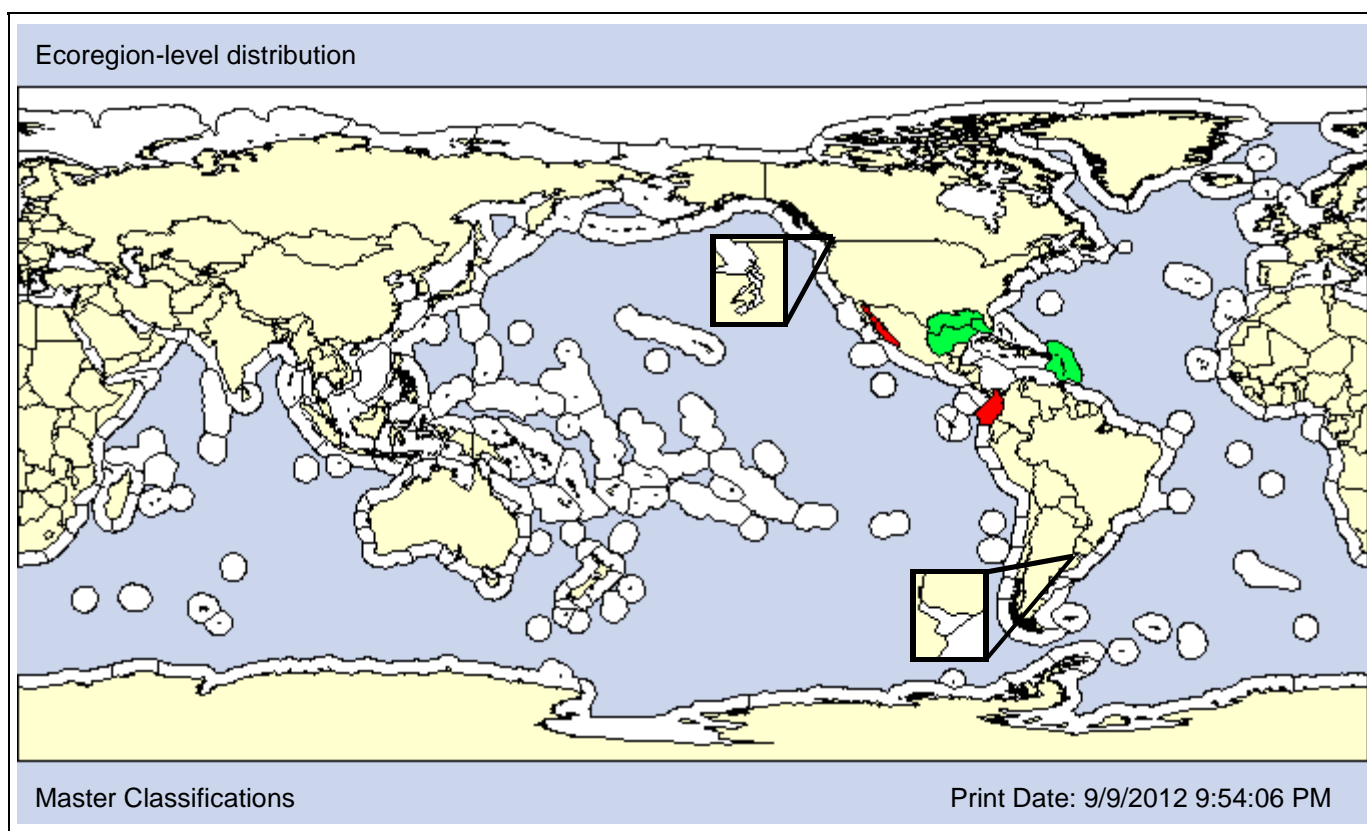
**Also Known As (Name - Type):**

Mercierellopsis prietoi  
Sphaeropomatus miamiensis

Synonym  
Synonym

**Common Names:**

**Type Locality:** Miami River, Florida, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

**Date 1st record:** 1979  
**Loc 1st record:** Gulf of California, Mexico  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	PO								

Comments: The Caribbean *Ficopomatus miamiensis* has invaded the Gulf of California and the Pacific end of the Panama Canal (Tovar-Hernández et al. 2009a). Transport associated with shrimp aquacultural activities is the most likely vector for the invasion in the Gulf of California.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - 3.8m] [Pref: 0 - 3.8m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
					<b>O</b>				<b>P</b>			<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 2 - 25psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
		<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							



**Taxon:** Polychaeta

**Taxonomic Author:** (Imajima & Hartman, 1964)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

**Subfamily:** Syllinae

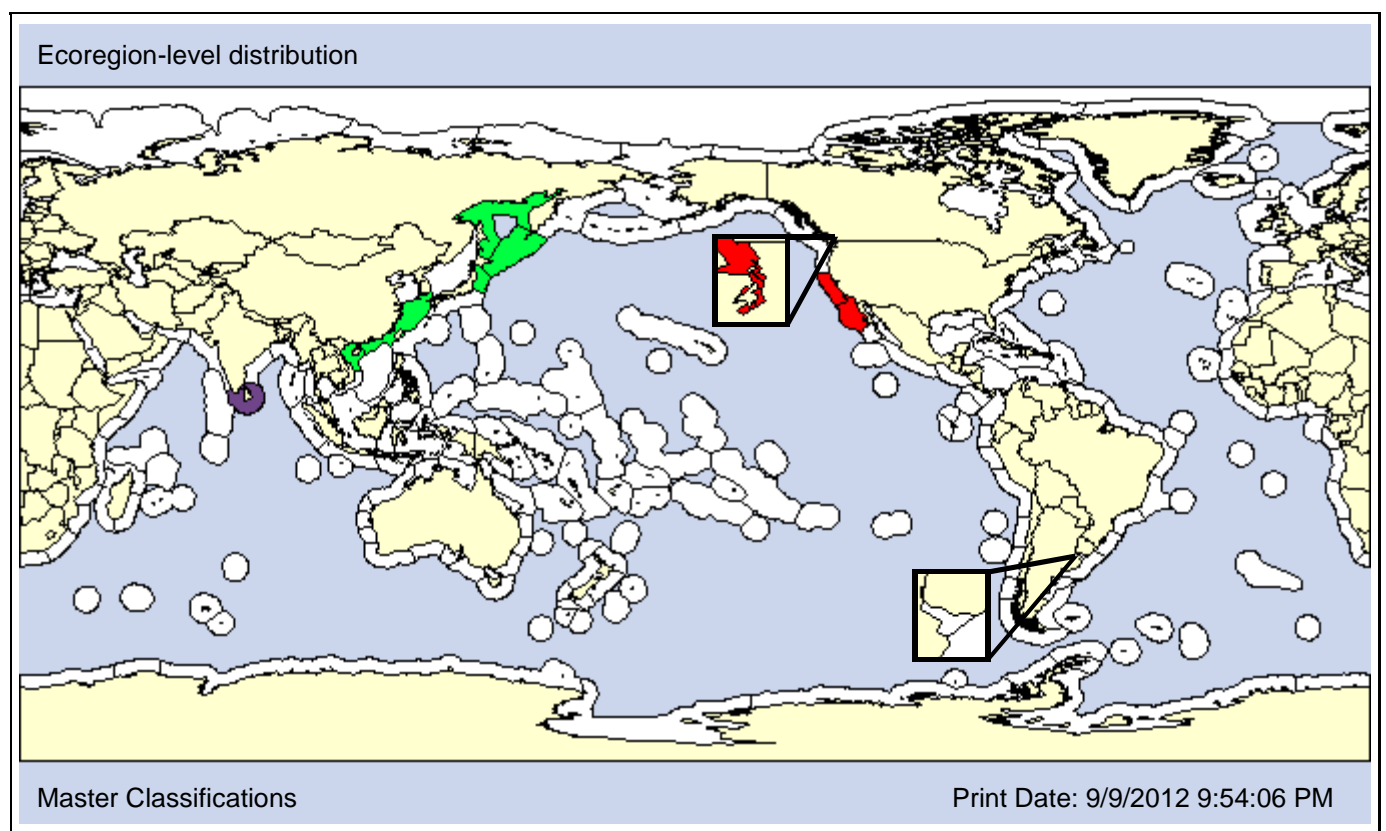
**Also Known As (Name - Type):**

Trypanosyllis (Trypanedenta) ohma  
Trypanosyllis ohma

Synonym  
Synonym

**Common Names:**

**Type Locality:** Shirikishinai, Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1978

**Loc 1st record:** Native

Newport Bay, California

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 42m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 16.54 - 22.9%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>				<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: 30.01 - 31.47psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** Hartmann-Schröder & Parker, 1990

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Phyllodocidae

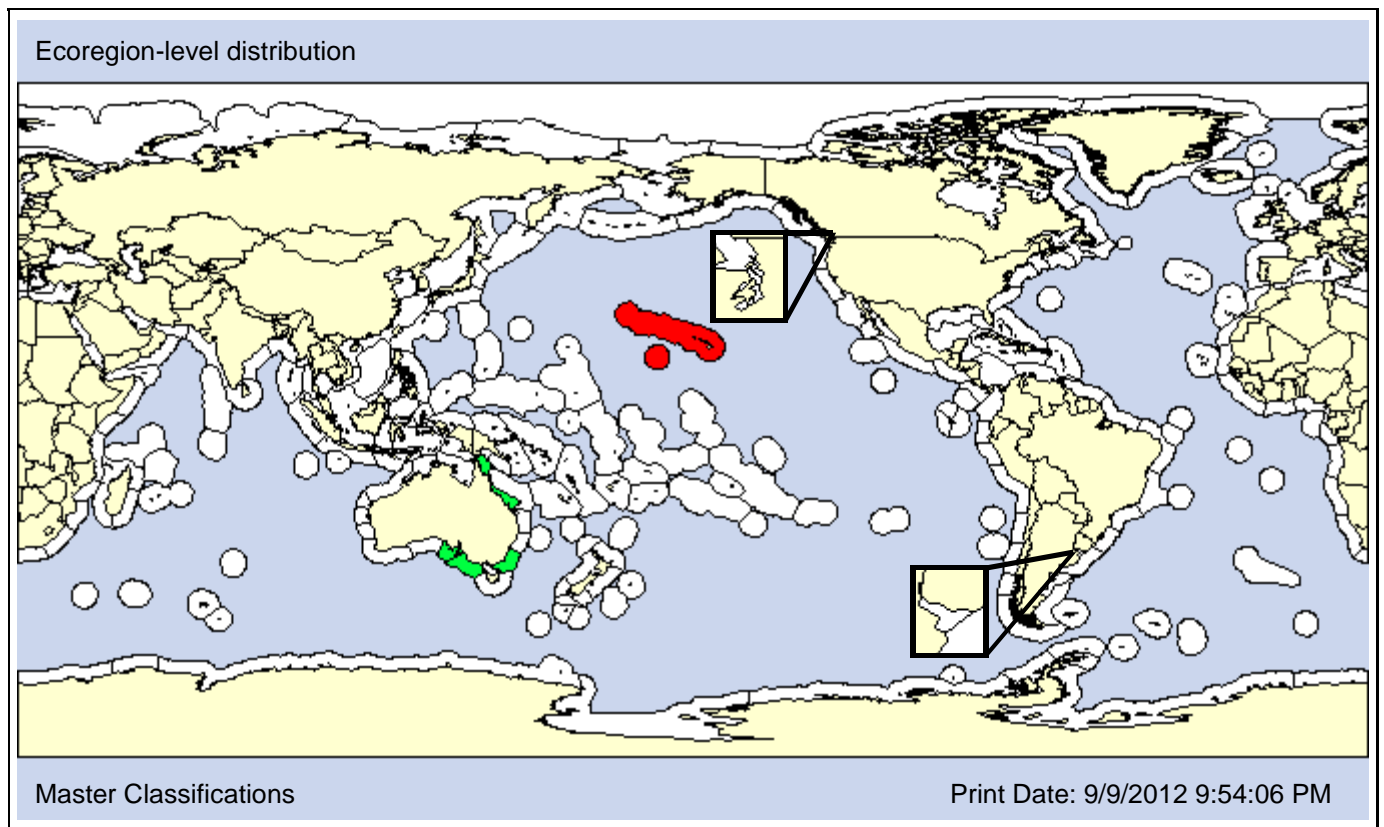
**Subfamily:** Eteoninae

**Also Known As (Name - Type):**

**Common Names:**

Hesionura australensis	Misspelling	
------------------------	-------------	--

**Type Locality:** Spencer Gulf, Australia



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1999  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>P</b>	<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 13.5 - 45m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 36.5psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

# Heteromastus filiformis Cmplx

Species ID: 381

**Taxon:** Polychaete

**Taxonomic Author:** (Claparède, 1864)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Scolecida

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Capitellidae

**Subfamily:**

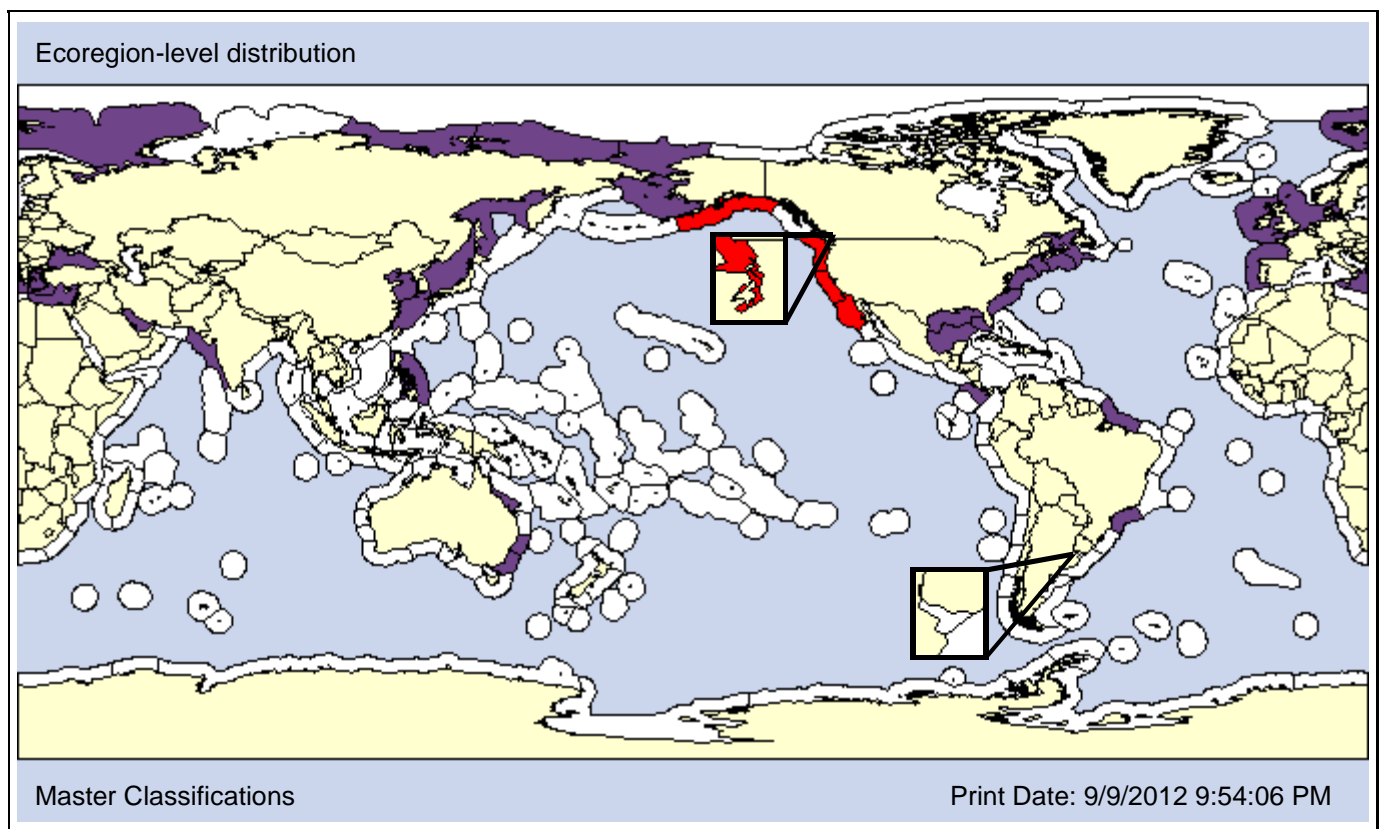
**Also Known As (Name - Type):**

Ancistria capillaris  
Ancistria minima  
Areniella filiformis  
Capitella costana

Ambiguous syn.  
Ambiguous syn.  
Ambiguous syn.  
nomen nudum

**Common Names:**

**Type Locality:**



**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Unknown

1936  
San Francisco Estuary, CA  
Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
X						AO X	PO								

Comments: *Heteromastus filiformis* constitutes a species complex. However, we follow Cohen and Carlton (1995) and classify it as NIS in the NEP based on the pattern of discovery in West Coast estuaries. We show the global distribution of *H. filiformis* even though it likely represents several species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 4680m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.8 - 100%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>		<b>O</b>									

**SALINITY [Obs: 8 - 34.03psu] [Pref: 16 - psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
			<b>X</b>						DF-SUR	DF-SUB <b>X</b>

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		<b>X</b>

**Taxon:** Polychaete

**Taxonomic Author:** (Hartman, 1951)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Terebellida

**Suborder:** Terebellida

**Infraorder:**

**Superfamily:**

**Family:** Ampharetidae

**Subfamily:**

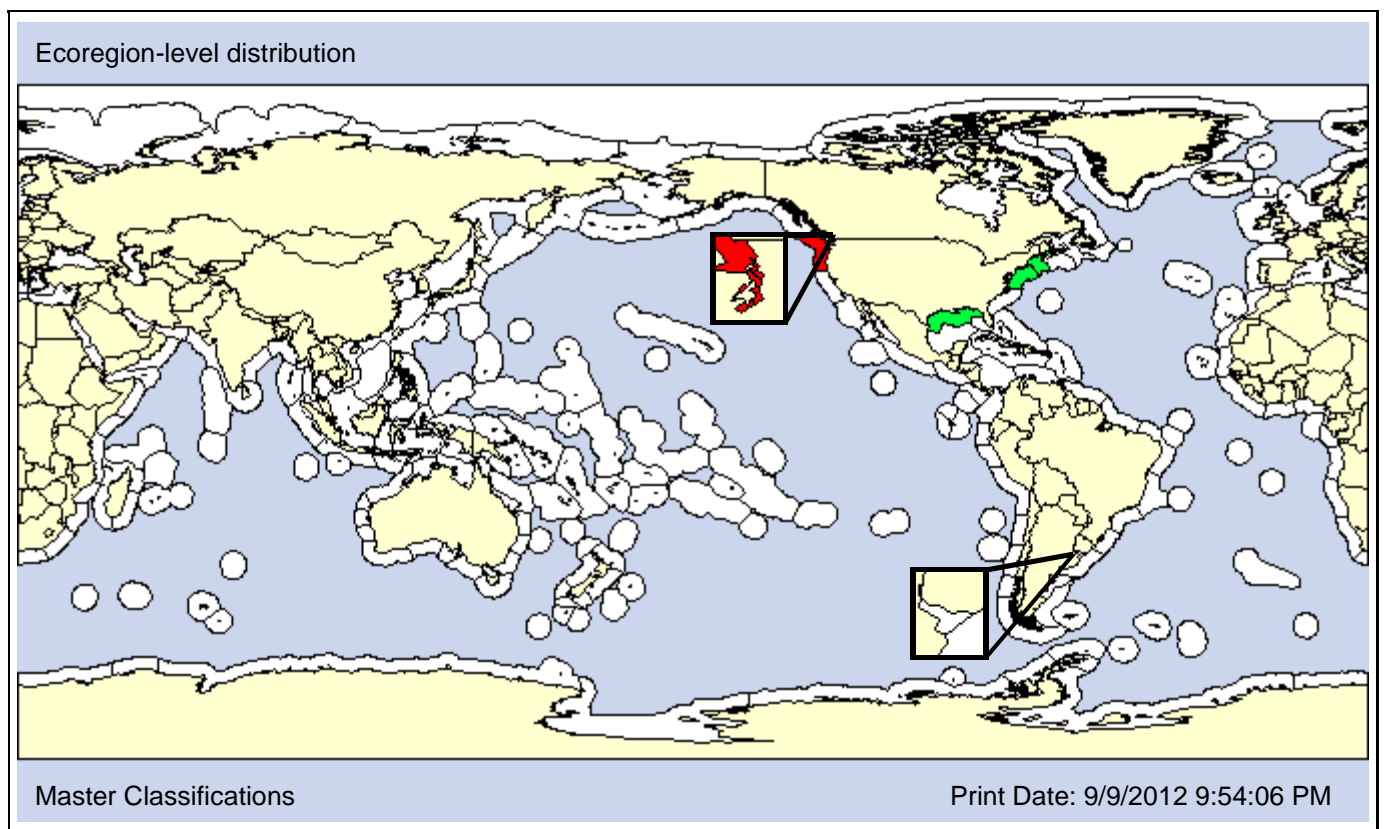
**Also Known As (Name - Type):**

Amphicteis floridus  
Hypaniola florida  
Hypaniola grayi

Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:** Florida, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1940

**Loc 1st record:**

Puget Sound, WA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
		<b>X</b>			<b>AO X</b>	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 22m] [Pref: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 4.75 - 85%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>			<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: 0.2 - 32.2psu] [Pref: 10 - psu]**

<b>Fresh O</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
			<b>X</b>						DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B <b>X</b>	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
						<b>X</b>							



**Taxon:** Polychaete

**Taxonomic Author:** Schmarda, 1861

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Scolecida

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Scalibregmatidae

**Subfamily:**

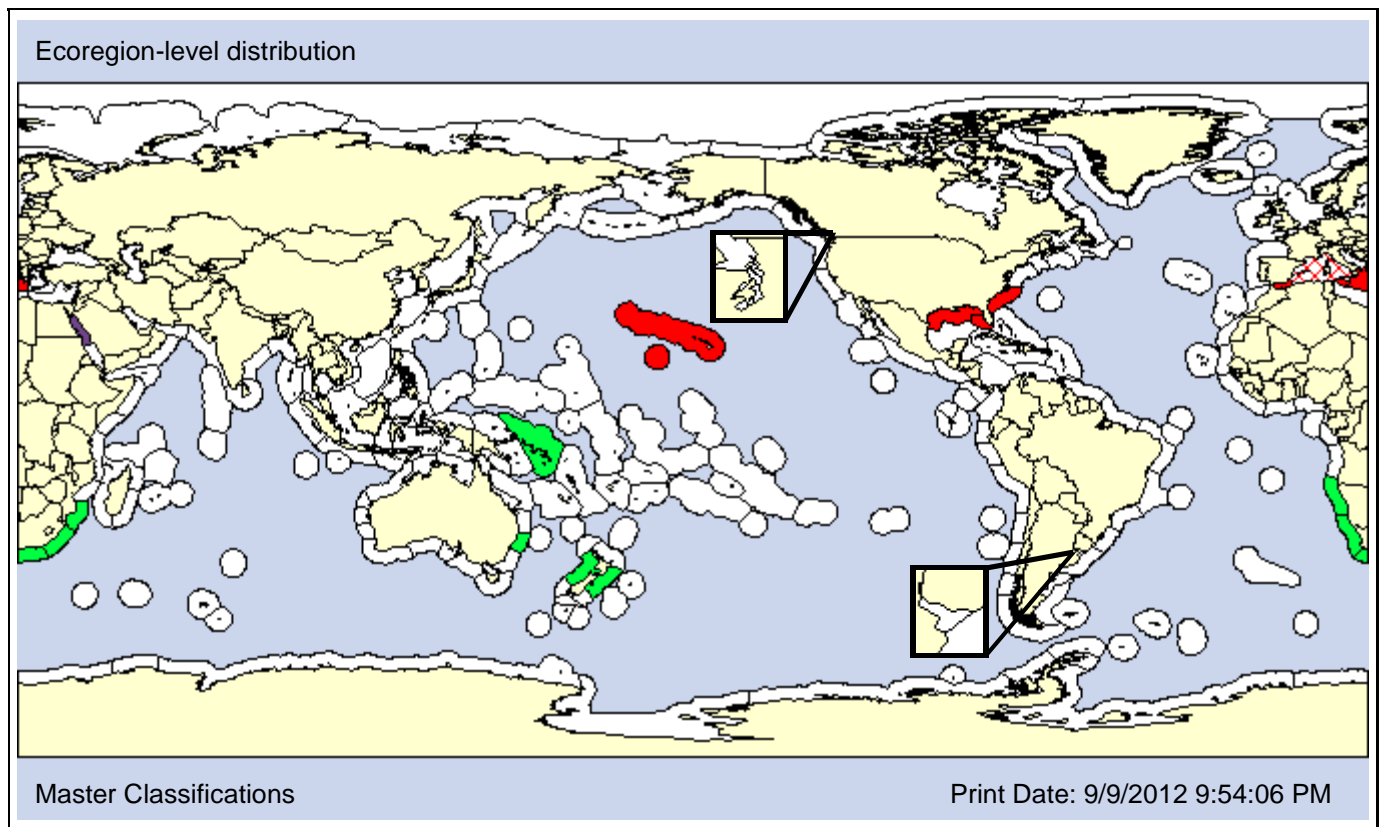
**Also Known As (Name - Type):**

Lipobranchius capensis  
 Oncoscolex dicranochaetus  
 Oncoscolex homochaetus

Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** Cape of Good Hope, South Africa



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 2002  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O		O	O				

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	X	X											

**DEPTH [Obs: 0 - 834m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep	O		
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 2.16%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O					

**CONSOLIDATED SUBSTRATE X**

R O	HP	Biogenic							Artificial Substrate					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 27.4 - 34.5psu]**

Fresh	Brackish O					Marine P		Hyper
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	
						O		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF X	
									DF-SUR	DF-SUB

**REPRODUCTION**

Sexual						Asexual				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
				LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X				X		

# *Hydroides brachyacanthus*

Species ID: 15702

**Taxon:** Polychaete

**Taxonomic Author:** Rioja, 1941

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

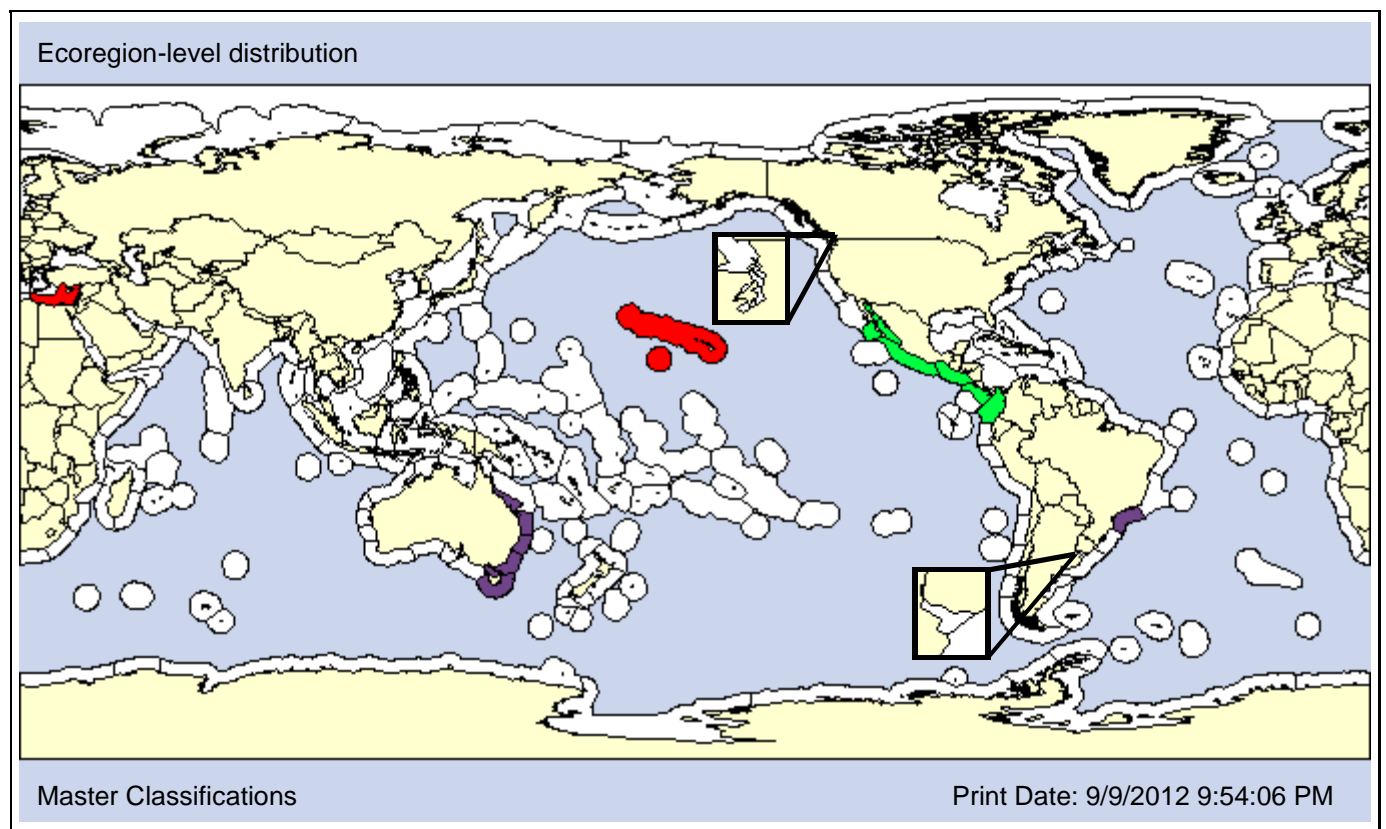
**Also Known As (Name - Type):**

Eupomatus brachyacantha  
 Hydroides brachyacantha  
 Hydroides branchyacantha  
 Hydroides branchyacanthus

Synonym  
 Convention  
 Misspelling  
 Misspelling

**Common Names:**

**Type Locality:** Mazatlan, Mexico



Master Classifications Print Date: 9/9/2012 9:54:06 PM

■ Native   
 ■ Nonindigenous   
  NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1939 Native

**Loc 1st record:** Hawaii Native

**Established:** Yes Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR		A	P				
<span style="color: red;">X</span>		<span style="color: red;">X</span>				AO	PO							

Comments: *Hydroides brachyacanthus* may be a species complex (Bastida-Zavala and ten Hove, 2002), and many of the records outside of the Tropical Northeast Pacific may represent other species. However, it appears to be introduced into Hawaii (Carlton and Eldredge, 2009) and the Levantine Sea in the Mediterranean (Çinar, 2006).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 200m] [Pref: 1 - 5m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>P</b>	

**SALINITY [Obs: - 40psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha		<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** Mörch, 1863

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

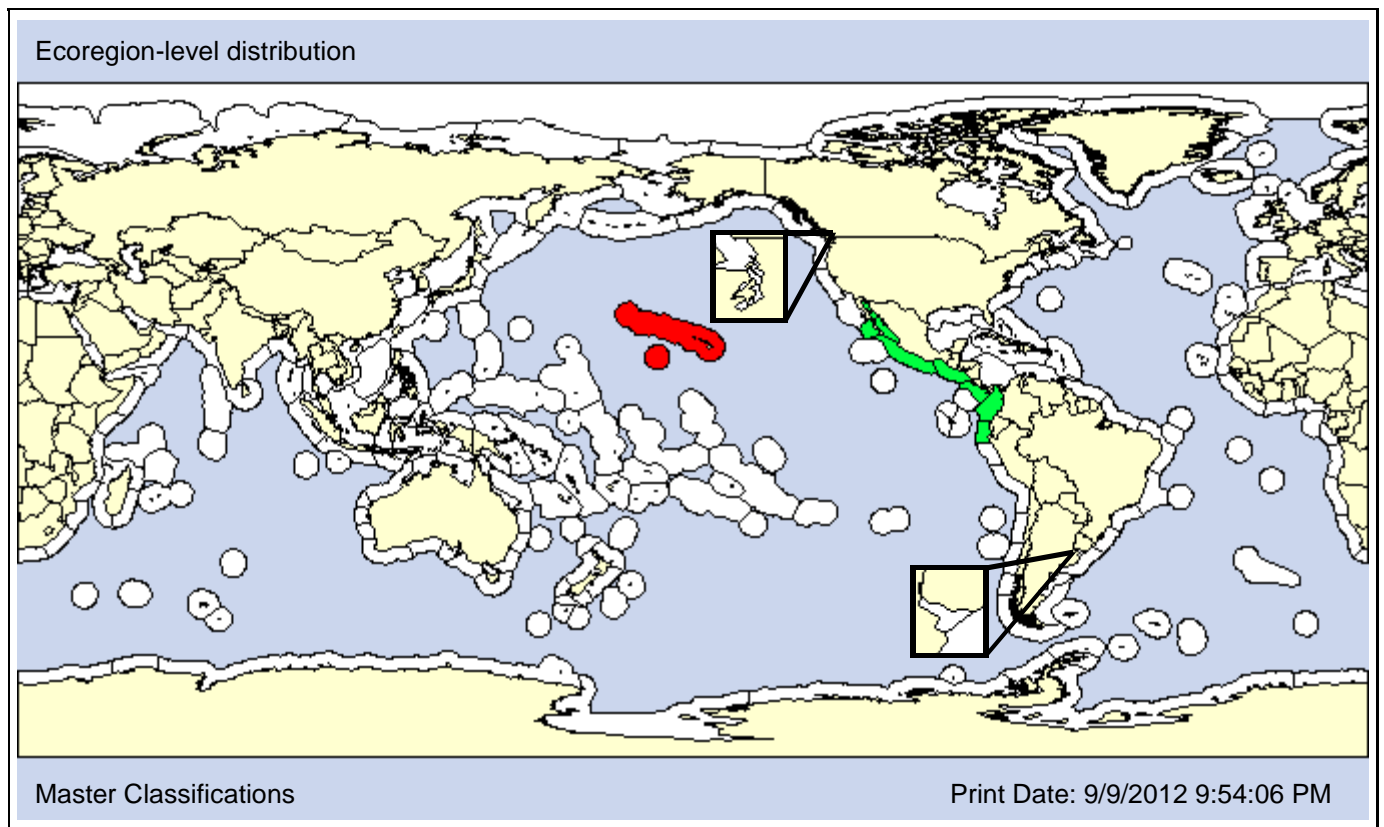
**Also Known As (Name - Type):**

Hydroides californicus	Synonym
Hydroides crucigera	Synonym
Vermilia crucigera	Synonym

**Common Names:**

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**Type Locality:** Punta Arenas, Costa Rica



■ Native  
 ■ Nonindigenous  
   NIS Not Established  
 ■ Cryptogenic  
 ■ Transient  
 ■ Unclassified  
 ■ Conflicting Classification  
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1936      Native

**Loc 1st record:** Kaneohe Bay, Hawaii      Native

**Established:** Yes      Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: *Hydroides cruciger* is a serpulid polychaete native to Eastern Tropical Pacific that has been introduced into Hawaii. However, Caribbean records of *Hydroides cruciger* belong to *H. bispinosus* and/or *H. parvus* (ten Hove and Kupriyanova, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	

**DEPTH [Obs: 0 - 31m] [Pref: 0 - 31m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY [Obs: - 35psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

**Taxon:** Polychaete

**Taxonomic Author:** (Verrill, 1873)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

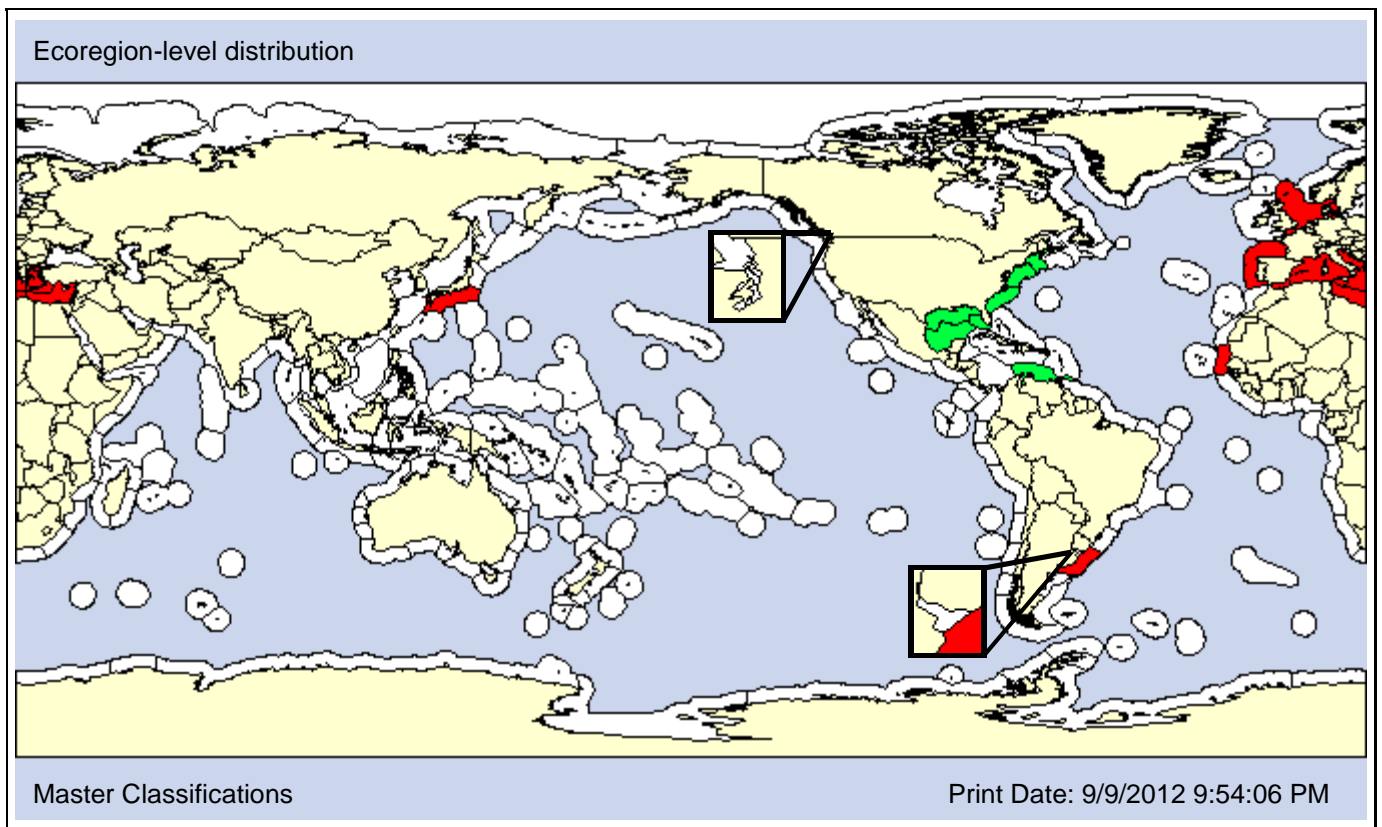
**Also Known As (Name - Type):**

Eupamotus dianthus	Synonym
Eupomatus dianthus	Synonym
Hydroides uncinata	Synonym
Serpula dianthus	Synonym

**Common Names:**

limy tubeworm
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**Type Locality:** New England, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1997

**Loc 1st record:** Osaka Bay, Japan

**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 50m] [Pref: 0 - 22m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>O</b>				<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 1 - 35psu] [Pref: 20 - 29psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Polychaete

**Taxonomic Author:** Mörch, 1863

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

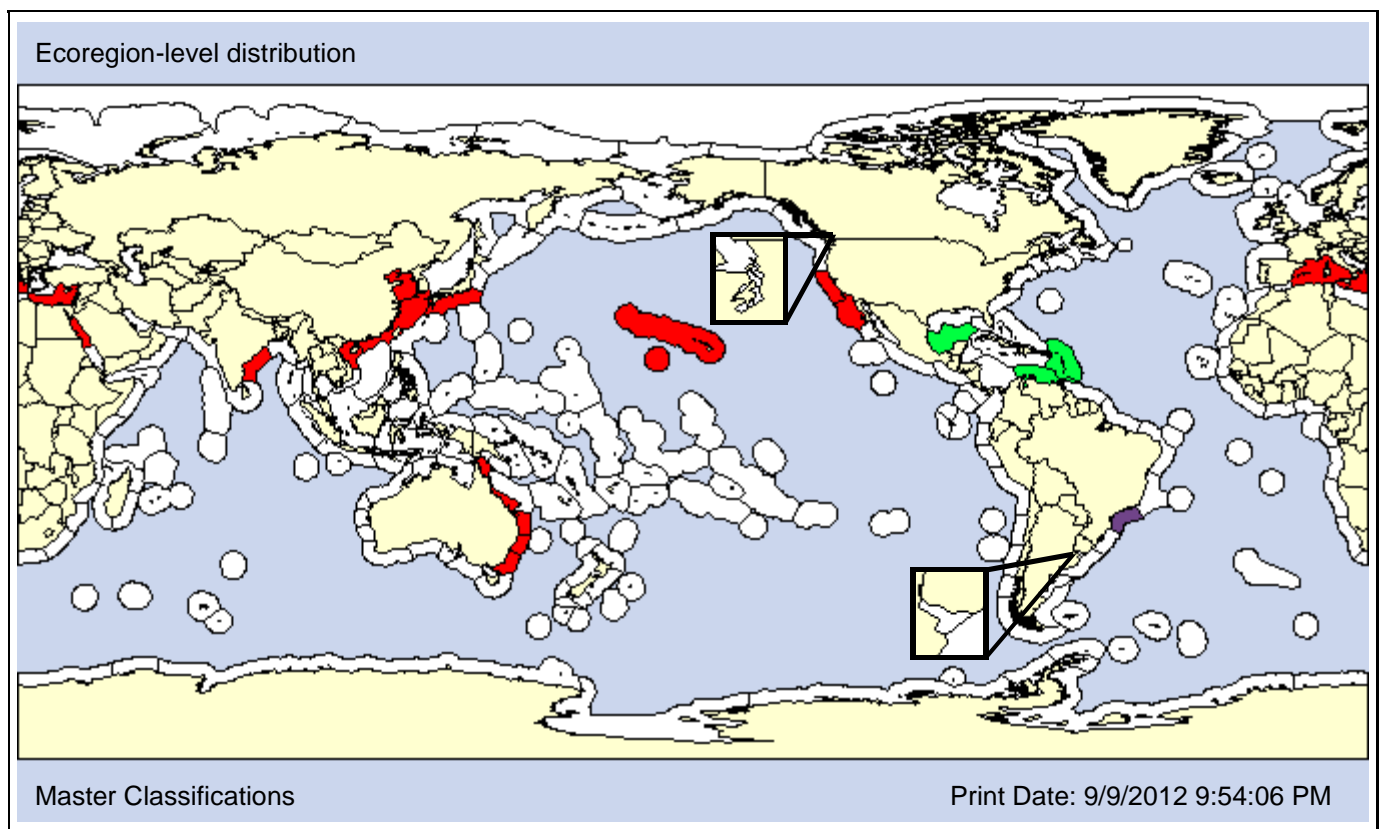
**Also Known As (Name - Type):**

Eupomatus dirampha	Synonym
Eupomatus lunifer	Synonym
Hydroides benzoni	Synonym
Hydroides cumingii	Synonym

**Common Names:**

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**Type Locality:** St. Thomas, West Indies



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** Unknown      1900      1999  
**Loc 1st record:** Unknown      Honolulu Harbor, Hawaii      San Diego Bay, CA  
**Established:** Yes      Yes      Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments: The global classification of *Hydroides diramphus* assumes that the Tropical Northwestern Atlantic is the native region.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>									<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (Haswell, 1883)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

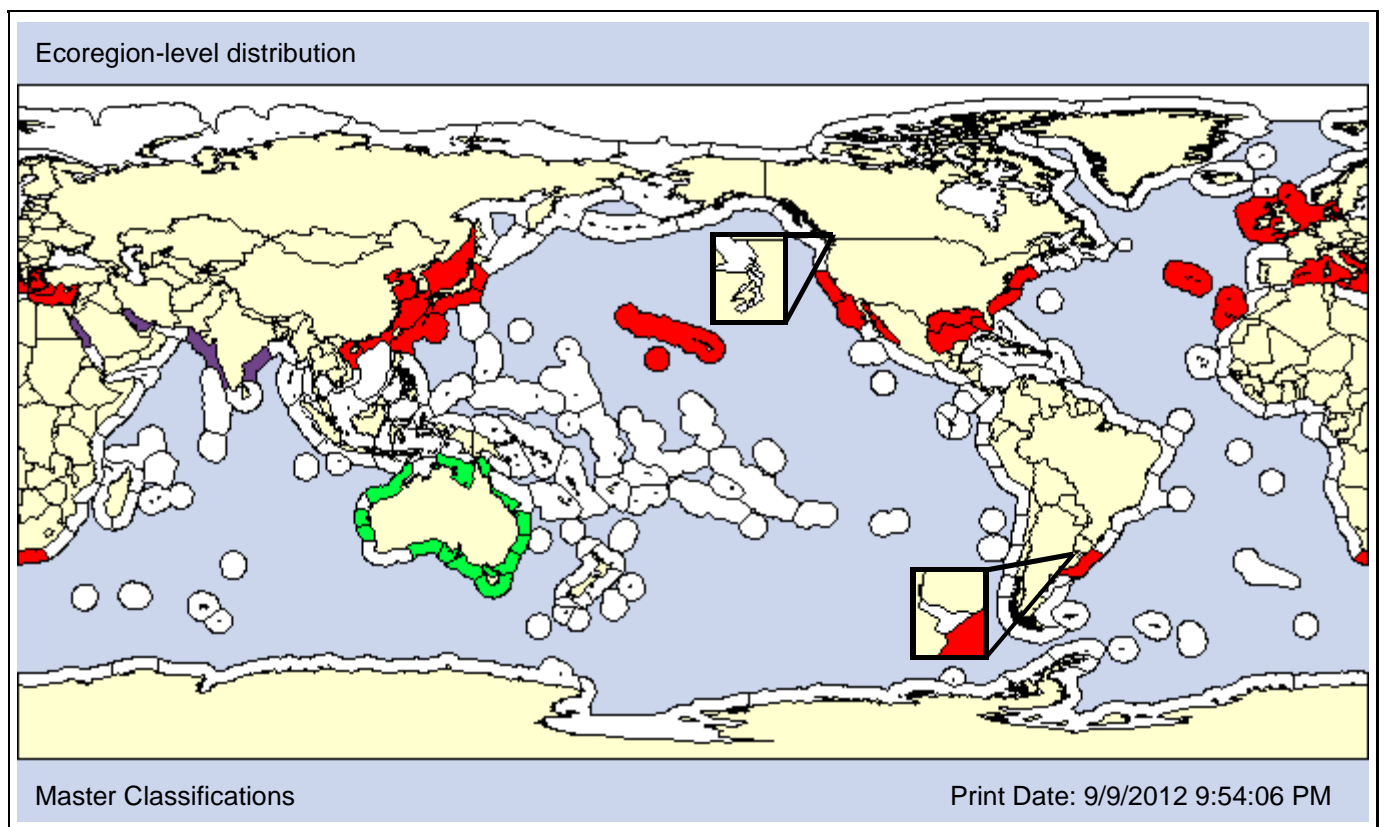
**Also Known As (Name - Type):**

Eupomatus elegans	Synonym
Eupomatus pectinata	Synonym
Eupomatus trypanon	Synonym
Hydroides abbreviatus	Synonym

**Common Names:**

Kasane-kannzashi
------------------

**Type Locality:** Sydney, Australia



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

**NWP**

**Hawaii**

**NEP**

**Date 1st record:** 1928

1929

1931

**Loc 1st record:** Wakayama Pref., Japan

Pearl Harbor, Oahu, Hawaii

Southern California

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: Our global classification of *Hydroides elegans* assumes it is native to Australia (Stafford and Willan, 2007). However, NIMPIS classifies it as cryptogenic in Australia, Japan, China, and SE Asia, while Iwasaki (2006) classifies it as a NIS in Japan. Further research is needed to determine its global distribution.

## REGIME

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

## ECOSYSTEM

Unconsolidated <b>X</b>						Consolidated <b>X</b>						Pelagic	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

DEPTH [Obs: 0 - 3947m] [Pref: 0.5 - 20m]

## Benthic Depth

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>O</b>			

## Pelagic Depth

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2.5 - 94.45%] **X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

CONSOLIDATED SUBSTRATE **X**

<b>R P</b>	<b>HP</b>	Biogenic <b>P</b>						Artificial Substrate <b>P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>								<b>P</b>	<b>P</b>	<b>O</b>	<b>P</b>

SALINITY [Obs: 14 - 42psu] [Pref: 20 - 36psu]

Fresh	Brackish <b>P</b>						Marine <b>P</b>		Hyper <b>O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
			<b>O</b>	<b>P</b>	<b>P</b>				

## TROPHIC LEVEL AND FEEDING

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								<b>X</b>	DF-SUR	DF-SUB

## REPRODUCTION

Sexual <b>X</b>						Asexual				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

## EARLY DEVELOPMENT

## JUVENILE DEVELOPMENT/DISPERSAL

V	OVI	OVO	DD	LP <b>X</b>			FR	SD	SP
				LP-B	LP-P	<b>X</b>			

## HABITAT ASSOCIATION

Pelagic			Benthic <b>X</b>							Epibiotic <b>X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** Okuda, 1934

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

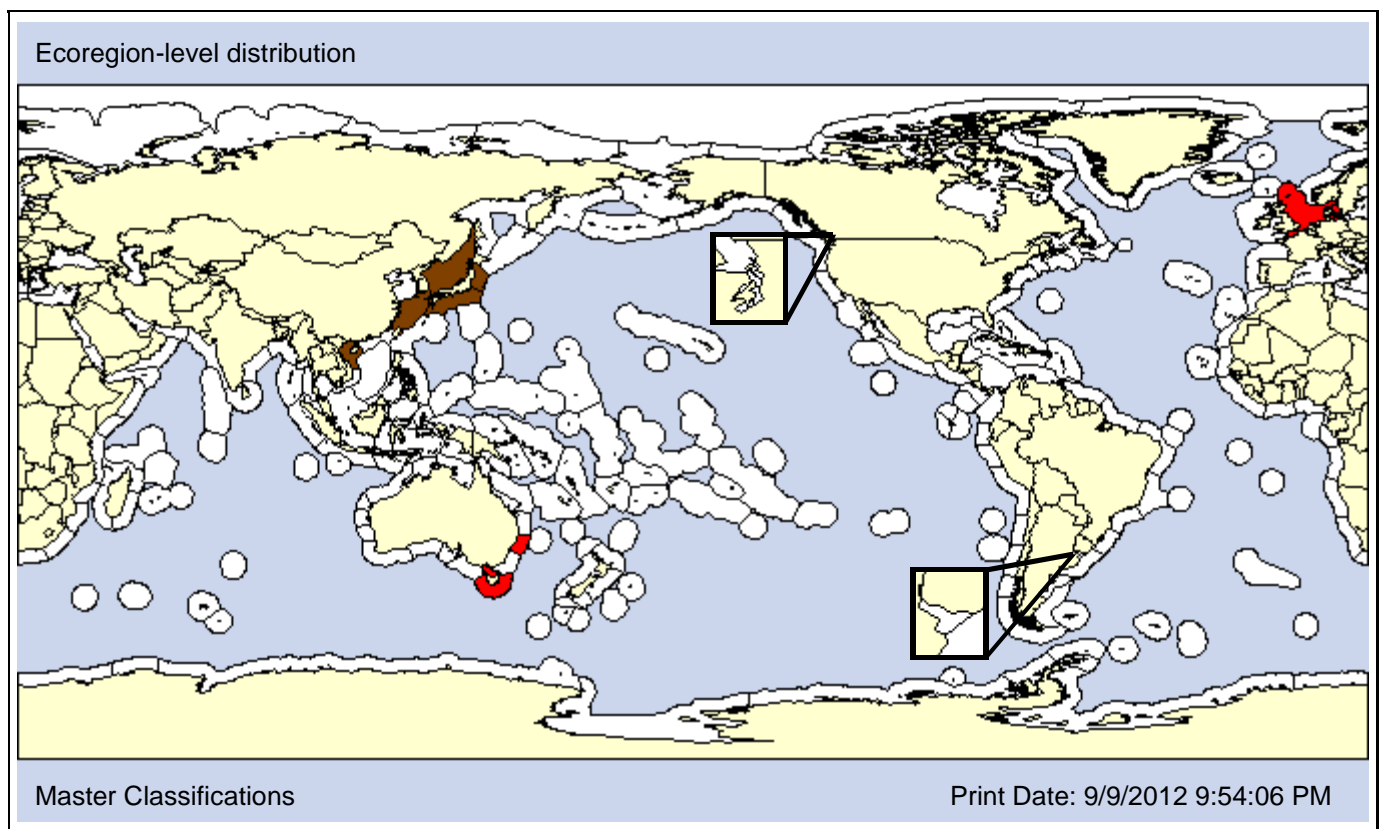
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Hydroides diplochone	Synonym	
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**Type Locality:** Japan



**Date 1st record:** 1980s

**Loc 1st record:** Korea

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: *Hydroides ezoensis* has been listed as native (Hayes et al., 2005, PICES Working Group 21, 2011), cryptogenic (Nishi and Tanaka 2008 in Link et al. 2008) and NIS (Washitani 2004) in different locations in Asia. We list the NWP as a conflict, but consider it a NIS in Europe (Streftaris et al. 2005) and Australia (Hayes et al. 2005).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 10m] [Pref: 0 - 2m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>									<b>O</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: - 34psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** Gunnerus, 1768

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

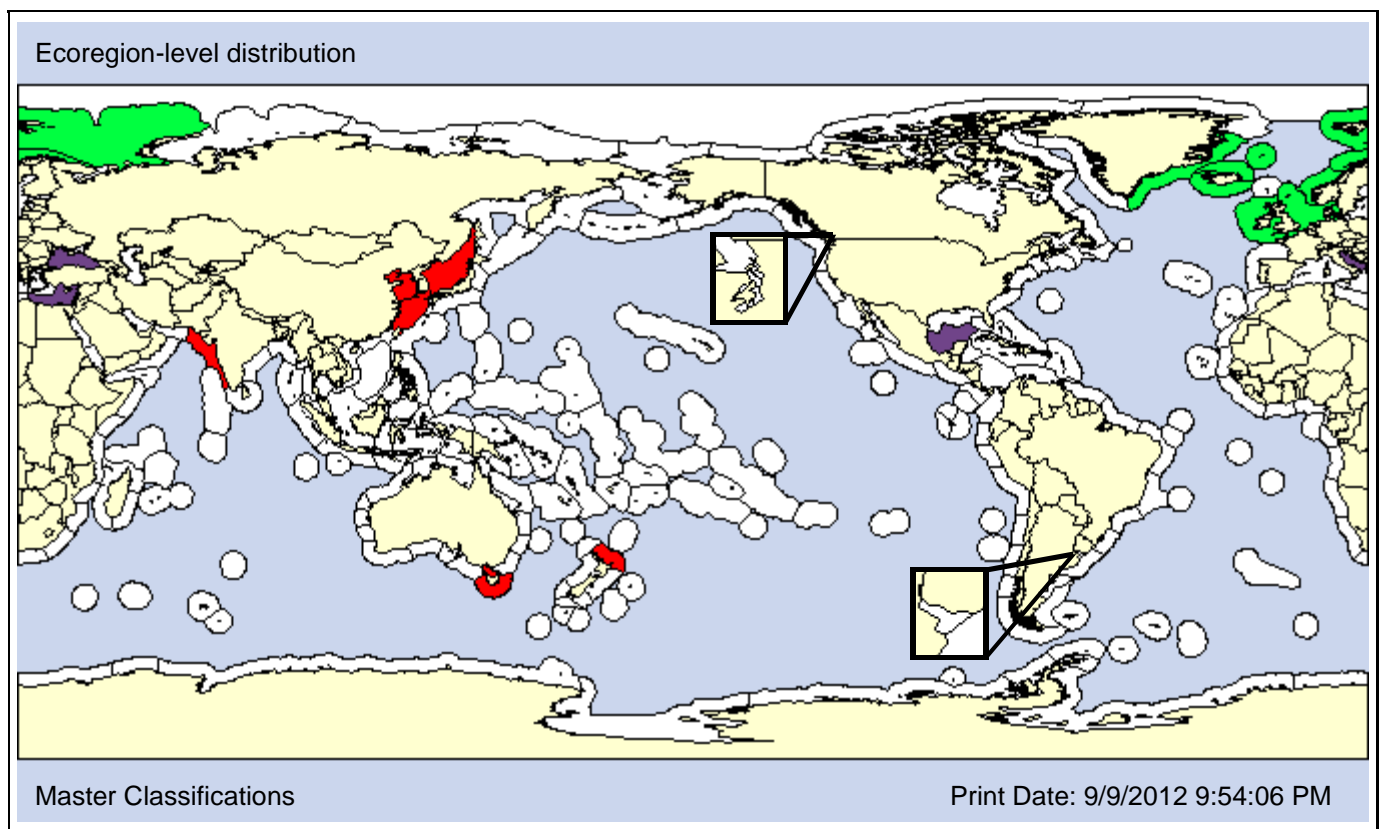
**Also Known As (Name - Type):**

Hydroides elegans of authors in part; not (Haswell 1883)	Misidentified
Hydroides norvegica	Convention
Sabella euplacana	Synonym
Serpula (Eupomatus) pectinata	Synonym

**Common Names:**

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**Type Locality:**



Master Classifications Print Date: 9/9/2012 9:54:06 PM

<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;"> </span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: cyan;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;"> </span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: *Hydroides norvegicus* is a northern European and Arctic species. However, its distribution is complicated by the failure to separate it from *H. elegans*. We tentatively list *H. norvegicus* as introduced into the Pacific, but the identity of this invader should be checked, as should the Mediterranean and Gulf of Mexico records.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 103m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>											<b>O</b>	

**SALINITY [Obs: 15 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Polychaete

**Taxonomic Author:** (Quatrefages, 1865)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

**Also Known As (Name - Type):**

Dexiospira pagenstecheri

Synonym

Janua (Dexiospira) pagenstecheri

Convention

Mera pusilla

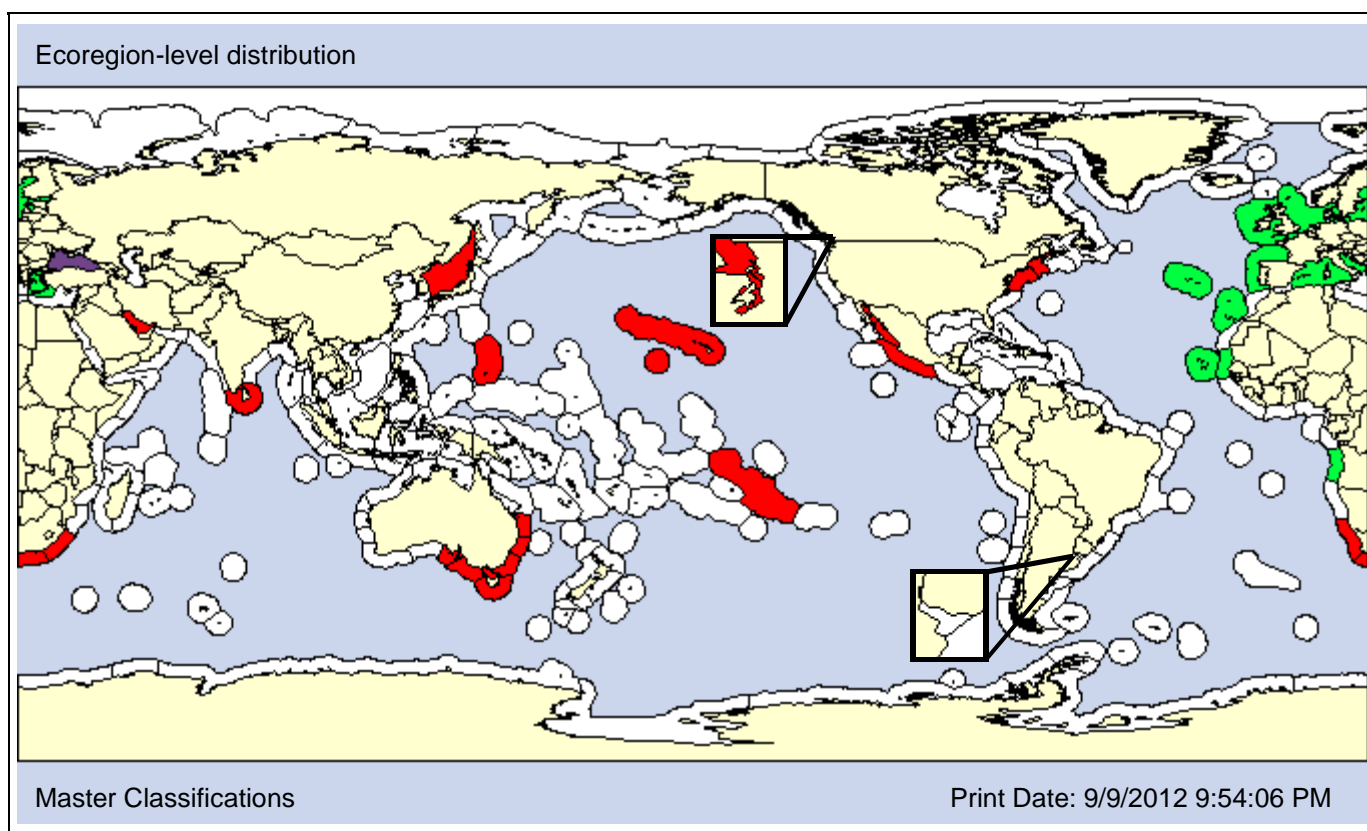
Synonym

Spirorbis gnomonicus

Synonym

**Common Names:**

**Type Locality:** France



**Date 1st record:**

1960s

Unknown

**Loc 1st record:**

Kaneohe Bay, Hawaii

Gulf of California, Mexico

**Established:**

Yes

Unknown

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: The taxonomy and history of *Janua pagenstecheri* is confused. We follow Knight-Jones et al. (1975) and consider *J. pagenstecheri* a Northeast Atlantic species. Accordingly, we tentatively classify it as NIS in the Pacific, while Mead et al. (2011) classify it as introduced in South Africa and Pederson et al. (2005) as NIS in New England.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 120m] [Pref: 2 - 90m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>O</b>				<b>O</b>					<b>O</b>	

**SALINITY [Obs: 29 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (Marenzeller, 1879)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Eunicida

**Suborder:** Eunicida

**Infraorder:**

**Superfamily:**

**Family:** Lumbrineridae

**Subfamily:**

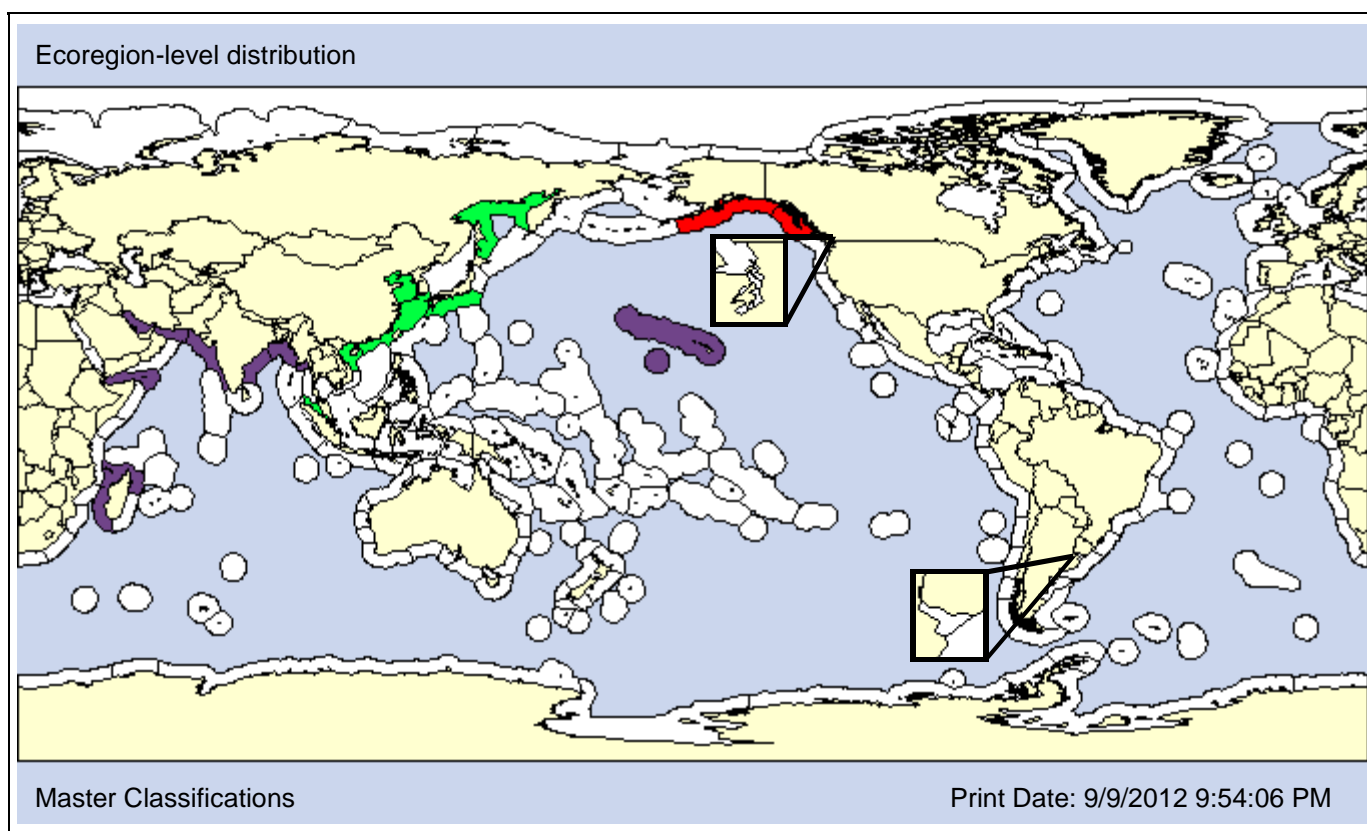
**Also Known As (Name - Type):**

Lumbriconereis heteropoda  
Lumbrineris heteropoda

Synonym  
Synonym

**Common Names:**

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP

Hawaii

NEP

**Date 1st record:** Native

Unknown

1979

**Loc 1st record:** Native

Unknown

Alaska

**Established:** Yes

Unknown

Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				X
X						AO	PO								

Comments: Carrera-Parra and Orensanz (2002) transferred Lumbrineris heteropoda to Kuwaita heteropoda, though they noted that some of the previous records of L. heteropoda may be a different species. L. heteropoda was considered as a likely invader in Prince William Sound, Alaska (Hines et al., 2000b).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O	O				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X				
		X											

**DEPTH [Obs: 64 - 468m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	O		
				O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
P	O			O		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 30 - 32psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						P			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		

<b>Taxon:</b> Polychaeta	<b>Taxonomic Author:</b> Norris	
<b>Kingdom:</b> Animalia	<b>Subkingdom:</b> Eumetazoa	<b>Phylum:</b> Annelida
<b>Subphylum:</b>	<b>Superclass:</b>	<b>Class:</b> Polychaeta
<b>Subclass:</b> Canalipalata	<b>Infraclass:</b>	<b>Superorder:</b>
<b>Order:</b> Sabellida	<b>Suborder:</b> Sabellida	<b>Infraorder:</b>
<b>Superfamily:</b>	<b>Family:</b> Sabellidae	<b>Subfamily:</b>

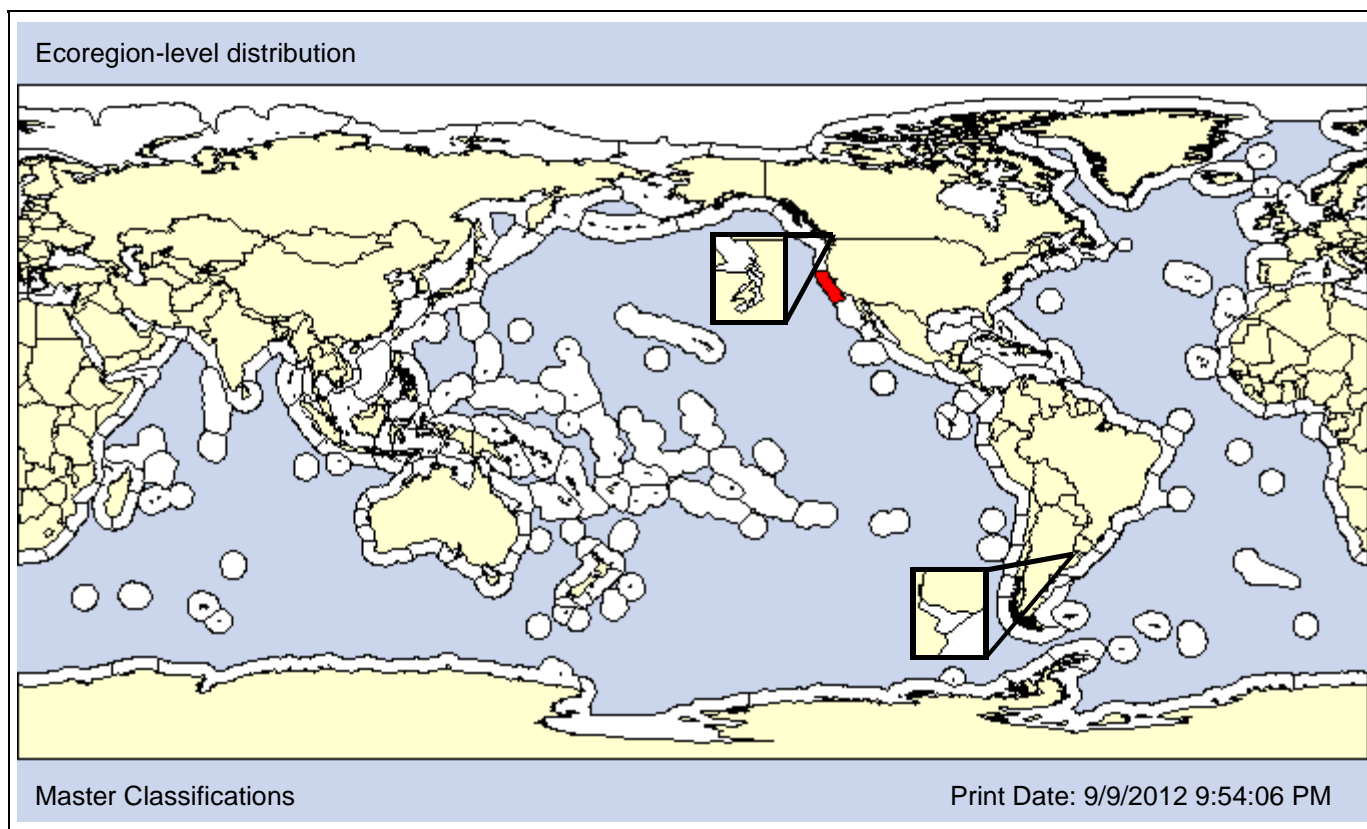
**Also Known As (Name - Type):**

Laonome sp. Fitzhugh of Blake and Ruff, 2007	Synonym
Laonome sp. SF1 Norris	Synonym
Potamilla sp. of Cohen and Carlton (1995)	Synonym

**Common Names:**

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**Type Locality:** California, USA



<span style="display:inline-block; width:15px; height:15px; background-color: #90EE90; border: 1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color: #FF0000; border: 1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color: #FFD700; border: 1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color: #ADD8E6; border: 1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color: #800080; border: 1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color: #8B4513; border: 1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1989  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	AA	IR			A	P				
<b>X</b>						AO	PO								

Comments: This undescribed sabellid polychaete is considered introduced in the San Francisco Estuary, where it was first found in 1989 (CANOD, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O						O		

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												P		P

**SALINITY [Obs: 0 - psu]**

<b>Fresh O</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
		O	O					

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Polychaete

**Taxonomic Author:** (Fauvel, 1932)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Amphinomida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Amphinomidae

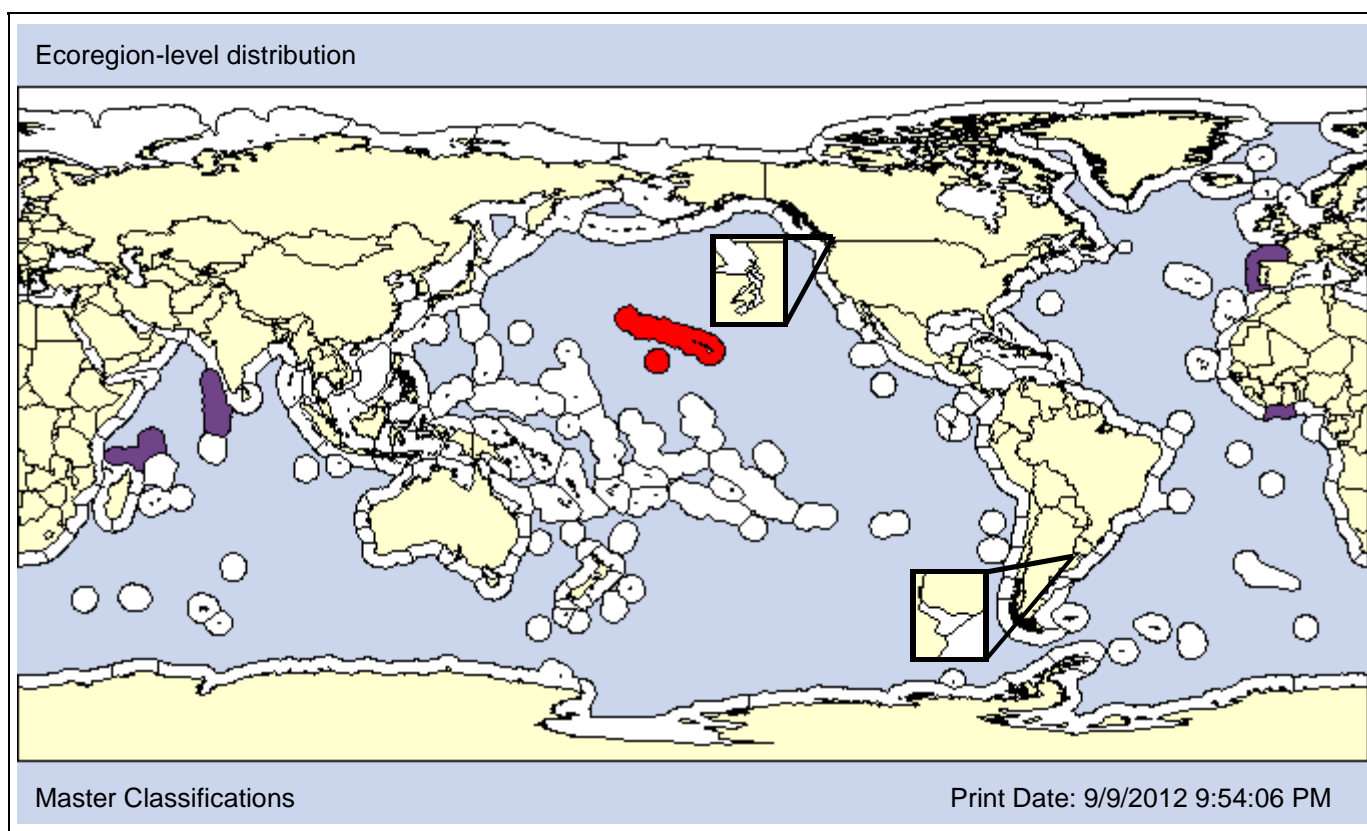
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Pseudeurythoe microcephala	Synonym	
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**Type Locality:** Maldives, Indian Ocean



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1998  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Linopherus microcephala* was classified as introduced in Hawaii (Nelson et al., 2007). We tentatively follow this classification but note that *L. microcephala* occurs in coral rubble (Bailey-Brock et al., 2007) and has been recorded from bathyal depths (Louzao et al., 2010), neither of which are characteristic of introduced species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0.5 - 1025m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
		<b>O</b>		<b>P</b>		

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC			<b>X</b>				



**Taxon:** Polychaete

**Taxonomic Author:** Day, 1961

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spioniformia

**Infraorder:**

**Superfamily:**

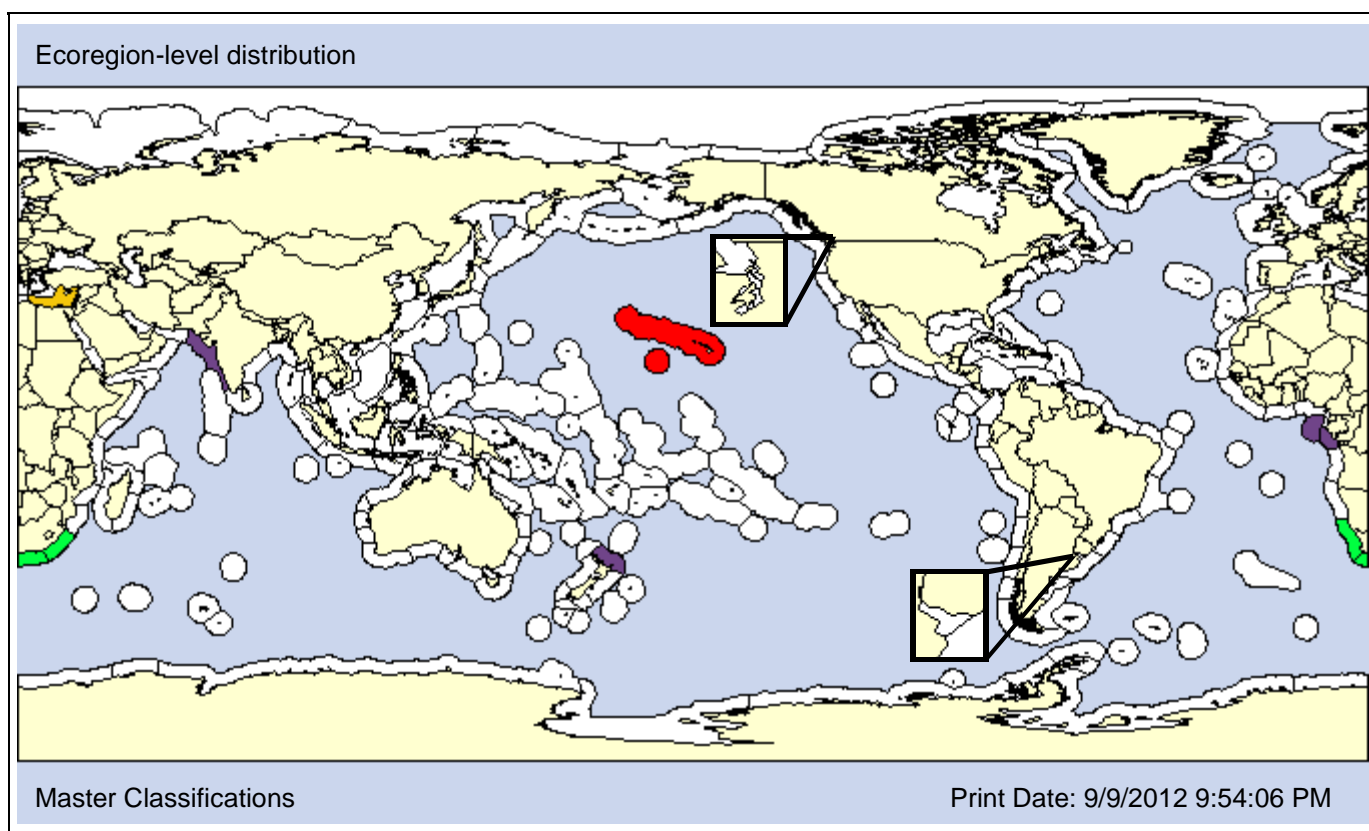
**Family:** Magelonidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Agulhas Bank, South Africa.



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1998  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: Assuming that *Magelona capensis* is native to South Africa, we follow Nelson et al. (2007) and classify it as introduced in Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O	O				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		X											

**DEPTH [Obs: 1.7 - 508m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	O		
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 34.6 - 35.8psu]**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR X	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P X				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		

**Taxon:** Polychaete

**Taxonomic Author:** (Bourne, 1883)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Sabellidae

**Subfamily:**

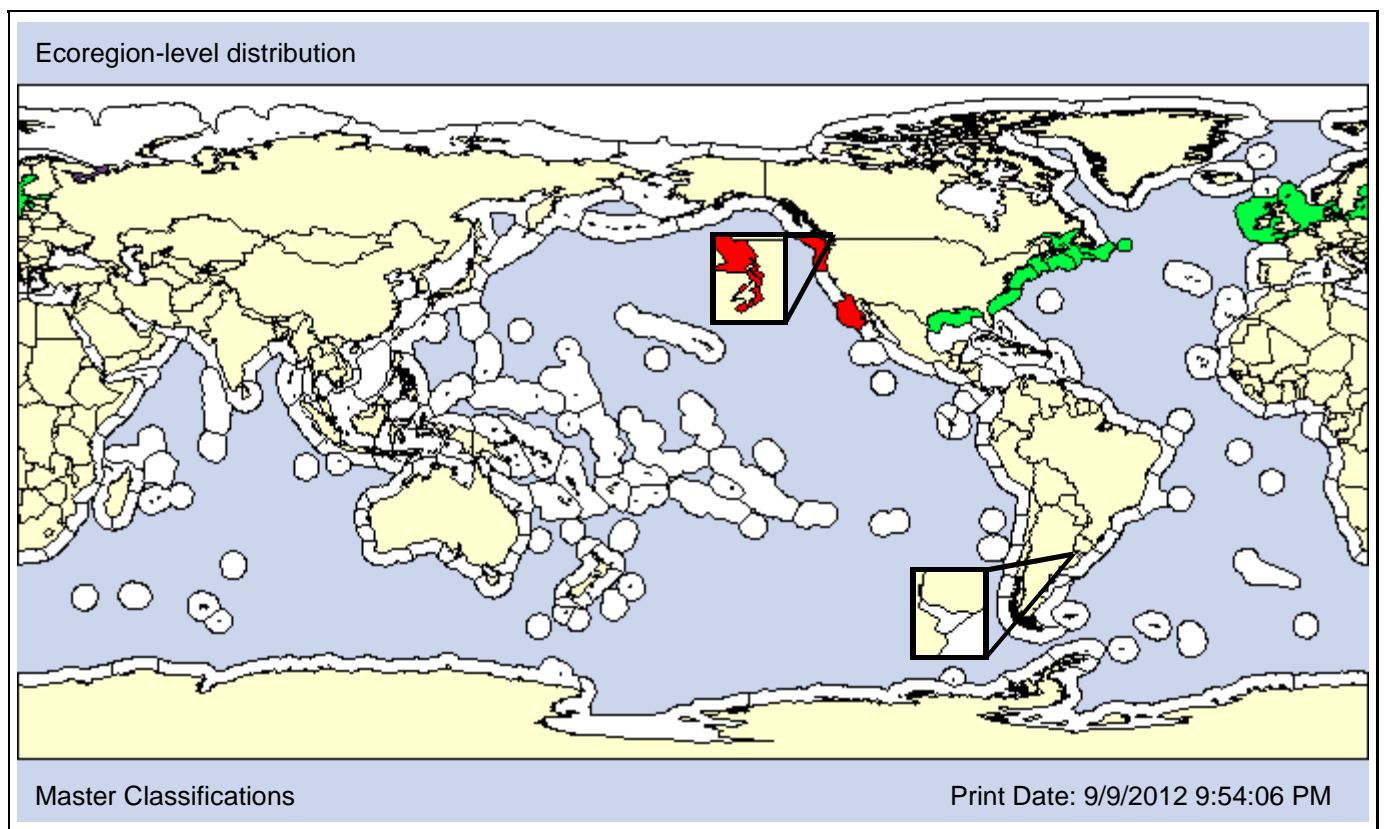
**Also Known As (Name - Type):**

Haplobranchus aestuarinus  
Haplobranchus aestuerina

Synonym  
Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:**

1980-1981

**Loc 1st record:**

Baker Bay, Columbia River

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>						AO	PO								

Comments: Kocheshkova and Matviy (2009) consider *Manayunkia aestuarina* to be alien in the Baltic. However, it is not listed in the "Baltic Sea Alien Species Database" or by Streftaris et al. (2005) in their list of alien species in the Baltic and Europe.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 30m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 0.65 - 95.21%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 5 - 50psu] [Pref: 6 - 15psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
		<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** (Verrill, 1873)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

**Family:** Spionidae

**Subfamily:**

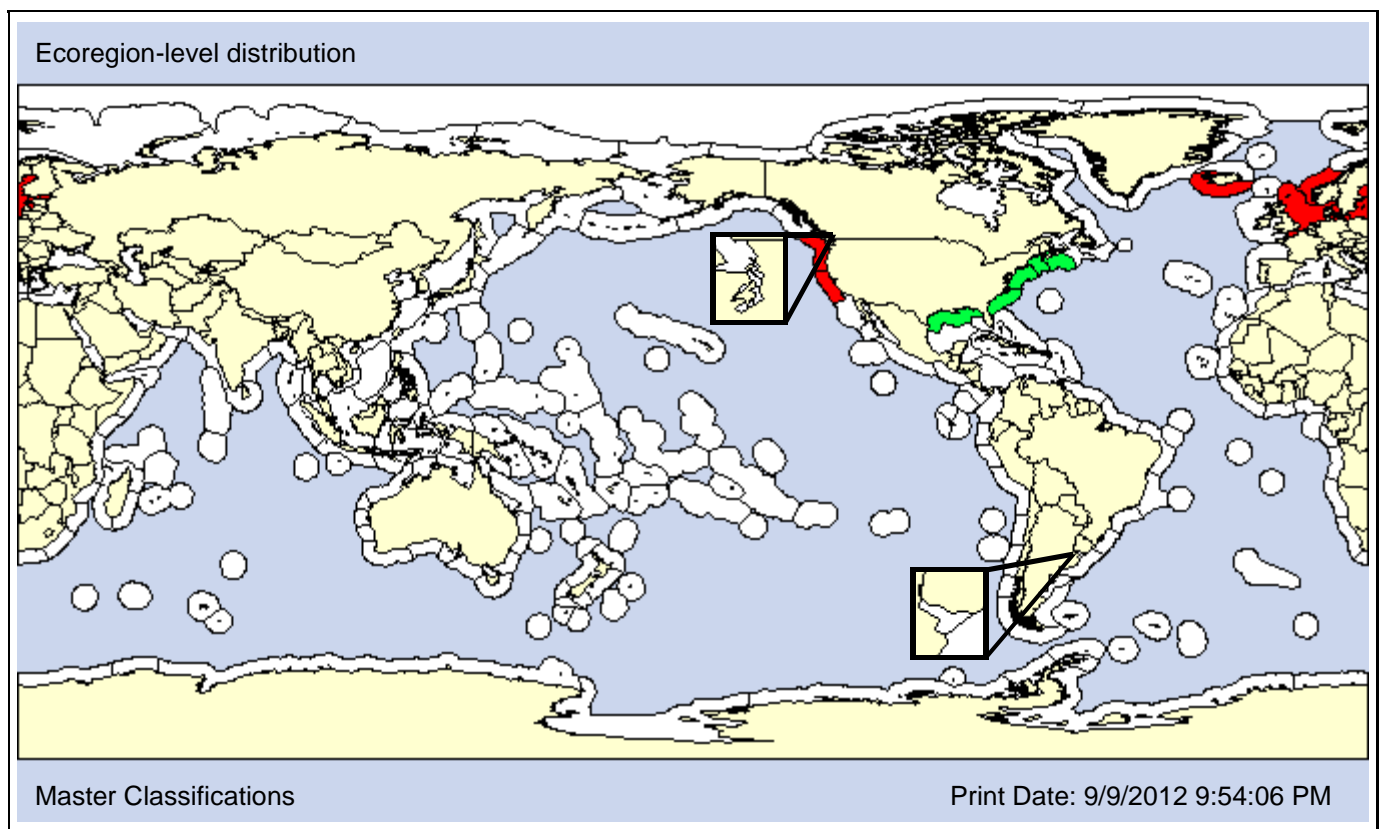
**Also Known As (Name - Type):**

Marenzelleria jonesi	Synonym
Scolecopides viridis	Synonym
Scolecopis tenuis	Synonym
Scolecopides viridis	Synonym

**Common Names:**

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**Type Locality:** Delaware, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1991  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments: The "Marenzelleria viridis" reported from the NEP may be *M. neglecta* (see Sikorski and Bick, 2004), however both are from the Atlantic and thus NIS in the Pacific. We will follow Sikorski and Bick (2004) and use *M. viridis* for the NEP species until further data become available.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 50m] [Pref: 0 - 13m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.5 - 98.66%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 32.9psu] [Pref: 2.5 - psu]**

<b>Fresh O</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** Moore, 1911

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Eunicida

**Suborder:** Eunicida

**Infraorder:**

**Superfamily:**

**Family:** Eunicidae

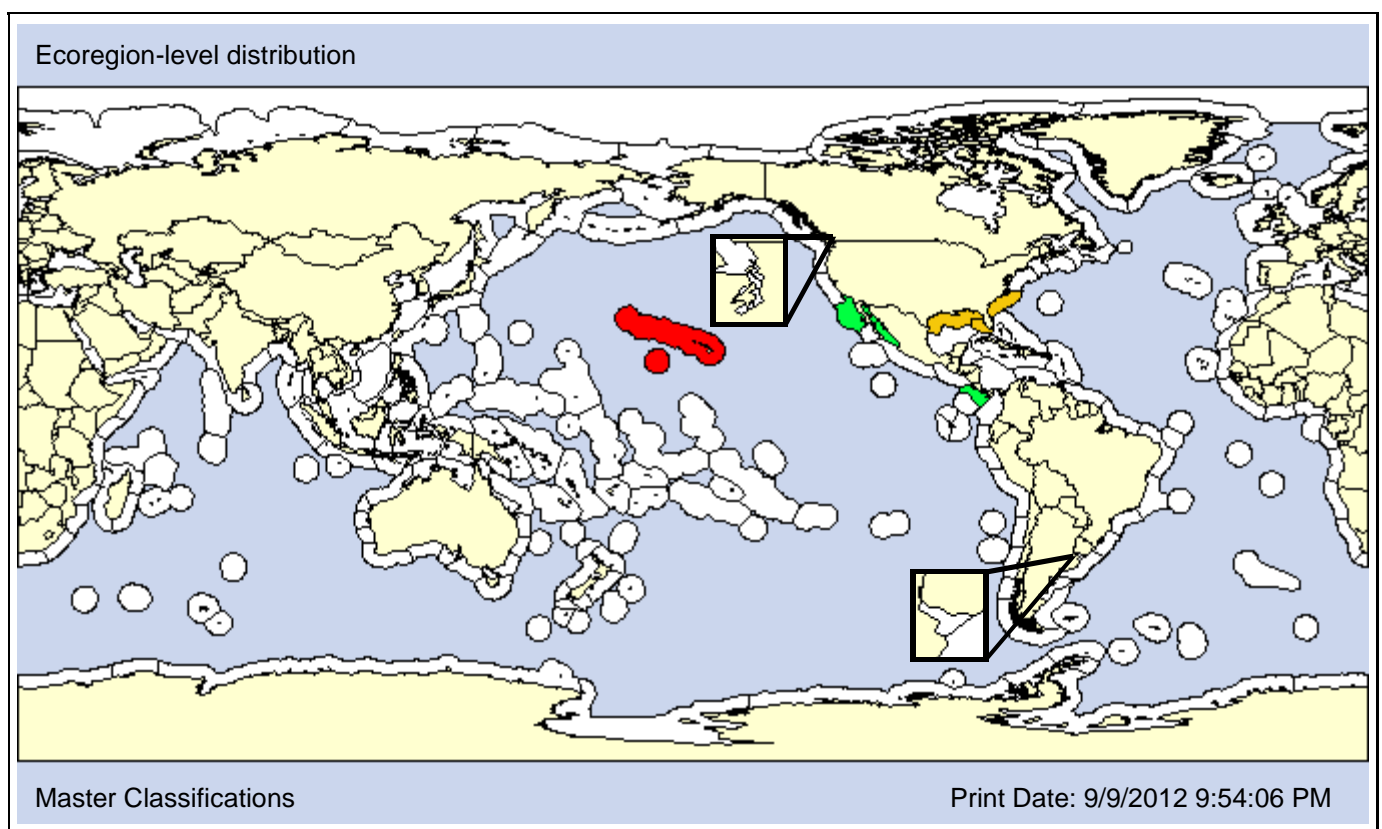
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Marphysa cf. conferta	Ambiguous syn.	
-----------------------	----------------	--

**Type Locality:** Santa Rosa Island, California, USA



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;">■</span> NIS Not Established	<span style="color: yellow;">■</span> Cryptogenic	<span style="color: lightblue;">■</span> Transient	<span style="color: purple;">■</span> Unclassified	<span style="color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;">■</span> Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 2002 Native  
**Loc 1st record:** Kaneohe Bay, Hawaii Native  
**Established:** Unknown Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X						AO	PO								

Comments: *Marphysa conferta* was originally described off of California in rocky habitats. The species reported from the Gulf of Mexico, reported as “*Marphysa cf. conferta*” in Fauchald et al. (2009), may be a different species than found in the Pacific. Thus, we classify it as cryptogenic in the NWA rather than introduced at this time.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X				X
		X											

**DEPTH [Obs: 0 - 200m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 44.36%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					O	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 31.4 - 35.2psu]**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			X	X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							



**Taxon:** Polychaeta

**Taxonomic Author:** Blake & Kudenov, 1978

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

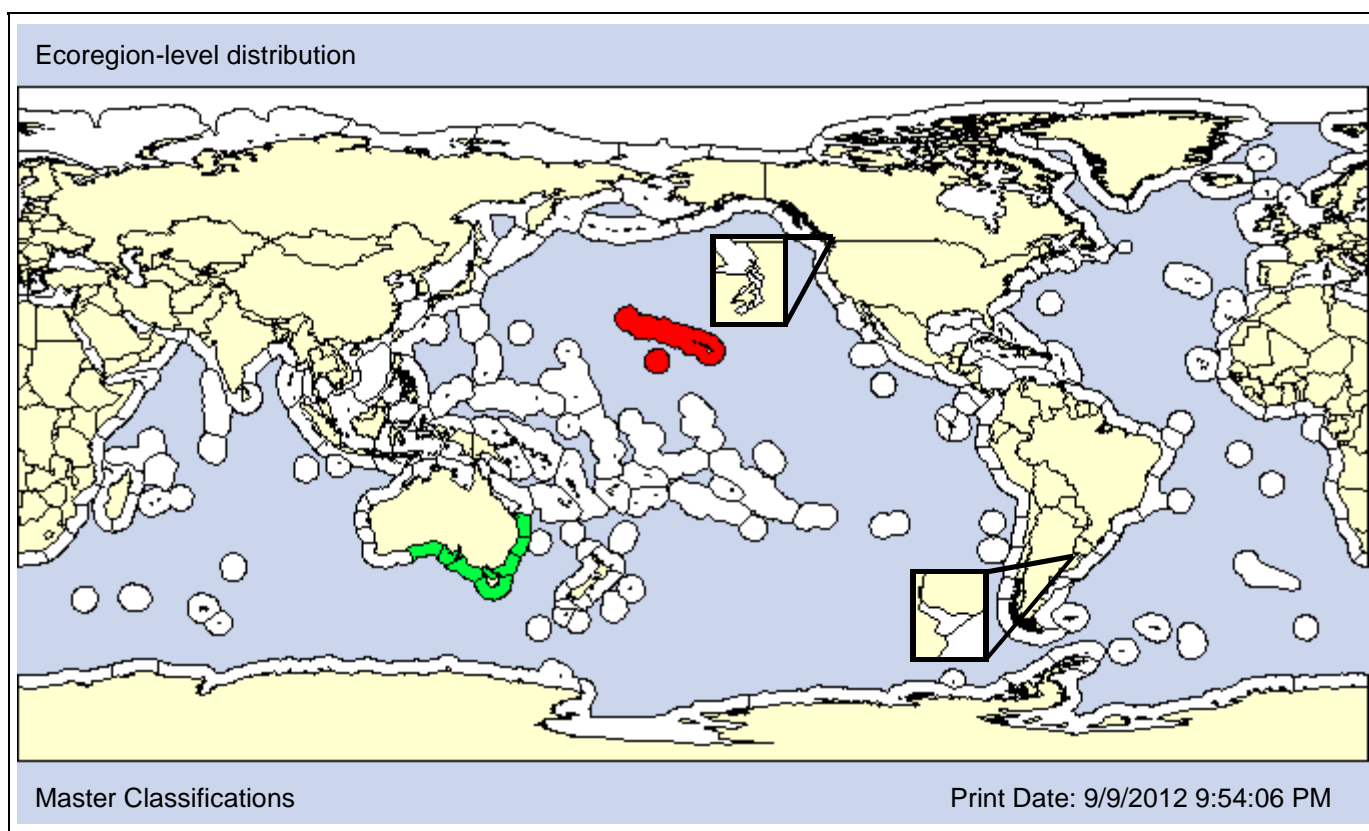
**Family:** Spionidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Botany Bay, Australia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1998  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH		<b>X</b>			
		<b>X</b>											

**DEPTH [Obs: 9.2 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 35psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** (Augener, 1913)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

**Subfamily:** Autolytinae

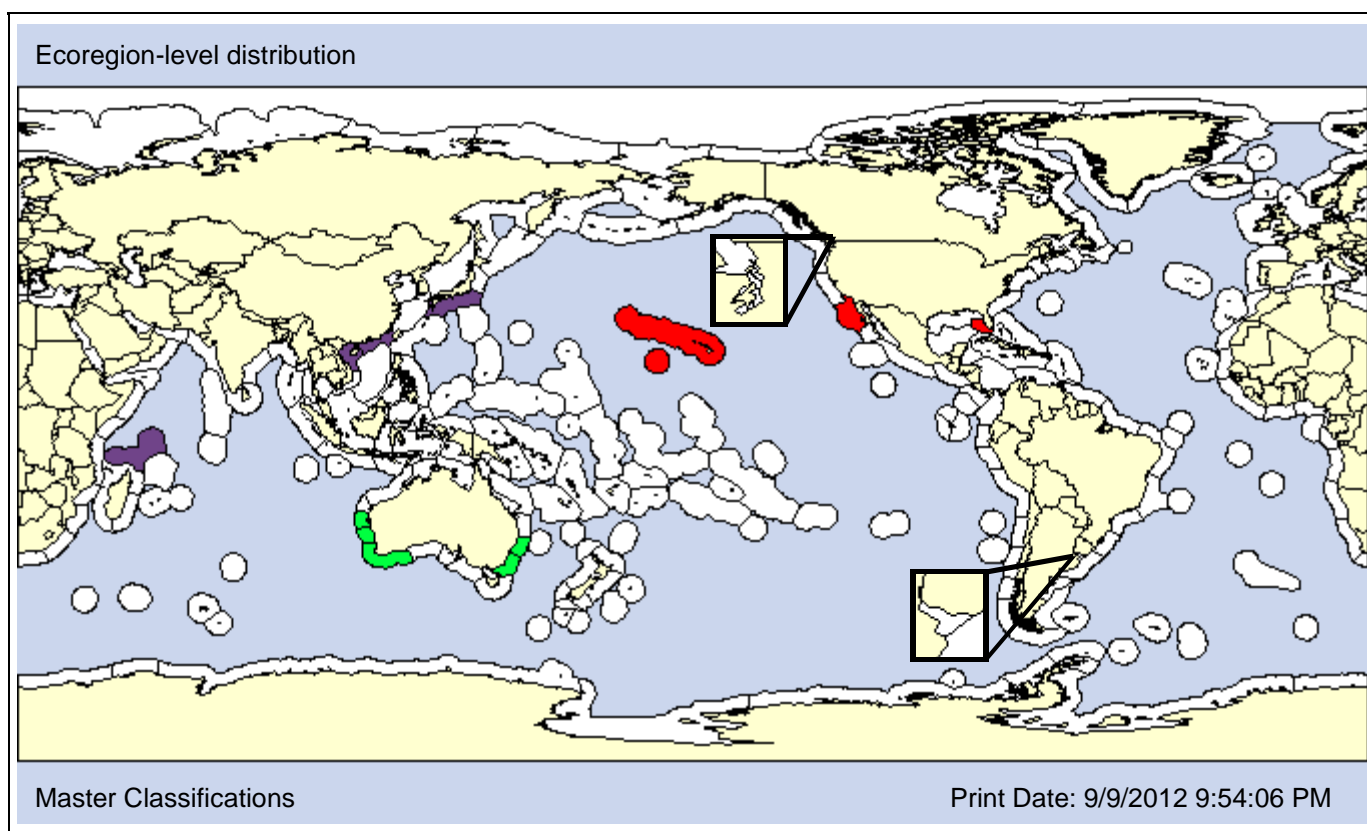
**Also Known As (Name - Type):**

Autolytus pachycerus  
Myrianida crassicirrata

Synonym  
Synonym

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b> Unknown	1959	2000?
<b>Loc 1st record:</b> Unknown	Kaneohe Bay, Hawaii	Southern California bays
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 1.5 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 96.3 - 96.3%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: 34.87 - 36.5psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC					<b>X</b>		<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (Moore, 1903)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Nereidiformia

**Infraorder:**

**Superfamily:**

**Family:** Nereididae

**Subfamily:**

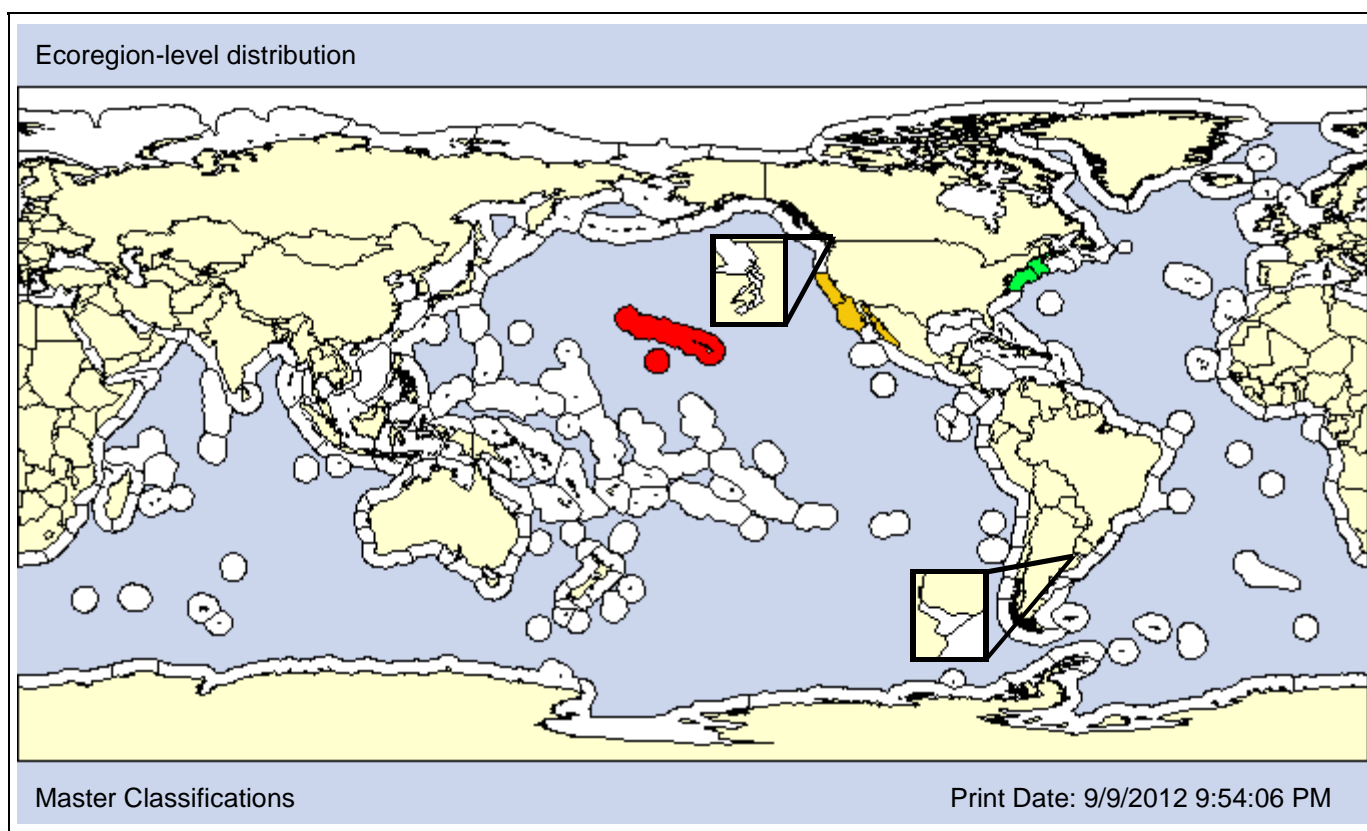
**Also Known As (Name - Type):**

Nereis (Neanthes) arenaceodentata  
 Nereis areanacoedentata  
 Nereis arenaceodentata  
 Neanthes acuminata complex

Synonym  
 Misspelling  
 Synonym  
 Ambiguous syn.

**Common Names:**

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1950s

1981

**Loc 1st record:**

Kaneohe Bay, Hawaii

Gulf of California, Mexico

**Established:**

Yes

Unknown

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: According to CANOD (2009), *Neanthes arenaceodentata* is part of the “problematic” *Neanthes acuminata* complex. The *N. acuminata* form reported from California is different than the Atlantic species, and is classified as cryptogenic in the NEP (CANOD, 2009). Even with this taxonomic uncertainty, the Hawaiian form is considered introduced (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 11.6m] [Pref: 0.01 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: 20 - 36psu] [Pref: 30 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
						<b>X</b>			DF-SUR	DF-SUB <b>X</b>

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
						<b>X</b>							

<b>Taxon:</b> Polychaete	<b>Taxonomic Author:</b> Harris	
<b>Kingdom:</b> Animalia	<b>Subkingdom:</b> Eumetazoa	<b>Phylum:</b> Annelida
<b>Subphylum:</b>	<b>Superclass:</b>	<b>Class:</b> Polychaeta
<b>Subclass:</b> Canalipalpata	<b>Infraclass:</b>	<b>Superorder:</b>
<b>Order:</b> Terebellida	<b>Suborder:</b> Terebellida	<b>Infraorder:</b>
<b>Superfamily:</b>	<b>Family:</b> Terebellidae	<b>Subfamily:</b>

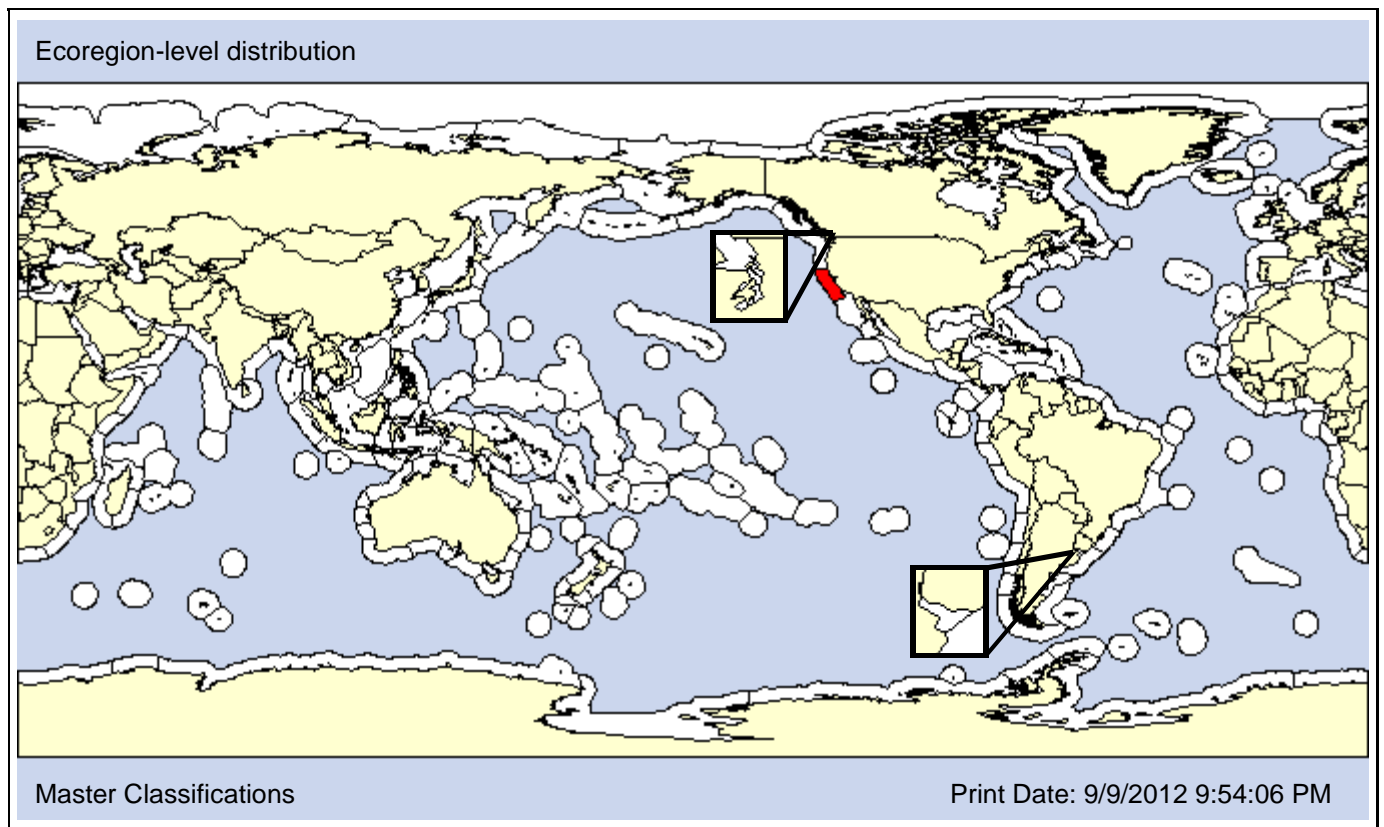
**Also Known As (Name - Type):**

Neoamphitrite sp. A (provisional)	Synonym
Neoamphitrite sp. A of Harris	Synonym

**Common Names:**

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**Type Locality:** California, USA



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 2004  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 5.5 - 12m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>			Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep				
			<b>O</b>					

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 51.06 - 88.41%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 24.5 - 31.17psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		



**Taxon:** Polychaeta

**Taxonomic Author:** (Grube, 1872)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

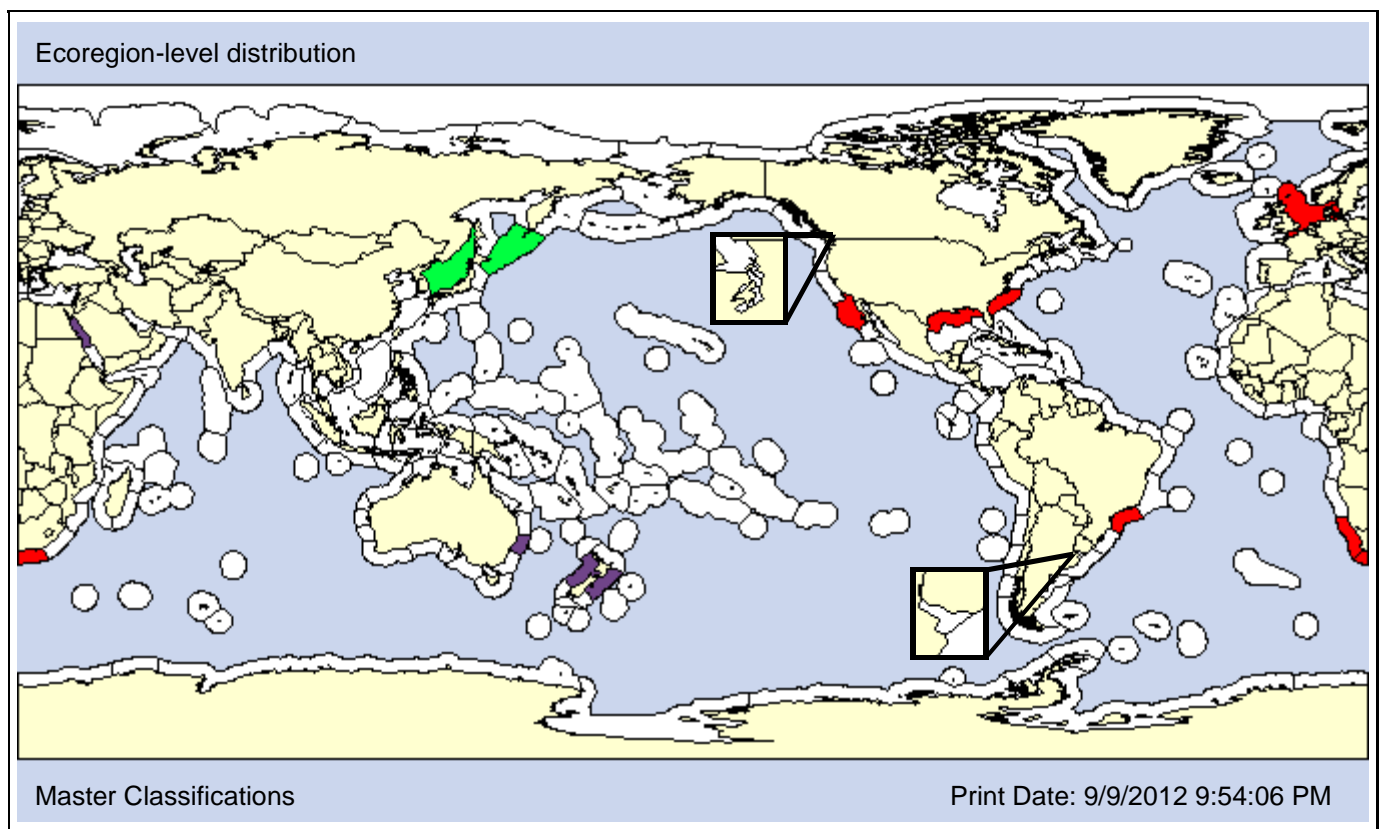
**Also Known As (Name - Type):**

Dexiospira brasiliensis	Synonym
Dexiospira oshoroensis	Synonym
Janua (Dexiospira) brasiliensis	Synonym
Janua brasiliensis	Synonym

**Common Names:**

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**Type Locality:** Florianópolis, Brazil



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown

1974

**Loc 1st record:** Unknown

Marina Del Rey, California

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: Though described from Brazil, Knight-Jones and Knight-Jones (1975) consider the Western Pacific or Indo-West Pacific as the possible native regions for *Neodexiospira brasiliensis*, and the PICES Working Group 21 (2011) listed it as native in the Sea of Japan. We consider introduced in the Atlantic and NEP and native in the NWP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X				TP	RI-PH	X			X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								P					O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H X		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
X										

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		X		LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	
						X							

**Taxon:** Polychaete

**Taxonomic Author:** Harris, 1985

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Terebellida

**Suborder:** Terebellida

**Infraorder:**

**Superfamily:**

**Family:** Terebellidae

**Subfamily:**

**Also Known As (Name - Type):**

Nicolea sp. A (SCAMIT)

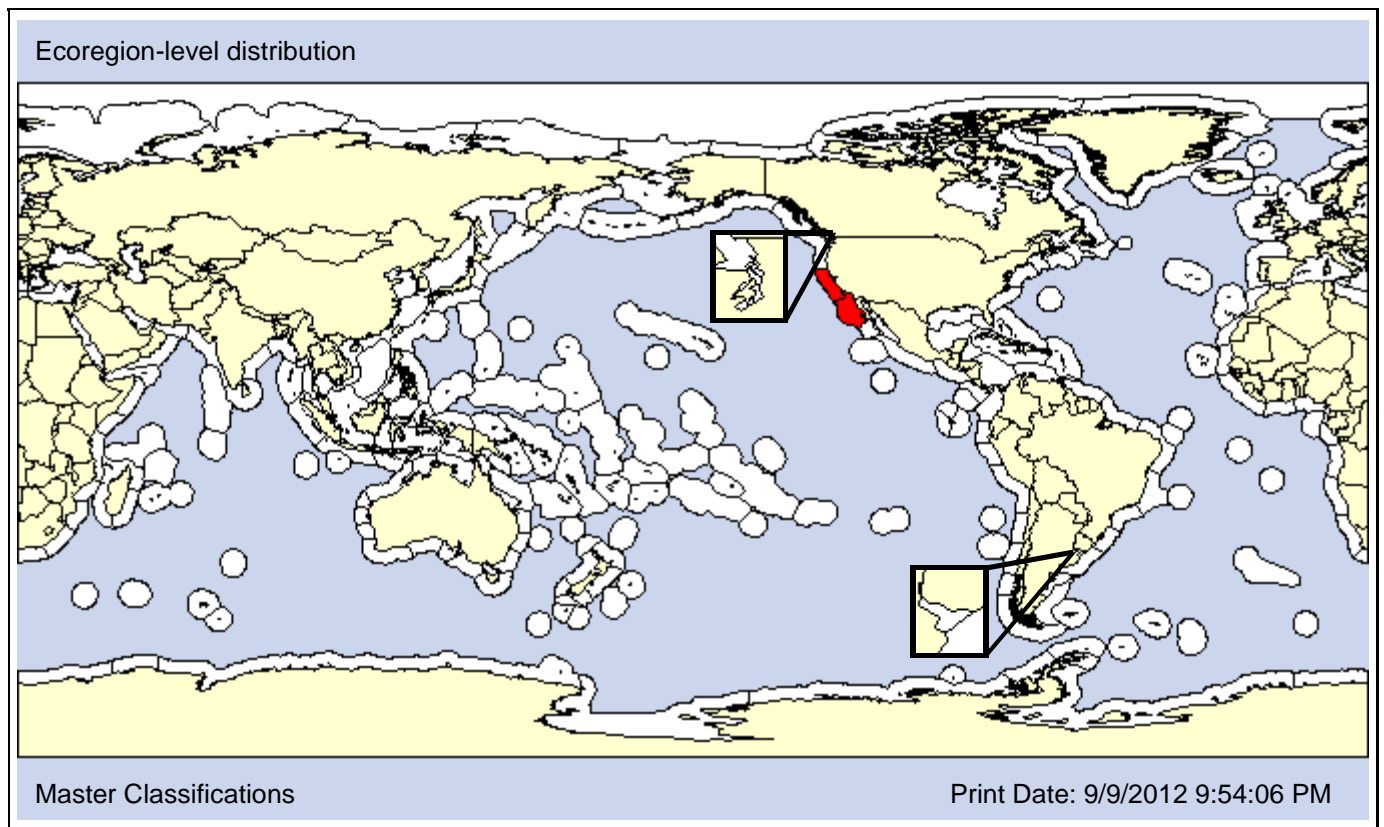
Convention

Nicolea sp. A Harris

Convention

**Common Names:**

**Type Locality:** California, USA



**Date 1st record:**

2000

**Loc 1st record:**

San Diego Bay, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: An unidentified terebellid polychaete was discovered in Southern California estuaries in 2000 and more recently in the San Francisco Estuary. It is considered introduced in California (CANOD, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 4 - 14m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 69.03 - 69.03%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: - 35.5psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** Örsted, 1844

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Terebellida

**Suborder:** Terebellida

**Infraorder:**

**Superfamily:**

**Family:** Terebellidae

**Subfamily:**

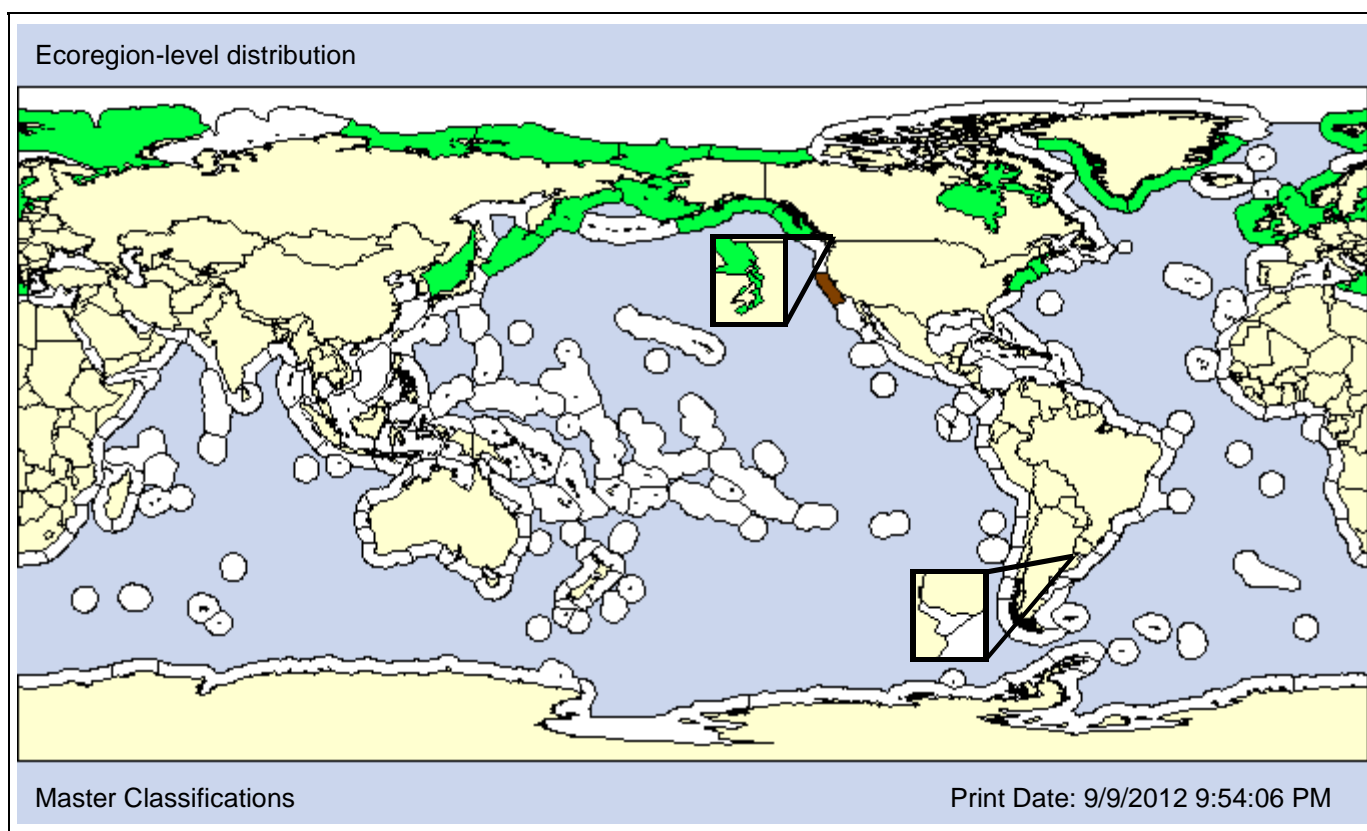
**Also Known As (Name - Type):**

Nicolea simplex	Synonym
Terebella longicornis	Synonym
Terebella textrix	Synonym
Terebella zostericola	Synonym

**Common Names:**

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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

Unknown

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Unknown

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: Blake and Ruff (2007) consider *Nicolea zostericola* as “possibly introduced from the east coast” (cryptogenic) in the San Francisco Estuary, while CANOD (2009) classifies it as introduced. However, given its trans-Arctic distribution and occurrence in British Columbia and Puget Sound, it is possible that it is native to San Francisco.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O	O				

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X				TP	RI-PH	X		X	X	X
		X											

**DEPTH [Obs: 0 - 510m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep	O		
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.73 - 80.25%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O	O				

**CONSOLIDATED SUBSTRATE X**

R	HP	Biogenic P						Artificial Substrate O						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O					O					O	

**SALINITY [Obs: 27 - 34psu]**

Fresh	Brackish O				Marine P		Hyper	
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	
						O		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF X	
								X	DF-SUR X	DF-SUB

**REPRODUCTION**

Sexual X						Asexual				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic X			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X		X		X	X	X
						X							

**Taxon:** Polychaete

**Taxonomic Author:** Paavo, Bailey-Brock, & Akesson, 2000

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Eunicida

**Suborder:** Eunicida

**Infraorder:**

**Superfamily:**

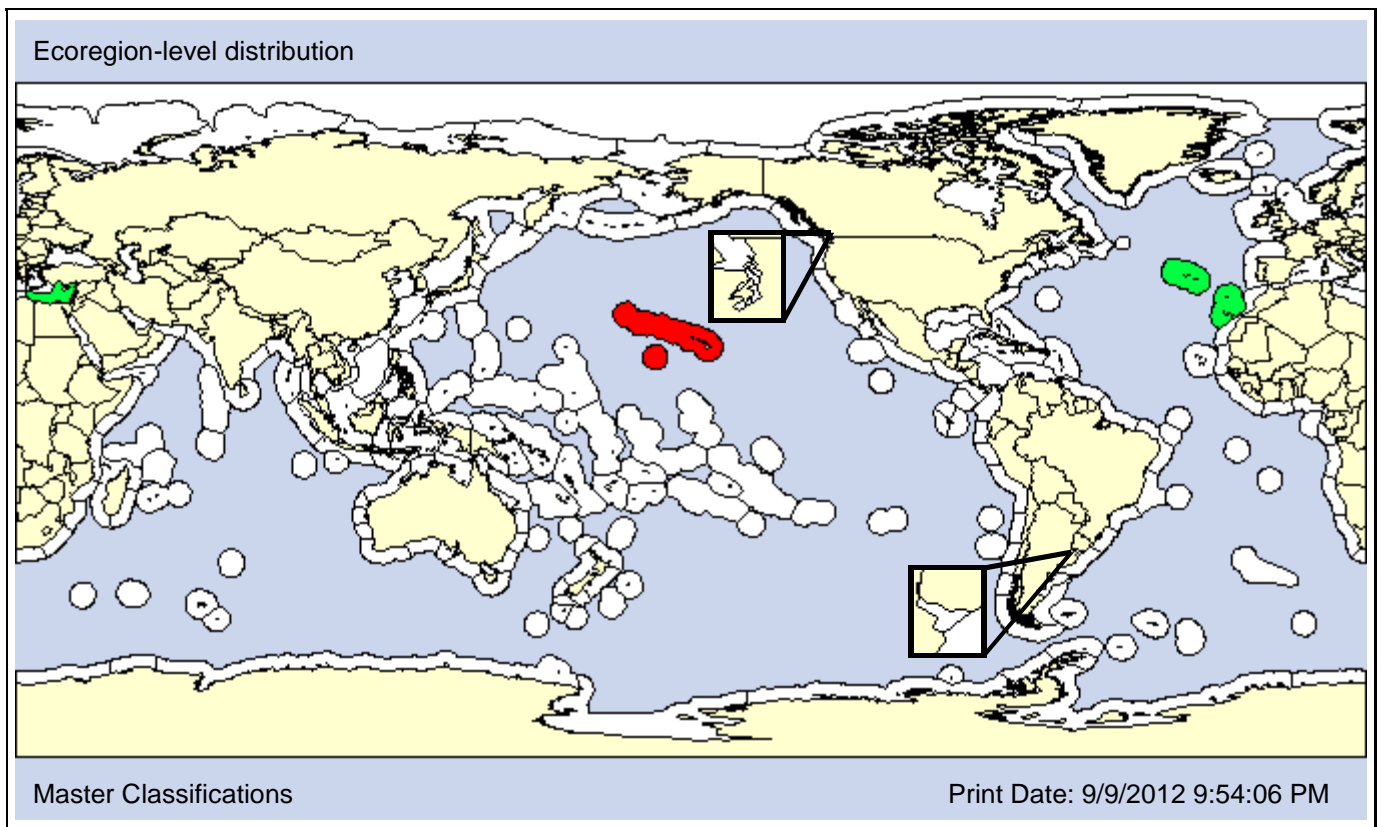
**Family:** Dorvilleidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1973

**Loc 1st record:** Oahu, Hawaii

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				
<b>X</b>		<b>X</b>				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
		X											

**DEPTH [Obs: 20 - 100m] [Pref: - 70m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H X		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	X									

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		
					X	X							



**Taxon:** Polychaete

**Taxonomic Author:** Paxton & Åkesson, 2007

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Eunicida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Dorvilleidae

**Subfamily:**

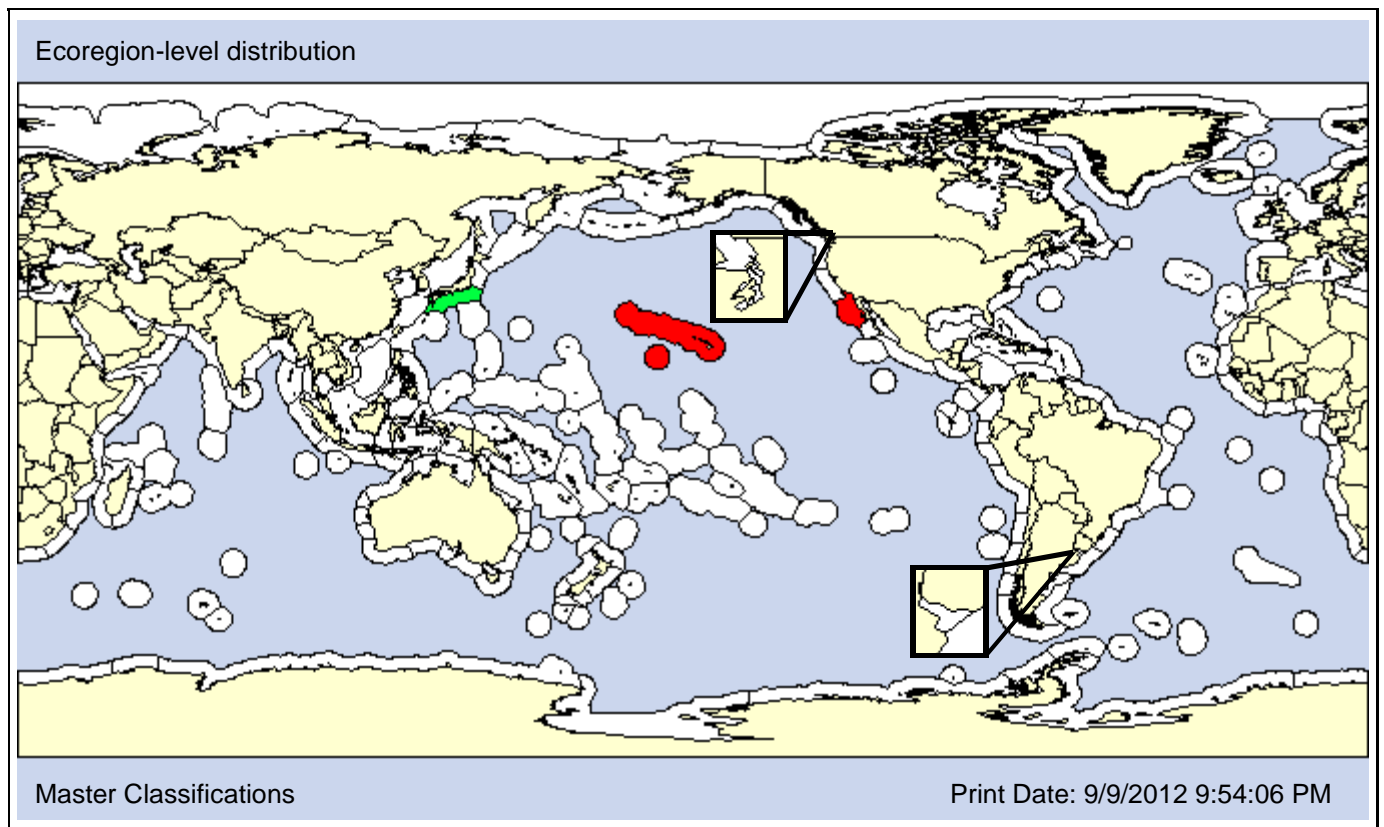
**Also Known As (Name - Type):**

Ophryotrocha labronica of authors, in part	Partial synonym

**Common Names:**

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**Type Locality:** Cultured from specimens collected in Sagami



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;"> </span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: cyan;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid gray; padding: 2px;"> </span> Unidentified
<b>NWP</b>			<b>Hawaii</b>		<b>NEP</b>		

**Date 1st record:** Native Unknown ca. 1975  
**Loc 1st record:** Native Unknown Los Angeles Harbor, CA  
**Established:** Yes Unknown Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments: Based on crossing experiments, Paxton and Åkesson (2010) erected *Ophryotrocha labronica pacifica* for the species in Japan, Hawaii, and California and *Ophryotrocha labronica labronica* for the species in the Mediterranean, eastern North Atlantic, and Australia. We assume that Japan is the native region for *O. labronica pacifica*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE** **X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b> <b>O</b>						<b>Marine</b> <b>O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Polychaete

**Taxonomic Author:** Grube, 1878

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Nereidiformia

**Infraorder:**

**Superfamily:**

**Family:** Nereididae

**Subfamily:**

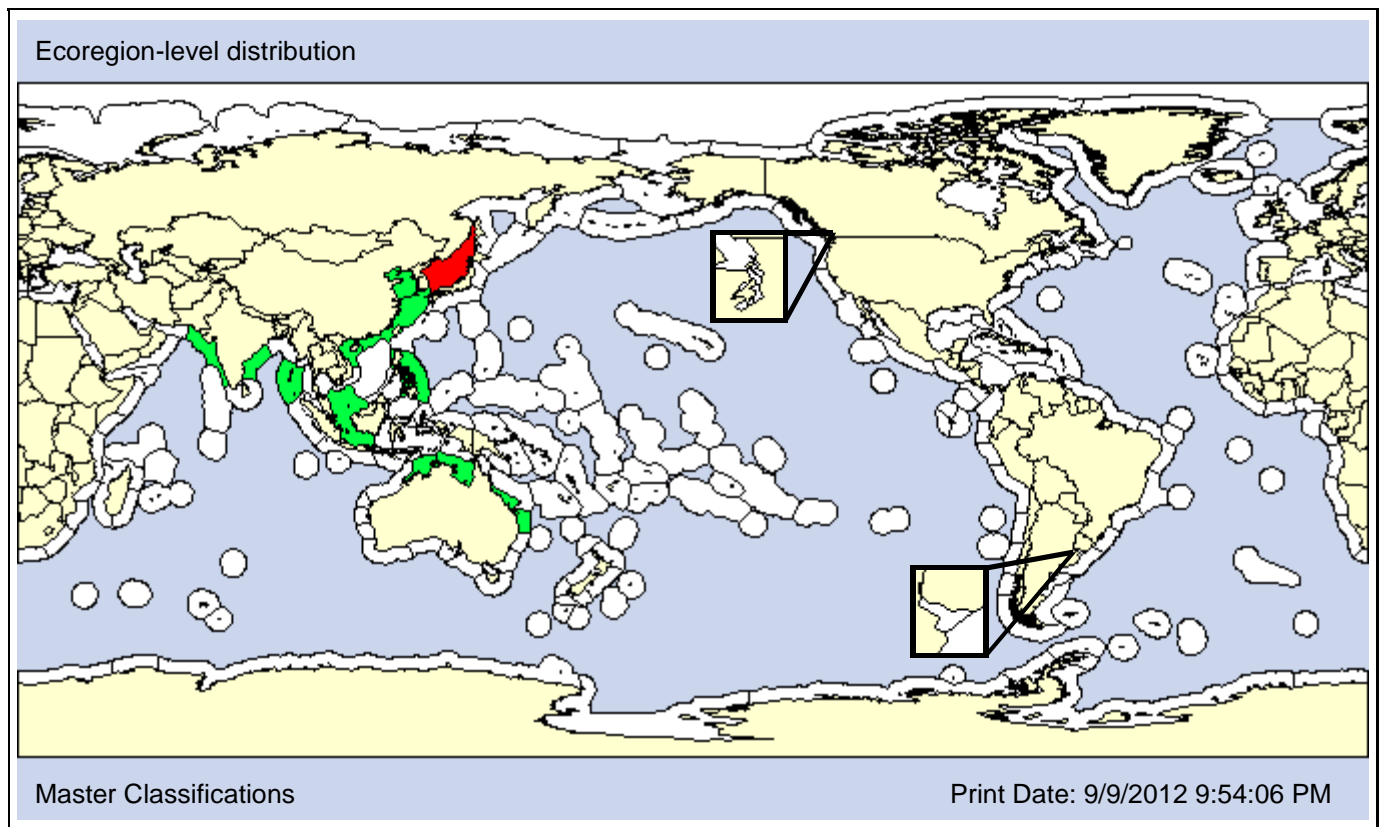
**Also Known As (Name - Type):**

Nereis (Neanthes) linea	Synonym
Nereis (Neanthes) orientalis	Synonym
Nereis (Perinereis) aiubhitensis	Synonym
Nereis aiubhitensis	Synonym

**Common Names:**

Asian marine clamworm
blue ragworm

**Type Locality:** Philippines



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown  
**Loc 1st record:** Sea of Japan  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
						AO	PO								
												X			

Comments: *Perinereis aiubhitensis* (= *Nereis aiubhitensis*) is native to the Yellow Sea through to the Western Indian Ocean. It is used as bait and is cultured in Asia. Mito and Uesugi (2004) list it as introduced in Japan. It has also been exported from Korea to Portugal, Spain, and France though it is not known if it has established wild populations.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>	<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>		
	<b>X</b>												

**DEPTH [Obs: 0 - 1.6m] [Pref: 0 - 0.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>		<b>O</b>				<b>O</b>

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>						<b>P</b>					

**SALINITY [Obs: 15 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
			<b>X</b>	<b>X</b>	<b>X</b>				DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (San Martin, 1990)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

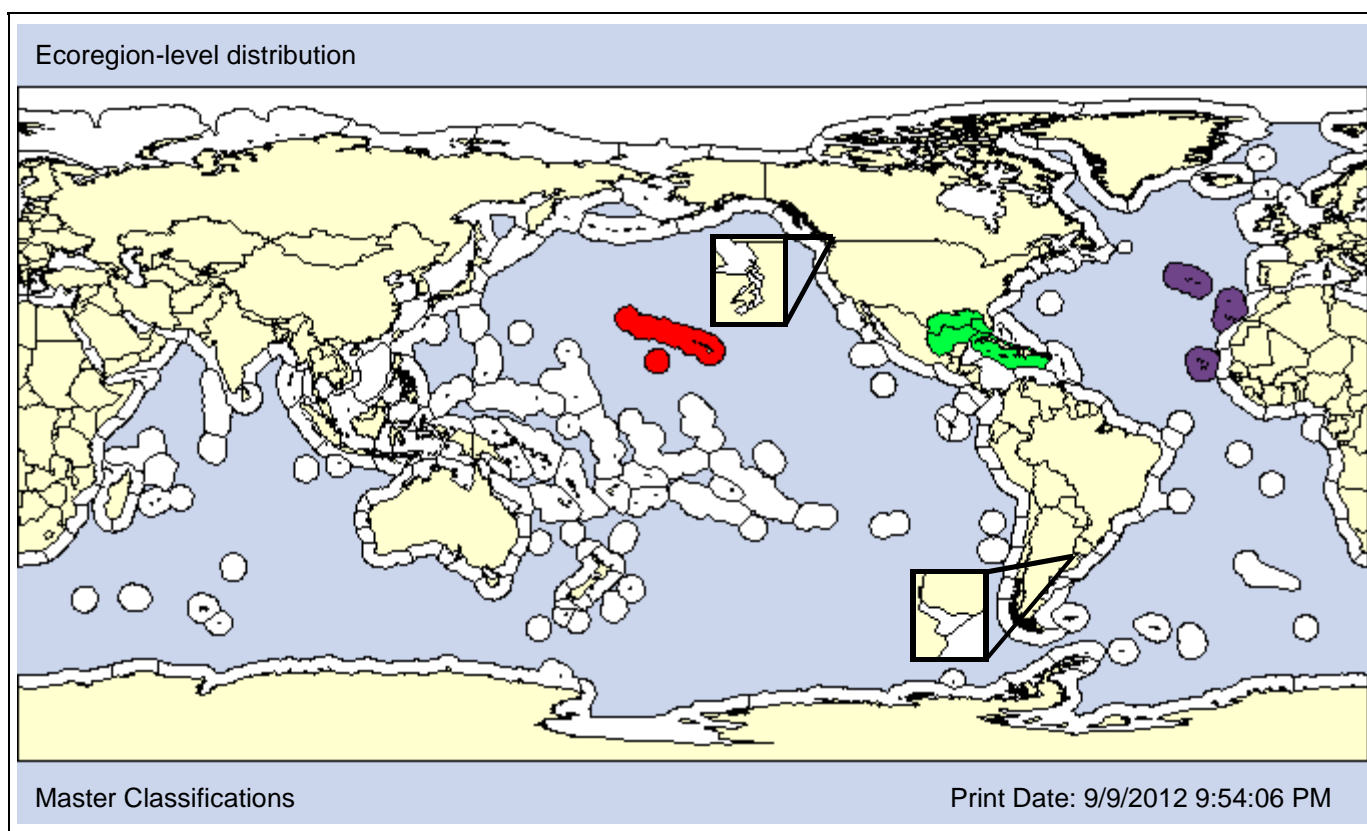
**Subfamily:** Eusyllinae

**Also Known As (Name - Type):**

**Common Names:**

Pionosyllis spinisetosa	Synonym	
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**Type Locality:** Gulf of Mexico, off Florida, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1999  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: Pionosyllis spinisetosa was transferred to Perkinsyllis spinisetosa by San Martin et al. (2009). It is native to the Gulf of Mexico and has been introduced into Hawaii (Nelson et al., 2007). Its status in the Northeast Atlantic is unknown.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X		X		TP	RI-PH				X	
	X	X											

**DEPTH [Obs: 0 - 37m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	P					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									O				O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC			X		X	X	
						X							

**Taxon:** Polychaete

**Taxonomic Author:** Claparède, 1870

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

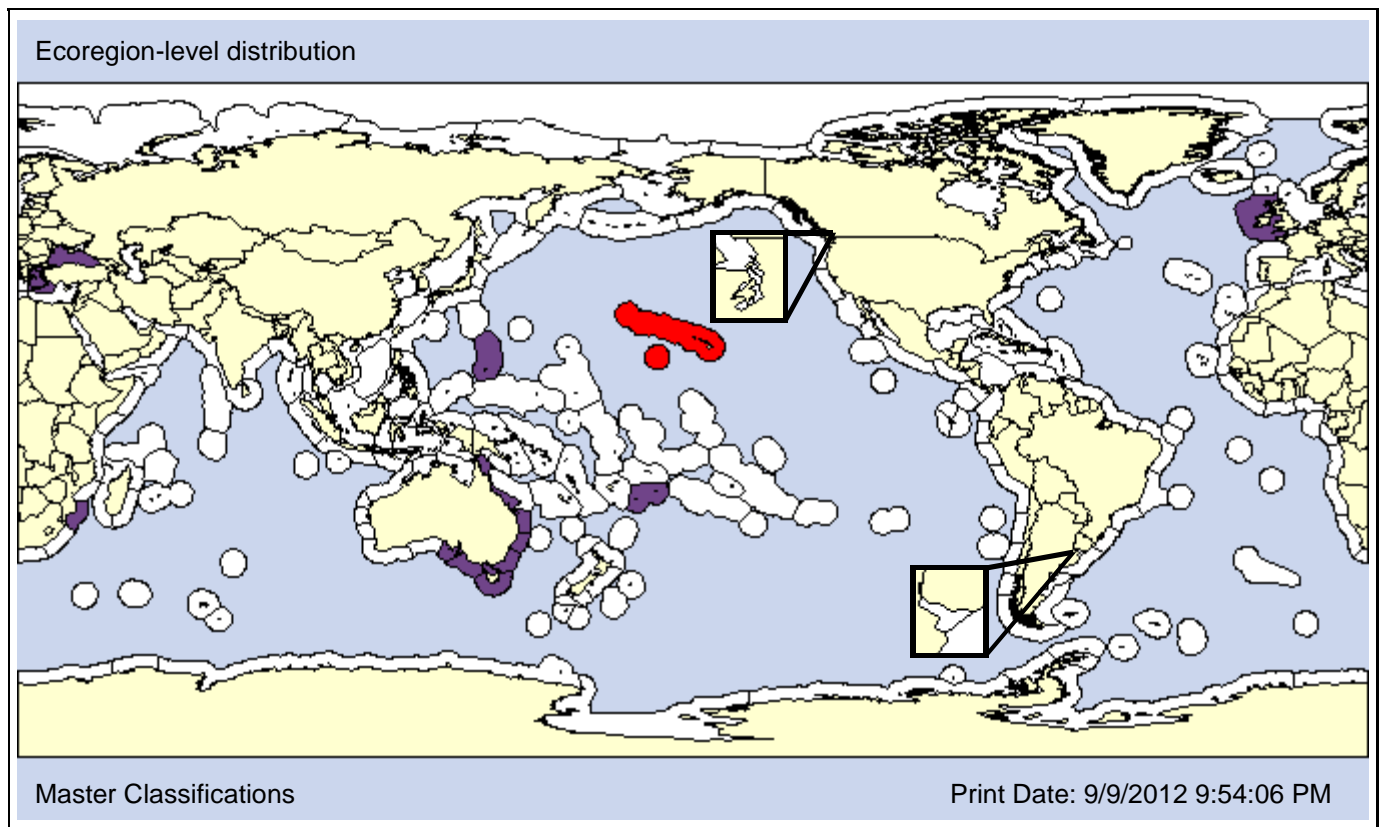
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Pileolaria (Pileolaria) militaris	Convention	
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**Type Locality:** France



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1960s  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: The native region of *Pileolaria militaris* is unknown. Carlton and Eldredge (2009) suggest it might be the North Atlantic but Olenin and Didžiulis (2009) classify it as cryptogenic in Europe. Therefore, we list it as unclassified except for Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 30m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>			<b>P</b>							<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Polychaeta

**Taxonomic Author:** Hartmann-Schröder, 1956

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

**Subfamily:** Exogoninae

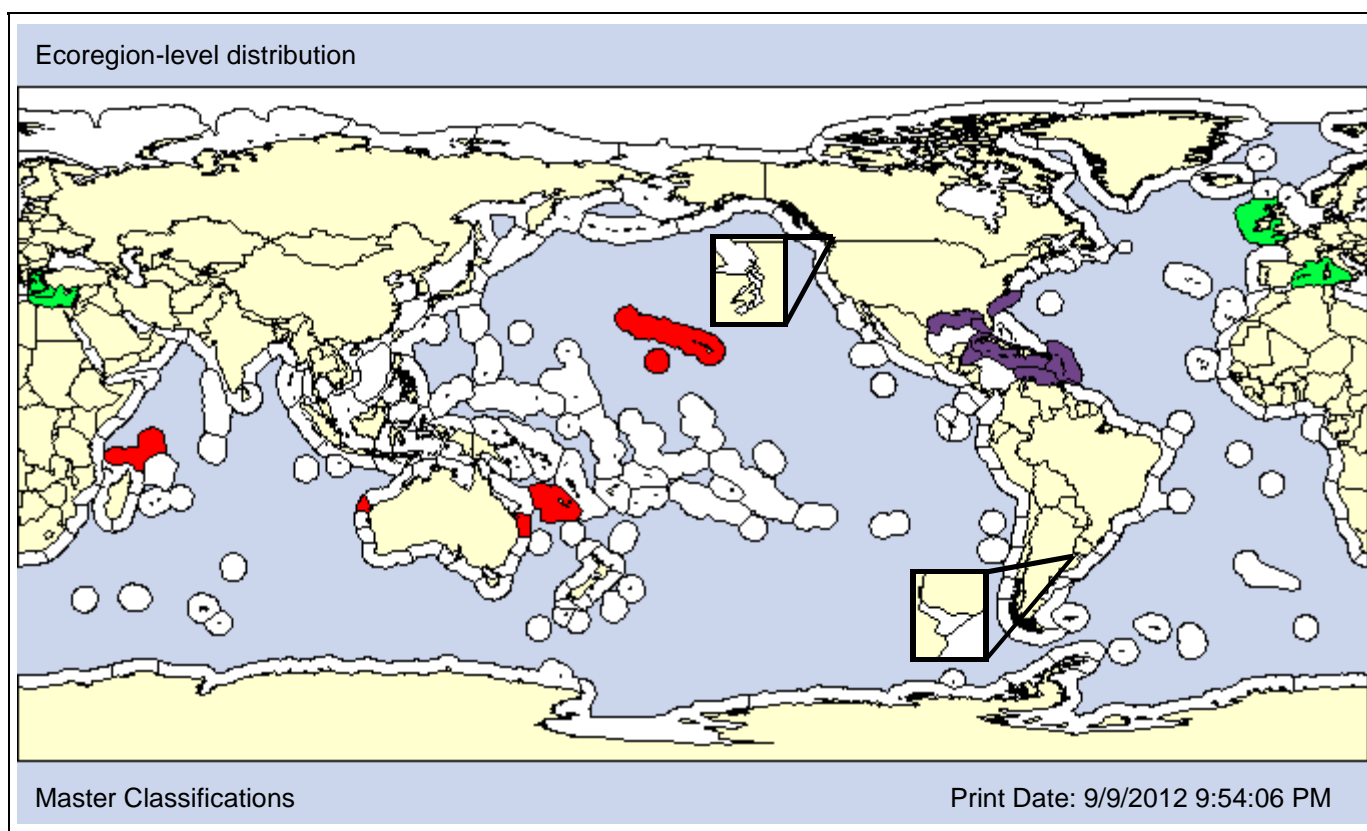
**Also Known As (Name - Type):**

Eurysyllis brevipes  
Plakosyllis quadrioculata

Synonym  
Synonym

**Common Names:**

**Type Locality:** Gulf of Naples, Italy



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 2001  
**Loc 1st record:** Mamala Bay, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									<b>X</b>

Comments: Nelson et al. (2007) classified *Plakosyllis brevipes* introduced in Hawaii. We consider it native to the North Atlantic and Mediterranean, unclassified in the NEA and Caribbean, and introduced in the Pacific and Indian Ocean.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X				TP	RI-PH					
		X											

**DEPTH [Obs: 1 - 168m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 2.16%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	P					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 34psu]**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		

**Taxon:** Polychaete

**Taxonomic Author:** Bosc, 1802

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

**Family:** Spionidae

**Subfamily:**

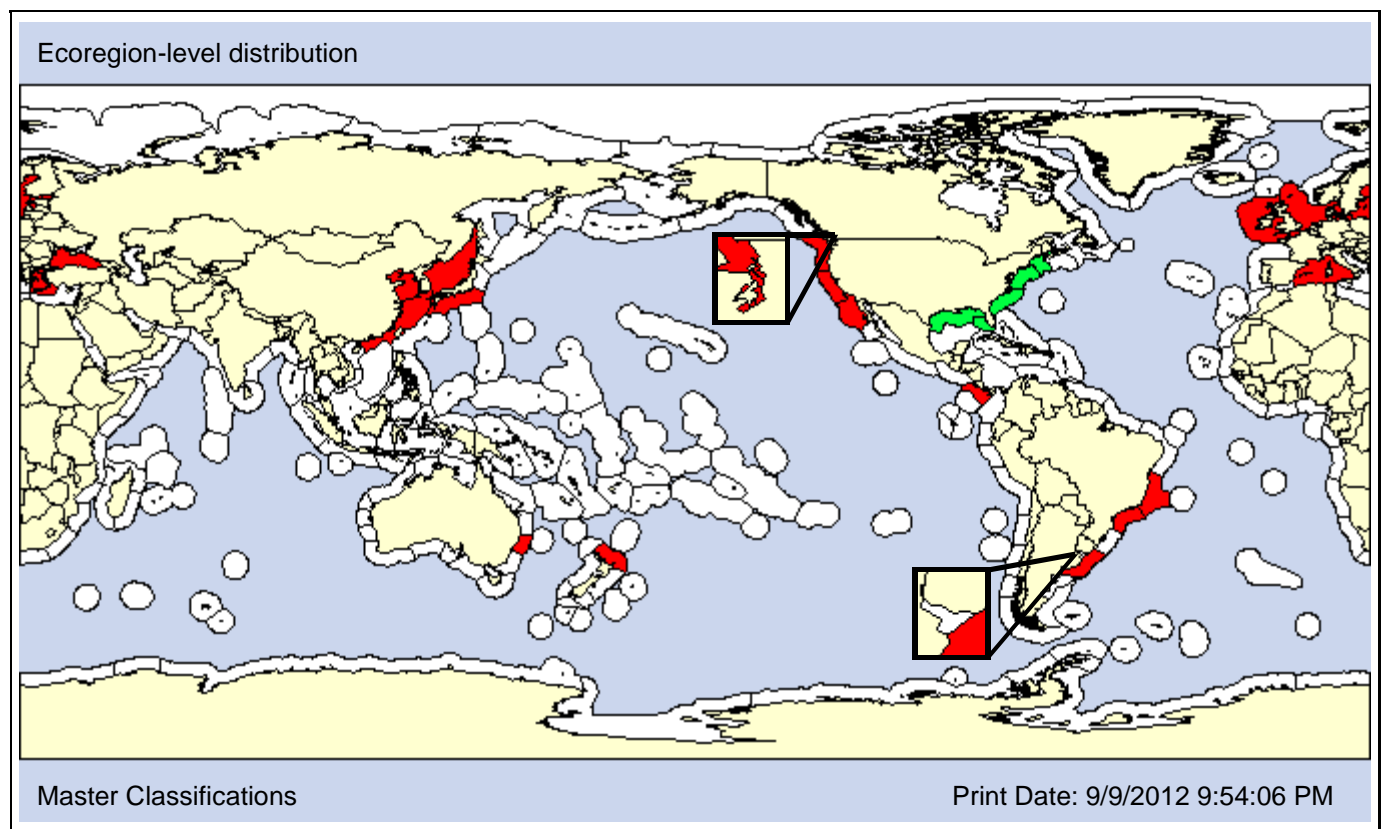
**Also Known As (Name - Type):**

Polydora amarincola	Synonym
Polydora ciliatum	Synonym
Polydora ligni	Synonym
Polydora littorea	Synonym

**Common Names:**

mud worm
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**Type Locality:** Charleston Harbor, South Carolina, USA



Master Classifications: NWP, Hawaii, NEP

Print Date: 9/9/2012 9:54:06 PM

Legend: Native (Green), Nonindigenous (Red), NIS Not Established (Cross-hatched), Cryptogenic (Yellow), Transient (Cyan), Unclassified (Purple), Conflicting Classification (Brown), Unidentified (White)

**Date 1st record:** 1994

1933

**Loc 1st record:** Peter the Great Bay, Russia

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
X		X				AO X	PO								

Comments: Based on the assumption that *Polydora cornuta* is native to the NWA, it is tentatively classified as NIS in the NEP, NWP, Australia, New Zealand, Mediterranean, and South America. However, further analysis is needed because of the presence of cryptic species (Rice et al., 2008).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 37m] [Pref: 0 - 16m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.56 - 98%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>		<b>O</b>								<b>O</b>	

**SALINITY [Obs: 5 - 34.9psu] [Pref: 28 - 32psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** Annenkova, 1934

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

**Family:** Spionidae

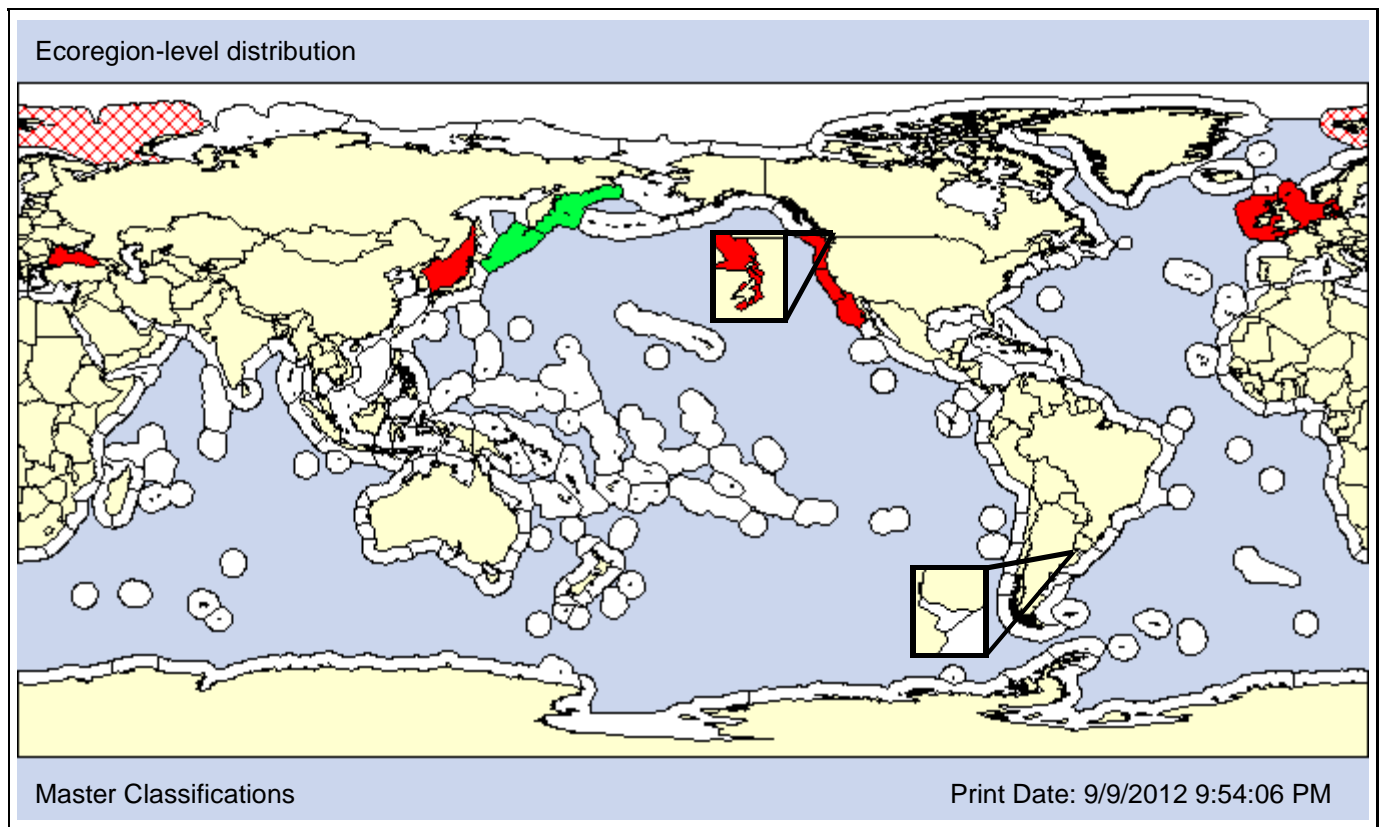
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Polydora ciliata limicola	Synonym	
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**Type Locality:** Commander Islands, Russia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** before 1981

1950s

**Loc 1st record:** Peter the Great Bay, Russia

Los Angeles Harbor, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: *Polydora limicola* was described from the western Bering Sea, and is presumably native to this cold temperate region. However, it is a fairly recent invader into Peter the Great Bay and has been found on the hulls of ships in the Barents Sea. It was first found in California in the 1950s and invaded the Black Sea in the 1960s.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
	X	X											

**DEPTH [Obs: 0 - 90m] [Pref: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.33 - 98%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>	<b>P</b>							<b>P</b>		<b>P</b>	<b>P</b>

**SALINITY [Obs: 6 - 32psu] [Pref: 6 - 17.5psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline P		Polyhaline O		Beta Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>
			<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** Woodwick, 1953

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

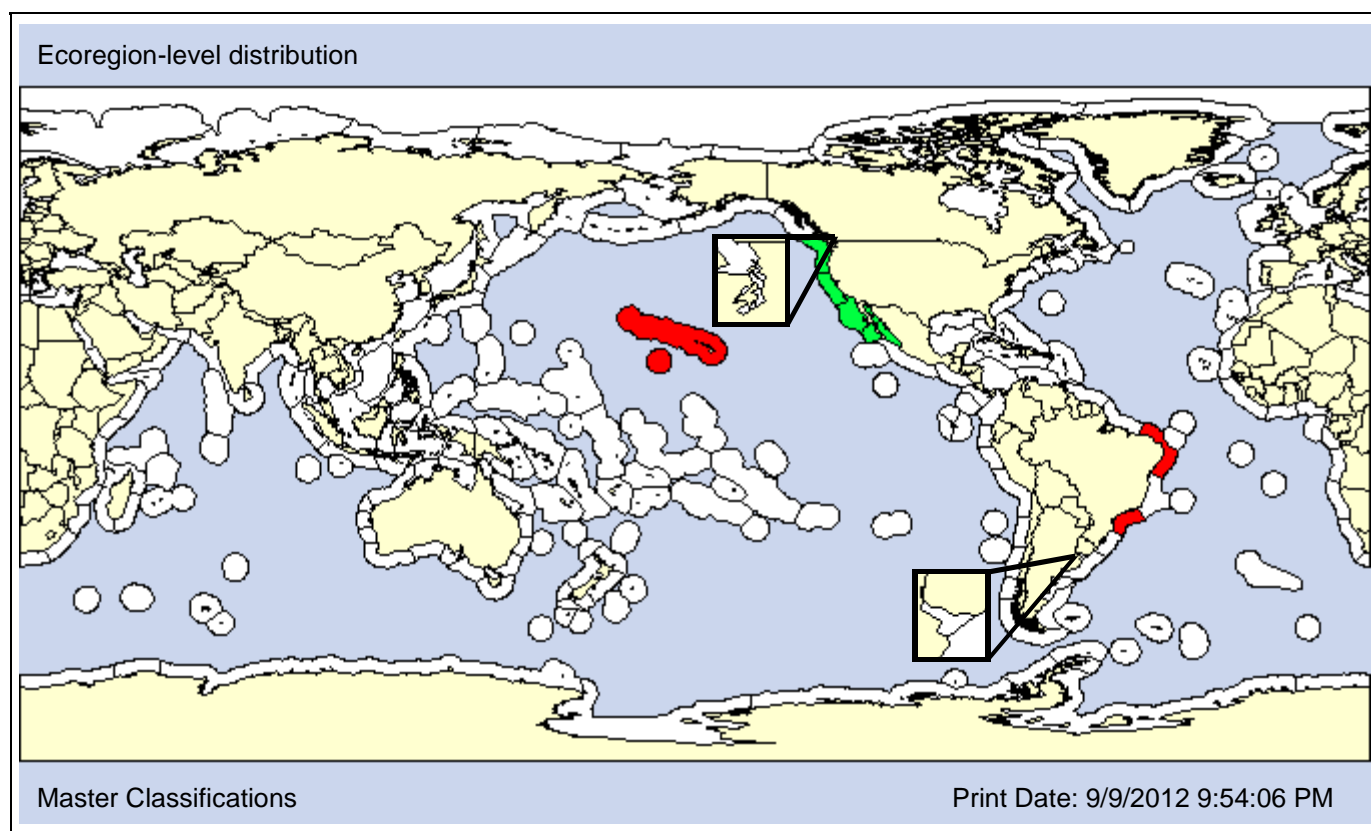
**Family:** Spionidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Southern California, USA



	Native		Nonindigenous		NIS Not Established		Cryptogenic		Transient		Unclassified		Conflicting Classification		Unidentified
				<b>NWP</b>				<b>Hawaii</b>				<b>NEP</b>			

<b>Date 1st record:</b>	1988	Native
<b>Loc 1st record:</b>	Oahu, Hawaii	Native
<b>Established:</b>	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 15.5m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.56 - 98%] **X****

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 28 - 35.04psu] [Pref: - 34psu]**

<b>Fresh</b>	<b>Brackish</b> <b>P</b>					<b>Marine</b> <b>P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b> <b>X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b> <b>X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B <b>X</b>	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b> <b>X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		



**Taxon:** Polychaete

**Taxonomic Author:** Hartman in Loosanoff & Engle, 1943

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

**Family:** Spionidae

**Subfamily:**

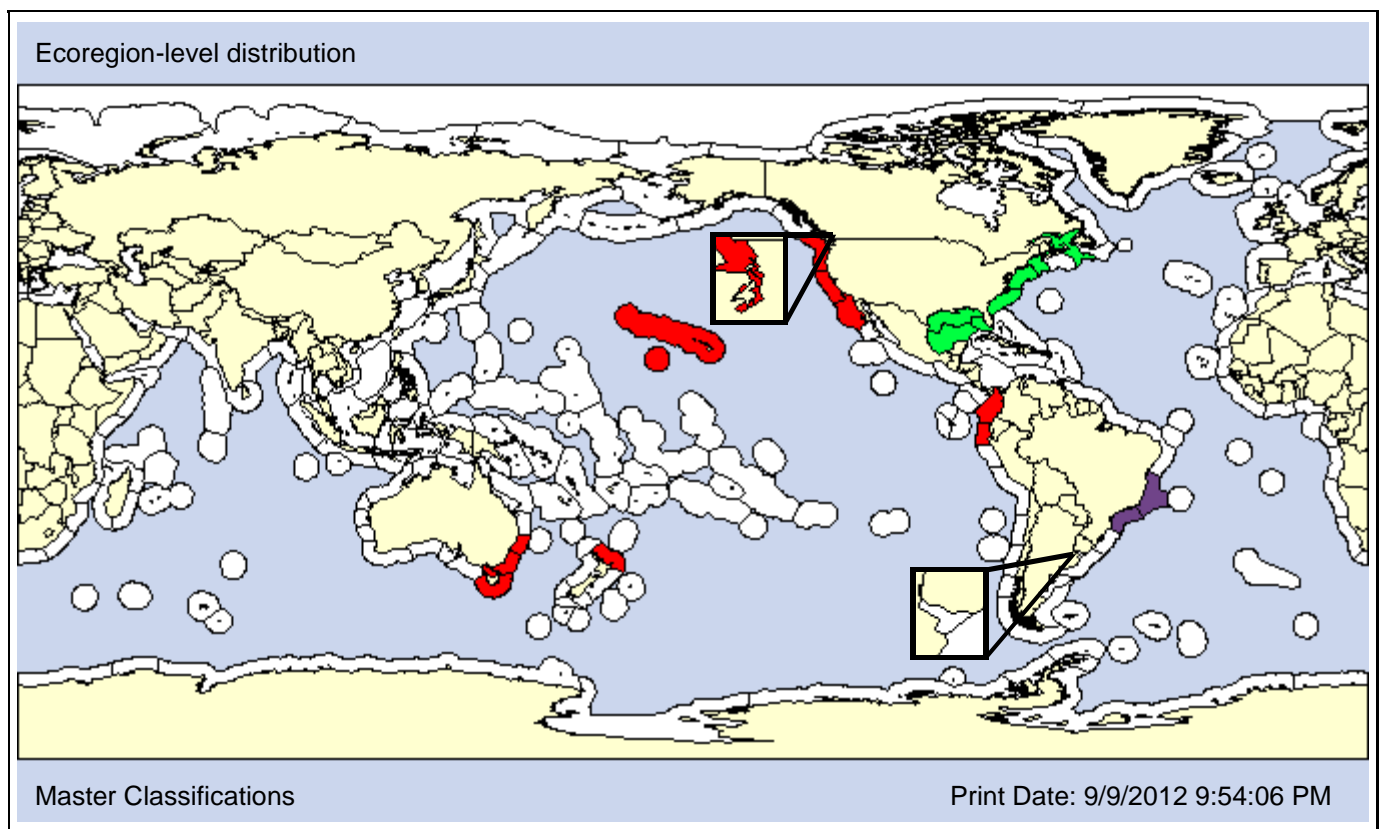
**Also Known As (Name - Type):**

Polydora ciliata of authors in part; not (Johnston, 1838)	Misidentified
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**Common Names:**

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**Type Locality:** Long Island Sound, Connecticut, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1940s

Unknown

**Loc 1st record:**

Oahu, Hawaii

Unknown

**Established:**

Yes

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA X	IR			A	P				
					AO X	PO									

Comments: We consider *Polydora websteri* native to the NEA, but note that some of the East Coast records may be a different species, *P. neocaeca* (Williams and Radashevsky 1999).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		<b>X</b>	<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 40m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 22.9 - 92.49%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>P</b>											

**SALINITY [Obs: 4 - 35psu] [Pref: 30 - psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
		<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>			<b>X</b>		<b>X</b>

**Taxon:** Polychaete

**Taxonomic Author:** Langerhans, 1884

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

**Subfamily:** Autolytinae

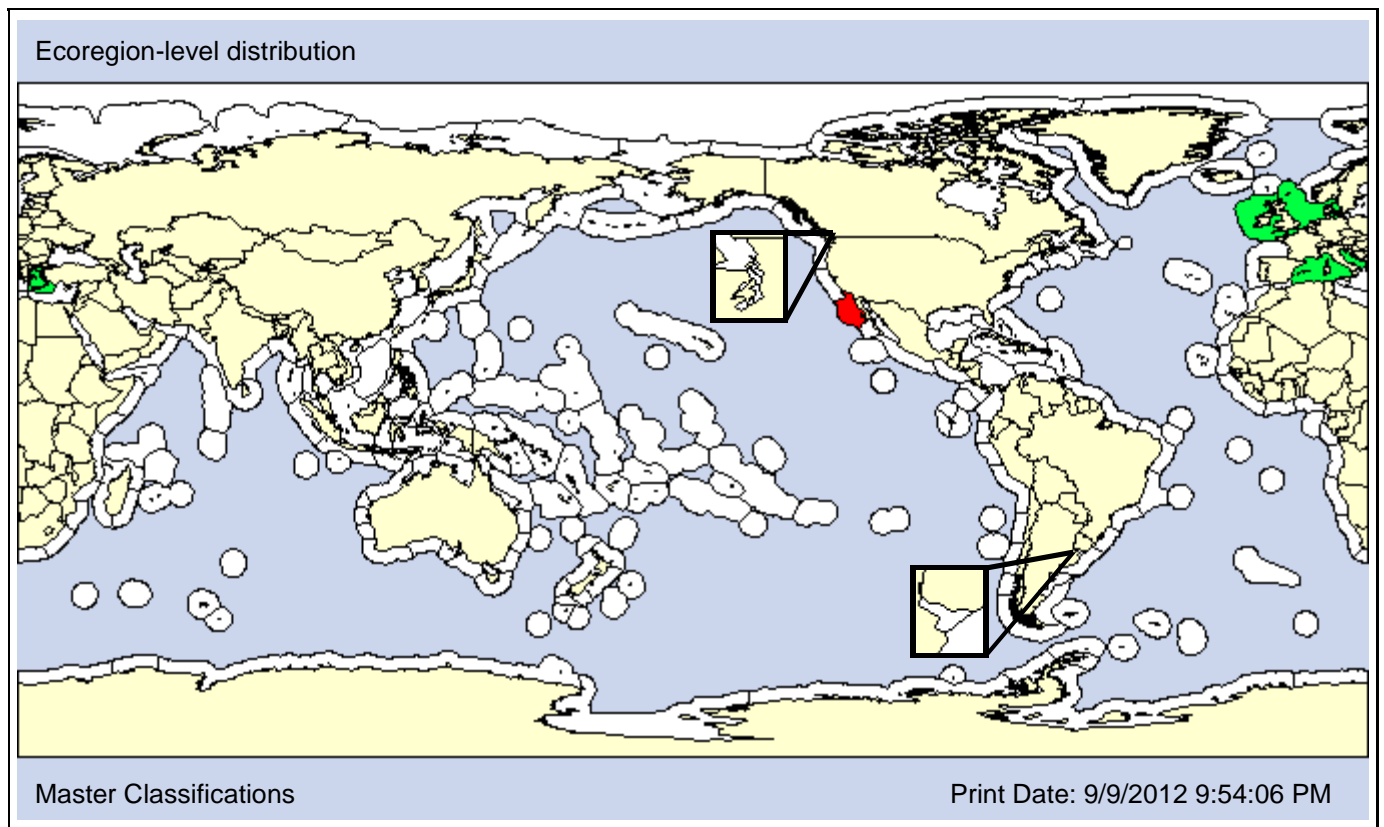
**Also Known As (Name - Type):**

Proceraea nematodes  
Procerastea perieri  
Procerastea perrieri

Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:** Madeira, Portugal



**Date 1st record:**

Unknown

**Loc 1st record:**

Santa Catalina Island, CA

**Established:**

Unknown

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
X		X				AO	PO								

Comments: The Atlantic and Mediterranean polychaete, *Procerastea nematodes*, was found on a floating dock in the Santa Catalina Islands, California (Blake and Ruff, 2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: 1 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												P	O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

**Taxon:** Polychaete

**Taxonomic Author:** Day, 1963

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Eunicida

**Suborder:** Eunicida

**Infraorder:**

**Superfamily:**

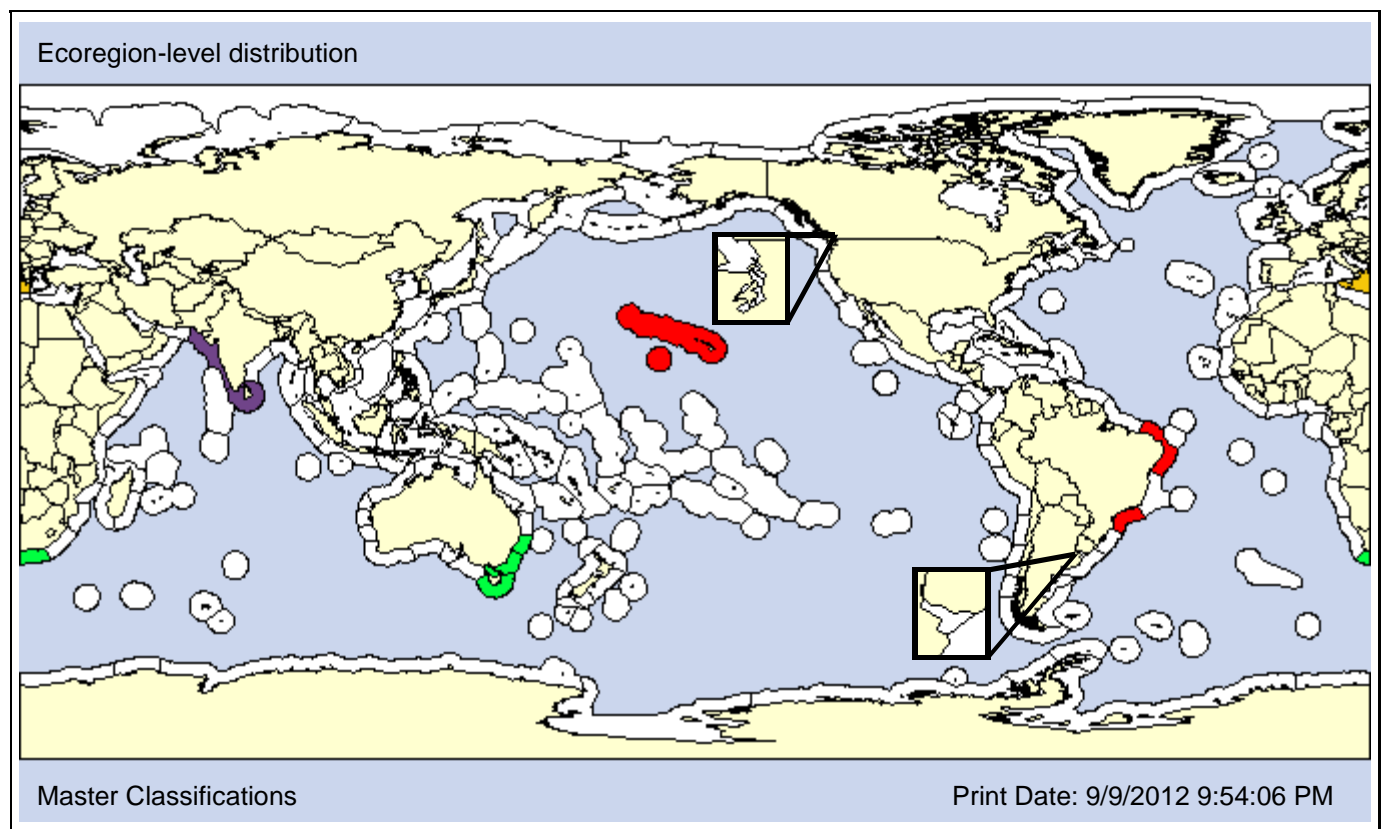
**Family:** Dorvilleidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Agulhas Bank, South Africa



<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-style:dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:lightgrey; border:1px solid black;"></span> Unidentified	<span style="display:inline-block; width:15px; height:15px; background-color:lightgrey; border:1px solid black;"></span> Conflicting Classification
		NWP		Hawaii		NEP	

**Date 1st record:** 2001  
**Loc 1st record:** Mamala Bay, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Protodorvillea biarticulata* was described from South Africa from a single specimen (Day, 1967a). We classify it as native in South Africa and southern Australia and introduced in Hawaii and the Atlantic. There are “questionable” reports of it in the Mediterranean (Zenetos et al., 2010), where we classify as cryptogenic.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>			
		<b>X</b>											

**DEPTH [Obs: 0.5 - 14.8m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>				<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 24 - 36psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** (Ehlers, 1913)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Eunicida

**Suborder:** Eunicida

**Infraorder:**

**Superfamily:**

**Family:** Dorvilleidae

**Subfamily:**

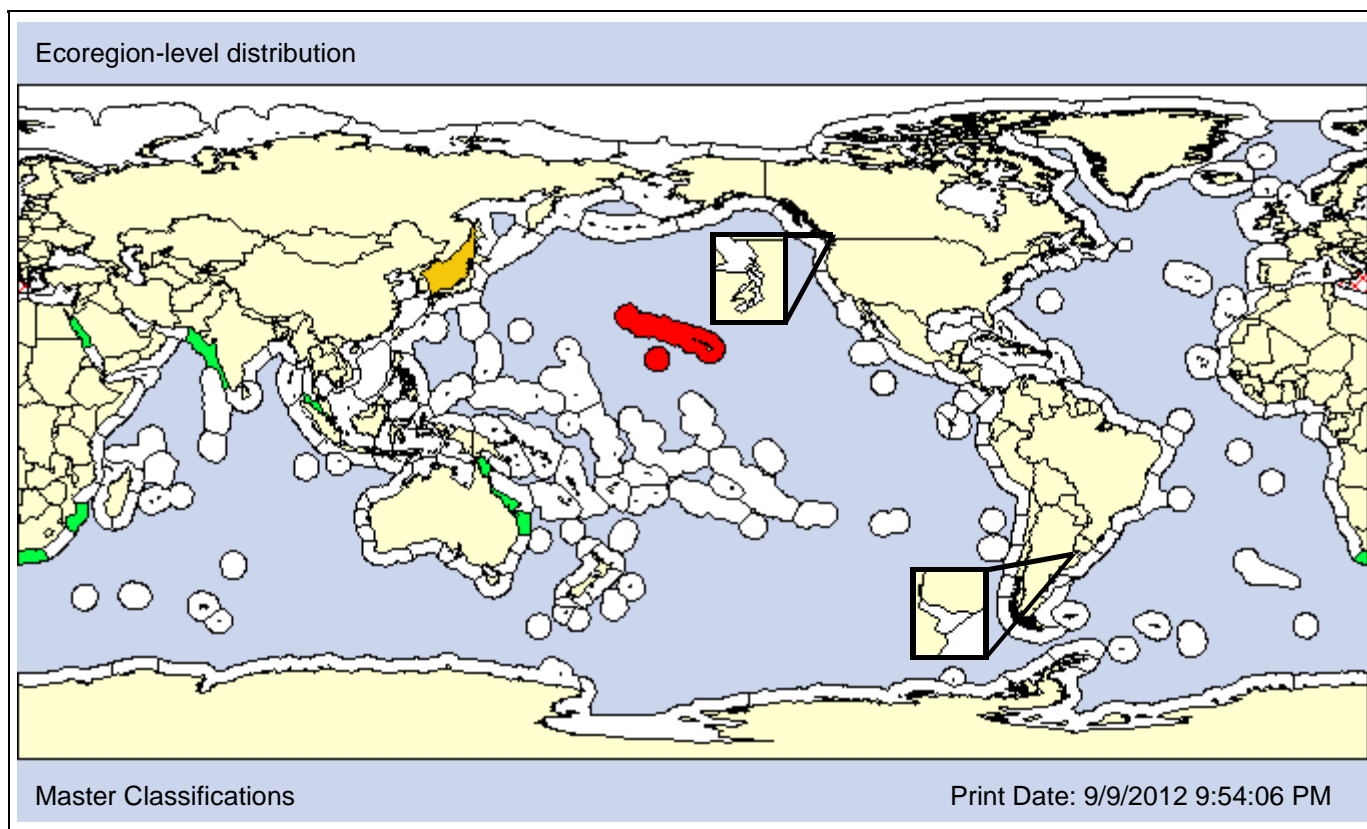
**Also Known As (Name - Type):**

Dorvillea egena	Synonym
Dorvillea gracilloides	Synonym
Dorvillea mandapamae	Synonym
Protodorvillea mandapamae	Synonym

**Common Names:**

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**Type Locality:** False Bay, South Africa



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

<b>Date 1st record:</b> <2009	<1999
<b>Loc 1st record:</b> Sea of Japan	Oahu, Hawaii
<b>Established:</b> Unknown	Yes

**VECTORS**

SH			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				X
						AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X				
	X	X											

**DEPTH [Obs: 0 - 150m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 5%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O				O	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 35.04 - 35.25psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		



**Taxon:** Polychaete

**Taxonomic Author:** (Remane, 1926)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Polychaeta incertae sedis

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Protodriloididae

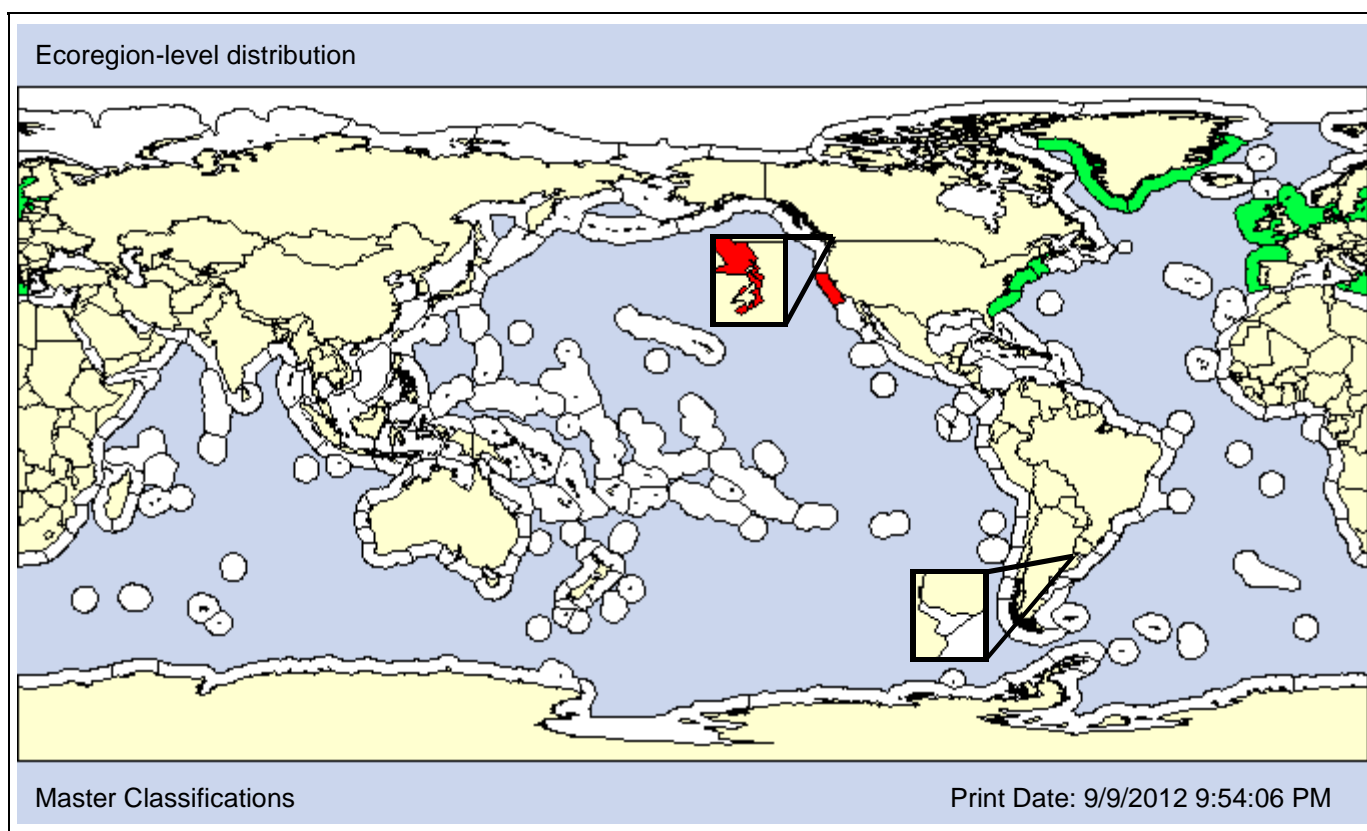
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Protodrilus chaetifer	Misspelling	
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**Type Locality:** Baltic Sea



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

<1959

**Loc 1st record:**

Puget Sound, WA

**Established:**

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: The interstitial polychaete *Protodriloides chaetifer* was described from the Baltic and is common in Europe. We tentatively classify it as introduced in California and Puget Sound based on its disjunct distribution.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	X	X											

**DEPTH [Obs: 0 - 34m] [Pref: 0 - 0.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	P		O			

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 29.8psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								X	DF-SUR X	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
				X						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		

**Taxon:** Polychaeta      **Taxonomic Author:** (Claparède, 1869)

**Kingdom:** Animalia      **Subkingdom:** Eumetazoa      **Phylum:** Annelida

**Subphylum:**      **Superclass:**      **Class:** Polychaeta

**Subclass:** Canalipalpata      **Infraclass:**      **Superorder:**

**Order:** Spionida      **Suborder:** Spionida      **Infraorder:**

**Superfamily:**      **Family:** Spionidae      **Subfamily:**

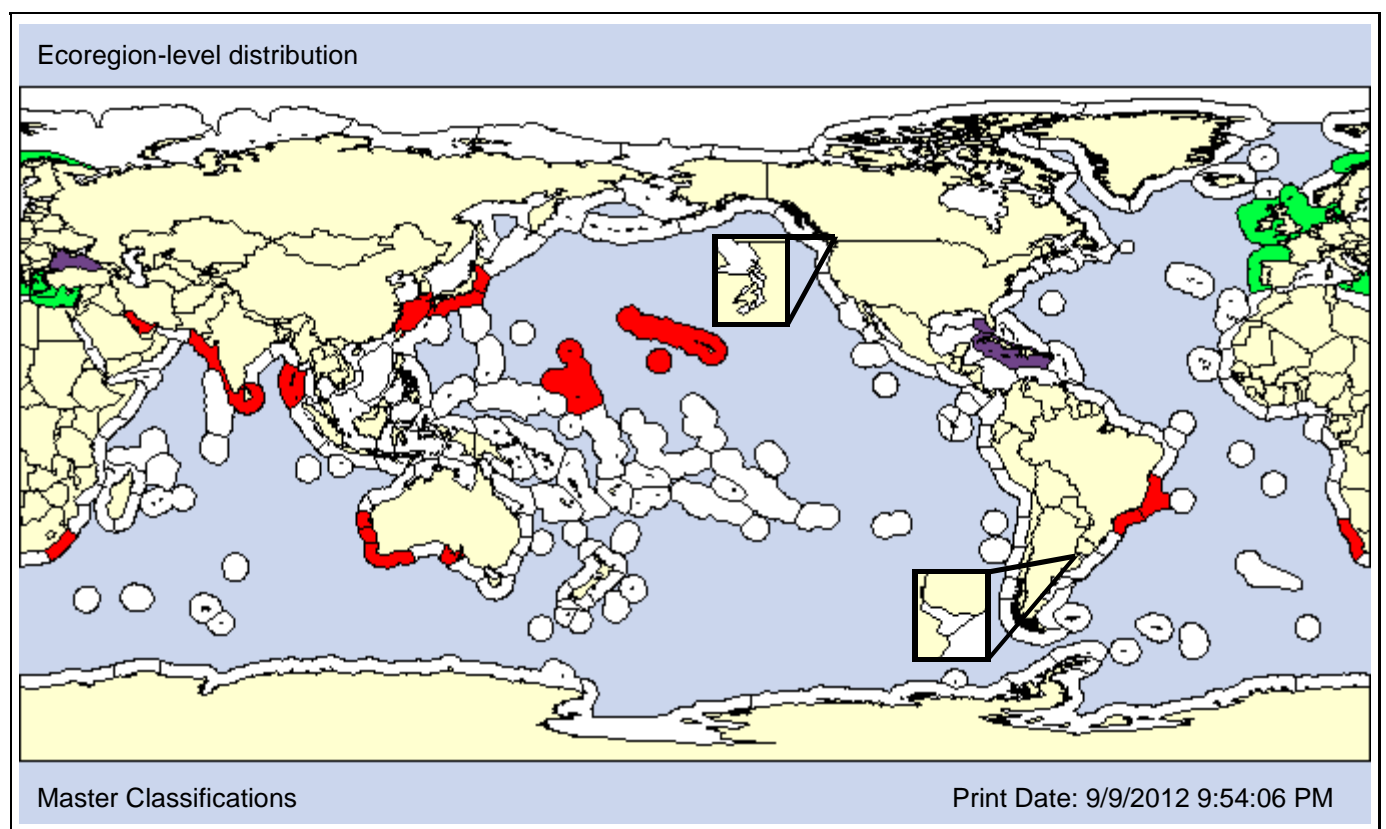
**Also Known As (Name - Type):**

Polydora (Carazzia) antennata	Synonym
Polydora (Pseudopolydora) antennata	Synonym
Polydora antennata	Synonym

**Common Names:**

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**Type Locality:** Gulf of Naples, Italy



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1937      1975

**Loc 1st record:** Japan      Kaneohe Bay, Hawaii

**Established:** Yes      Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: Silva and Barros (2011) consider *Pseudopolydora antennata* a European species introduced into Brazil. Assuming a European origin, we consider it introduced in Hawaii (as do Nelson et al., 2007), the rest of the Pacific, and South Africa. We list it as unclassified in the Caribbean.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 80m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	

**SALINITY [Obs: 34.1 - 35.2psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		<b>X</b>

# *Pseudopolydora bassarginensis*

Species ID: 3230

**Taxon:** Polychaete

**Taxonomic Author:** (Zachs, 1933)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

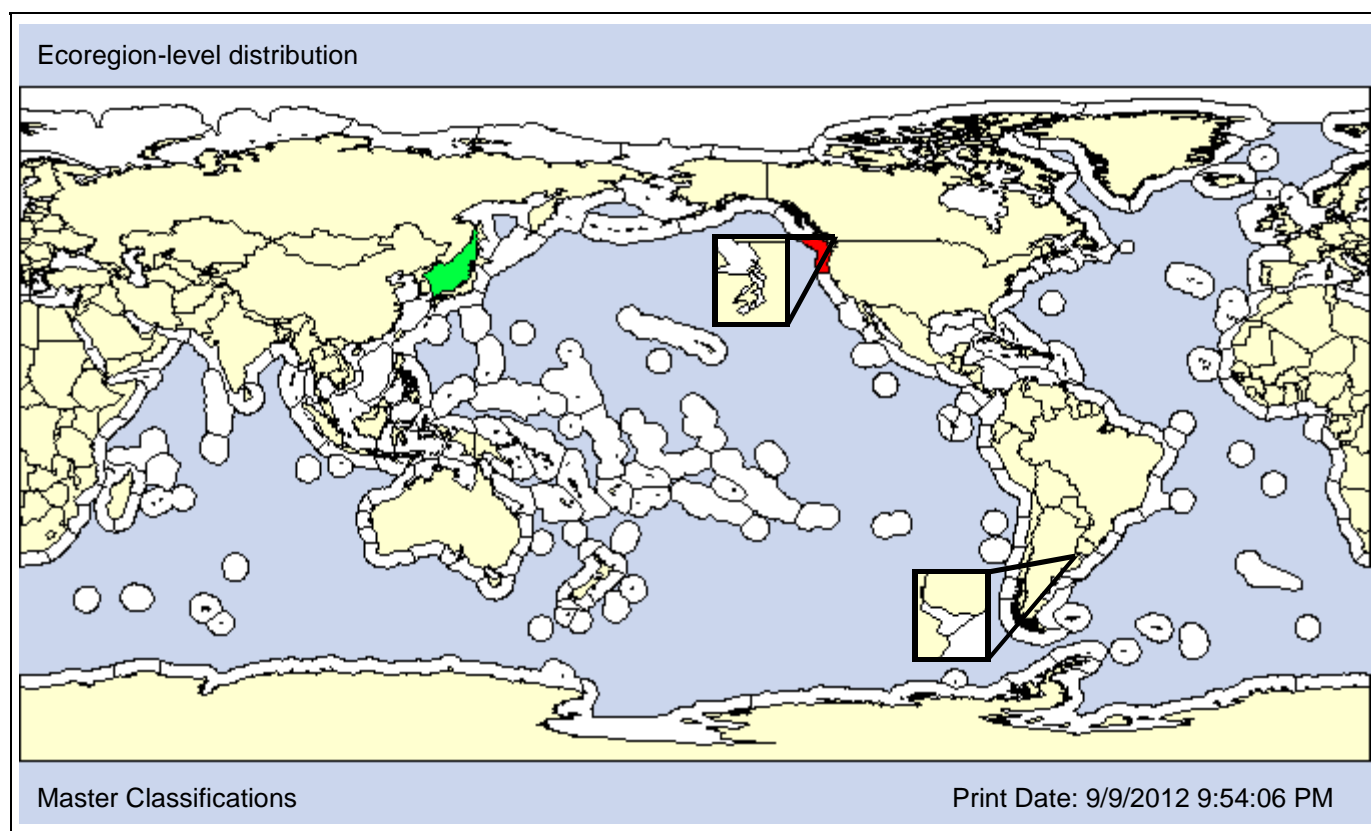
**Family:** Spionidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Peter the Great Bay, Russia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

2000

**Loc 1st record:** Native

Willapa Bay, Washington

**Established:** Yes

Unknown

### VECTORS

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	

**SALINITY [Obs: - 19psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
					<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		<b>X</b>

**Taxon:** Polychaete      **Taxonomic Author:** Moore, 1905

**Kingdom:** Animalia      **Subkingdom:** Eumetazoa      **Phylum:** Annelida

**Subphylum:**      **Superclass:**      **Class:** Polychaeta

**Subclass:** Canalipalpata      **Infraclass:**      **Superorder:**

**Order:** Sabellida      **Suborder:** Sabellida      **Infraorder:**

**Superfamily:**      **Family:** Sabellidae      **Subfamily:**

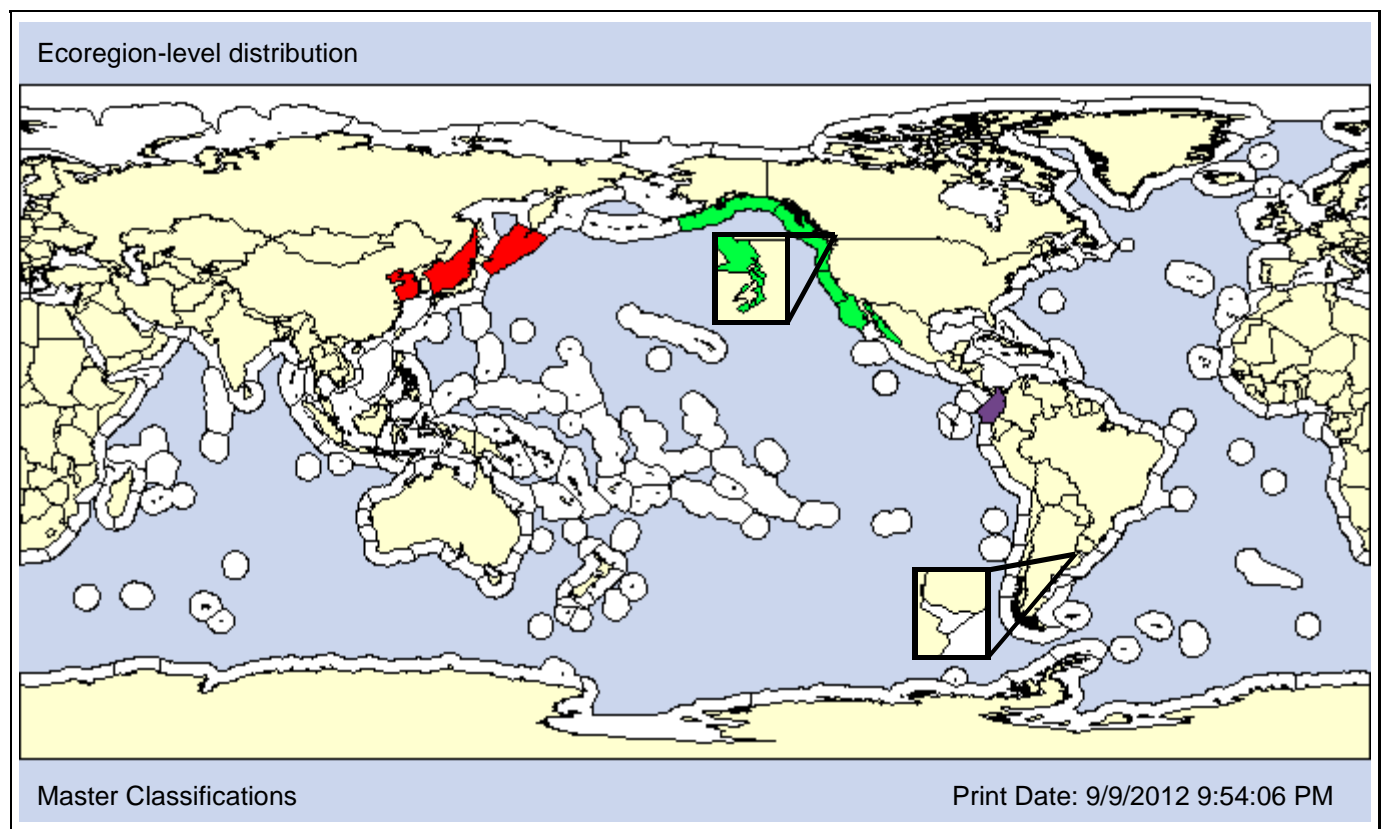
**Also Known As (Name - Type):**

Laonome oculifera	Synonym
Potamilla ocellata	Synonym
Pseudopotamilla brevibranchia	Misspelling
Pseudopotamilla lampra	Synonym

**Common Names:**

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**Type Locality:** Afognak Island, Alaska, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1982      Native

**Loc 1st record:** Hakodate Bay, Japan      Native

**Established:** Yes      Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: *Pseudopotamilla ocellata* was originally described from Alaska. It is considered cryptogenic in the NEP by CANOD (2009), however we classify it as native in the NEP. It is considered introduced in the Sea of Japan by Zvyagintsev et al. (2011).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	
	X	X											

**DEPTH [Obs: 0 - 268m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.73 - 68.5%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: 30.01 - 31.3psu]**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>	<b>X</b>							



**Taxon:** Polychaete

**Taxonomic Author:** (McIntosh, 1885)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

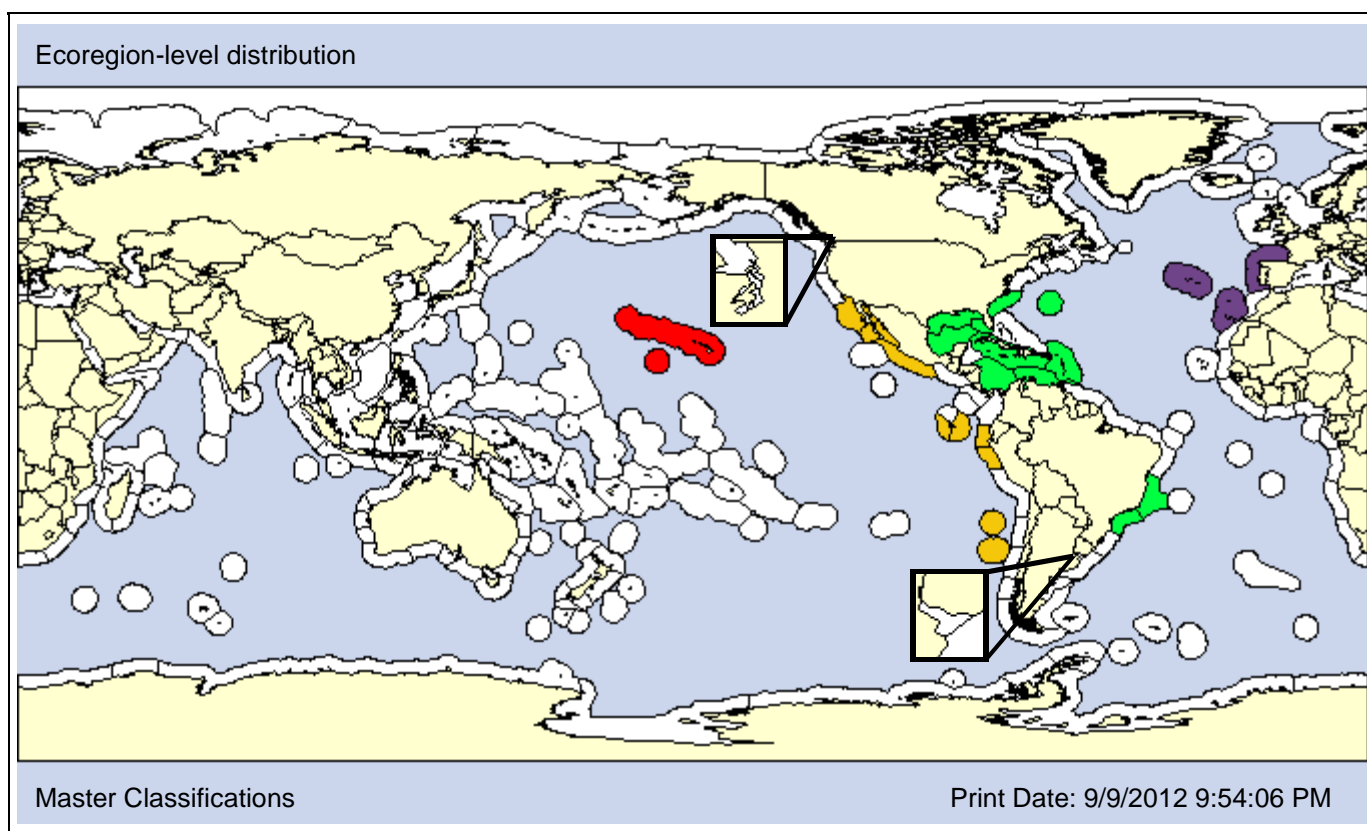
**Also Known As (Name - Type):**

Pomatostegus galeatus	Synonym
Pseudovermilia cornuta	Synonym
Pseudovermilia pileum	Synonym
Spirobranchus occidentalis	Synonym

**Common Names:**

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**Type Locality:** Bermuda



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1937

<1961

**Loc 1st record:**

Kaneohe Bay, Hawaii

Southern California

**Established:**

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: We consider *Pseudovermilia occidentalis* native to the NWA and Caribbean and cryptogenic in the eastern Pacific. We follow Nelson et al. (2007) and list it as introduced in Hawaii, though Coles et al. (2002a) consider it native to Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated X			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
		<b>X</b>										

**DEPTH [Obs: 0 - 795m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	

**SALINITY [Obs: 34.1 - 35.2psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (Verrill, 1873)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Scolecida

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Maldanidae

**Subfamily:**

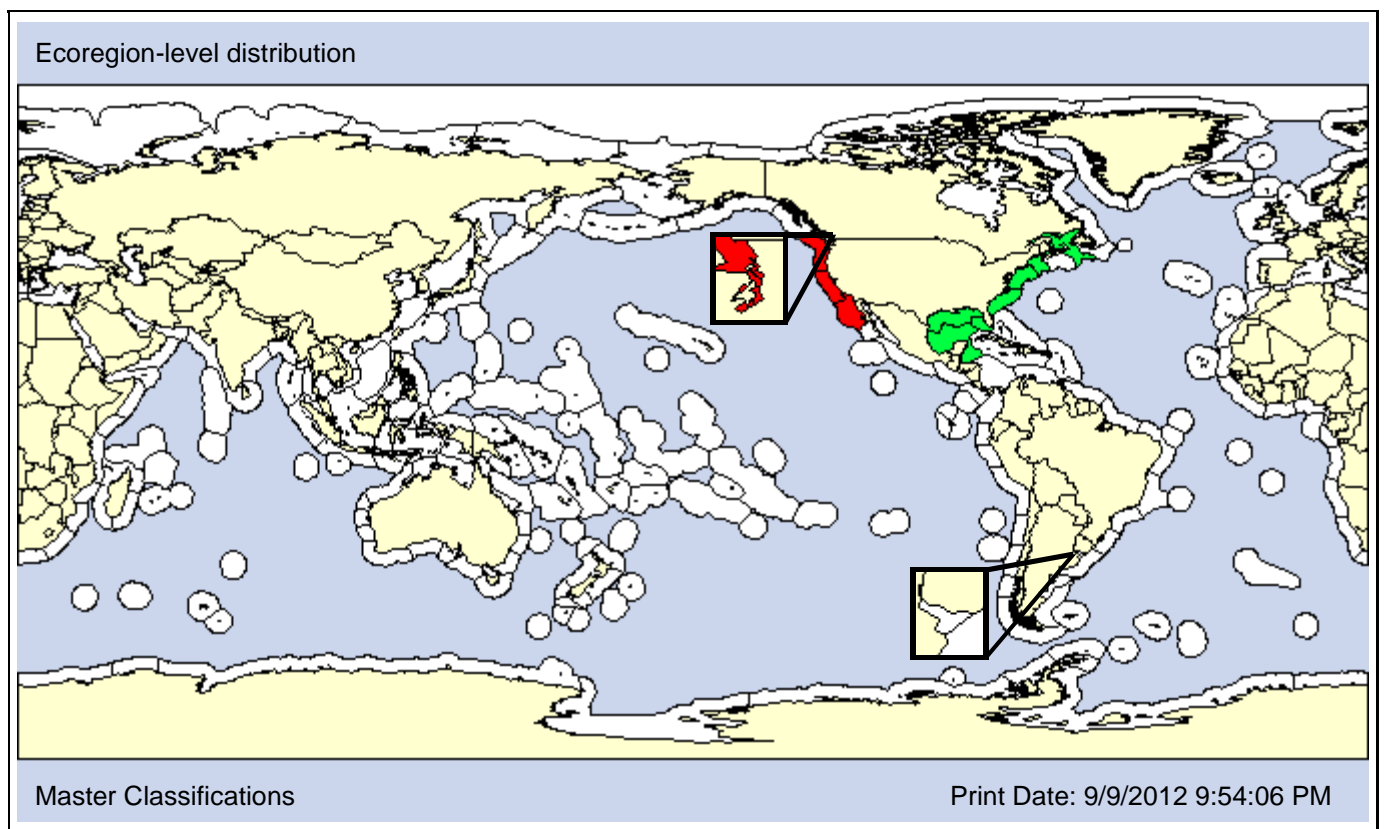
**Also Known As (Name - Type):**

Branchioasychis americana	Synonym
Branchioasychis elongatus	Synonym
Maldane elongata	Synonym
Maldanopsis elongatus	Synonym

**Common Names:**

bamboo worm ( <i>Sabaco elongatus</i> )
---

**Type Locality:**



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px solid black; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px); display: inline-block; width: 15px; height: 10px;"></span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: cyan;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:**

1960

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>					<b>AO X</b>	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 22m] [Pref: 0 - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 9.8 - 95.07%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>											

**SALINITY [Obs: 22 - 36psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>
					<b>O</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR	DF-SUB <b>X</b>

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** (Grube, 1878)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Sabellidae

**Subfamily:**

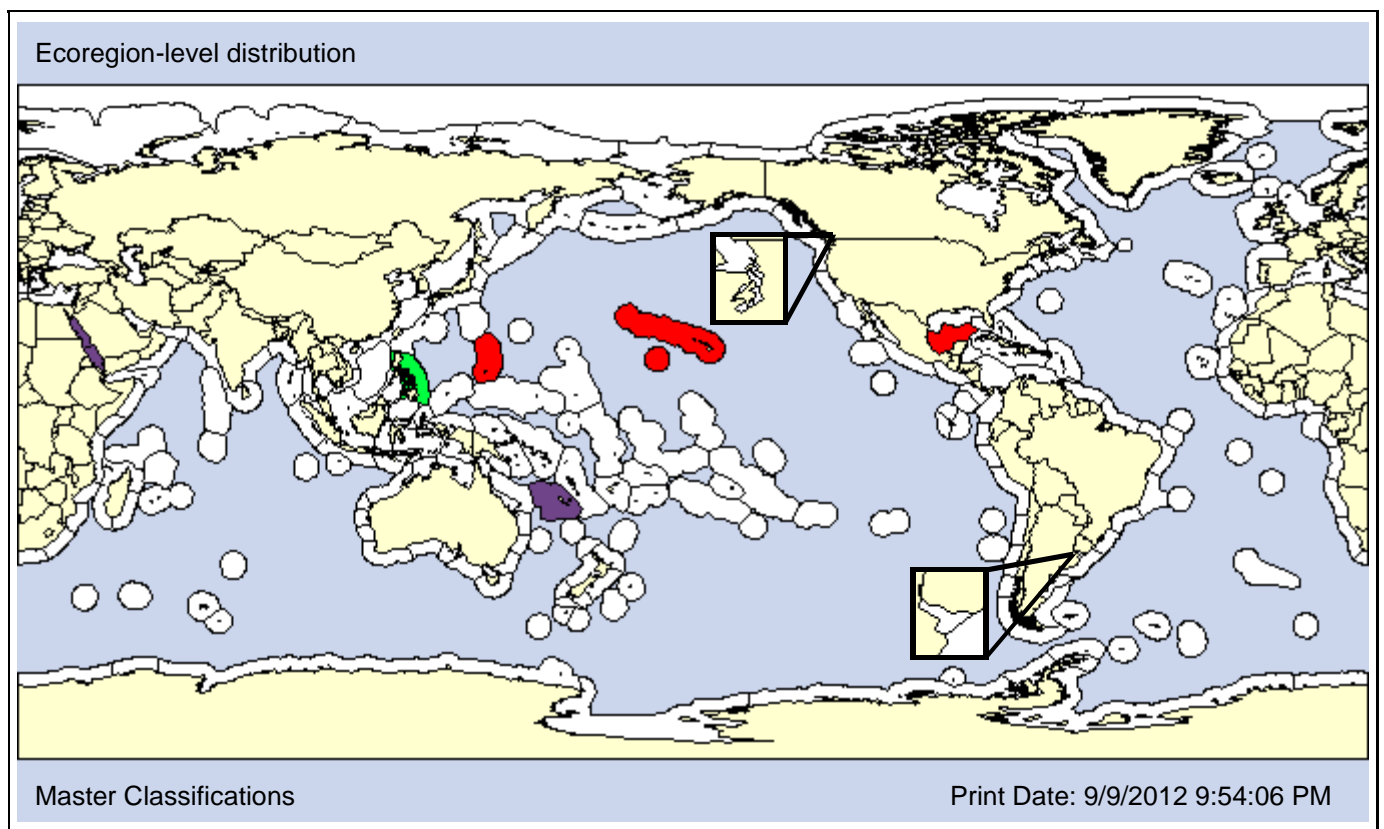
**Also Known As (Name - Type):**

Sabella indica Savigny, 1822	Synonym
Sabella spectabilis	Synonym
Sabellastarte indica (Savigny, 1822)	Synonym
Sabellastarte sanctijosephi of Hawaiian authors, not Gravier,	Misidentified

**Common Names:**

Featherduster worm

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1946  
**Loc 1st record:** Halape, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
X		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>										<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H <b>X</b>		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Polychaete

**Taxonomic Author:** (Moore, 1923)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

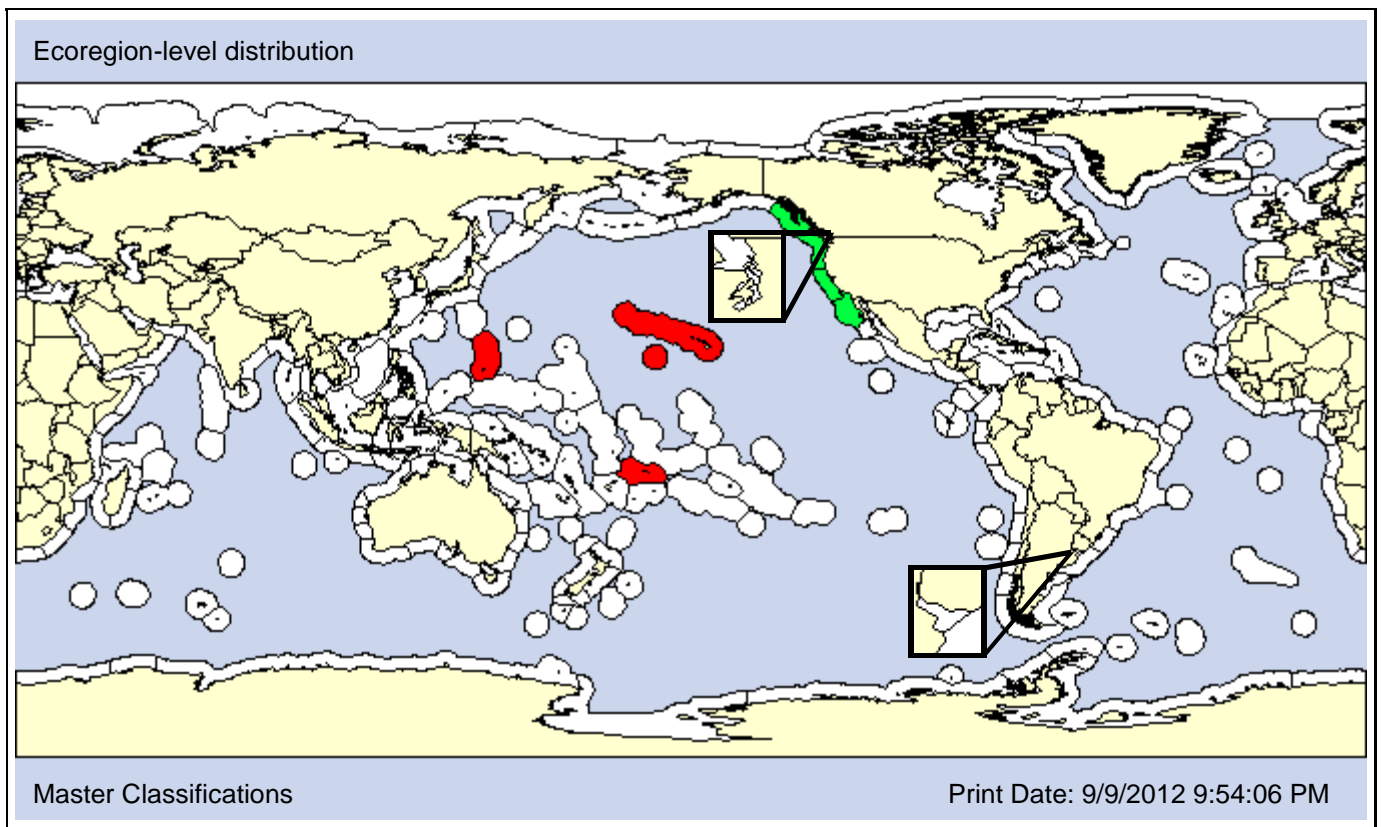
**Also Known As (Name - Type):**

Filograna tribranchiata	Synonym
Salmacina dysteri tribranchiata	Synonym
Salmancia dysteri of Hawaiian authors in part; not Huxley, 1	Misidentified

**Common Names:**

sea frost  
tangled white tube worm

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1935      Native

**Loc 1st record:** Kaneohe Bay, Hawaii      Native

**Established:** Yes      Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR		A	P				
X		X				AO	PO							

Comments: Carlton and Eldredge (2009) consider the harbor populations of *Salmacina* in Hawaii to be *S. tribranchiata*, a NEP species, and not *S. dysteri*, a European species. We tentatively assign reports of *S. dysteri* in Guam and American Samoa to *S. tribranchiata*, though note that these would represent introduced populations in either case.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K	
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 600m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>					<b>O</b>						<b>O</b>	<b>O</b>

**SALINITY [Obs: - 34psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Polychaete

**Taxonomic Author:** (Westheide, 1974)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

**Subfamily:** Exogoninae

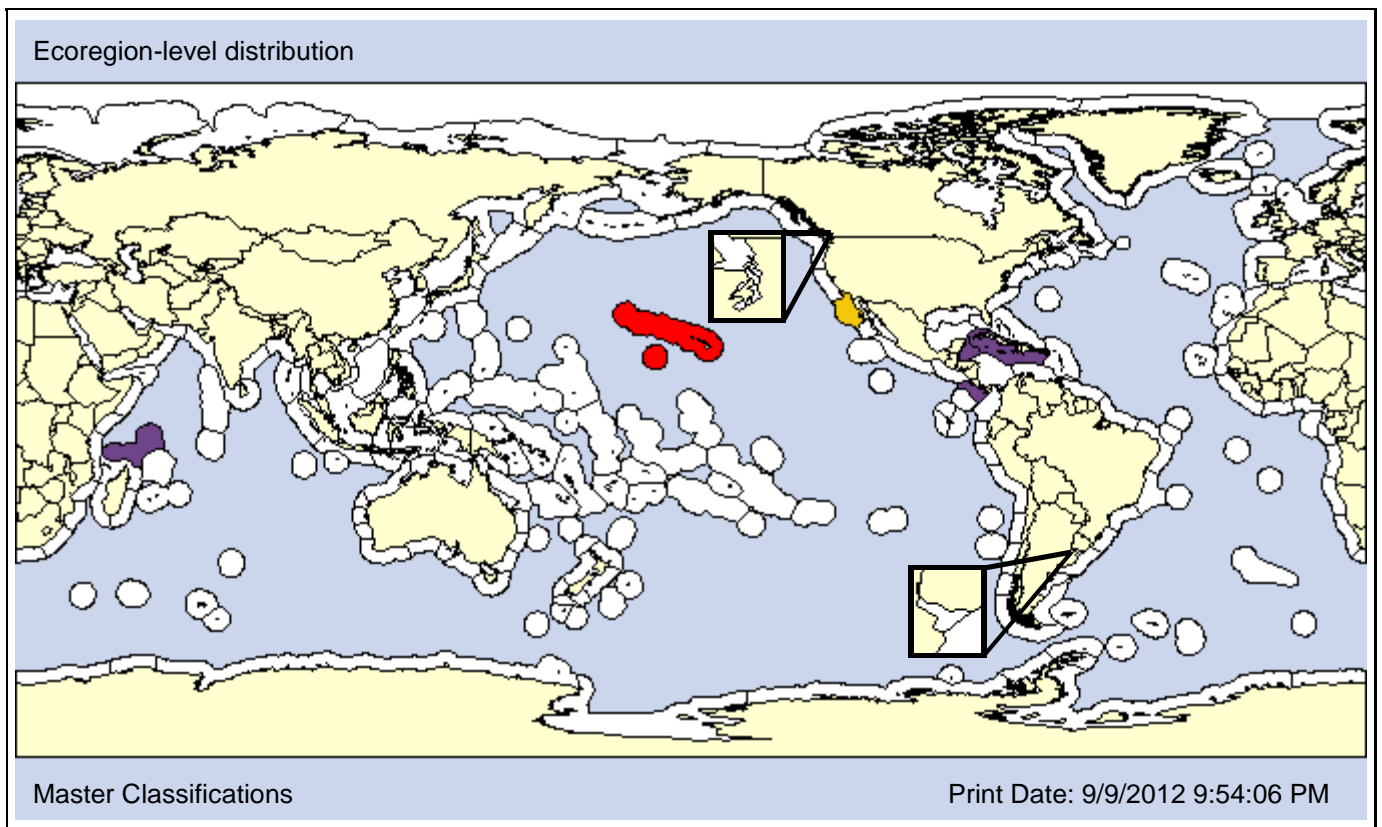
**Also Known As (Name - Type):**

Brania mediodentata  
Grubeosyllis mediodentata

Synonym  
Synonym

**Common Names:**

**Type Locality:** Galapagos, Ecuador



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 2001 (Hawaii) 1995 (NEP)  
**Loc 1st record:** Mamala Bay, Oahu, Hawaii (Hawaii) Bahia San Quintin, Mexico (NEP)  
**Established:** Yes (Hawaii) Yes (NEP)

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: Aguado and San Martin (2006) synonymize *Brania mediodentata* and *Grubeosyllis mediodentata* with *Salvatoria mediodentata*. Based on the taxonomic uncertainties, we classify it as cryptogenic in the NEP, but as NIS in Hawaii given its recent record (Nelson et al., 2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			X		TP	RI-PH	X			X	
		X											

**DEPTH [Obs: 0.25 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.9 - 70%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY [Obs: 35 - 36psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	O	
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X		LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		
						X							

**Taxon:** Polychaete

**Taxonomic Author:** Blake & Kudenov, 1978

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

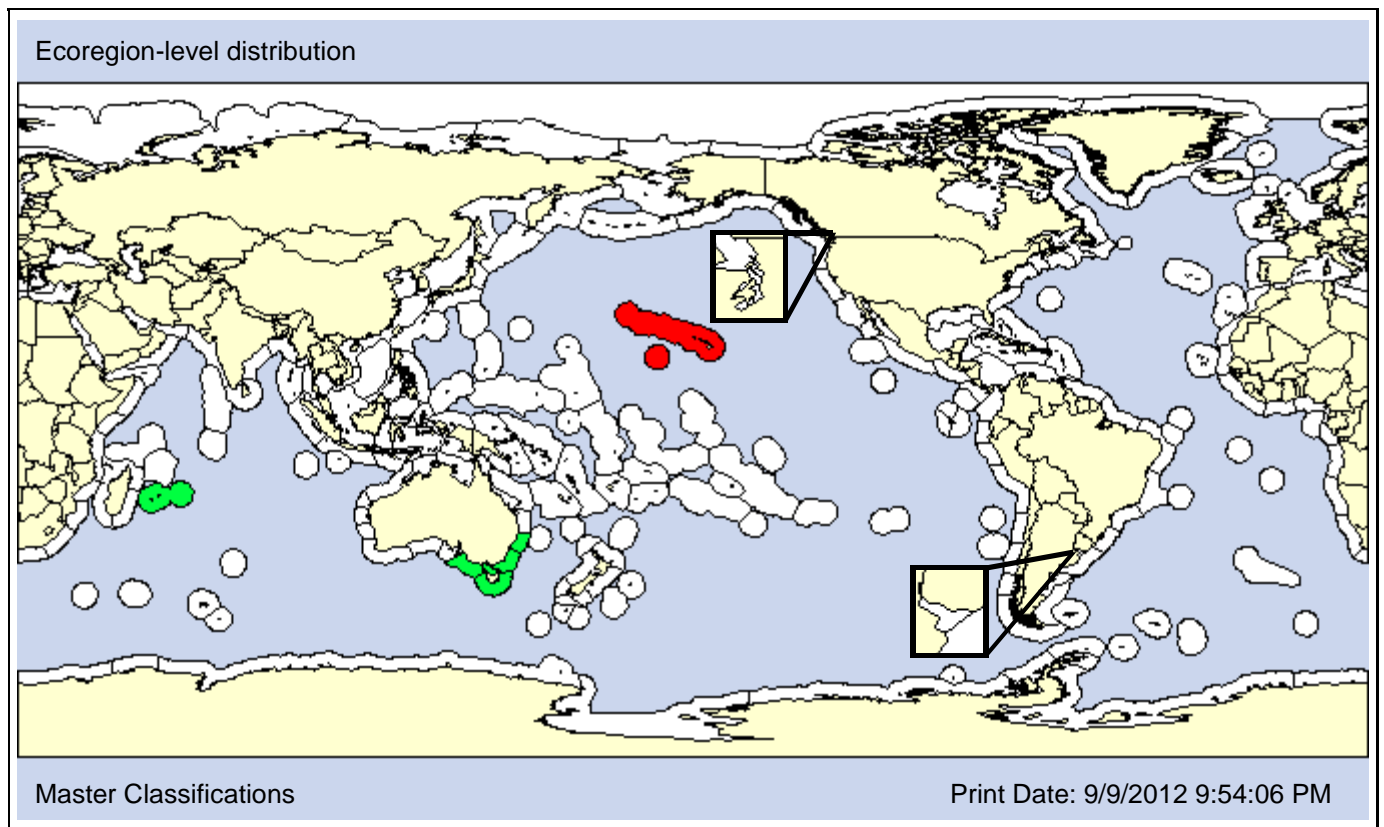
**Family:** Spionidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Westernport, Victoria, Australia



	Native		Nonindigenous		NIS Not Established		Cryptogenic		Transient		Unclassified		Conflicting Classification		Unidentified
					NWP				Hawaii						NEP

**Date 1st record:** <1999  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments: Nelson et al. (2007) classifies *Scolelepis victoriensis* as introduced into Hawaii. We consider this spionid polychaete to be native to Australia and the southern Indian Ocean

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0.5 - 4.2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.98 - 2.18%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 35.5 - 36.6psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaeta

**Taxonomic Author:** Gravier, 1906

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Scolecida

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Capitellidae

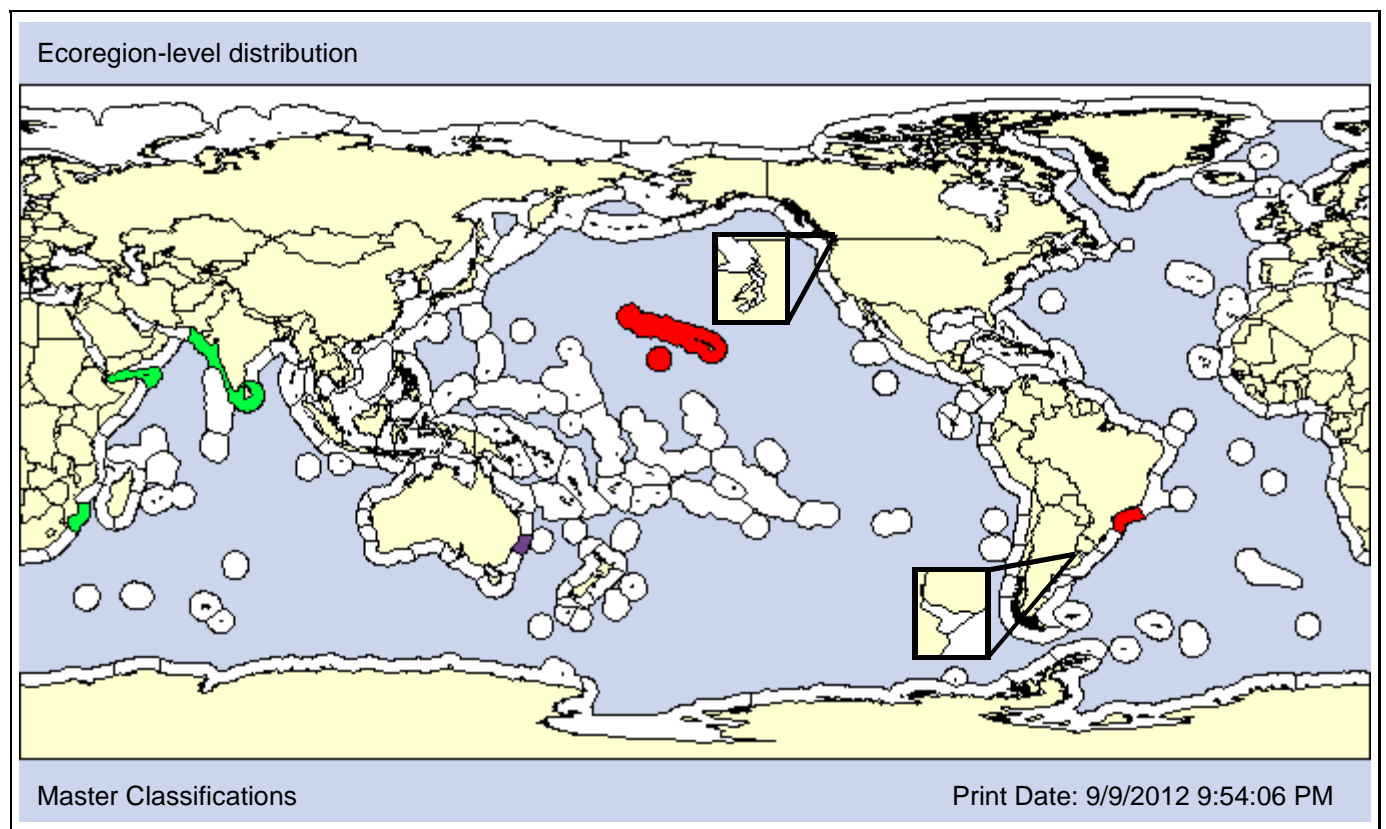
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Scyphoproctus diiboutiensis	Misspelling	
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**Type Locality:** Gulf of Aden



**Date 1st record:** <1999  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>						AO	PO								

Comments: *Scyphoproctus djiboutiensis* is listed as introduced in Hawaii by Nelson et al. (2007). We consider it native to the Indian Ocean, unclassified in eastern Australia, and introduced to Brazil (see Rizzo and Amaral, 2001).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 15m] [Pref: 0 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.98 - 2.18%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>				<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 23.9 - 36.5psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** Wiley, 1905

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

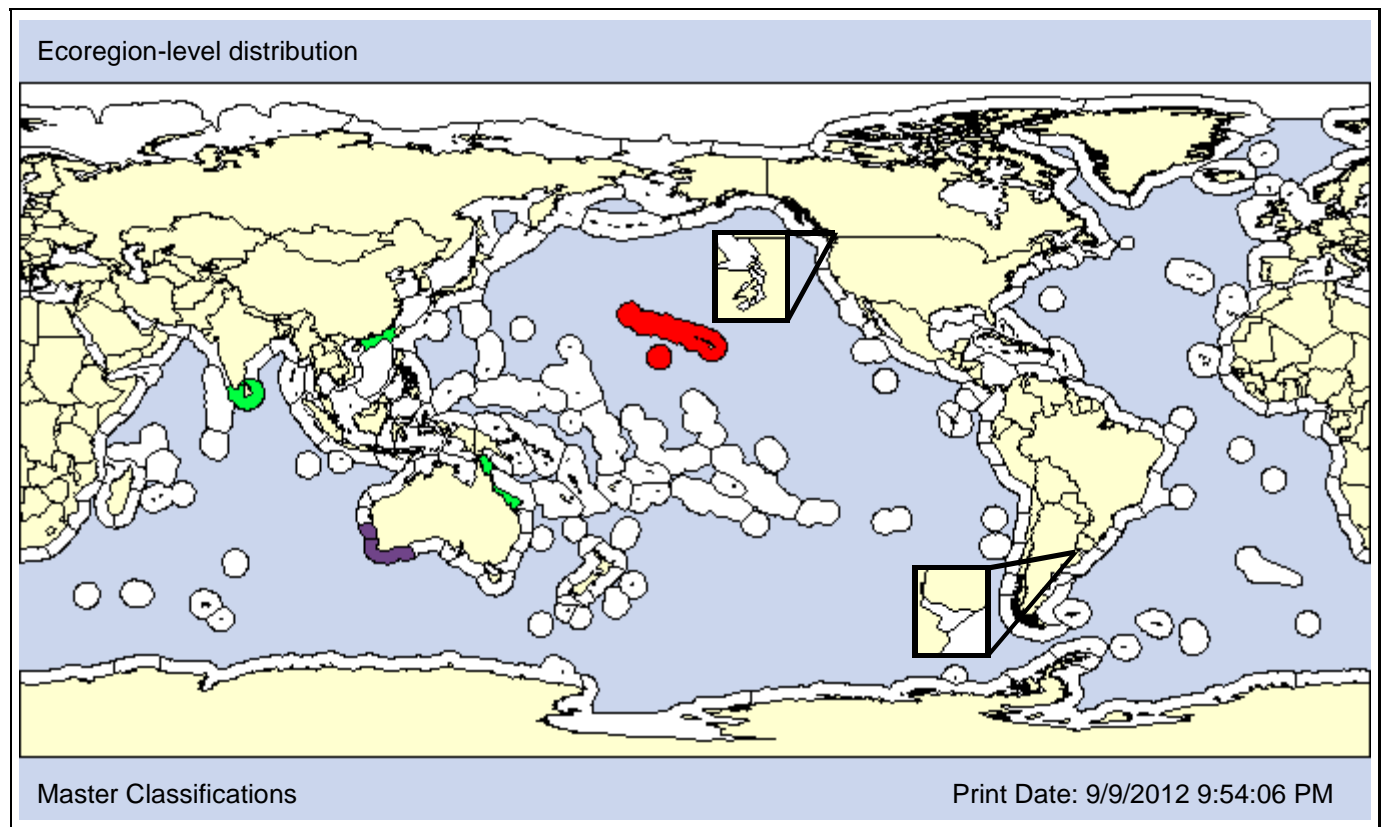
**Also Known As (Name - Type):**

Serpula vermicularis of Hawaiian authors	Misidentified
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**Common Names:**

--

**Type Locality:** Sri Lanka



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1936  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 30m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>P</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Polychaete      **Taxonomic Author:** Perkins, 1981

**Kingdom:** Animalia      **Subkingdom:** Eumetazoa      **Phylum:** Annelida

**Subphylum:**      **Superclass:**      **Class:** Polychaeta

**Subclass:** Aciculata      **Infraclass:**      **Superorder:**

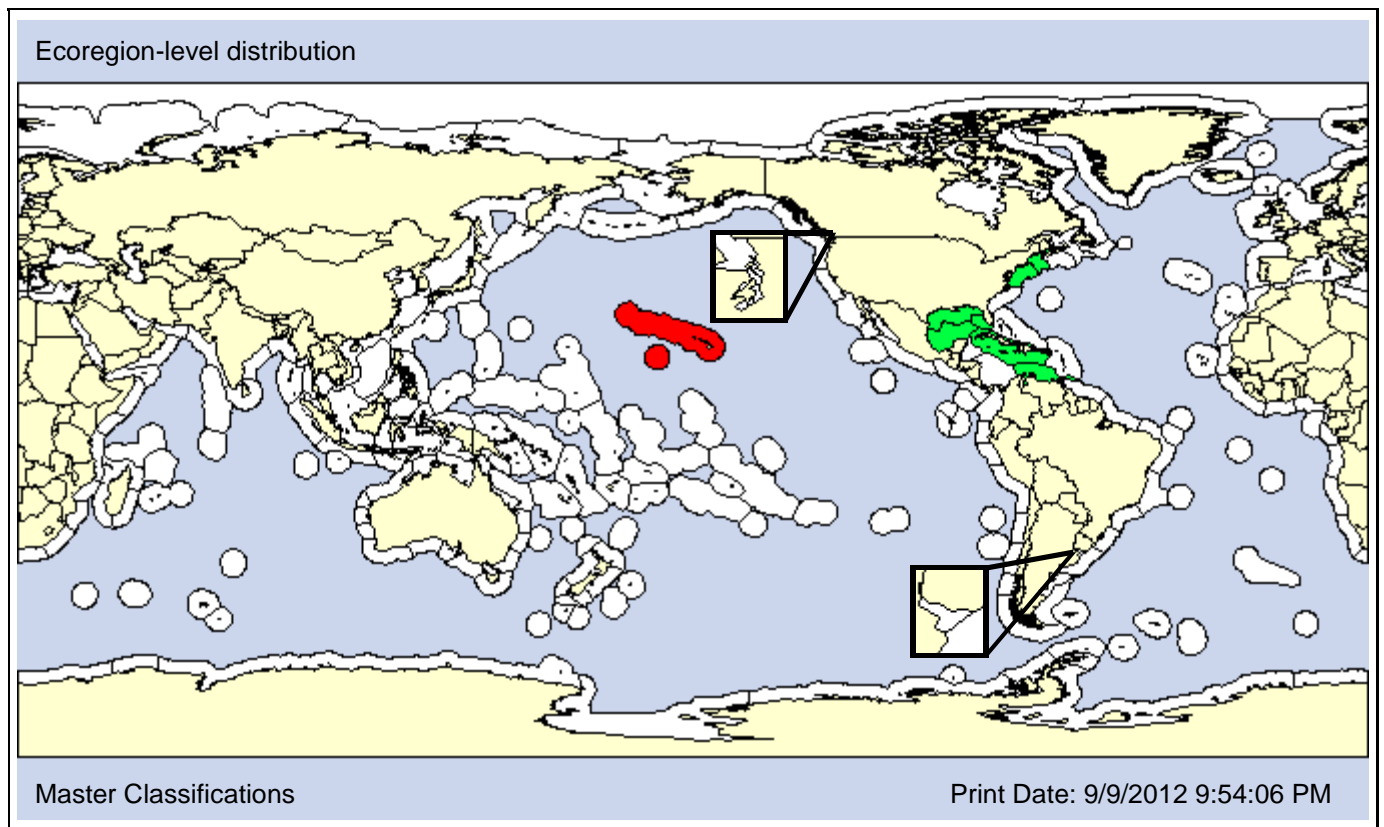
**Order:** Phyllodocida      **Suborder:** Phyllodocida      **Infraorder:**

**Superfamily:**      **Family:** Syllidae      **Subfamily:** Exogoninae

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Florida, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1999

**Loc 1st record:** Oahu, Hawaii

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA	IR			A	P			
<b>X</b>						AO	PO							

Comments: *Sphaerosyllis riseri* is an Atlantic species that Nelson et al. (2007) list as introduced in Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X		X		TP	RI-PH		X			
	X	X											

**DEPTH [Obs: 0 - 14.8m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 1.98%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	P				O	

**CONSOLIDATED SUBSTRATE X**

R	HP	Biogenic O							Artificial Substrate					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O						O	O					

**SALINITY [Obs: 24 - 36.5psu]**

Fresh	Brackish O					Marine O		Hyper
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	O
					O	O		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
				LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		

<b>Taxon:</b> Polychaete	<b>Taxonomic Author:</b> Maciolek, 1990	
<b>Kingdom:</b> Animalia	<b>Subkingdom:</b> Eumetazoa	<b>Phylum:</b> Annelida
<b>Subphylum:</b>	<b>Superclass:</b>	<b>Class:</b> Polychaeta
<b>Subclass:</b> Canalipalpata	<b>Infraclass:</b>	<b>Superorder:</b>
<b>Order:</b> Spionida	<b>Suborder:</b> Spionida	<b>Infraorder:</b>
<b>Superfamily:</b>	<b>Family:</b> Spionidae	<b>Subfamily:</b>

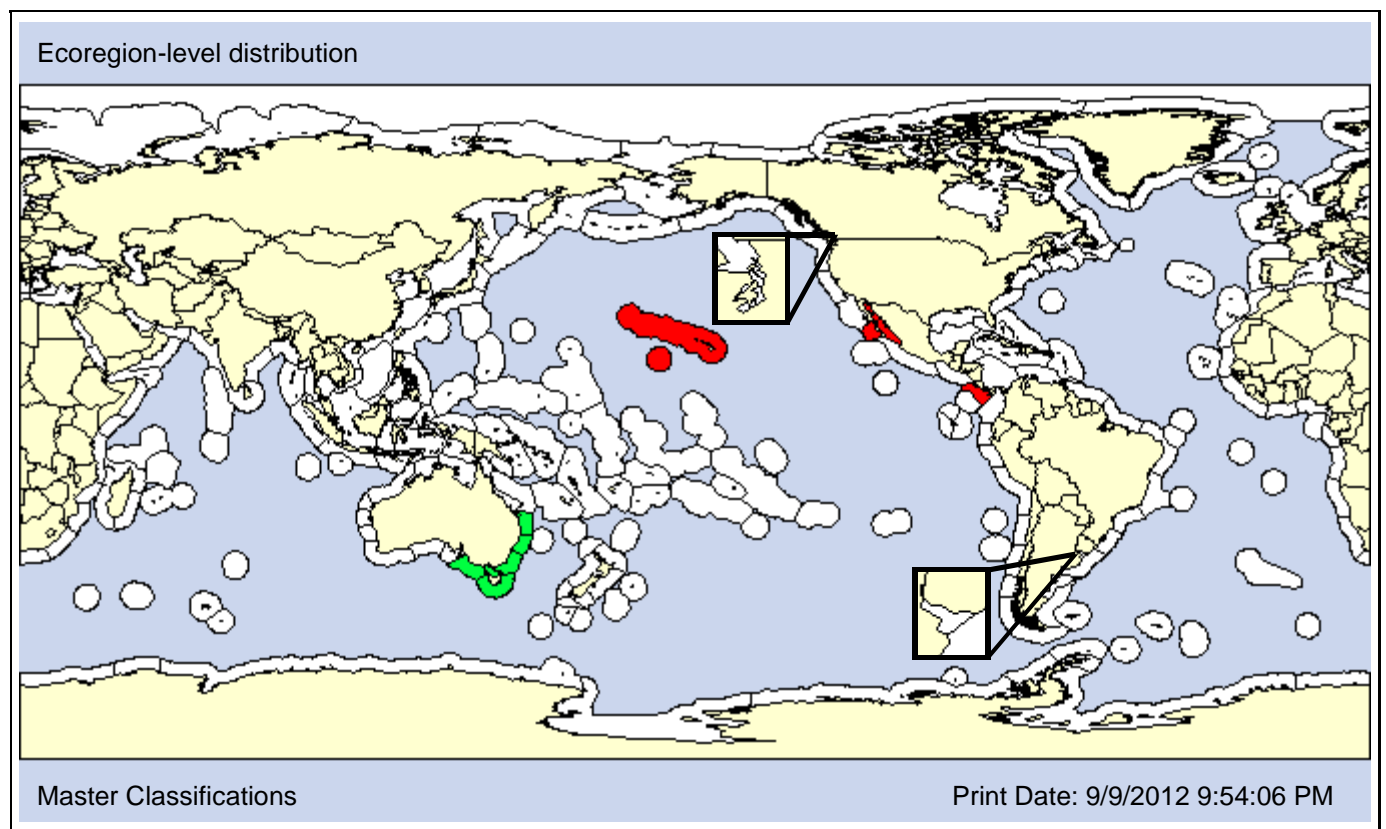
**Also Known As (Name - Type):**

Spio ca. pacifica of Brusca and Hendrickx, 2008	Ambiguous syn. Synonym
Spio pacifica of Blake and Kudenov, 1978	

**Common Names:**

--

**Type Locality:** Botany Bay, New South Wales , Australia



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

<b>Date 1st record:</b>	<1999	<1982
<b>Loc 1st record:</b>	Oahu, Hawaii	Sinaloa, Mexico
<b>Established:</b>	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>						AO	PO								

Comments: *Spio blakei*, originally described as *Spio pacifica*, is native to Australia. *S. blakei* or *S. pacifica* have been reported from Hawaii (Nelson et al., 2007) and western Mexico and Costa Rica (Dean, 2004), and is presumably introduced in these regions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 74m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 0.66 - 44.36%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 27.4 - 36.6psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR X	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** (Baird, 1865)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Sabellida

**Suborder:** Sabellida

**Infraorder:**

**Superfamily:**

**Family:** Serpulidae

**Subfamily:**

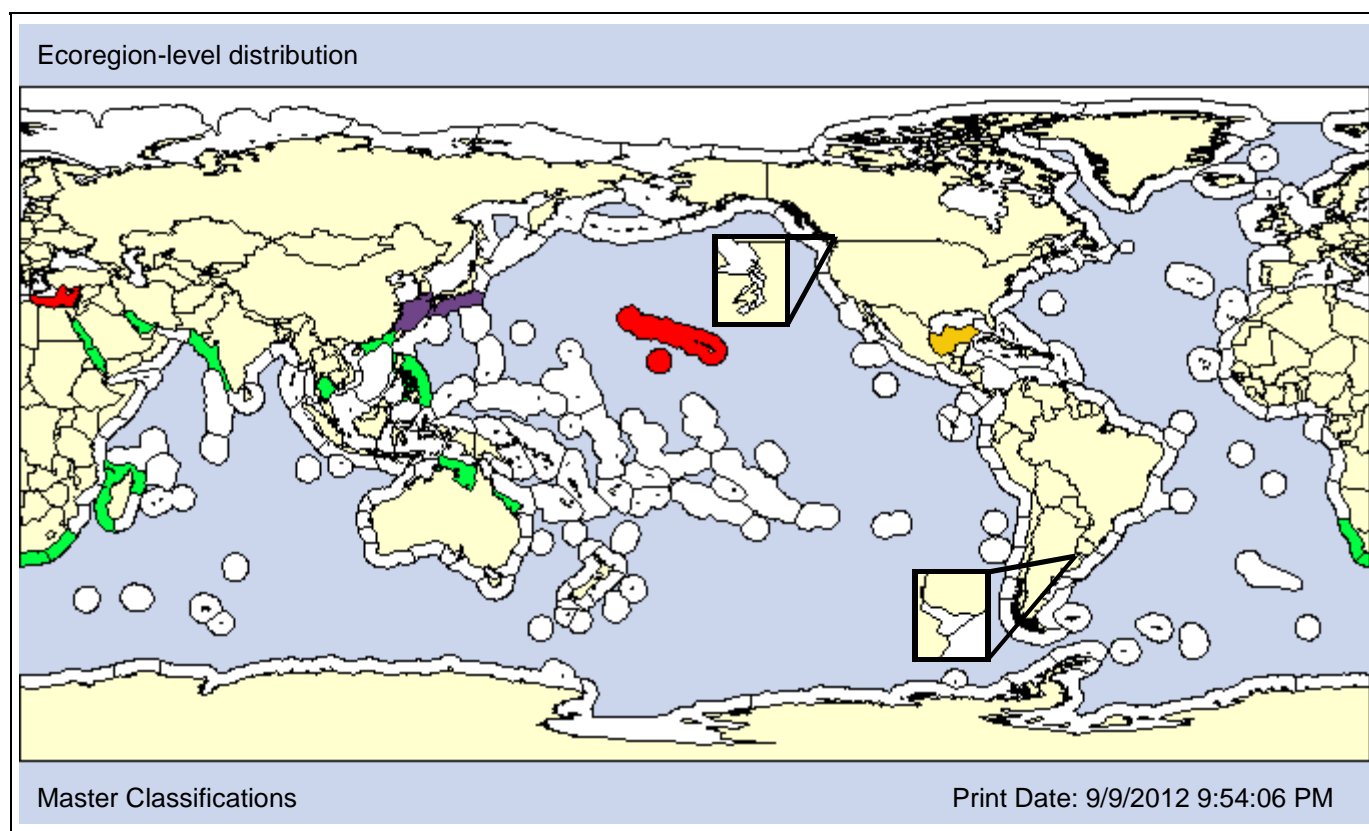
**Also Known As (Name - Type):**

Placostegus cariniferus var. kraussii  
 Pomatoceros (Pomatoleios) caerulescens  
 Pomatoleios caerulescens  
 Pomatoleios crossland

Synonym  
 Synonym  
 Synonym  
 Misspelling

**Common Names:**

**Type Locality:** Cape of Good Hope, South Africa



Master Classifications Print Date: 9/9/2012 9:54:06 PM

Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1967  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR	X	A	P				
X		X				AO	PO								

Comments: *Spirobranchus kraussii* (= *Pomatoleios kraussii*) is an Indo-Pacific serpulid polychaete that occurs in Japan and South Africa and has been introduced into Hawaii (Carlton and Eldredge, 2009) and the Mediterranean (Zenetos et al., 2010). We list it as unclassified in Japan and cryptogenic in the Gulf of Mexico because of taxonomic uncertainties.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>

**DEPTH [Obs: 0 - 1.5m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>									<b>O</b>	<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 31 - 36psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

# *Streblospio benedicti* Cmplx

Species ID: 804

**Taxon:** Polychaete

**Taxonomic Author:** Webster, 1879

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Canalipalpata

**Infraclass:**

**Superorder:**

**Order:** Spionida

**Suborder:** Spionida

**Infraorder:**

**Superfamily:**

**Family:** Spionidae

**Subfamily:**

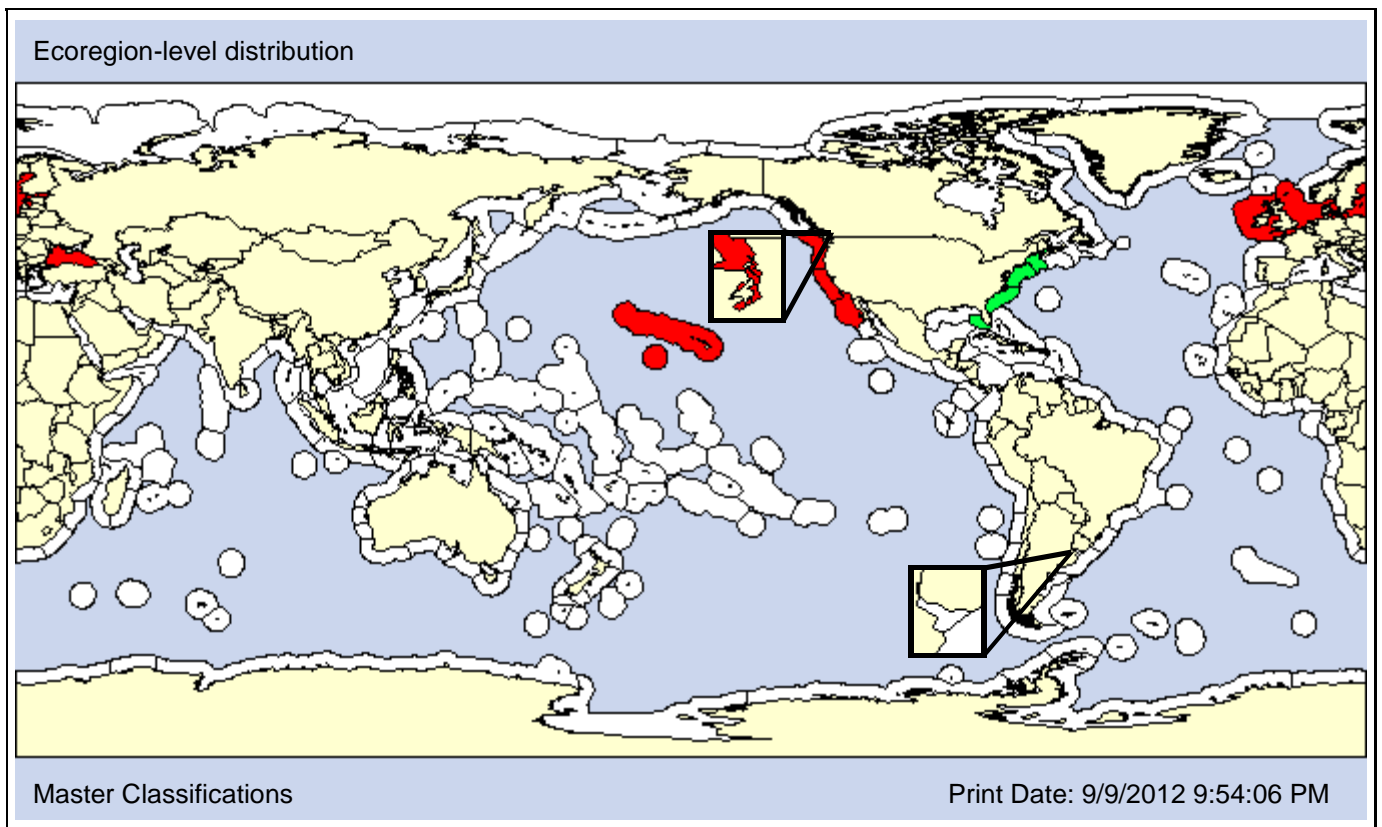
**Also Known As (Name - Type):**

Streblospio benedicti  
Streblospio benedicti complex  
Streblospio lutincola

Ambiguous syn.  
Convention  
Ambiguous syn.

**Common Names:**

**Type Locality:** New Jersey, USA



**Date 1st record:**

1977

1932

**Loc 1st record:**

Halawa Stream, Oahu

San Francisco Estuary, CA

**Established:**

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments: "*Streblospio benedicti*" has been divided into *S. benedicti* which occurs on the Atlantic and Pacific coasts and *S. gynobranchiata* which occurs in the Gulf of Mexico. We assume that the *S. benedicti* on the Pacific Coast was introduced from the Atlantic, while those in Hawaii were introduced from the Atlantic or secondarily from the Pacific.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 224.6m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.59 - 100%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>		<b>O</b>								<b>O</b>	

**SALINITY [Obs: 1.9 - 35.33psu] [Pref: 28 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P O</b>
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>		<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		<b>X</b>
						<b>X</b>							



**Taxon:** Polychaete

**Taxonomic Author:** Perkins, 1981

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

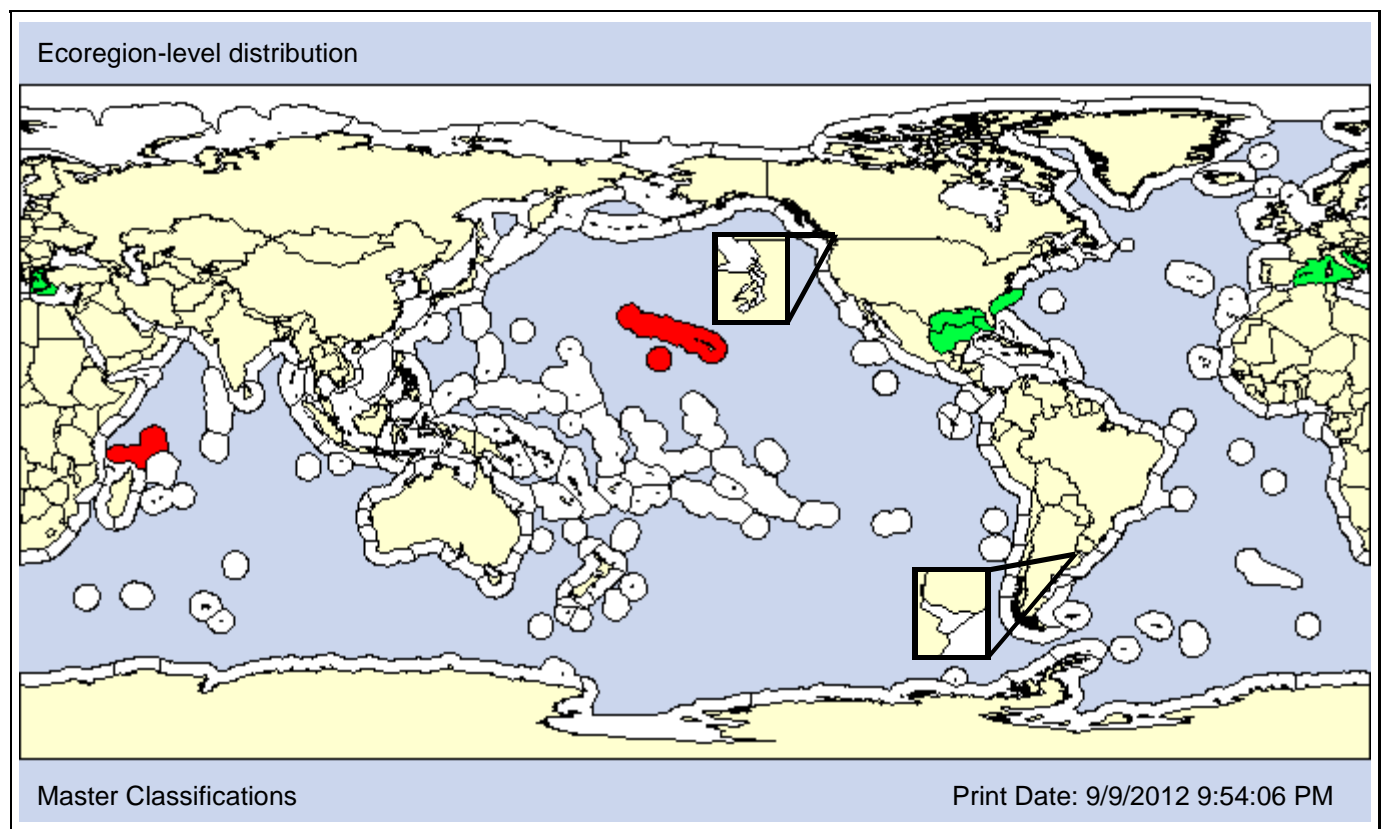
**Family:** Syllidae

**Subfamily:** Eusyllinae

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Florida, USA



	Native		Nonindigenous		NIS Not Established		Cryptogenic		Transient		Unclassified		Conflicting Classification		Unidentified
			<b>NWP</b>						<b>Hawaii</b>			<b>NEP</b>			

**Date 1st record:** 2001  
**Loc 1st record:** Oahu, Hawaii,  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments: We consider *Syllides bansei* native to the North Atlantic and Mediterranean. Nelson et al. (2007) classify it as introduced in Hawaii and we classify it as introduced in the Indian Ocean.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH		<b>X</b>			
		<b>X</b>											

**DEPTH [Obs: 0.5 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>				<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 35.25psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Polychaete

**Taxonomic Author:** Imajima, 1966

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Annelida

**Subphylum:**

**Superclass:**

**Class:** Polychaeta

**Subclass:** Aciculata

**Infraclass:**

**Superorder:**

**Order:** Phyllodocida

**Suborder:** Phyllodocida

**Infraorder:**

**Superfamily:**

**Family:** Syllidae

**Subfamily:** Syllinae

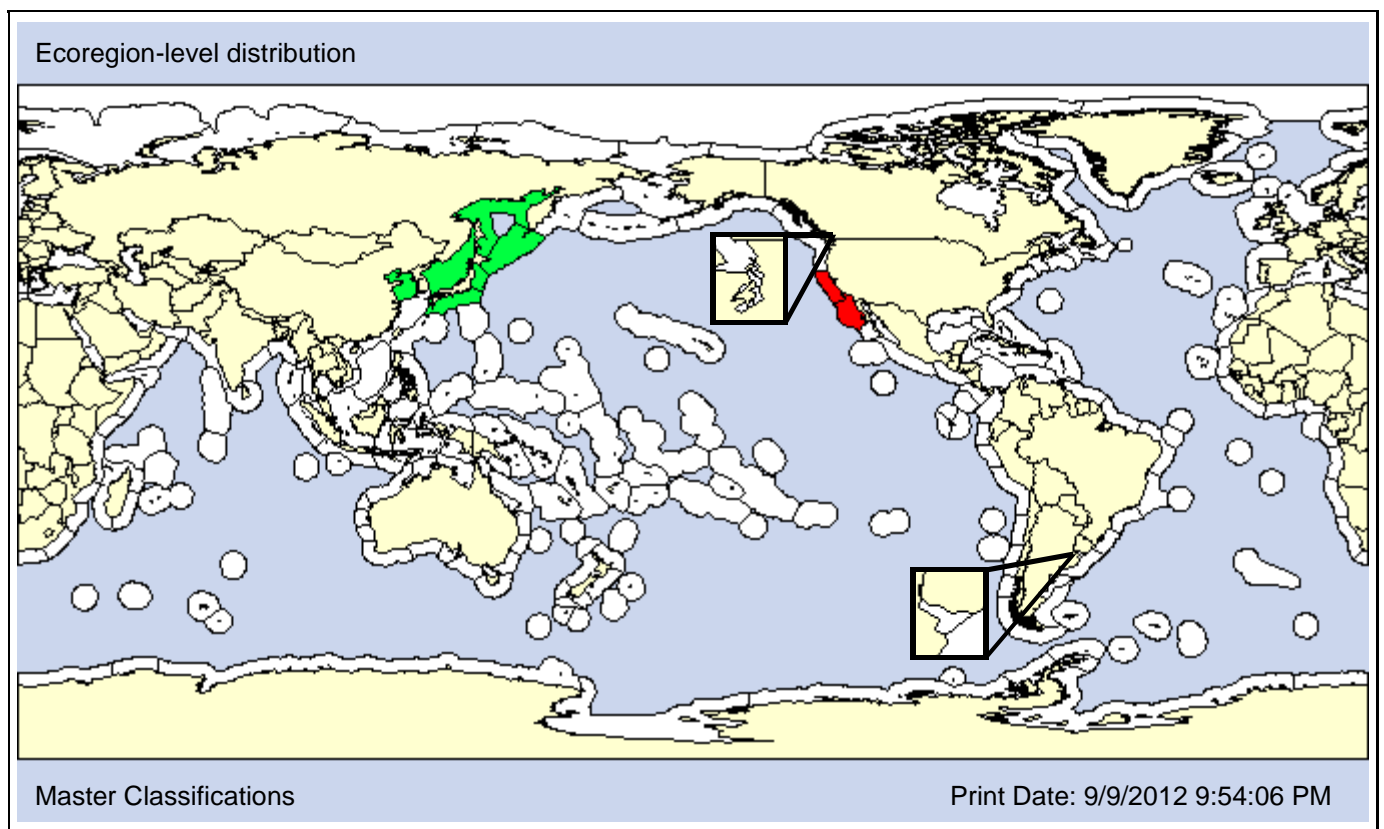
**Also Known As (Name - Type):**

Syllis (Typosyllis) nipponica  
Syllis nipponica

Synonym  
Synonym

**Common Names:**

**Type Locality:** Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1998

**Loc 1st record:** Native

Los Angeles + Long Beach, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 272m] [Pref: 4 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 7.79 - 99.19%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 25.5 - 33.27psu] [Pref: 30 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
						<b>X</b>							

Kingdom: Animalia

Phylum: Bryozoa

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**Taxon:** Bryozoan

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Inovicellina

**Infraorder:**

**Superfamily:** Aeteoidea

**Family:** Aeteidae

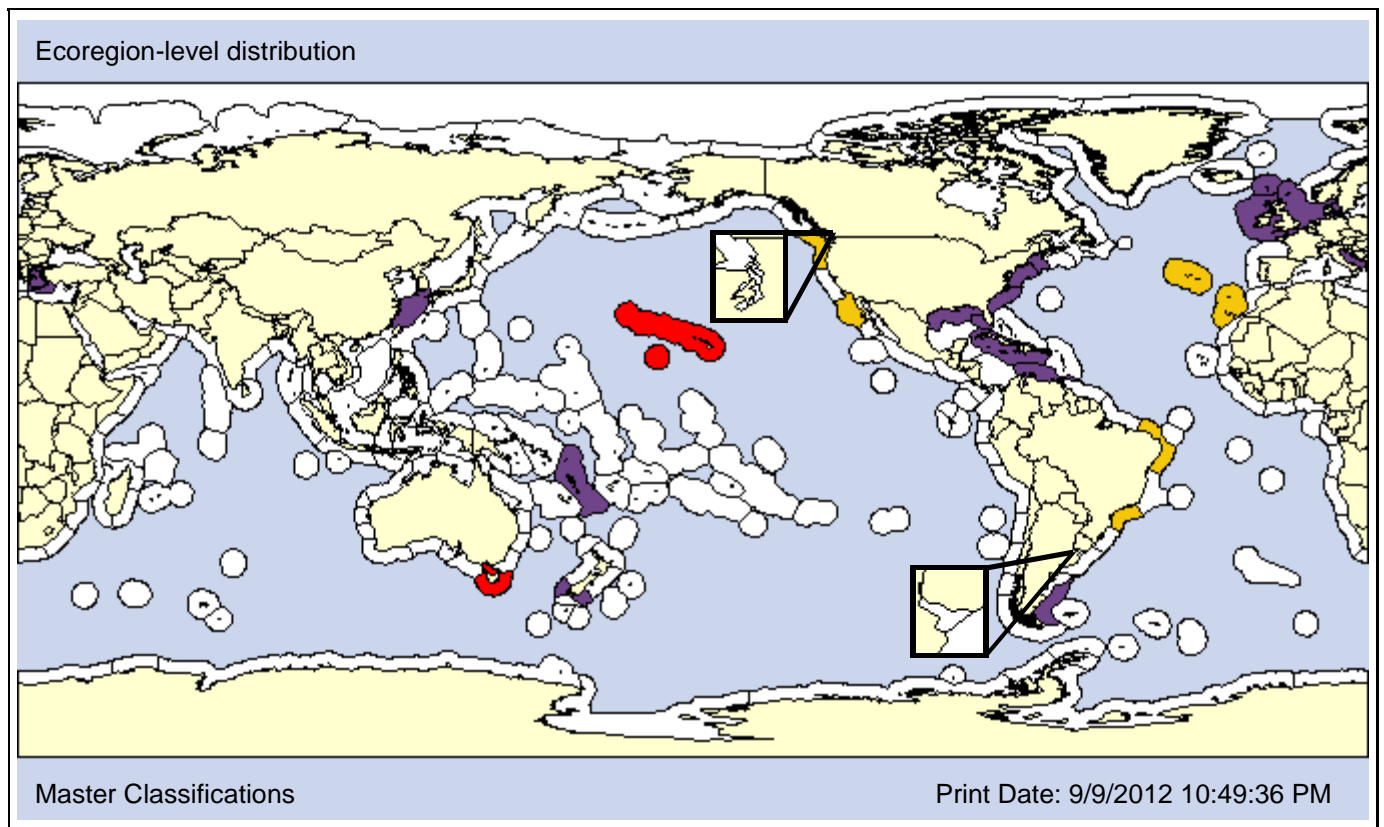
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Sertularia anguina	Synonym	
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

**NWP**

**Hawaii**

**NEP**

**Date 1st record:** Unknown

1997

1950

**Loc 1st record:** Unknown

Honolulu Harbor, Hawaii

Los Angeles Harbor, CA

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: *Aetea anguina* is a wide-spread species whose native region is unknown, and which may constitute a species complex. It has been classified as introduced in Australia (Hewitt et al., 2004) and Hawaii (Carlton and Eldredge, 2009), and cryptogenic in California (CANOD, 2009), Canary Islands (DAISIE), and Brazil (Ignacio et al., 2010).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	<b>X</b>

**DEPTH [Obs: 15 - 100m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>O</b>						<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							



**Taxon:** Bryozoa

**Taxonomic Author:** (Landsborough, 1852).

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Inovicellina

**Infraorder:**

**Superfamily:** Aeteoidea

**Family:** Aeteidae

**Subfamily:**

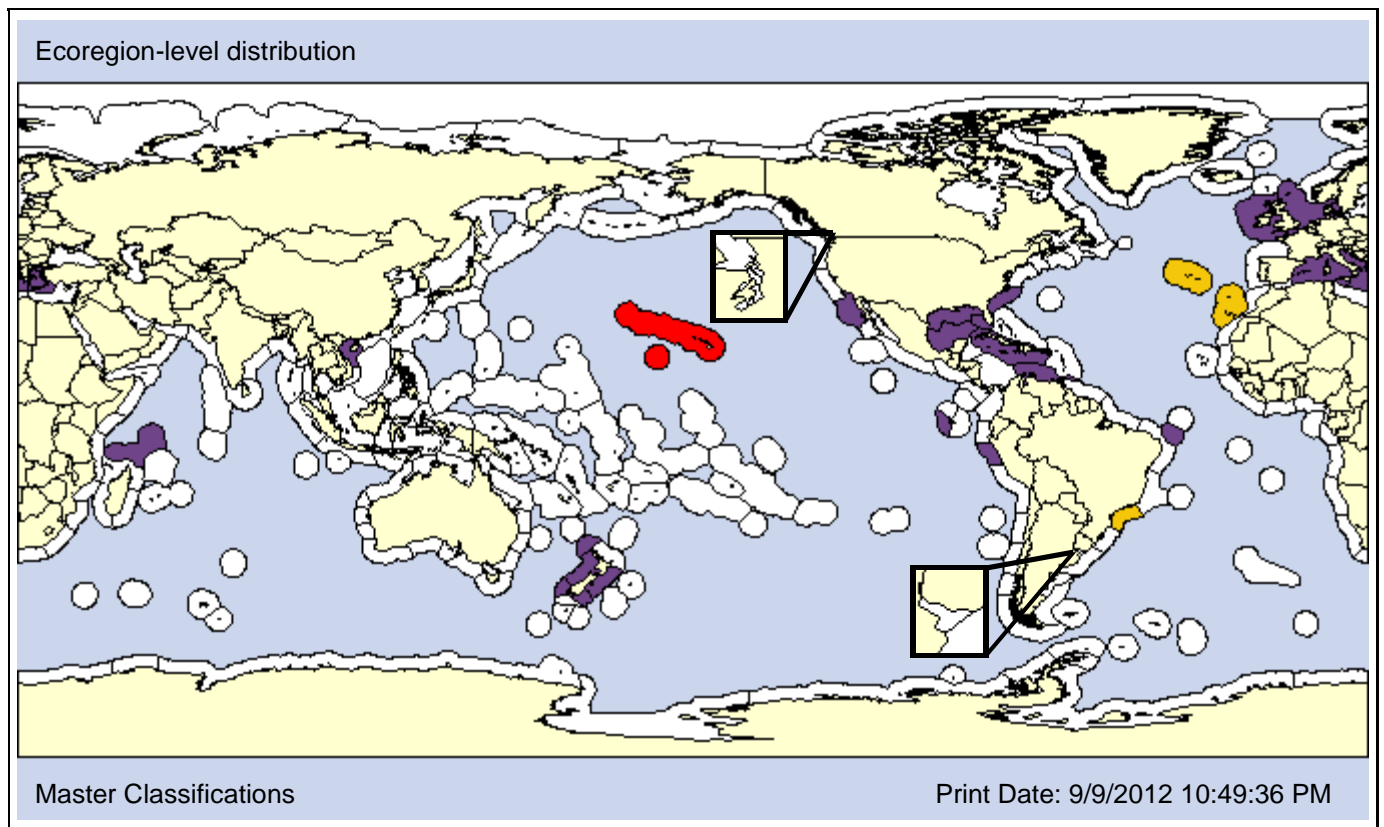
**Also Known As (Name - Type):**

Aetea recta of Soule et al., 1987  
 Aetea truncate  
 Anguinaria truncata

Misidentified  
 Misspelling  
 Synonym

**Common Names:**

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>		<b>NEP</b>		

**Date 1st record:**

1935

Unknown

**Loc 1st record:**

Kaneohe Bay, Hawaii

Unknown

**Established:**

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	PO								

Comments: The native region of *Aetea truncata* is unknown, though it is considered introduced in Hawaii (Carlton and Eldredge, 2009) and cryptogenic in the Azores (DAISIE) and Brazil (Ignacio et al., 2010).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH			<b>X</b>	<b>X</b>	<b>X</b>

**DEPTH [Obs: 2 - 44m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>								<b>Artificial Substrate P</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>				<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoa

**Taxonomic Author:** (Verrill, 1873)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ctenostomatida

**Suborder:**

**Infraorder:**

**Superfamily:**

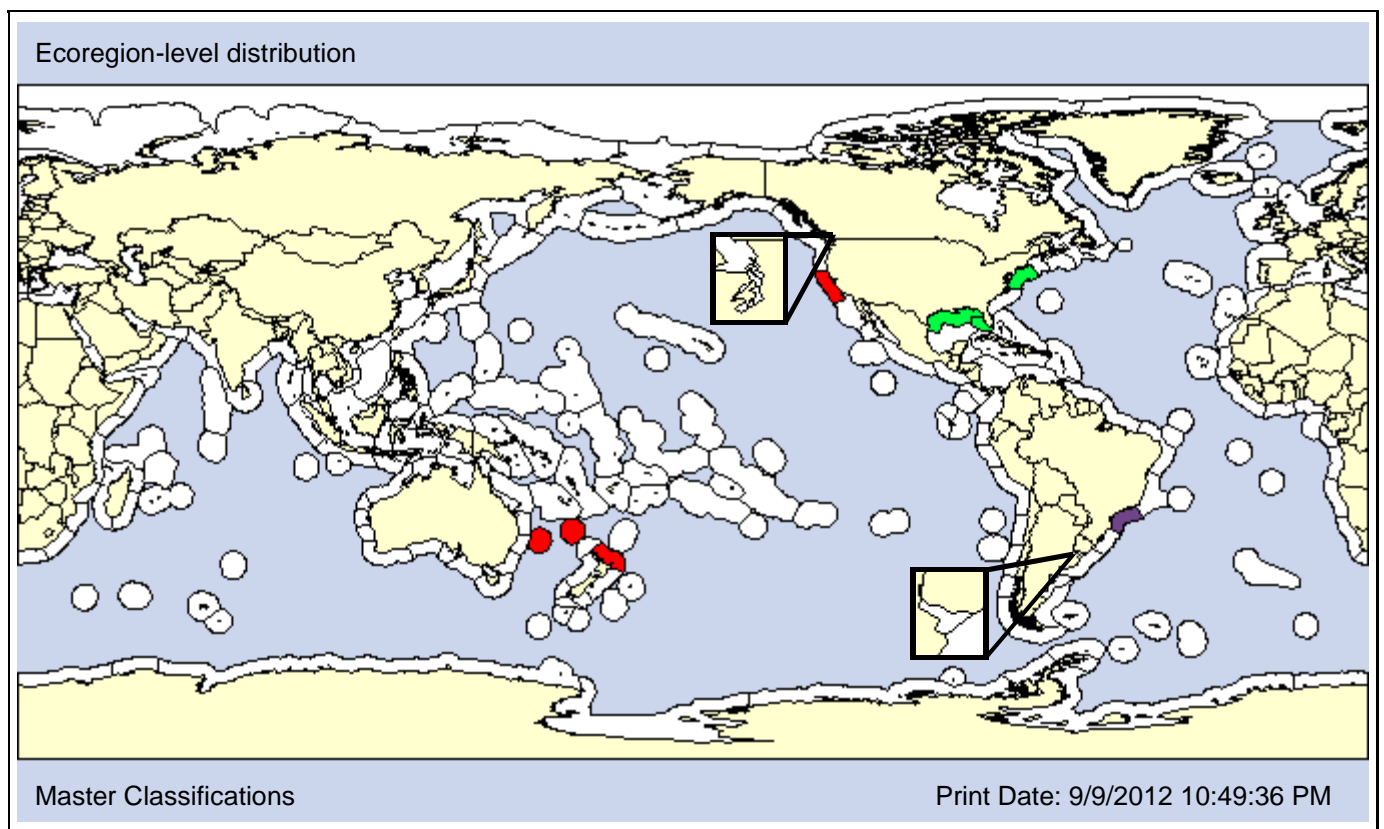
**Family:** Aeверrilliidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



**Date 1st record:**

2000

**Loc 1st record:**

San Fransico Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: We classify *Aeверrillia armata* as native to the NWA, including the Gulf of Mexico. It was first reported in the NEP from the San Francisco Estuary in 2000 (CANOD, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 16.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>O</b>					<b>O</b>	<b>O</b>	

**SALINITY [Obs: 12 - psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
				<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Bryozoa

**Taxonomic Author:** (Lamarck, 1816)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ctenostomatida

**Suborder:** Carnosa

**Infraorder:**

**Superfamily:** Vesicularioidea

**Family:** Vesiculariidae

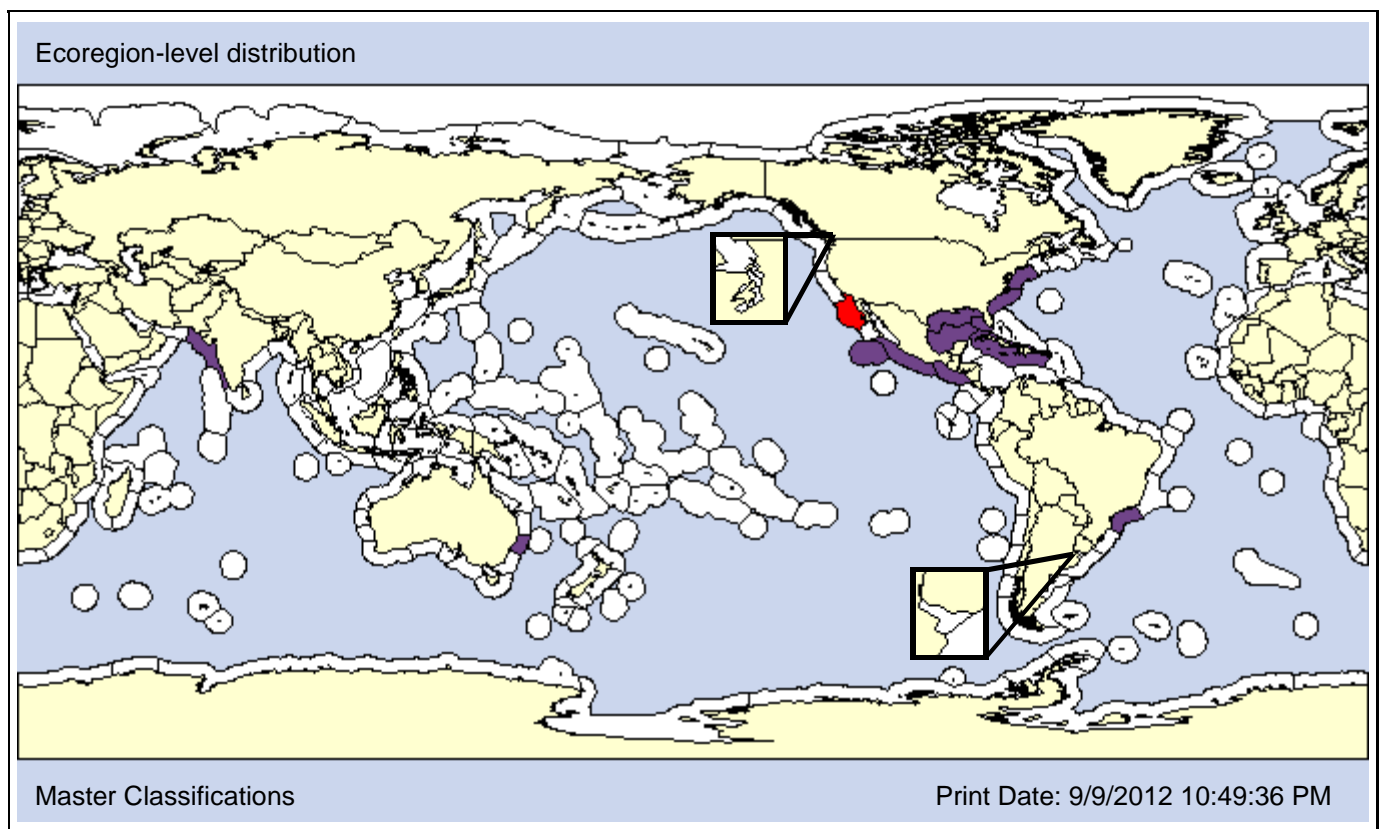
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Amathia spiralis	Synonym	sheep's wool bryozoan
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

2005

**Loc 1st record:**

San Diego Bay, CA

**Established:**

Unknown

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: Osburn (1953) reported *Amathia convoluta* from the Eastern Tropical Pacific; however it was not reported from the NEP until 2005, suggesting a recent anthropogenic introduction or a range extension. The native region is not known but may be the NWA. Osburn also reported it from Europe and Australia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			X		TP	RI-PH	X			X	

**DEPTH [Obs: 9 - 36m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									O				O	

**SALINITY [Obs: 18 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
					O	P			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	
						X							

**Taxon:** Bryozoa

**Taxonomic Author:** Busk, 1886

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ctenostomatida

**Suborder:** Carnosa

**Infraorder:**

**Superfamily:** Vesicularioidea

**Family:** Vesiculariidae

**Subfamily:**

**Also Known As (Name - Type):**

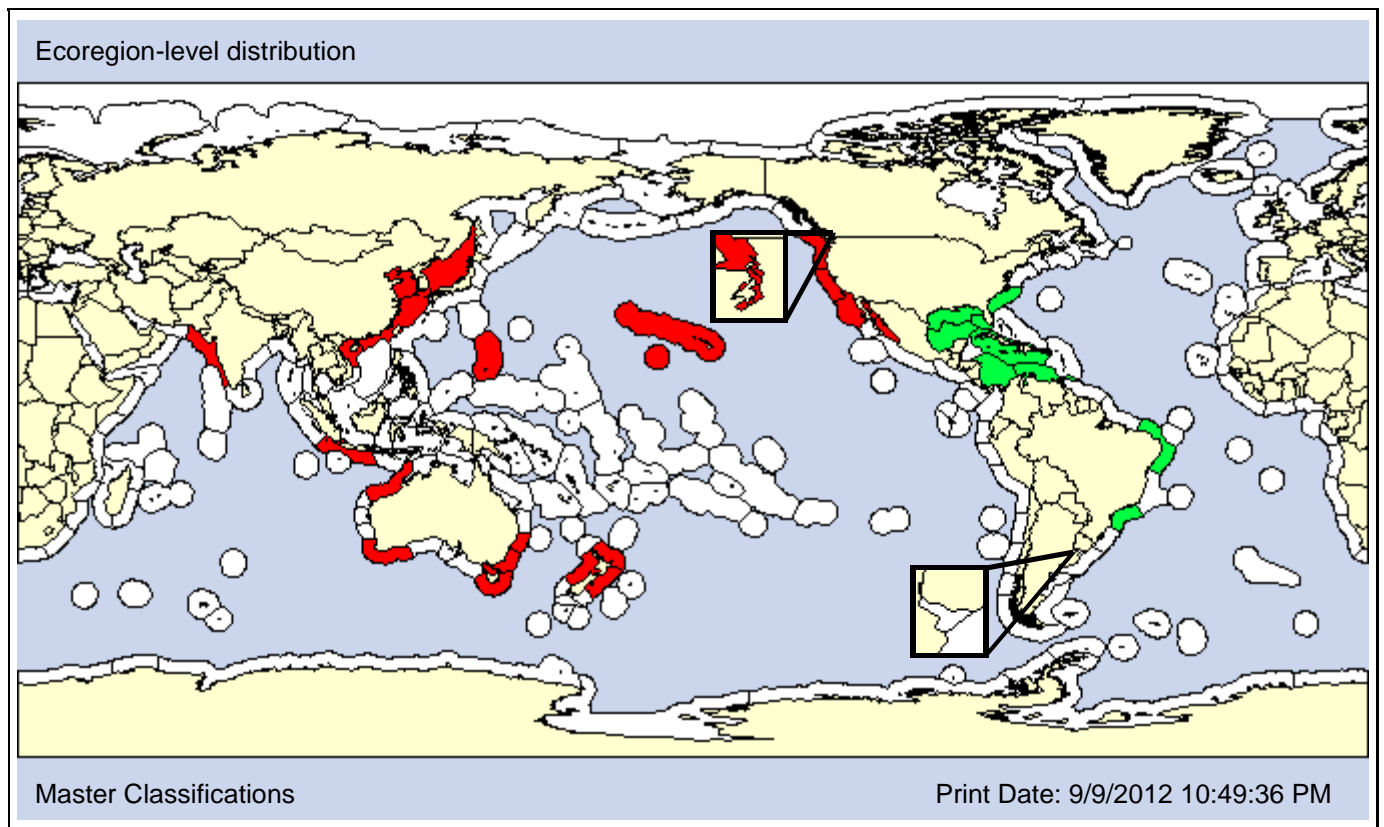
Amathia brasiliensis of authors in part; not Bush, 1886  
Amathia goodei

Misidentified  
Synonym

**Common Names:**

bushy bryozoa  
delicate sheep's-wool bryozoa

**Type Locality:** Bahia, Brazil



**Date 1st record:** Unknown 1935 1925  
**Loc 1st record:** Unknown Kaneohe Bay, Hawaii Puget Sound, WA  
**Established:** Yes Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments: Fehlaue-Ale et al. (2011) removed *Amathia brasiliensis* from synonymy with *A. distans*, which confounds their distributions. We tentatively consider both species native to the western Atlantic, as does Cranfield et al., 1998a, and thus introduced in the Pacific. We note that CANOD (2009) considers it cryptogenic in the NEP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 145m] [Pref: 0 - 5.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>					<b>O</b>	<b>P</b>		<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY [Pref: 30 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Bryozoan

**Taxonomic Author:** van Beneden, 1845

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ctenostomatida

**Suborder:** Carnosa

**Infraorder:**

**Superfamily:** Paludicelloidea

**Family:** Nolellidae

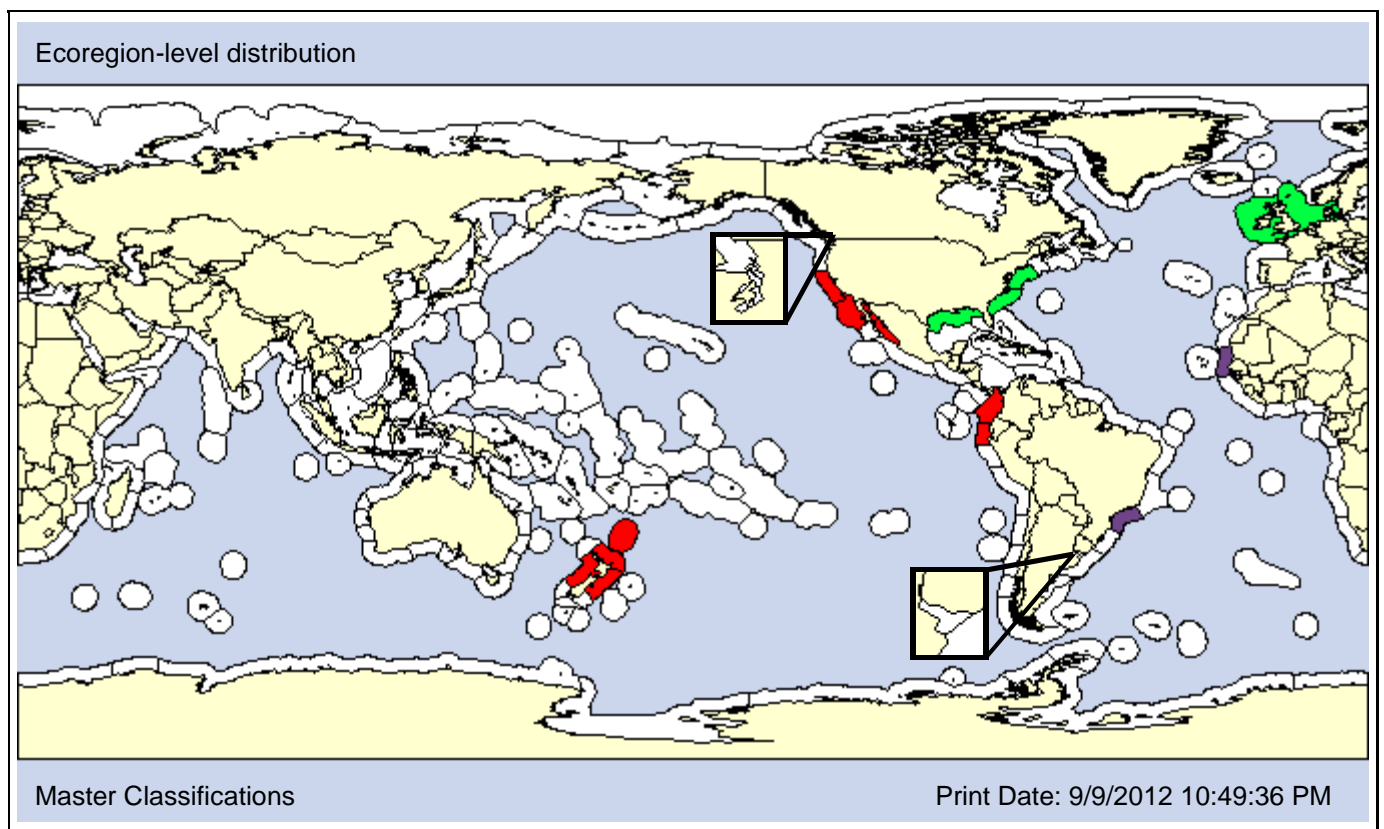
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Anquinella palmata	Synonym	ambiguous bryozoan

**Type Locality:**



**Date 1st record:**

1953

**Loc 1st record:**

Newport Harbor, California

**Established:**

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P				
		X				AO X	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X	X	

**DEPTH [Obs: 0 - 45m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

R P	HP	Biogenic O						Artificial Substrate P						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O									P	O	P	

**SALINITY [Obs: 13 - 32psu] [Pref: 30 - psu]**

Fresh	Brackish O						Marine P		Hyper
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
			O	O	O				

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual X				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
				LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic X			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

**Taxon:** Bryozoa

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Electridae

**Subfamily:**

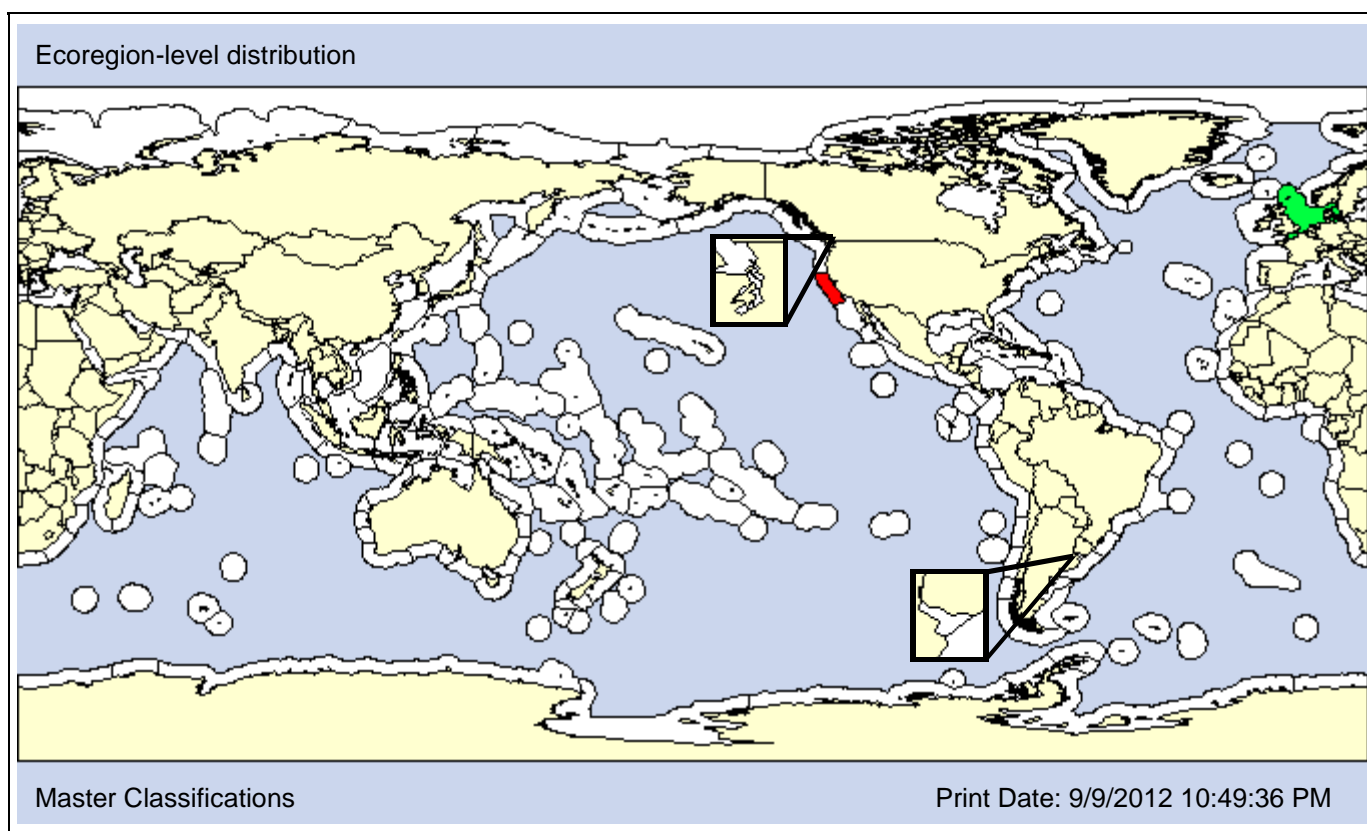
**Also Known As (Name - Type):**

Aspidelectra melolontha of NEP authors  
Aspidelectra sp. (Cohen and Carlton 1995)

Synonym  
Synonym

**Common Names:**

**Type Locality:** California, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

**Date 1st record:** 1970s  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Crooks et al. (2011) classify *Aspidelectra cf. melolontha* as “Cryptogenic (Probable exotic)” in the San Francisco Estuary. We classify it as NIS in the NEP since this genus only appears to occur in San Francisco. The base species, *Aspidelectra melolontha*, is native to the North Sea.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

# Bowerbankia gracilis Cmplx

Species ID: 107

**Taxon:** Bryozoa

**Taxonomic Author:** Leidy, 1855

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ctenostomatida

**Suborder:** Carnosa

**Infraorder:**

**Superfamily:** Vesicularioidea

**Family:** Vesiculariidae

**Subfamily:**

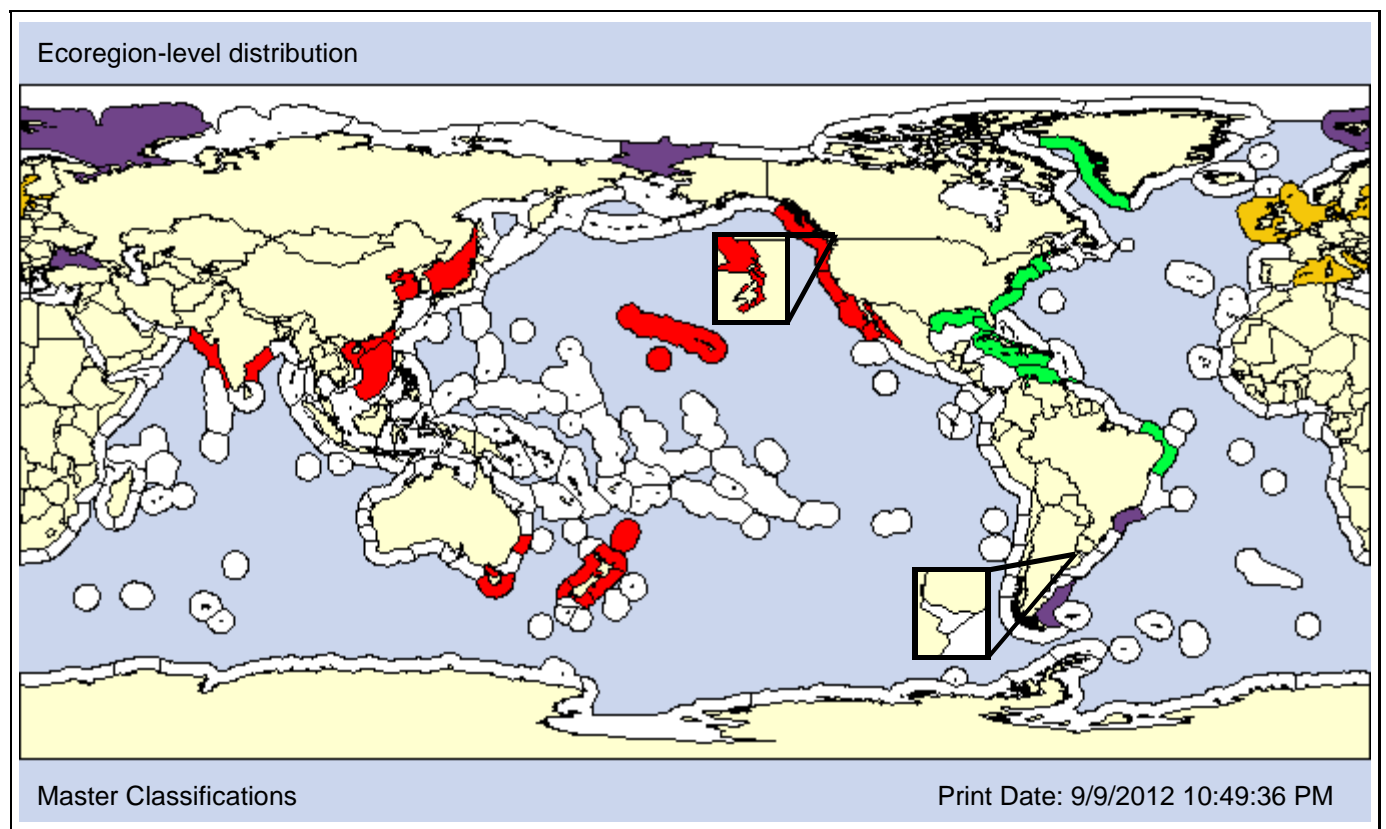
**Also Known As (Name - Type):**

Bowerbankia ?gracilis	Ambiguous syn.
Bowerbankia caudata	Ambiguous syn.
Bowerbankia gracilis	Ambiguous syn.
Bowerbankia gracilis aggregata	Ambiguous syn.

**Common Names:**

creeping bryozoan
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**Type Locality:** New Jersey, USA



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** Unknown

1966

1923

**Loc 1st record:** Unknown

Oahu, Hawaii

Unknown

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P		<b>X</b>		
		<b>X</b>				<b>AO X</b>	PO								

Comments: Bowerbankia gracilis is likely a species complex. Nonetheless we follow McCann et al. (2007) and tentatively classify it as native in the NWA and introduced in the Pacific, recognizing it may not be the same species in all regions. Carlton and Eldredge (2009) list "Bowerbankia sp., cf. gracilis" as introduced in Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated X			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
		<b>X</b>										

**DEPTH [Obs: 0 - 90m] [Pref: 7 - 13m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 57%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>								<b>Artificial Substrate P</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>				<b>O</b>		<b>P</b>			<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 5.4 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoa

**Taxonomic Author:** (Adams, 1798)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ctenostomatida

**Suborder:** Carnosa

**Infraorder:**

**Superfamily:** Vesicularioidea

**Family:** Vesiculariidae

**Subfamily:**

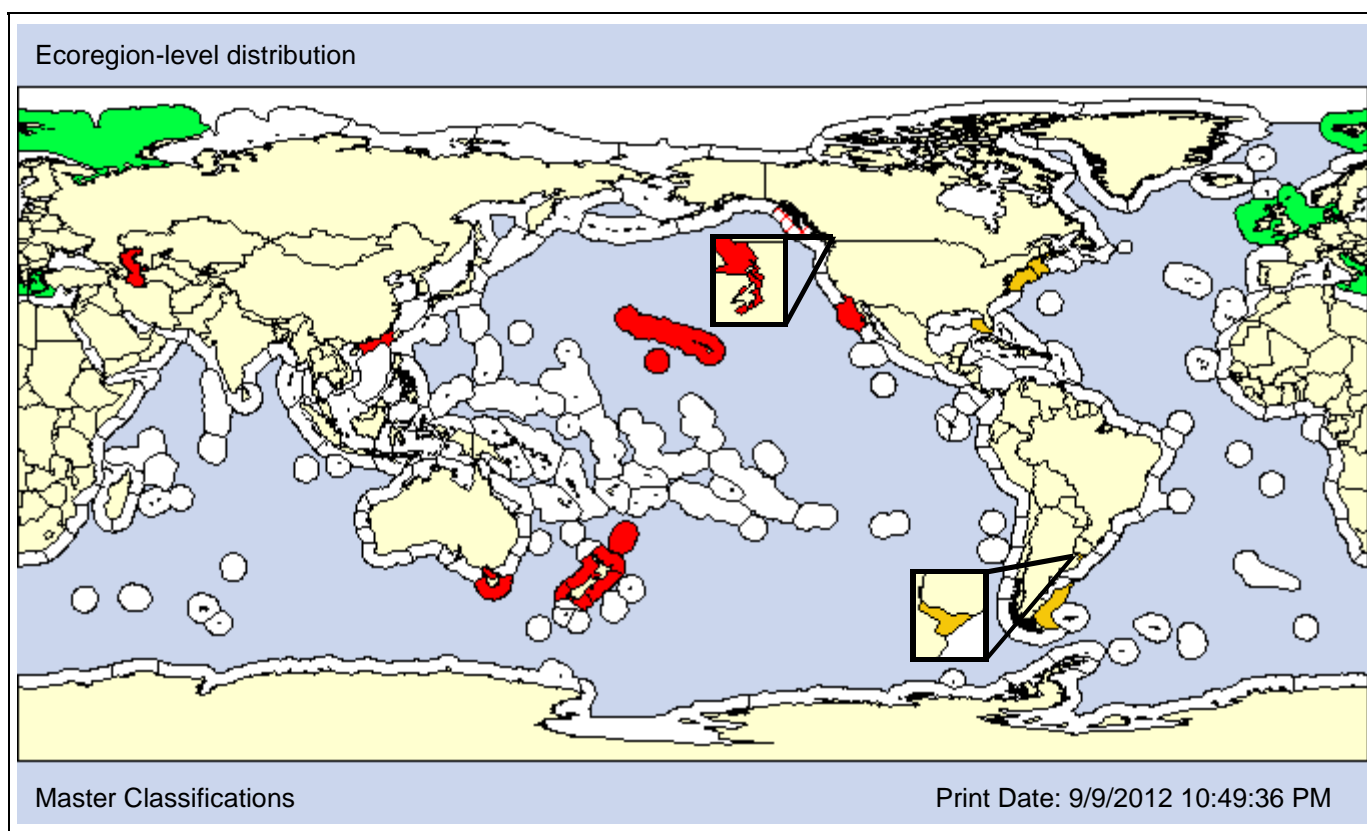
**Also Known As (Name - Type):**

Bowerbankia cf. imbricata  
Bowerbankia imbricate  
Sertularia imbricata

Ambiguous syn.  
Misspelling  
Synonym

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1966 (NWP) <1953 (Hawaii)  
**Loc 1st record:** Oahu, Hawaii (NWP) Alaska and Puget Sound (Hawaii)  
**Established:** Yes (NWP) Yes (Hawaii)

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	PO								

Comments: *Bowerbankia imbricata* is not listed as introduced in Europe or the Mediterranean (e.g., Olenin and Didžiulis, 2009; Zenetos et al., 2010). We tentatively list it as native in these regions and introduced in the Pacific. The Hawaiian form is listed as “*Bowerbankia cf. imbricata*” by Carlton and Eldredge (2009) and may be a different species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 150m] [Pref: - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>				<b>P</b>	<b>O</b>					<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Bryozoan

**Taxonomic Author:** Robertson, 1905

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

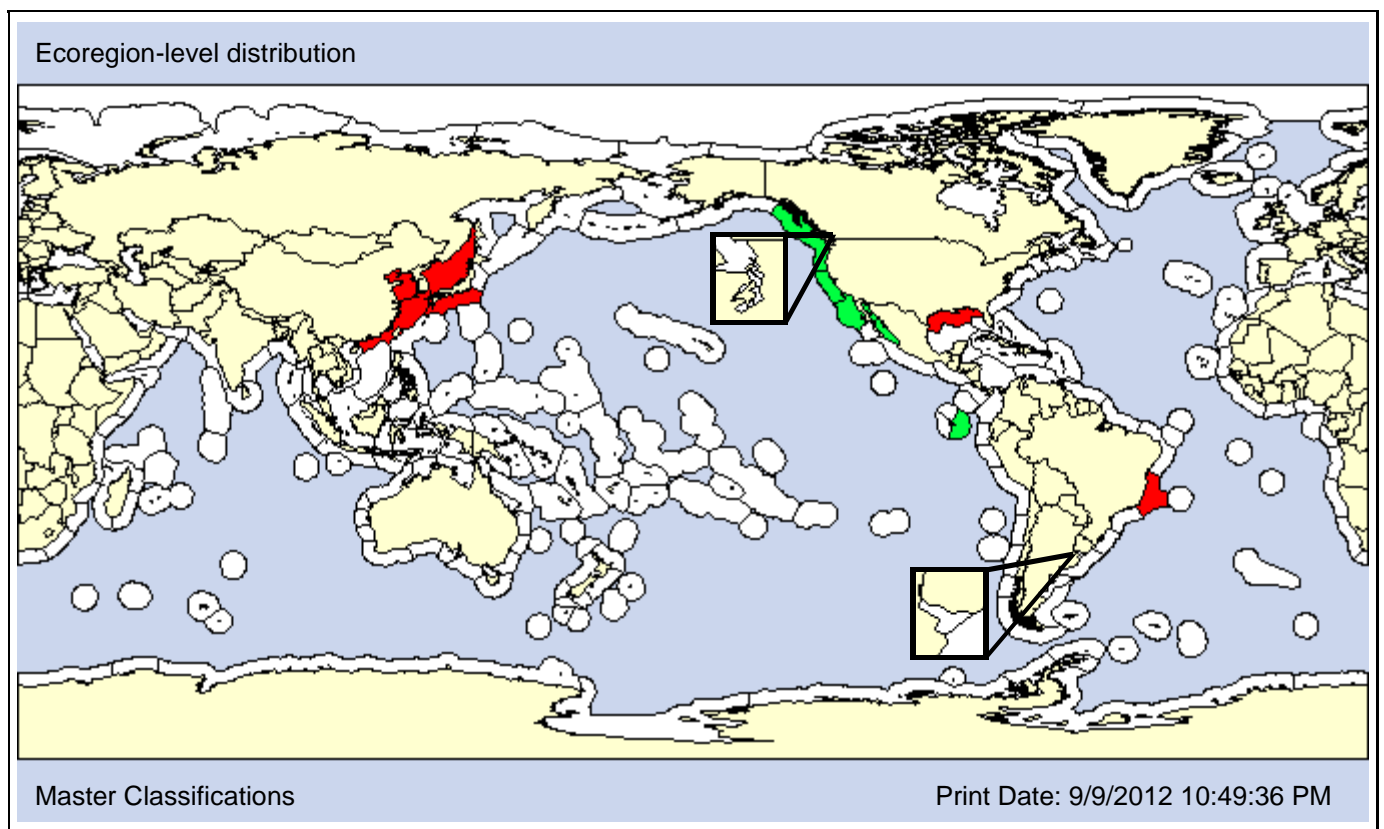
**Family:** Bugulidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1980s

Native

**Loc 1st record:** Korea

Native

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				
<b>X</b>		<b>X</b>				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: - 70m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													P	

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						P			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Bryozoan

**Taxonomic Author:** (Lamouroux, 1816)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Bugulidae

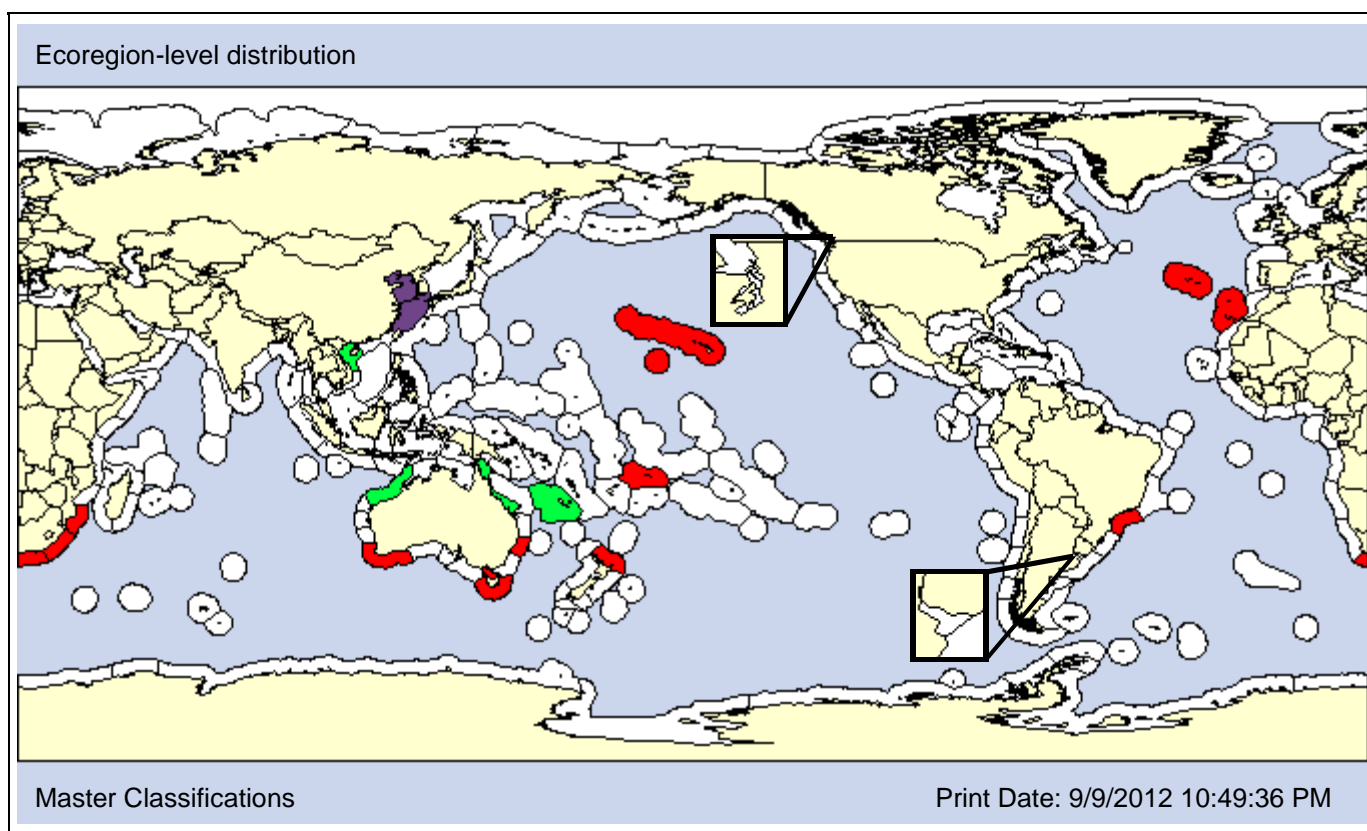
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Acamarchis dentata	Synonym	
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown 1997  
**Loc 1st record:** Unknown Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: While Carlton and Eldredge (2009) state that the native region for *Bugula dentata* is unknown, Mead et al. (2011) state that its origin is the Indo-Pacific. Thus we classify it as native in the Central Indo-Pacific, introduced in southern Australia (Pollard and Pethebridge, 2002b) and Atlantic, and unclassified in the NWP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 4 - 54m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>										<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoan

**Taxonomic Author:** (Thompson in Gray, 1848)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Bugulidae

**Subfamily:**

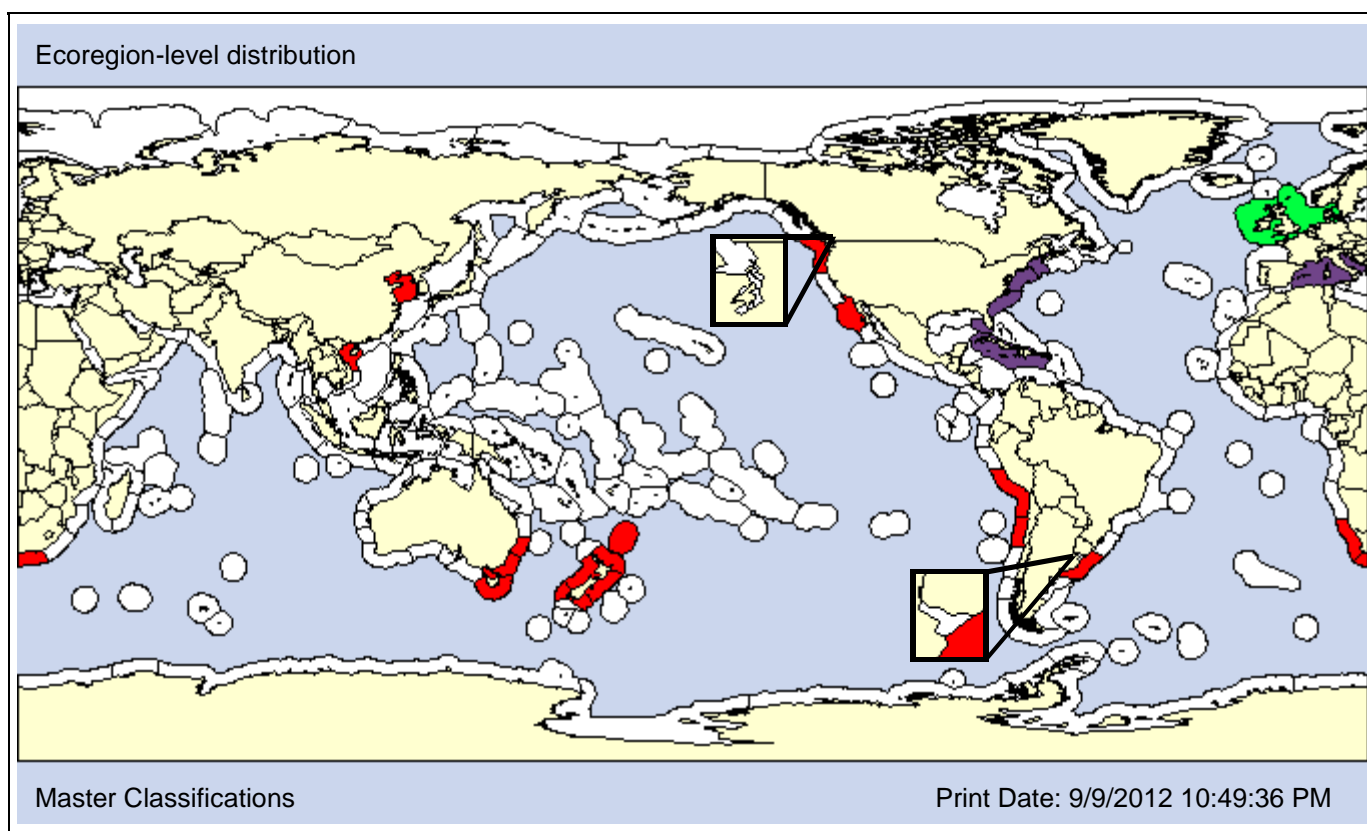
**Also Known As (Name - Type):**

**Common Names:**

Avicella mediterranea  
Avicularia flabellata  
Flustra avicularis

Synonym  
Synonym  
Synonym

**Type Locality:**



**Date 1st record:** Unknown

1905

**Loc 1st record:** Unknown

San Diego Bay, CA

**Established:** Yes

Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Following Inglis et al. (2008b), we classify *Bugula flabellata* as native in the British Isles and North Sea. Based on this classification, we classify it as NIS in the Southern Atlantic and Pacific while Mead et al. (2011) classifies it as introduced in South Africa. Embryos of *B. flabellata* receive nutrition while being brooded.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	X
		X											

**DEPTH [Obs: 0 - 128m] [Pref: 9 - 21m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		

**CONSOLIDATED SUBSTRATE X**

R P	HP	Biogenic O						Artificial Substrate P						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							O					P	O	

**SALINITY [Pref: 35 - psu]**

Fresh	Brackish P						Marine P		Hyper
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						P			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual X				
H X		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		
	X				X					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X		FR	SD	SP
X				LP-B	LP-P X			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic X			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	
						X							

**Taxon:** Bryozoan

**Taxonomic Author:** Ryland, 1960

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Bugulidae

**Subfamily:**

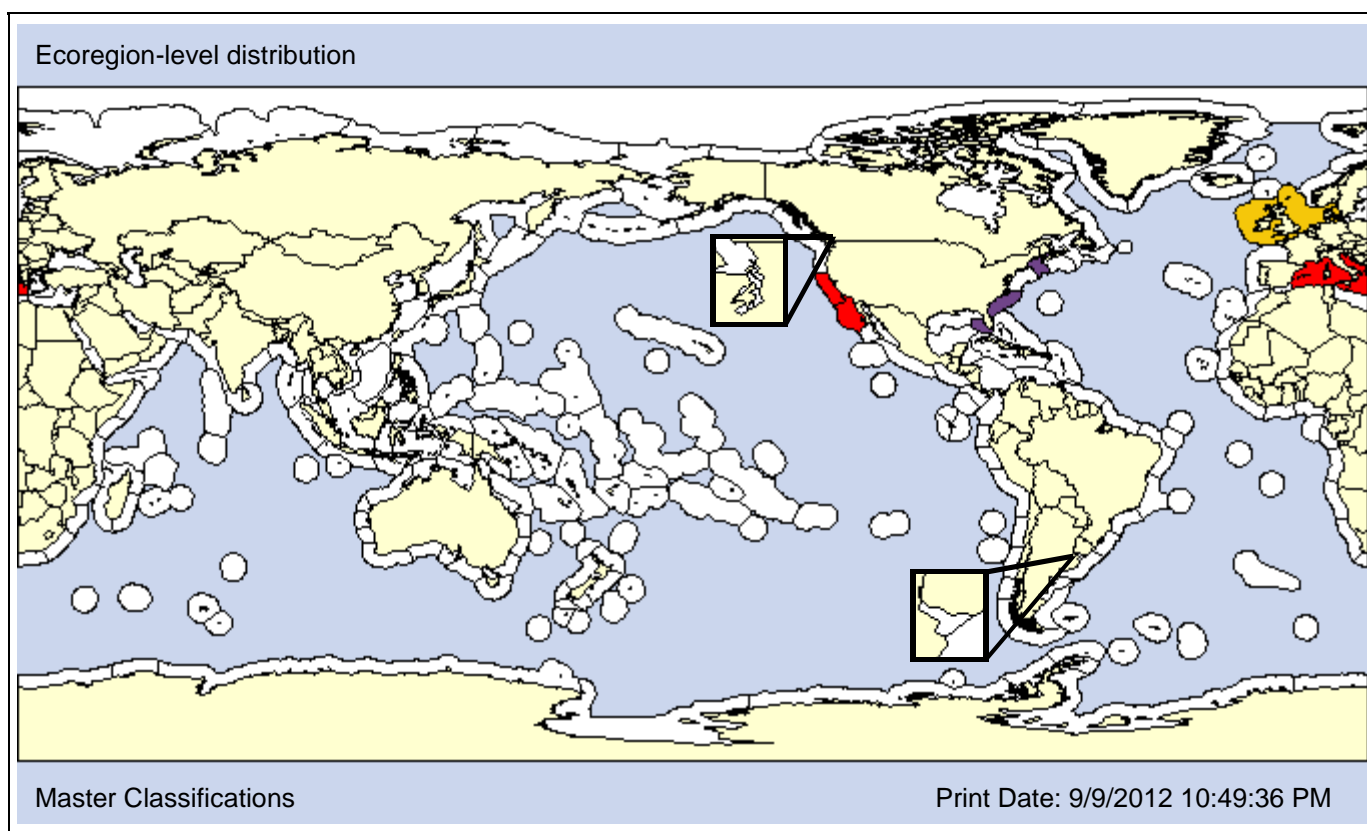
**Also Known As (Name - Type):**

Bugula ditrupa of Marcus, 1937; not Busk, 1858

Misidentified

**Common Names:**

**Type Locality:**



**Date 1st record:**

2003

**Loc 1st record:**

Monterey Bay, California

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: The native region of *Bugula fulva* is unknown; but it is considered introduced in the NEP (deRivera et al., 2007) and Mediterranean (Zenetos et al., 2010) and cryptogenic in the Northeast Atlantic (Olenin and Didžiulis, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: 0 - 77m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										O		O	O	

**SALINITY [Obs: - 36.5psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	O	
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X		LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							



**Taxon:** Bryozoa

**Taxonomic Author:** Norman, 1909

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Bugulidae

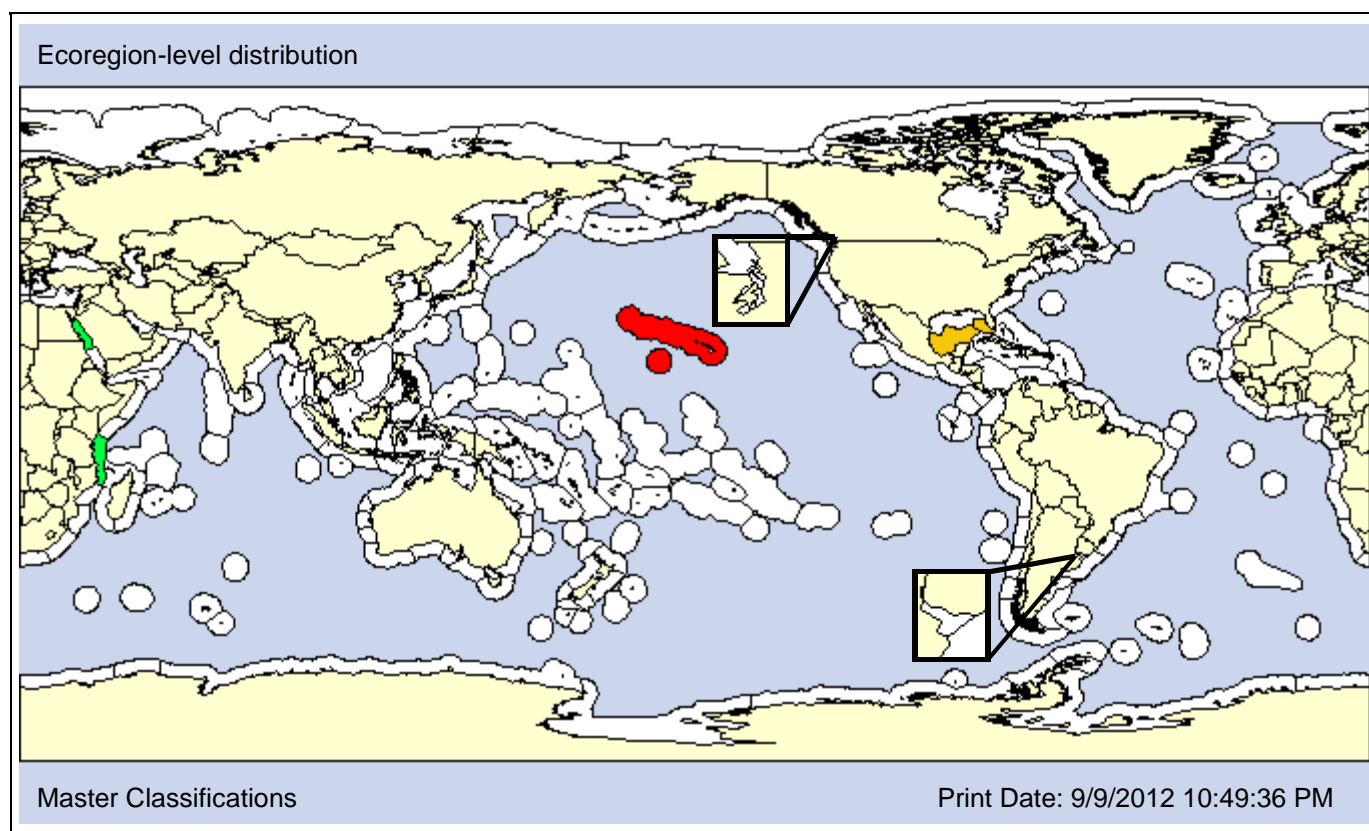
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Bugula robusta of Hawaiian authors	Synonym	
------------------------------------	---------	--

**Type Locality:** Red Sea (neotype)



■ Native
 ■ Nonindigenous
   NIS Not Established
 ■ Cryptogenic
 ■ Transient
 ■ Unclassified
 ■ Conflicting Classification
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1996  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: Based on Winston and Woollacott's (2008) revision of Bugula, we consider B. minima an Indian Ocean species. The records from the Atlantic are classified as cryptogenic until they can be evaluated against the Winston and Woollacott revision.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

Unconsolidated						Consolidated X						Pelagic	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		X		X	

**DEPTH [Obs: - 18m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

R	HP	Biogenic O						Artificial Substrate O						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O											O	

**SALINITY**

Fresh	Brackish O						Marine O		Hyper
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual X				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
				LP-B	LP-P				

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic X			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

**Taxon:** Bryozoa

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Bugulidae

**Subfamily:**

**Also Known As (Name - Type):**

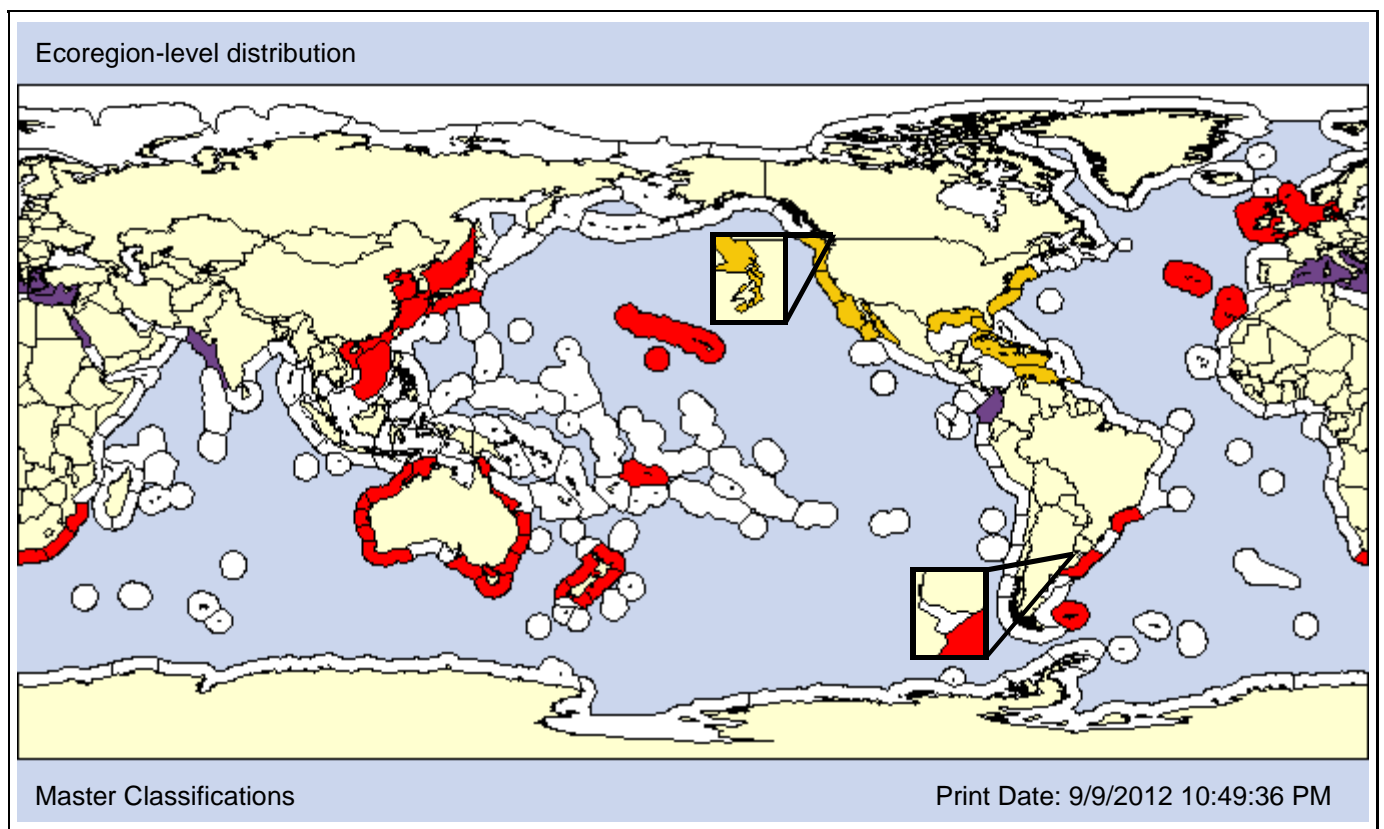
Anamarchis neritina  
Bugula neritina  
Bugula neritina complex  
Cellularia neritina

Ambiguous syn.  
Ambiguous syn.  
Convention  
Ambiguous syn.

**Common Names:**

brown bryozoan  
common bugula

**Type Locality:**



<b>Date 1st record:</b> Unknown	1921	1905
<b>Loc 1st record:</b> Unknown	Pearl Harbor, Oahu, Hawaii	Monterey Bay, California
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
	<b>X</b>	<b>X</b>				<b>AO X</b>	<b>PO X</b>								

Comments: Bugula neritina is a species complex consisting of at least three cryptic species (Mackie et al., 2006). We use regional classifications when available to show current thinking about its distribution, recognizing that several of these populations probably consist of different species and/or mixes of species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 320m] [Pref: 0 - 5m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 82.7 - 82.7%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>O</b>	<b>P</b>	<b>O</b>		<b>P</b>	<b>P</b>	

**SALINITY [Obs: 14 - 36psu] [Pref: 18 - 36psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>
			<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		
<b>X</b>					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
<b>X</b>				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoan

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

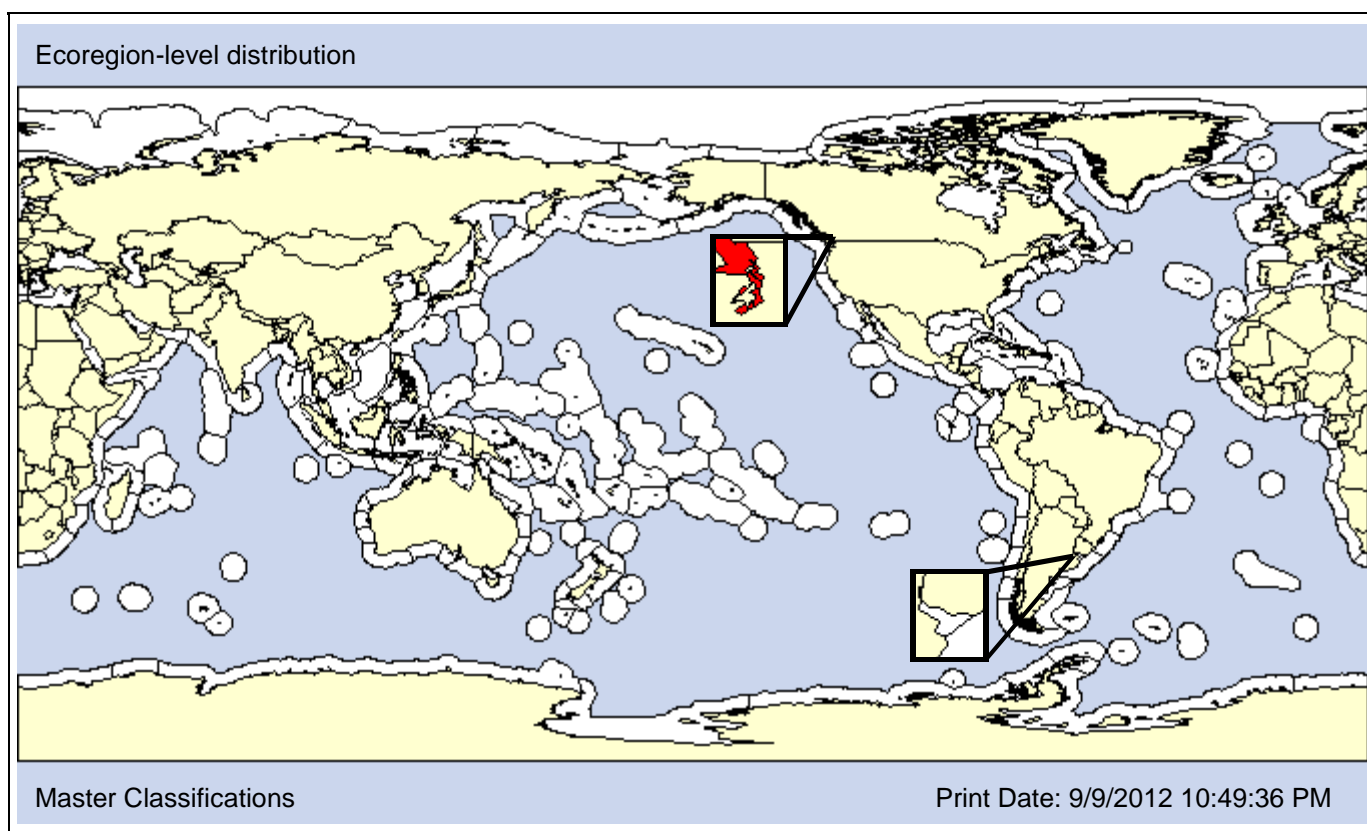
**Family:** Bugulidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Washington, USA



**Date 1st record:**

1993

**Loc 1st record:**

Puget Sound, WA

**Established:**

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Bugula sp. 1* of Cohen et al. (1998) resembles *B. turbinata*, a northeast Atlantic species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>O</b>		

**SALINITY [Obs: 29 - 34psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Bryozoan

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Bugulidae

**Subfamily:**

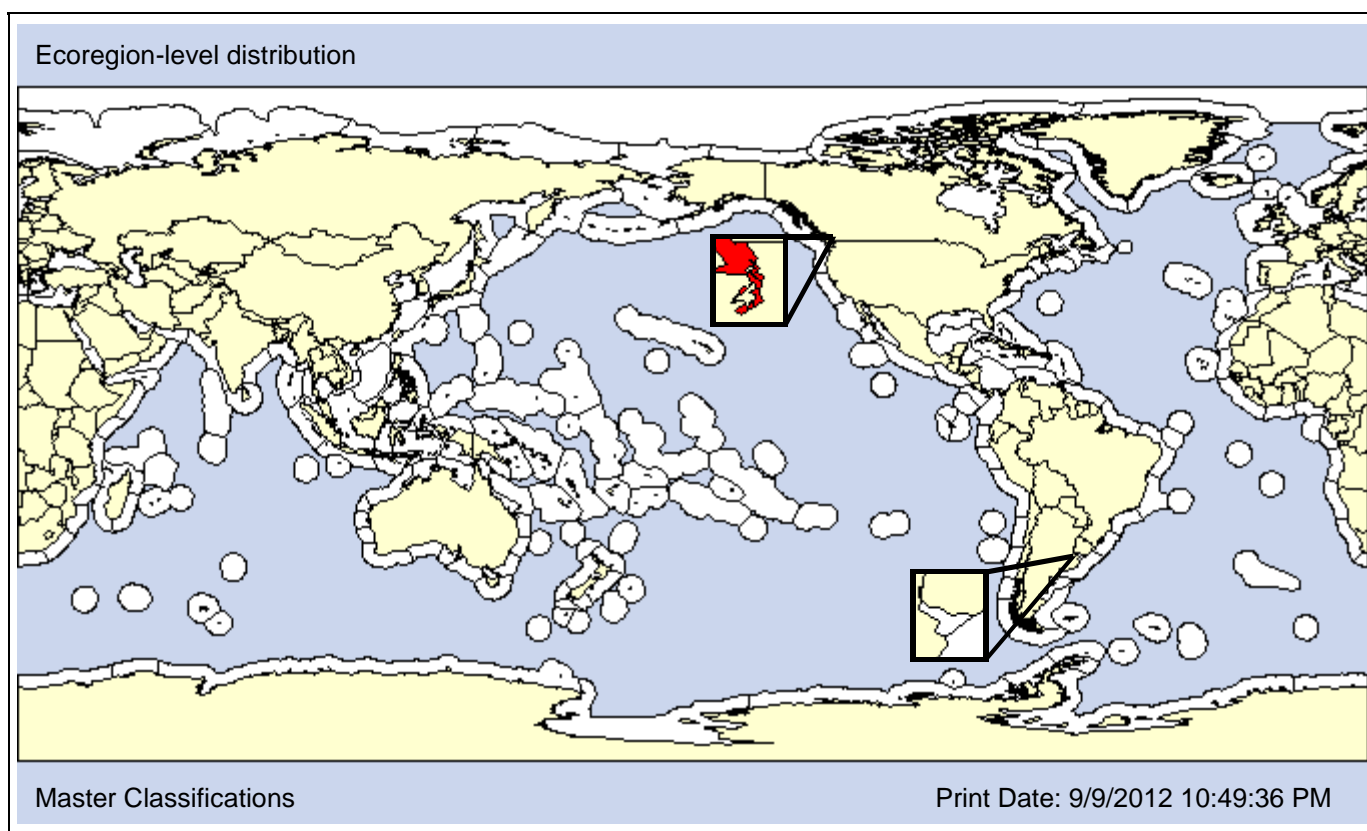
**Also Known As (Name - Type):**

**Common Names:**

[Empty box for Also Known As (Name - Type)]

[Empty box for Common Names]

**Type Locality:** Washington, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1998

**Loc 1st record:**

Puget Sound, WA

**Established:**

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Bugula sp. 2* of Cohen et al. (1998) resembles *B. fulva*, a North Atlantic species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>								<b>Artificial Substrate O</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												O		

**SALINITY [Obs: 29 - 34psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							



**Taxon:** Bryozoan

**Taxonomic Author:** Ryland, 1960

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Bugulidae

**Subfamily:**

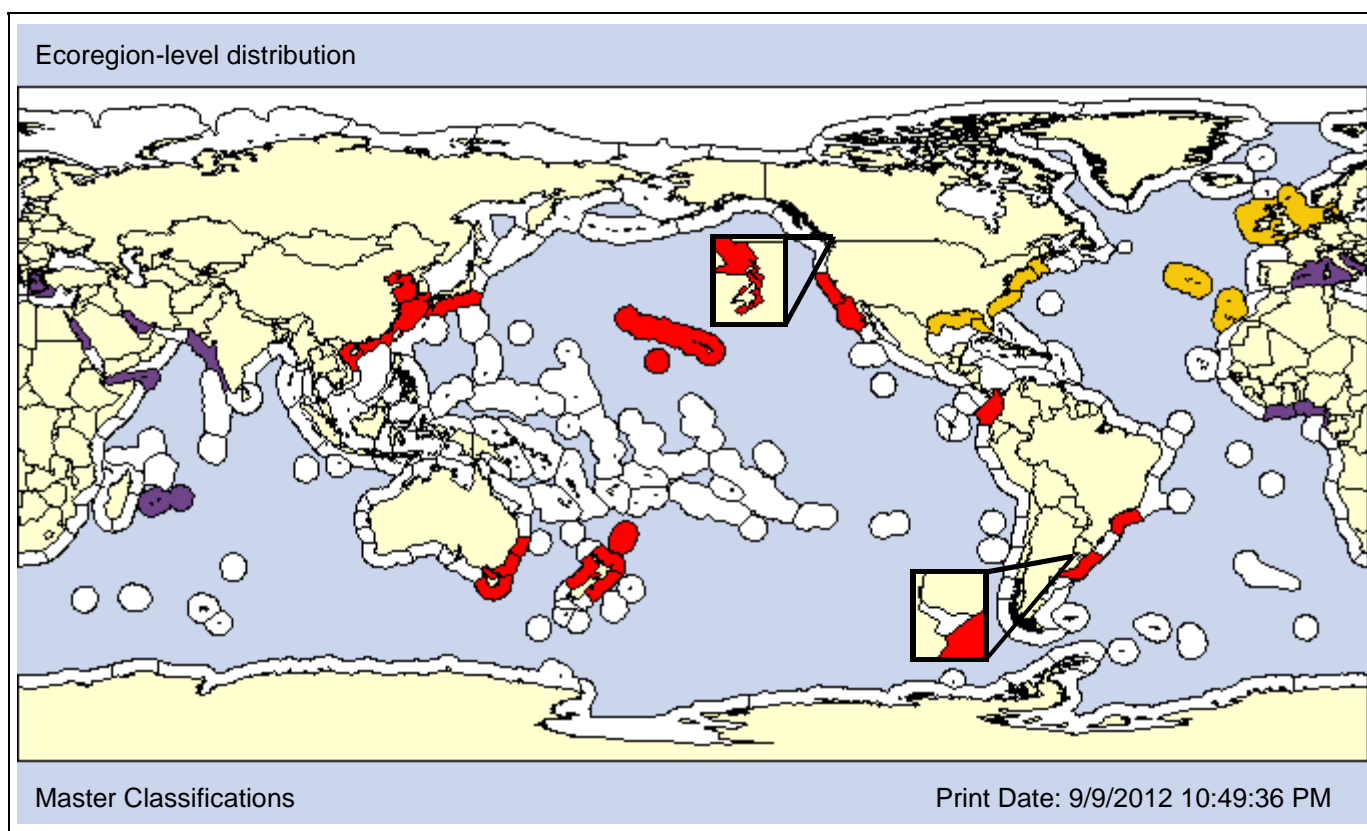
**Also Known As (Name - Type):**

Bugula californica of authors

Misidentified

**Common Names:**

**Type Locality:** Swansea, Wales



**NWP**

**Hawaii**

**NEP**

**Date 1st record:** 1997

1935

1972

**Loc 1st record:** Port of Nagoya, Japan

Kaneohe Bay, Hawaii

Newport Bay, California

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	PO								

Comments: The native region for *Bugula stolonifera* is unknown, though it is considered an Atlantic species by Soule et al. (2007). We follow regional designations and classify it as NIS in the Pacific and Southwest Atlantic, cryptogenic in the NWA and the Atlantic coast of Europe, and unknown elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 68m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>						<b>P</b>			<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>

**SALINITY [Obs: 20 - 37psu] [Pref: - 26psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoan

**Taxonomic Author:** (Audouin, 1826)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Neocheilostomatina

**Infraorder:** Flustrina

**Superfamily:** Buguloidea

**Family:** Candidae

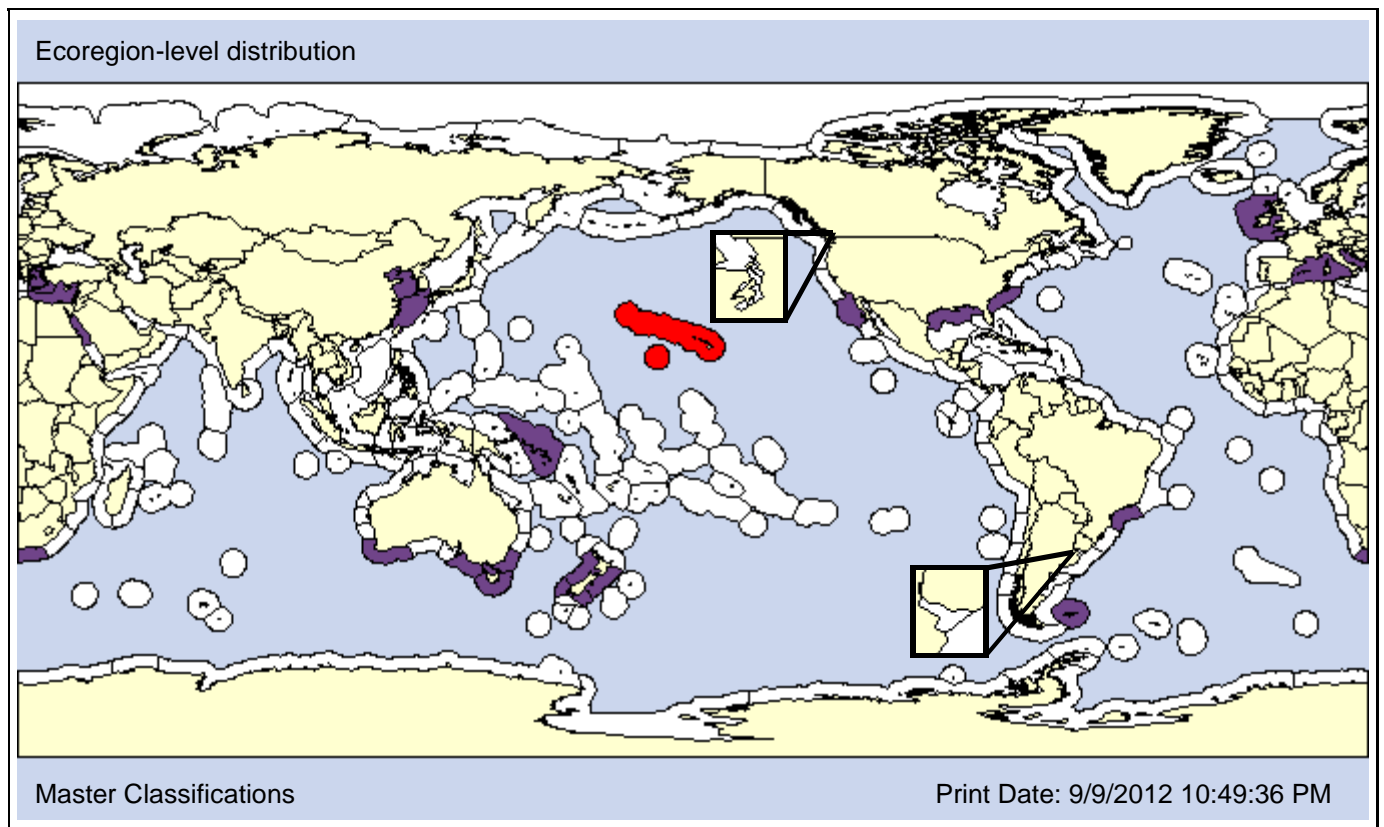
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Caberia boryi	Misspelling	
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**Type Locality:** Red Sea



**Date 1st record:** Unknown

1966

1889

**Loc 1st record:** Unknown

Kaneohe Bay, Hawaii

Southern California

**Established:** Yes

Yes

Unknown

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: The native range of *Caberea boryi* is unknown (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 15 - 100m] [Pref: 20 - 60m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>					<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Bryozoan

**Taxonomic Author:** (Levinsen, 1909)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

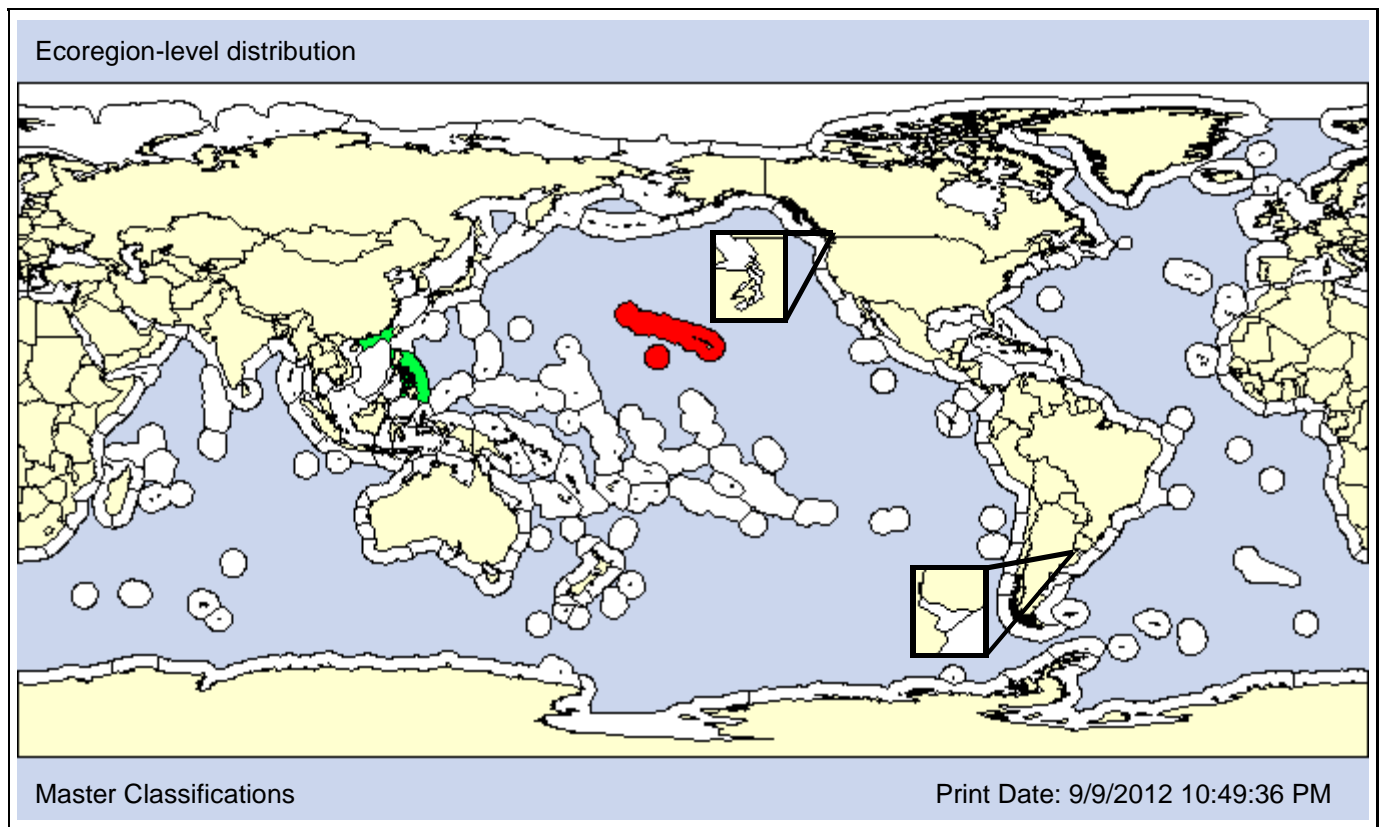
**Family:** Bugulidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1997  
**Loc 1st record:** Honolulu Harbor, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Bryozoa

**Taxonomic Author:** (Waters, 1913)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Bugulidae

**Subfamily:**

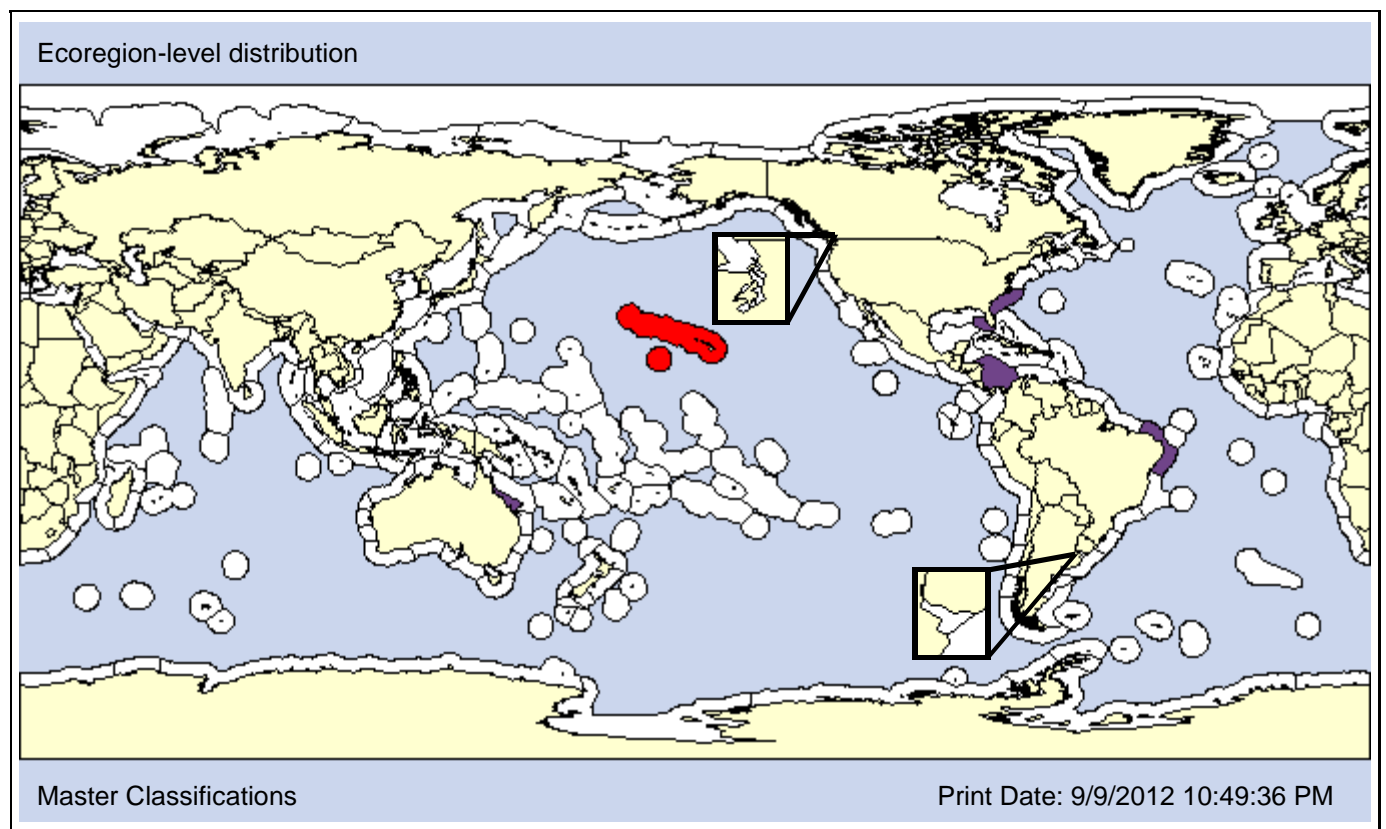
**Also Known As (Name - Type):**

Bugula armata  
 Caulibugula armata of Marcus, 1938  
 Caulibugula armata of Osburn, 1940  
 Stirparia dendrograpta

Synonym  
 Misidentified  
 Misidentified  
 Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:**

1997

**Loc 1st record:**

Honolulu Harbor, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Carlton and Eldredge (2009) list *Caulibugula dendrograpta* as introduced into Hawaii based on its recent discovery (1997) and consider it an Indo-Pacific species. However, it is widely distributed in the Western Atlantic, from Brazil (Lira et al., 2010) to North Carolina (Maturu, 1966). Thus, we list it as unclassified outside of Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		X		X	

**DEPTH [Obs: - 23m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O										P	O	P

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							



**Taxon:** Bryozoa

**Taxonomic Author:** (Canu, 1928)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Malacostegina

**Infraorder:**

**Superfamily:** Membraniporoidea

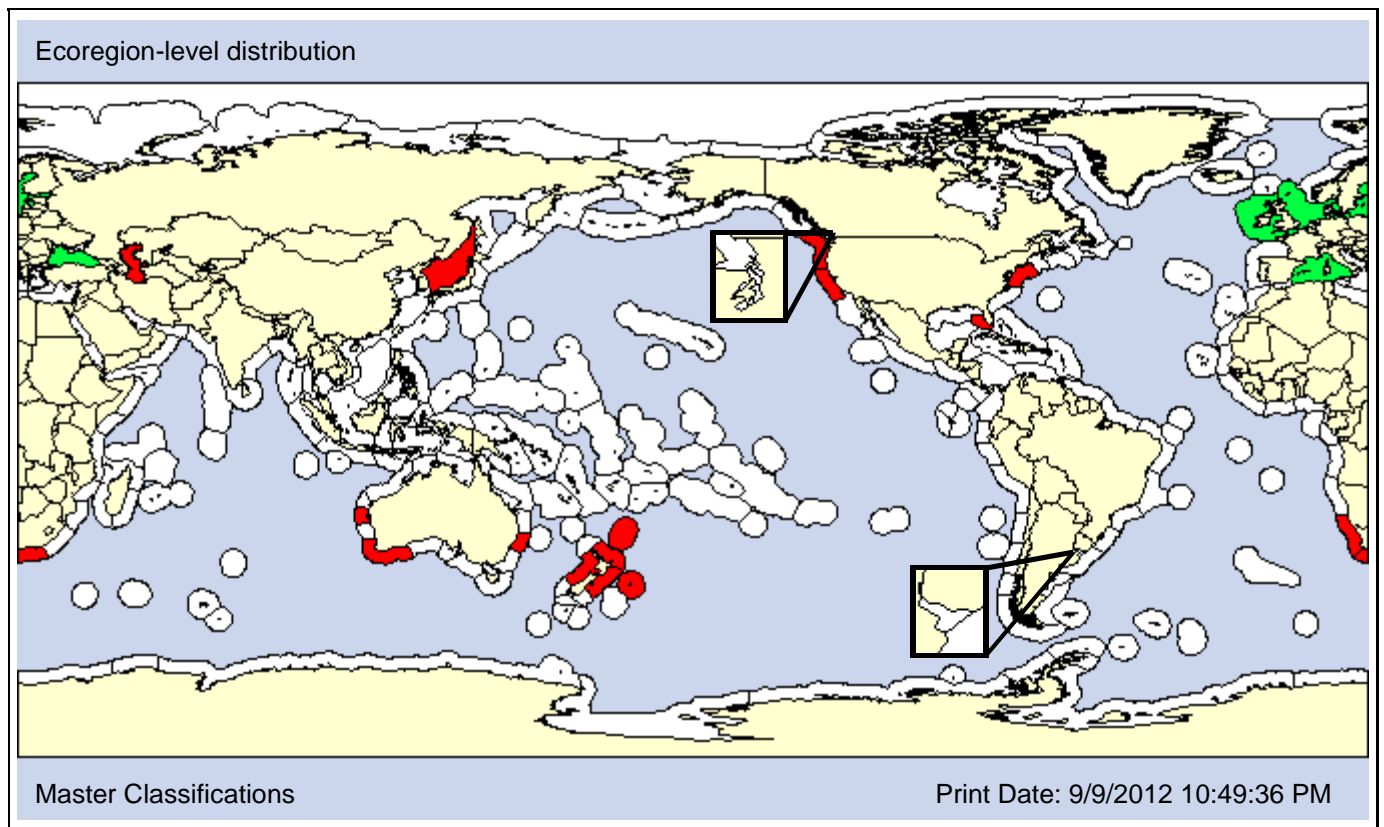
**Family:** Electridae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Tunisia



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		<b>NWP</b>	<b>Hawaii</b>		<b>NEP</b>		

**Date 1st record:** <1975

Unknown

**Loc 1st record:** Peter the Great Bay, Russia

Unknown

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				X
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>P</b>					<b>P</b>			<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>

**SALINITY [Obs: 1 - 40psu] [Pref: 18 - 27.5psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

# Conopeum tenuissimum

Species ID: 1142

**Taxon:** Bryozoa

**Taxonomic Author:** (Canu, 1908)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Malacostegina

**Infraorder:**

**Superfamily:** Membraniporoidea

**Family:** Electridae

**Subfamily:**

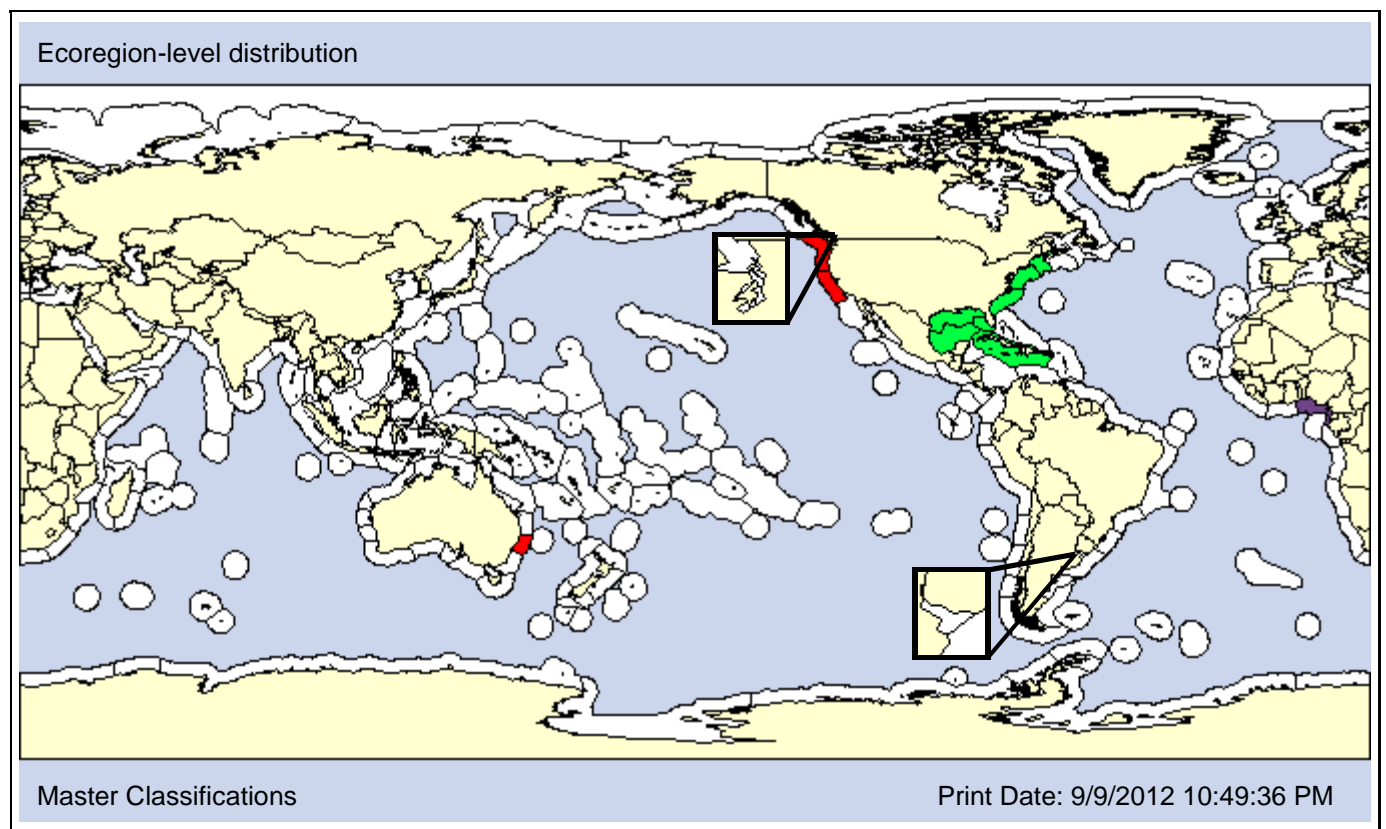
**Also Known As (Name - Type):**

Conopeum commensale of Aldrich, 1961; not Kirkpatrick and	Misidentified
Conopeum commensale of Carlton, 1979; not Kirkpatrick and	Misidentified
Conopeum commensale of Filice, 1959; not Kirkpatrick and	Misidentified
Conopeum reticulum of authors	Misidentified

**Common Names:**

lacy crust bryozoa

**Type Locality:** Pliocene fossils from Argentina



**Date 1st record:**

1951

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			<b>AO X</b>	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 4m] [Pref: 0 - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>O</b>					<b>O</b>				<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 11 - 40psu] [Pref: 18 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoan

**Taxonomic Author:** (Moll, 1803)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

**Family:** Cryptosulidae

**Subfamily:**

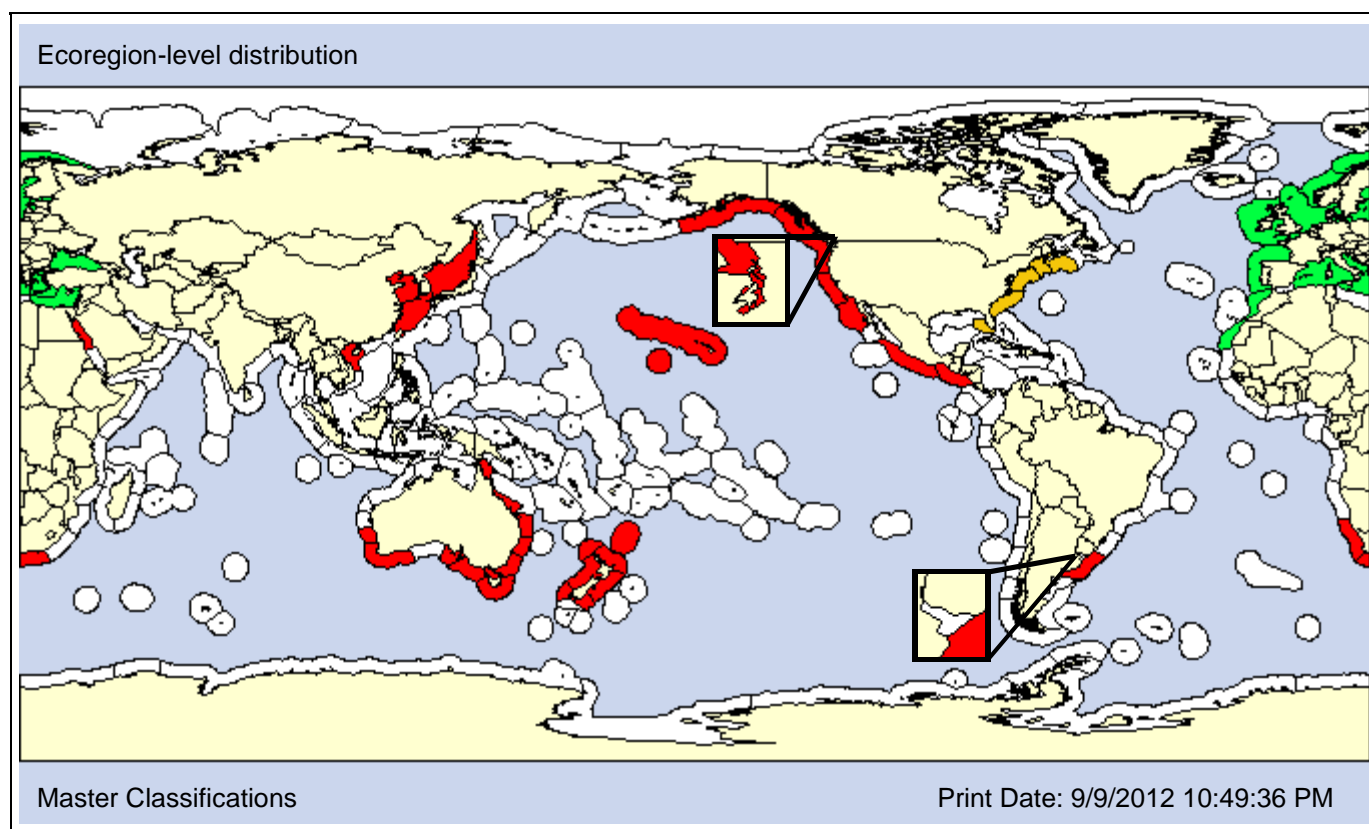
**Also Known As (Name - Type):**

Eschara pallasiana	Synonym
Hippoporia pallasiana	Synonym
Lepralia pallasiana	Synonym

**Common Names:**

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**Type Locality:**



NWP

Hawaii

NEP

**Date 1st record:** Unknown

1966

1943

**Loc 1st record:** Unknown

Kaneohe Bay, Hawaii

Newport Bay, California

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
		X				AO X	PO							

Comments: *Cryptosula pallasiana* has been considered an Atlantic species (Carlton and Eldredge, 2009); however it may be a species complex (Soule et al., 2007). We list it as native to the NEA and Mediterranean, cryptogenic in the NWA, and introduced in the SWA, Pacific, and South Africa, recognizing that these may constitute different species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 60m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>				<b>P</b>	<b>O</b>				<b>P</b>	<b>P</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
<b>X</b>				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoa

**Taxonomic Author:** (Hincks, 1880)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Electridae

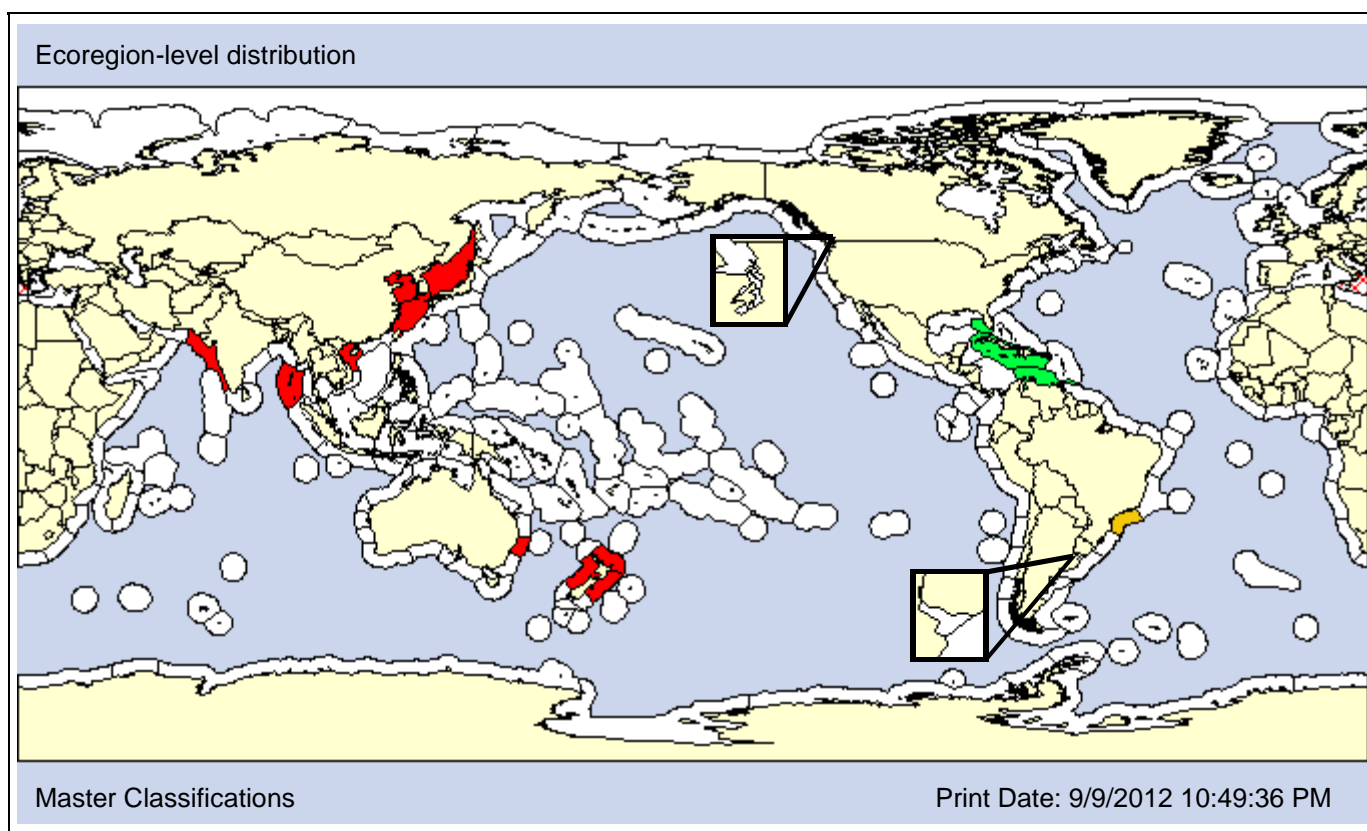
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Membranipora tenella	Synonym	
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**Type Locality:** Atlantic coast of Florida, USA



■ Native  
 ■ Nonindigenous  
   NIS Not Established  
   Cryptogenic  
   Transient  
   Unclassified  
   Conflicting Classification  
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1952

**Loc 1st record:** Japan

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
X		X			AO	PO									

Comments: Classification of *Electra tenella* assumes that it is native to the NWA and Caribbean, though this is not certain. Transport on floating plastics may be an important vector in the transport of *E. tenella*. Some of the reports of *E. tenella* in New Zealand may be the native *E. angulata*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 10 - 18m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>P</b>				<b>O</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 27 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>



**Taxon:** Bryozoa

**Taxonomic Author:** (Macgillivray, 1860)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

**Family:** Exochellidae

**Subfamily:**

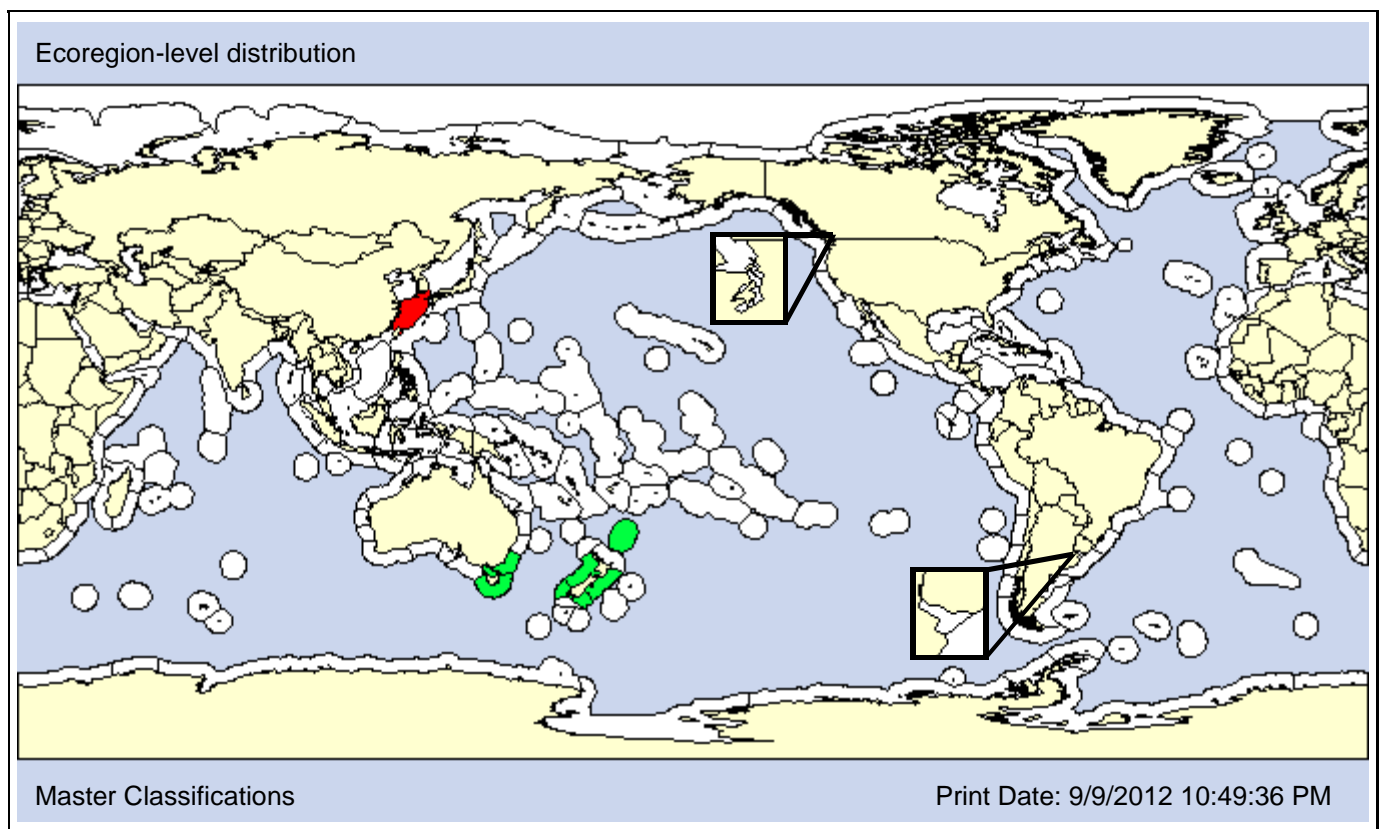
**Also Known As (Name - Type):**

Escharoides excavate	Misspelling
Escharoides sauroglossa	Synonym
Lepralia excavata	Synonym
Smittina foliaceana	Synonym

**Common Names:**

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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1980

**Loc 1st record:** Sangju, Korea

**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

# Hippopodina tahitiensis

Species ID: 170019

**Taxon:** Bryozoa

**Taxonomic Author:** (Leca & d'Hondt, 1993)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Neocheilostomatina

**Infraorder:** Ascophora

**Superfamily:** Schizoporelloidea

**Family:** Hippopodinidae

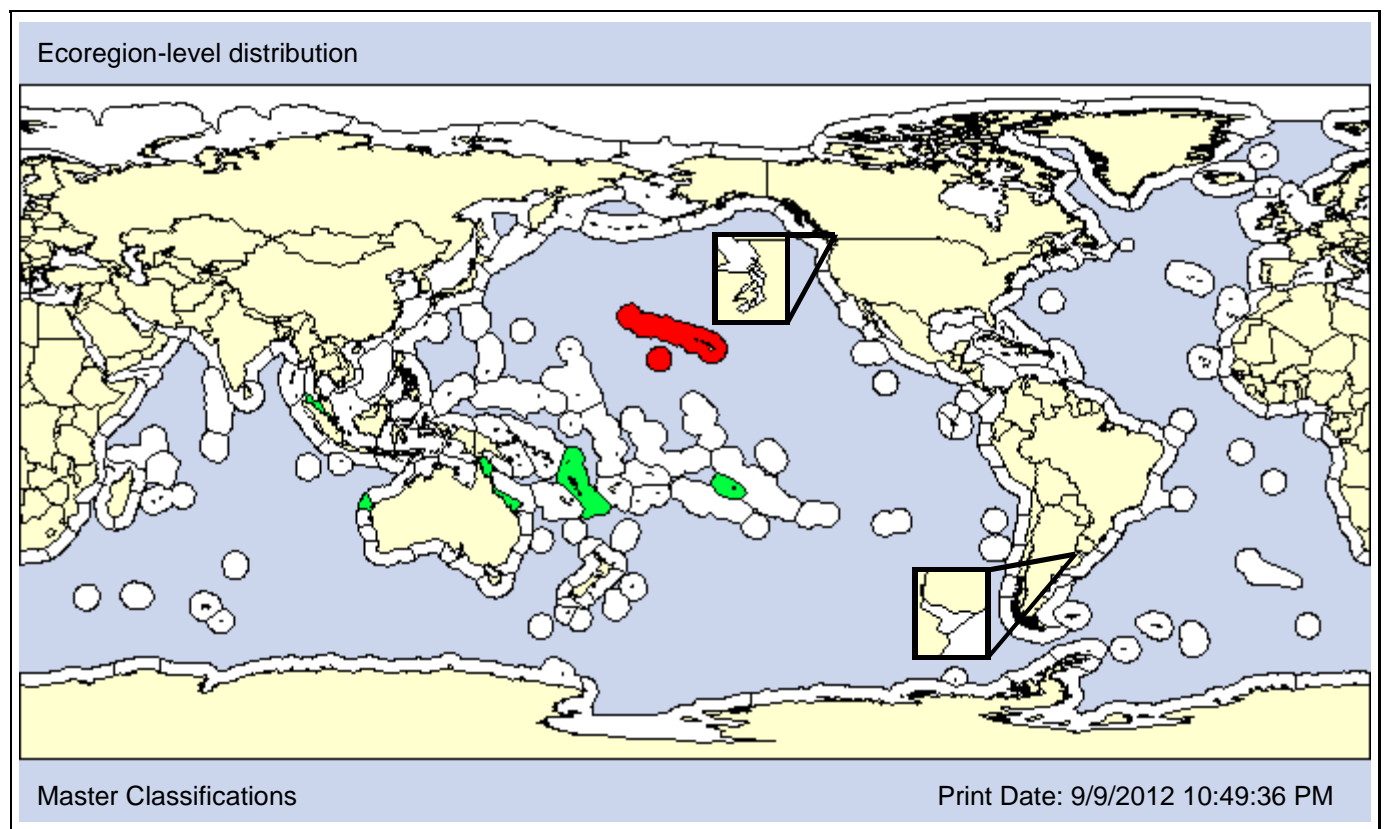
**Subfamily:**

**Also Known As (Name - Type):**

Hippopodina feegeensis of Hawaiian authors, not of Busk, 1  
Hippopodina viriosa Misidentified  
Synonym

**Common Names:**

**Type Locality:** French Polynesia



**Date 1st record:**

1948

**Loc 1st record:**

Honolulu Harbor, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Hippopodina tahitiensis is a wide-spread species, including reports from Africa, India and Columbia (Tilbrook et al., 2001).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		X		X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O											O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

# Membranipora chesapeakensis

Species ID: 101883

**Taxon:** Bryozoan

**Taxonomic Author:** Banta, Perez, & Santagata, 1995

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Membraniporidae

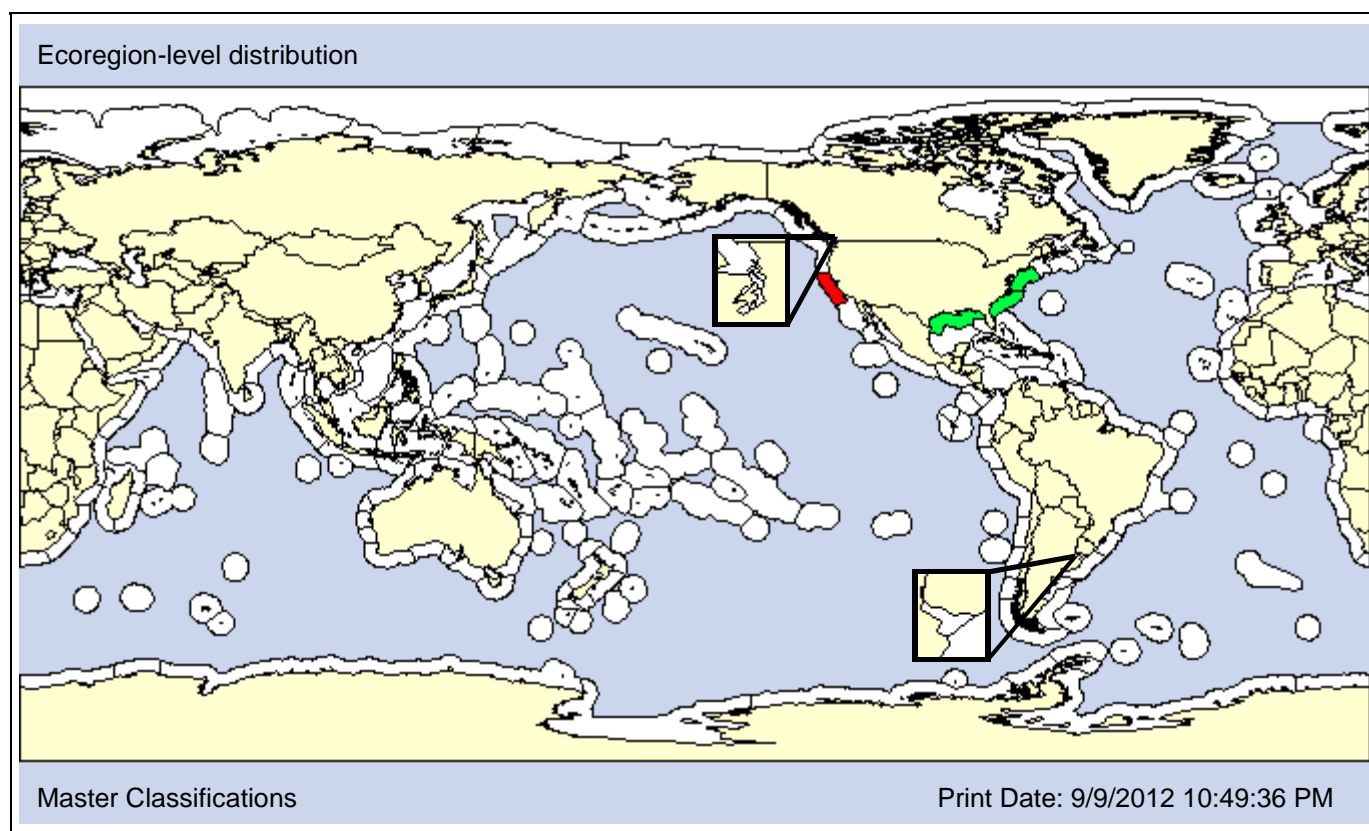
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Conopeum chesapeakensis	Synonym	
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**Type Locality:** Chesapeake Bay, Maryland, USA



**Date 1st record:**

about 2000

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

## VECTORS

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

Unconsolidated						Consolidated <b>X</b>						Pelagic	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE **X****

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE **X****

<b>R P</b>	<b>HP</b>	Biogenic						Artificial Substrate <b>P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish <b>P</b></b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual <b>X</b></b>						<b>Asexual <b>X</b></b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic <b>X</b></b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

# Membraniporopsis tubigerum

Species ID: 101864

**Taxon:** Bryozoan

**Taxonomic Author:** (Osburn, 1940)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Neocheilostomatina

**Infraorder:** Flustrina

**Superfamily:** Flustroidea

**Family:** Sinoflustridae

**Subfamily:**

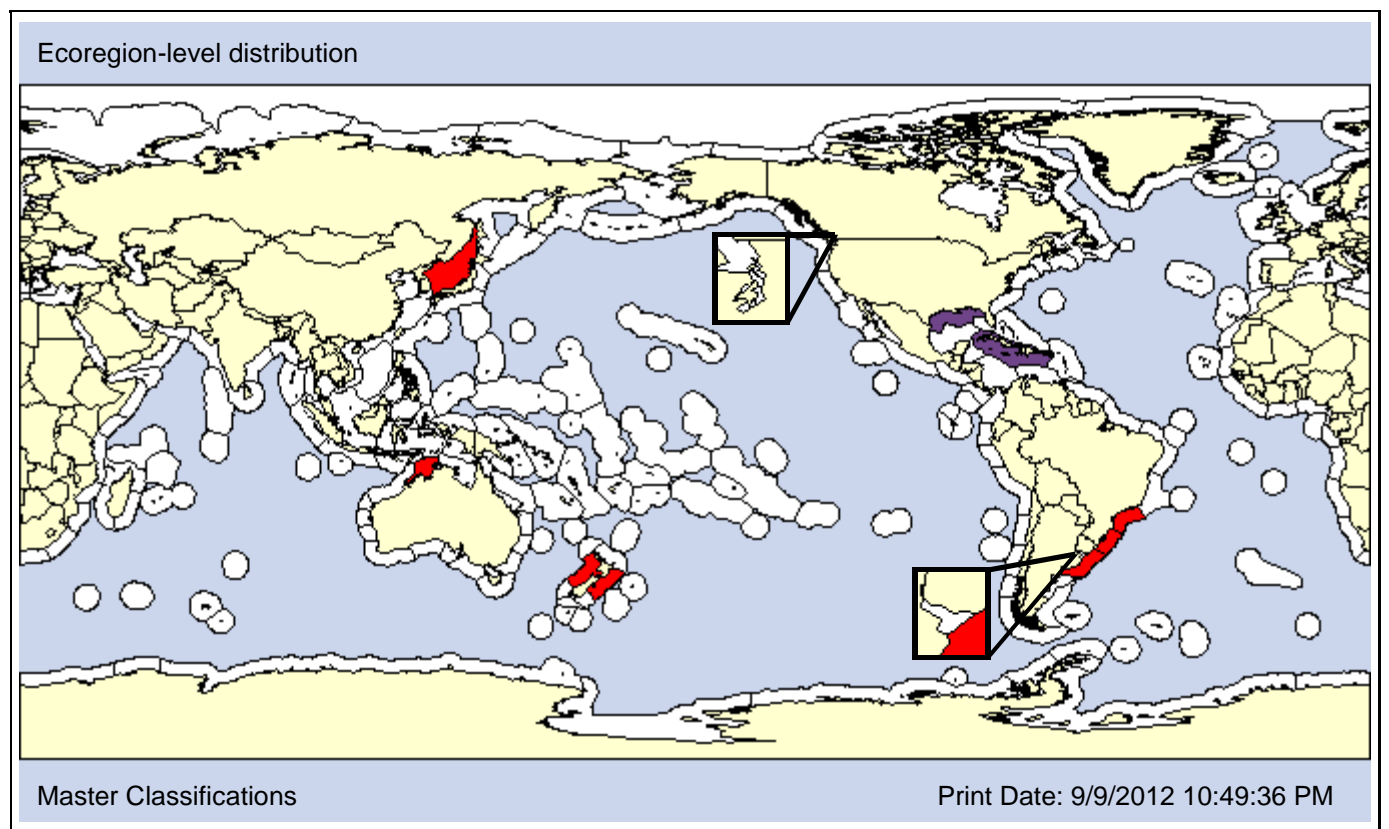
**Also Known As (Name - Type):**

Conopeum tubigerum  
Membraniporopsis tubigera

Synonym  
Convention

**Common Names:**

**Type Locality:** Puerto Rico, Texas, and Florida



**Date 1st record:** <1977

**Loc 1st record:** Sea of Japan

**Established:** Unknown

## VECTORS

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
X		X				AO	PO							

Comments: Membraniporopsis tubigerum was described from the SE United States, but this may not represent the native region. It is considered introduced in the SWA and New Zealand (Gordon et al., 2006; Gappa et al., 2010). We tentatively classify it as NIS in the NWP. It forms large wracks on exposed sandy beaches in Uruguay.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>				<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>	<b>X</b>							



**Taxon:** Bryozoan

**Taxonomic Author:** Gosse, 1855

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ctenostomatida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Nolellidae

**Subfamily:**

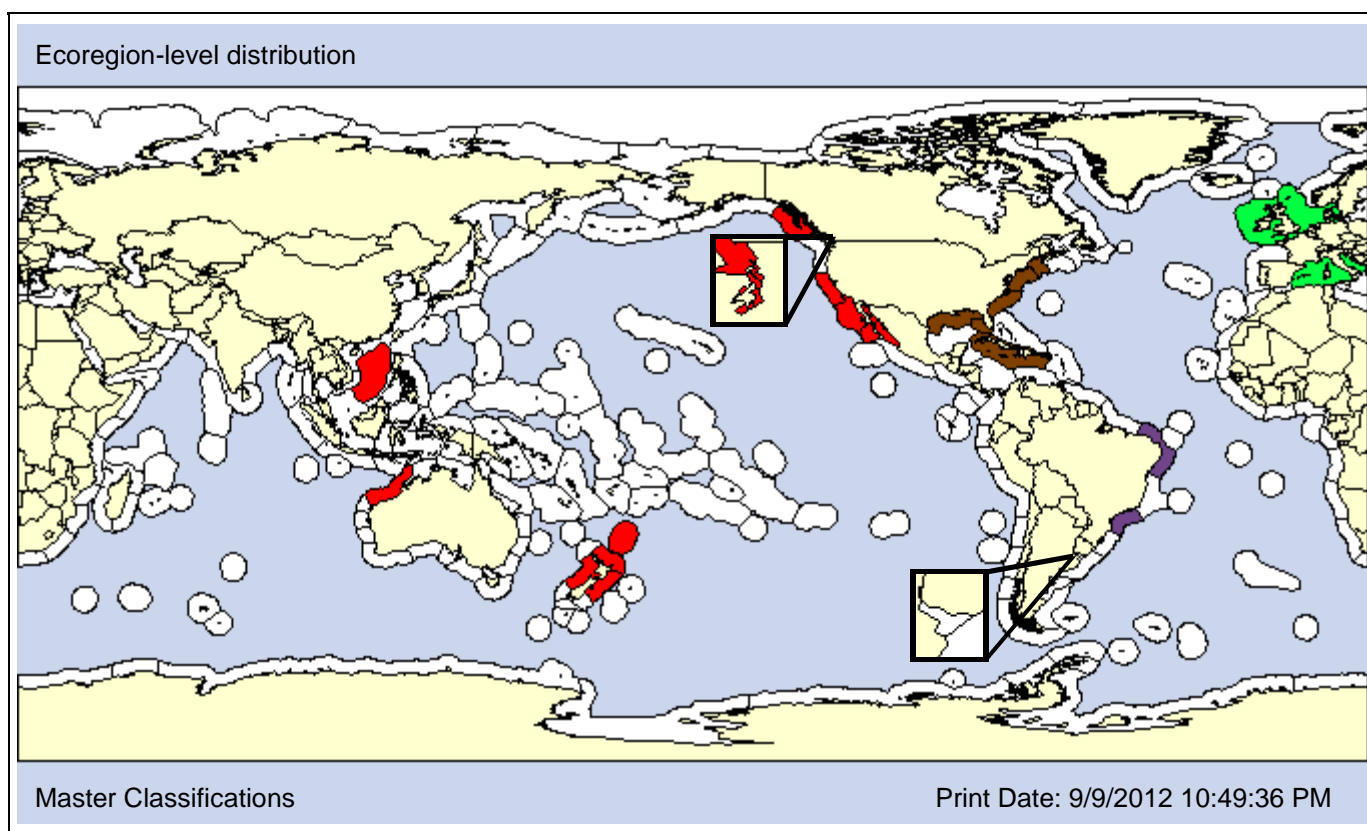
**Also Known As (Name - Type):**

Cylindroecium giganteum	Synonym
Farrella dilatata	Synonym
Farrella gigantea	Synonym
Nolella gigantea	Synonym

**Common Names:**

--

**Type Locality:**



**Date 1st record:**

about 1923

**Loc 1st record:**

Vancouver Island, Canada

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: The distribution of *Nolella stipata* is confused because of its earlier synonymy with *N. dilatata*, which Hayward (1985) and WoRMS do not accept. In particular, records for the NWA and Brazil may be *N. dilatata* in part. McCann et al. (2007) list it as cryptogenic in the southern U.S., resulting in a conflicting classification in the NWA.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X		X		TP	RI-PH	X		X	X	
		X											

**DEPTH [Obs: 0 - 90m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 22.9 - 22.9%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					O	

**CONSOLIDATED SUBSTRATE X**

R O	HP	Biogenic P						Artificial Substrate P						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			P					P	P		P	P	O	O

**SALINITY [Obs: 26.6 - 36.3psu] [Pref: - 30psu]**

Fresh	Brackish O					Marine P		Hyper
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	O
						O		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual X				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
		X		LP-B	LP-P	X			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic X			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	X
						X							

**Taxon:** Bryozoan

**Taxonomic Author:** (Audouin, 1826)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

**Family:** Savignyellidae

**Subfamily:**

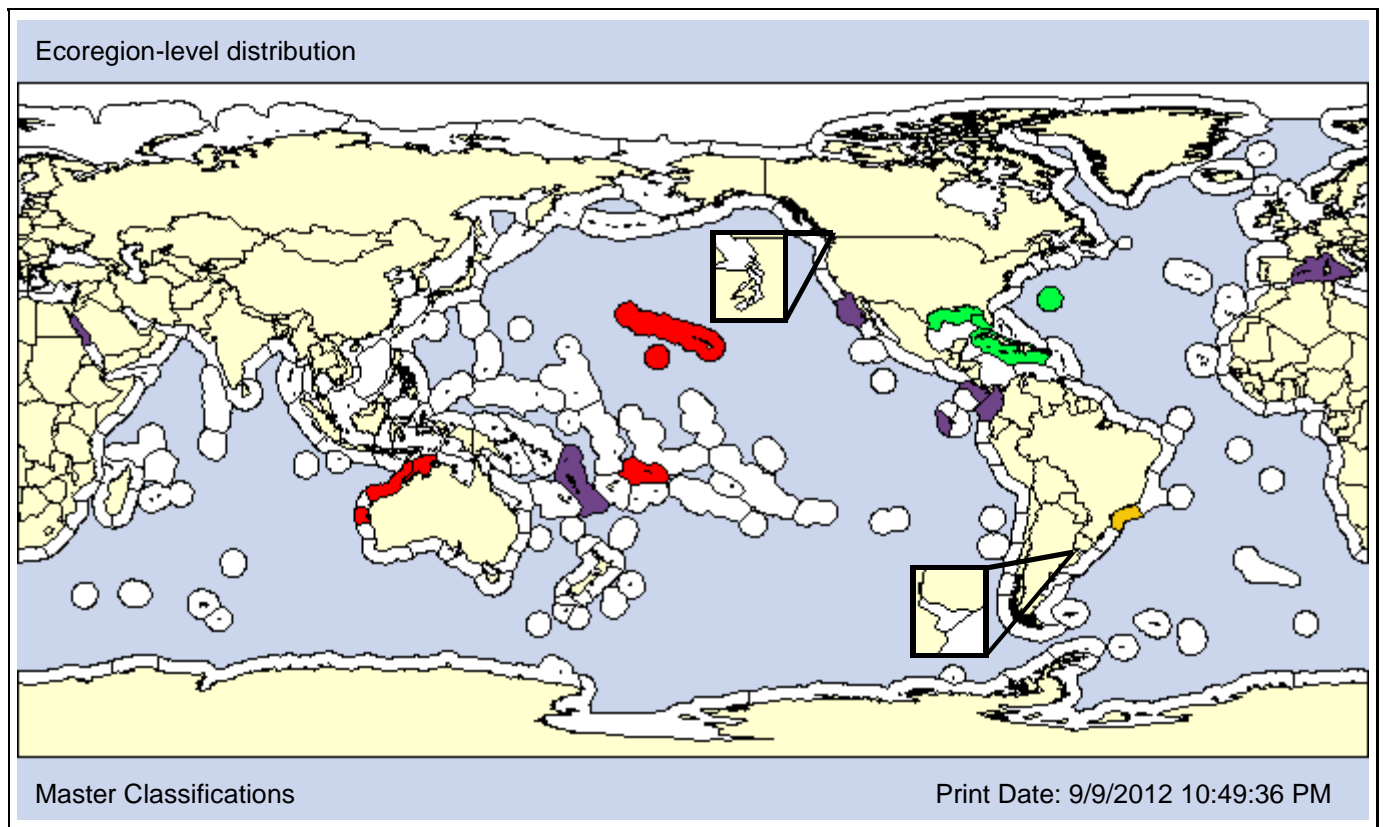
**Also Known As (Name - Type):**

Catenaria lafontii  
Eucratea lafontii  
Savignyella lafonti

Synonym  
Synonym  
Misspelling

**Common Names:**

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

<b>Date 1st record:</b>	1935	Unknown
<b>Loc 1st record:</b>	Kaneohe Bay, Hawaii	Unknown
<b>Established:</b>	Yes	Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Because Miocene specimens of *Savignyella lafontii* have been found in the Gulf of Mexico and Caribbean, we tentatively classify it as native, though McCann et al. (2007) classifies it as cryptogenic in the Gulf of Mexico. We classify it as nonindigenous in Hawaii, Samoa and Australia, cryptogenic in Brazil and unclassified elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 44m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>							<b>P</b>				<b>O</b>	<b>P</b>

**SALINITY [Pref: 30 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoa

**Taxonomic Author:** (Waters, 1878)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

**Family:** Schizoporellidae

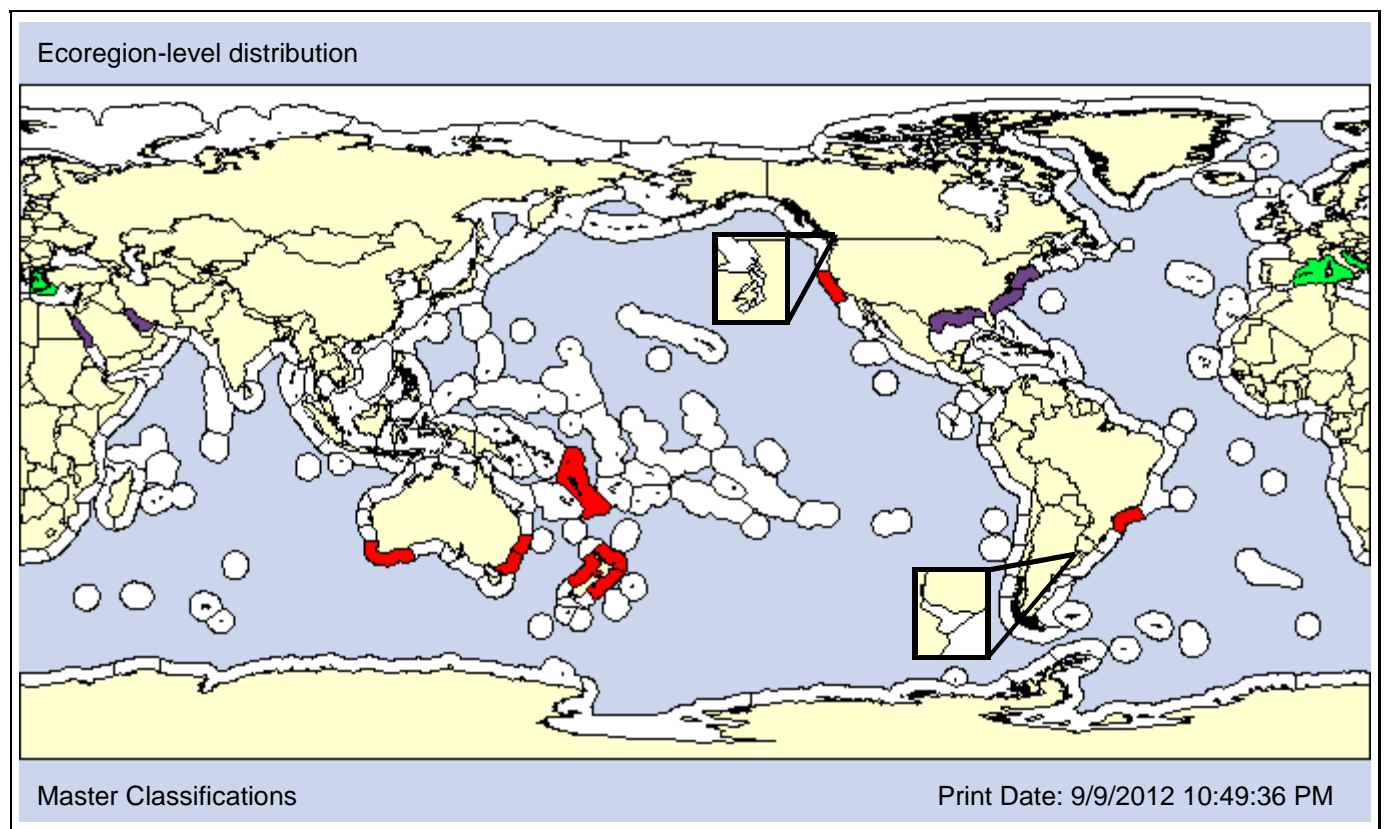
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Lepralia errata	Synonym	branching bryozoan
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**Type Locality:** Naples, Italy



**Date 1st record:**

<1979

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: *Schizoporella errata* has been consistently misidentified in a large percentage of studies (Tompsett et al., 2009). Nonetheless, it appears to be native to the Mediterranean and introduced into the San Francisco Estuary. Its status in other areas requires taxonomic confirmation.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	
	X	X											

**DEPTH [Obs: 0 - 10m] [Pref: 0 - 3.5m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
P				O		

**CONSOLIDATED SUBSTRATE X**

R O	HP	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											O	O	O	O

**SALINITY [Obs: 8 - 18psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
			O	O	O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H X		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		
					X					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X		FR	SD	SP
		X		LP-B	LP-P X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
					X	X							

**Taxon:** Bryozoa

**Taxonomic Author:** Ortmann, 1890

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

**Family:** Schizoporellidae

**Subfamily:**

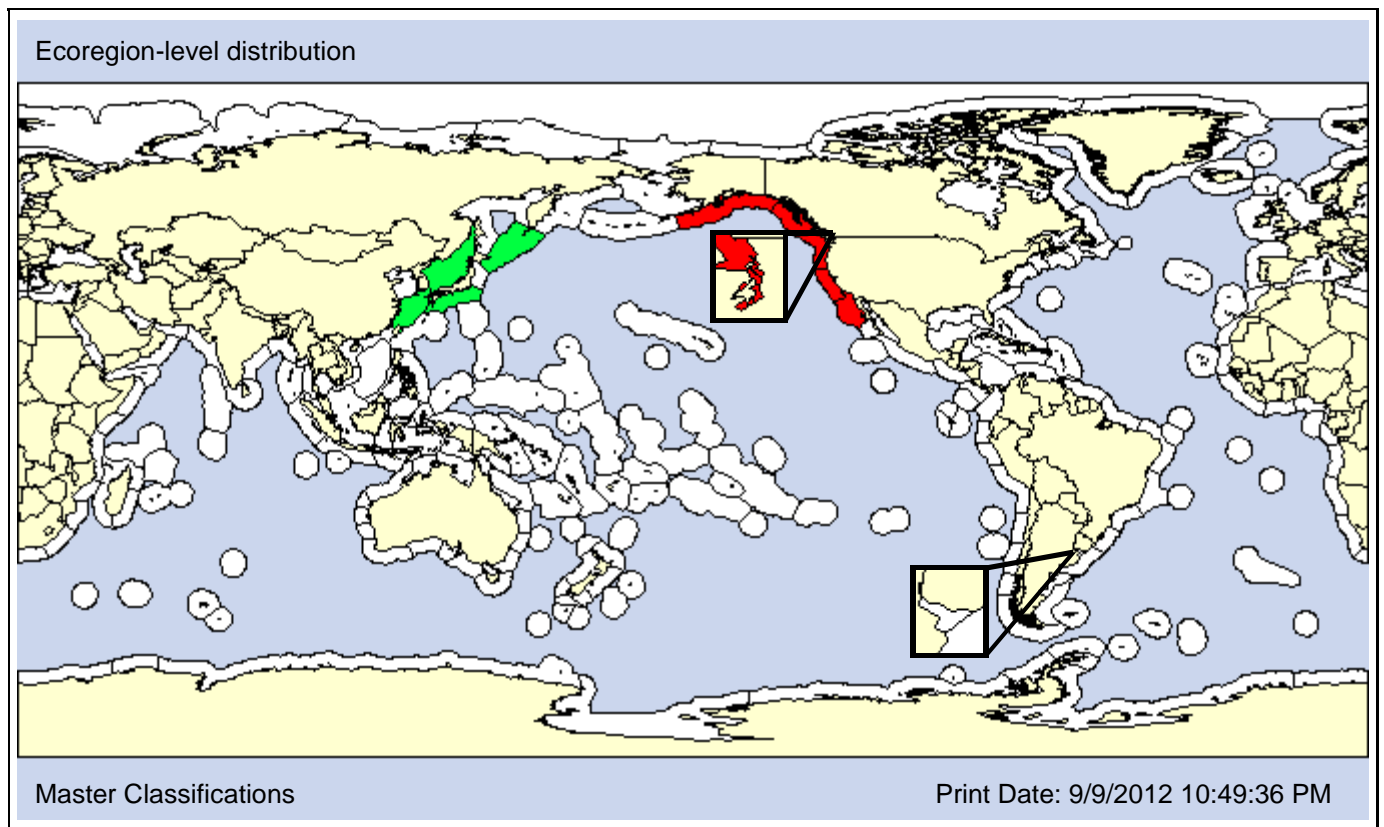
**Also Known As (Name - Type):**

Schizoporella unicornis of NEP authors; not (Johnston, 1847) Misidentified  
Schizoporella unicornis var. japonica Synonym

**Common Names:**

single horn bryozoan (Schizoporella japonica)

**Type Locality:** Sagami Bay, Japan



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

**Date 1st record:** Native

1927

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	<b>PO X</b>								

Comments: The distribution of Schizoporella japonica is confounded because the records of S. unicornis along the U.S. Pacific coast "are likely referable to S. japonica "(Dick et al., 2005; also see Soule et al., 2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 53m] [Pref: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>									<b>P</b>	<b>P</b>	

**SALINITY [Obs: 18 - 30psu] [Pref: 20 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Bryozoa

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

**Family:** Schizoporellidae

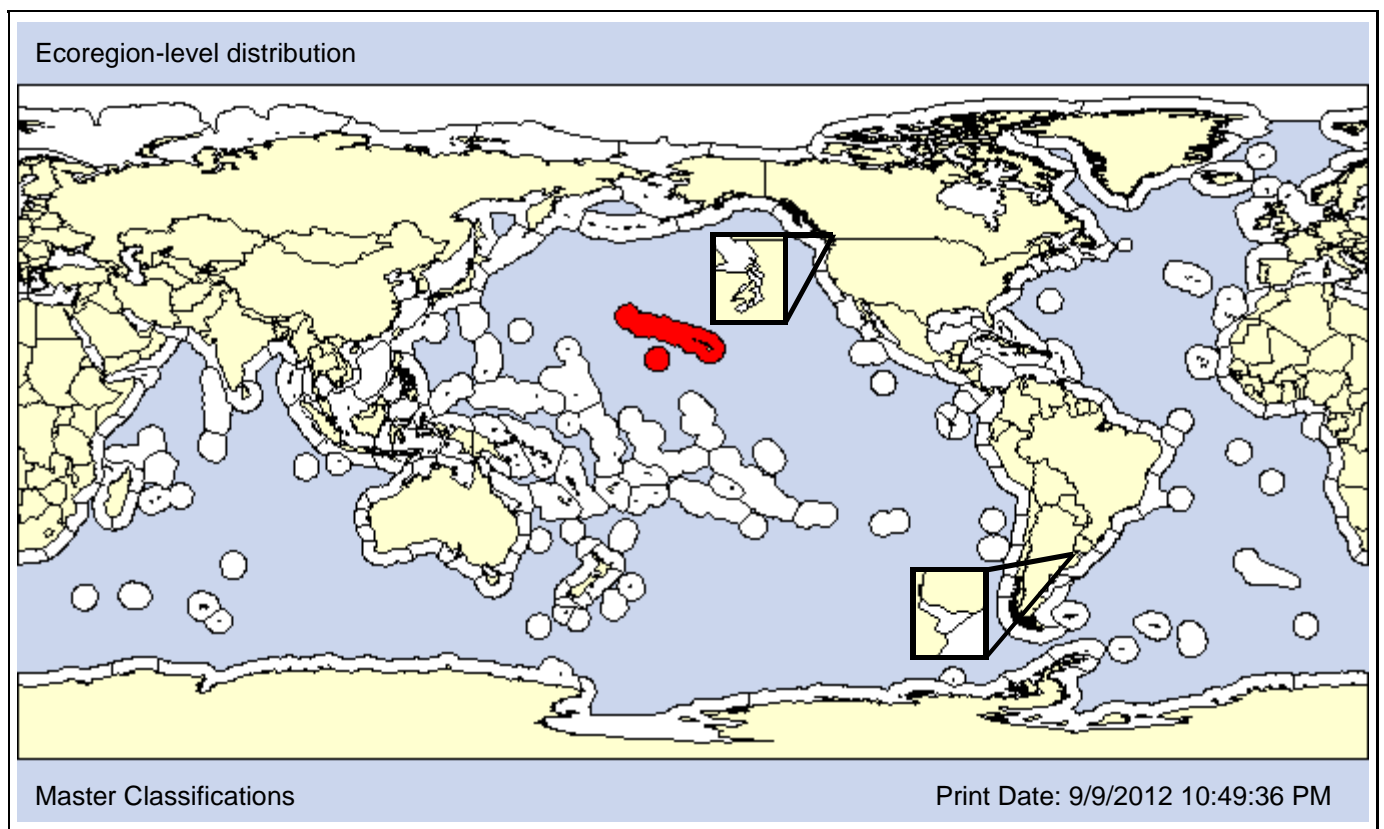
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Schizoporella errata of Hawaiian authors	Partial synonym	
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**Type Locality:** Hawaii, USA



**Date 1st record:**

1935

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		<b>X</b>				AO	PO								

Comments: The taxonomy of Schizoporella is confused and the specific species in Hawaii are unknown. However, Carlton and Eldredge (2009) suggest that there is one or more non-native species in Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											O	O	O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Bryozoa

**Taxonomic Author:** (Johnston in Wood, 1844)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

**Family:** Schizoporellidae

**Subfamily:**

**Also Known As (Name - Type):**

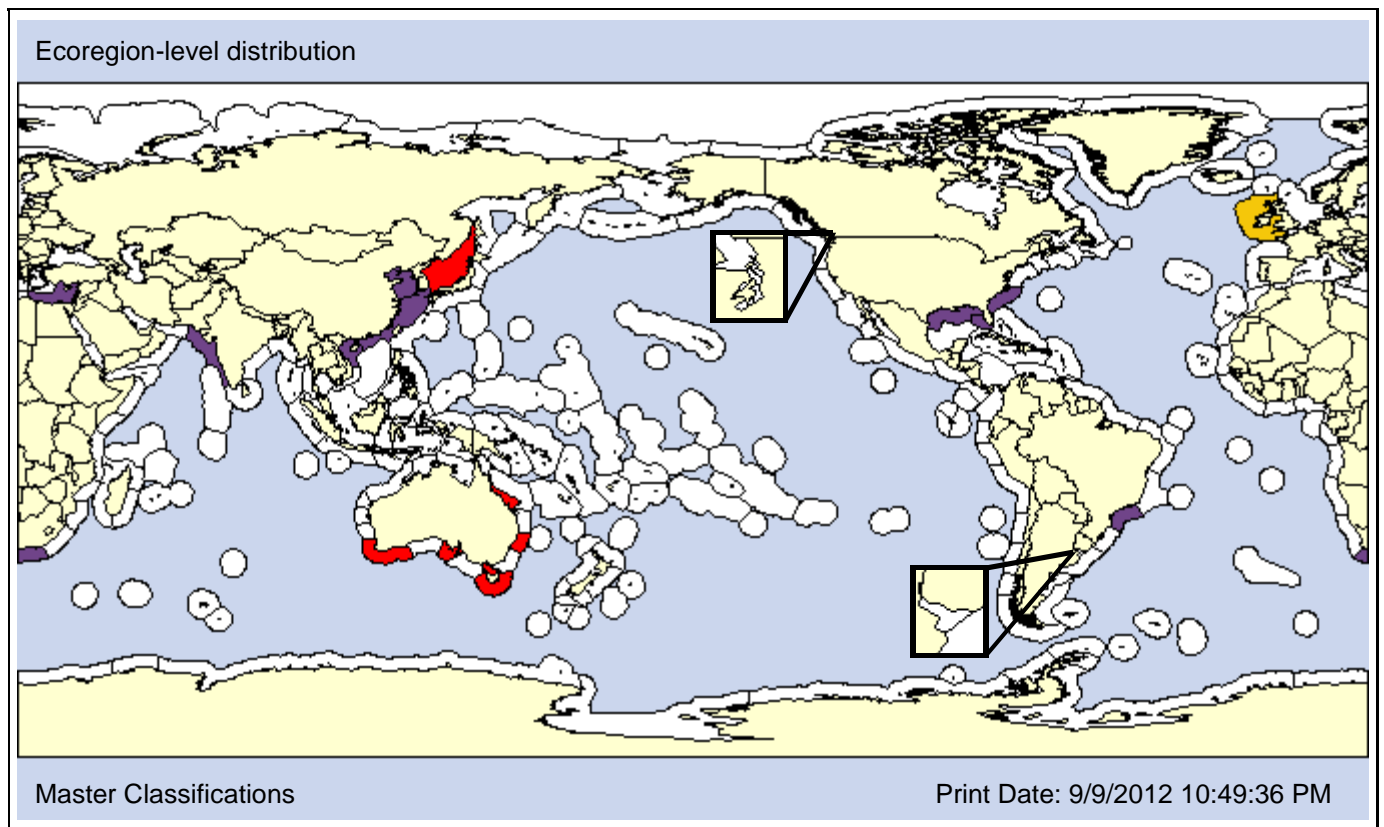
Lepralia unicornis

Synonym

**Common Names:**

lace coral  
orange encrusting bryozoan  
single horn bryozoan

**Type Locality:** England



**Date 1st record:** Unknown

**Loc 1st record:** Unknown

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
		<b>X</b>				AO	PO								

Comments: The distribution of *Schizoporella unicornis* is confounded because *S. unicornis* var. *japonica* was elevated to a species (Dick et al., 2005). We assume that records of *S. unicornis* along the Pacific coast of North America are *S. japonica*. Zvyagintsev et al. (2011) lists *S. unicornis* as introduced in Peter the Great Bay, Russia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 185m] [Pref: 0 - 5.5m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 46 - 65.33%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>				<b>O</b>				<b>O</b>	<b>O</b>	<b>O</b>	

**SALINITY [Obs: 18 - 32.41psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
					<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		
<b>X</b>					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
<b>X</b>				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoa

**Taxonomic Author:** (Audouin, 1826)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Anasca

**Infraorder:**

**Superfamily:**

**Family:** Epistomiidae

**Subfamily:**

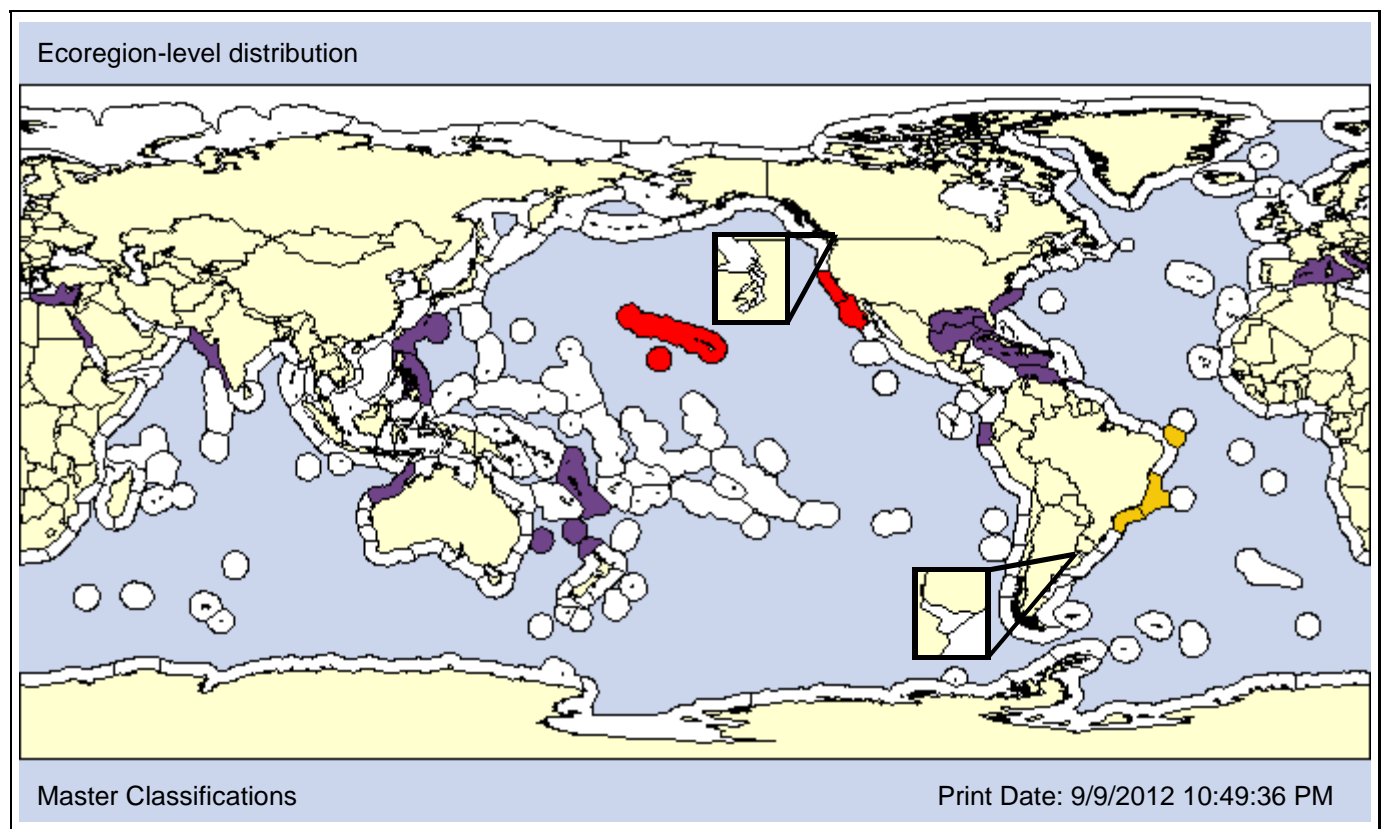
**Also Known As (Name - Type):**

Gemellaria avicularis  
Loricaria aegyptiaca  
Synnotum aviculare

Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:** Red Sea



**Date 1st record:**

1966

Unknown

**Loc 1st record:**

Oahu, Hawaii

Unknown

**Established:**

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
		<b>X</b>				AO	PO							

Comments: The native region of *Synnotum aegyptiacum* is unknown, though Lagaaij (1968 in Tilbrook et al., 2001) reported its occurrence in the Tertiary of Indonesia and the Caribbean. Foss (2011) classifies it as "cryptogenic - likely introduced" in California.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 10 - 82m] [Pref: - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>				
C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
<b>O</b>	<b>O</b>					<b>O</b>		<b>P</b>			<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoan

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ctenostomatida

**Suborder:** Stolonifera

**Infraorder:**

**Superfamily:**

**Family:** Triticellidae

**Subfamily:**

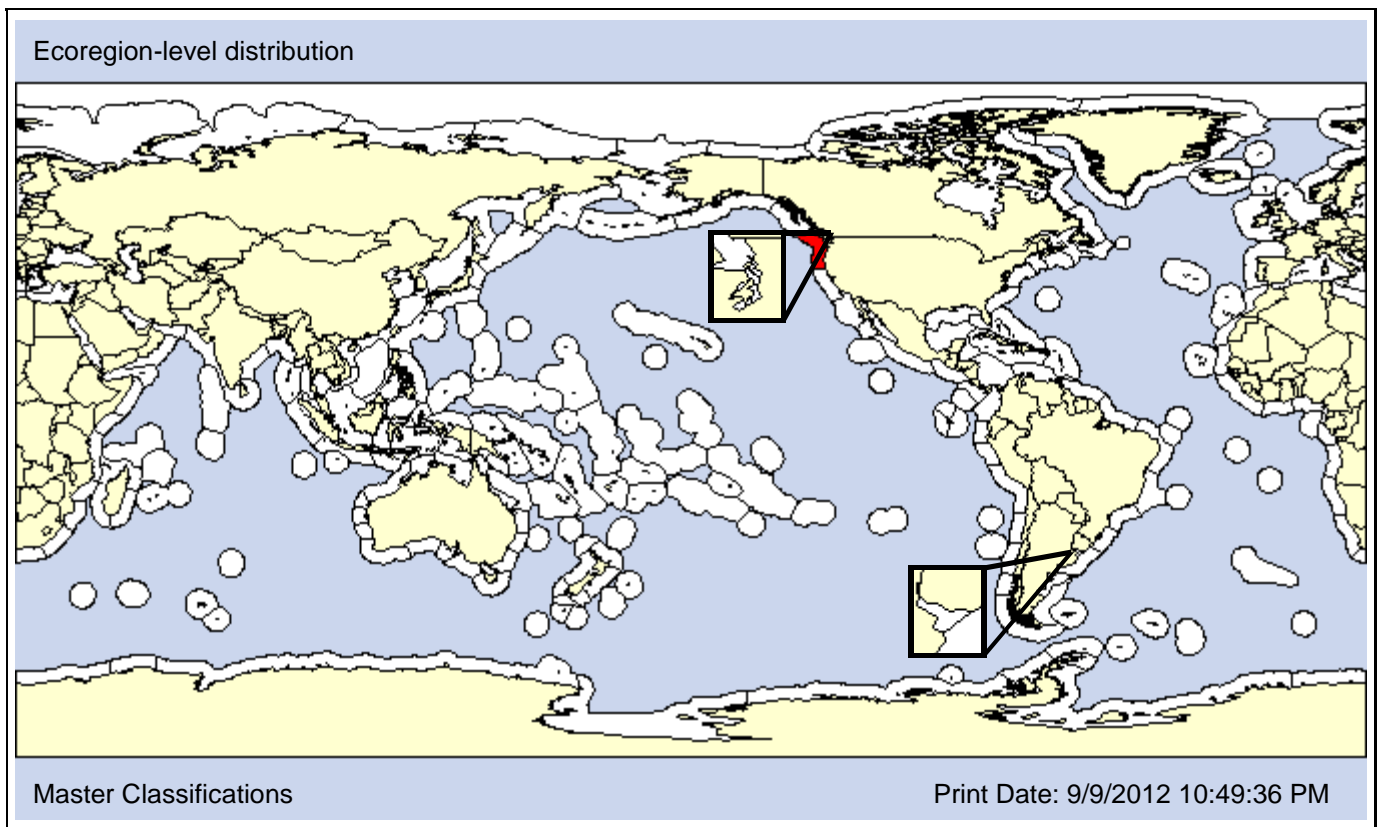
**Also Known As (Name - Type):**

Triticella sp. (Carlton, 2003)  
Triticella sp. of Wonham and Carlton, 2005

Synonym  
Synonym

**Common Names:**

**Type Locality:** Oregon, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1988  
**Loc 1st record:** Coos Bay, Oregon  
**Established:** Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		<b>X</b>				AO	PO								

Comments: An unidentified bryozoan, *Triticella sp. B*, was reported by C. Hewitt in Coos Bay, Oregon in 1988 and 1989. It is considered introduced, possibly from Japan (Carlton, 2003). It is not known if it is established.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							



**Taxon:** Bryozoan

**Taxonomic Author:** (Norman, 1864)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Neocheilostomatina

**Infraorder:** Ascophora

**Superfamily:** Hippothooidea

**Family:** Trypostegidae

**Subfamily:**

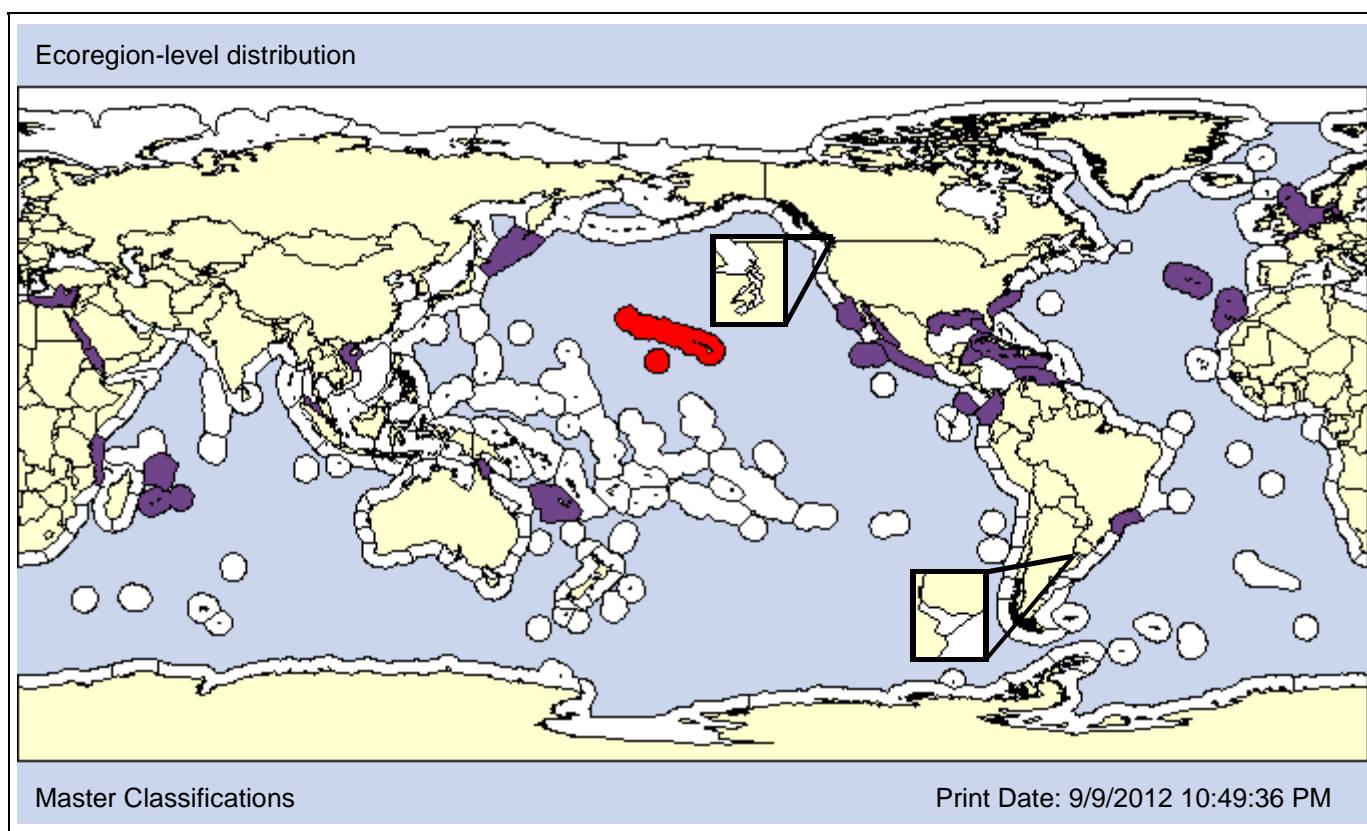
**Also Known As (Name - Type):**

Gemellipora glabra forma striatula  
Lepralia venusta

Synonym  
Synonym

**Common Names:**

**Type Locality:** Guernsey, English Channel



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b> Unknown	1966	Unknown
<b>Loc 1st record:</b> Unknown	Kaneohe Bay, Hawaii	Unknown
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: *Trypostega venusta* is a wide-spread species whose native region is unknown though fossils have been reported from Morocco.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X				TP	RI-PH	X	X		X	
		X											

**DEPTH [Obs: 3 - 180m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O						O					O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	X
						X							

# Victorella pavid

Species ID: 1144

**Taxon:** Bryozoan

**Taxonomic Author:** Saville Kent, 1870

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ctenostomatida

**Suborder:** Carnosa

**Infraorder:**

**Superfamily:** Paludicelloidea

**Family:** Victorellidae

**Subfamily:**

**Also Known As (Name - Type):**

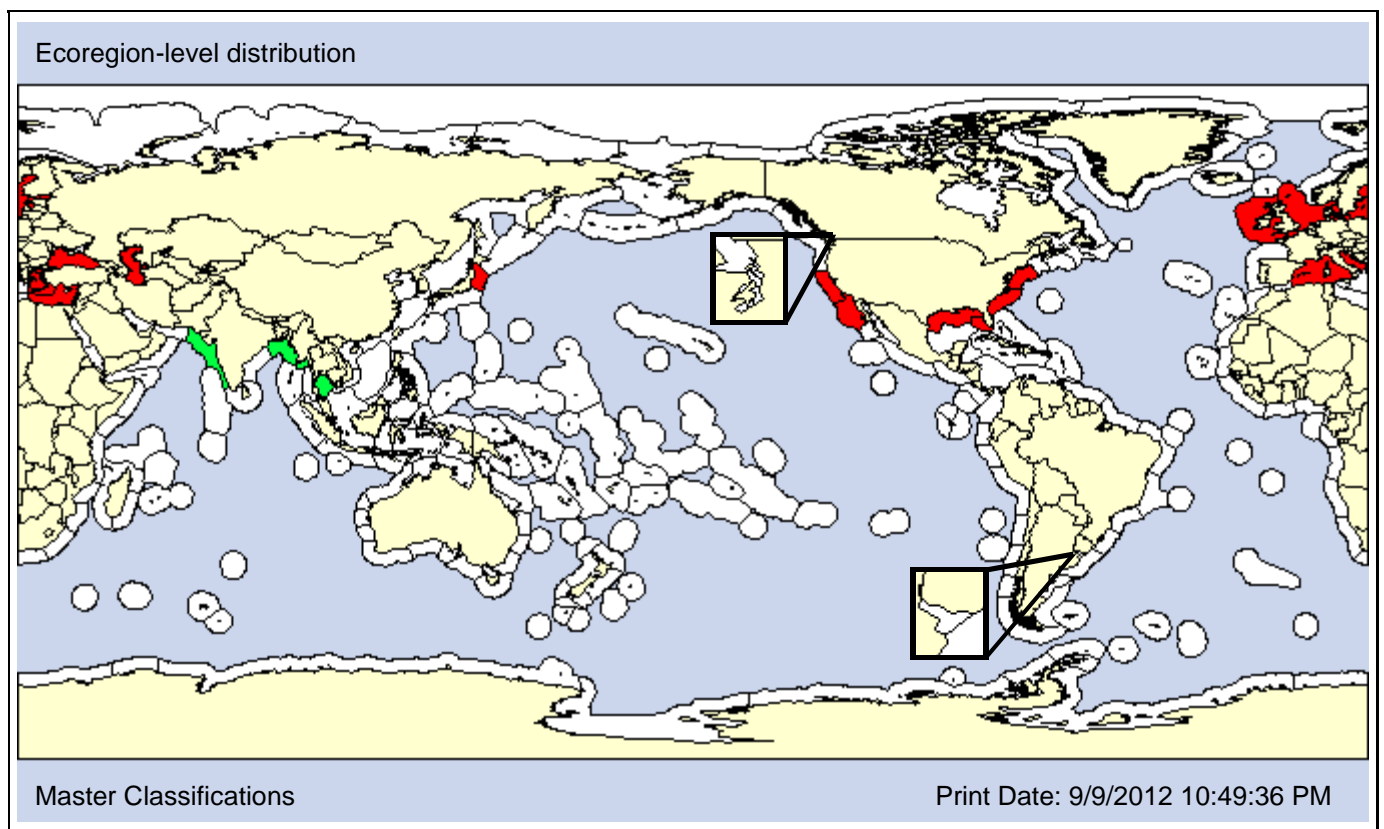
Victorella bengalensis  
Victorella cf. pavid of Soule et al. 2007

Synonym  
Ambiguous syn.

**Common Names:**

trembling sea mat

**Type Locality:** England



**Date 1st record:** by 1943

1967

**Loc 1st record:** Japan

San Francisco Estuary, CA

**Established:** Unknown

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
		X				AO X	PO X								

Comments: Carlton (1979) suggested that *Victorella pavid* was native to the Indian Ocean, while it is introduced in Europe (Olenin and Didžiulis, 2009). We consider it introduced in the NEP, NWP, NEA, NWA, and Mediterranean, though the "*Victorella pavid*" in the NEP may not be the same species as reported in other parts of the world.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 5m] [Pref: 0 - 2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>						<b>P</b>		<b>P</b>		<b>P</b>	<b>P</b>	

**SALINITY [Obs: 0.5 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H <b>X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
	<b>X</b>									

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoan

**Taxonomic Author:** Banta, 1969

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

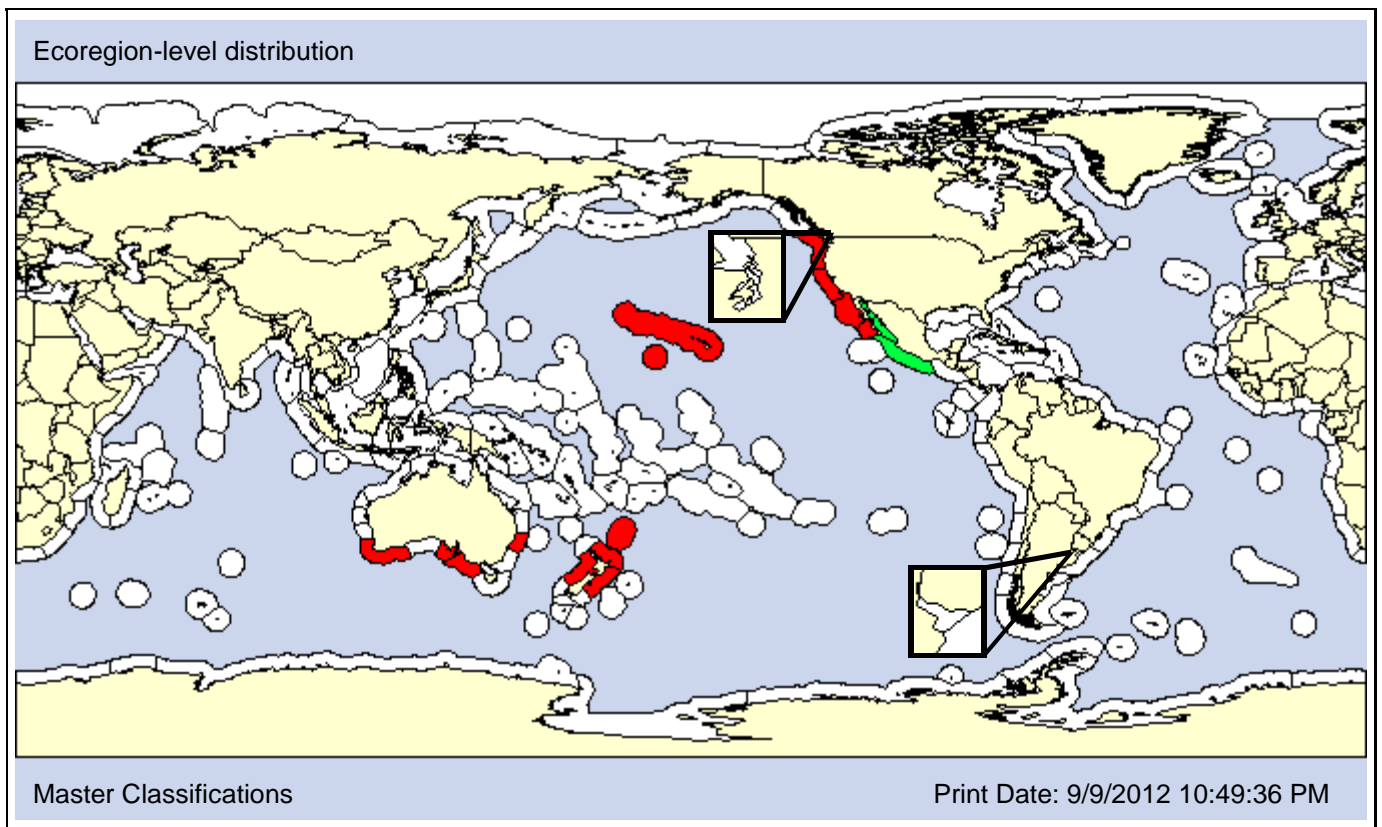
**Family:** Watersiporidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Gulf of California, Mexico



	Native		Nonindigenous		NIS Not Established		Cryptogenic		Transient		Unclassified		Conflicting Classification		Unidentified
					NWP				Hawaii						NEP

<b>Date 1st record:</b>	1998	1964
<b>Loc 1st record:</b>	Kahului Harbor, Maui, Hawaii	San Diego, CA
<b>Established:</b>	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		<b>X</b>				AO	PO								

Comments: The native range of *Watersipora arcuata* is thought to be the Mexican-Eastern Pacific (Mackie et al., 2006). It is considered introduced in California because of its appearance in several embayments in the mid-1960s.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>O</b>				<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
<b>X</b>										

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Bryozoan

**Taxonomic Author:** Soule & Soule, 1968

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

**Family:** Watersiporidae

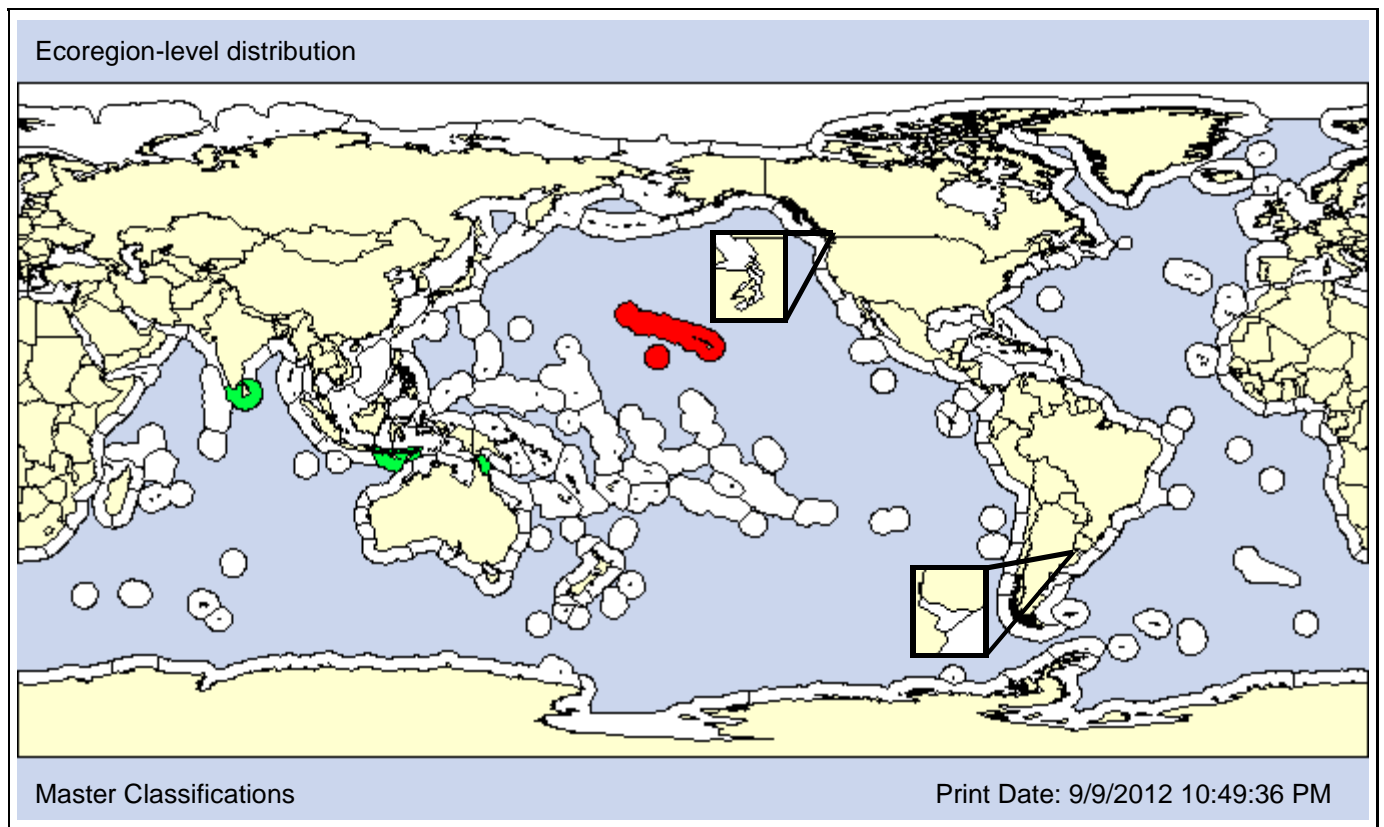
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Watersipora subovoidea sensu Harmer, 1957 of Dick, 2006	Synonym	
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**Type Locality:** Honolulu, Hawaii, USA



■ Native
 ■ Nonindigenous
   NIS Not Established
   Cryptogenic
   Transient
   Unclassified
   Conflicting Classification
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1966

**Loc 1st record:**

Ala Wai Canal, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K	
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 10m] [Pref: 0 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>					<b>P</b>					<b>P</b>	<b>P</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Bryozoa

**Taxonomic Author:** Mackie et al., 2006

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

**Family:** Watersiporidae

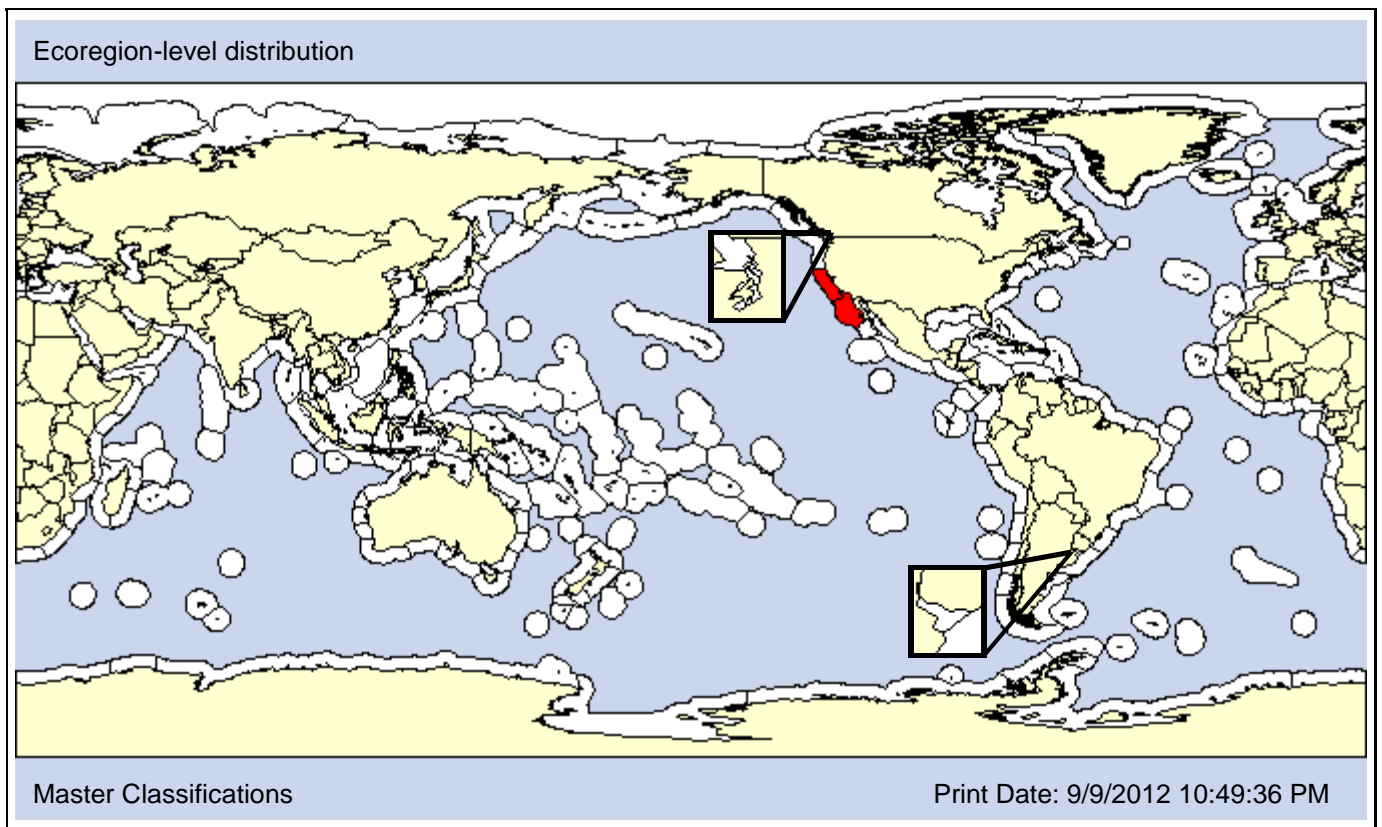
**Subfamily:**

**Also Known As (Name - Type):**

Watersipora subtorquata of authors in part; not Waters, 1874 Misidentified  
Watersipora subtorquata/ n. sp. Mackie Synonym

**Common Names:**

**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

2006

**Loc 1st record:**

Santa Cruz, California

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		<b>X</b>				AO	PO								

Comments: This unidentified bryozoan is related to the "Watersipora subtorquata" group. It was first recognized from Santa Cruz, California in 2006.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Bryozoan

**Taxonomic Author:** (d'Orbigny, 1852)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Cheilostomatida

**Suborder:** Ascophora

**Infraorder:**

**Superfamily:**

**Family:** Watersiporidae

**Subfamily:**

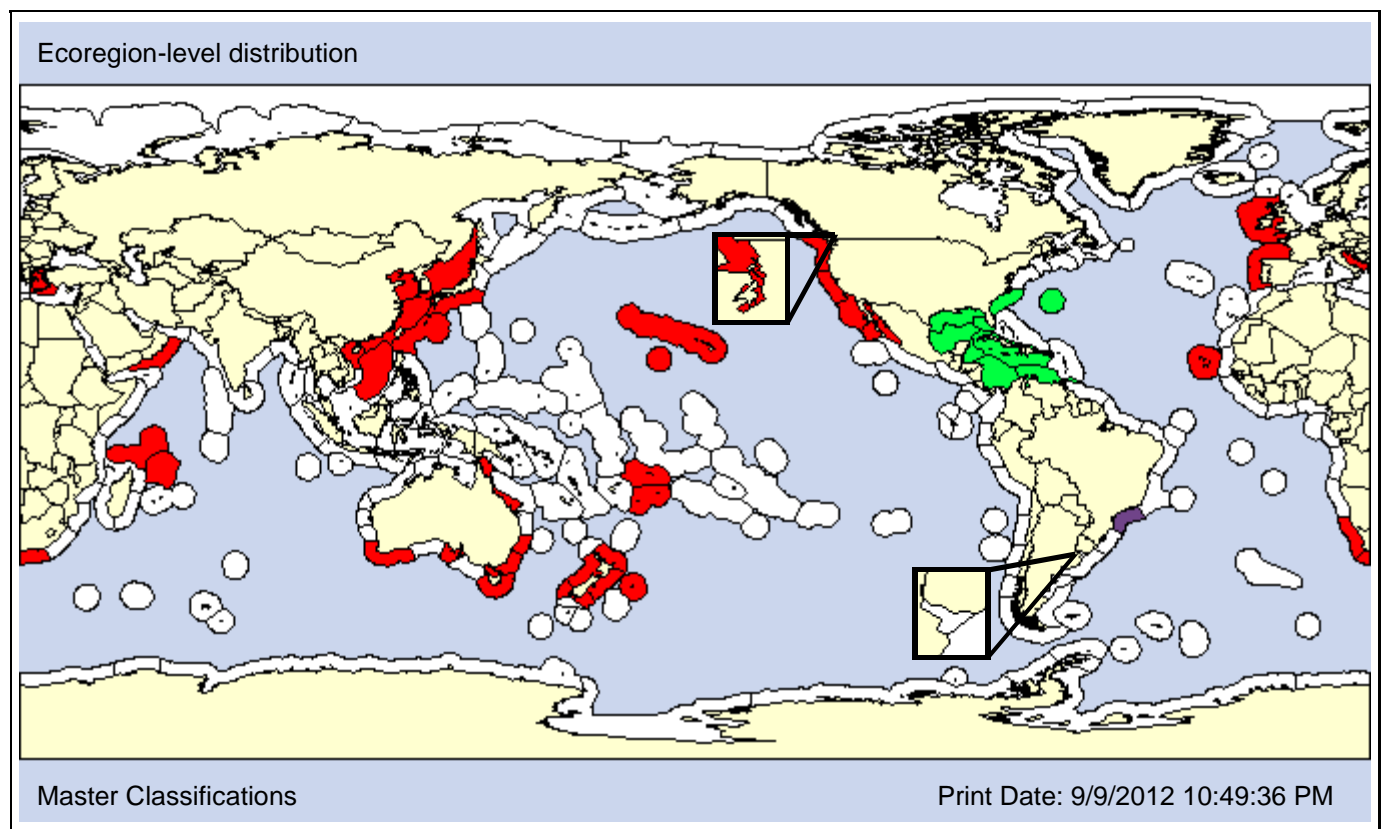
**Also Known As (Name - Type):**

Cellepora subtorquata	Synonym
Escharina torquata	Synonym
Watersipora subovoidea of Smithsonian Marine St.; not (d'O	Misidentified
Watersipora 'subtorquata' of Cohen and Carlton, 1995	Synonym

**Common Names:**

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**Type Locality:** Rio de Janeiro, Brazil



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii			NEP	

<b>Date 1st record:</b> Unknown	1966	1963
<b>Loc 1st record:</b> Unknown	Pearl Harbor, Oahu, Hawaii	Southern California
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	<b>PO X</b>								

Comments: We classify *Watersipora subtorquata* as native in the Caribbean-Atlantic based on Mackie et al. (2006) and NIS in the NEA and Pacific while Mead et al. (2011) classifies it as introduced in South Africa. However, its taxonomy is confused and it is possible that it may consist of more than one native or introduced species in many areas.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 76m] [Pref: 0 - 12m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>				<b>O</b>		<b>P</b>			<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 25 - 49psu] [Pref: 29 - 37psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>
					<b>O</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
<b>X</b>										

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
<b>X</b>				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bryozoa

**Taxonomic Author:** (Delle Chiaje, 1828)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Bryozoa

**Subphylum:**

**Superclass:**

**Class:** Gymnolaemata

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ctenostomatida

**Suborder:** Carnosa

**Infraorder:**

**Superfamily:** Vesicularioidea

**Family:** Vesiculariidae

**Subfamily:**

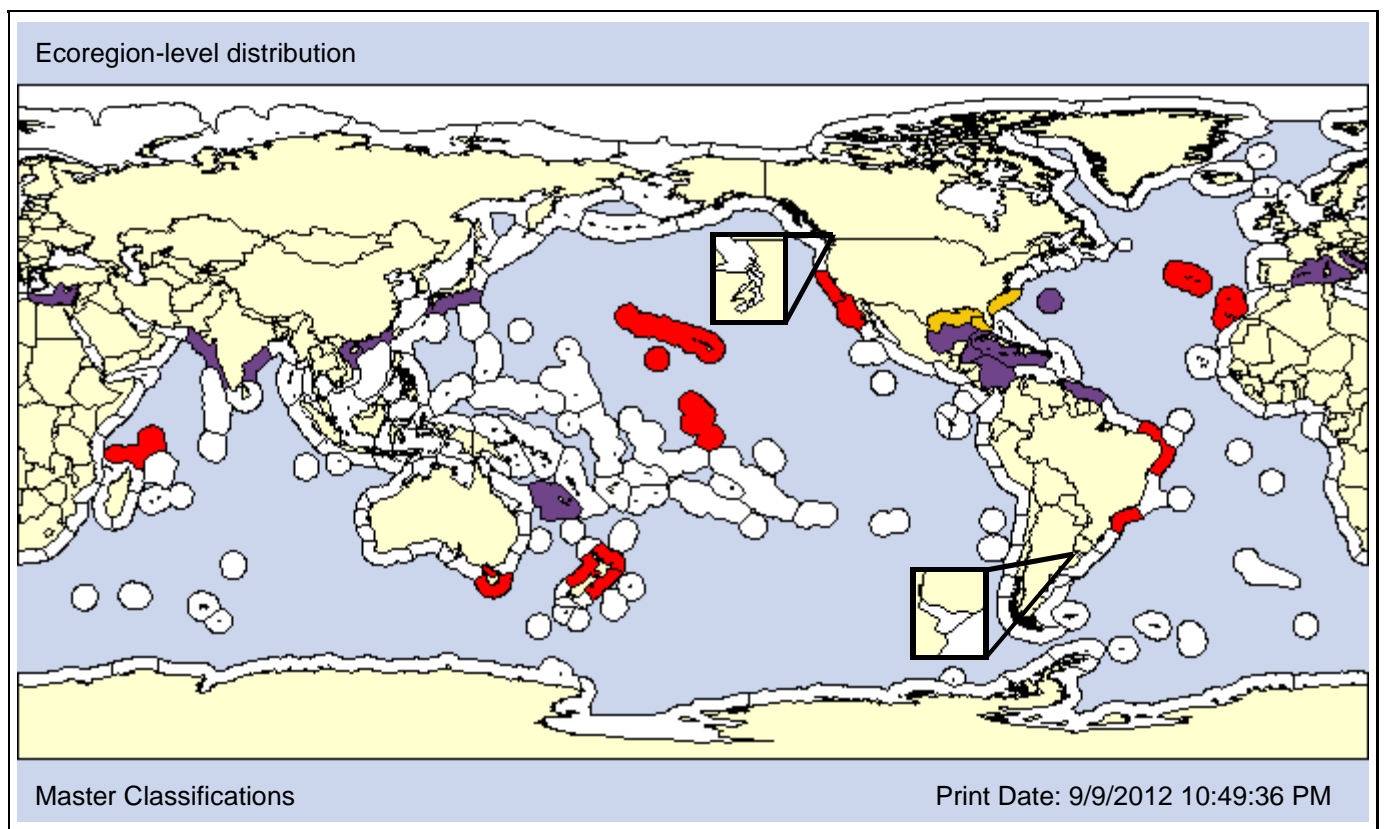
**Also Known As (Name - Type):**

Amathia coutinhii	Synonym
Hydra verticillata	Synonym
Zoobotryon pellucidum	Synonym
Zoobotryon pellucidus	Synonym

**Common Names:**

spaghetti bryozoan
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

<b>Date 1st record:</b> Unknown	<1921	1905
<b>Loc 1st record:</b> Japan	Honolulu, Hawaii	San Diego Bay, CA
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	PO								

Comments: Cranfield et al. (1998a,b) suggest that the Mediterranean is the native region of *Zoobotryon verticillatum*, while Carlton and Eldredge (2009) consider it to be unknown. Soule et al. (2007) consider it a species complex in the NEP. We list the Mediterranean as unclassified and elsewhere use regional classifications when available.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X		X		TP	RI-PH	X		X	X	
		X											

**DEPTH [Obs: 0 - 19m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 17.2 - 21.35%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>P</b>	<b>P</b>			<b>P</b>	<b>P</b>	<b>O</b>

**SALINITY [Obs: 15 - 56psu] [Pref: 30 - 36psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

Kingdom: Animalia

Phylum: Phoronida

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**Taxon:** Phoronid

**Taxonomic Author:** Wright, 1856

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Phoronida

**Subphylum:**

**Superclass:**

**Class:**

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Phoronidae

**Subfamily:**

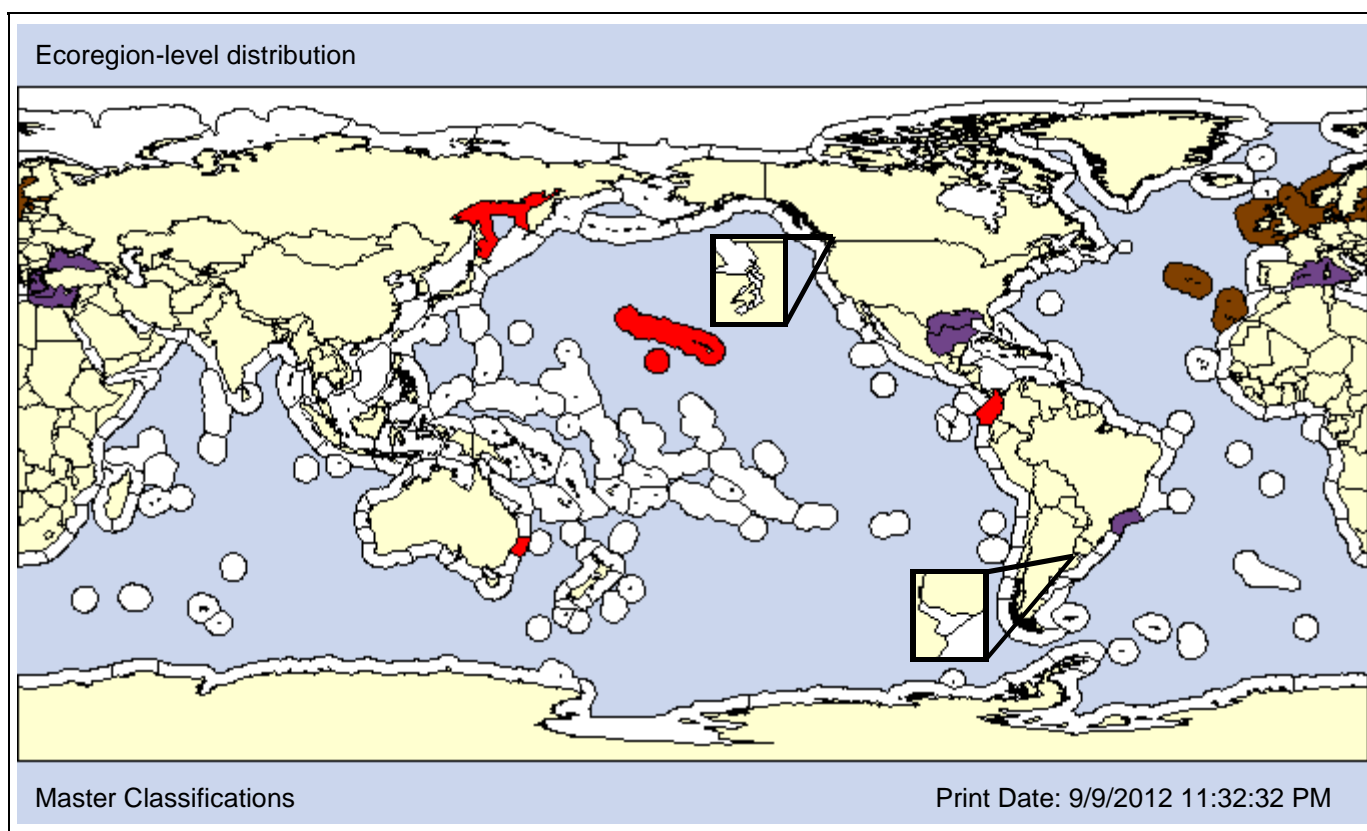
**Also Known As (Name - Type):**

Actinotropha hippocrepia  
 Phoronis (Crepina) gracilis  
 Phoronis capensis  
 Phoronis gracilis

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** Illfracombe, United Kingdom



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown 1976  
**Loc 1st record:** Unknown Kaneohe Bay, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR		A	P				
		X				AO	PO							

Comments: Carlton and Eldredge (2009) consider *Phoronis hippocrepia* native to the North/South Atlantic while Olenin and Didžiulis (2009) consider it introduced to Europe. We classify the NEA as a conflict, the Mediterranean and Gulf of Mexico as unclassified, and Pacific ecoregions as introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X	X	X

**DEPTH [Obs: 0 - 55m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

R O	HP	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		P	P	O						O		P	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
						X		X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H X		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
		X		LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					X
						X							

Kingdom: Animalia

Phylum: Entoprocta

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**Taxon:** Entoproct

**Taxonomic Author:** (Foettinger, 1886)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Entoprocta

**Subphylum:**

**Superclass:**

**Class:**

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Coloniales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Barentsiidae

**Subfamily:**

**Also Known As (Name - Type):**

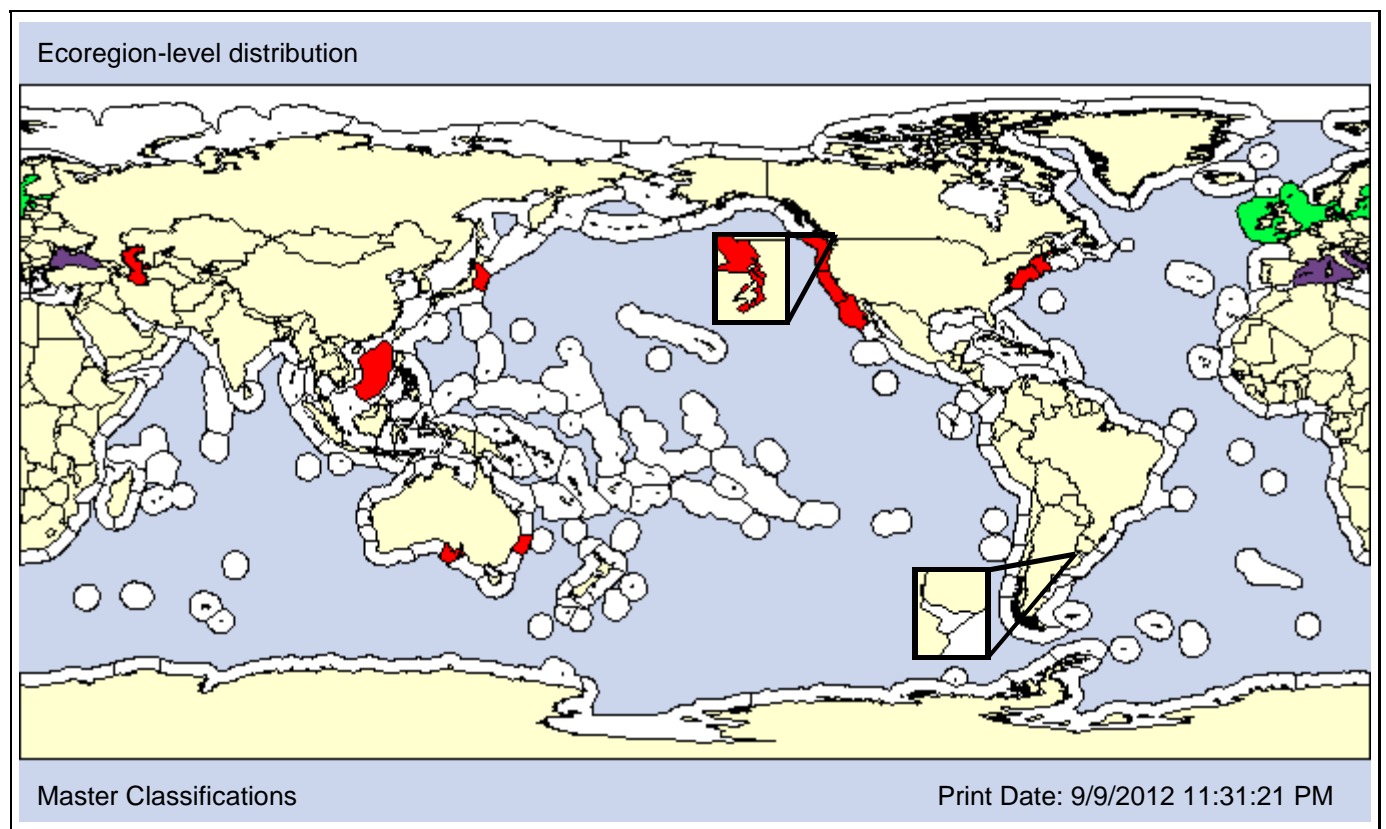
Ascopodaria gracilis of Craig 1929 not (M. Sars 1835)  
 Barentsia gracilis of Hedgpeth, 1964; not (M. Sars, 1835)  
 Pedicellina benedeni

Misidentified  
 Misidentified  
 Synonym

**Common Names:**

nodding head

**Type Locality:** Belgium



**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Yes

1929  
 San Francisco Estuary, CA  
 Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	<b>PO X</b>								

Comments: Olenin and Didžiulis (2009) consider *Barentsia benedeni* a native European species. It is considered introduced in the NEP (Cohen and Carlton, 1995), NWA (Ruiz et al., 2000), Australia (NIMPIS, 2002r), Japan (NIMPIS, 2002r), and Caspian Sea (Paavola et al., 2005). We classify it as introduced in the South China Sea.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 8 - 90m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 8.41 - 71.51%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>	<b>O</b>	<b>O</b>					<b>O</b>		<b>P</b>	<b>O</b>	

**SALINITY [Obs: 7 - 35psu] [Pref: 18 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>	<b>X</b>		
				<b>X</b>						

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Entoproct

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Entoprocta

**Subphylum:**

**Superclass:**

**Class:**

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Coloniales

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Barentsiidae

**Subfamily:**

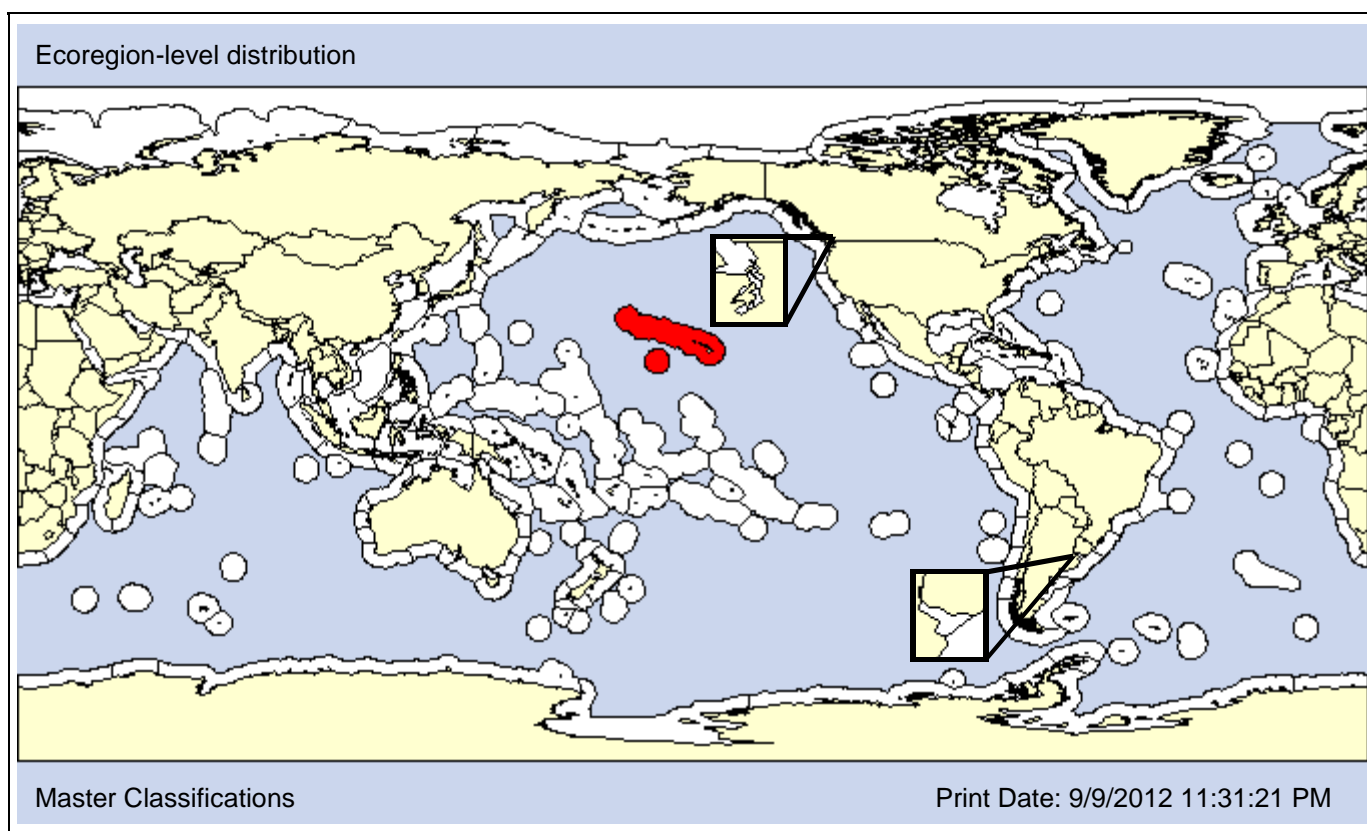
**Also Known As (Name - Type):**

**Common Names:**

Barentsia gracilis of Soule and Soule, 1968

Misidentified

**Type Locality:** Hawaii, USA



**Date 1st record:**

1966

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H+B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		X		LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							



**Kingdom: Animalia**

**Phylum: Mollusca**

**Class: Bivalvia**

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**Taxon:** Bivalve

**Taxonomic Author:** Coles et al., 2007

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Tellinoidea

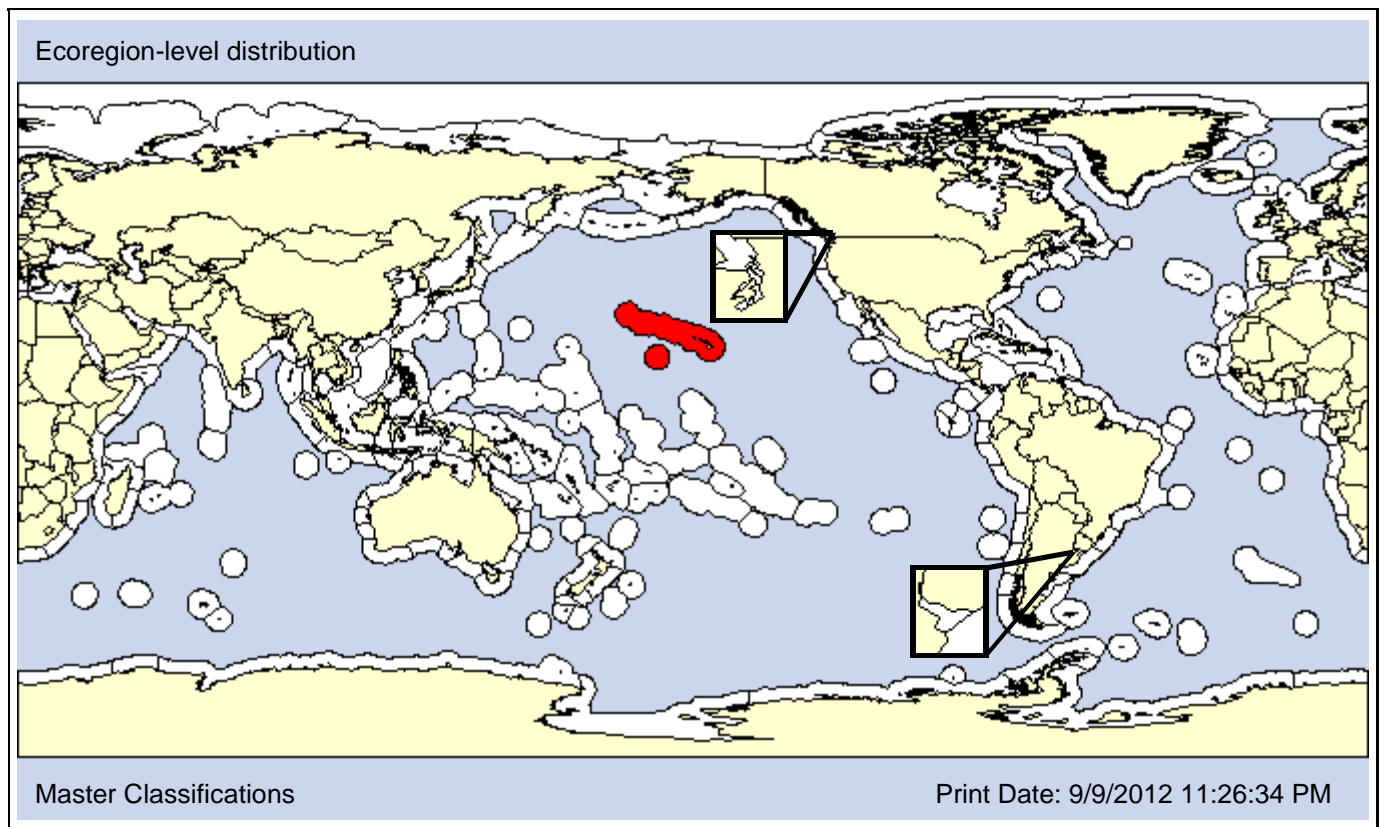
**Family:** Semelidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1996  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				X
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		

**Taxon:** Bivalve

**Taxonomic Author:** Reeve, 1859

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Pectinoida

**Suborder:**

**Infraorder:**

**Superfamily:** Anomioidea

**Family:** Anomiidae

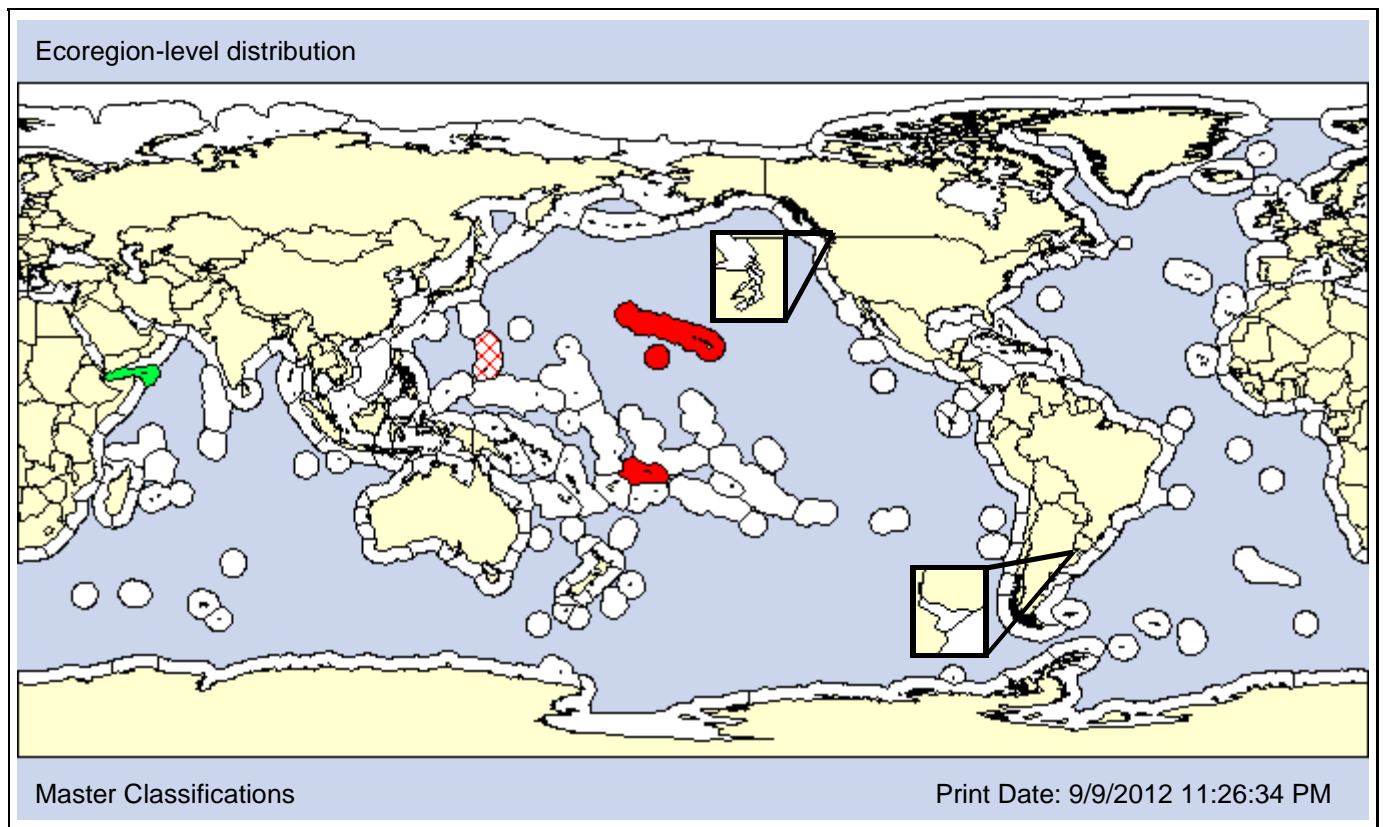
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Monia nobilis	Synonym	jingle shell saddle oyster
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**Type Locality:** Hawaii, USA



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="color: red; border: 1px dashed red;">■</span> NIS Not Established	<span style="color: yellow;">■</span> Cryptogenic	<span style="color: lightblue;">■</span> Transient	<span style="color: purple;">■</span> Unclassified	<span style="color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black;">■</span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1859  
**Loc 1st record:** Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		<b>X</b>				AO	PO								

Comments: The Indo-West Pacific is likely the native region for *Anomia nobilis*, and Pleistocene fossils have been found in Djibouti in the Gulf of Aden. The introduced Guam population appears to have gone extinct.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 60m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>									<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** (Lamarck, 1819)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Pectinoida

**Suborder:**

**Infraorder:**

**Superfamily:** Pectinoidea

**Family:** Pectinidae

**Subfamily:** Pectininae

**Also Known As (Name - Type):**

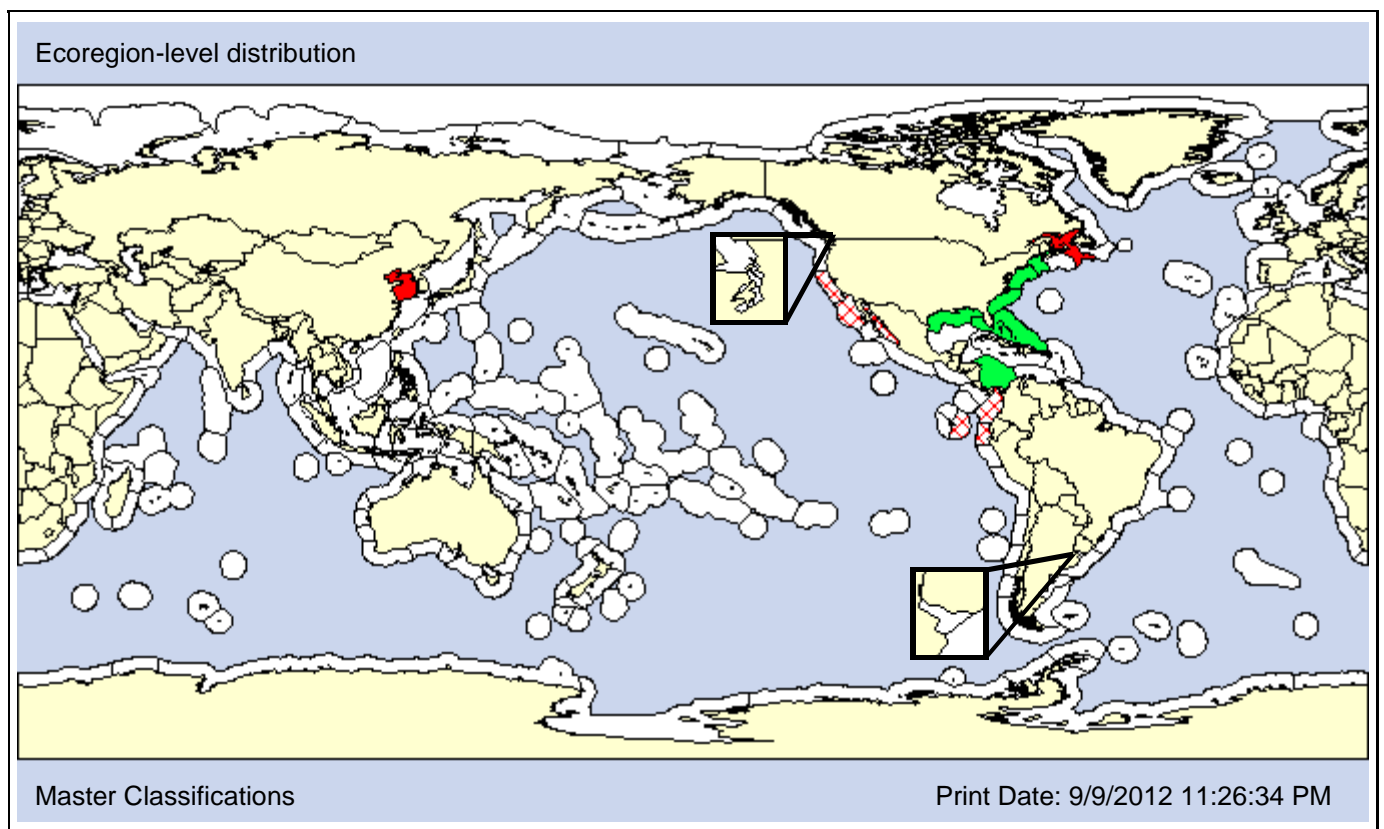
Aequipecten irradians  
Argopecten irradians amplicostatus  
Argopecten irradians concentricus  
Argopecten irradians irradians

Synonym  
Convention  
Convention  
Convention

**Common Names:**

Atlantic bay scallop  
bay scallop

**Type Locality:**



**Date 1st record:** 1981

1870s-1880s

**Loc 1st record:** Shandong, China

San Francisco Estuary, CA

**Established:** Yes

No

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P				
					X	AO X	PO								

Comments: *Argopecten irradians* is a NWA scallop. In the 1960s and 1970s shells were found in California (Carlton, 1979; CANOD, 2009) and there were earlier records (1880-1978) from Baja California, Gulf of California, Peru, and Ecuador in the U.S. National Museum (OBIS). Chavanich et al. (2010) report it introduced into the Yellow Sea.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 80m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 14 - 38psu] [Pref: 20 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								



**Taxon:** Bivalve

**Taxonomic Author:** (Lamarck, 1801)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Myoida

**Suborder:**

**Infraorder:**

**Superfamily:** Pholadoidea

**Family:** Teredinidae

**Subfamily:** Bankiinae

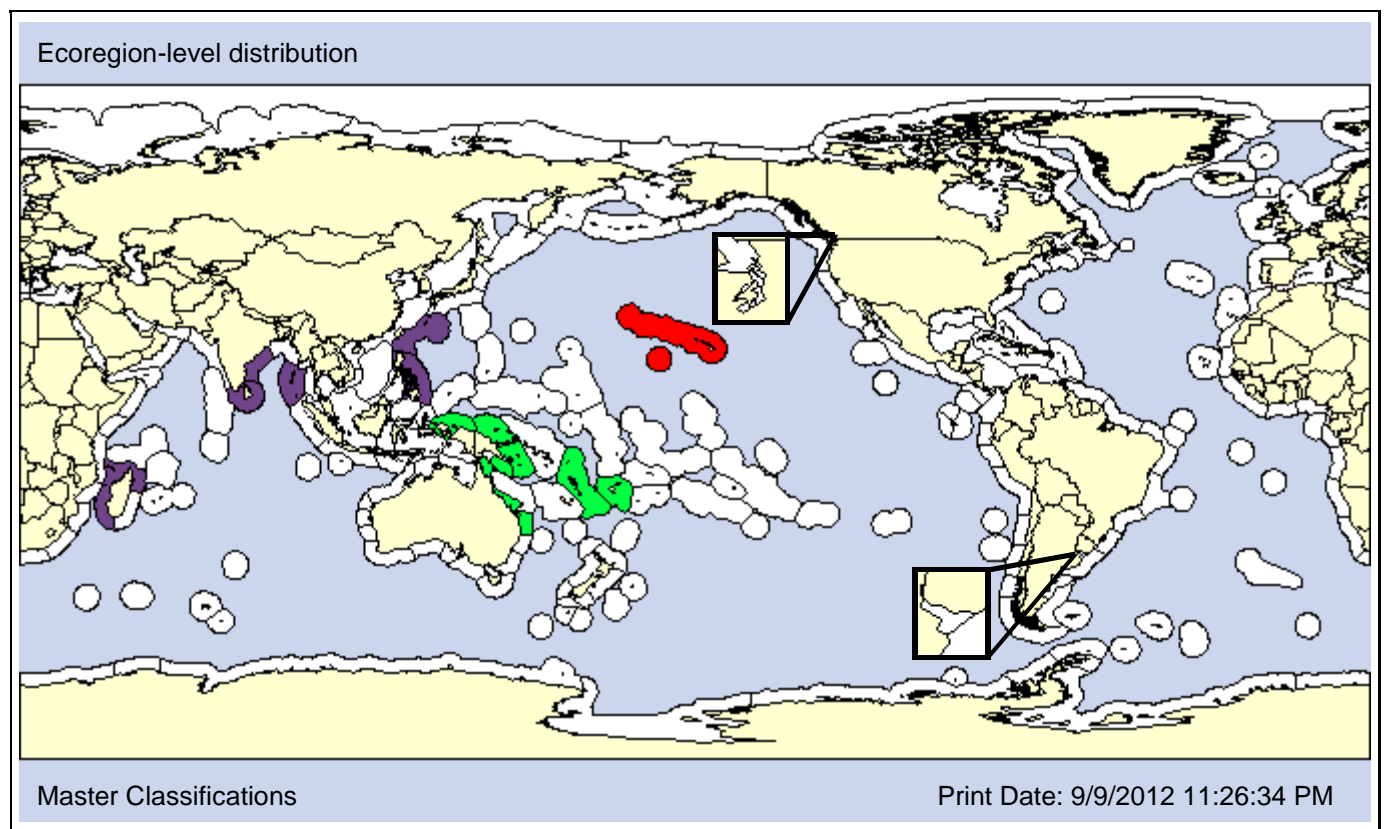
**Also Known As (Name - Type):**

Bankia (Bankia) bipalmulata	Convention
Bankia annamariae	Synonym
Bankia hawaiiensis	Synonym
Bankia konaensis	Synonym

**Common Names:**

--

**Type Locality:** India?



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1936  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>	<b>X</b>				AO	PO									<b>X</b>

Comments: The "Southern Hemisphere" is considered the native region for *Bankia bipalmulata* (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - 23m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P			P	P

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					

**Taxon:** Bivalve

**Taxonomic Author:** Reeve, 1846

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Chamoidea

**Family:** Chamidae

**Subfamily:**

**Also Known As (Name - Type):**

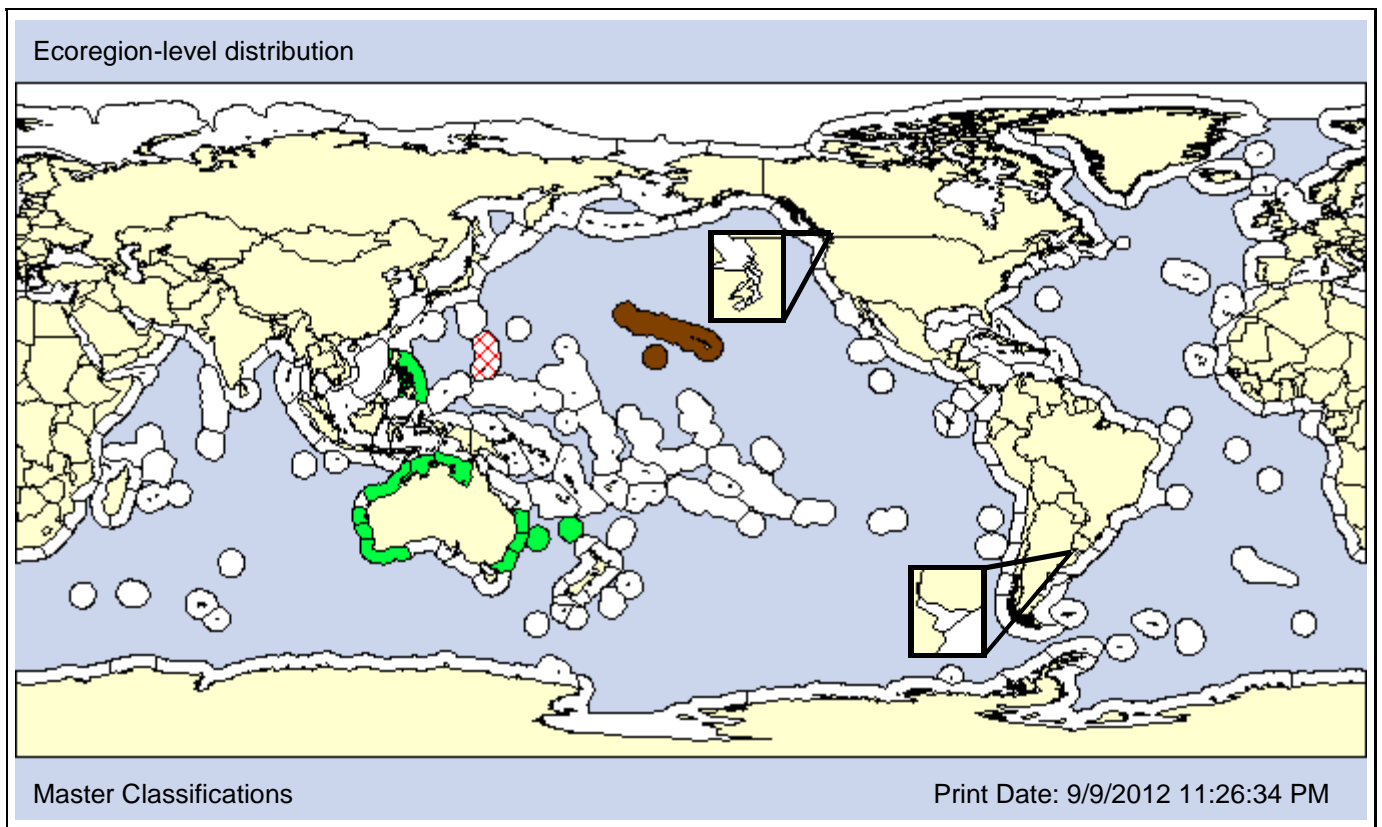
Chama asperella of WoRMS  
Chama hendersoni

Ambiguous syn.  
Synonym

**Common Names:**

jewelbox  
southern Chama

**Type Locality:**



■ Native   
 ■ Nonindigenous   
 X NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
  Unidentified

**Date 1st record:**

<1915

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: *Chama fibula* was introduced into Guam but went extinct. In Hawaii, Carlton and Eldredge (2009) consider it introduced while Paulay (pers. comm.) states that it is "not NIS in Hawaii, no evidence to that effect; could list as cryptogenic." Thus, we list it as a conflict in Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X		X

**DEPTH [Obs: 0 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O								O			O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

**Taxon:** Bivalve

**Taxonomic Author:** Linnaeus, 1758

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroidea

**Suborder:**

**Infraorder:**

**Superfamily:** Chamoidea

**Family:** Chamidae

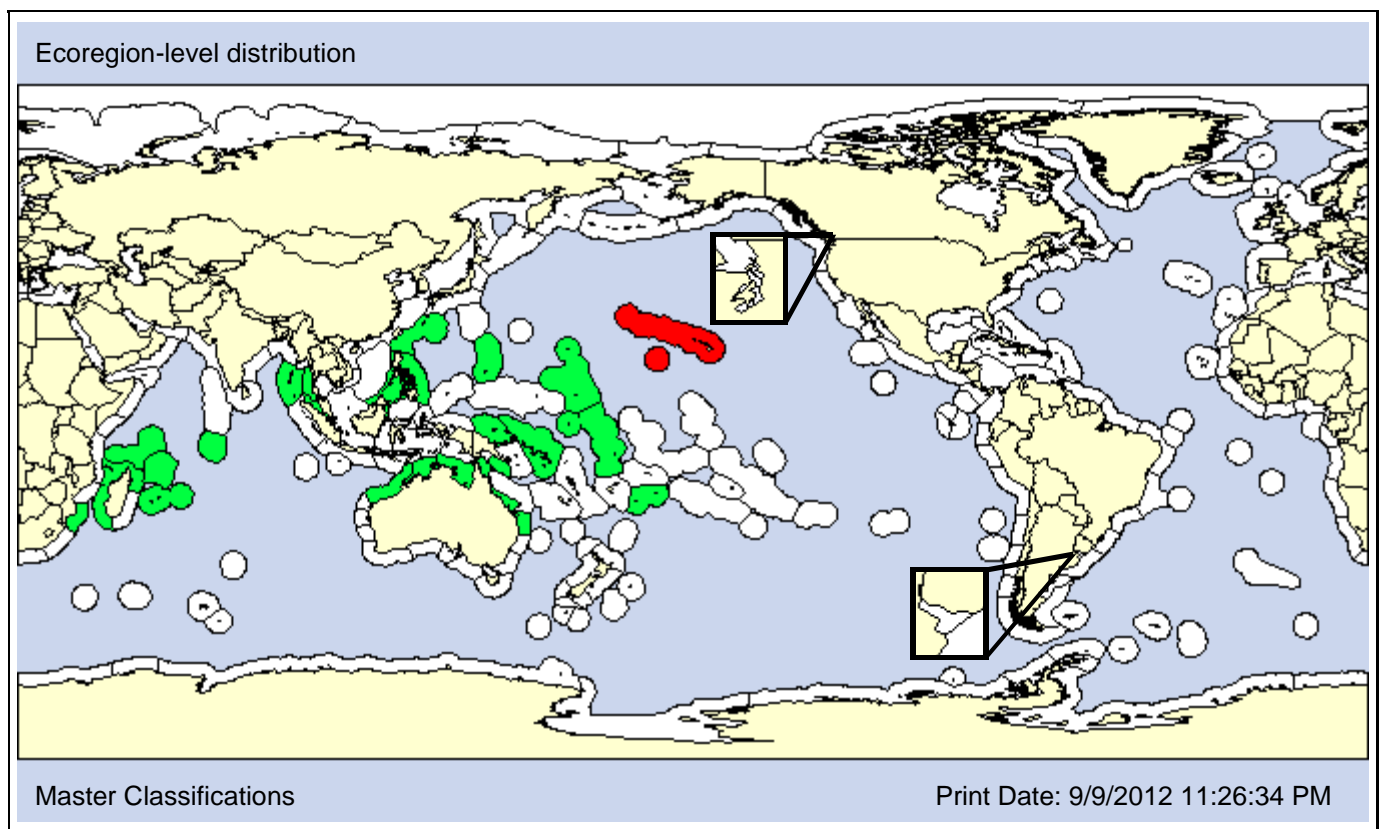
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Lazarus jewel box

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1996

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>

**DEPTH [Obs: 0 - 70m] [Pref: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>											<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** Gmelin, 1791

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Veneroida

**Suborder:** Neoheterodontei

**Infraorder:**

**Superfamily:** Chamoidea

**Family:** Chamidae

**Subfamily:**

**Also Known As (Name - Type):**

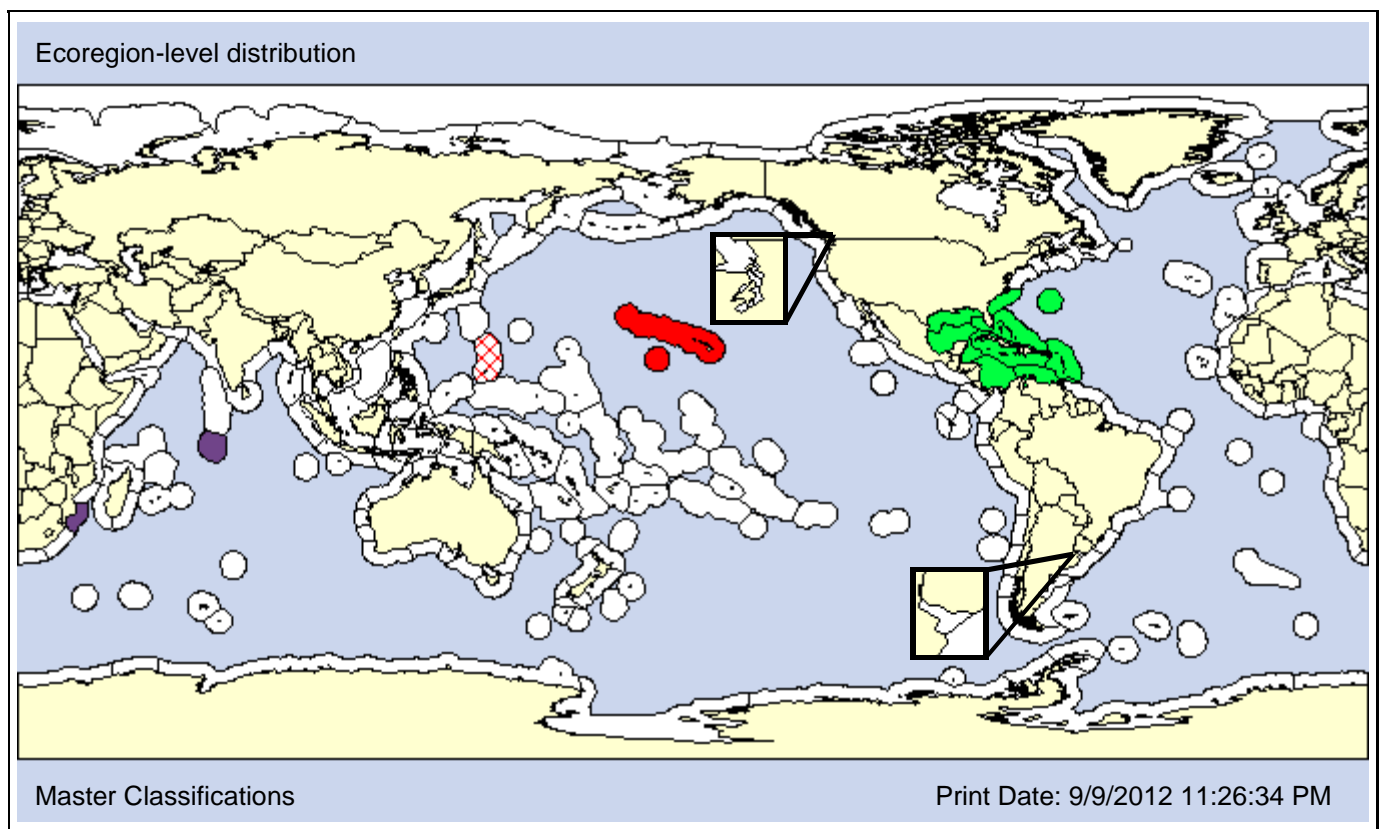
Chama citrea  
 Chama elatensis of Coles et al; not Delsaerd, 1986  
 Chama imbricata  
 Chama macerophylla var. sulphurea Poulsen, 1878

Synonym  
 Misidentified  
 Synonym  
 Synonym

**Common Names:**

leafy jewelbox  
 rock oyster (*Chama macerophylla*)

**Type Locality:**



**Date 1st record:**

1996

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: *Chama macerophylla* was introduced into Guam but went extinct.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 525m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>											<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>	<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Bivalve

**Taxonomic Author:** Broderip, 1835

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Veneroida

**Suborder:** Neoheterodontei

**Infraorder:**

**Superfamily:** Chamoidea

**Family:** Chamidae

**Subfamily:**

**Also Known As (Name - Type):**

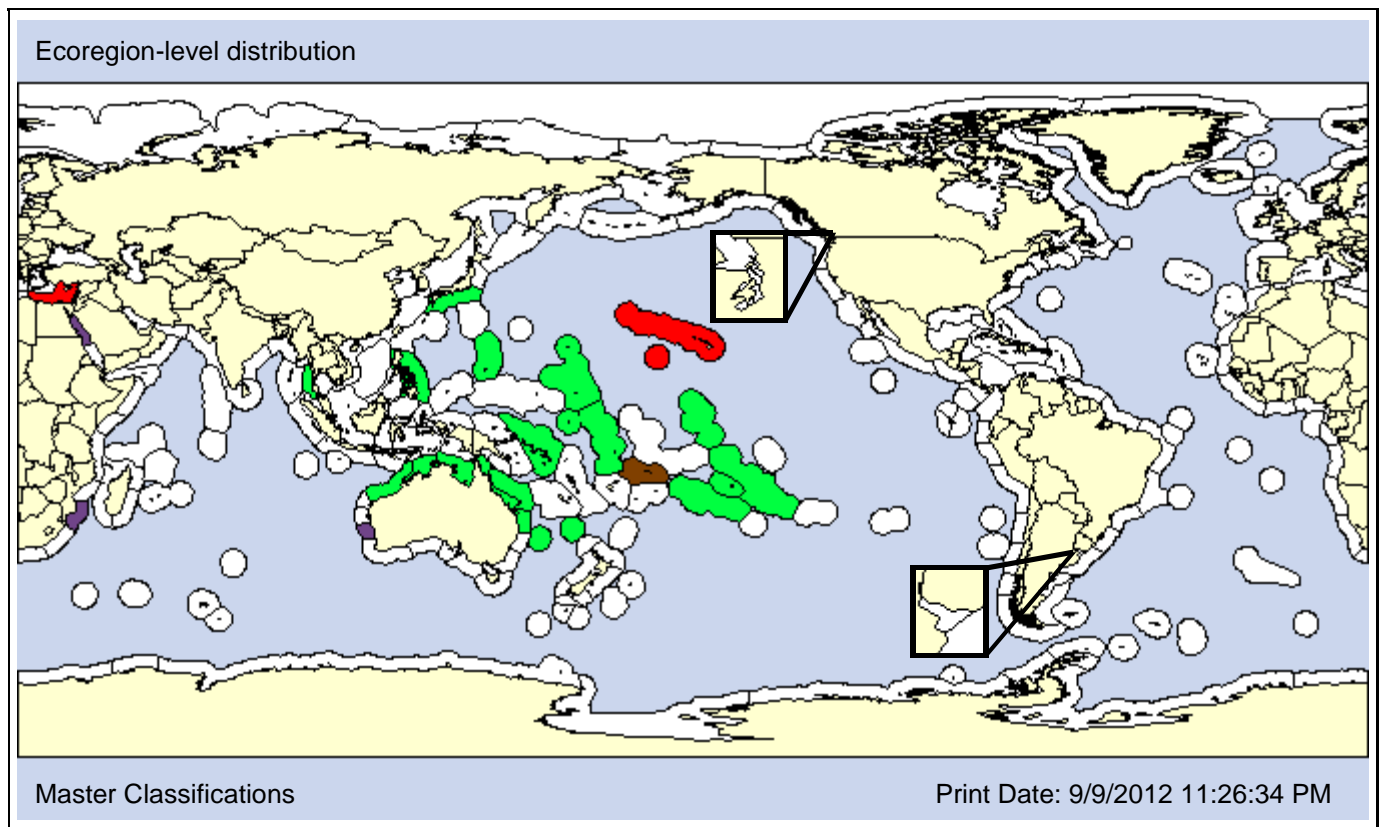
Chama aerruginosa  
Chama broderipii  
Chama carditaeformis  
Chama claasseni

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

reflexed jewel box

**Type Locality:**



**Date 1st record:** Native 1950  
**Loc 1st record:** Native Pearl Harbor, Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Coles et al. (2003) consider *Chama pacifica* as introduced to American Samoa. However, Paulay (2011) classifies it as indigenous to Samoa and all of South Polynesia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X		X	
		X											

**DEPTH [Obs: 0 - 40m] [Pref: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O											O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
				X						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
					X	X							

**Taxon:** Bivalve

**Taxonomic Author:** (Müller, 1774)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Cyrenoidea

**Family:** Cyrenidae

**Subfamily:**

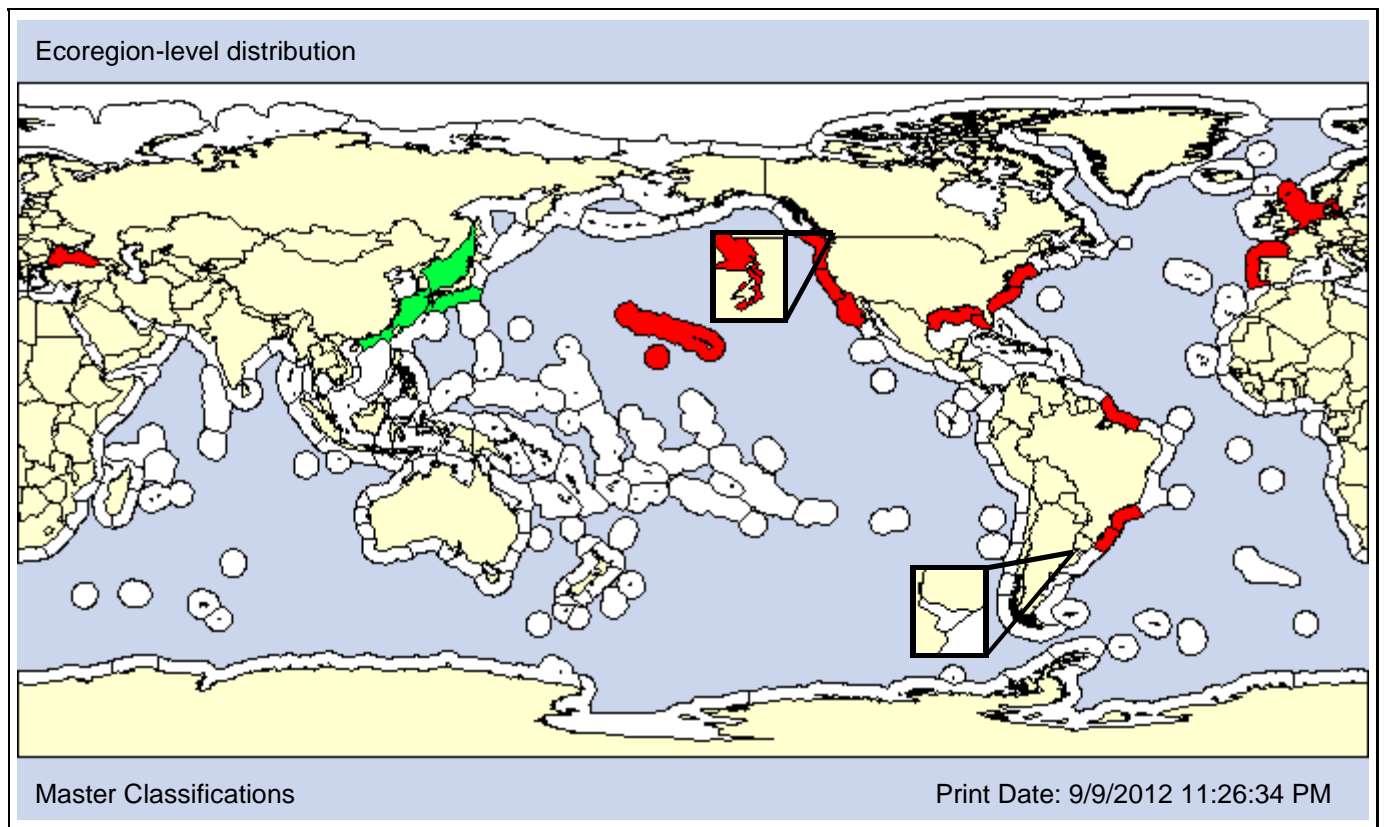
**Also Known As (Name - Type):**

Corbicula fluminalis	Synonym
Corbicula fluviatilis	Synonym
Corbicula manilensis	Synonym
Corbicula sinensis	Synonym

**Common Names:**

Asian clam (*Corbicula fluminea*)

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** Native 1982 1924  
**Loc 1st record:** Native Hawaii Vancouver Island, Canada  
**Established:** Yes Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR	X		A	P		X	
X						AO	PO	X			X				

Comments: *Corbicula fluminea* is primarily a freshwater clam, though it can occur in low salinity waters. It is a hermaphrodite that is both cross- and self-fertilizing.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 26.7m] [Pref: - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 72 - 92.7%] [Pref % Fines: - 72%]**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>O</b>	<b>P</b>			

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 20.9psu] [Pref: 0 - 2psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline P		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Bivalve

**Taxonomic Author:** Schrenck, 1861

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Myoida

**Suborder:** Myina

**Infraorder:**

**Superfamily:** Myoidea

**Family:** Corbulidae

**Subfamily:** Corbulinae

**Also Known As (Name - Type):**

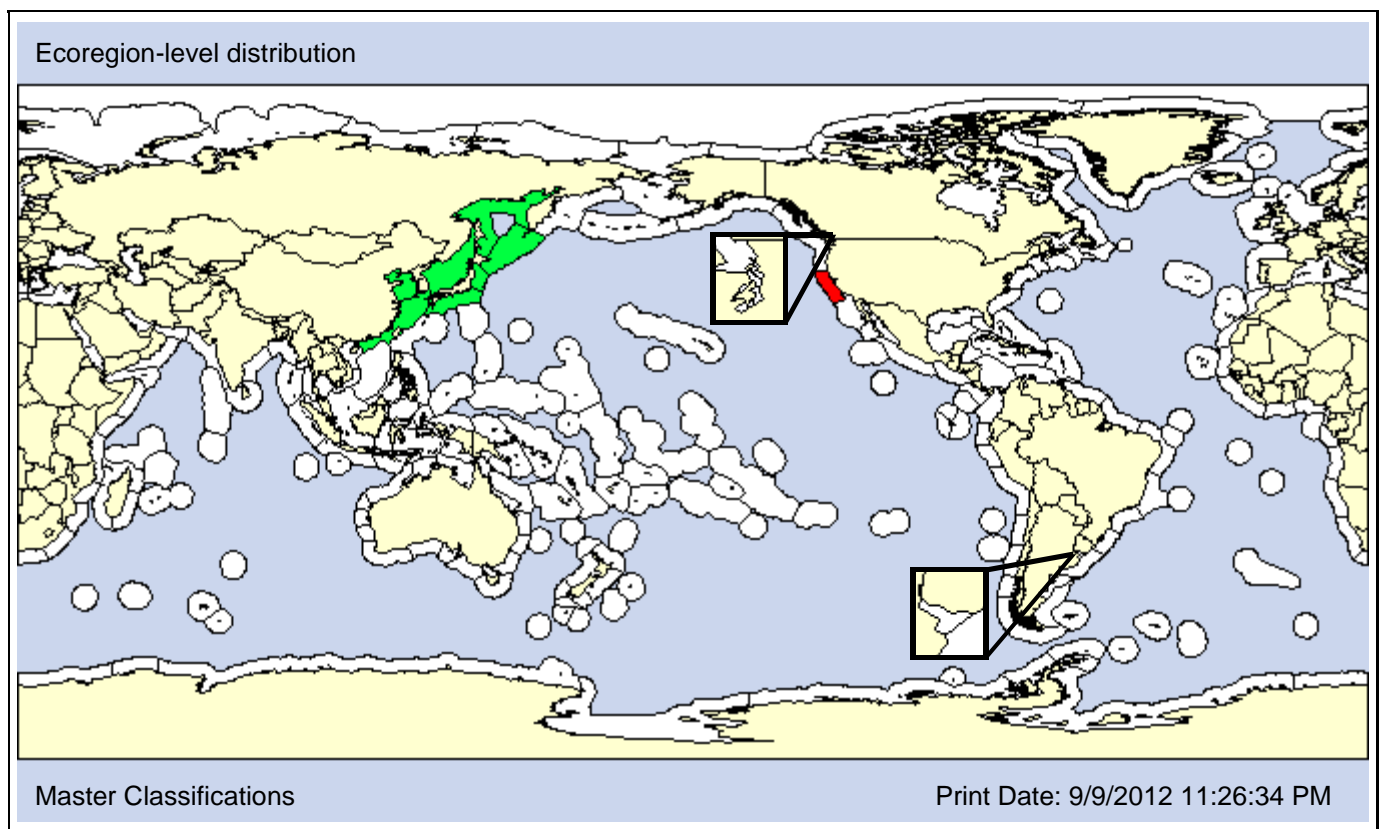
Corbula (Potamocorbula) amurensis  
 Potamocorbula amurensis  
 Potamocorbula amurensis takatuayamaensis

Convention  
 Synonym  
 Synonym

**Common Names:**

Amur River corbula  
 Asian clam (Corbula amurensis)  
 brackish-water corbula

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1896

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
<span style="color: red;">X</span>						AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 46m] [Pref: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2.19 - 100%] [Pref % Fines: - 88%]**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0.4 - 33psu] [Pref: 5 - 16psu]**

<b>Fresh O</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline P		Polyhaline P		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC				<b>X</b>	<b>X</b>		

**Taxon:** Bivalve

**Taxonomic Author:** (Thunberg, 1793)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Ostreoida

**Suborder:** Ostreina

**Infraorder:**

**Superfamily:** Ostreoidea

**Family:** Ostreidae

**Subfamily:** Crassostreinae

**Also Known As (Name - Type):**

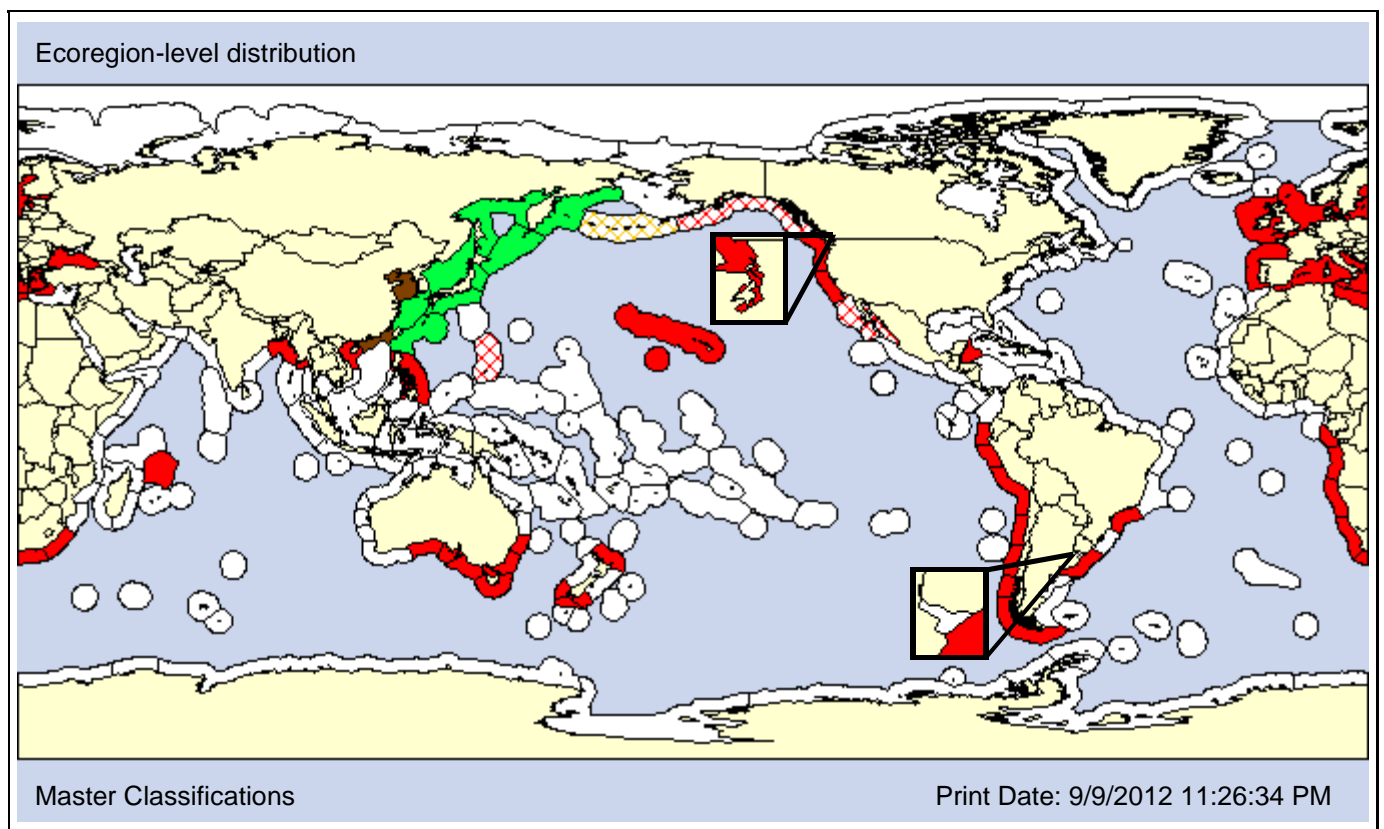
Crassostrea angulata of WoRMS  
 Crassostrea talienwhanensis  
 Dioeciostrea hispaniola  
 Gryphaea angulata

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Japanese oyster  
 Pacific cupper oyster  
 Pacific oyster

**Type Locality:**



Master Classifications

Print Date: 9/9/2012 11:26:34 PM

■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

NWP

Hawaii

NEP

**Date 1st record:** Native/Stocked

1939

1875

**Loc 1st record:** Native/Stocked

Kaneohe Bay, Hawaii

Puget Sound, WA

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X		X		AO	PO								

Comments: The introduced range of *Crassostrea gigas* in Asia is confused by the transport of different strains among countries for aquaculture even though it may occur naturally within the ecoregion. Ecoregions in Asia with reported imports from other areas are listed as conflicts. In the NEP, it is established in British Columbia and Washington.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 7m] [Pref: 0 - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>		<b>O</b>		<b>O</b>	<b>P</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>P</b>								<b>O</b>	<b>O</b>	<b>O</b>	

**SALINITY [Obs: 3 - 42psu] [Pref: 10 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
		<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H <b>X</b>		G/D	SF <b>X</b>				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					
	<b>X</b>				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Bivalve

**Taxonomic Author:** (Gmelin, 1791)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Ostreoida

**Suborder:** Ostreina

**Infraorder:**

**Superfamily:** Ostreoidea

**Family:** Ostreidae

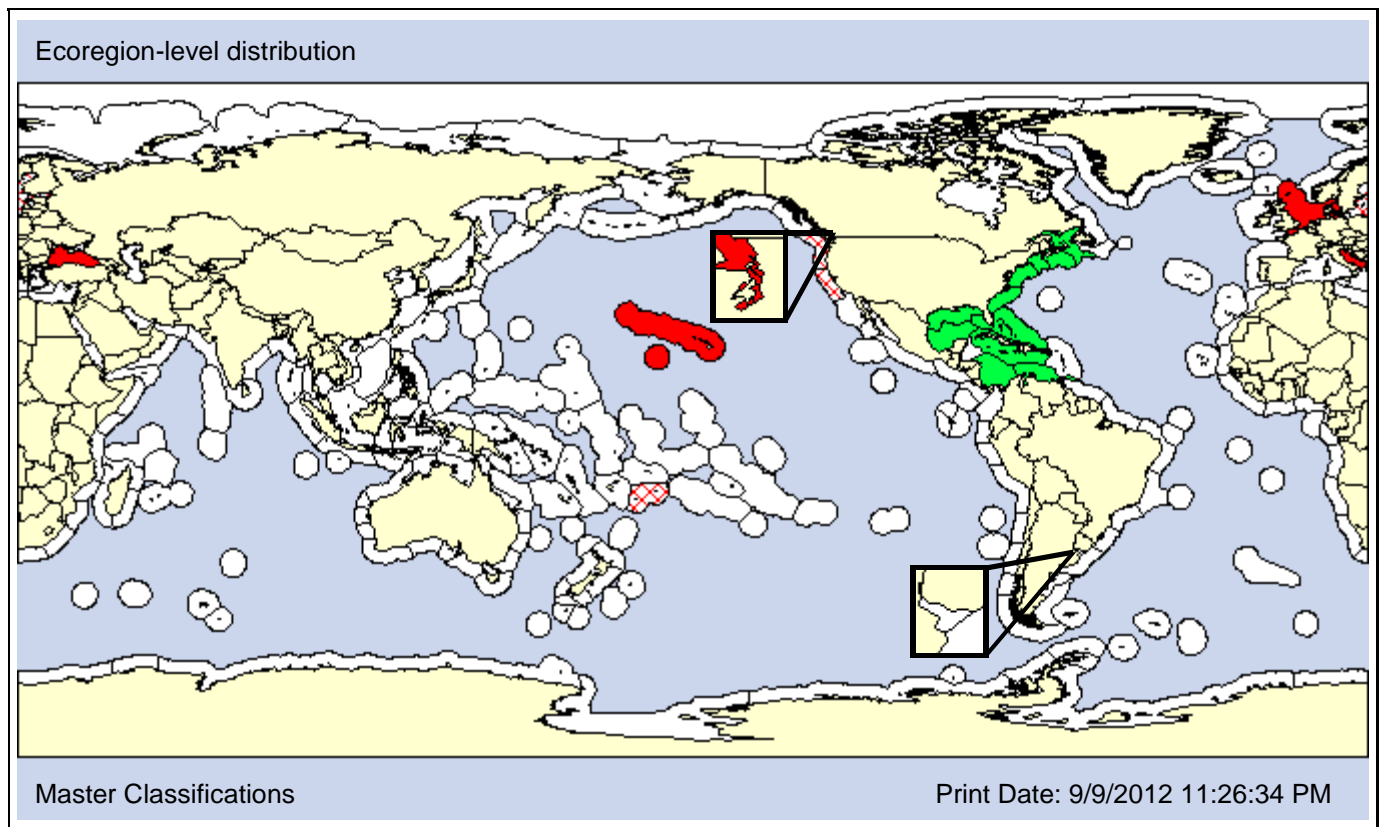
**Subfamily:** Crassostreinae

**Also Known As (Name - Type):**

Crassostrea brasiliana	Synonym	American cupped oyster
Crassostrea brasiliensis	Synonym	American oyster
Crassostrea floridensis	Synonym	Atlantic oyster
Dioecioostrea americana	Synonym	Eastern oyster

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b> 1956	1895	1869
<b>Loc 1st record:</b> Japan	Pearl Harbor, Oahu, Hawaii	San Francisco Estuary, CA
<b>Established:</b> Unknown	Yes	Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X		AO	PO								

Comments: The southern boundary of *Crassostrea virginica* in the Atlantic can only be verified to the Yucatan Peninsula (Eastern Oyster Biol. Rev. Team, 2007). The only wild population in the NEP is in Boundary Bay, Canada (Coan et al., 2000). *C. virginica* was introduced into Japan though its locations and establishment are not known.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - 7.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>						<b>O</b>					

**SALINITY [Obs: 6 - 35psu] [Pref: 10 - 28psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** (Totten, 1834)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Veneroidea

**Family:** Veneridae

**Subfamily:** Gemminae

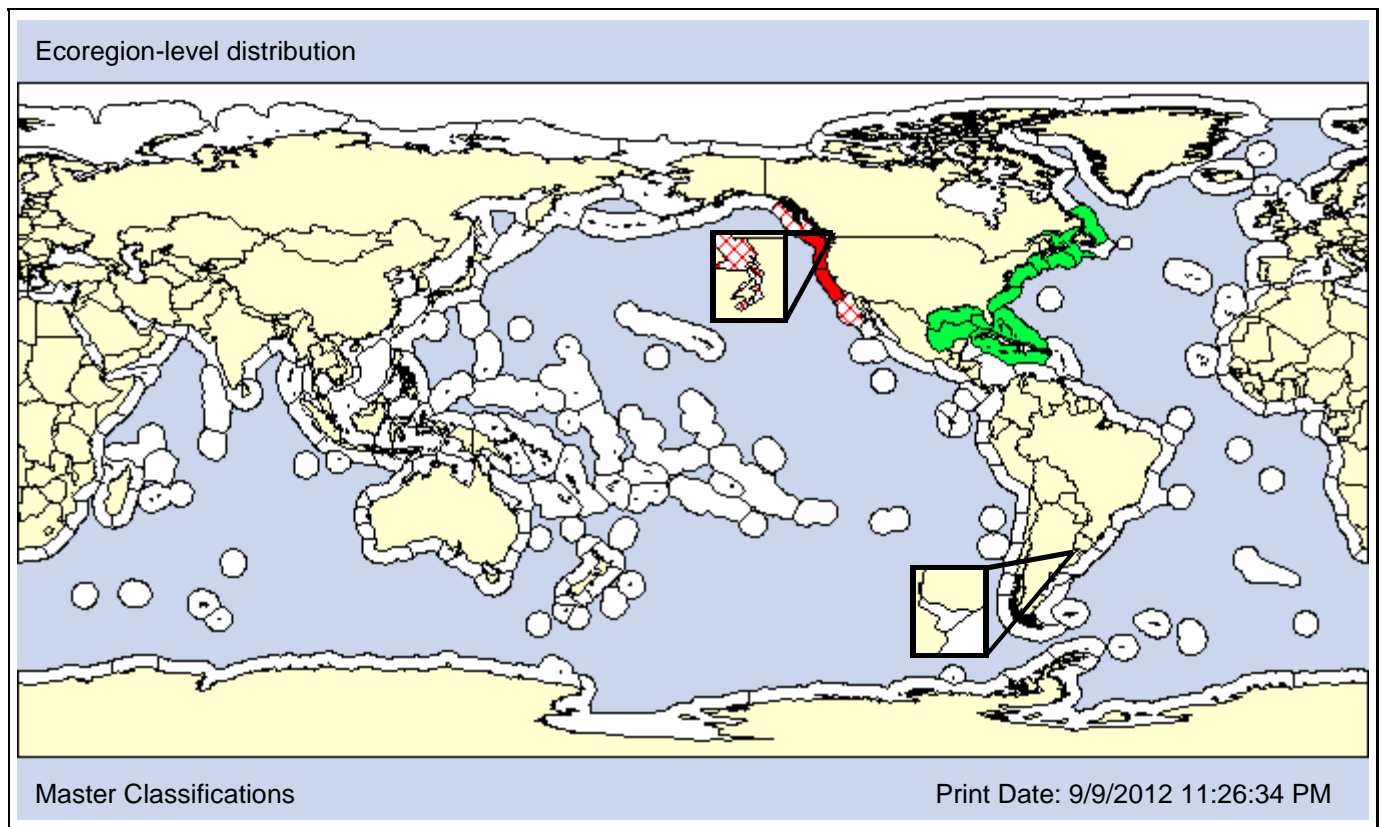
**Also Known As (Name - Type):**

Cyrena purpurea	Synonym
Gemma fretensis	Synonym
Gemma tottenii	Synonym
Parastarte concentrica	Synonym

**Common Names:**

amethyst gem clam
gem clam

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1893  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

SH			MS	AF <span style="color: red;">X</span>			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA <span style="color: red;">X</span>	IR			A	P			
						AO <span style="color: red;">X</span>	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 5 - 100%] **X****

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 5 - 31.4psu]**

<b>Fresh</b>	<b>Brackish</b> <b>P</b>					<b>Marine</b> <b>P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b> <b>X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Bivalve

**Taxonomic Author:** (Dillwyn, 1817)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Mytiloida

**Suborder:**

**Infraorder:**

**Superfamily:** Mytilidea

**Family:** Mytilidae

**Subfamily:** Modiolinae

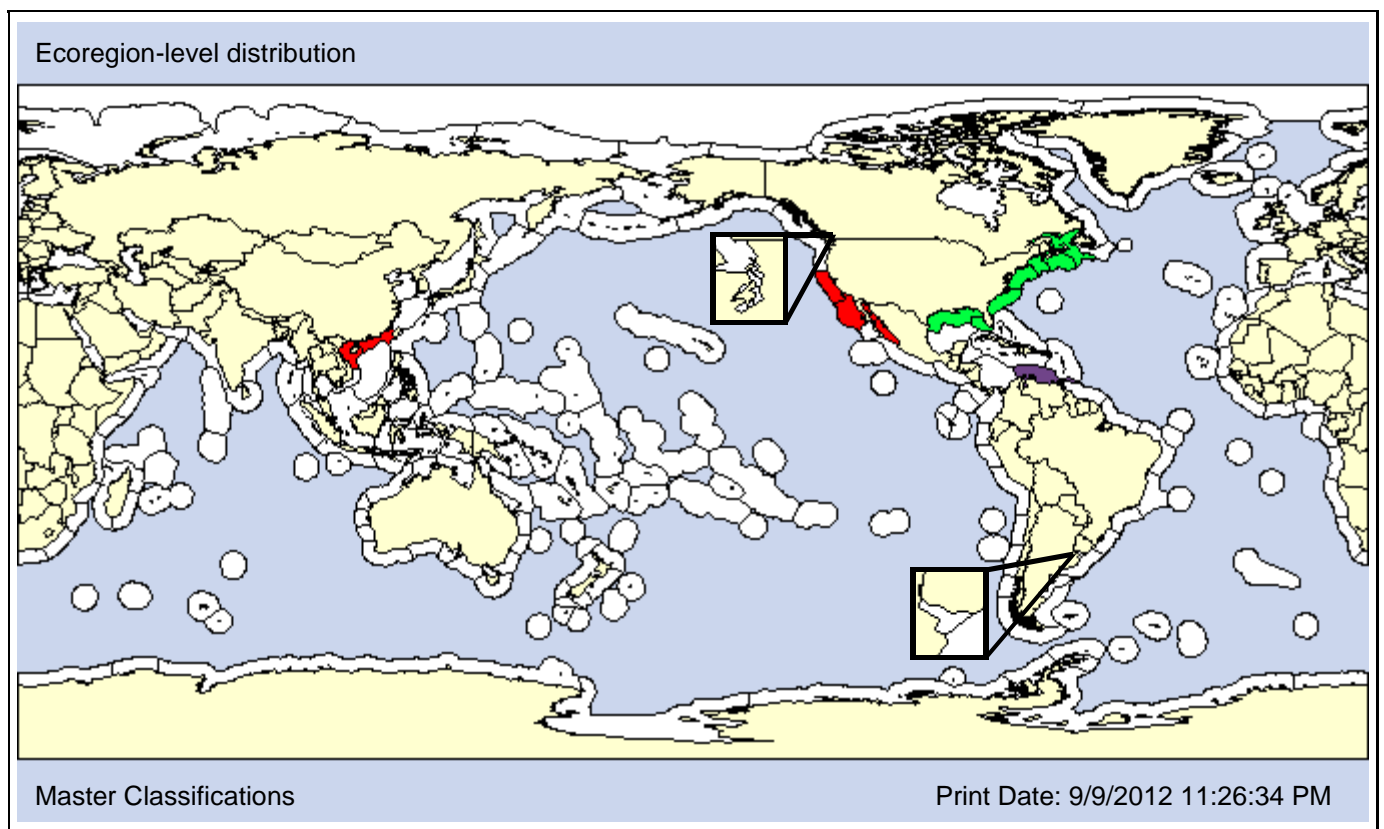
**Also Known As (Name - Type):**

Arcuatula demissa	Synonym
Ischadium demissa	Synonym
Ischadium demissum	Synonym
Modiola plicatula	Synonym

**Common Names:**

Northern ribbed mussel  
ribbed mussel

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1894

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			<b>AO X</b>	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>	<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 30m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 42.42 - 72%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>		<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>	<b>O</b>				<b>P</b>	<b>O</b>		<b>O</b>	<b>P</b>	<b>O</b>	

**SALINITY [Obs: 5 - 70psu] [Pref: 18 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P O</b>
			<b>O O</b>		<b>P P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC				<b>X</b>		<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** (Linnaeus, 1767)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Myoida

**Suborder:** Myina

**Infraorder:**

**Superfamily:** Hiatelloidea

**Family:** Hiatellidae

**Subfamily:** Hiatellidae

**Also Known As (Name - Type):**

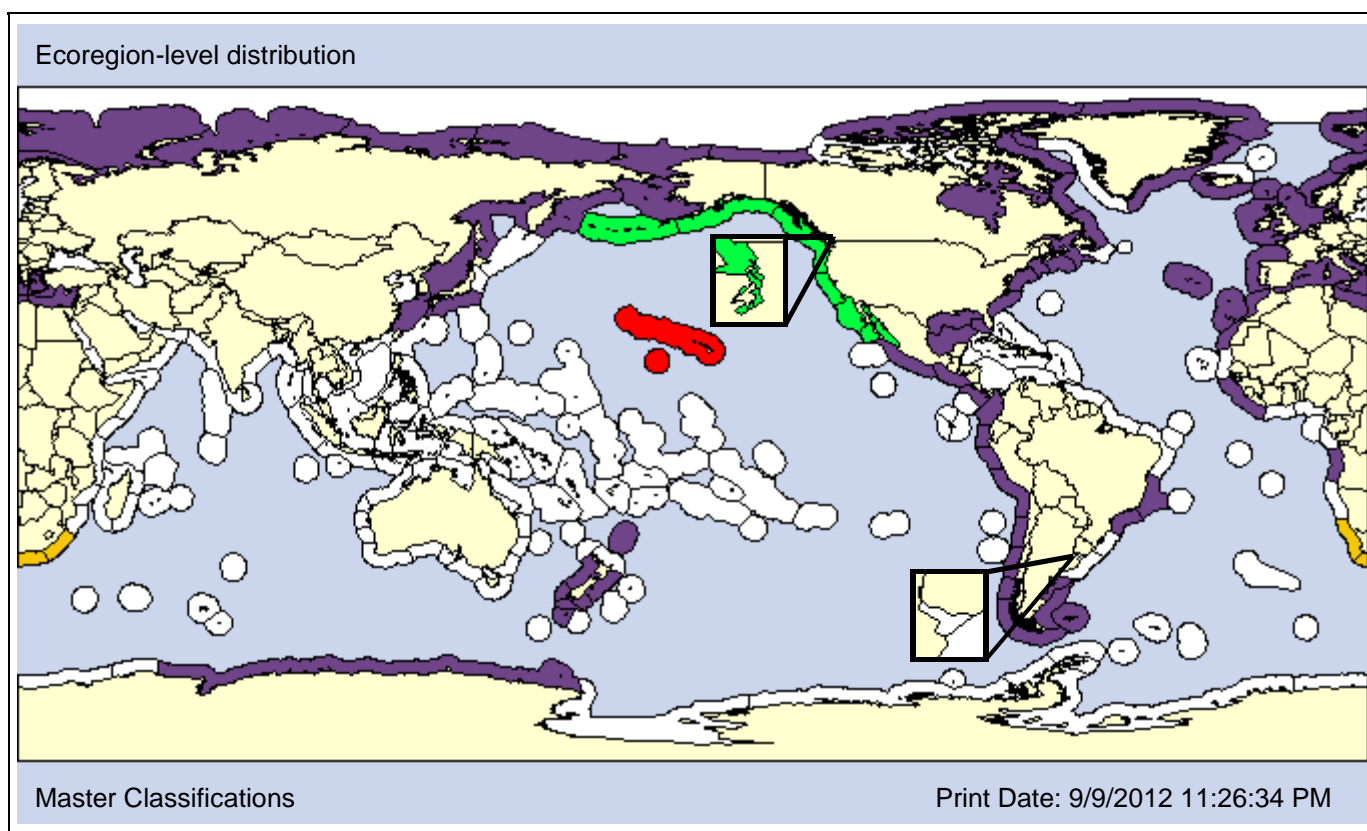
Didonta bicarinata  
Hiatella monoperta  
Hiatella striata  
Mya arctica

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

Arctic hiatella  
little gaper  
nestling clam  
nestling saxicave

**Type Locality:** Arctic



**Date 1st record:** Unknown <1920 Native  
**Loc 1st record:** Unknown Oahu, Hawaii Native  
**Established:** Yes Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: “Hiatella arctica” likely consists of a species complex. Nonetheless, CANOD (2009) classifies H. arctica as native in California, Carlton and Eldredge (2009) as NIS in Hawaii, and Mead et al. (2011) as cryptogenic in South Africa. Because of the taxonomic uncertainty, we list it as unclassified in other areas.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
		<b>X</b>											

**DEPTH [Obs: 0 - 1190m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 0 - 97%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>		<b>O</b>			<b>P</b>					<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 23 - 34.26psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
					<b>O</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>	<b>X</b>			<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Bivalve

**Taxonomic Author:** (Reeve, 1863)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Anomalodesmata

**Suborder:**

**Infraorder:**

**Superfamily:** Thracioidea

**Family:** Laternulidae

**Subfamily:**

**Also Known As (Name - Type):**

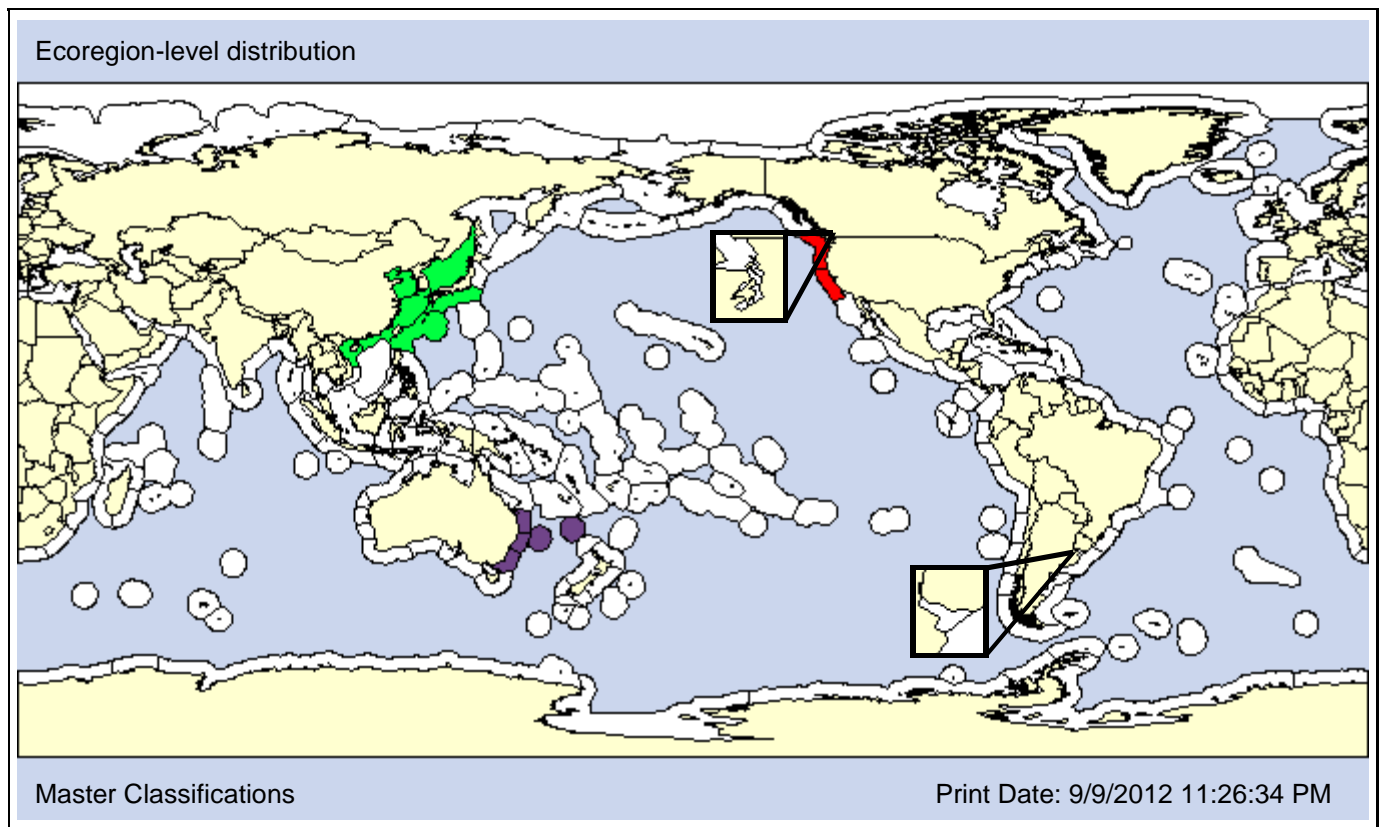
Anatina cristella  
 Anatina kamkurama  
 Anatina peichiliensis  
 Laternula (Exolaternula) marilina

Synonym  
 Synonym  
 Synonym  
 Convention

**Common Names:**

Asian lanternshell  
 duck lantern clam  
 littoral spoon clam  
 Sotoori-Gai

**Type Locality:**



**Date 1st record:** Native

1963

**Loc 1st record:** Native

Coos Bay, Oregon

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
X						AO	PO X								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>	<b>X</b>		TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 25m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 7.4 - 40.3%] **X****

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 7 - 34psu] [Pref: 27 - 30psu]**

<b>Fresh</b>	<b>Brackish</b> <b>P</b>					<b>Marine</b> <b>P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b> <b>X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Bivalve

**Taxonomic Author:** (Dunker, 1857)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Mytiloidea

**Suborder:**

**Infraorder:**

**Superfamily:** Mytilidea

**Family:** Mytilidae

**Subfamily:**

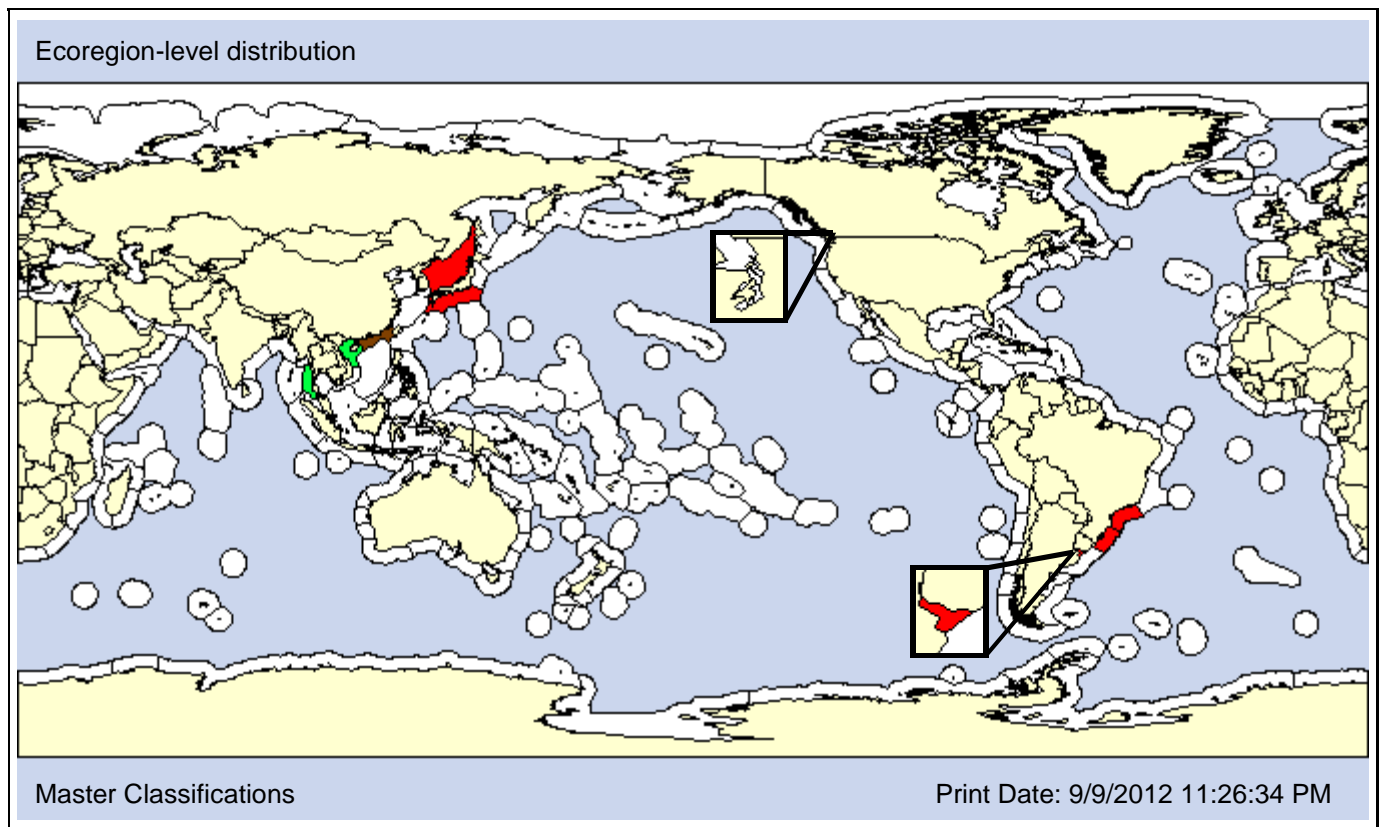
**Also Known As (Name - Type):**

Dreissena siamensis	Synonym
Limnoperna depressa	Synonym
Limnoperna lacustris	Synonym
Limnoperna lemeslei	Synonym

**Common Names:**

golden mussel
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1987

**Loc 1st record:** Lake Biwa, Japan

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P				
<b>X</b>						AO	PO									

Comments: *Limnoperna fortunei* is primarily a freshwater species but can tolerate salinities up to 12 psu. It is native to water bodies in mainland southeast Asia, including China, but has since invaded Hong Kong, Japan, and South America.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>						<b>O</b>			<b>O</b>	<b>P</b>

**SALINITY [Obs: 0 - 12psu] [Pref: 0 - 3psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF <b>X</b>				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					
					<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** (Lamarck, 1819)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Mytiloidea

**Suborder:**

**Infraorder:**

**Superfamily:** Mytilidea

**Family:** Mytilidae

**Subfamily:**

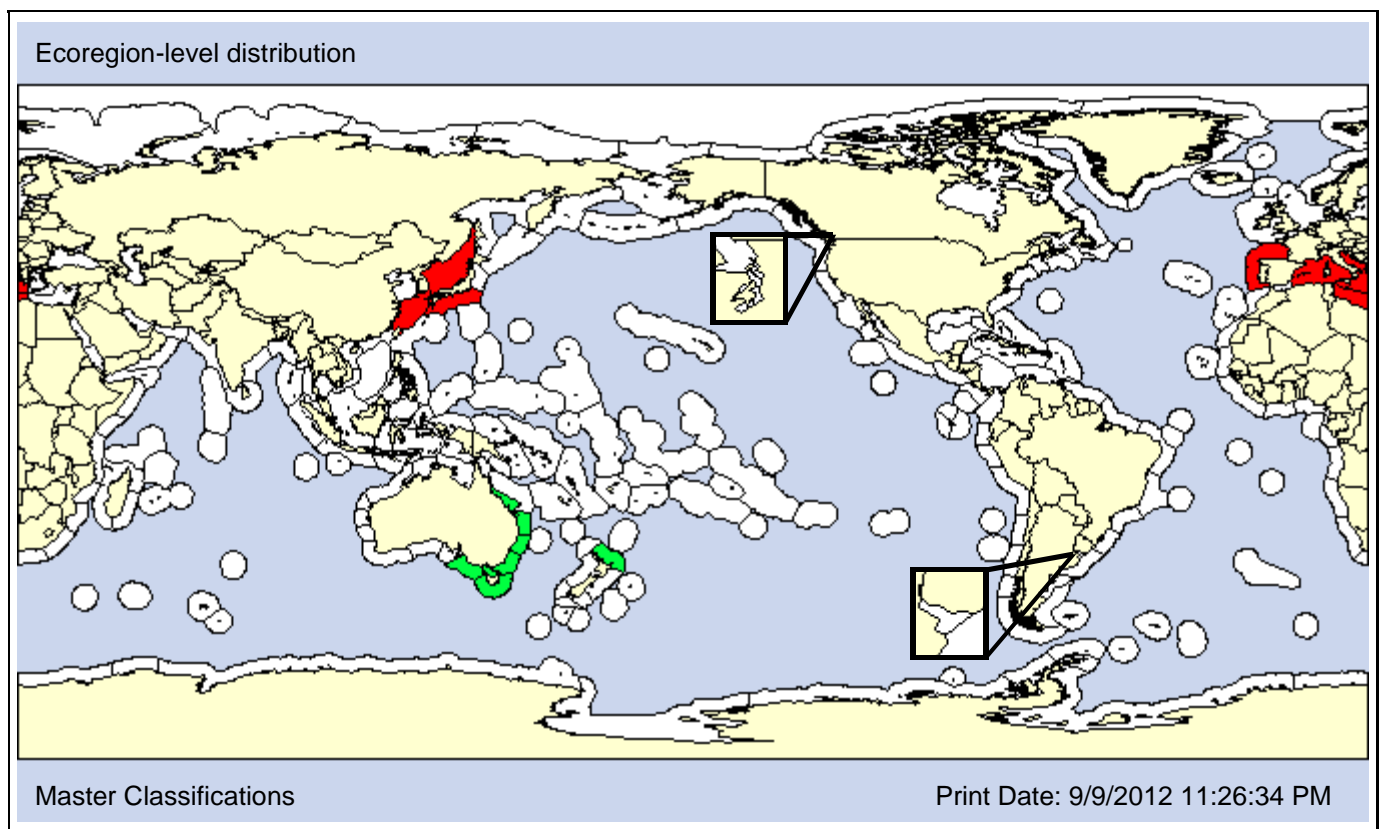
**Also Known As (Name - Type):**

Limnoperna fortunei kikuchii	Synonym
Modiola fluviatilis	Synonym
Modiola securis	Synonym
Modiola vexillum	Synonym

**Common Names:**

black pygmy mussel  
Koroen-kawahibarigai

**Type Locality:**



**Date 1st record:** 1972

**Loc 1st record:** Lake Kojima, Okayama, Japan

**Established:** Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
X		X				AO	PO								

Comments: *Limnoperna securis* (= *Xenostrobus securis*) was first reported from Japanese waters in 1972 from Lake Kojima, Okayama (MEI, 2008).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>	<b>O</b>									<b>O</b>	

**SALINITY [Obs: 1 - 31psu] [Pref: 18 - 19psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** (Sowerby, 1851)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Veneroidea

**Family:** Veneridae

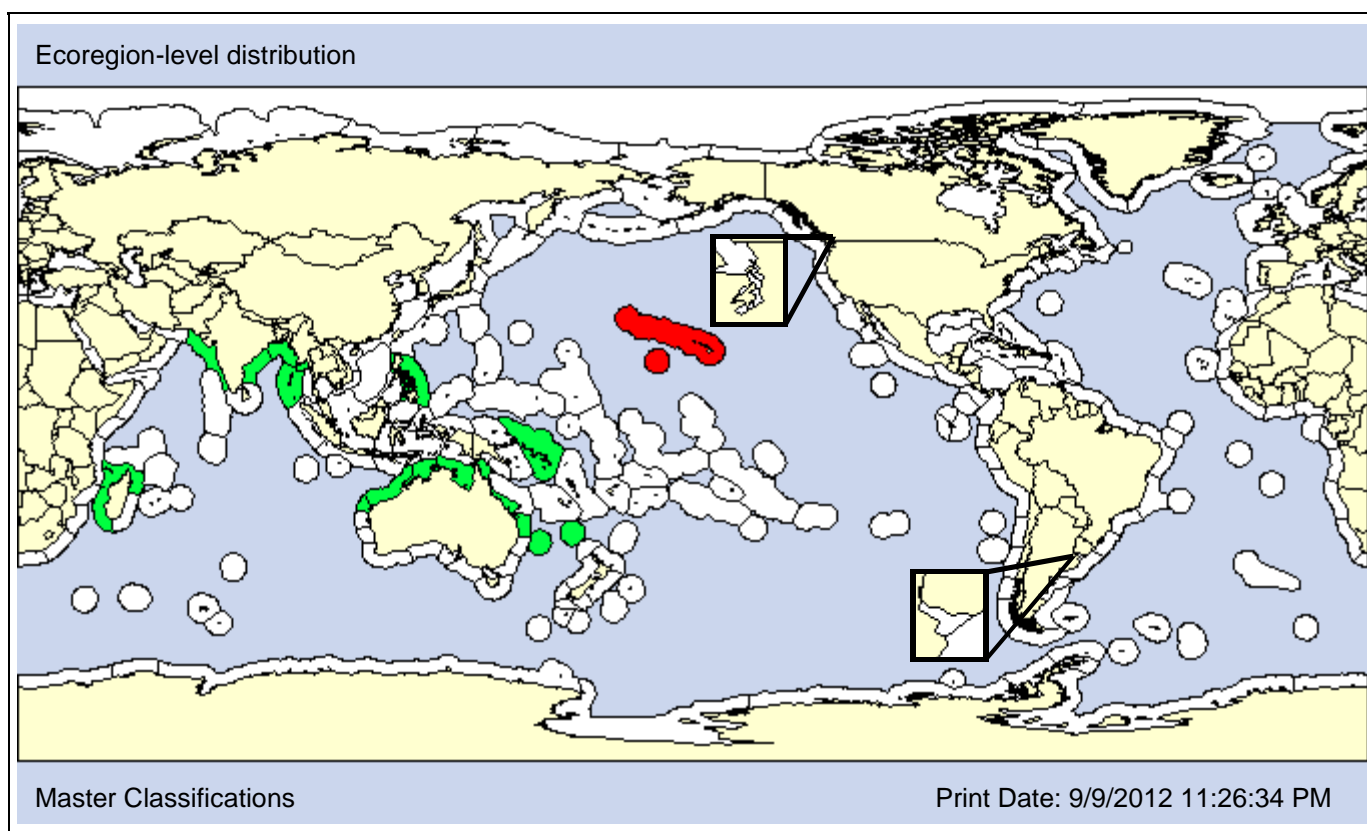
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Lioconcha pseudofastigiata	Synonym	
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1985  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
					<b>X</b>								



**Taxon:** Bivalve

**Taxonomic Author:** (Deshayes, 1863)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Myoida

**Suborder:** Pholadina

**Infraorder:**

**Superfamily:** Pholadoidea

**Family:** Teredinidae

**Subfamily:** Teredininae

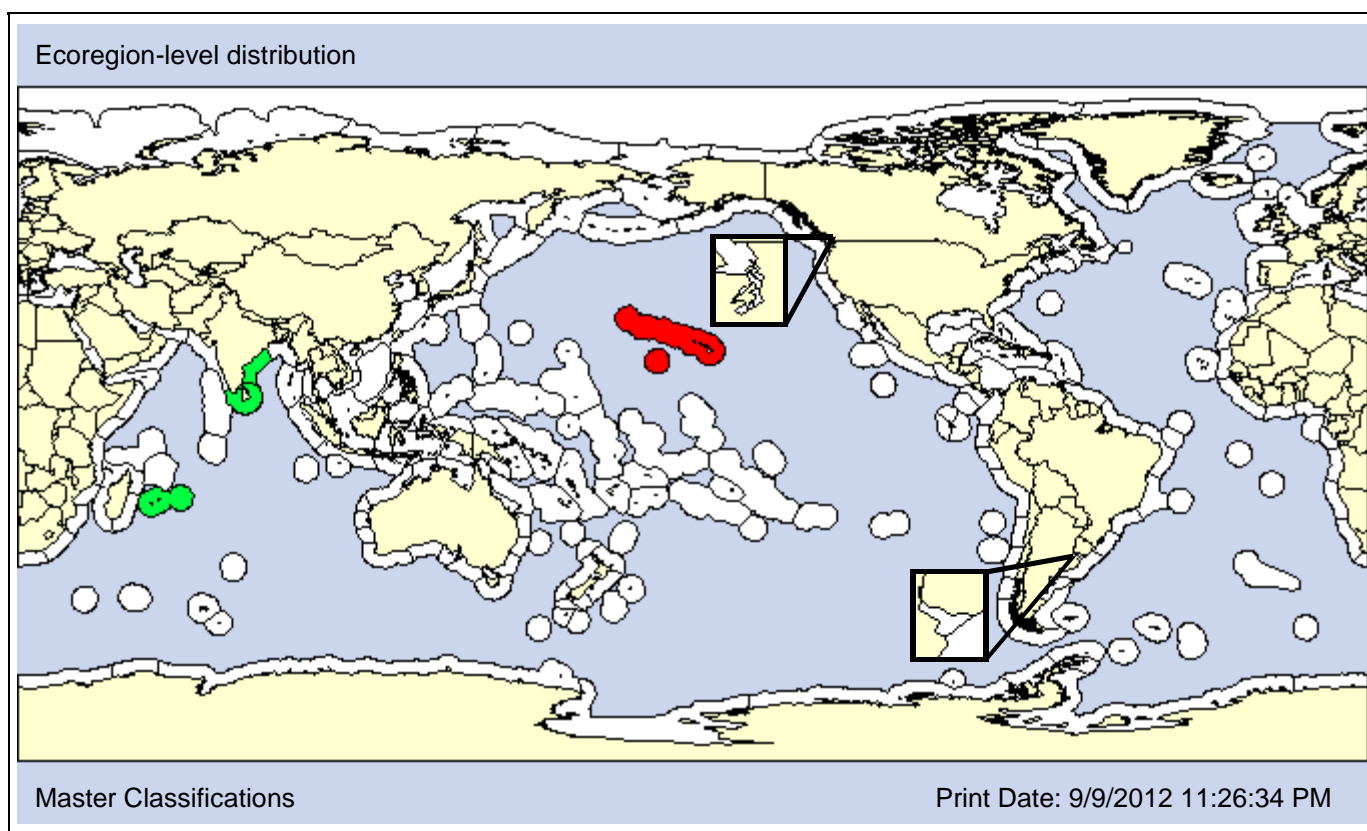
**Also Known As (Name - Type):**

Teredo ?milleri of authors  
Teredo affinis

Misidentified  
Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:** 1923  
**Loc 1st record:** Kauai, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
	X	X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - 23m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P			P	O

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					

**Taxon:** Bivalve

**Taxonomic Author:** (Quatrefages, 1849)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Myoida

**Suborder:**

**Infraorder:**

**Superfamily:** Pholadoidea

**Family:** Teredinidae

**Subfamily:** Teredininae

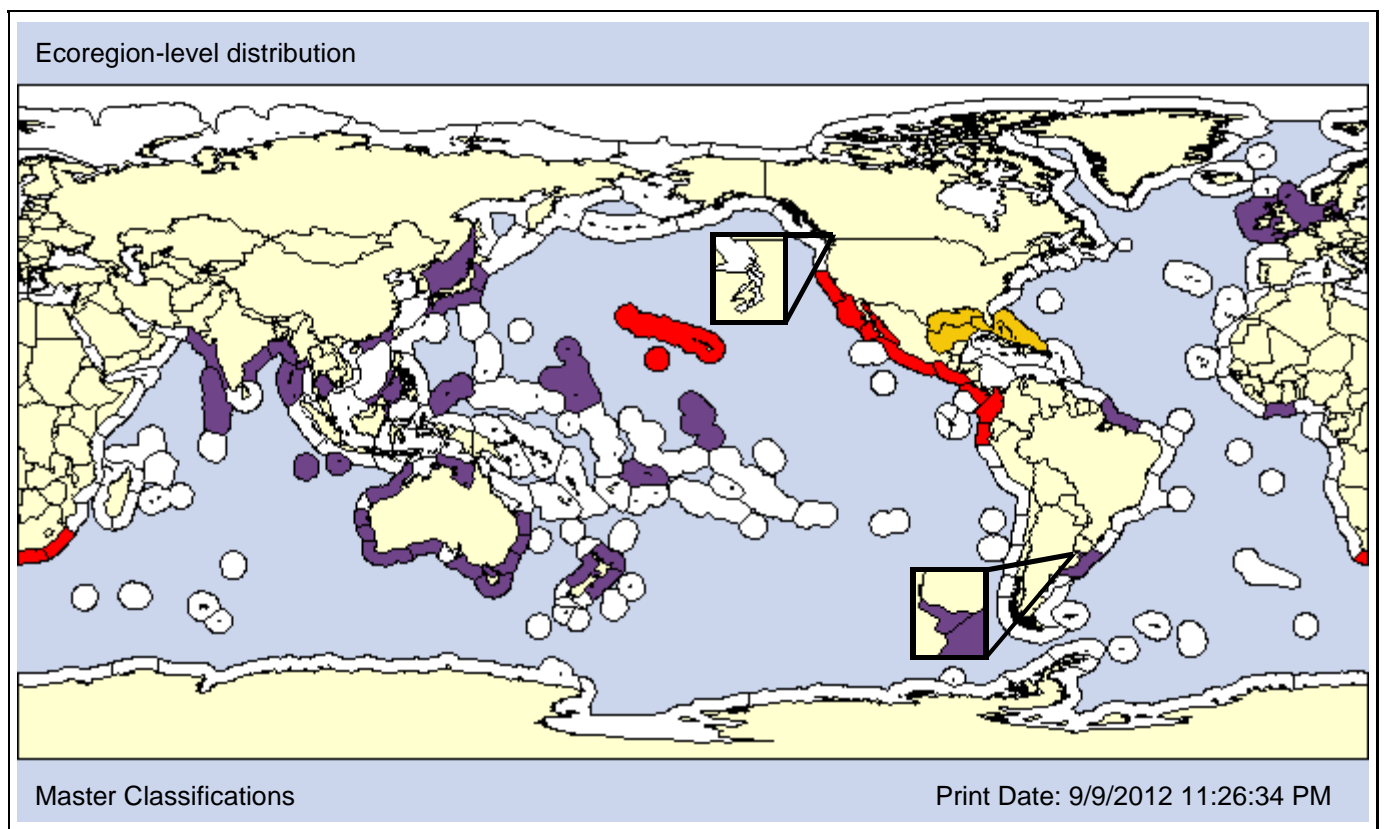
**Also Known As (Name - Type):**

Teredo arabica	Synonym
Teredo calmani	Synonym
Teredo chlorotica	Synonym
Teredo dagmarae	Synonym

**Common Names:**

blacktip shipworm
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**Type Locality:** Spain



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP

Hawaii

NEP

**Date 1st record:** Unknown

1902

1871

**Loc 1st record:** Unknown

Oahu, Hawaii

San Diego Bay, CA

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				X
		X				AO	PO								

Comments: The native distribution of the shipworm *Lyrodus pedicellatus* is unknown though Carlton and Eldredge (2009) speculate that it is the “Southern Hemisphere”. It is considered introduced to the NEP, tropical Eastern Pacific, Hawaii, and South Africa, and cryptogenic in Florida, which we extrapolate to the northern Caribbean.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			X		TP	RI-PH				X	

**DEPTH [Obs: 2 - 62m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic P			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
O	P					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

R	HP	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									O	P			P	

**SALINITY [Pref: 29 - 36psu]**

Fresh	<b>Brackish P</b>						<b>Marine P</b>		Hyper
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						P			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
		X		LP-B X	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X				X	

# *Lyrodus takanoshimensis*

Species ID: 3380

**Taxon:** Bivalve

**Taxonomic Author:** (Roch, 1929)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Myoida

**Suborder:**

**Infraorder:**

**Superfamily:** Pholadoidea

**Family:** Teredinidae

**Subfamily:** Teredininae

**Also Known As (Name - Type):**

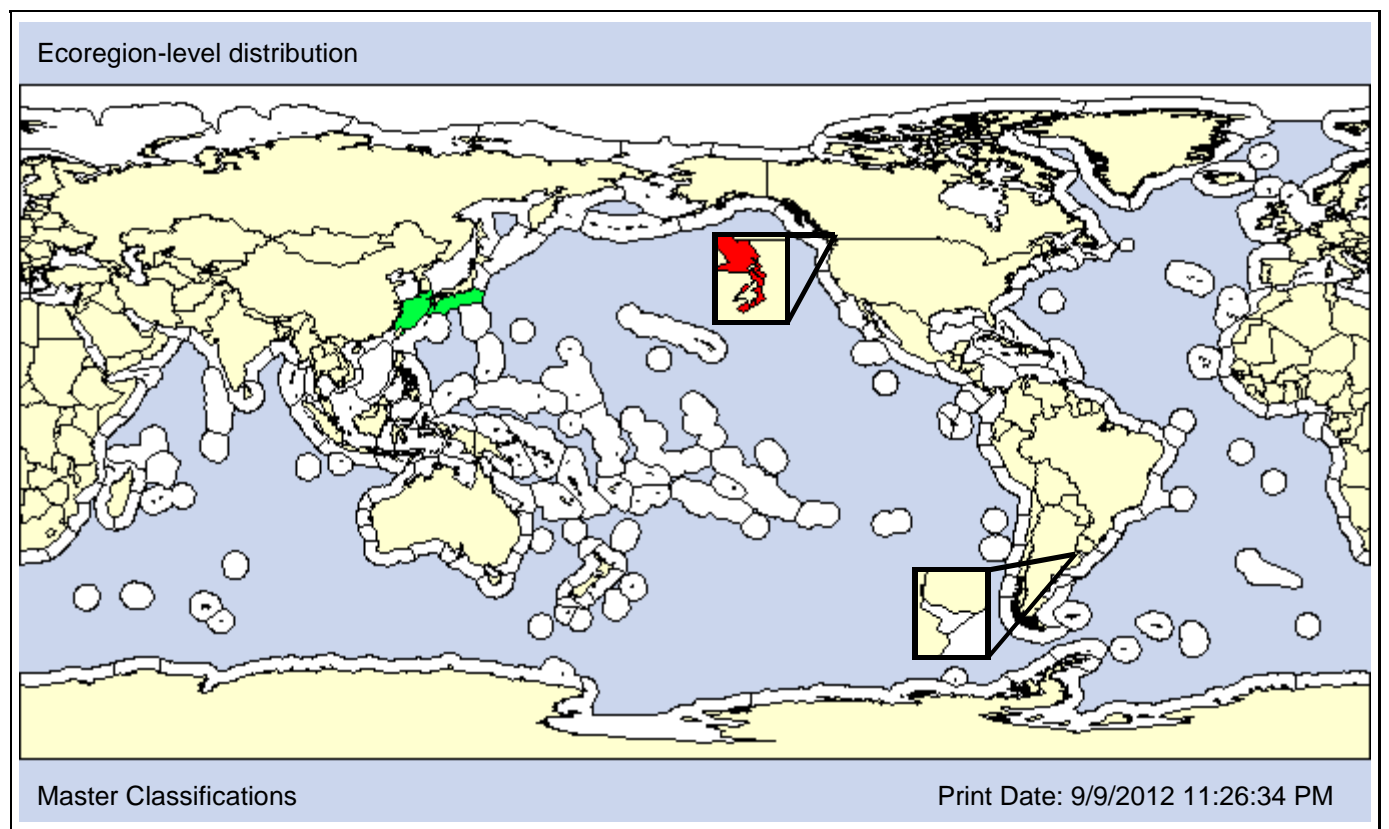
Teredo dicroa  
Teredo takanoshimensis

Synonym  
Synonym

**Common Names:**

Takanoshima shipworm

**Type Locality:** Takanoshima, Japan



**Date 1st record:** Native

1981

**Loc 1st record:** Native

Ladysmith Harbor, B.C.

**Established:** Yes

Unknown

## VECTORS

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P		X	
						AO	PO X							

Comments: *Lyrodus takanoshimensis* likely invaded British Columbia, Canada through infestation of the wooden crates used to transport Pacific oyster seed. It is not known whether it is established.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>								<b>Artificial Substrate O</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>				<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					

# Macoma petalum

Species ID: 1174

**Taxon:** Bivalve

**Taxonomic Author:** (Valenciennes, 1821)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Tellinoidea

**Family:** Tellinidae

**Subfamily:** Macominae

**Also Known As (Name - Type):**

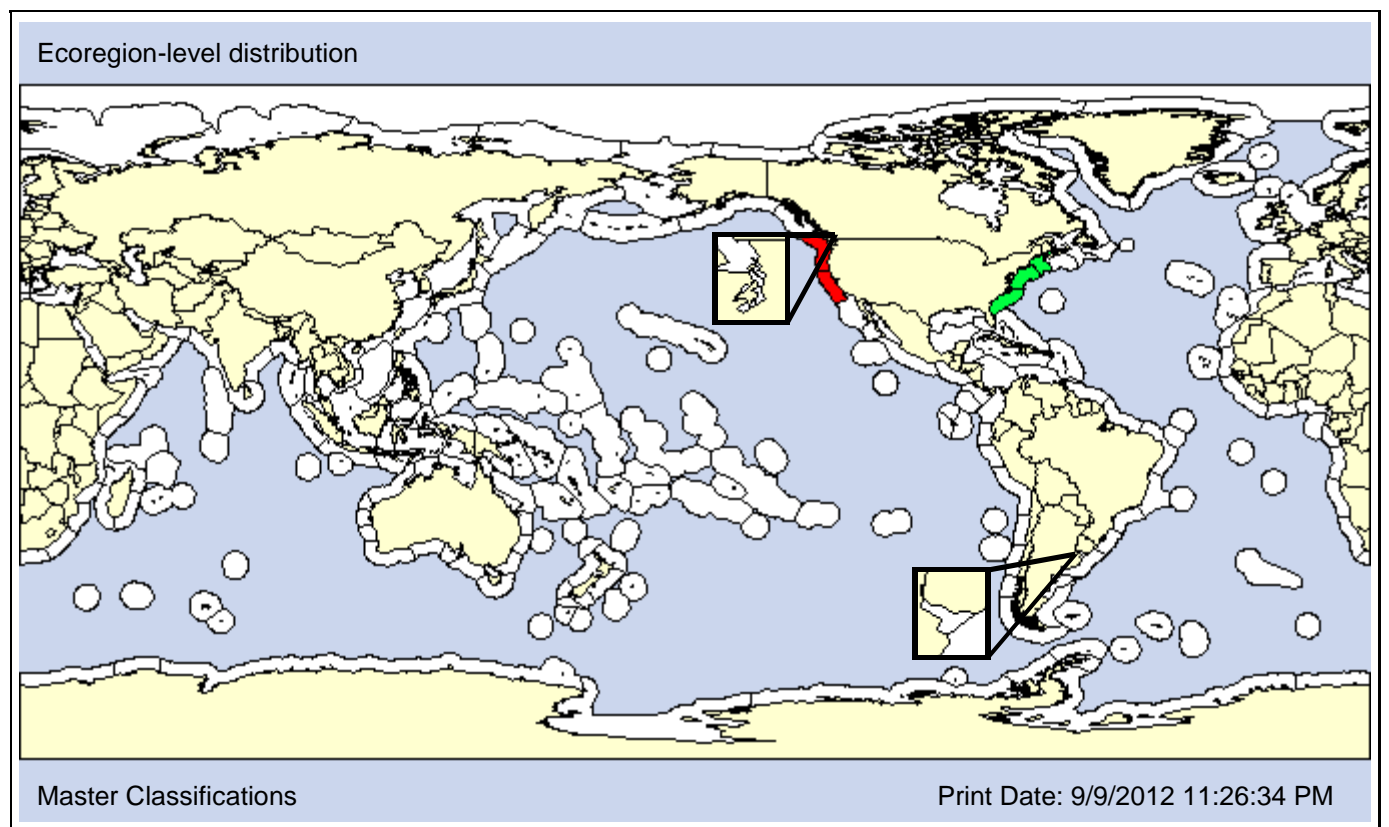
Macoma balthica of NEP authors in part

Misidentified

**Common Names:**

Baltic clam

**Type Locality:**



**Date 1st record:**

Early 1850s to early 1900s

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
X	X					AO X	PO								

Comments: *Macoma petalum* is recognized as genetically distinct from the boreal and European *M. balthica* (Vainola 2003). Its range along the Pacific Coast has not been determined, but there are introduced populations in the San Francisco Estuary and other estuaries in central/northern California, Oregon, and Washington.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 11m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 94.78 - 100%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>		<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 5.7 - 31psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF <b>X</b>				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		



**Taxon:** Bivalve

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:**

**Superorder:** Euheterodonta

**Order:** Myoida

**Suborder:** Pholadina

**Infraorder:**

**Superfamily:** Pholadoidea

**Family:** Pholadidae

**Subfamily:**

**Also Known As (Name - Type):**

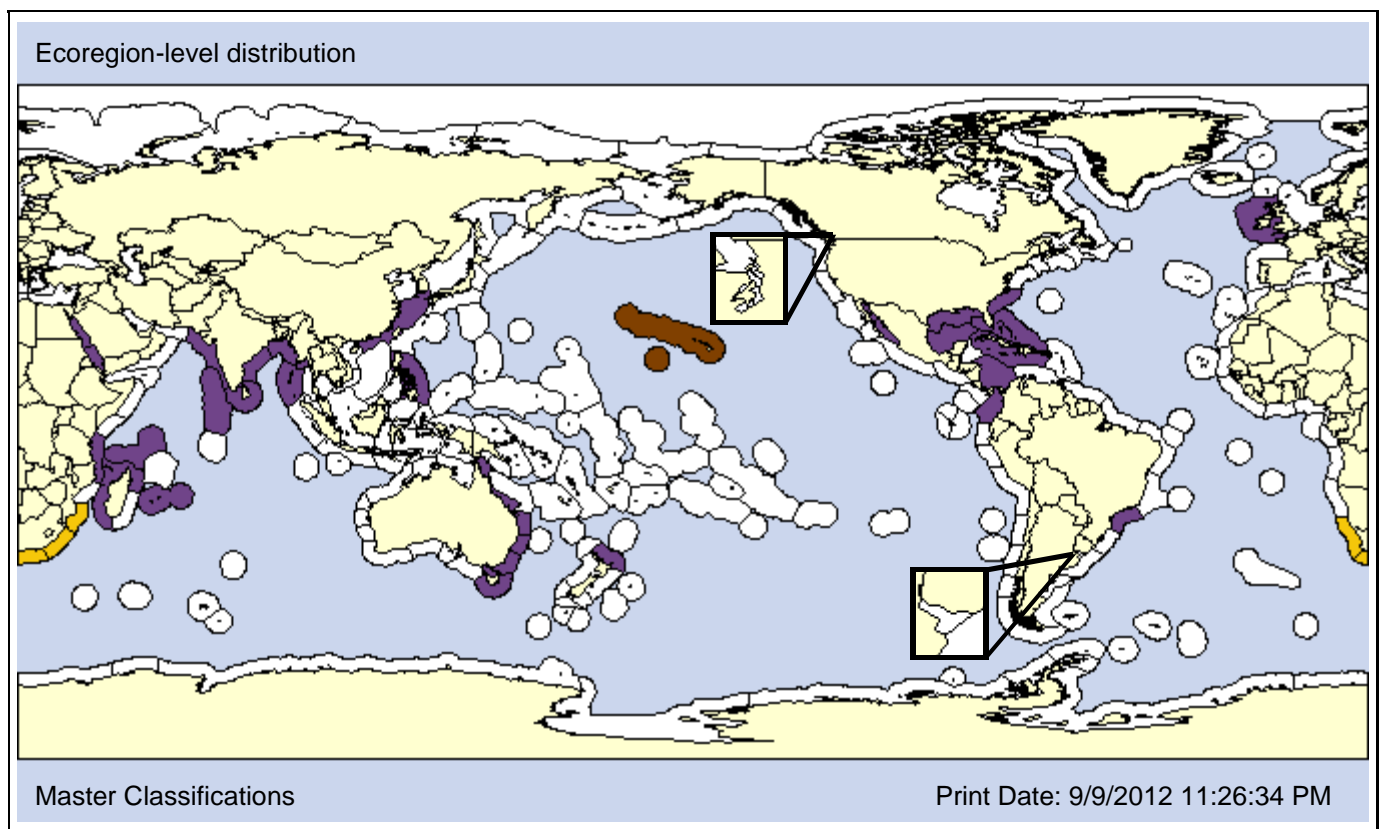
Hiata infelix  
 Martesia americana  
 Martesia hawaiiensis  
 Martesia hawaiiensis

Synonym  
 Synonym  
 Synonym  
 Misspelling

**Common Names:**

Olepe-naka-loa  
 striate piddock  
 striated wood piddock

**Type Locality:**



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown                      1915  
**Loc 1st record:** Unknown                      Pearl Harbor, Oahu, Hawaii  
**Established:**    Yes                              Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		<b>X</b>				AO	PO								

Comments: The origin of *Martesia striata* is unknown but may be the southwestern Pacific Ocean. Carlton and Eldredge (2009) consider it introduced into Hawaii while Paulay (2011) considers it cryptogenic. Thus, we list this as a conflict for Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: 0 - 200m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P			P	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
				X						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					

**Taxon:** Bivalve

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Veneroidea

**Family:** Veneridae

**Subfamily:** Venerinae

**Also Known As (Name - Type):**

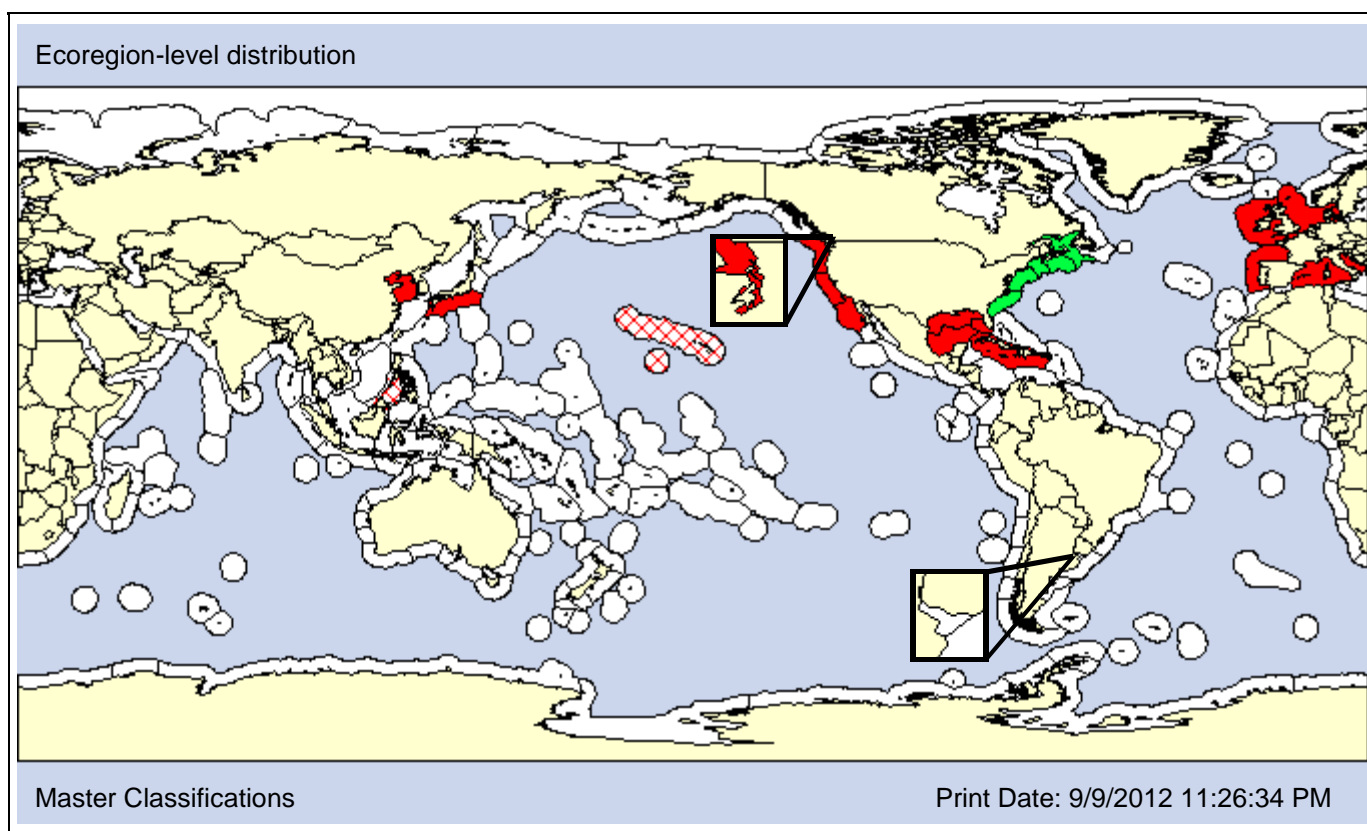
Mercenaria mercenaria texana of authors  
 Venus (Mercenaria) mercenaria  
 Venus mercenaria

Misidentified  
 Synonym  
 Synonym

**Common Names:**

cherrystone  
 hard shell clam  
 Hon-binosugai  
 quahog

**Type Locality:** Pennsylvania (montibus Sveciae fossilis), USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1996 1901  
**Loc 1st record:** Tokyo Bay, Japan San Francisco Estuary, CA  
**Established:** Yes No Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P		X		
X				X	X	AO	PO								

Comments: The NWA clam *Mercenaria mercenaria* has established populations in the NEP, NWP, and Mediterranean, and went extinct in Hawaii. According to Arnold et al. (2009), only *M. campechiensis* is native to Gulf of Mexico and occurrences of *M. mercenaria* in the Gulf represent an introduction.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 15m] [Pref: 0 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 74 - 76%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 4 - 35psu] [Pref: 18 - 28psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
		<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Bivalve

**Taxonomic Author:** (Lamarck, 1818)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Veneroidea

**Family:** Veneridae

**Subfamily:** Meretricinae

**Also Known As (Name - Type):**

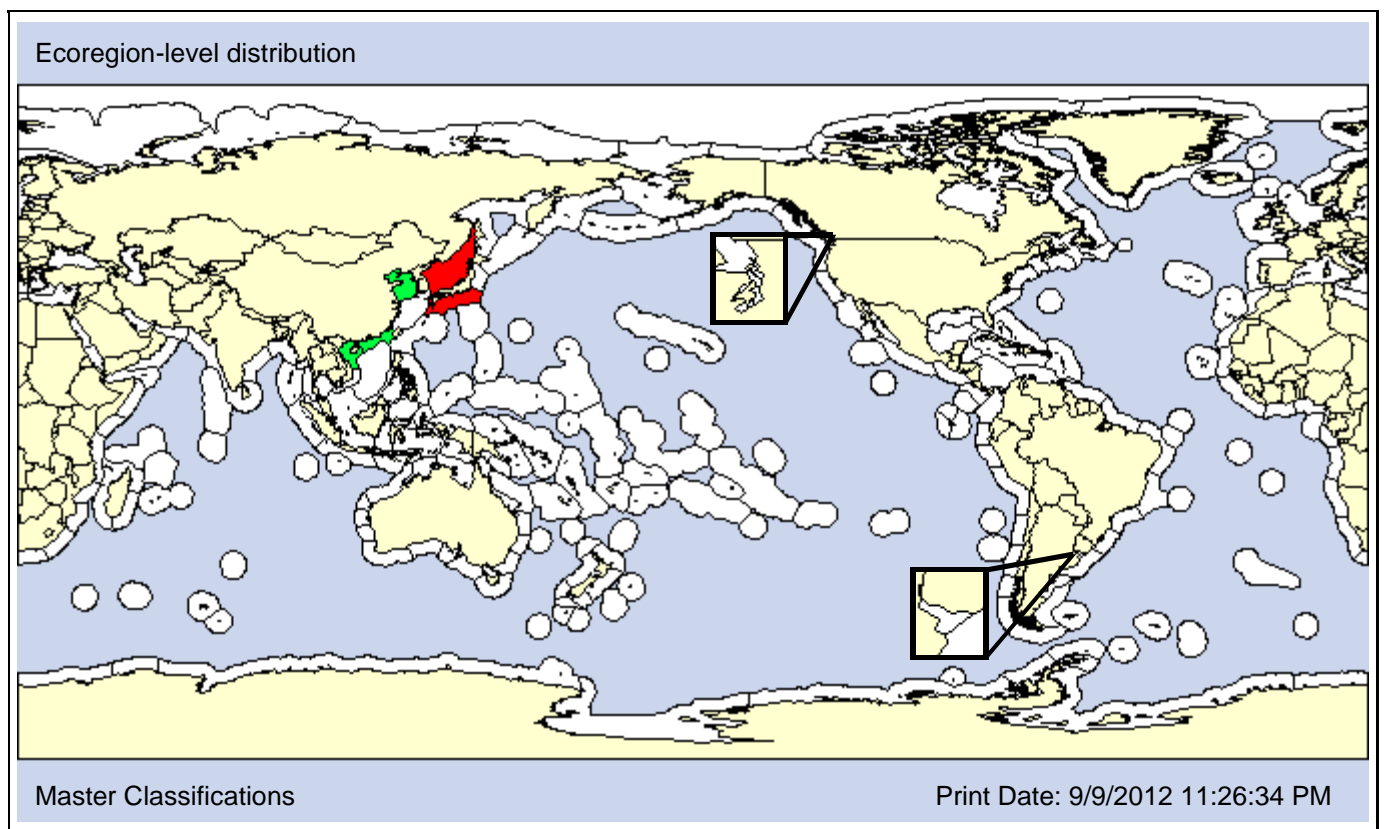
Cytherea petechialis  
Cytherea zonaria

Synonym  
Synonym

**Common Names:**

Chinese hard clam

**Type Locality:**



**Date 1st record:** 1969

**Loc 1st record:** Japan

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: Meretrix petechialis was introduced into Japan from China or Korea.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

Unconsolidated X						Consolidated						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	X	X											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O					

**CONSOLIDATED SUBSTRATE**

R	HP	Biogenic							Artificial Substrate					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 10 - 40psu] [Pref: - 30psu]**

Fresh	Brackish O					Marine P		Hyper O
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	O
				O	O	O		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		

**Taxon:** Bivalve

**Taxonomic Author:** (Benson in Cantor, 1842)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Mytiloida

**Suborder:**

**Infraorder:**

**Superfamily:** Mytilidea

**Family:** Mytilidae

**Subfamily:** Crenellinae

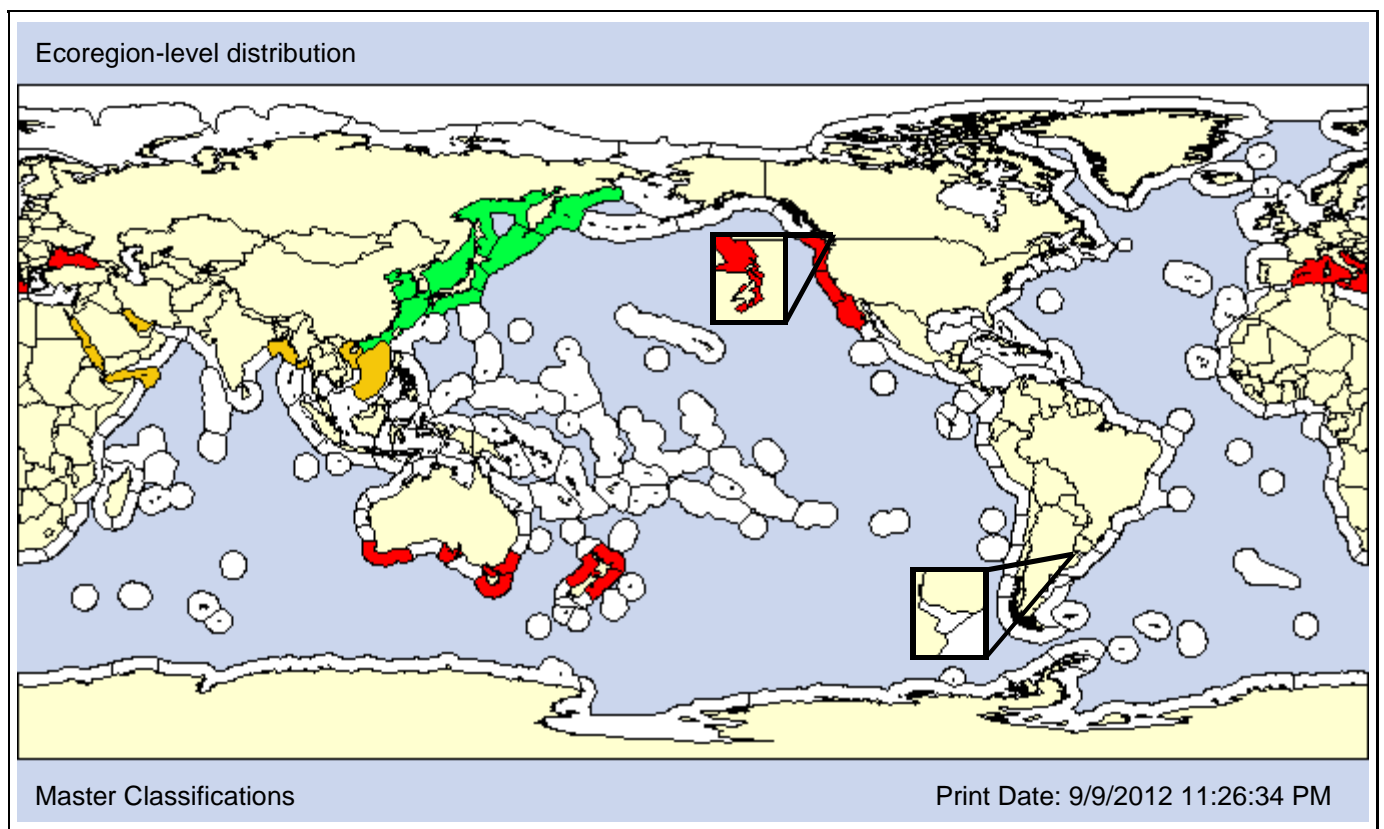
**Also Known As (Name - Type):**

Arcuatula senhousia	Synonym
Brachidontes senhousia	Synonym
Modiolus senhousia	Synonym
Volsella senhausi	Synonym

**Common Names:**

Asian date mussel
date mussel
green mussel ( <i>Musculista senhousia</i> )
Japanese mussel

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** Native

1924

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO <b>X</b>								

Comments: In the NEP, the green mussel, *Musculista senhousia*, can form extensive mats covering the bottom. It appears to have gone extinct in Elkhorn Slough Estuary in central California (Wasson et al., 2001).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 30m] [Pref: 0 - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.56 - 99.19%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>P</b>	<b>O</b>			

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>	<b>O</b>				<b>P</b>				<b>P</b>	<b>O</b>	

**SALINITY [Obs: 17 - 37psu] [Pref: 20 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
				<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC				<b>X</b>		<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Bivalve

**Taxonomic Author:** Linnaeus, 1758

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Myoida

**Suborder:**

**Infraorder:**

**Superfamily:** Myoidea

**Family:** Myidae

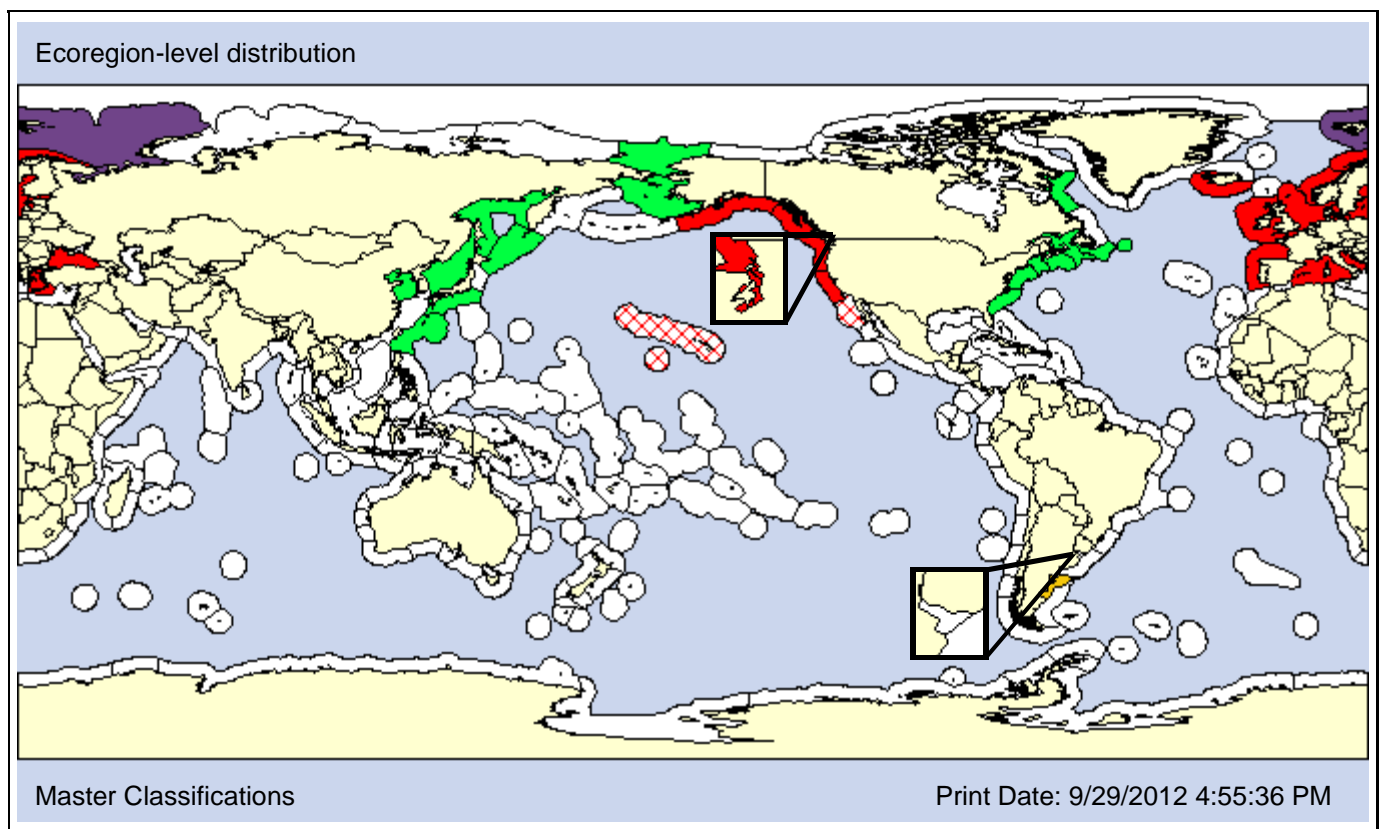
**Subfamily:** Myinae

**Also Known As (Name - Type):**

Mya elongata	Synonym	Atlantic soft-shell clam
Mya hemphilli	Synonym	long-necked clam
Mya japonica	Synonym	softshell clam
Mya subtruncata	Synonym	steamer clam ( <i>Mya arenaria</i> )

**Common Names:**

**Type Locality:** O. Europae septentrionalis (North Sea)



NWP

Hawaii

NEP

**Date 1st record:** Native

1923

1874

**Loc 1st record:** Native

Hawaii

San Francisco Estuary, CA

**Established:** Yes

No

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				<b>X</b>
<b>X</b>				<b>X</b>		<b>AO X</b>	PO								

Comments: *Mya arenaria* is thought to have originally occupied the NWA, NEA, NEP, and NWP. During the Pleistocene glaciation, it went extinct in the NEP, from southeast Alaska south, and the NEA (Strasser, 1999). It was subsequently reintroduced to the U.S. Pacific coast with oyster shipments from the NWA.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 268m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 100%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>			<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0.4 - 34psu] [Pref: 14 - 30psu]**

<b>Fresh O</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Bivalve

**Taxonomic Author:** (Conrad, 1831)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Dreissenioidea

**Family:** Dreissenidae

**Subfamily:**

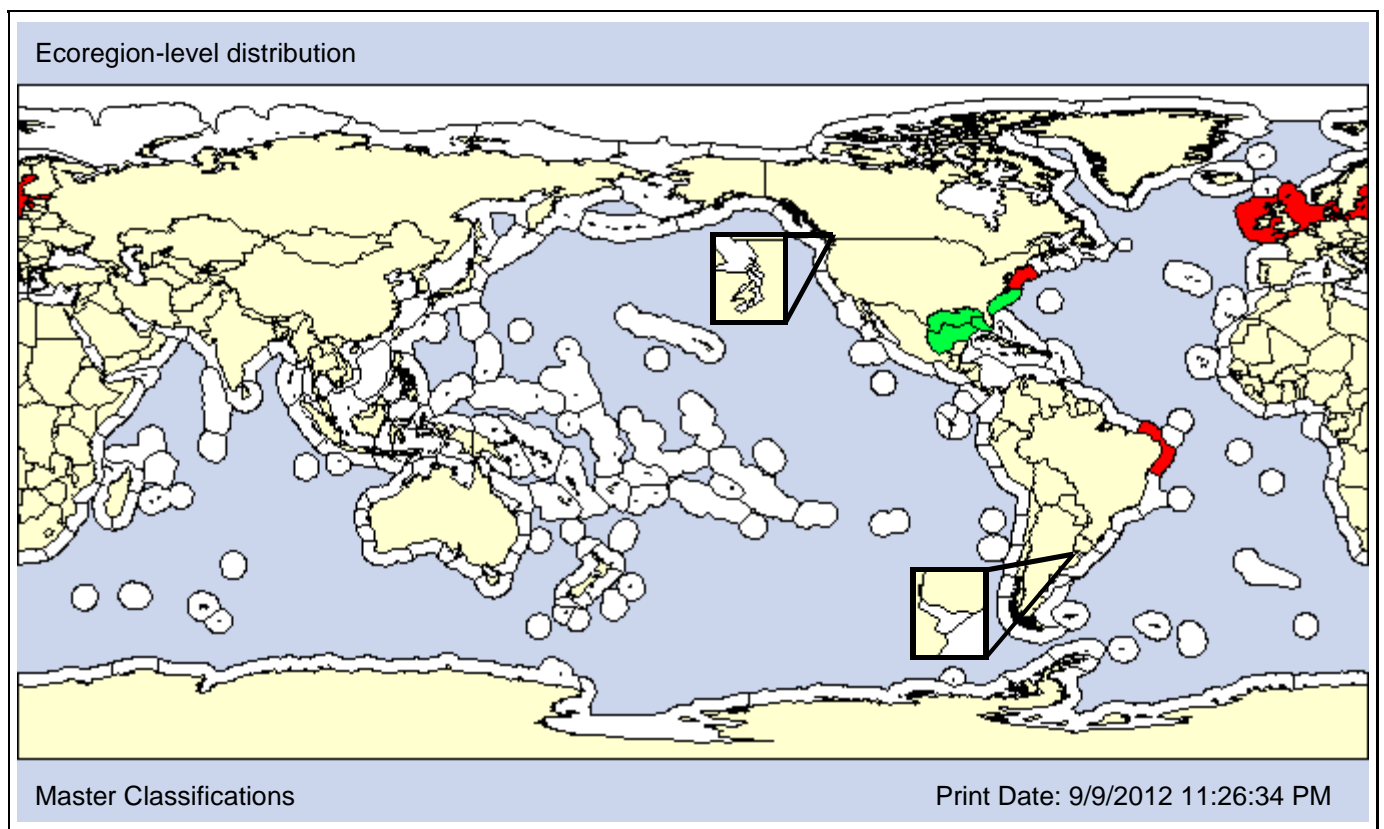
**Also Known As (Name - Type):**

Congeria cochleata	Synonym
Congeria leucophaeta	Synonym
Dreissena cumingiana	Synonym
Mytilus americanus	Synonym

**Common Names:**

Conrad's false mussel  
dark false mussel

**Type Locality:**



**Date 1st record:** Unknown

**Loc 1st record:** Unknown

**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: Mito and Uesugi (2004) list *Mytilopsis leucophaeata* [as *Mystilopsis leucophaeta*] as introduced to Japan, but the specific locations are unknown.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 55m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>							<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 0 - 31psu] [Pref: 0 - 10psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** (Récluz, 1849)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Dreissenioidea

**Family:** Dreissenidae

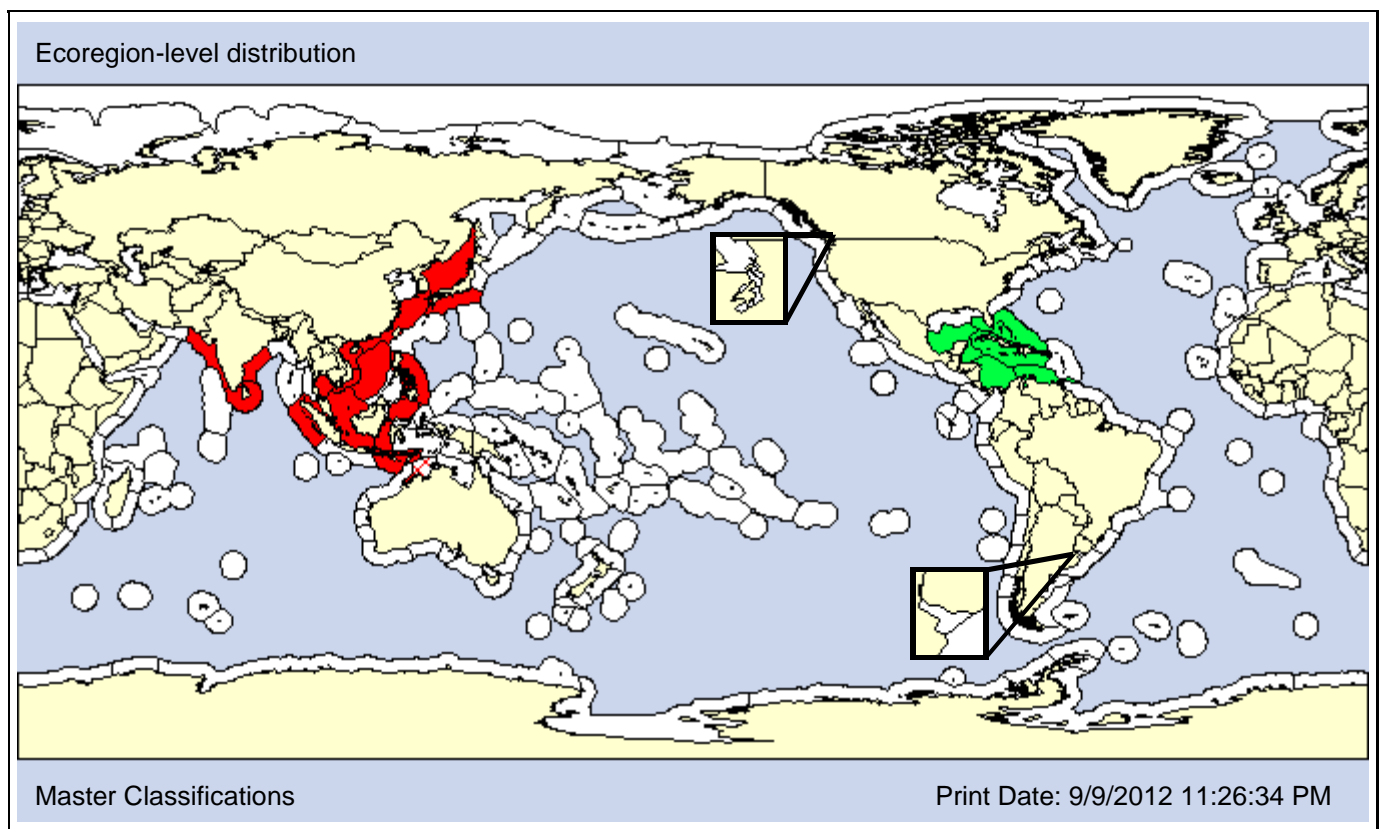
**Subfamily:**

**Also Known As (Name - Type):**

Congeria sallei	Synonym	black striped mussel
Dreissena gundlachii	Synonym	false mussel
Dreissena mörchiana	Synonym	Igai-damashi
Dreissena sallei	Synonym	Santo Domingo false mussel

**Common Names:**

**Type Locality:**



**Date 1st record:** 1974

**Loc 1st record:** Shimizu City, Shizuoka, Japan

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				X
X		X				AO	PO								

Comments: Most authors report the introduced *Mytilopsis* in Asia and Indo-Pacific as the Atlantic and Caribbean *M. sallei*. However, Wangkulangkul and Lheknim (2008) consider the species introduced in the NWP to be *M. adamsi*, originally described from the Pacific side of Panama. In either case, this mussel would be nonindigenous in the NWP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>					<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 3m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>								<b>Artificial Substrate P</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>					<b>P</b>		<b>P</b>		<b>O</b>	<b>O</b>

**SALINITY [Obs: 0 - 50psu] [Pref: 9 - 27psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** Lamarck, 1819

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Mytiloidea

**Suborder:**

**Infraorder:**

**Superfamily:** Mytilidea

**Family:** Mytilidae

**Subfamily:** Mytilinae

**Also Known As (Name - Type):**

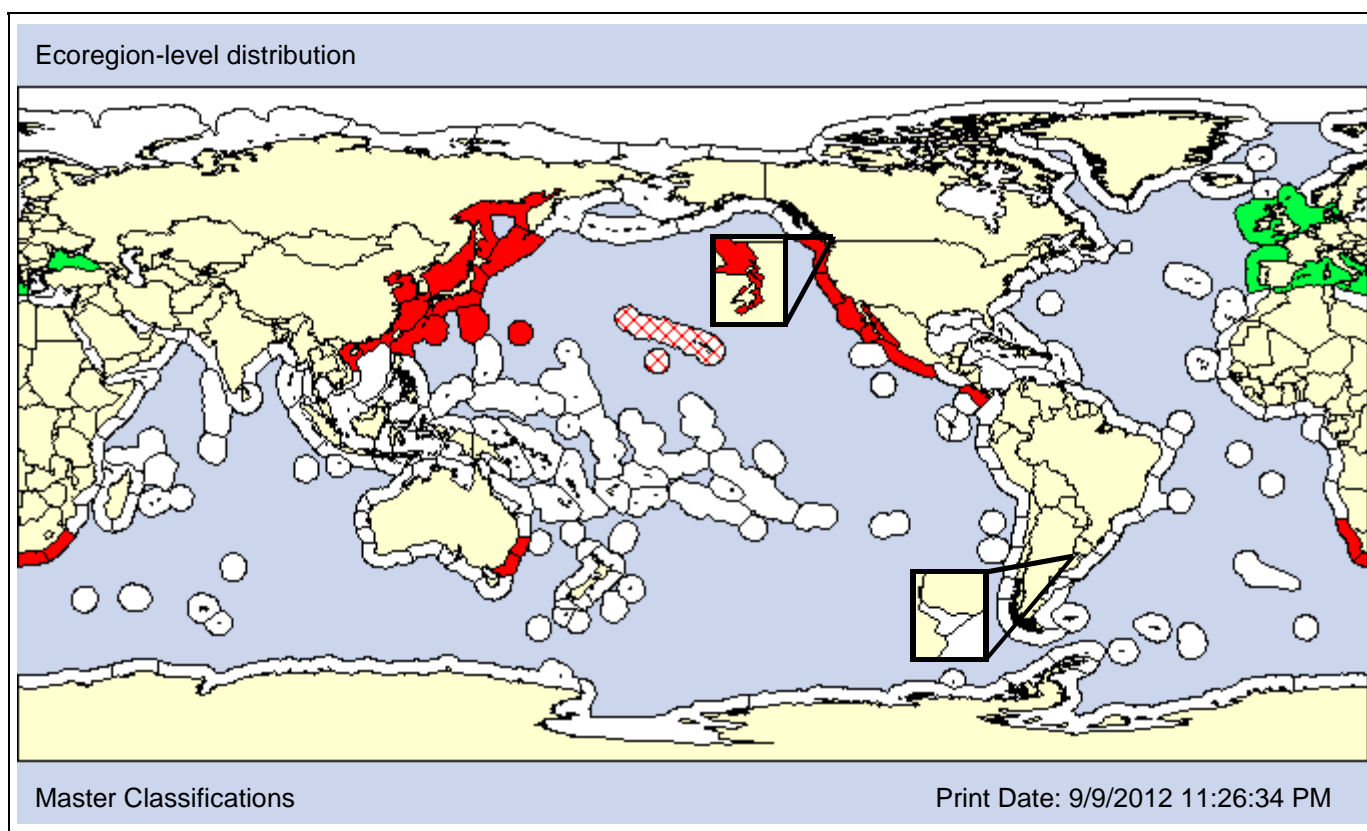
Mytilus edulis diegensis  
 Mytilus edulis galloprovincialis  
 Mytilus edulis zhirmunskii

Synonym  
 Synonym  
 Synonym

**Common Names:**

bay mussel (*Mytilus galloprovincialis*)  
 blue mussel (*Mytilus galloprovincialis*)  
 Mediterranean mussel  
 Murasaki-igai

**Type Locality:**



Master Classifications: Native (green), Nonindigenous (red), NIS Not Established (hatched), Cryptogenic (yellow), Transient (light blue), Unclassified (purple), Conflicting Classification (brown), Unidentified (white)

NWP

Hawaii

NEP

**Date 1st record:** 1932

1998

1947

**Loc 1st record:** Seto Inland Sea, Japan

Pearl Harbor, Oahu, Hawaii

Southern California

**Established:** Yes

No

Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR		A	P				
X		X			X	AO	PO	X						

Comments: In the NEP, the native *Mytilus trossulus* and the introduced *M. galloprovincialis* can only be distinguished reliably using genetic analysis, and the two species can hybridize. *M. galloprovincialis* has become an abundant fouling species in the NEP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 45m] [Pref: 0 - 8m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 5.28 - 96.42%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>								<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 18 - 39.42psu] [Pref: 33 - 36psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC				<b>X</b>			<b>X</b>
						<b>X</b>							



# Neotrapezium liratum

Species ID: 3381

**Taxon:** Bivalve

**Taxonomic Author:** (Reeve, 1843)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Arcticoidea

**Family:** Trapezidae

**Subfamily:**

**Also Known As (Name - Type):**

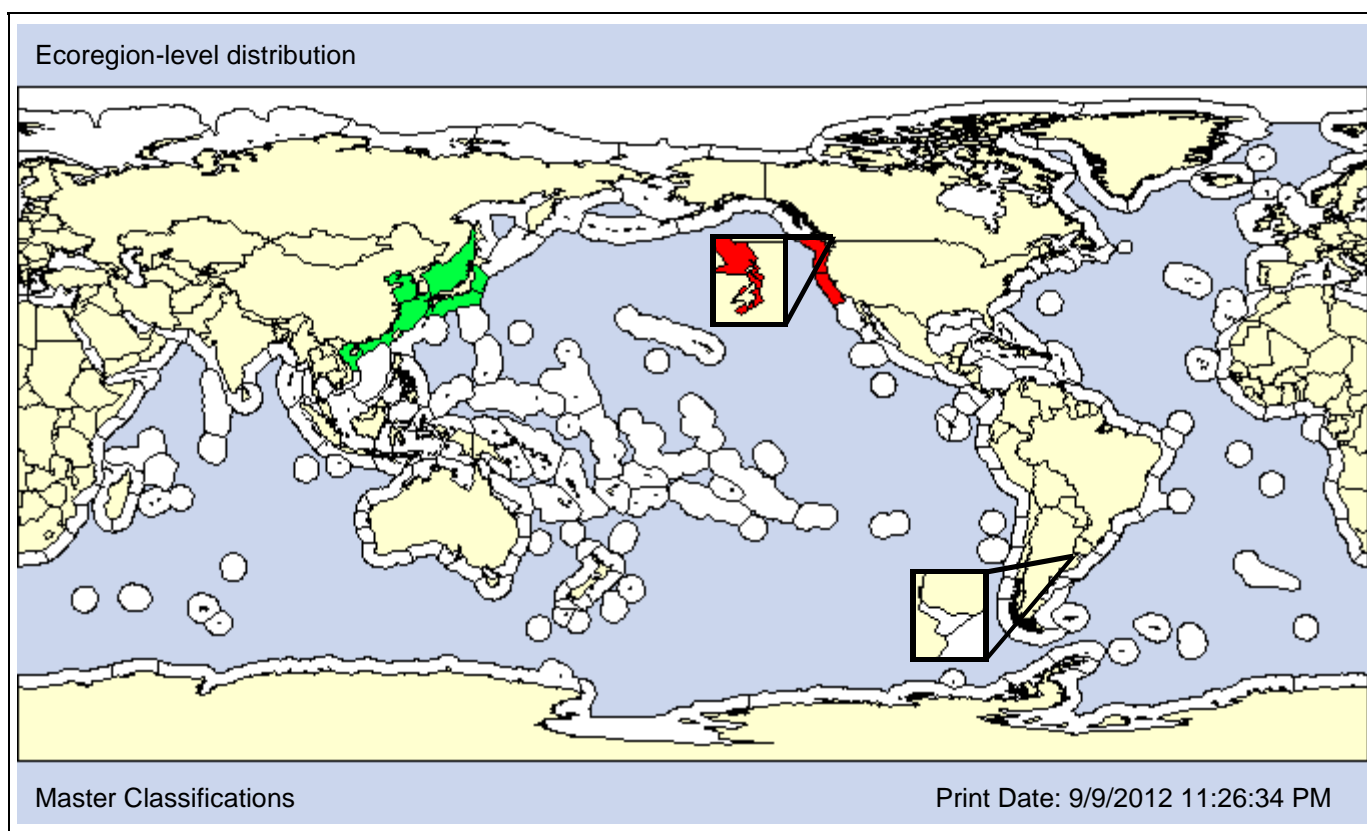
Cypricardia lirata  
 Cypricardia liratum  
 Trapezium (Neotrapezium) liratum  
 Trapezium japonicum

Synonym  
 Synonym  
 Convention  
 Synonym

**Common Names:**

Japanese clam  
 quadrate trapezium

**Type Locality:** No locality



**Date 1st record:** Native

1924

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P				
X		X				AO	PO X								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 3m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>O</b>						<b>O</b>				<b>O</b>	

**SALINITY [Obs: 9 - 25psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** (Reeve, 1857)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Tellinoidea

**Family:** Psammobiidae

**Subfamily:**

**Also Known As (Name - Type):**

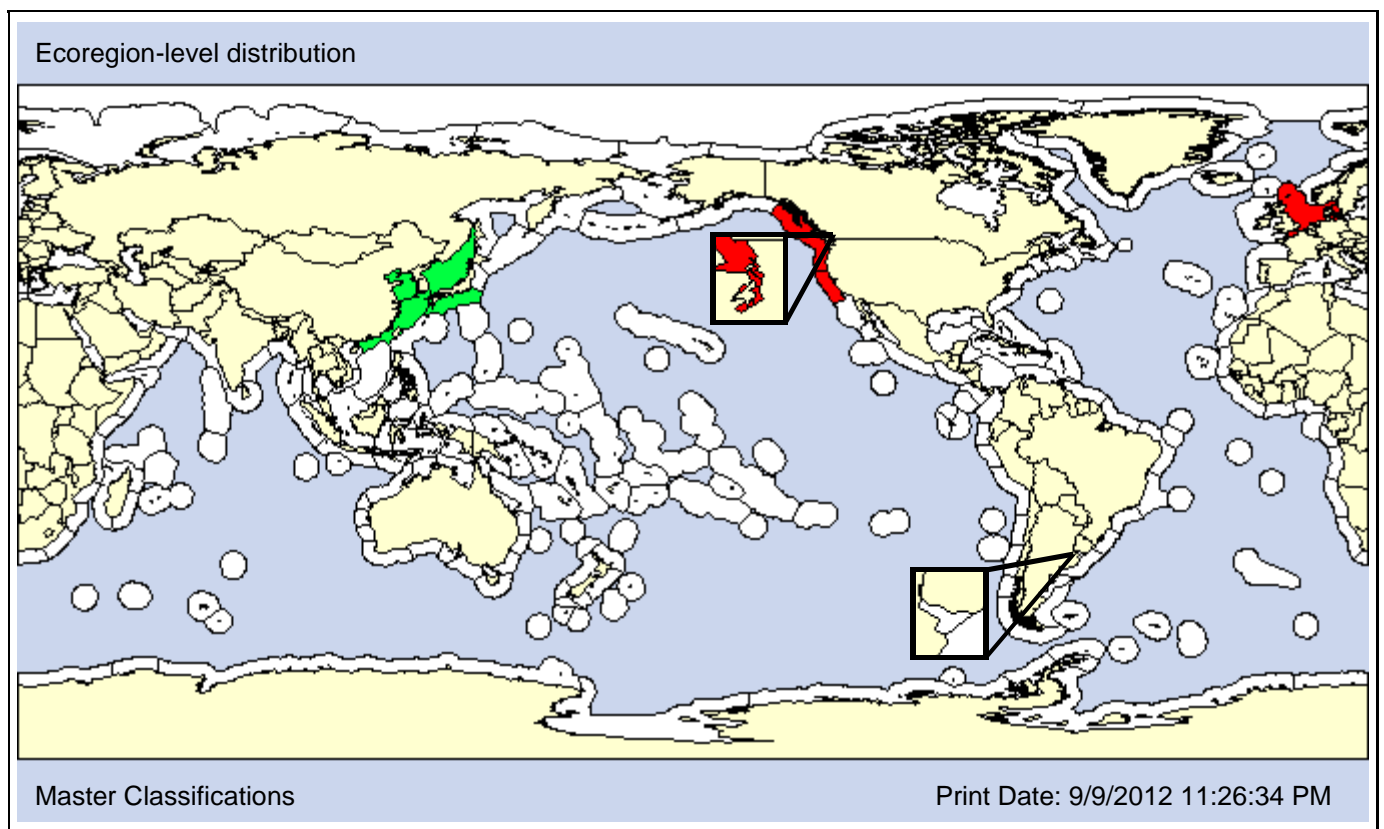
Nuttallia olivacea  
Nuttallia solida  
Psammobia olivacea

Synonym  
Synonym  
Synonym

**Common Names:**

dark mahogany clam  
purple mahogany clam  
purple mahogany-clam  
varnish clam

**Type Locality:**



**Date 1st record:** Native

1991

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P		X		
X						AO	PO	X						

Comments: *Nuttallia obscurata*, a native to the NWP, initially invaded Puget Sound in the earlier 1990s. It has since been migrating southward, with a single shell found in Elkhorn Slough in central California in 2001 (CANOD, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 10m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.05 - 49.75%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>	<b>P</b>			<b>P</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 9.6 - 32.7psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Bivalve

**Taxonomic Author:** Linnaeus, 1758

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Ostreoida

**Suborder:** Ostreina

**Infraorder:**

**Superfamily:** Ostreoidea

**Family:** Ostreidae

**Subfamily:** Ostreinae

**Also Known As (Name - Type):**

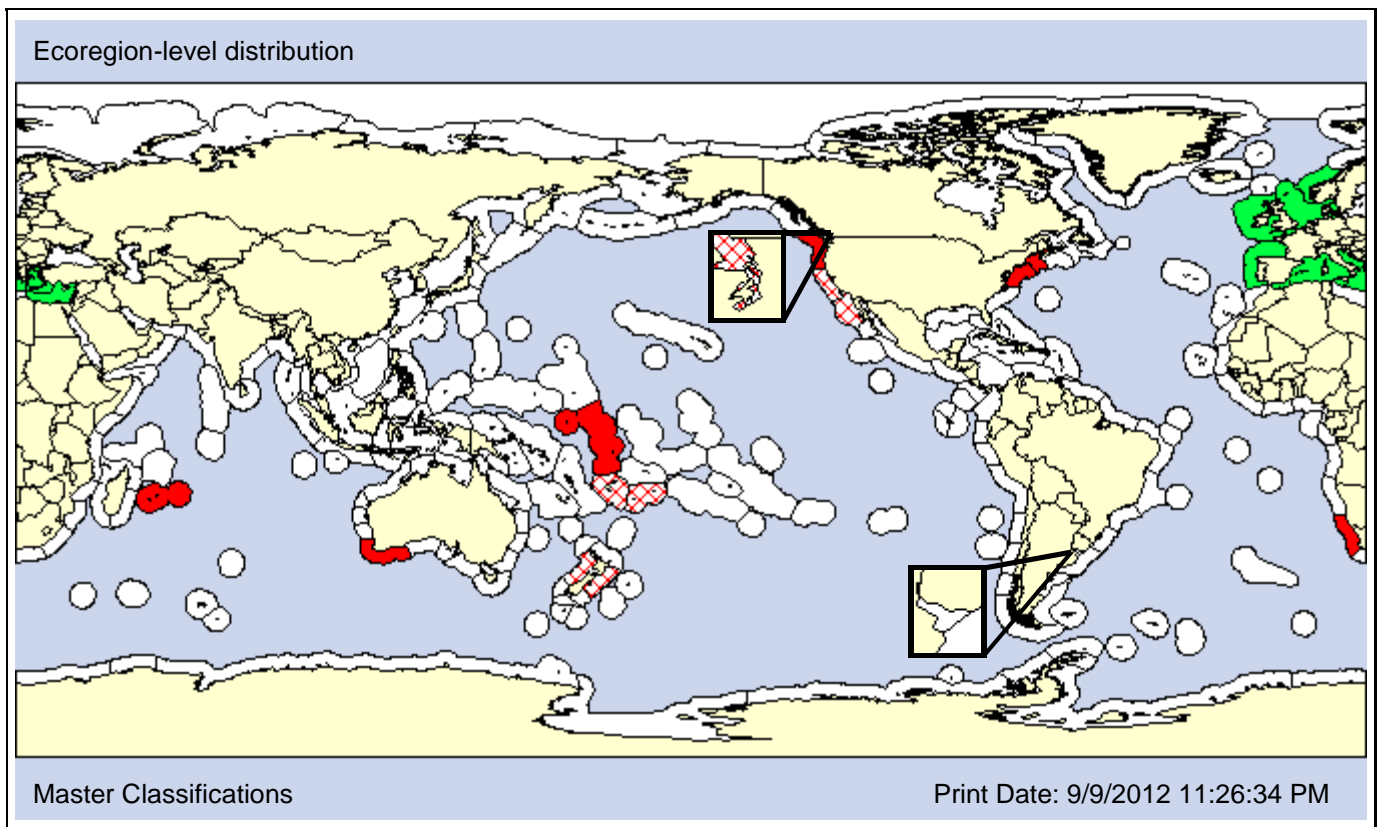
Monoeciostrea europa  
Ostrea adriatica  
Ostrea boblayei  
Ostrea corbuloides

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

edible oyster  
European flat oyster

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1952

1951

**Loc 1st record:** Japan

Puget Sound, WA

**Established:** Unknown

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: The European flat oyster, *Ostrea edulis*, was introduced into the NEP but did not become established. It was introduced into Japan in 1952 (Iwasaki, 2006) though the location and status of the population(s) are unknown.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 30m] [Pref: 0 - 9m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>			<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>										<b>O</b>	

**SALINITY [Obs: 15 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
				<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** Carpenter, 1864

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorphia

**Infraclass:**

**Superorder:**

**Order:** Ostreoida

**Suborder:** Ostreina

**Infraorder:**

**Superfamily:** Ostreoidea

**Family:** Ostreidae

**Subfamily:** Ostreinae

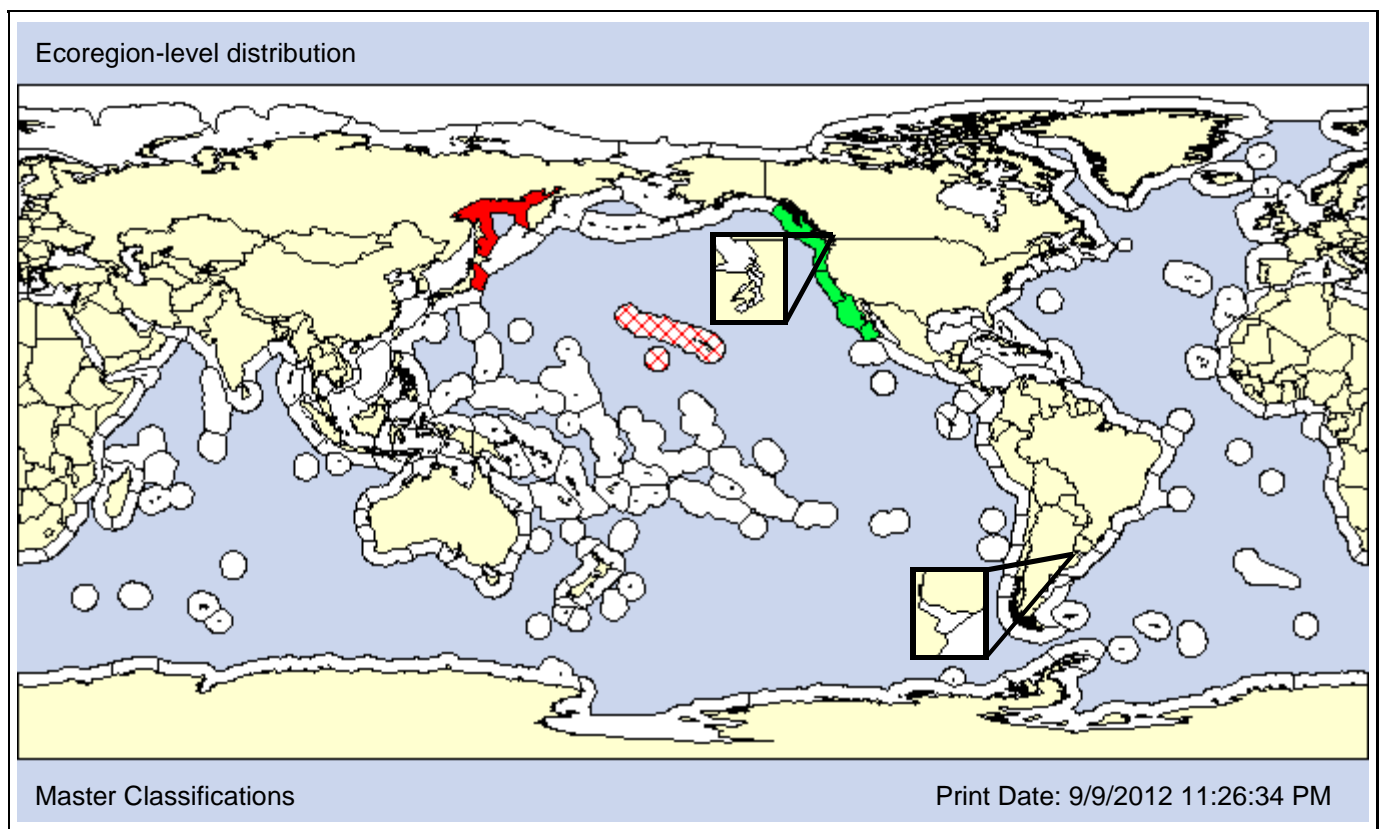
**Also Known As (Name - Type):**

Conchophylla lurida	Synonym
Ostrea conchaphila of NEP authors in part	Partial synonym

**Common Names:**

--

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1948

1893

**Loc 1st record:** Japan

Honolulu, Hawaii

**Established:** Unknown

No

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: Based on molecular data, Polson et al. (2009) separated *Ostrea lurida* and *O. conchaphila*. *O. lurida* occurred from British Columbia, Canada south to the western side of Baja, Mexico. *O. conchaphila* was only found in the Gulf of California. We assume that the species introduced into Hawaii and Japan was *O. lurida*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
	X	X											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O						

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			P											

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
					O	P			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							



**Taxon:** Bivalve

**Taxonomic Author:** (Conrad, 1849)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Myoida

**Suborder:**

**Infraorder:**

**Superfamily:** Hiatelloidea

**Family:** Hiatellidae

**Subfamily:**

**Also Known As (Name - Type):**

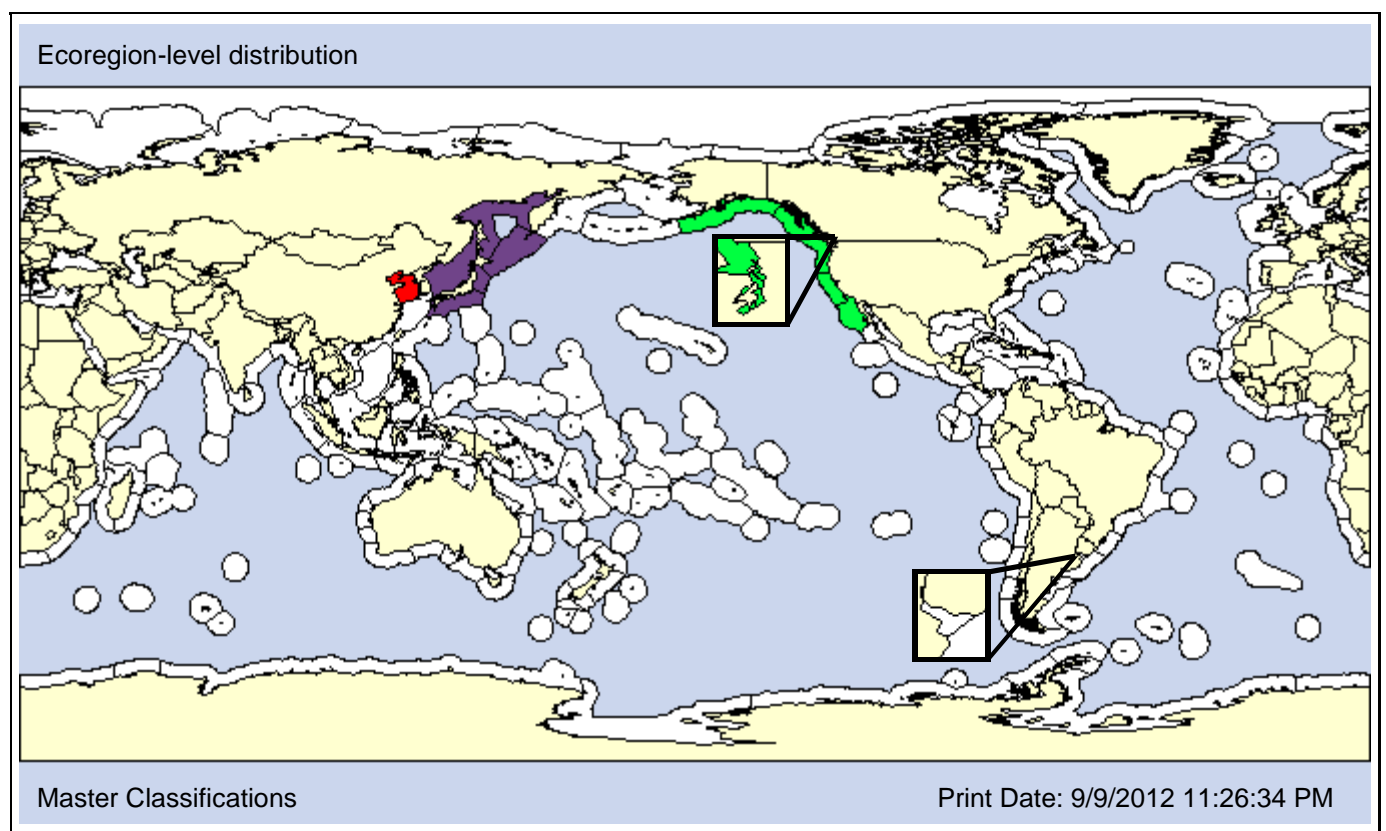
Glycymeris estrellana  
Mya abrupta  
Panopaea fragilis  
Panopaea generosa

Synonym  
Synonym  
Synonym  
Misspelling

**Common Names:**

geoduck  
Pacific geoduck

**Type Locality:** Columbia River, USA



**Date 1st record:** 1998

Native

**Loc 1st record:** Dalian, China

Native

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: *Panopea generosa* (= *P. abrupta*; see Vadopalas et al., 2010) was introduced into the Yellow Sea in 1998 (Chen et al., 2006a). A "putative junior synonym", *P. japonica*, occurs from Sakhalin Island, Russia to Kyushu, Japan. Because of taxonomic uncertainties, we list these northern populations of *P. generosa* as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 268m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 4.93 - 37%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>		<b>P</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 27.5 - 33.1psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Bivalve

**Taxonomic Author:** (Jay, 1856)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Pectinoida

**Suborder:**

**Infraorder:**

**Superfamily:** Pectinoidea

**Family:** Pectinidae

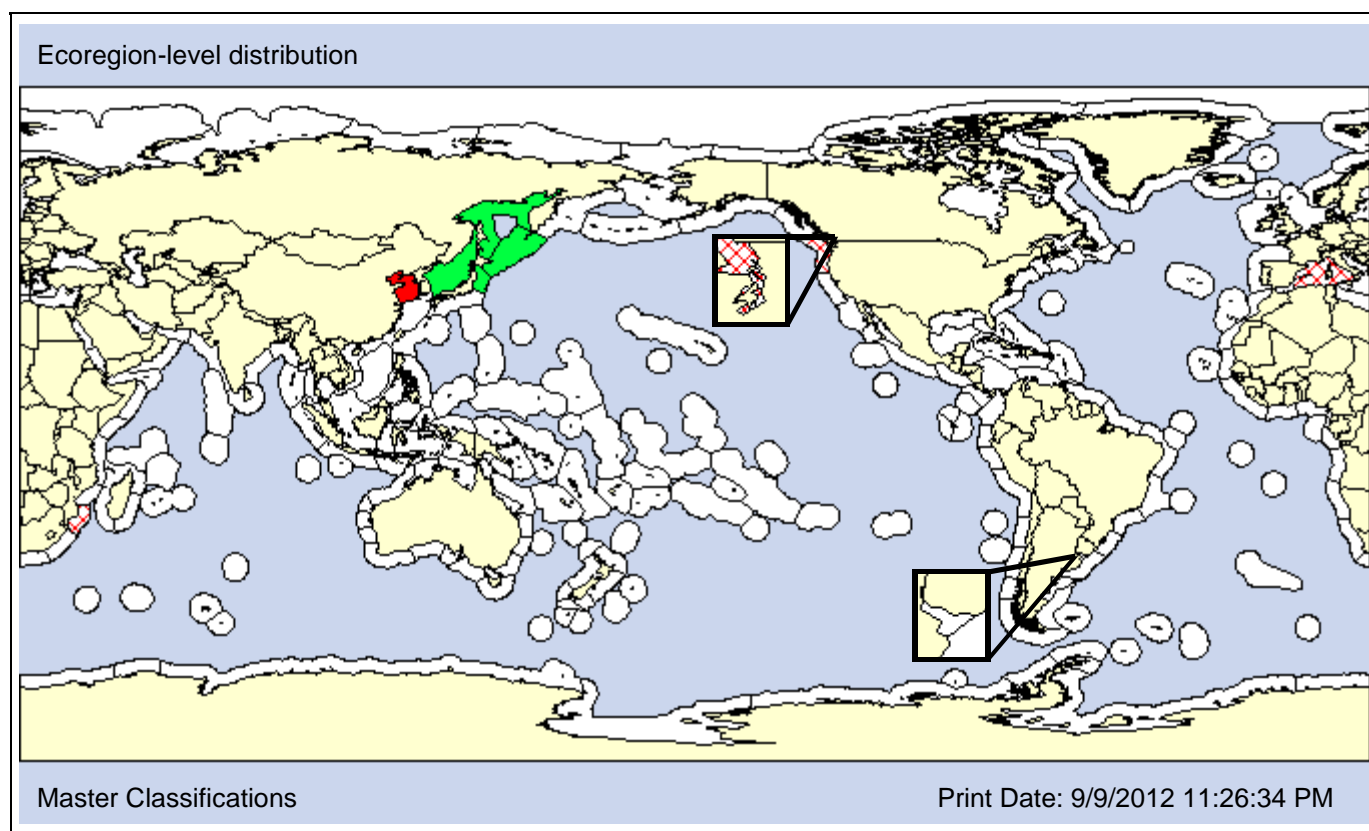
**Subfamily:** Chlamydinæ

**Also Known As (Name - Type):**

Mizuhopecten yessoensis	Synonym	giant ezo scallop
Patinopecten tokyoensis	Synonym	Japanese sea scallop
Pecten brandti	Synonym	Japanese weathervane
Pecten yessoensis	Synonym	Japanese weathervane scallop

**Common Names:**

**Type Locality:**



■ Native
 ■ Nonindigenous
 X NIS Not Established
 ■ Cryptogenic
 ■ Transient
 ■ Unclassified
 ■ Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1981

1984

**Loc 1st record:** Liaoning and Shandong, China

British Columbia, Canada

**Established:** Yes

No

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: *Patinopecten yessoensis* is native to Japan and western Russia. It was introduced into the Yellow Sea in 1981 and has established a wild population (Chen et al., 2006a). It is cultured in British Columbia and France, but apparently has not established wild populations.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0.5 - 200m] [Pref: 4 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 18 - 34psu] [Pref: 30 - 34psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Bivalve

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorphia

**Infraclass:**

**Superorder:**

**Order:** Pectinoida

**Suborder:**

**Infraorder:**

**Superfamily:** Pectinoidea

**Family:** Pectinidae

**Subfamily:** Pectininae

**Also Known As (Name - Type):**

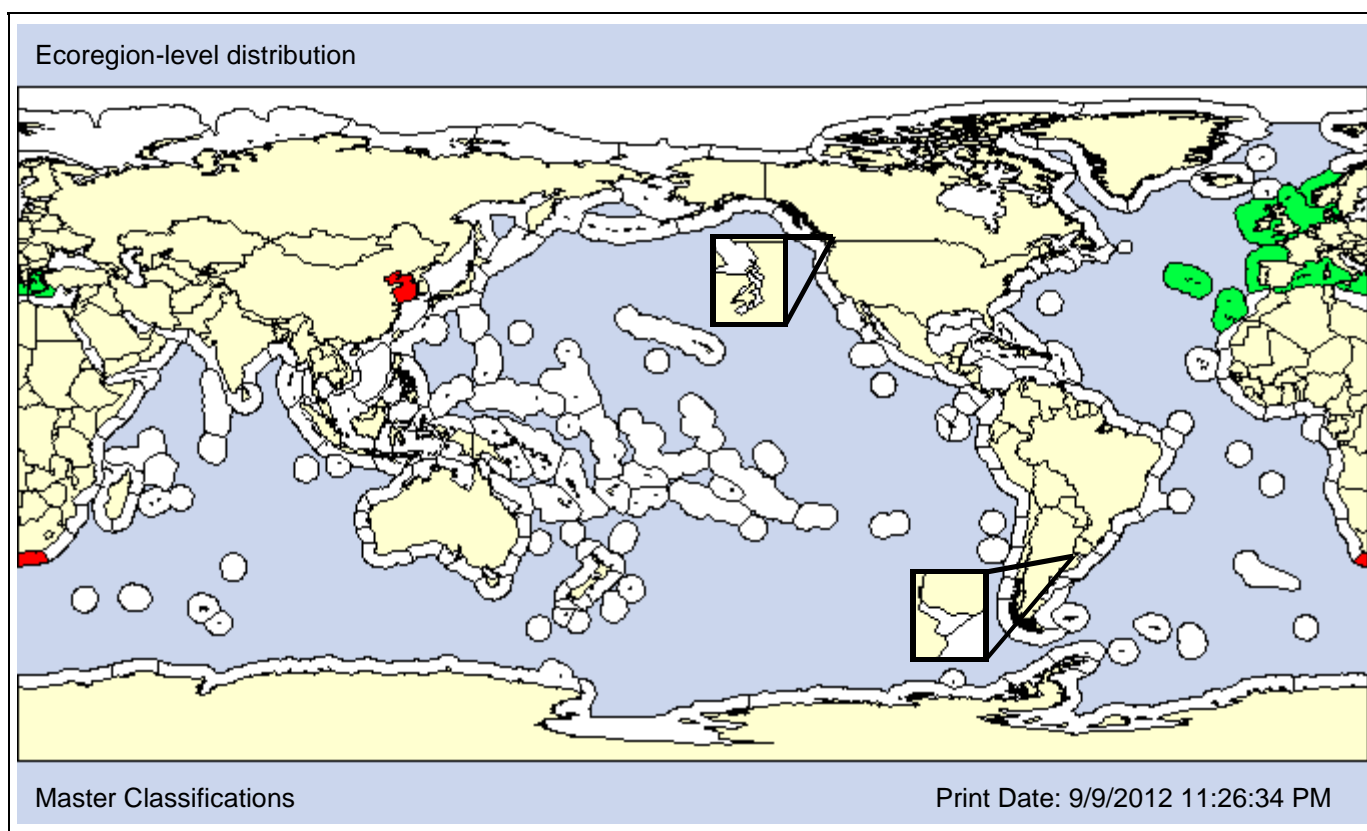
Chlamys maximus  
Pecten maxima

Synonym  
Convention

**Common Names:**

great scallop  
king scallop

**Type Locality:**



**Date 1st record:** late 1990s

**Loc 1st record:** China

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: *Pecten maximus* was introduced into China in the late 1990s from Europe and, according to Chen et al. (2006a), has established a wild population in the Qingdao coastal waters.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0.5 - 183m] [Pref: 20 - 24m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>		<b>P</b>		<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 25 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Bivalve

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Mytiloidea

**Suborder:**

**Infraorder:**

**Superfamily:** Mytilidea

**Family:** Mytilidae

**Subfamily:**

**Also Known As (Name - Type):**

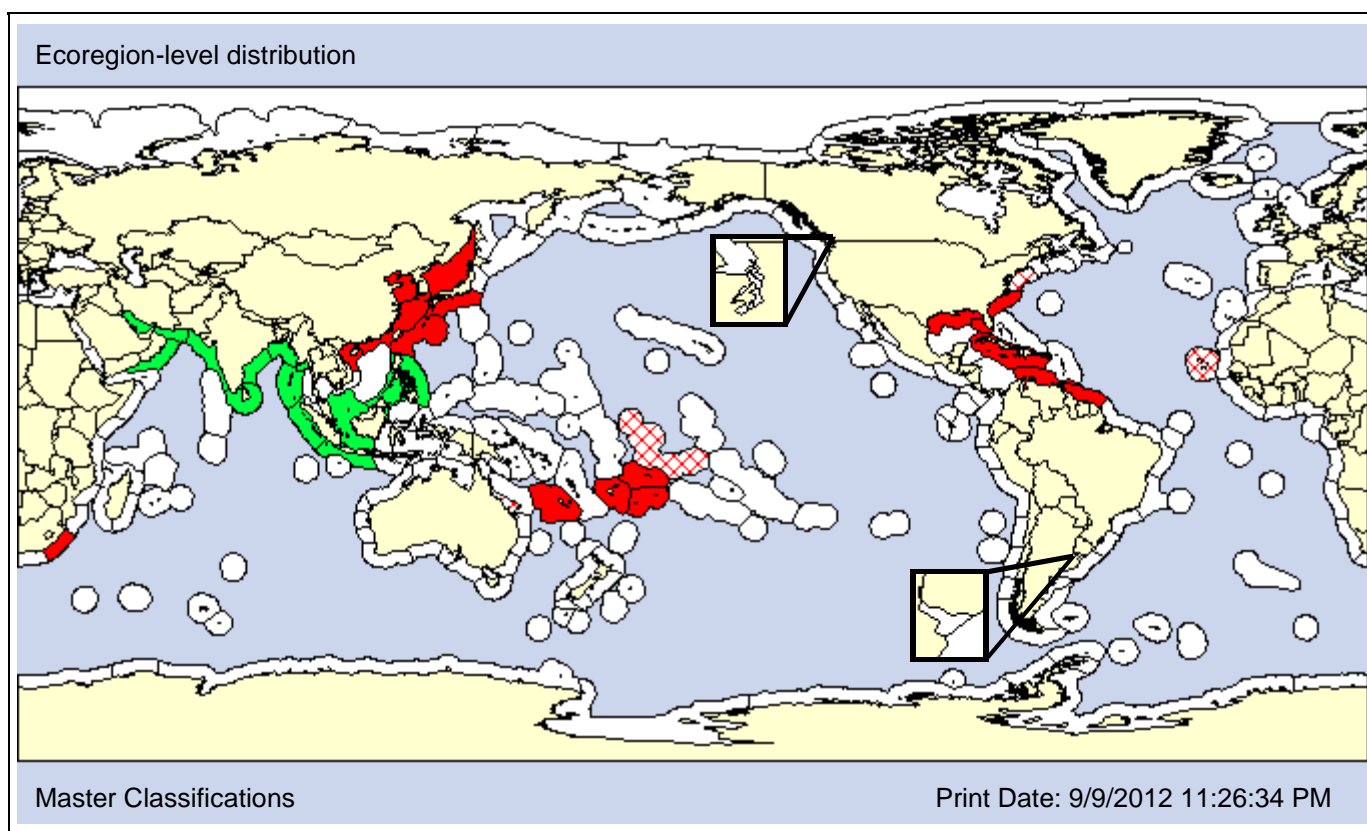
Chloromya samaradinus  
Chloromya viridis  
Mytilus opalus  
Mytilus samaradinus

Synonym  
Synonym  
Synonym  
Misspelling

**Common Names:**

Asian green mussel  
green lipped mussel  
green mussel (*Perna viridis*)  
Midori-igai

**Type Locality:**



**Date 1st record:** 1967

**Loc 1st record:** Okitsu, Osaka Bay, Japan

**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 10m] [Pref: - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>							<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 18 - 80psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF <b>X</b>				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					
					<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Bivalve

**Taxonomic Author:** (Retzius, 1788)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Veneroidea

**Family:** Veneridae

**Subfamily:** Petricolinae

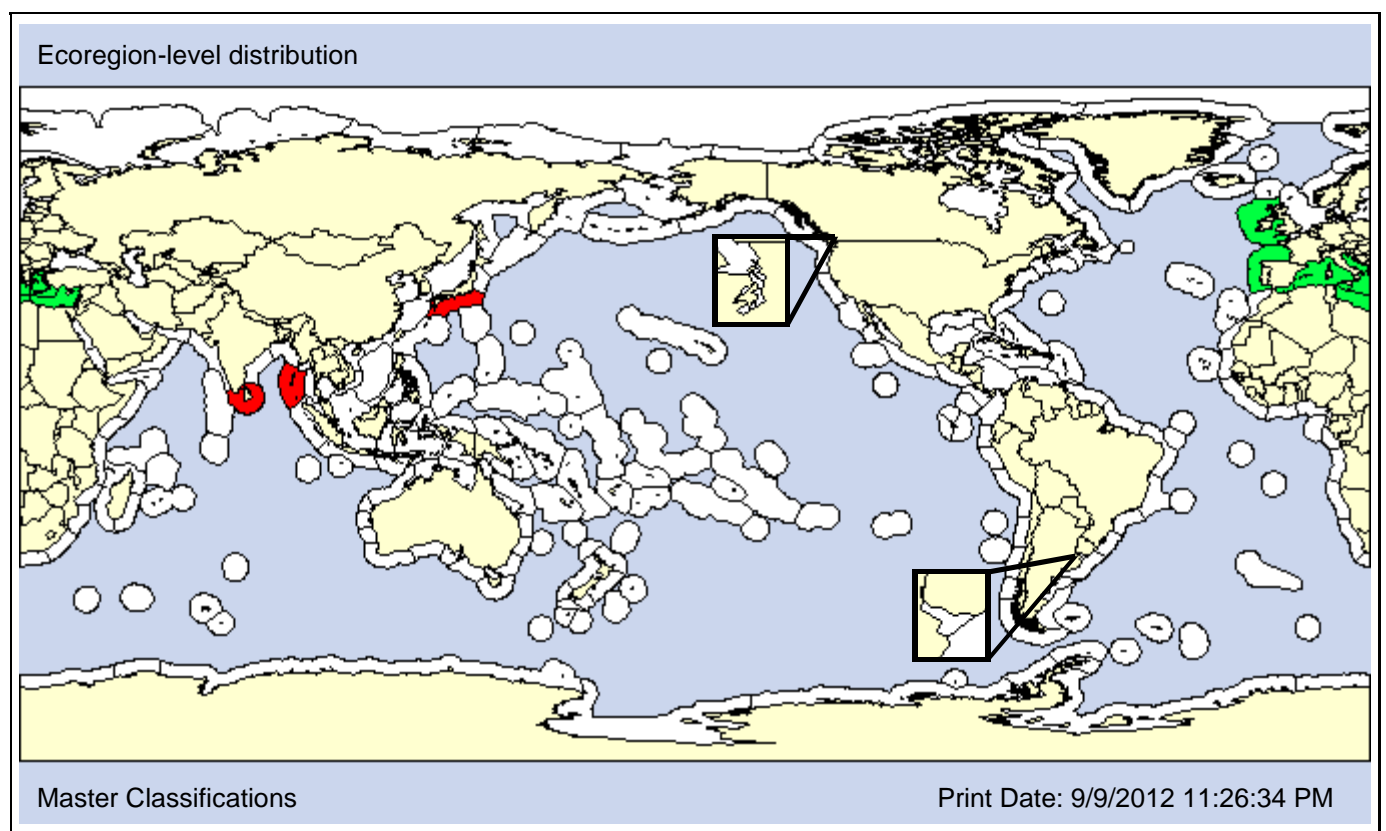
**Also Known As (Name - Type):**

Mya decussata	Synonym
Petricola costellata	Synonym
Petricola rariflamma	Synonym
Petricola rocellaria	Synonym

**Common Names:**

Usukara-shiotsugai
--------------------

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1985

**Loc 1st record:** Sano, Osaka Bay, Japan

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
		X			AO	PO									

Comments: It is not certain that the "*Petricola* sp. cf. *lithophaga*" reported from Japan (Horikoshi and Okamoto, 2007a; Iwasaki et al., 2004b) is the same as the European species, though the Japanese taxon is considered to be introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>								<b>O</b>			<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					
						<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** (Lamarck, 1818)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Veneroidea

**Family:** Veneridae

**Subfamily:** Petricolinae

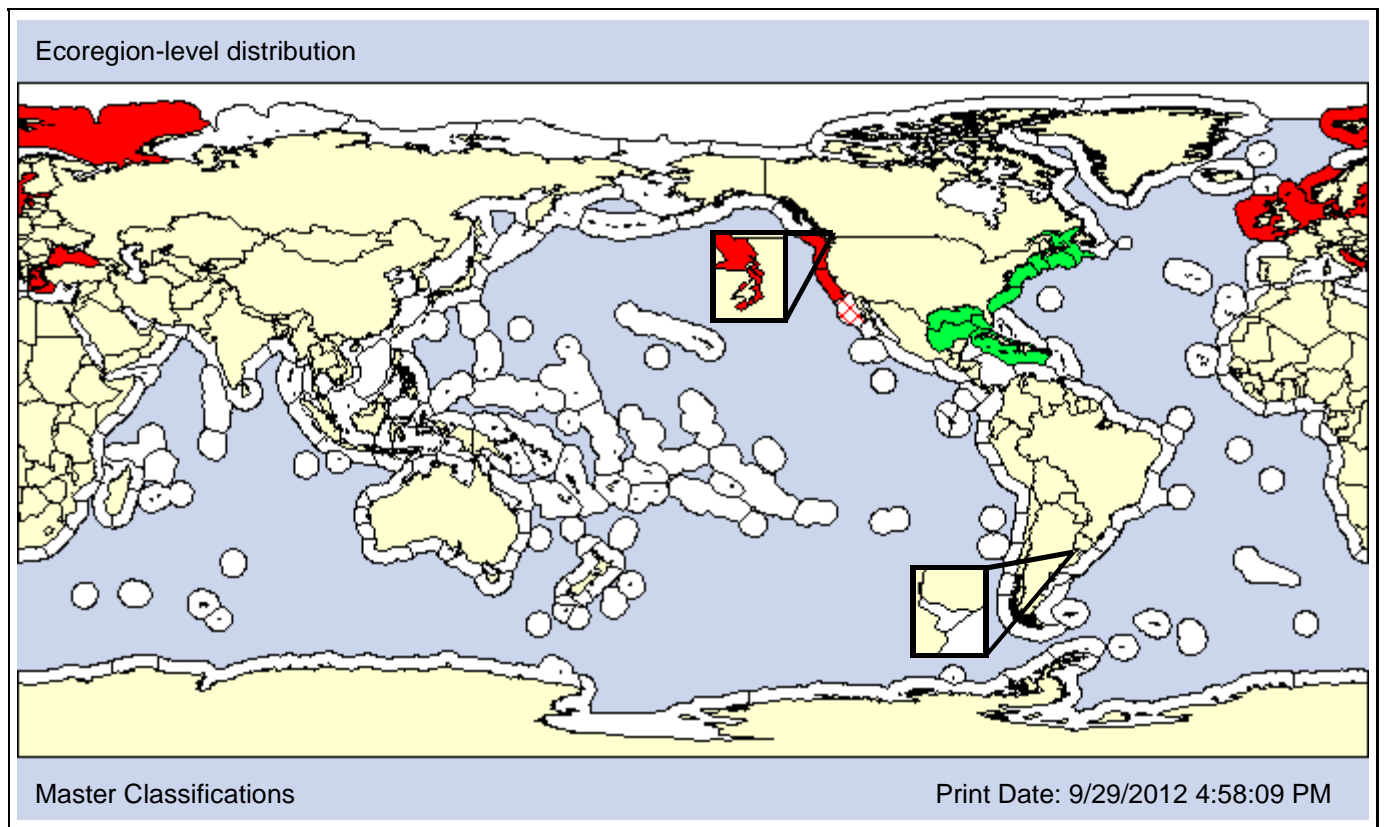
**Also Known As (Name - Type):**

Gastranella tumida	Synonym
Petricola carolinensis	Synonym
Petricola flagellata	Synonym
Petricola fornicata	Synonym

**Common Names:**

American piddock
false angelwing

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1927  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>						<b>AO X</b>	PO								

Comments: Living populations of *Petricolaria pholadiformis* in the San Francisco Estuary have not been confirmed in recent decades, though it is established in Willapa Bay, WA (Coan and Valentich-Scott, 2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 49m] [Pref: 0 - 0.3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 65.81 - 65.81%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP P</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>				

**SALINITY [Obs: 7.5 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>	<b>X</b>				

**Taxon:** Bivalve

**Taxonomic Author:** (Adams, 1869)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Veneroidea

**Family:** Veneridae

**Subfamily:**

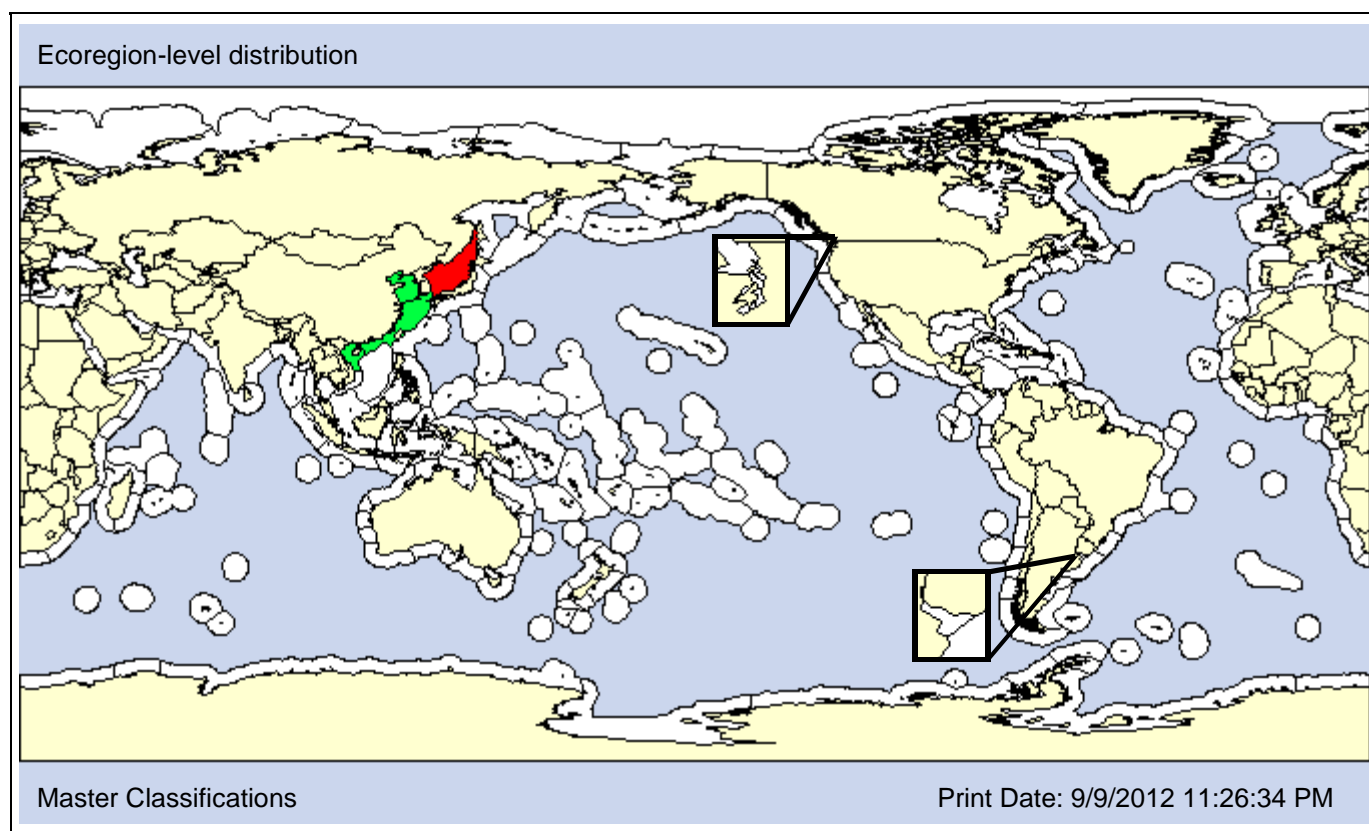
**Also Known As (Name - Type):**

Dosinia (Phacosoma) gibba  
 Dosinia gibba

Synonym  
 Synonym

**Common Names:**

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

**Date 1st record:** <1895 or 2002

**Loc 1st record:** Sea of Japan?

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
						AO	PO								

Comments: *Phacosoma gibba* appears to be native to southern China, while Iwasaki (2006) and Otani (2006) list it as being recently introduced into Japan. However, *Dosinia gibba* (= *P. gibba*) has been reported from Tateyama, Japan since before 1895 (Pilsbry, 1895). We tentatively list it as NIS in Japan, though the historical records should be checked.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			X		TP	RI-PH					
	X	X											

**DEPTH [Obs: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Bivalve

**Taxonomic Author:** (Hinds, 1843)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Myoida

**Suborder:** Myina

**Infraorder:**

**Superfamily:** Myoidea

**Family:** Corbulidae

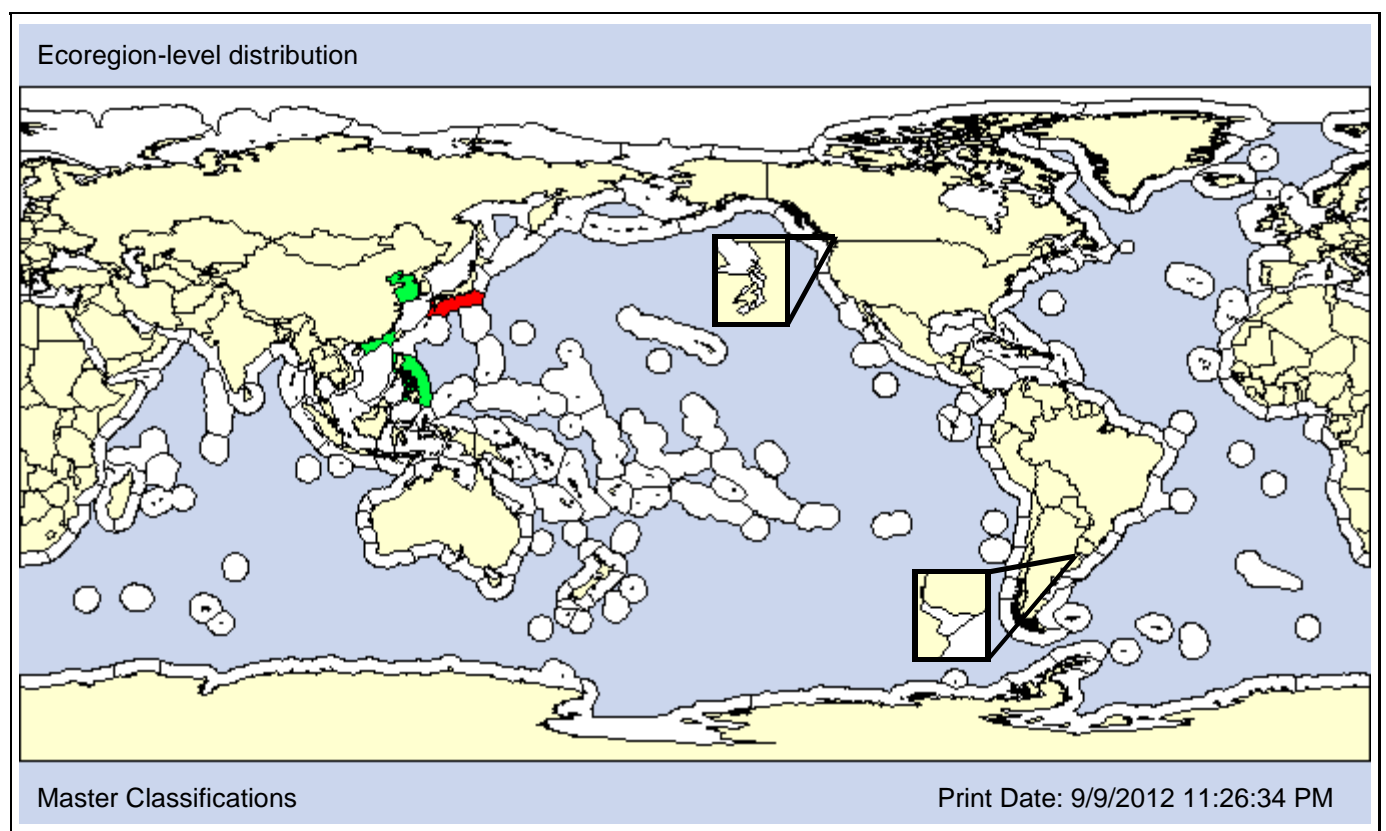
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Corbula laevis	Synonym	hiratanumakodakigai
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**Type Locality:**



**Date 1st record:** Unknown

**Loc 1st record:** Unknown

**Established:** Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P				<b>X</b>
						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 16m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 3.7 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
		<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
<b>X</b>					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		



**Taxon:** Bivalve

**Taxonomic Author:** (Born, 1778)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Pteriomorpha

**Infraclass:**

**Superorder:**

**Order:** Ostreoida

**Suborder:** Ostreina

**Infraorder:**

**Superfamily:** Ostreoidea

**Family:** Ostreidae

**Subfamily:** Crassostreinae

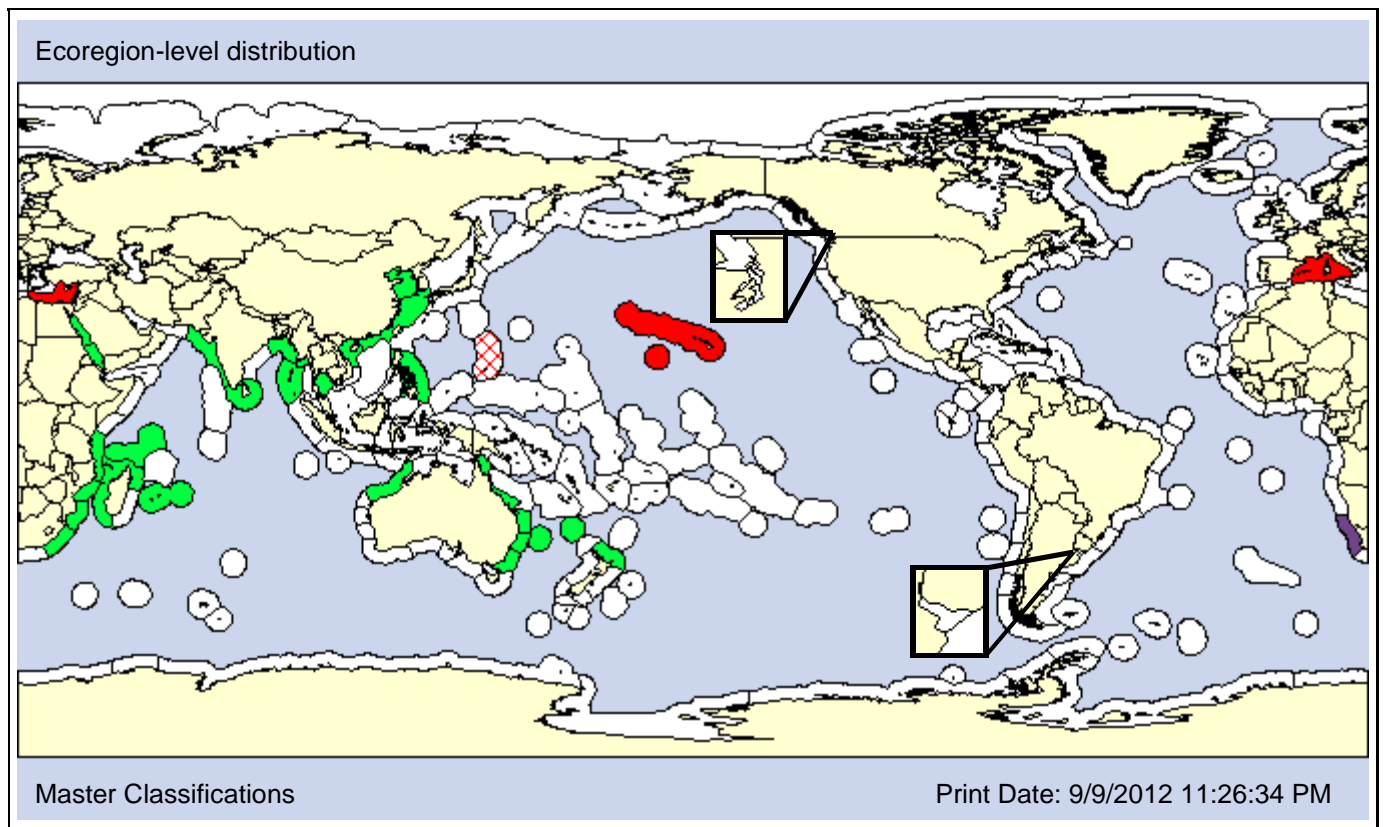
**Also Known As (Name - Type):**

Crassostrea commercialis of authors	Misidentified
Crassostrea cucullata	Synonym
Ostrea cucullata	Synonym
'Saccostrea cucullata' of Carlton and Eldredge, 2009	Partial synonym

**Common Names:**

hooded oyster
Sydney cupped oyster

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Native 1996  
**Loc 1st record:** Native Pearl Harbor, Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		<b>X</b>				AO	PO								

Comments: Genetic analysis indicates that *Saccostrea cucullata* is a complex (Lam and Morton, 2006), reported from South Africa, Indian Ocean, Indo-Pacific, China, Australia, New Zealand. Introduced populations have been reported from Hawaii (Carlton and Eldredge, 2009) and questionably the Mediterranean (Zenetos et al., 2010).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 392m] [Pref: 1 - 192m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>						<b>P</b>				<b>O</b>	<b>P</b>

**SALINITY [Obs: - 35psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Bivalve

**Taxonomic Author:** Habe, 1951

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Myoida

**Suborder:**

**Infraorder:**

**Superfamily:** Myoidea

**Family:** Myidae

**Subfamily:** Cryptomyiinae

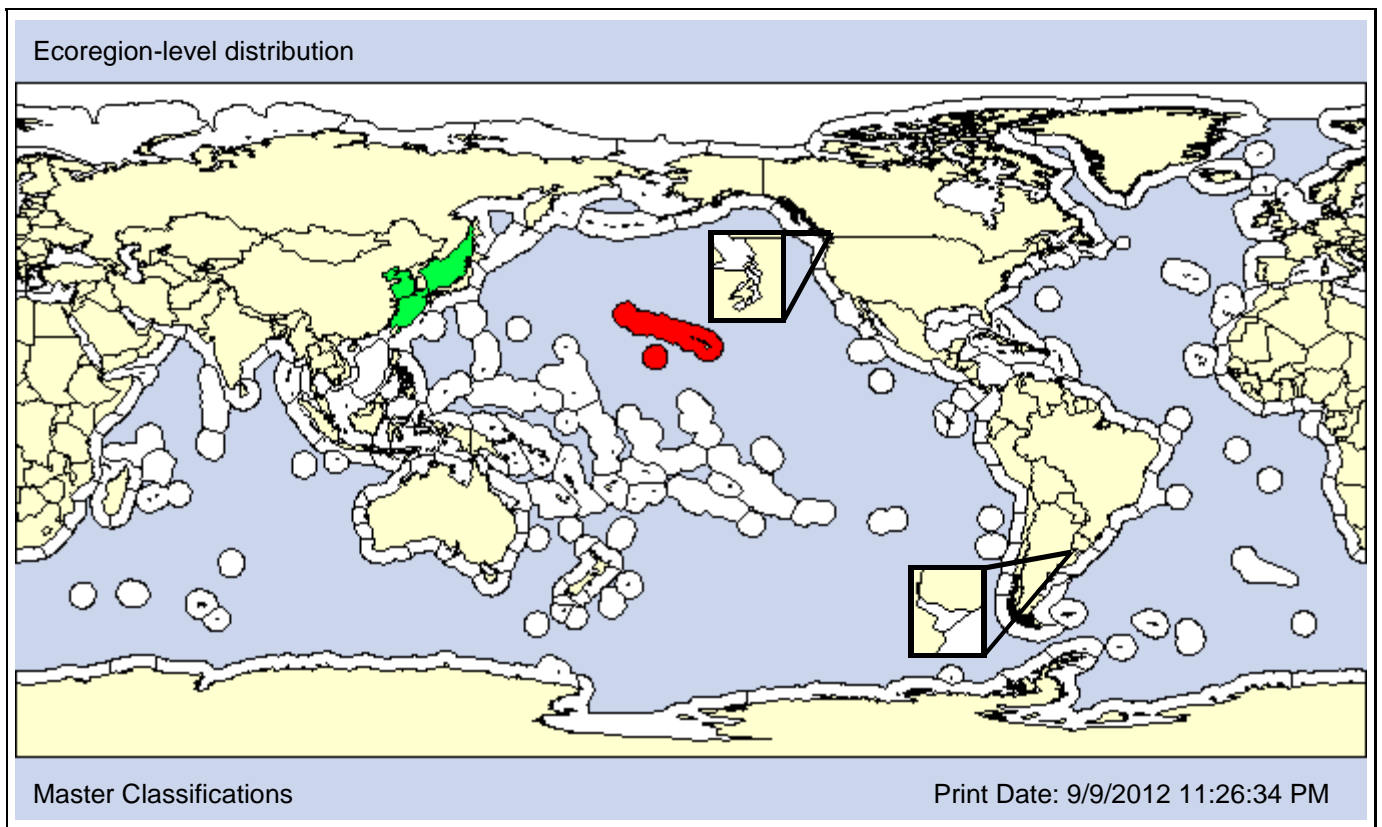
**Also Known As (Name - Type):**

Sphenia ?coreanica of Coles et al., 1999  
 Sphenia cf. fragilis of Long, 1974  
 Sphenia luticola of Coles et al., 2009

Synonym  
 Synonym  
 Misidentified

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1968  
**Loc 1st record:** Native Pearl Harbor, Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		<b>X</b>				AO	PO								

Comments: *Sphenia coreanica* is native to Japan. The identification in Hawaii is tentative until more mature specimens are examined.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>			<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			<b>O</b>			

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

# *Spisula solidissima*

Species ID: 120170

**Taxon:** Bivalve

**Taxonomic Author:** (Dillwyn, 1817)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Mactroidea

**Family:** Mactridae

**Subfamily:**

**Also Known As (Name - Type):**

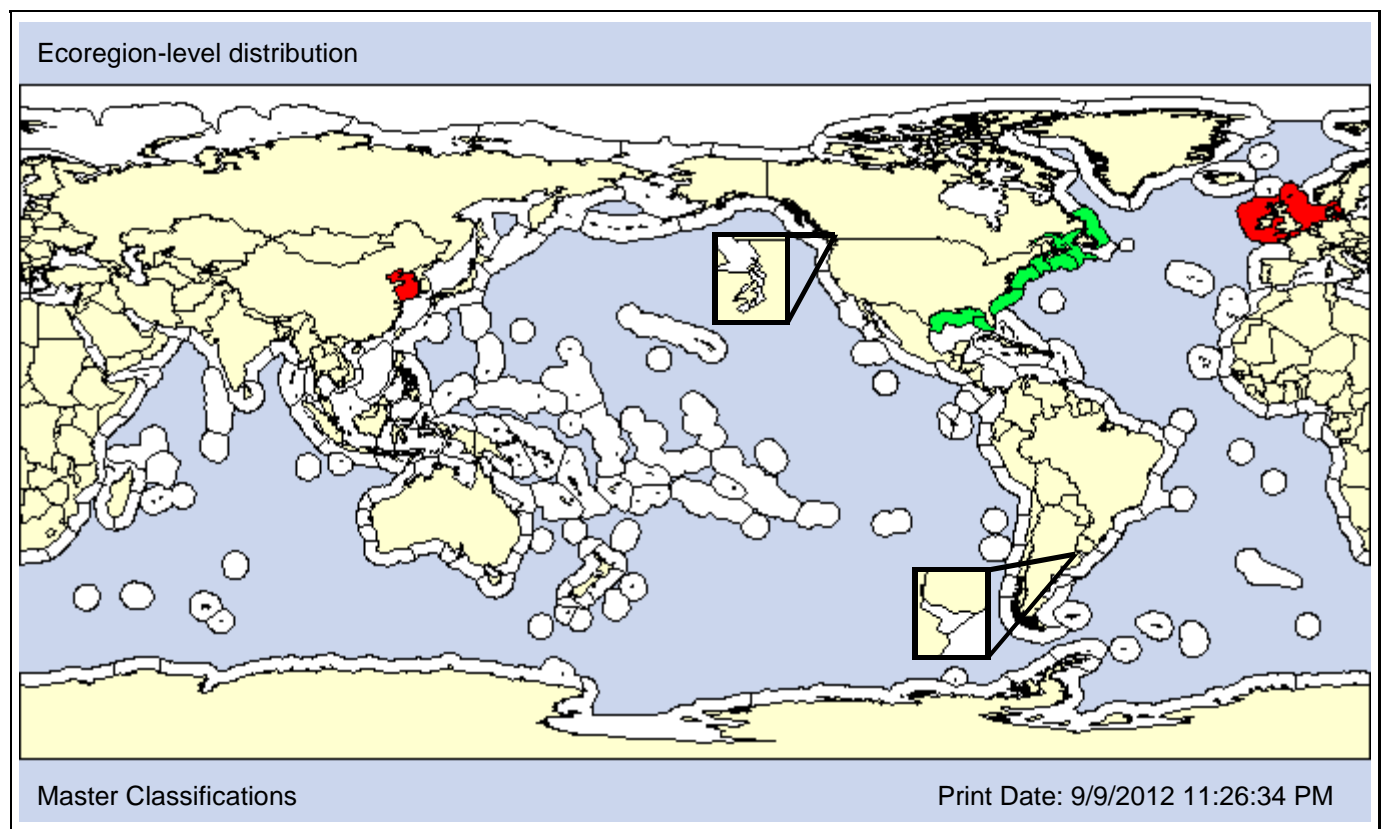
Mactra solidissima

Synonym

**Common Names:**

Atlantic surf clam  
surf clam

**Type Locality:**



**Date 1st record:** 2006

**Loc 1st record:** Qingdao, China

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 1 - 128m] [Pref: - 36m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 25 - 35psu] [Pref: 28 - 35psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Bivalve

**Taxonomic Author:** Clapp, 1923

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Myoida

**Suborder:**

**Infraorder:**

**Superfamily:** Pholadoidea

**Family:** Teredinidae

**Subfamily:** Teredininae

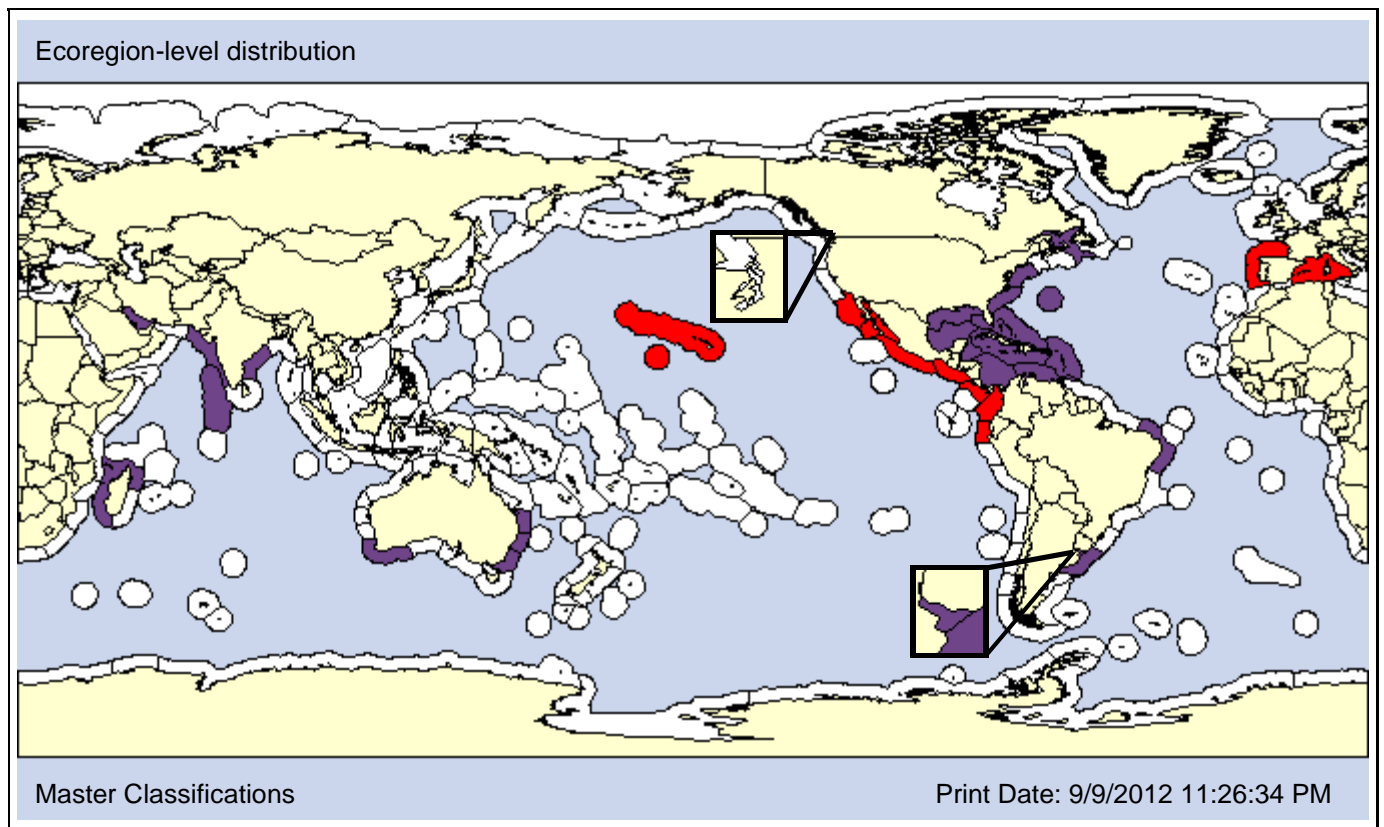
**Also Known As (Name - Type):**

Teredo aegyptia	Synonym
Teredo balatro	Synonym
Teredo batilliformis	Synonym
Teredo fragilis	Synonym

**Common Names:**

Bartsch shipworm
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**Type Locality:** Port Tampa, Florida, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1935 (NWP)      1920s (Hawaii)      1920s (NEP)  
**Loc 1st record:** Hilo Harbor, Hawaii (NWP)      San Diego Bay, CA (Hawaii)

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: There is disagreement as to whether the southern hemisphere (Carlton and Eldredge, 2009) or Caribbean (Coan et al., 2000) is the native region of *Teredo bartschi*. In either case, it is considered introduced in Hawaii, the NEP, and Europe. We list it as unclassified in other areas until additional information becomes available.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - 36m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>		<b>P</b>	<b>P</b>	

**SALINITY [Obs: 7 - 45psu] [Pref: 12 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper O</b>	
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>
			<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
							<b>X</b>	<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					



**Taxon:** Bivalve

**Taxonomic Author:** Bartsch, 1923

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Myoida

**Suborder:**

**Infraorder:**

**Superfamily:** Pholadoidea

**Family:** Teredinidae

**Subfamily:** Teredininae

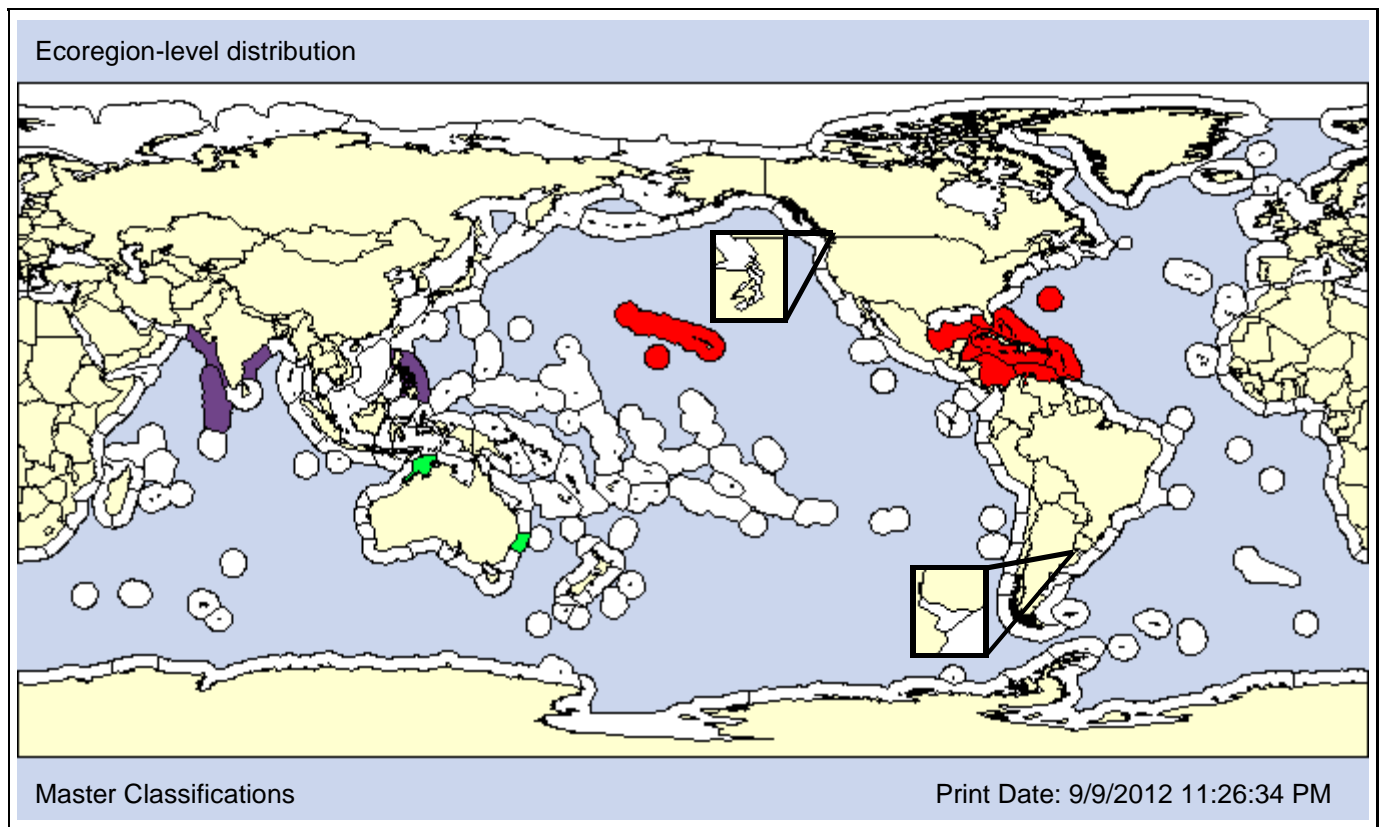
**Also Known As (Name - Type):**

Teredo (Zopoteredo) clappi	Convention
Teredo adanensis	Synonym
Teredo clappi of Sivickis, 1928; not Bartsch, 1923	Misidentified
Teredo hermitensis	Synonym

**Common Names:**

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**Type Locality:** Key West, Florida, USA (from hull of ship)



Master Classifications Print Date: 9/9/2012 11:26:34 PM

<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;"> </span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: cyan;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid gray; padding: 2px;"> </span> Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 1922  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: *Teredo clappi* is considered "Southern hemisphere" species (Carlton and Eldredge, 2009); thus we classify the Australian populations as native.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P			P	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
							X	X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					

**Taxon:** Bivalve

**Taxonomic Author:** Clapp, 1924

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Myoida

**Suborder:**

**Infraorder:**

**Superfamily:** Pholadoidea

**Family:** Teredinidae

**Subfamily:** Teredininae

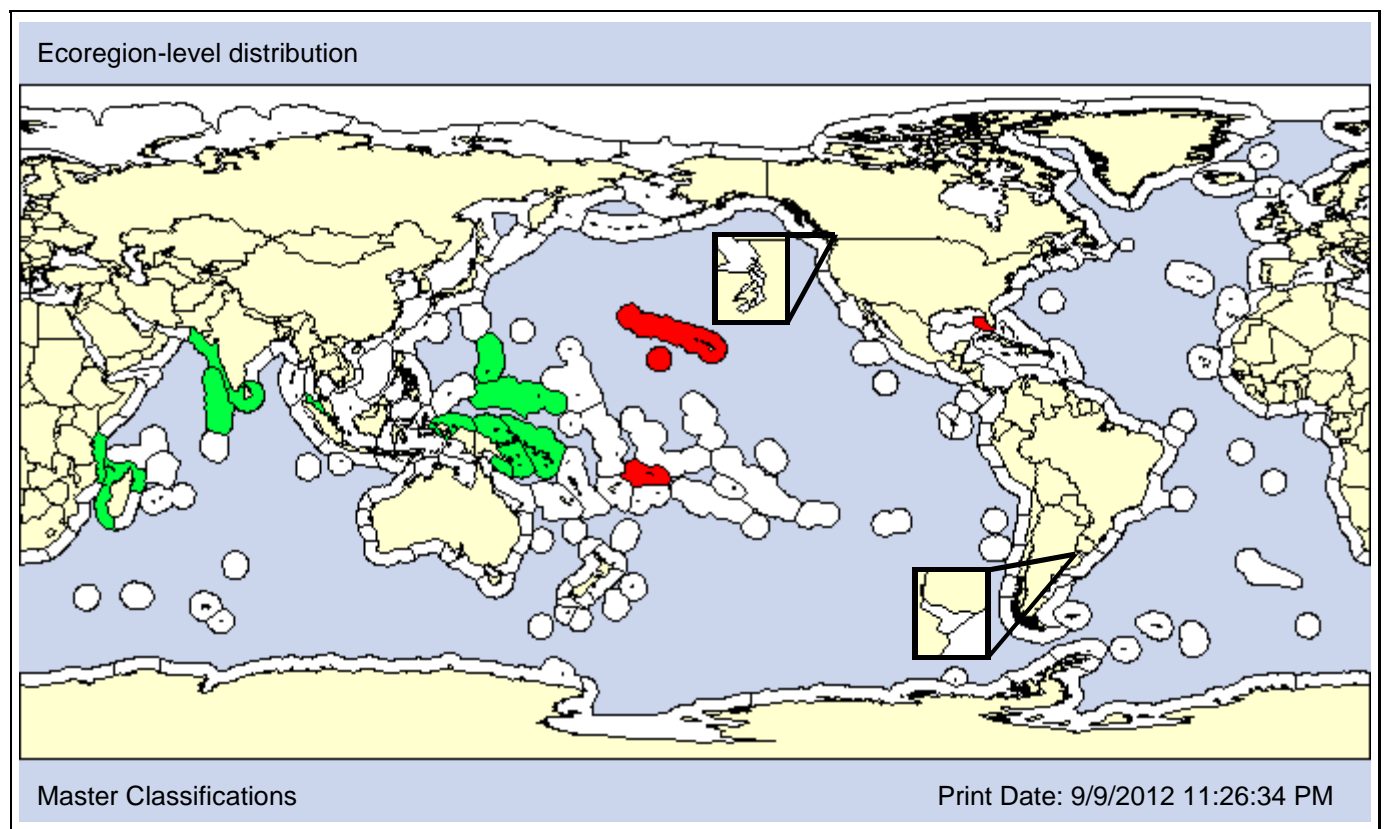
**Also Known As (Name - Type):**

Teredo (Zopoteredo) fulleri	Synonym
Teredo bicorniculata	Synonym
Teredo indomalaica	Synonym

**Common Names:**

yellow-margin shipworm

**Type Locality:** West Indies



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1935  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>								<b>Artificial Substrate P</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P			P	

**SALINITY [Obs: 29 - 34psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
							X	X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					

**Taxon:** Bivalve

**Taxonomic Author:** von Martens, 1894

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:** Euheterodonta

**Order:** Myoida

**Suborder:** Pholadina

**Infraorder:**

**Superfamily:** Pholadoidea

**Family:** Teredinidae

**Subfamily:** Teredininae

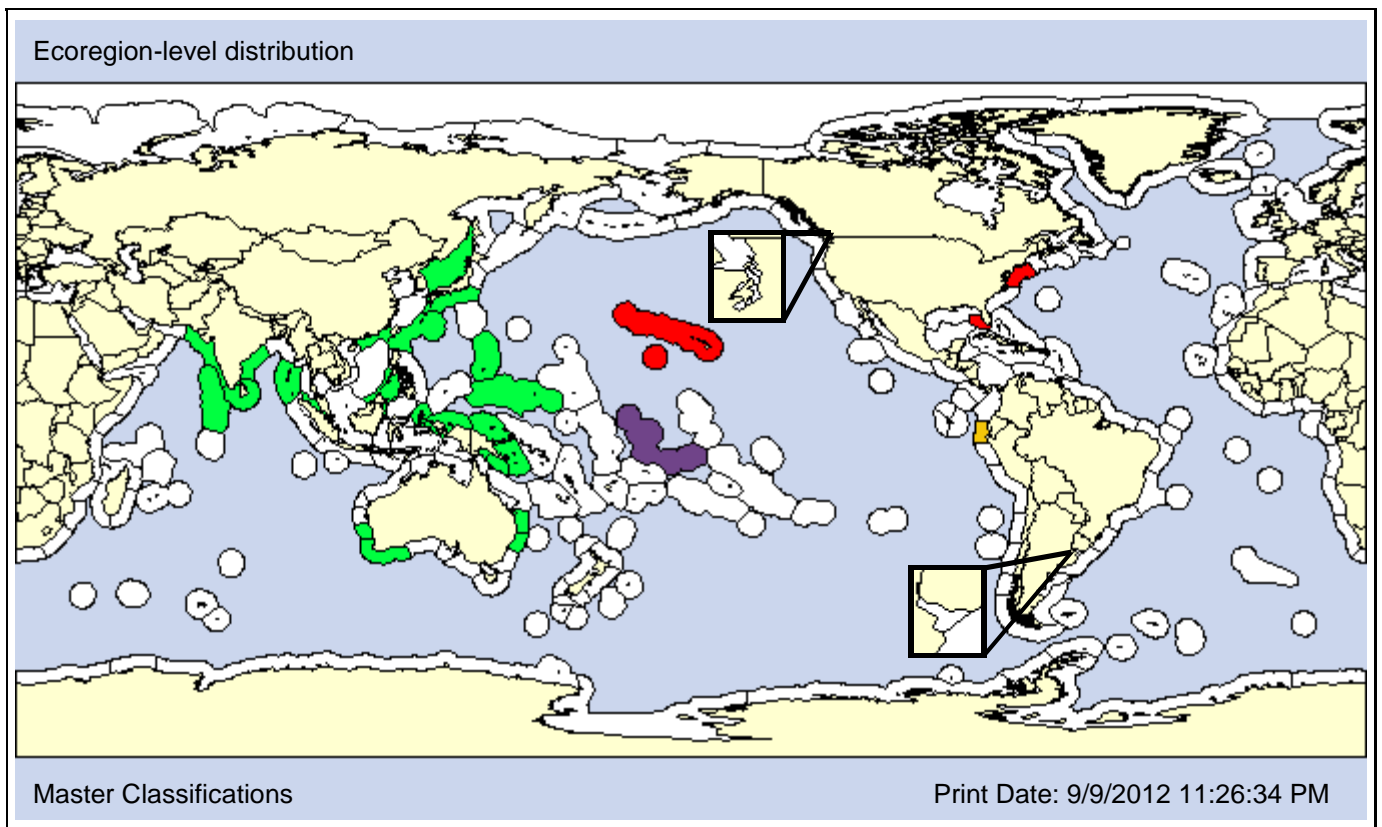
**Also Known As (Name - Type):**

Teredo bensoni	Synonym
Teredo furcillatus	Synonym
Teredo krappei	Synonym
Teredo laciniata	Synonym

**Common Names:**

deep-cleft shipworm
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**Type Locality:** Molucca Islands, Indonesia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native <1921

**Loc 1st record:** Native Pearl Harbor, Oahu, Hawaii

**Established:** Yes Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P			P	P

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
							X	X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		X		LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					

**Taxon:** Bivalve

**Taxonomic Author:** Linnaeus, 1758

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Myoida

**Suborder:**

**Infraorder:**

**Superfamily:** Pholadoidea

**Family:** Teredinidae

**Subfamily:** Teredininae

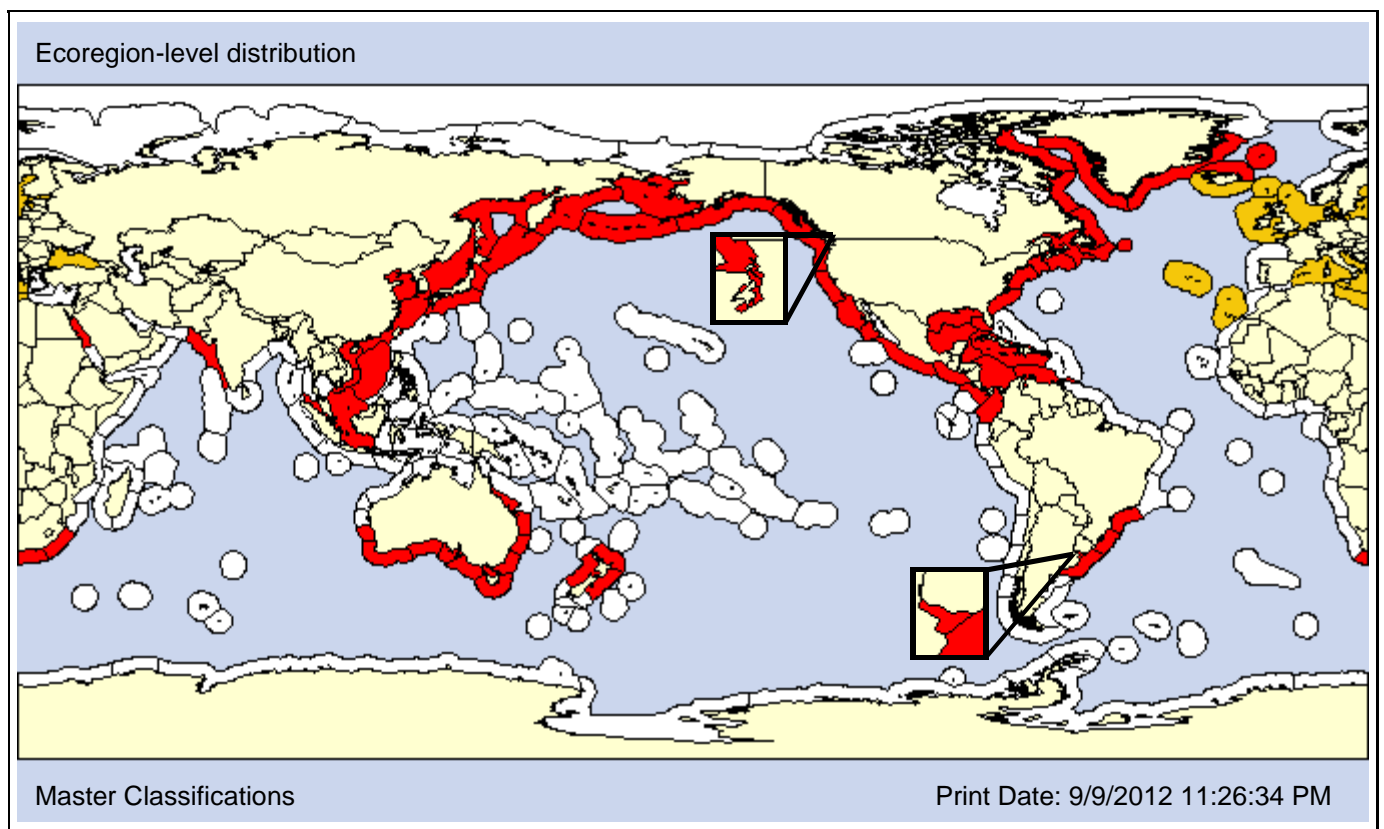
**Also Known As (Name - Type):**

Pholas teredo	Synonym
Teredo beachi	Synonym
Teredo borealis	Synonym
Teredo japonica	Synonym

**Common Names:**

Atlantic shipworm
naval shipworm

**Type Locality:** Netherlands



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown

**Loc 1st record:** Unknown

**Established:** Yes

1913

San Francisco Estuary, CA

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
		X			AO	PO									

Comments: The shipworm *Teredo navalis* has been widely introduced over the globe. The NEA and Mediterranean are considered possible native regions for *T. navalis* by some authors, while a number of European researchers consider it cryptogenic in these areas (e.g, Zenetos et al., 2011).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>		<b>P</b>	<b>O</b>	

**SALINITY [Obs: 5 - 45psu] [Pref: 12 - 35psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
							<b>X</b>	<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					



<b>Taxon:</b> Bivalve	<b>Taxonomic Author:</b> Gould, 1861	
<b>Kingdom:</b> Animalia	<b>Subkingdom:</b> Eumetazoa	<b>Phylum:</b> Mollusca
<b>Subphylum:</b>	<b>Superclass:</b>	<b>Class:</b> Bivalvia
<b>Subclass:</b> Heterodonta	<b>Infraclass:</b> Euheterodonta	<b>Superorder:</b>
<b>Order:</b> Veneroida	<b>Suborder:</b>	<b>Infraorder:</b>
<b>Superfamily:</b> Tellinoidea	<b>Family:</b> Semelidae	<b>Subfamily:</b>

**Also Known As (Name - Type):**

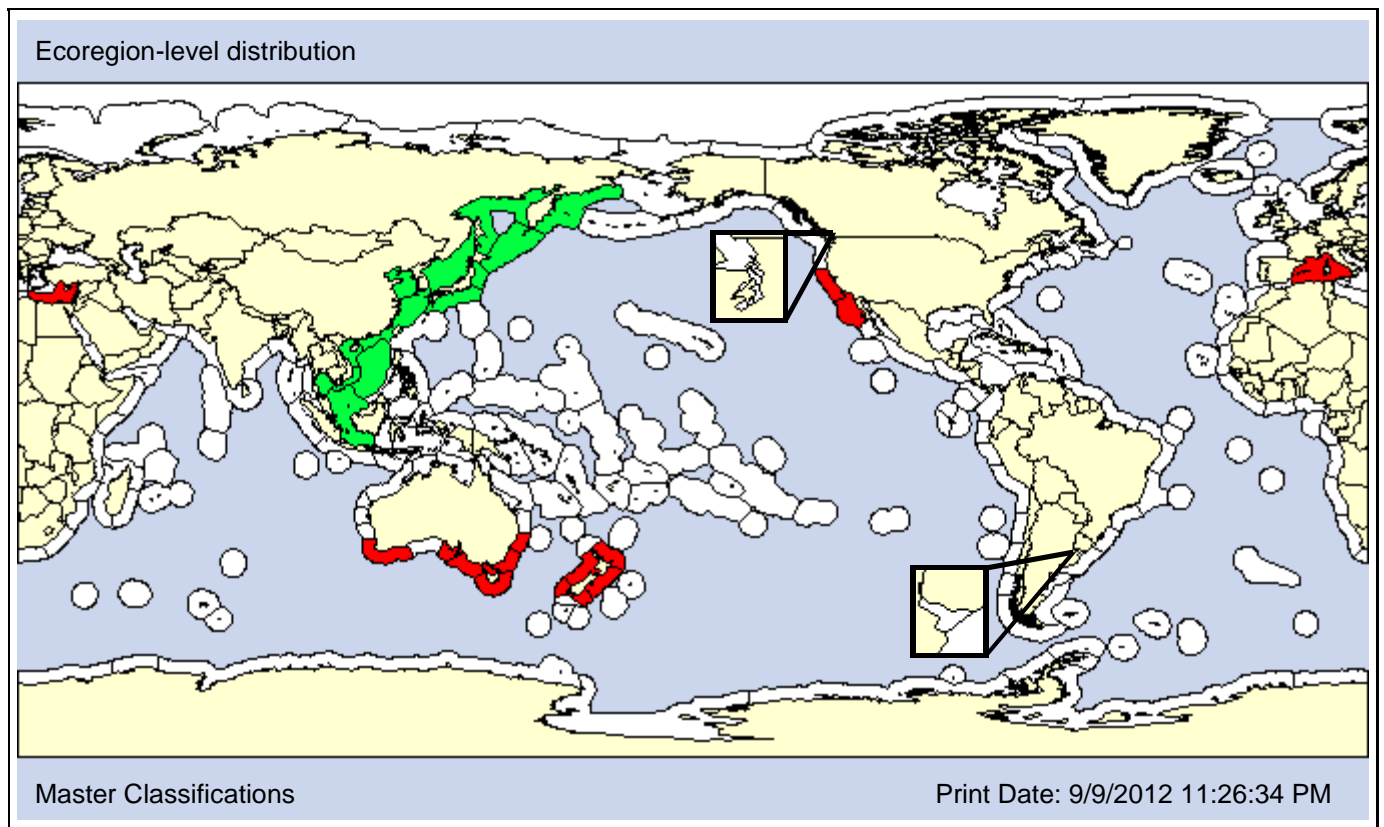
Endopleura lubrica  
 Theora (Endopleura) lubrica  
 Theora fragilis of NEP authors; not (Adams, 1855)

Synonym  
 Convention  
 Misidentified

**Common Names:**

Asian semele

**Type Locality:**



<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px dashed red;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:brown; border:1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; background-color:white; border:1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** Native 1968  
**Loc 1st record:** Native Newport Bay, California  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				
<b>X</b>						AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 100m] [Pref: 0 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 5.19 - 99.19%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 27 - 34.87psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

# Venerupis philippinarum

Species ID: 859

**Taxon:** Bivalve

**Taxonomic Author:** (Adams & Reeve, 1850)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Bivalvia

**Subclass:** Heterodonta

**Infraclass:** Euheterodonta

**Superorder:**

**Order:** Veneroida

**Suborder:**

**Infraorder:**

**Superfamily:** Veneroidea

**Family:** Veneridae

**Subfamily:** Tapetinae

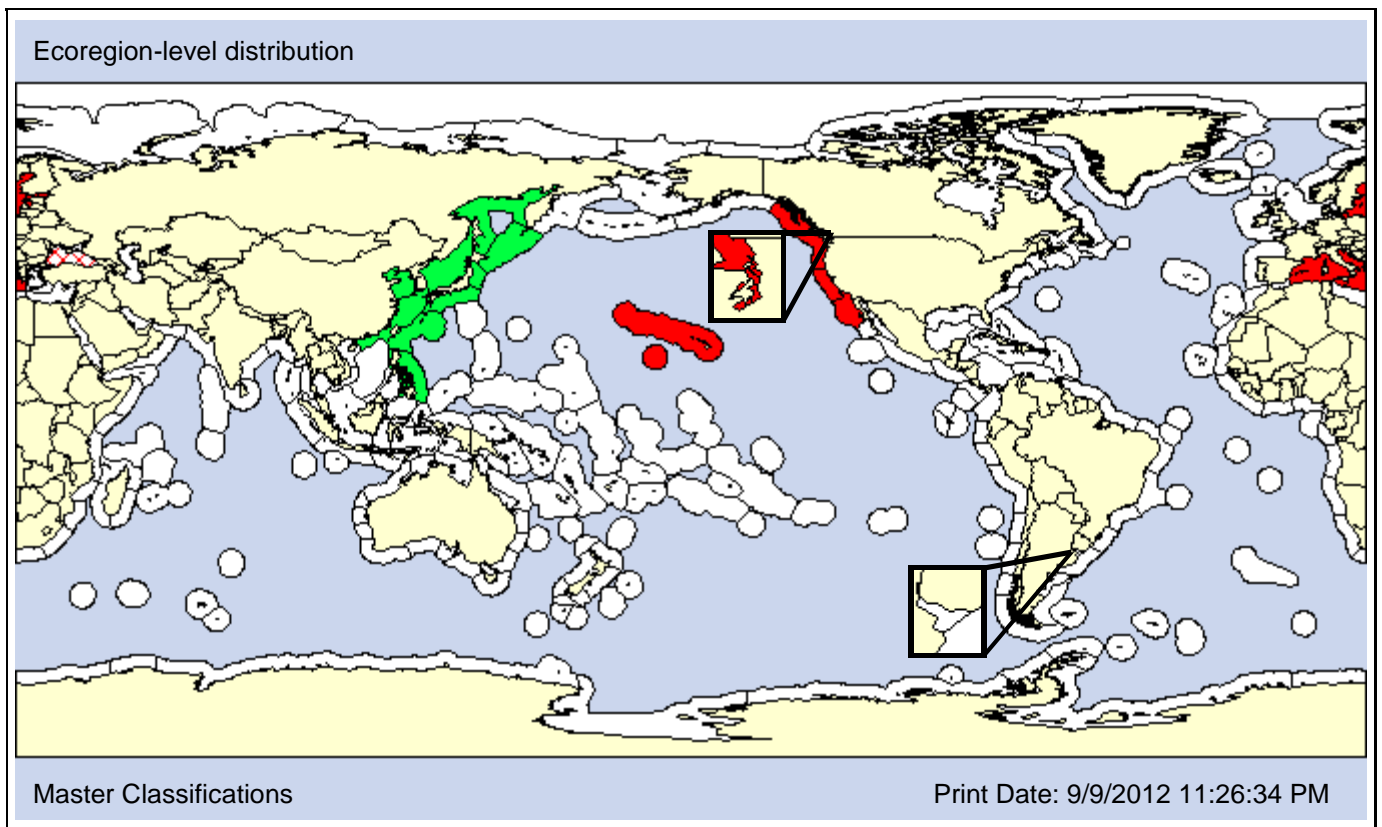
**Also Known As (Name - Type):**

Paphia bifurcata	Synonym
Ruditapes philippinarum	Synonym
Tapes philippinarum	Synonym
Venerupis japonica	Synonym

**Common Names:**

Japanese littleneck clam
Manila clam
okupi
pupu 'olepe

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii			NEP	

**Date 1st record:** Native 1918 1924  
**Loc 1st record:** Native Pearl Harbor, Oahu, Hawaii Puget Sound, WA  
**Established:** Yes Yes Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P		X	
X				X		AO	PO X	X						

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 23.5m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 0.6 - 96.6%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>		<b>P</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 10 - 34.65psu] [Pref: 24 - 31psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Kingdom: Animalia**

**Phylum: Mollusca**

**Class: Gastropoda**

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**Taxon:** Gastropod

**Taxonomic Author:** (Lovén, 1844)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Sacoglossa

**Suborder:** Plakobranchacea

**Infraorder:**

**Superfamily:** Limapontioidea

**Family:** Limapontiidae

**Subfamily:**

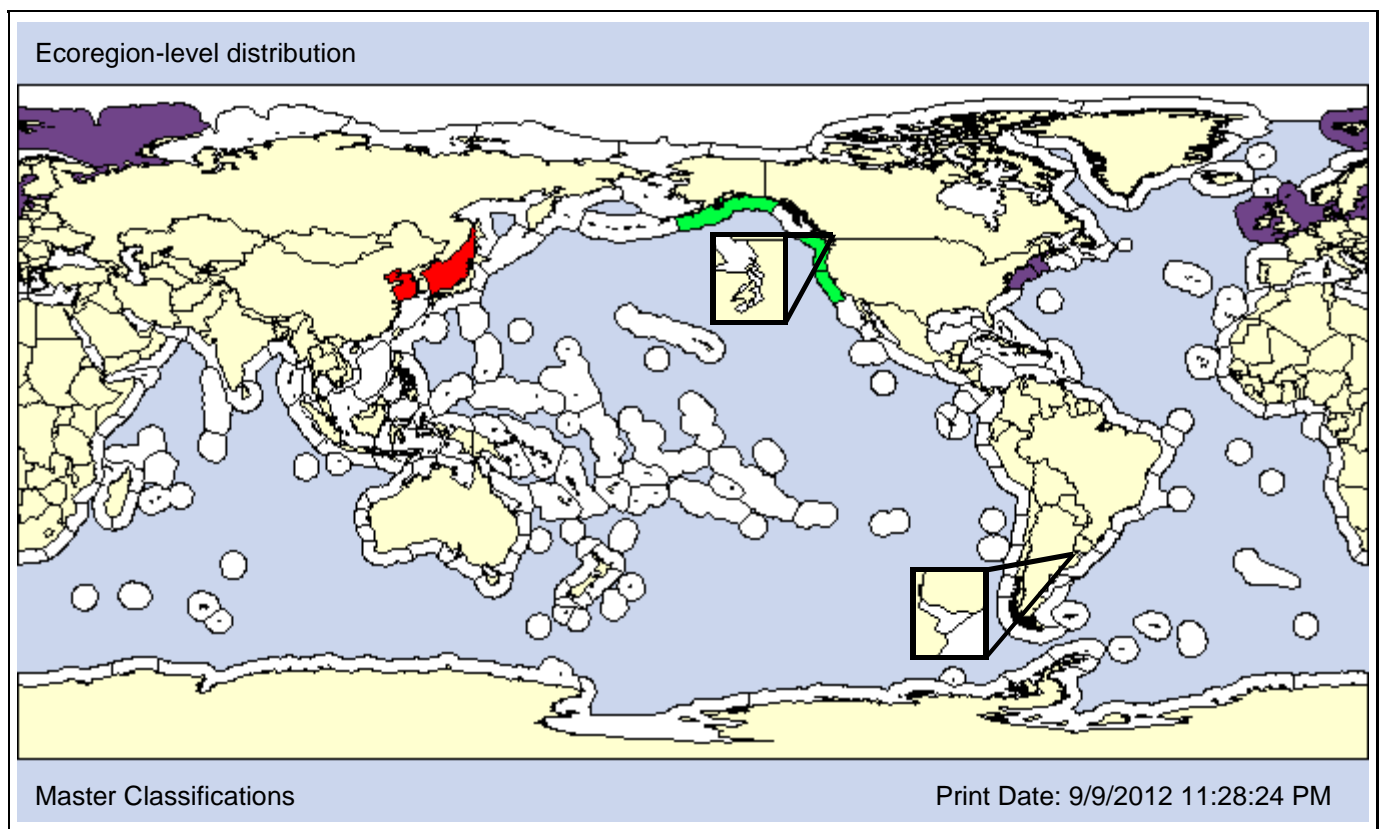
**Also Known As (Name - Type):**

Alderia amphibia	Synonym
Alderia harvardiensis	Synonym
Alderia scaldiana	Synonym
Stiliger modestus	Synonym

**Common Names:**

modest alderia
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**Type Locality:** Norway



**Date 1st record:** about 2001

Native

**Loc 1st record:** Peter the Great Bay, Russia

Native

**Established:** Unknown

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: Genetic evidence indicates that *Alderia modesta* evolved in the Pacific and then migrated to the Atlantic (Krug et al., 2007), though it is unclear whether this was a natural or human mediated transfer. The recent discovery of *A. modesta* in the Sea of Japan is suggestive of an introduction, and we tentatively classify it as NIS in the NWP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 3.7m] [Pref: 0 - 0.2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 4.86 - 95.5%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 5 - 40psu] [Pref: 25 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	



# *Amphithalamus inclusus*

Species ID: 14697

**Taxon:** Gastropod

**Taxonomic Author:** Carpenter, 1864

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Risssooidea

**Family:** Barleeiidae

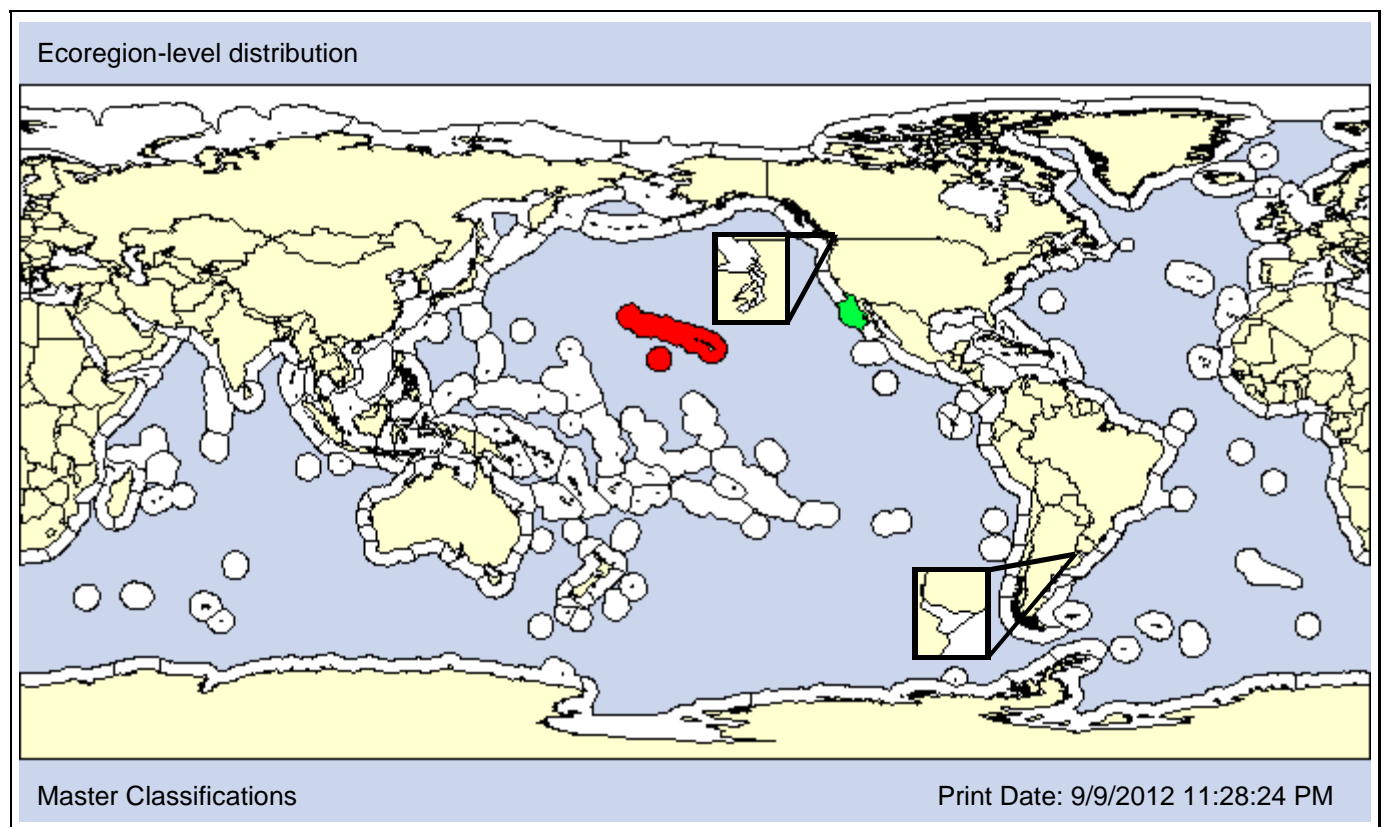
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Californian barley snail

**Type Locality:** San Diego, California, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

<b>Date 1st record:</b>	1981	Native
<b>Loc 1st record:</b>	Kawaihae Harbor, Hawaii	Native
<b>Established:</b>	Unknown	Yes

### VECTORS

SH <span style="color: red;">X</span>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
<span style="color: red;">X</span>		<span style="color: red;">X</span>				AO	PO								

Comments: The establishment of *Amphithalamus inclusus* in Hawaii is unknown (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: - 200m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Gastropod

**Taxonomic Author:** Kuroda, 1953

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Risssoidea

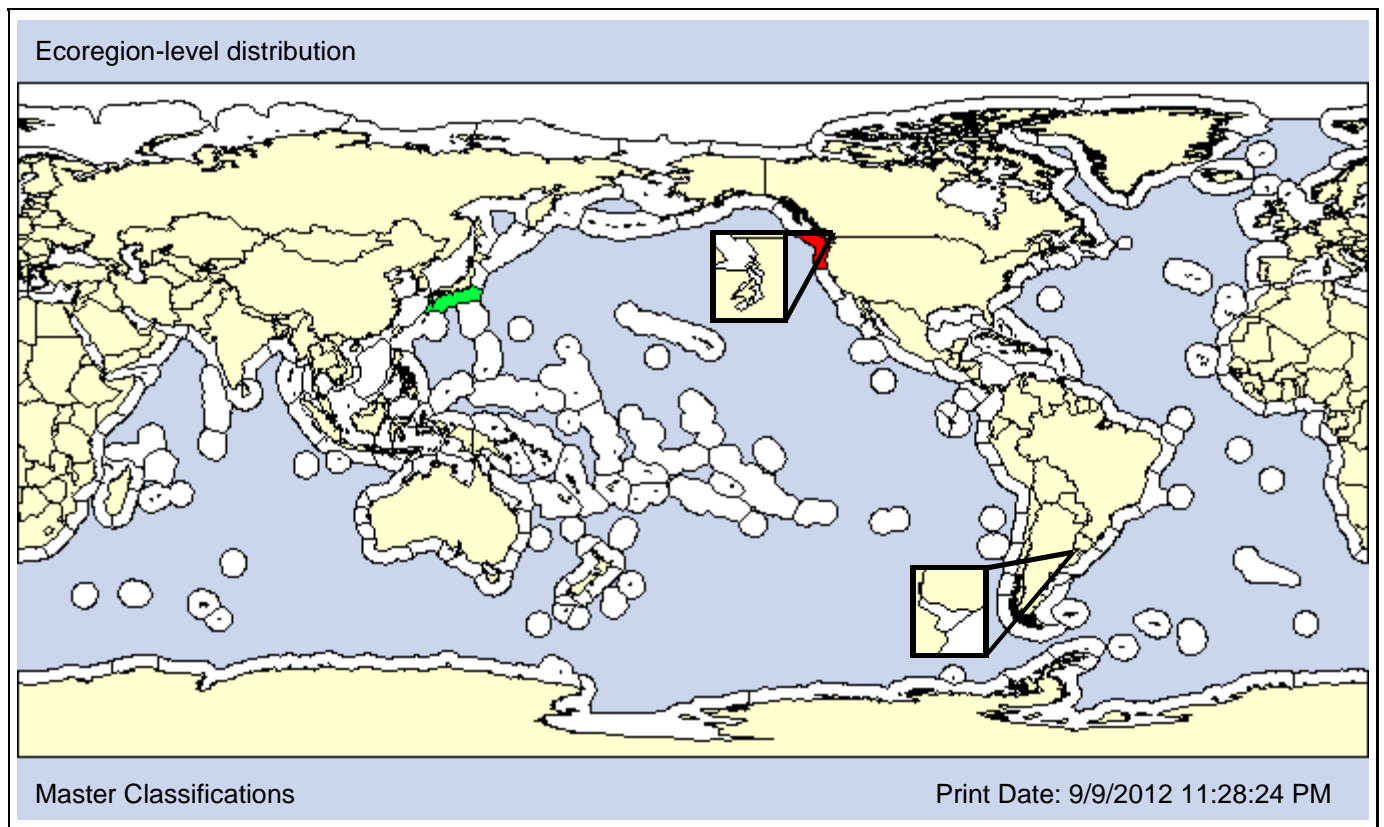
**Family:** Assimineidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

2007

**Loc 1st record:** Native

Coos Bay, Oregon

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - 0.01m] [Pref: 0 - 0.01m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	<b>P</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - 25psu] [Pref: 0 - 25psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>								

**Taxon:** Gastropod

**Taxonomic Author:** (Roller, 1972)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Nudibranchia

**Suborder:** Dexiarchia

**Infraorder:** Aeolidida

**Superfamily:** Flabellinoidea

**Family:** Flabellinidae

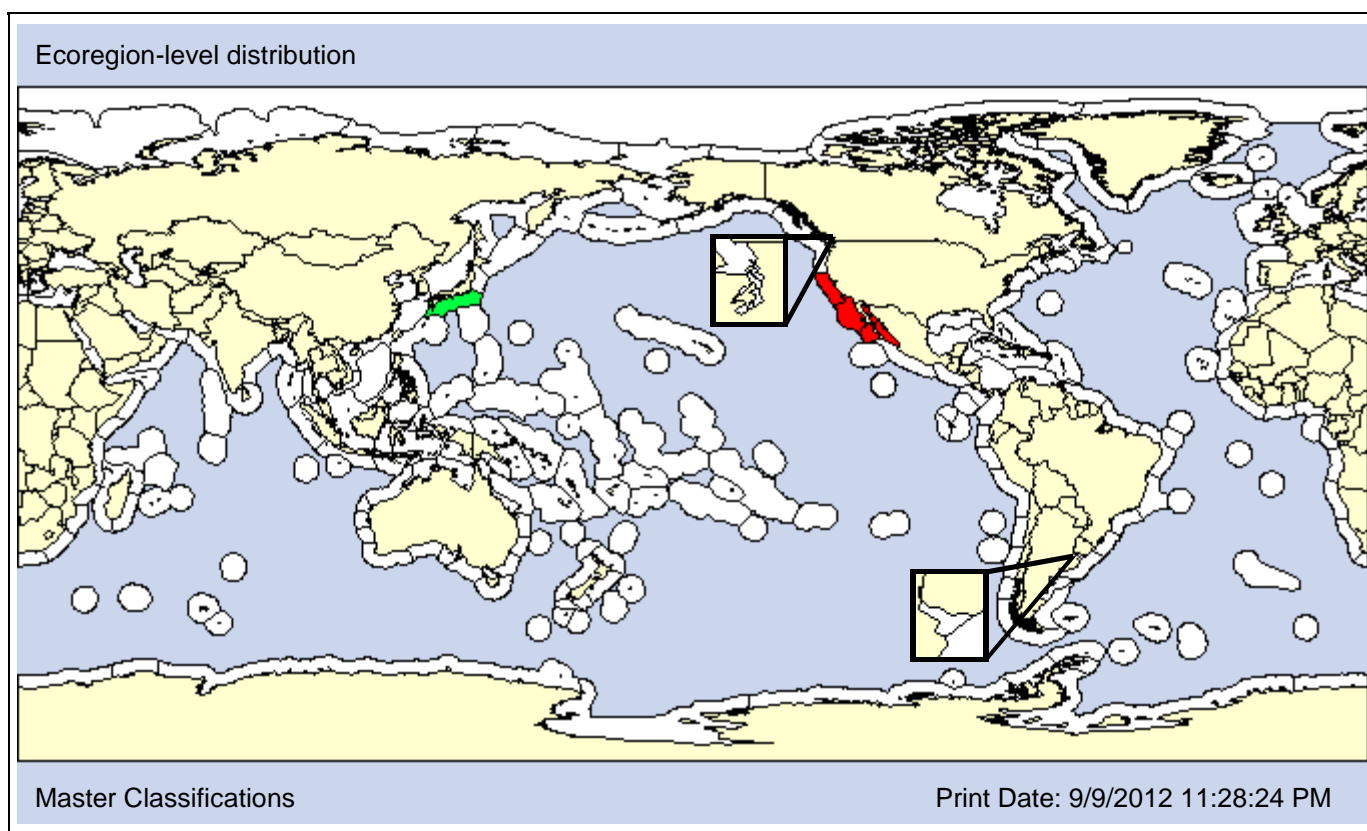
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Babaina festiva	Synonym	single-stalk aeolis
-----------------	---------	---------------------

**Type Locality:** California, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1968

**Loc 1st record:** Native

Southern California

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: Assuming that *Babakina festiva* is native to Japan (CANOD, 2009), we classify it as NIS in the NEP. Because of the taxonomic uncertainties in identifying these nudibranchs (Gosliner et al., 2007), reports from the Caribbean, Spain, New Zealand, and Brazil need to be confirmed.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	<b>X</b>
							<b>X</b>						

**DEPTH [Obs: 0 - 7m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>P</b>						<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** (Sowerby, 1855)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Cerithioidea

**Family:** Batillariidae

**Subfamily:**

**Also Known As (Name - Type):**

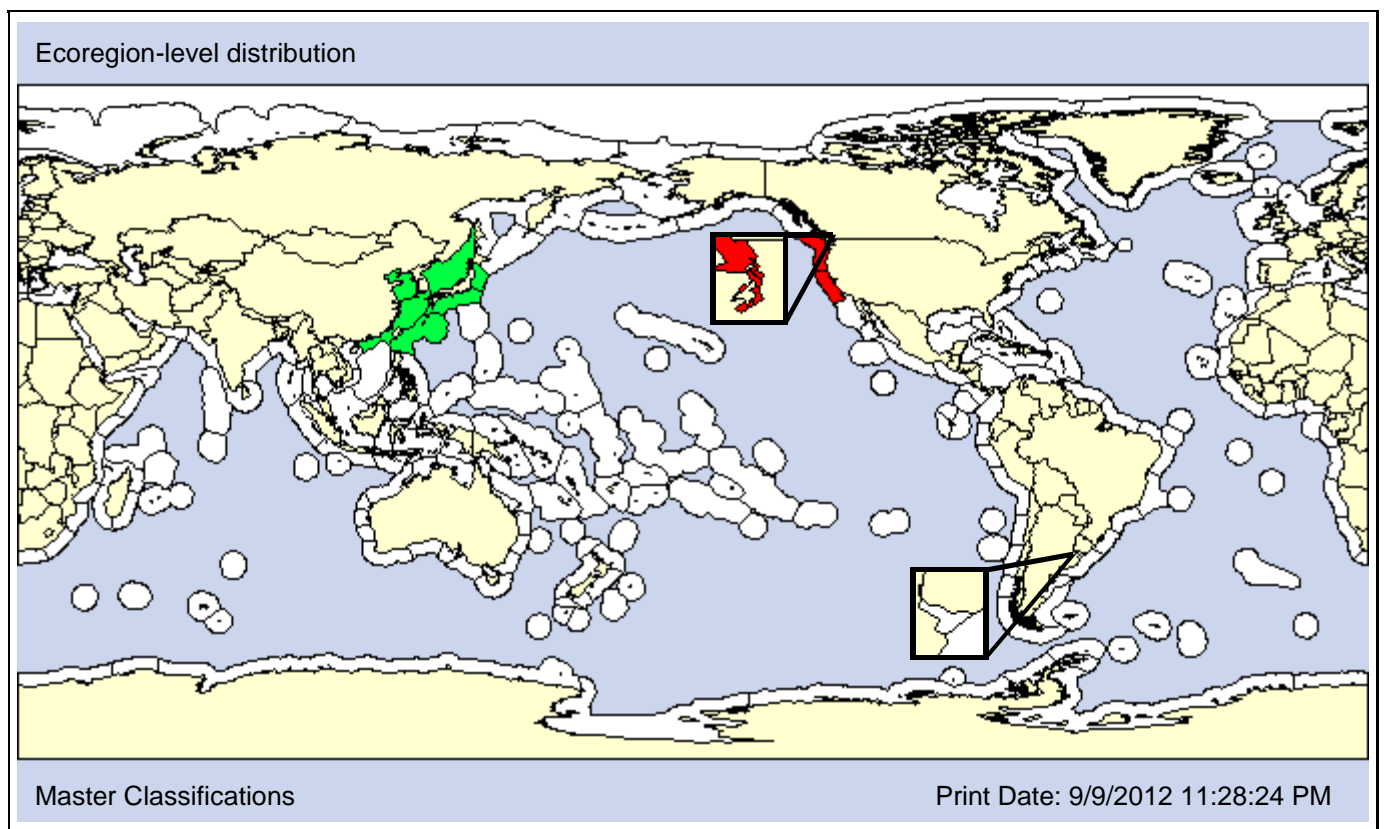
Batillaria cumingi

Synonym

**Common Names:**

Asian hornsnail  
Cuming's false cerith  
Japanese false cerith  
Japanese mud snail

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1924

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
		<b>X</b>			AO	PO <b>X</b>									

Comments: The introduced *Batillaria attramentaria* is competitively displacing the native snail, *Cerithidea californica*, in the NEP. McLean (2007) synonymizes *B. cumingi* with *B. attramentaria*, though WoRMS lists both as valid species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>												

**DEPTH [Obs: 0 - 0.3m] [Pref: 0 - 0.3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>O</b>					<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>								



**Taxon:** Gastropod

**Taxonomic Author:** (Carpenter, 1864)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Pyramidelloidea

**Family:** Pyramidellidae

**Subfamily:**

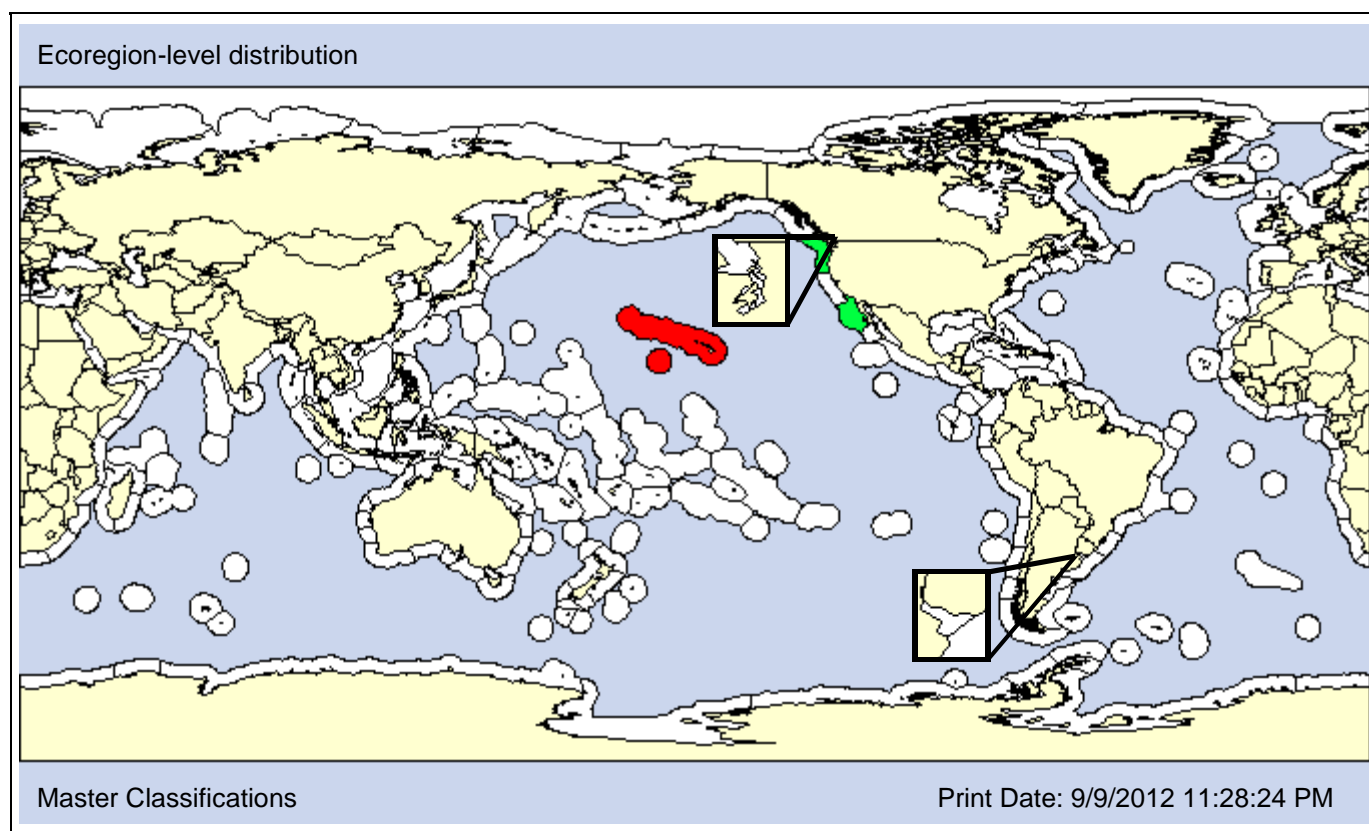
**Also Known As (Name - Type):**

Chrysallida cincta  
Odostomia cincta

Synonym  
Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:** 1981 Native  
**Loc 1st record:** Kawaihae Harbor, Hawaii Native  
**Established:** Unknown Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: The establishment of *Boonea cincta* in Hawaii is unknown (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
		X											

**DEPTH [Obs: 12 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

# *Bostrycapulus calyptraeiformis*

Species ID: 170047

**Taxon:** Gastropod

**Taxonomic Author:** (Deshayes, 1830)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Calyptraeioidea

**Family:** Calyptraeidae

**Subfamily:**

**Also Known As (Name - Type):**

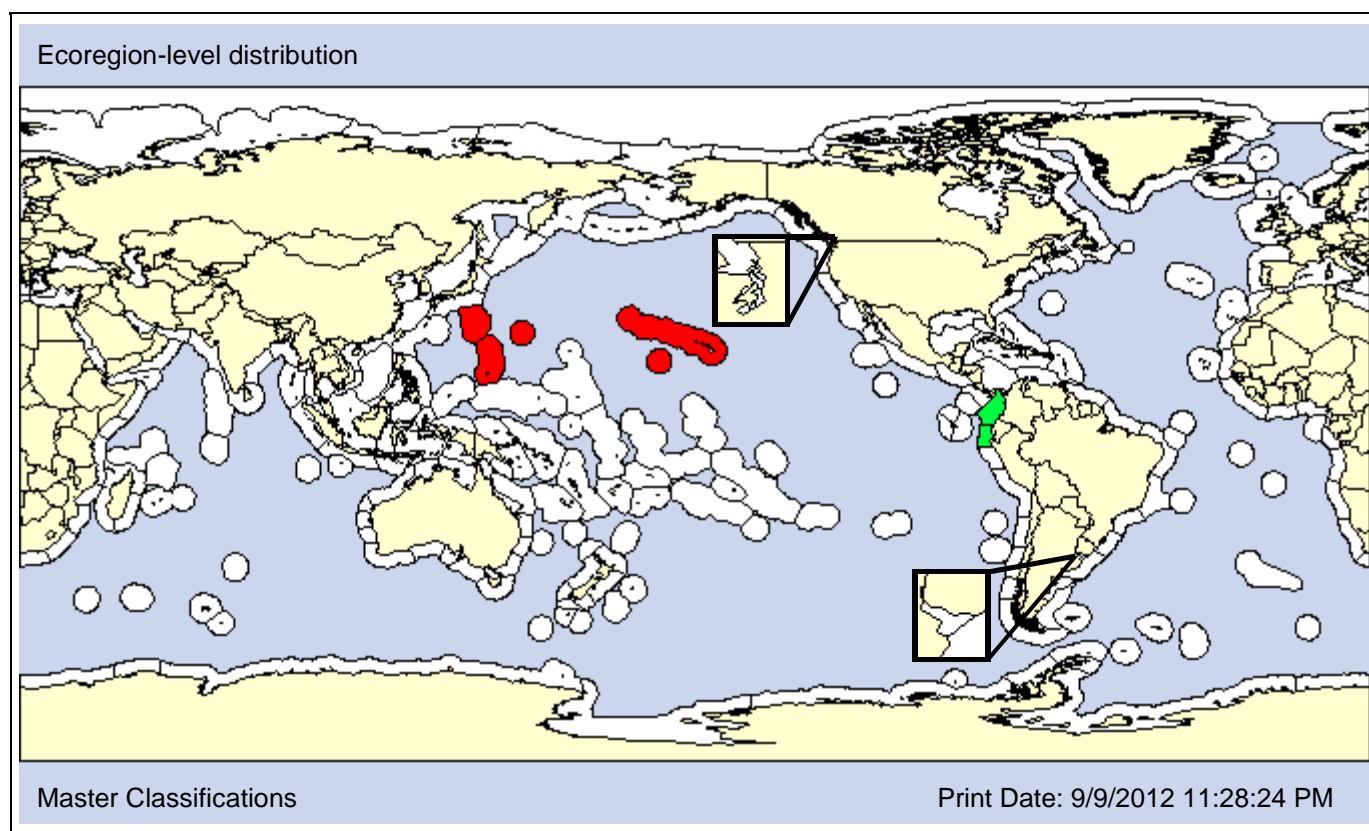
Bostrycapulus aculeatus in part  
Bostrycapulus calyptraeiformis  
Calyptraea echinus  
Crepidula aculeata of authors

Partial synonym  
Misspelling  
Synonym  
Misidentified

**Common Names:**

hoof sheel

**Type Locality:** Peru?



**Date 1st record:** 1913  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>

**DEPTH [Obs: 0 - 50m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>										<b>P</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>									

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

# *Busycotypus canaliculatus*

Species ID: 1189

**Taxon:** Gastropod

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Neogastropoda

**Suborder:**

**Infraorder:**

**Superfamily:** Buccinoidea

**Family:** Buccinidae

**Subfamily:**

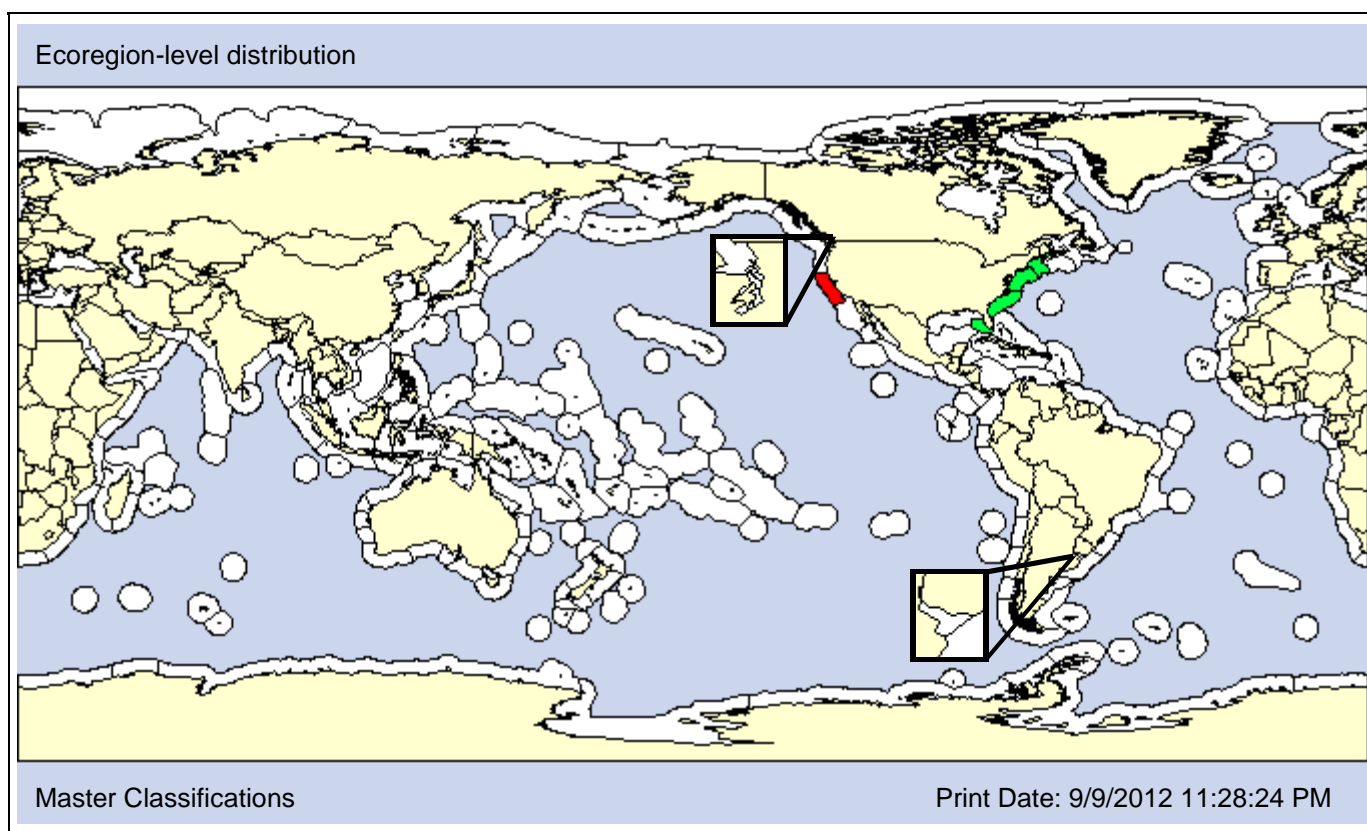
**Also Known As (Name - Type):**

Busycon canaliculatum	Synonym
Fulgur canaliculatus	Synonym
Murex canaliculatus	Synonym
Pyrula canaliculatus	Synonym

**Common Names:**

channeled whelk
-----------------

**Type Locality:** Ad Canadam



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1938  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P		<b>X</b>	
						<b>AO X</b>	PO			<b>X</b>				

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 50m] [Pref: 0 - 28m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 18 - psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
			<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Gastropod

**Taxonomic Author:** (Bergh, 1896)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Nudibranchia

**Suborder:** Dexiarchia

**Infraorder:** Aeolidida

**Superfamily:** Aeolidioidea

**Family:** Facelinidae

**Subfamily:**

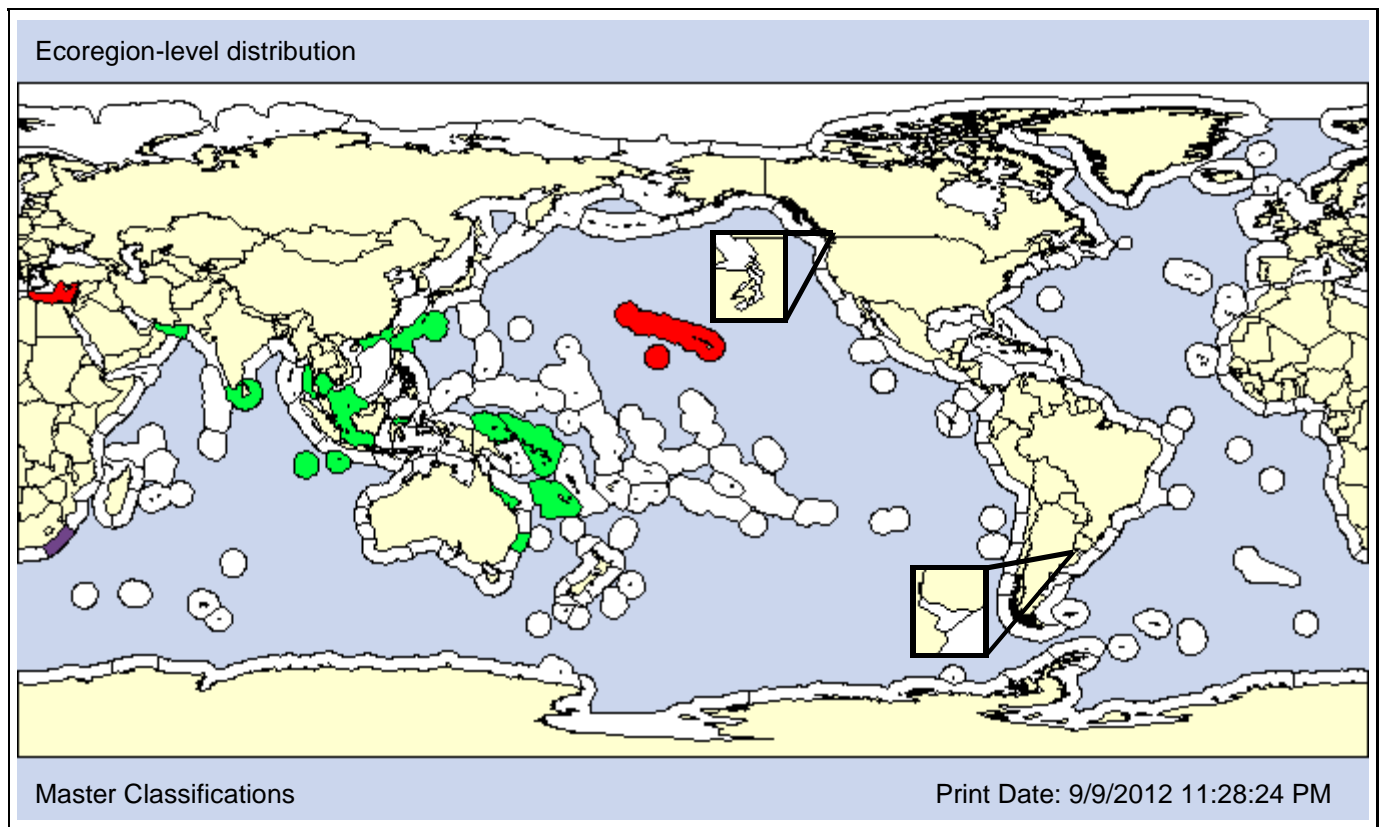
**Also Known As (Name - Type):**

Learchis indica	Synonym
Phidiana indica	Synonym

**Common Names:**

Indian nudibranch
-------------------

**Type Locality:** India



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1968

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	X				
X		X			AO	PO									

Comments: In Hawaii, the introduced *Caloria indica* feeds on the introduced hydroid, *Pennaria tiarella*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: -15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H+B	Oth
		<b>P</b>										<b>O</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Gastropod

**Taxonomic Author:** Behrens, 1984

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Nudibranchia

**Suborder:** Dexiarchia

**Infraorder:** Aeolidida

**Superfamily:** Fionoidea

**Family:** Tergipedidae

**Subfamily:**

**Also Known As (Name - Type):**

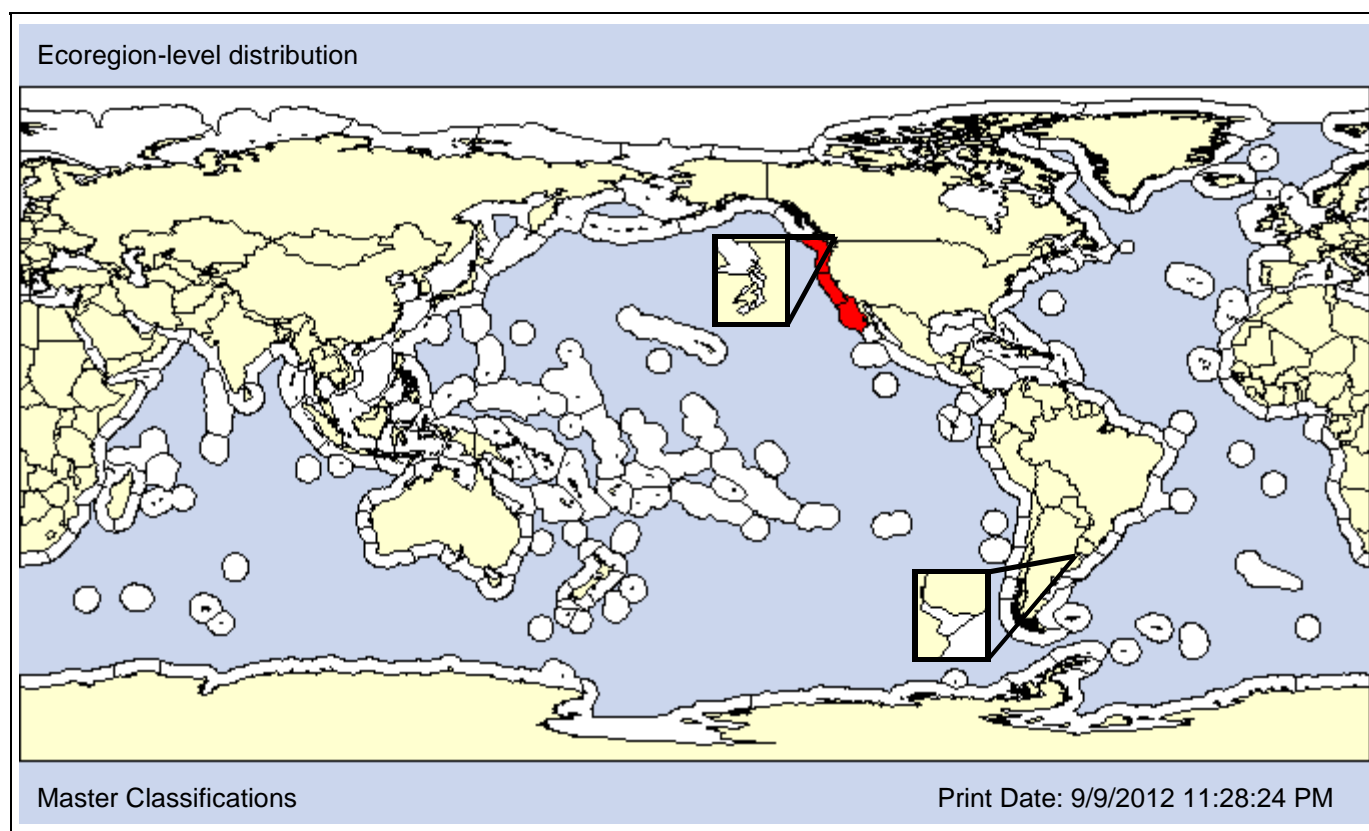
Trinchesia sp of Behrens and Tuel, 1977

Synonym

**Common Names:**

Doc's aeolid  
Ricketts' aeolid

**Type Locality:** Port of Redwood City, San Francisco Bay, USA



**Date 1st record:** Native

1974

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: Cohen and Carlton (1995) consider the origin of *Catriona rickettsi* to be unknown, while CANOD (2009) lists it as Japan. It is considered a NIS in the NEP based on its recent discovery (1974) in San Francisco and subsequent discovery in other estuaries. We tentatively classify it as native in Japan though we have no specific locations.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 18m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** Adams, 1861

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Rissooidea

**Family:** Pomatiopsidae

**Subfamily:**

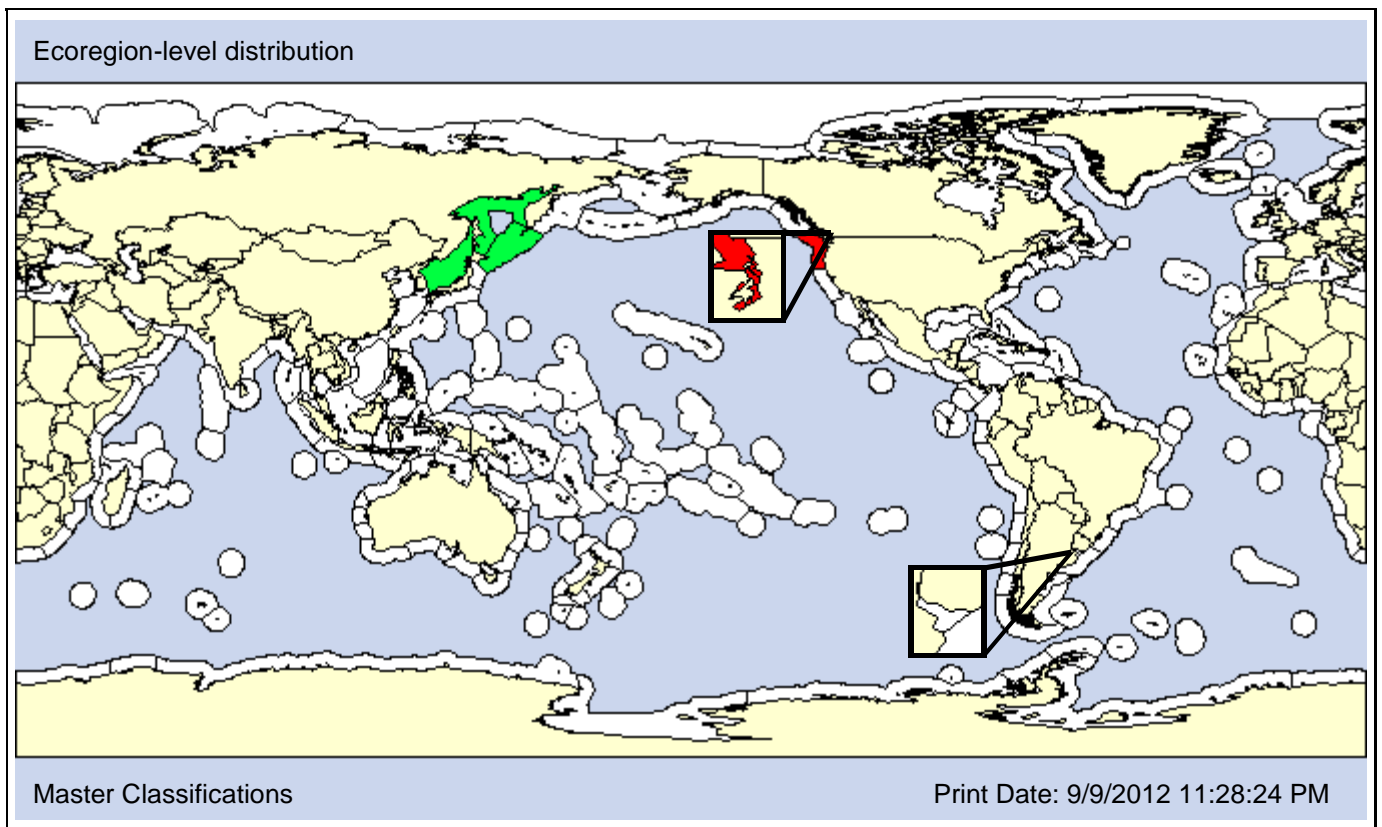
**Also Known As (Name - Type):**

**Common Names:**

--

kubikiregai-modoki Manchurian cecina
---

**Type Locality:** Olga and Vladimir Bays, Manchuria



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		<b>NWP</b>	<b>Hawaii</b>		<b>NEP</b>		

**Date 1st record:** Native

1961

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>						AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH			<b>X</b>		

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
						<b>O</b>

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>O</b>		<b>P</b>				

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
					<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR X	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						<b>X</b>
					<b>X</b>								

**Taxon:** Gastropod

**Taxonomic Author:** (Dall & Bartsch, 1909)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Pyramidelloidea

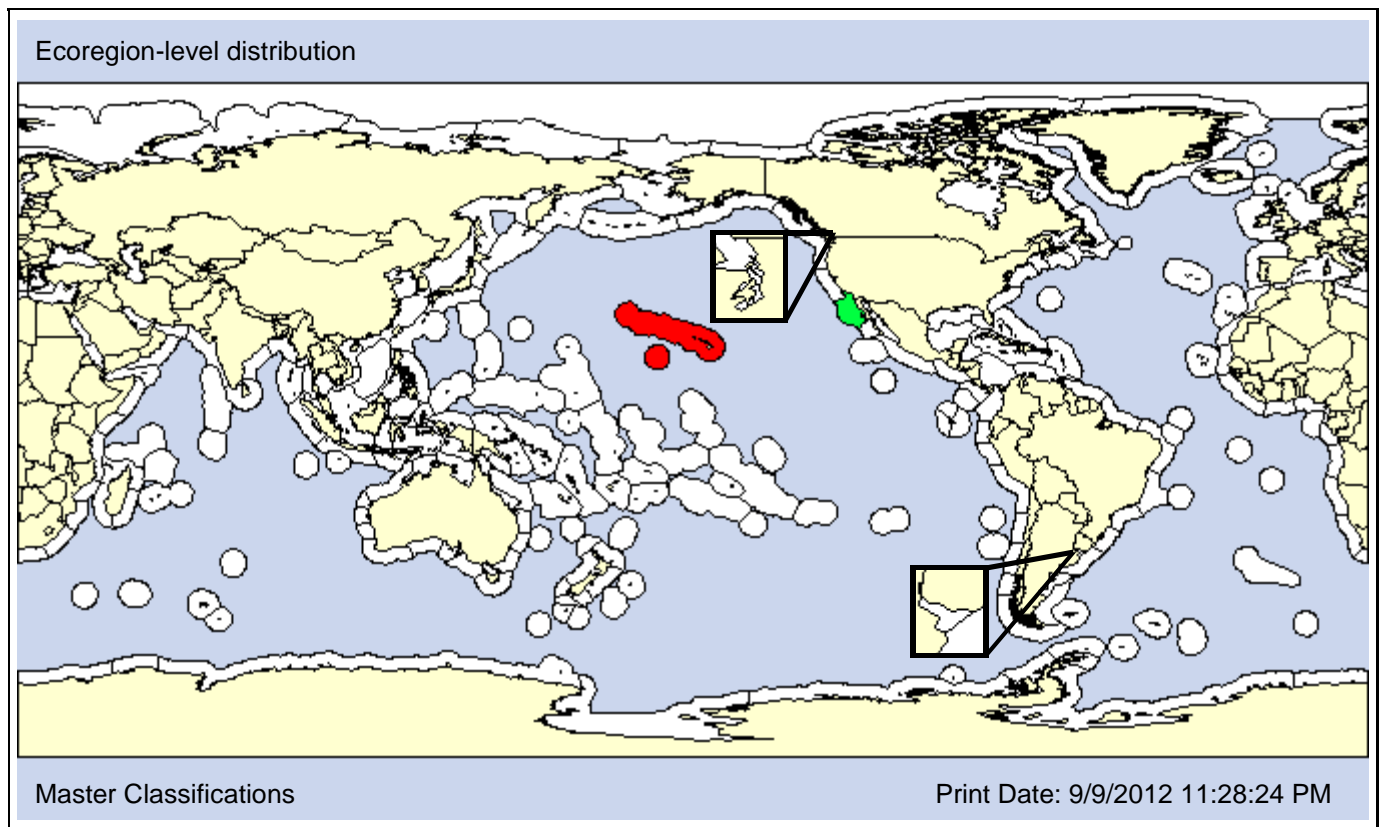
**Family:** Pyramidellidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



<b>Date 1st record:</b>	1981	Native
<b>Loc 1st record:</b>	Kawaihae Harbor, Hawaii	Native
<b>Established:</b>	Unknown	Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
<span style="color: red;">X</span>		<span style="color: red;">X</span>				AO	PO							

Comments: The establishment of *Chrysallida trachis* in Hawaii is unknown (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
		X											

**DEPTH [Obs: 12 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Gastropod

**Taxonomic Author:** Say, 1822

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Calyptraeoidea

**Family:** Calyptraeidae

**Subfamily:**

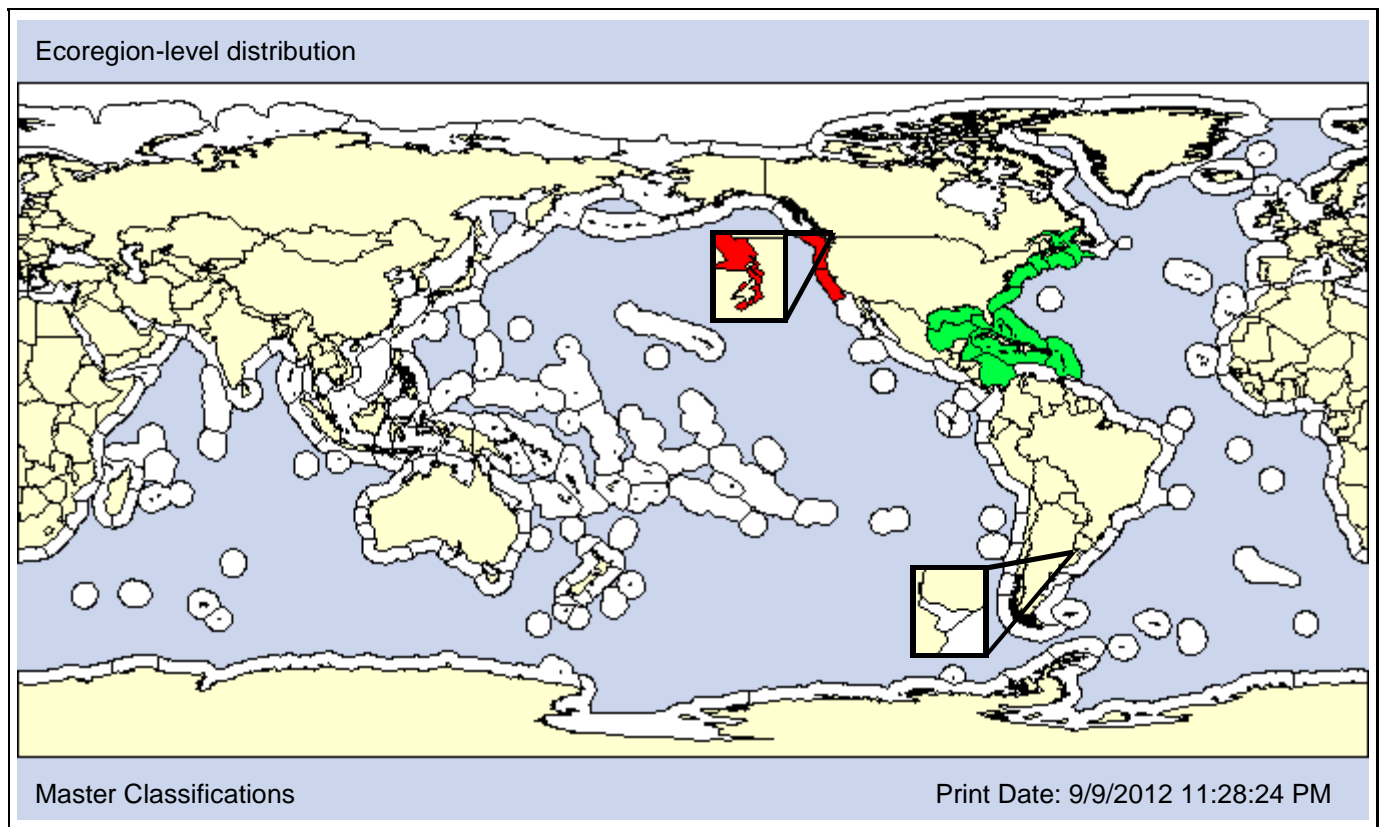
**Also Known As (Name - Type):**

Crepidula acuta	Synonym
Crepidula glauca	Synonym
Crypta convexa	Synonym
Crypta glauca	Synonym

**Common Names:**

common Atlantic slippersnail (*Crepidula convexa*)  
convex slipper shell  
slipper shell

**Type Locality:** Cape May, New Jersey, USA (neotype)



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1898

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
		<b>X</b>			<b>AO X</b>	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 7m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 95.07 - 96.55%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>					<b>O</b>				<b>O</b>	<b>O</b>	

**SALINITY [Obs: 12 - 26psu] [Pref: 20 - 26psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>		<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Gastropod

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Calyptraeidea

**Family:** Calyptraeidae

**Subfamily:**

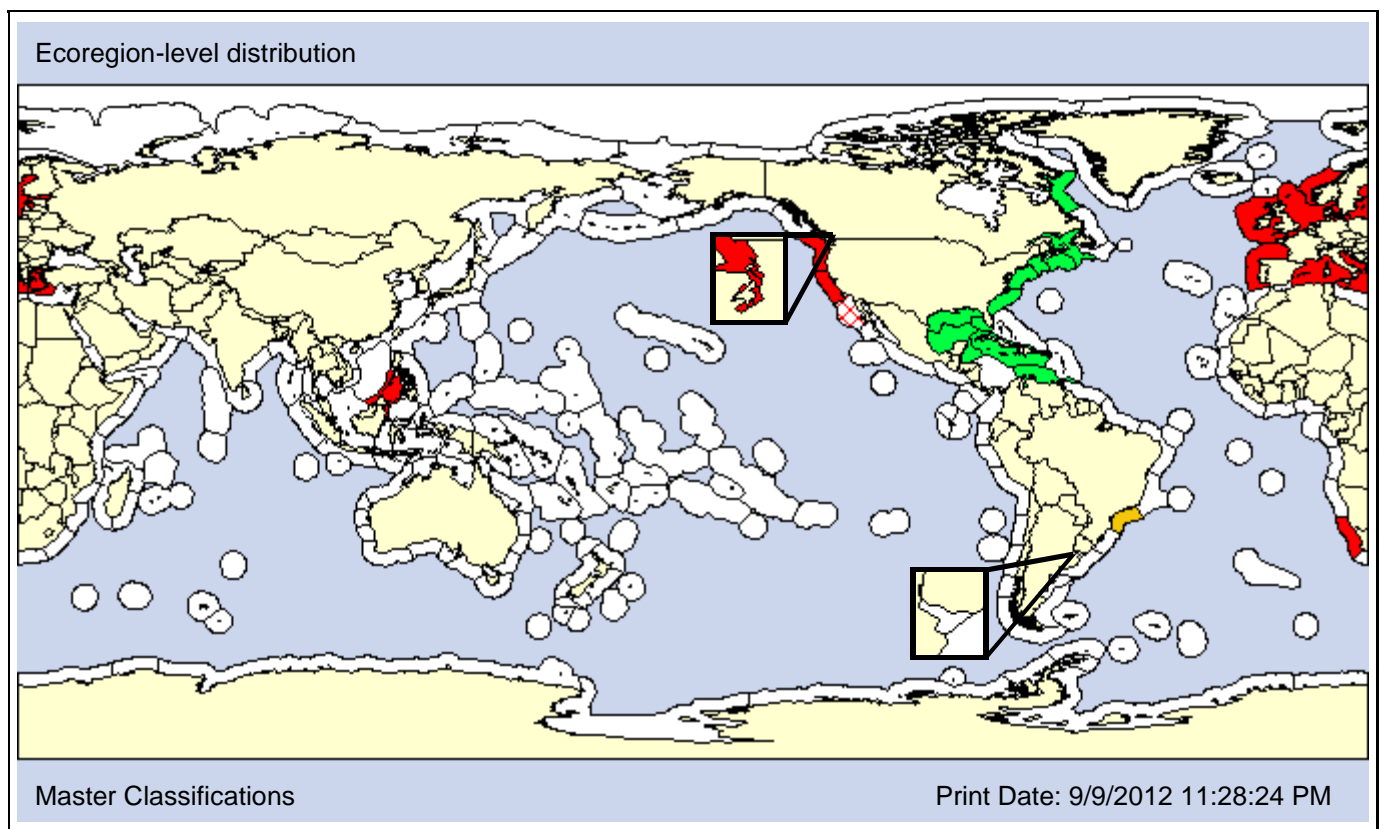
**Also Known As (Name - Type):**

Crepidula densata	Synonym
Crepidula maculata	Synonym
Crepidula riisei	Synonym
Crypta densata	Synonym

**Common Names:**

common Atlantic slipper-shell
common Atlantic slippersnail ( <i>Crepidula fornicata</i> )
slipper limpet

**Type Locality:**



**Date 1st record:**

1905

**Loc 1st record:**

Puget Sound, WA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments: The *Crepidula fornicata* previously reported from Humboldt Bay, California were shown to be *C. convexa* based on mtDNA (McGlashan et al., 2008). It is possible that some of the other reports of *C. fornicata* in the NEP may actually be *C. convexa*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 79m] [Pref: 0 - 49m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			<b>O</b>	<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>	<b>O</b>								<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 14 - 35.6psu] [Pref: - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>		<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Gastropod      **Taxonomic Author:** Sowerby, 1824

**Kingdom:** Animalia      **Subkingdom:** Eumetazoa      **Phylum:** Mollusca

**Subphylum:**      **Superclass:**      **Class:** Gastropoda

**Subclass:** Caenogastropoda      **Infraclass:**      **Superorder:**

**Order:** Littorinimorpha      **Suborder:**      **Infraorder:**

**Superfamily:** Calyptraeioidea      **Family:** Calyptraeidae      **Subfamily:**

**Also Known As (Name - Type):**

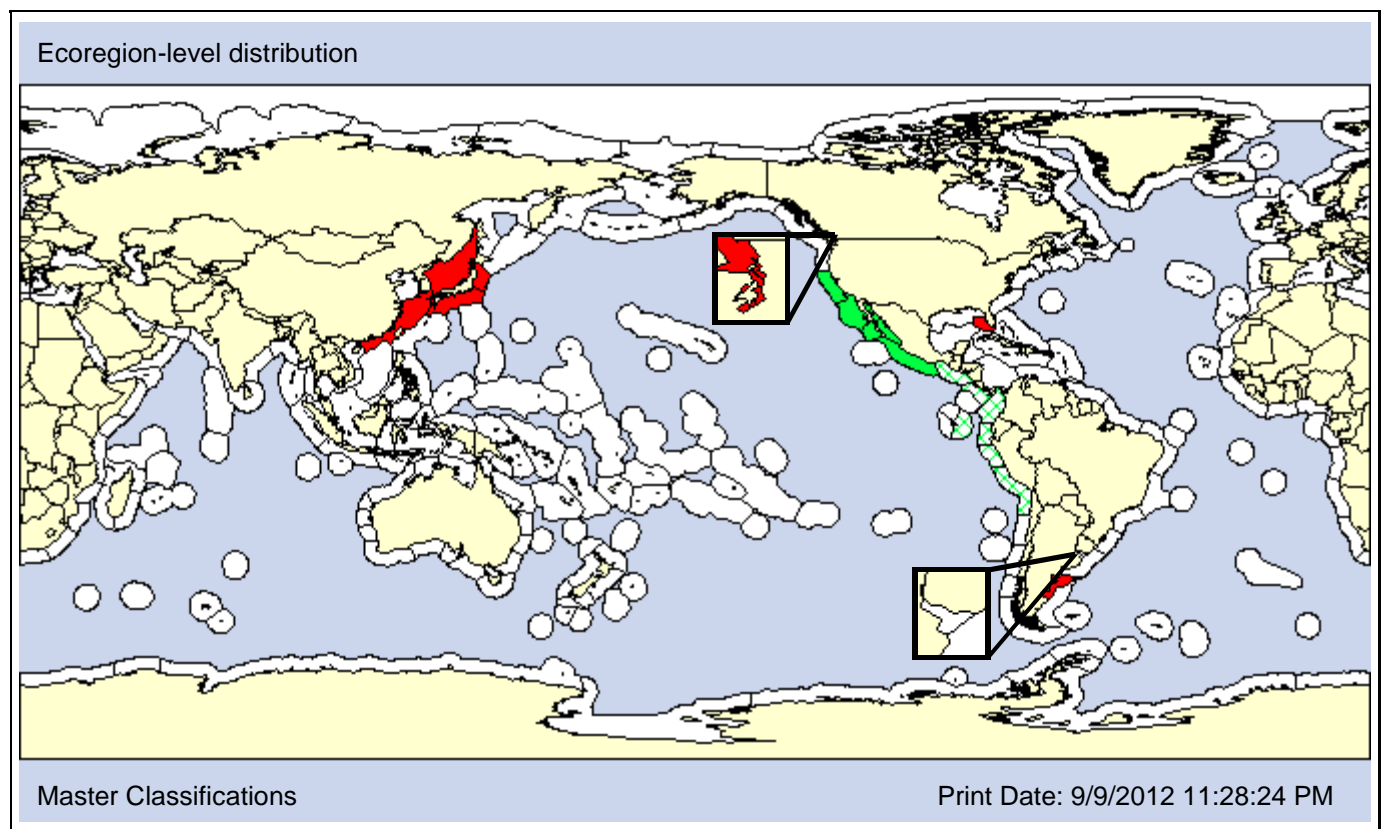
Calyptreaa amygdalus  
 Crepidula rugosa of Carpenter, 1856; not Anton, 1839

Synonym  
 Misidentified

**Common Names:**

onyx slipper shell  
 simamenou-funegai

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

**Date 1st record:** 1968      2005

**Loc 1st record:** Miura Peninsula, Japan      Puget Sound, WA

**Established:** Yes      Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		<b>X</b>				AO	PO								

Comments: *Crepidula onyx* is native to central and southern California. It was introduced into Puget Sound, WA in 2005 (Collin et al., 2006). Because reports of *C. onyx* from Panama south are likely another species, we list it as native but not established in the southern range, though this requires additional study.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
	<b>X</b>	<b>X</b>					<b>X</b>						

**DEPTH [Obs: 0 - 200m] [Pref: 0 - 29m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2.98 - 74.07%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>									<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 15 - 34psu] [Pref: 32 - 34psu]**

<b>Fresh</b>	<b>Brackish O</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>									

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** Say, 1822

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Calyptraeidea

**Family:** Calyptraeidae

**Subfamily:**

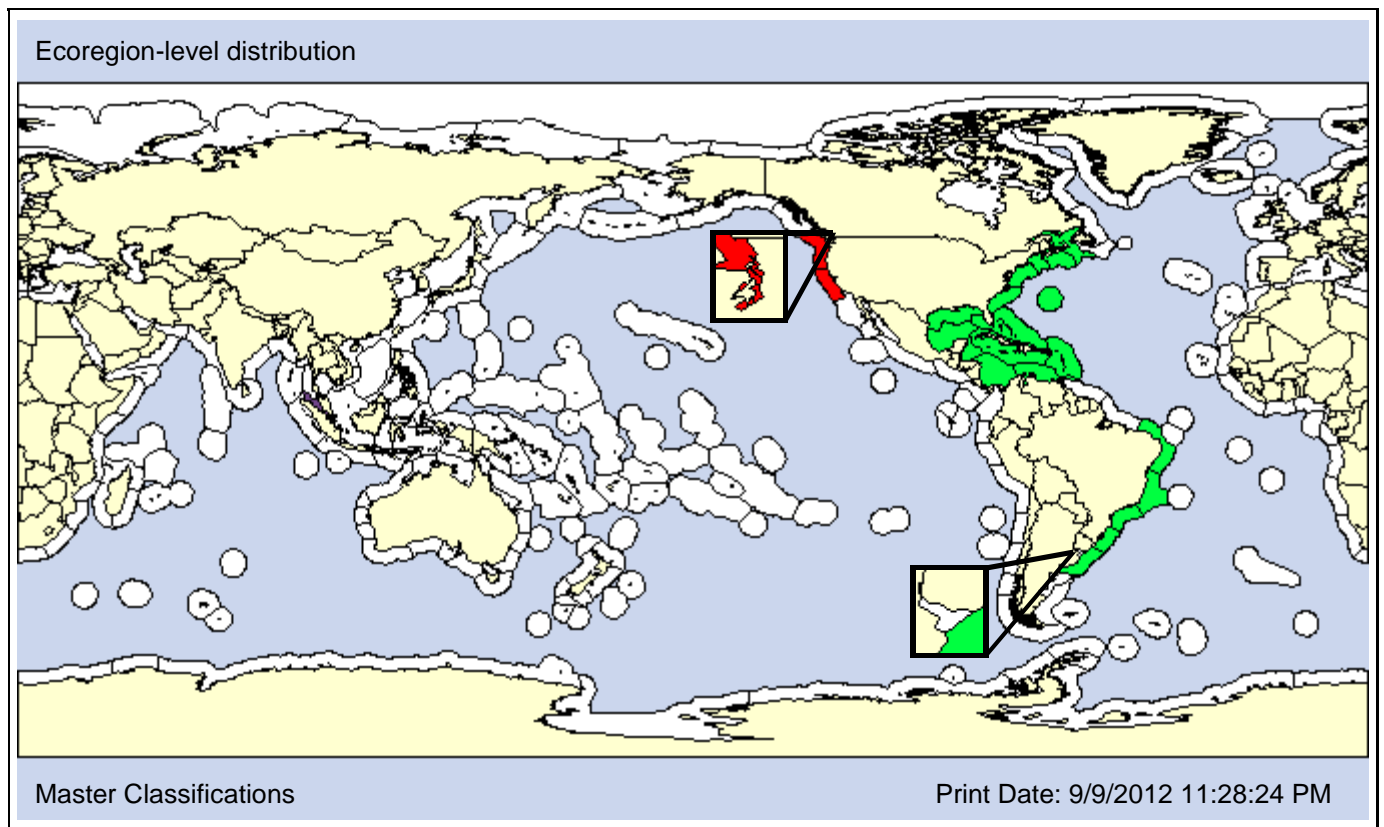
**Also Known As (Name - Type):**

Crepidula lamina	Synonym
Crepidula rhysema	Synonym
Crepidula triangula	Synonym
Crypta plana	Synonym

**Common Names:**

Eastern white slipper shell

**Type Locality:** Woods Hole, Massachusetts, USA (neotype)



**Date 1st record:**

1901

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments: We list *Crepidula plana* as introduced in the NEP. However, Collin et al. (2006) concluded it is difficult to verify introductions of *C. plana* in the NEP because of the difficulty in distinguishing it from native *C. perforans*, *C. williamsi*, *C. fimbriata*, and *C. explanata*, as well as “flat white species of *Crepidula* from other parts of the world.”

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH <b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 110m] [Pref: 1 - 73m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	

**SALINITY [Obs: 15 - 30psu] [Pref: 19 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>		<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

# Crucibulum spinosum

Species ID: 4620

**Taxon:** Gastropod

**Taxonomic Author:** (Sowerby, 1824)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Calyptraeoidea

**Family:** Calyptraeidae

**Subfamily:**

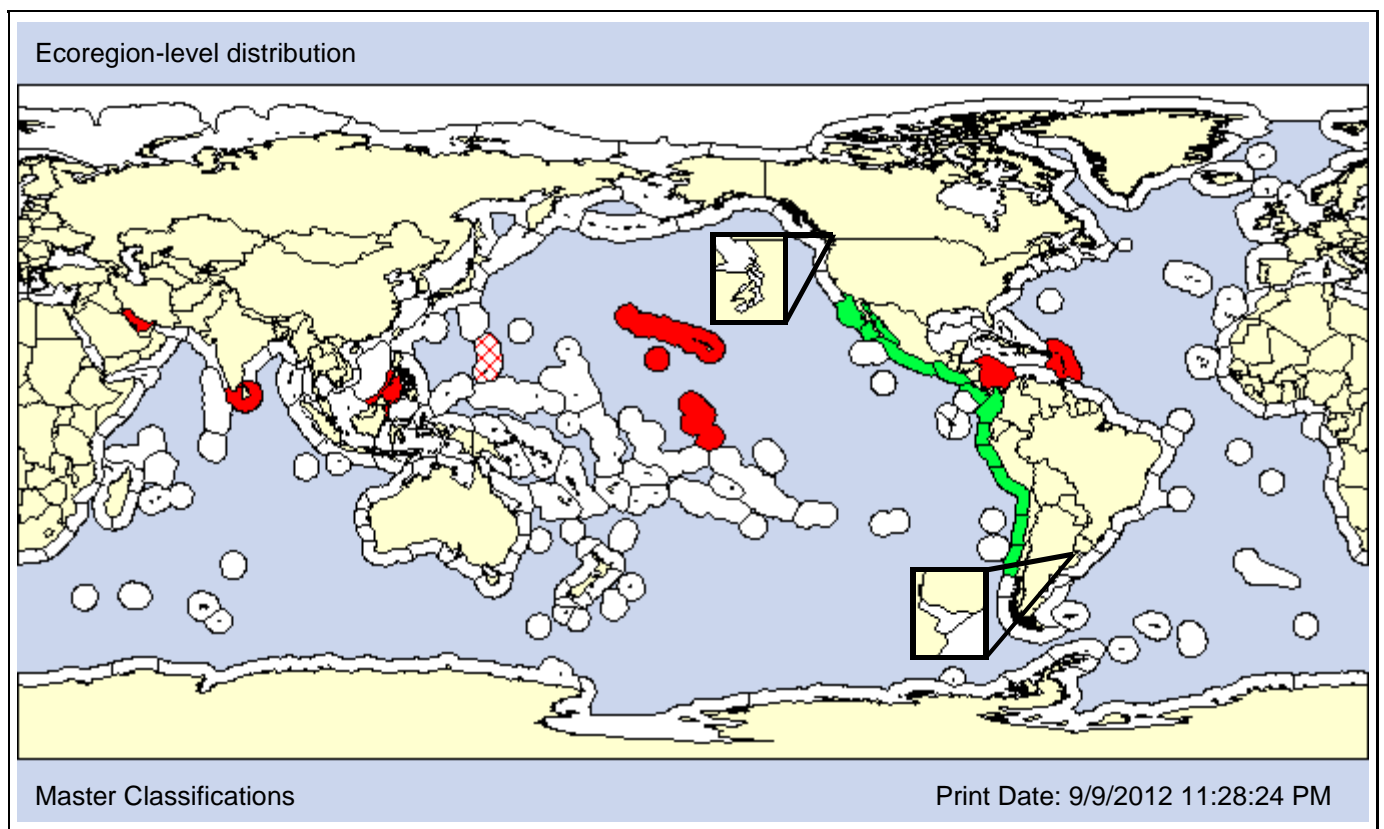
**Also Known As (Name - Type):**

Calyptreaea spinosa	Synonym
Crucibulum maculata	Synonym
Crucibulum peziza	Synonym
Crucibulum tubifera	Synonym

**Common Names:**

spiny cup-and-saucer  
spiny cup-and-saucer snail

**Type Locality:**



**Date 1st record:** 1946 Native  
**Loc 1st record:** Honolulu Harbor, Hawaii Native  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 55m] [Pref: 0 - 8m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 8.59 - 89.8%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>											<b>O</b>	<b>O</b>

**SALINITY [Obs: 31 - 33psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H X		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>									

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Gastropod

**Taxonomic Author:** (O'Donoghue, 1922)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Nudibranchia

**Suborder:** Dexiarchia

**Infraorder:** Aeolidida

**Superfamily:** Fionoidea

**Family:** Tergipedidae

**Subfamily:**

**Also Known As (Name - Type):**

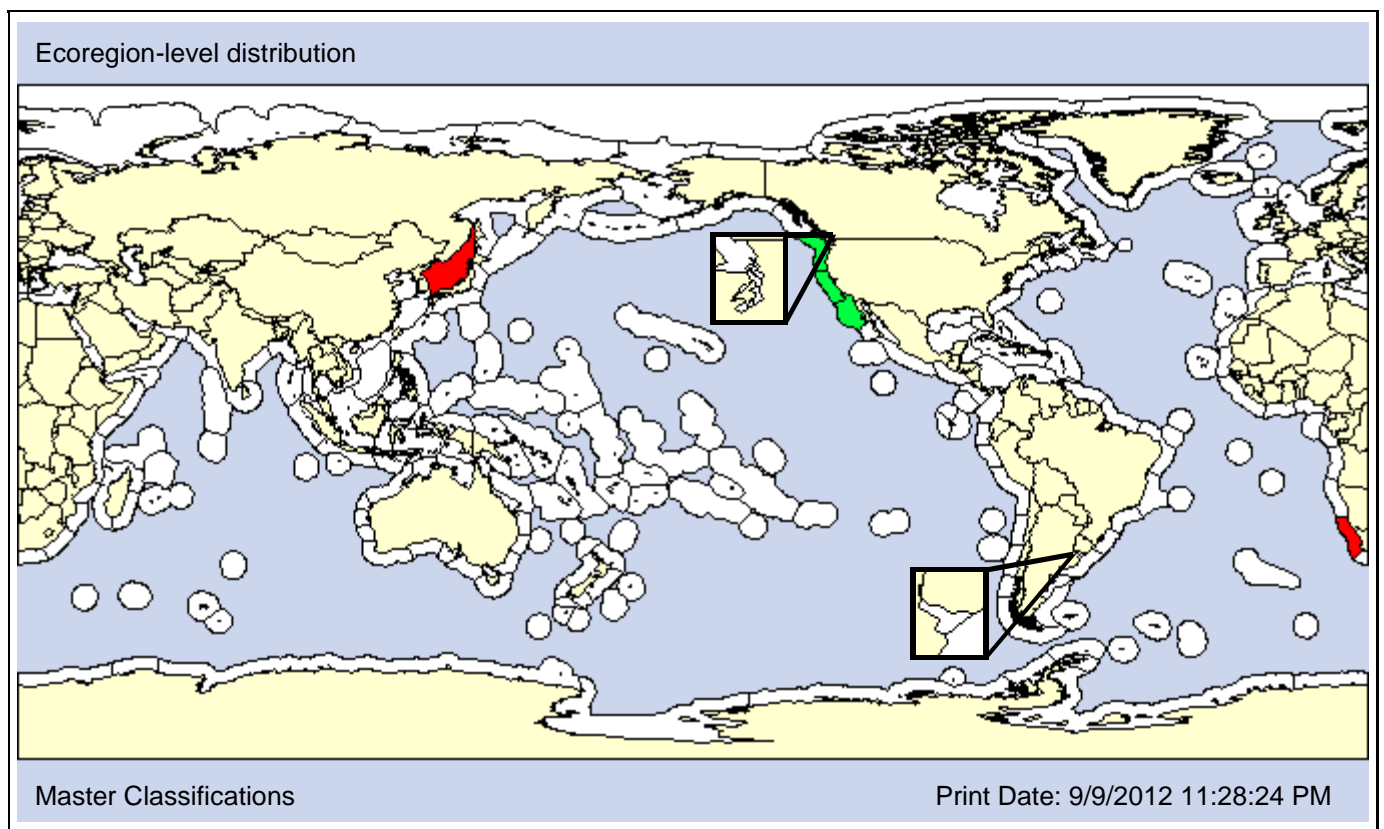
Amphorina columbiana  
 Catriona alpha  
 Catriona columbiana  
 Cuthona alpha

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

British Columbia aeolid.  
 red-tentacled cuthona

**Type Locality:**



**Date 1st record:** 1997

Native

**Loc 1st record:** Sea of Japan

Native

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												P	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

**Taxon:** Gastropod

**Taxonomic Author:** (Marcus, 1958)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Nudibranchia

**Suborder:** Dexiarchia

**Infraorder:** Aeolidida

**Superfamily:** Fionoidea

**Family:** Tergipedidae

**Subfamily:**

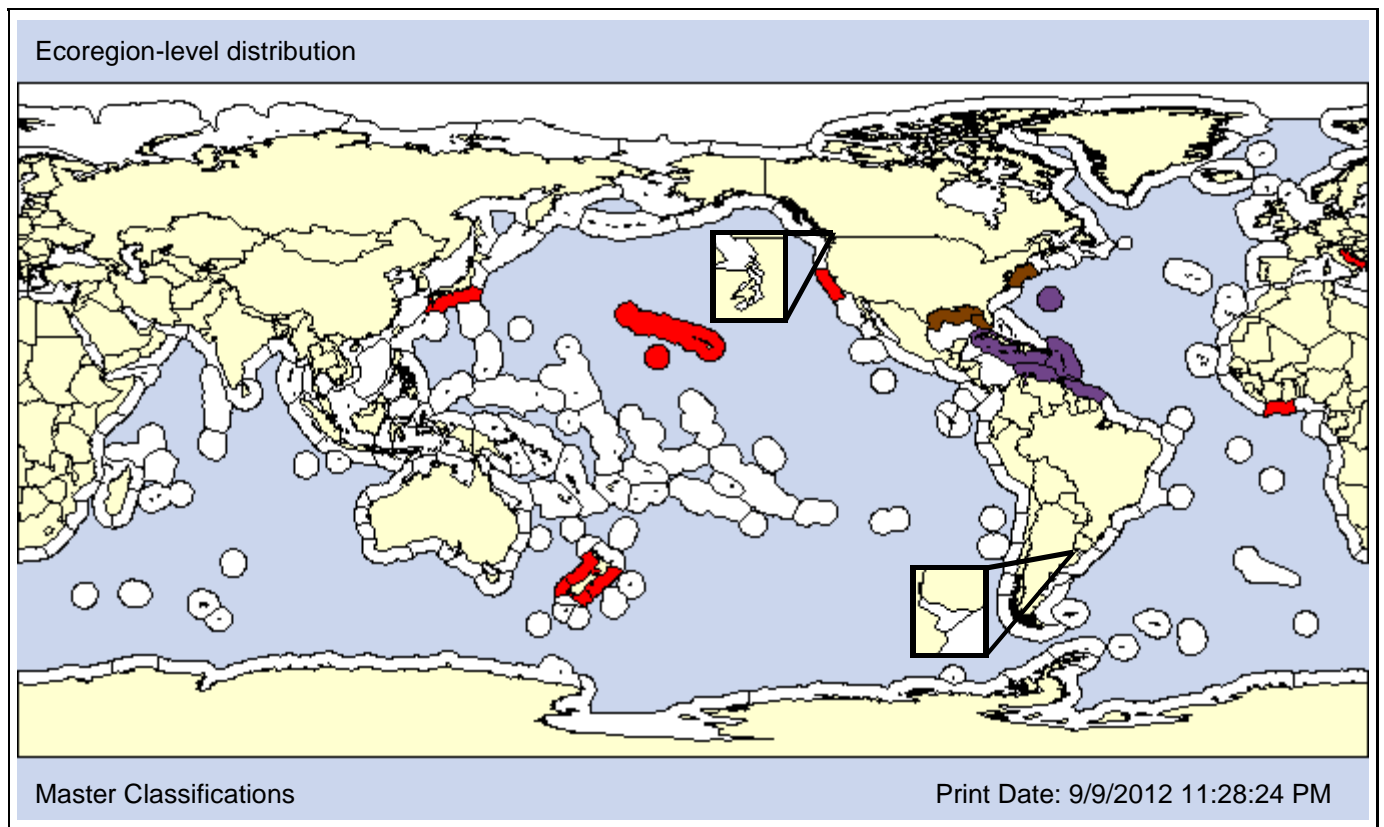
**Also Known As (Name - Type):**

Catriona perca	Synonym
Cuthona reflexa	Synonym
Trinchesia perca	Synonym
Trinchesia sp. of Carlton, 1979	Synonym

**Common Names:**

Lake Merritt cuthona

**Type Locality:** Brazil



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b> 1992	1972	1967
<b>Loc 1st record:</b> Japan	Kaneohe Bay, Hawaii	San Francisco Estuary, CA
<b>Established:</b> Unknown	Yes	Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: In the NEP, *Cuthona perca* has only been reported from Lake Merritt, a lagoon of the San Francisco Estuary. Carlton and Eldredge (2009) consider *C. perca* native to the NWA, though USGS NAS and NEMESIS list it as introduced in Florida and Chesapeake Bay. We list these as conflicts and the West Tropical Atlantic as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											<b>P</b>	<b>O</b>	<b>P</b>	

**SALINITY [Obs: 18 - 34psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** (Sowerby, 1835)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Vetigastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Fissurelloidea

**Family:** Fissurellidae

**Subfamily:** Diodorinae

**Also Known As (Name - Type):**

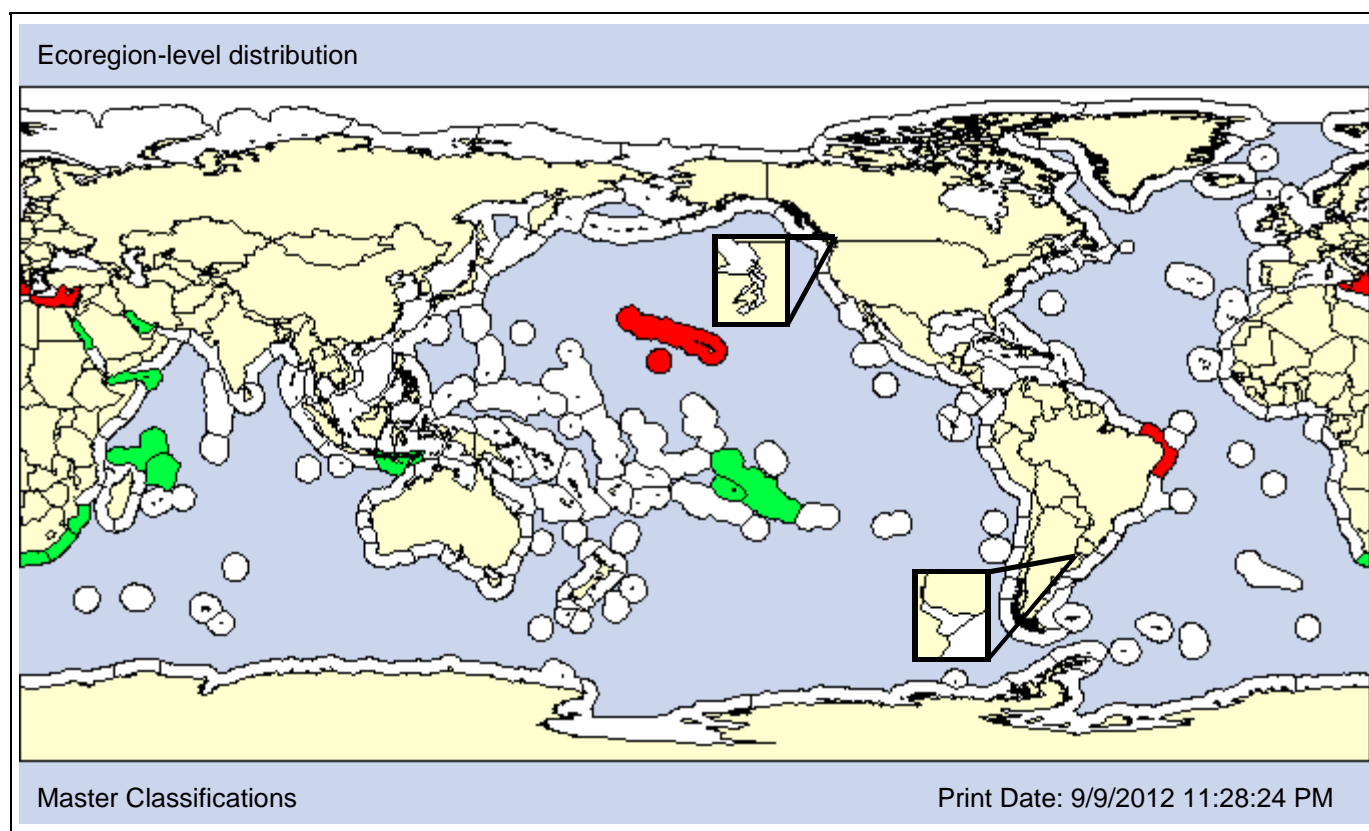
Capiluna ruepellii  
 Diodora ruppelli  
 Diodora ruppellii  
 Fissurella ruppelli

Synonym  
 Misspelling  
 Misspelling  
 Synonym

**Common Names:**

Ruppell's keyhole limpet

**Type Locality:** Red Sea



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1962  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR		A	P				
X		X				AO	PO	X						

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X		X	
	X	X											

**DEPTH [Obs: 0 - 70m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			O	O	O	

**CONSOLIDATED SUBSTRATE X**

R O	HP	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O											O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X						X
						X							

**Taxon:** Gastropod

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Pyramidelloidea

**Family:** Pyramidellidae

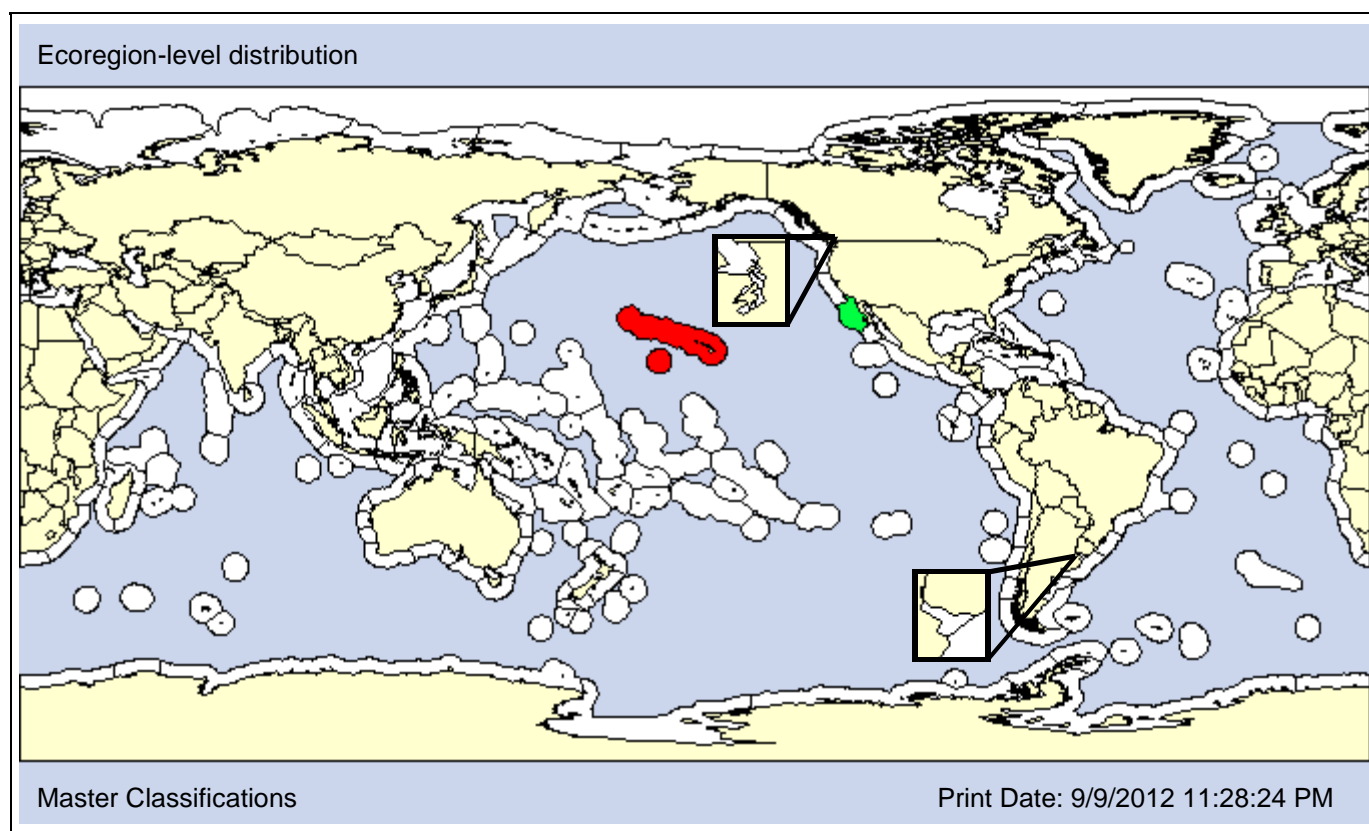
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Odostomia cf. americana	Ambiguous syn.	
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1981 Native  
**Loc 1st record:** Kawaihae Harbor, Hawaii Native  
**Established:** Unknown Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: Carlton and Eldredge (2009) consider *Evalea cf. americana* native to the NEP. Its establishment in Hawaii is unknown.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 12 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							



**Taxon:** Gastropod

**Taxonomic Author:** (Dall & Bartsch, 1907)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Pyramidelloidea

**Family:** Pyramidellidae

**Subfamily:**

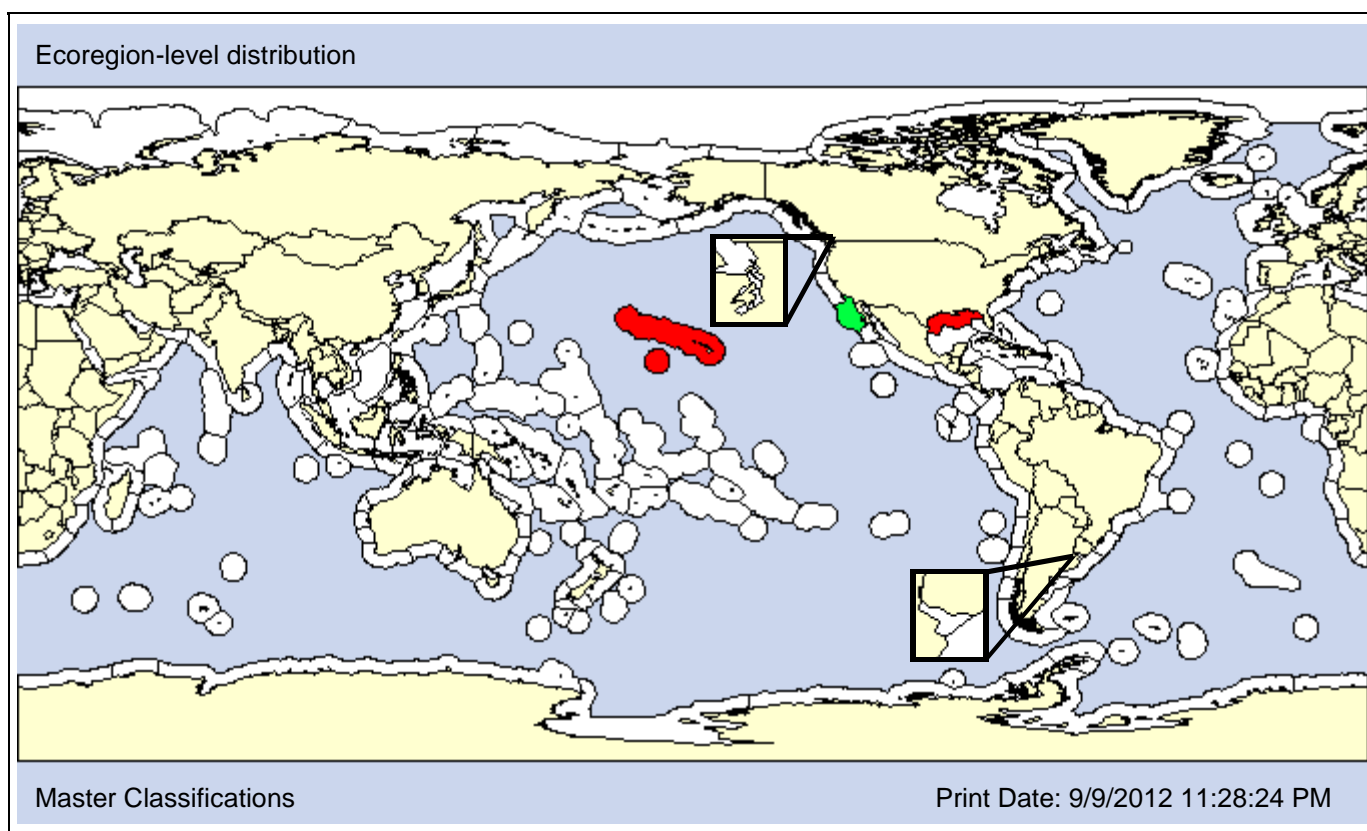
**Also Known As (Name - Type):**

Ivadella navisa	Misspelling
Ividella navisa	Synonym
Odostomia navisa	Synonym
Odostomia (Ividella) navisa	Synonym

**Common Names:**

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**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii			NEP	

**Date 1st record:** 1981 Native  
**Loc 1st record:** Kawaihae Harbor, Hawaii Native  
**Established:** Unknown Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: Carlton and Eldredge (2009) list Ividella navisa is a NEP species introduced to Hawaii, though its establishment status is unknown. However, WoRMS lists I. navisa as a synonym of Folinella navisa, which has been reported from the Gulf of Mexico (Rosenberg et al., 2009). The Gulf of Mexico record needs to be verified (Malacolog).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
		X											

**DEPTH [Obs: 12 - 93m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Gastropod

**Taxonomic Author:** Philippi, 1845

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Vetigastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Haliotoidea

**Family:** Haliotidae

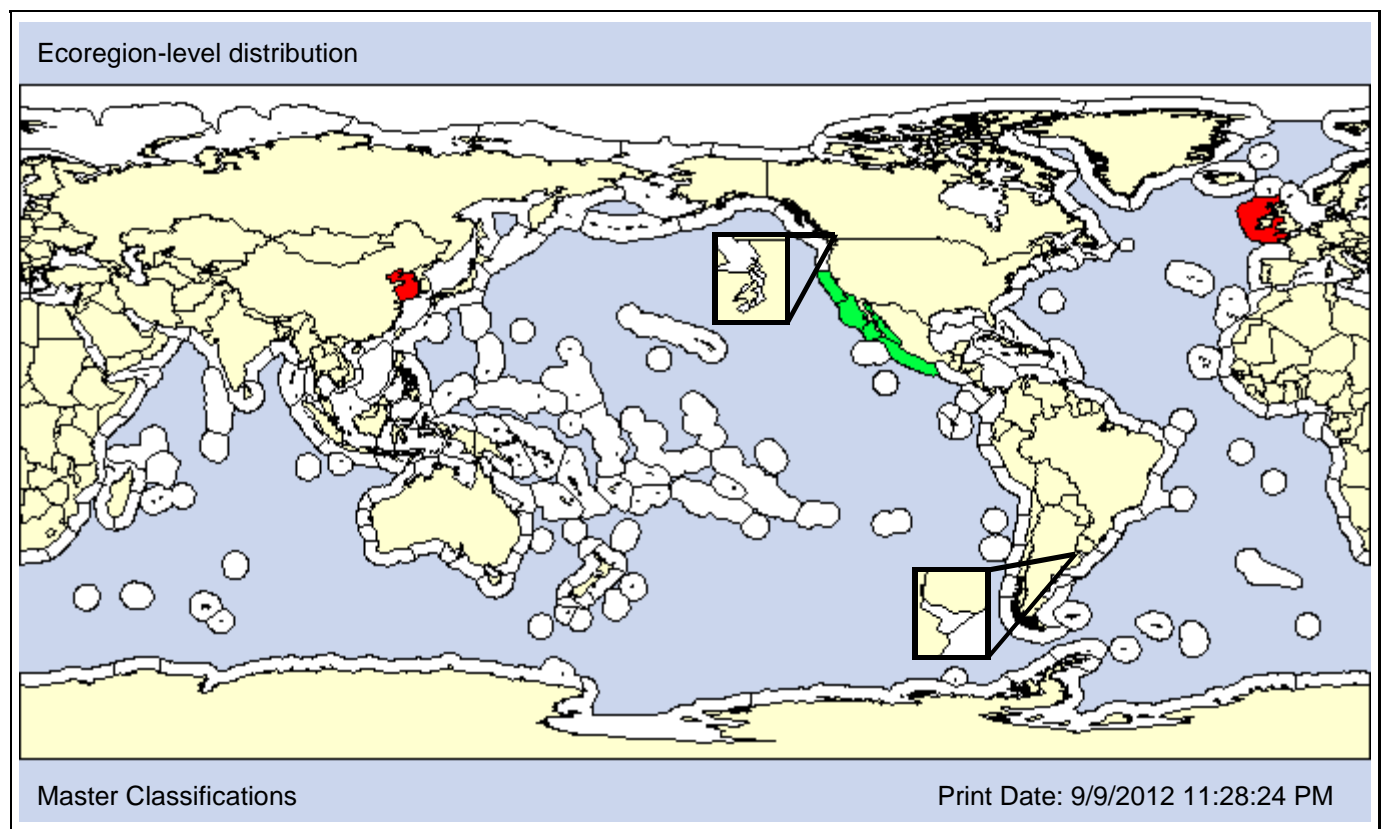
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

blue abalone  
green abalone

**Type Locality:**



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

NWP
Hawaii
NEP

**Date 1st record:** mid-1980s

Native

**Loc 1st record:** Dalian, China

Native

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: *Haliotis fulgens* is listed as a species of concern in Southern California. It was introduced into the Yellow Sea in the 1980s and is considered to have established wild populations.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				

**DEPTH [Obs: 0 - 18m] [Pref: 2 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** Gmelin, 1791

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Vetigastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Haliotoidea

**Family:** Haliotidae

**Subfamily:**

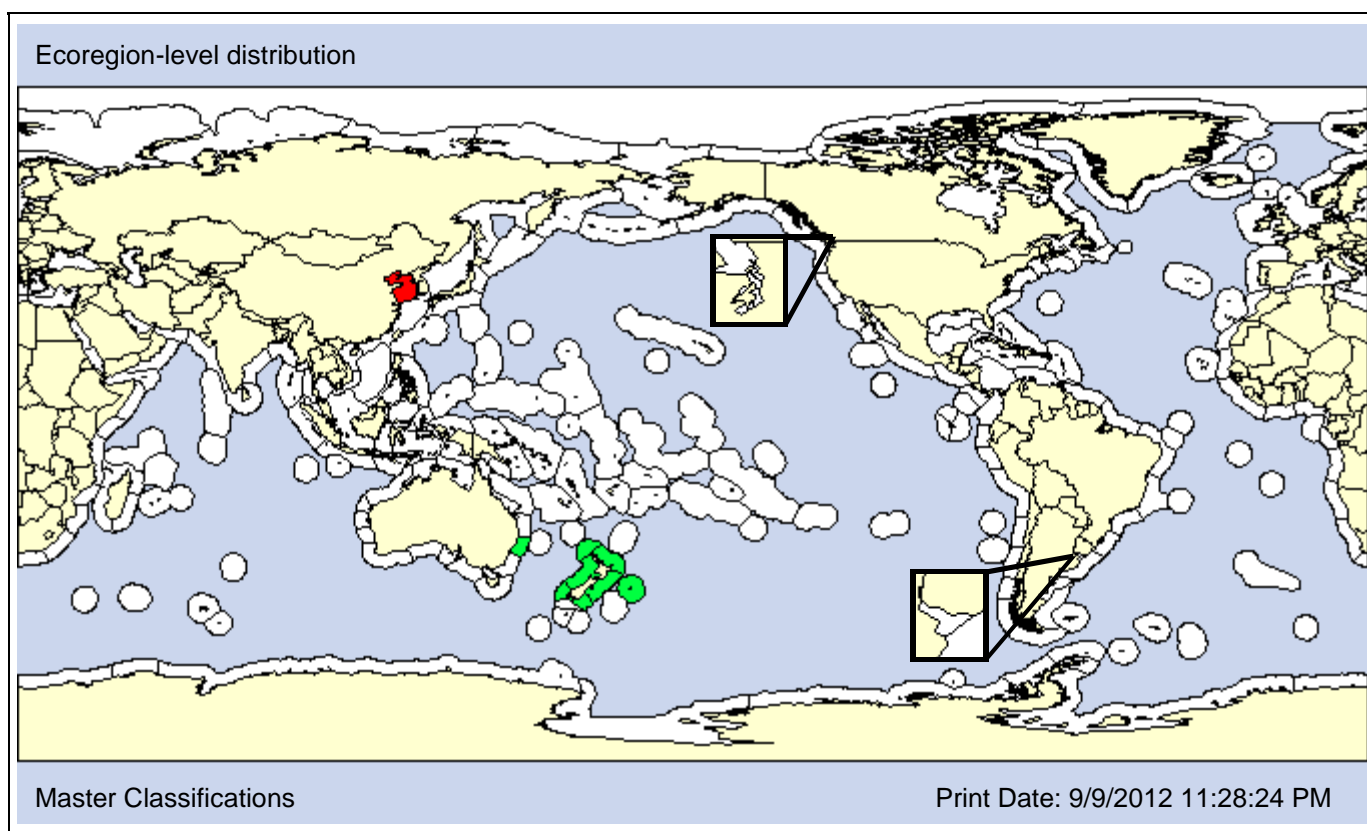
**Also Known As (Name - Type):**

Haliotis (Paua) iris	Convention
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**Common Names:**

rainbow abalone
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**Type Locality:**



**Date 1st record:** 1990s - 2000

**Loc 1st record:** Yellow Sea?

**Established:** Unknown

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X		AO	PO								

Comments: Chavanich et al. (2010) report the purposeful introduction of the New Zealand abalone, *Haliotis iris*, into China while Seo and Lee (2008) report it as introduced into Korea. Though neither paper gives any specific locations, we assume that the introduced locations include the Yellow Sea.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** Jonas, 1845

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Vetigastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Haliotoidea

**Family:** Haliotidae

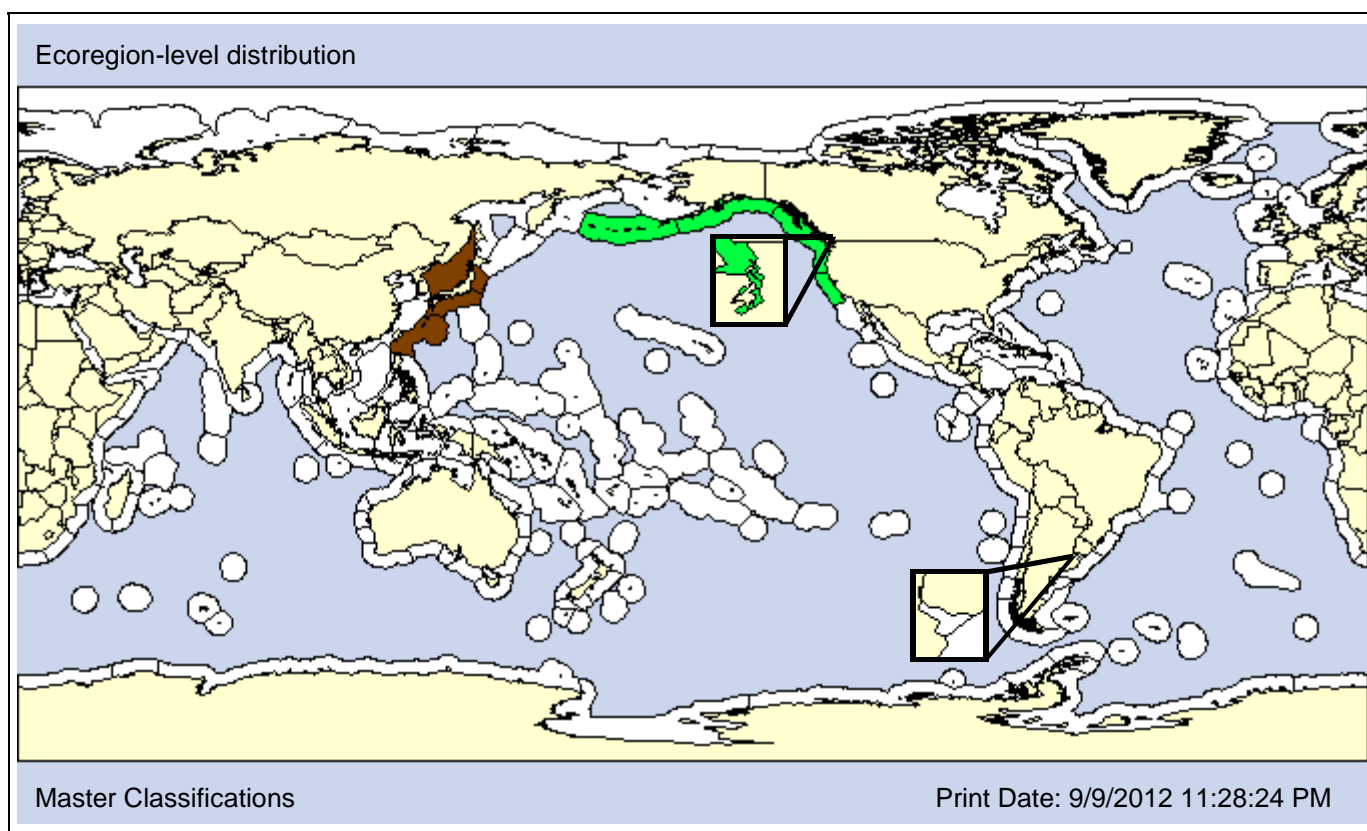
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

pinto abalone

**Type Locality:**



**Date 1st record:** 1932

Native

**Loc 1st record:** Japan and Korea

Native

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
				X		AO	PO							

Comments: Iwasaki (2006) states that *Haliotis kamtschatkana* was first reported in Japanese waters in the 1980s. However, Nomura (1932) reports it from beach deposits in Japan and living populations in “Northern to Western Japan. Korea. Japan Sea. Kamtchatka.” We list the NWP as a conflict, with the possibility of both native and introduced populations.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>

**DEPTH [Obs: 0 - 30m] [Pref: 12 - 17m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Gastropod

**Taxonomic Author:** Donovan, 1808

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Vetigastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Haliotoidea

**Family:** Haliotidae

**Subfamily:**

**Also Known As (Name - Type):**

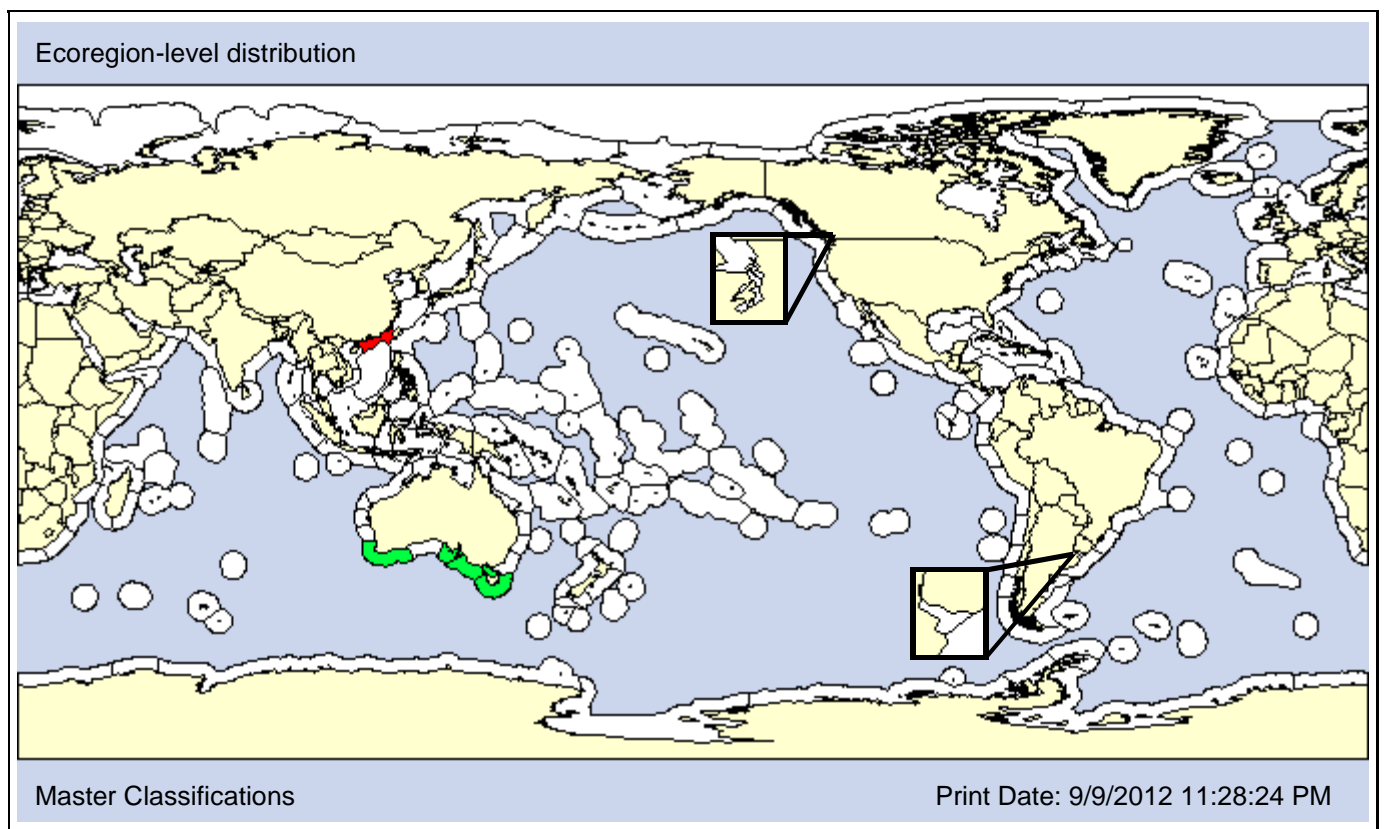
Haliotis albicans  
Haliotis excisa  
Haliotis glabra

Synonym  
Synonym  
Synonym

**Common Names:**

greenlip abalone  
green-lip Abalone

**Type Locality:**



**Date 1st record:** Unknown

**Loc 1st record:** Korea

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: The Australian abalone, *Haliotis laevis*, was introduced into southern China presumably for aquaculture. Seo and Lee (2008) also report it as introduced into Korea though no specific locations are given. It is not known whether it is established in the wild in southern China or the NWP in general.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>			

**DEPTH [Obs: 10 - 30m] [Pref: 10 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** Swainson, 1822

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Vetigastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Haliotoidea

**Family:** Haliotidae

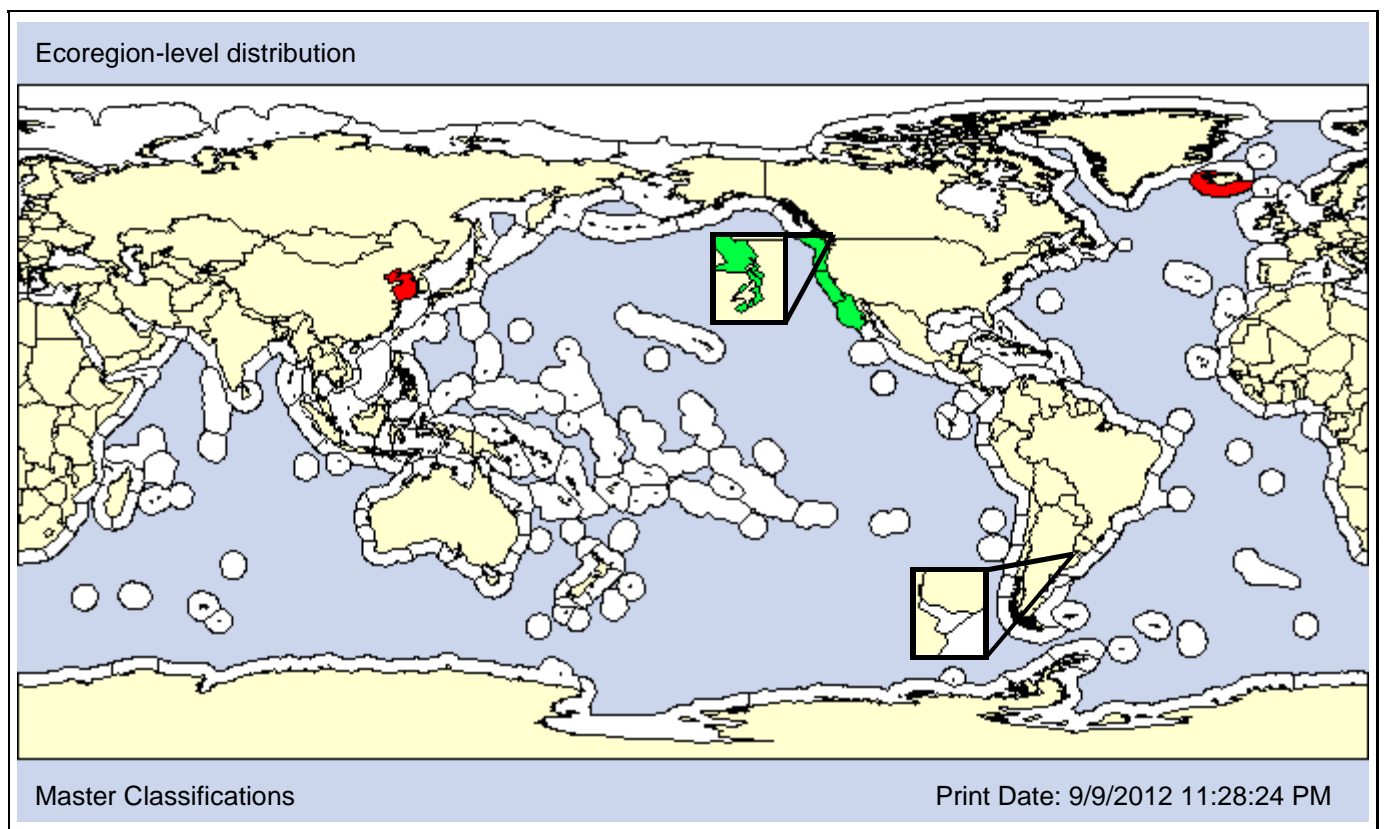
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

red abalone (*Haliotis rufescens*)

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** mid-1980s

Native

**Loc 1st record:** Dalian, China

Native

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: Iwasaki (2006) states that *Haliotis rufescens* was first introduced into Japan in 1966, though no specific locations are given. UNDP/GEF (2007) reports it from Dalian, China in the mid-1980s.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH <b>X</b>				<b>X</b>

**DEPTH [Obs: 0 - 80m] [Pref: 6 - 17m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** Linnaeus, 1758

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Vetigastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Haliotoidea

**Family:** Haliotidae

**Subfamily:**

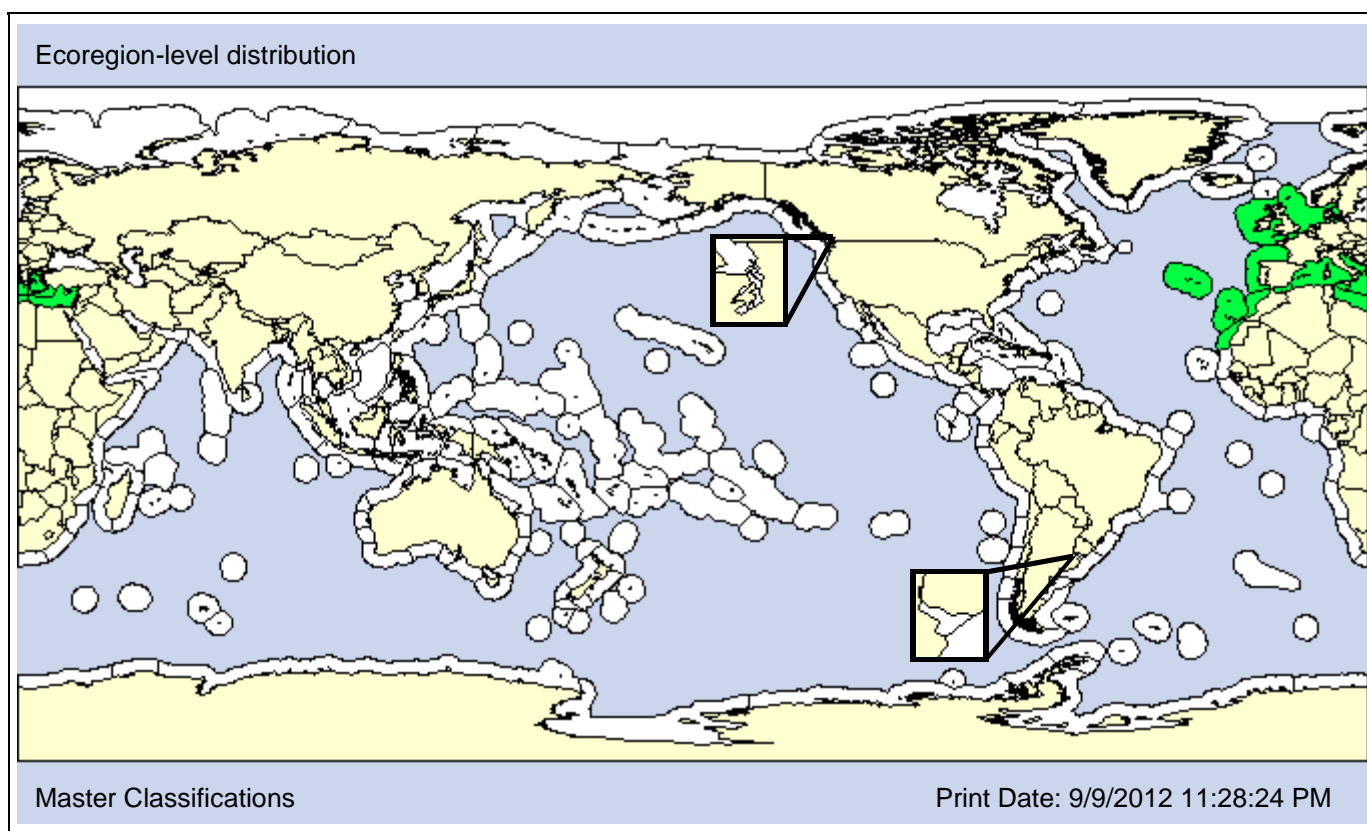
**Also Known As (Name - Type):**

Haliotus tuberculata	Misspelling
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**Common Names:**

green ormer
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1980s

**Loc 1st record:** Japan

**Established:** Unknown

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X		AO	PO								

Comments: According to Iwasaki (2006) *Haliotis tuberculata* was introduced into Japan, though no specific sites were given and it is not known if it has become established in the wild. According to WoRMS, *H. tuberculata* occurs in Europe but is absent from British and Irish mainlands.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				

**DEPTH [Obs: 0 - 40m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** Pilsbry, 1895

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Cephalaspidea

**Suborder:**

**Infraorder:**

**Superfamily:** Haminoeioidea

**Family:** Haminoeidae

**Subfamily:**

**Also Known As (Name - Type):**

?Haloa rotundata

Synonym

Haloa japonica

Synonym

Haminea binotata var. japonica

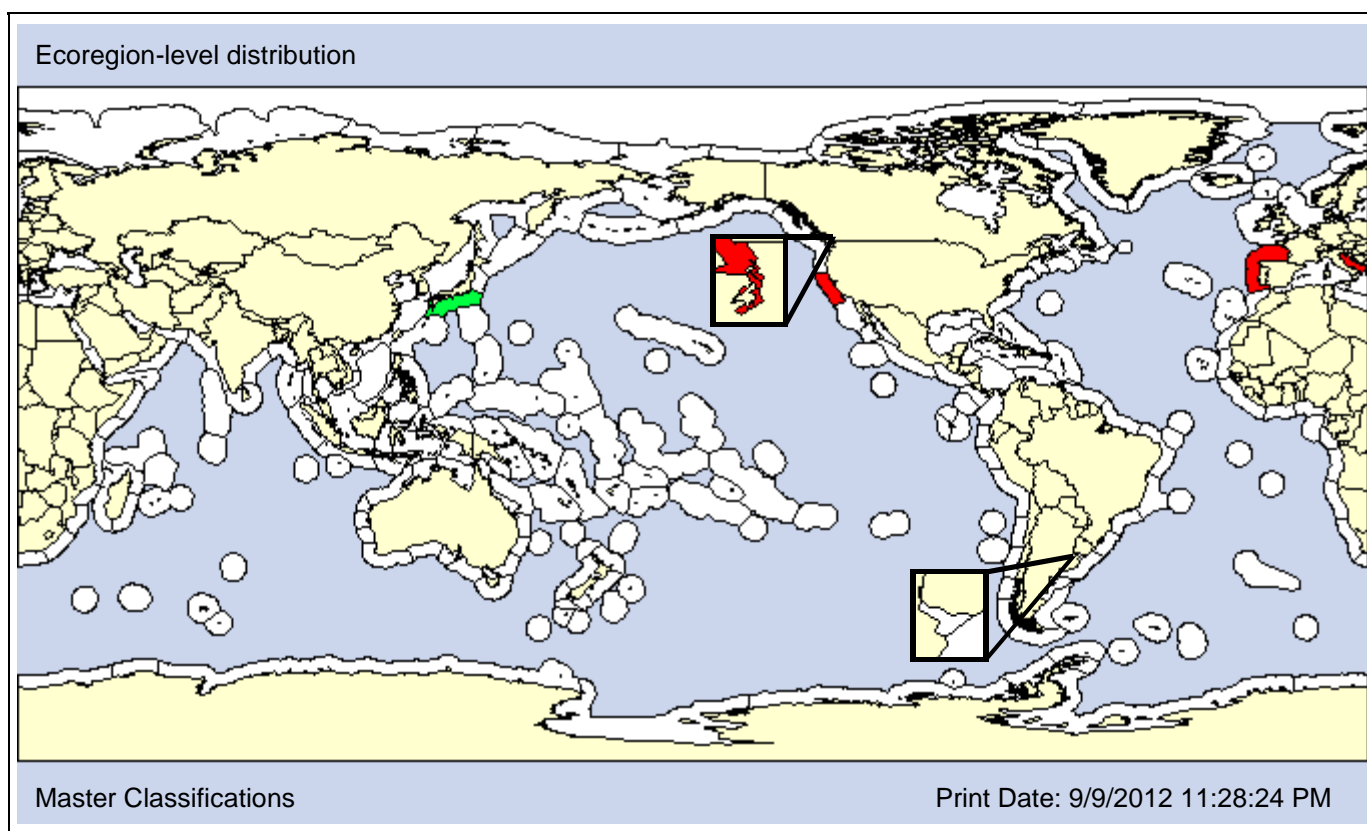
Synonym

Haminoea callidegenita

Synonym

**Common Names:**

**Type Locality:** Nemoto, Boshu, Japan



**Date 1st record:** Native

1985

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P				
X						AO	PO X								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>	<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>					<b>P</b>					<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B <b>X</b>	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Gastropod

**Taxonomic Author:** (Say, 1822)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Neogastropoda

**Suborder:**

**Infraorder:**

**Superfamily:** Buccinoidea

**Family:** Nassariidae

**Subfamily:**

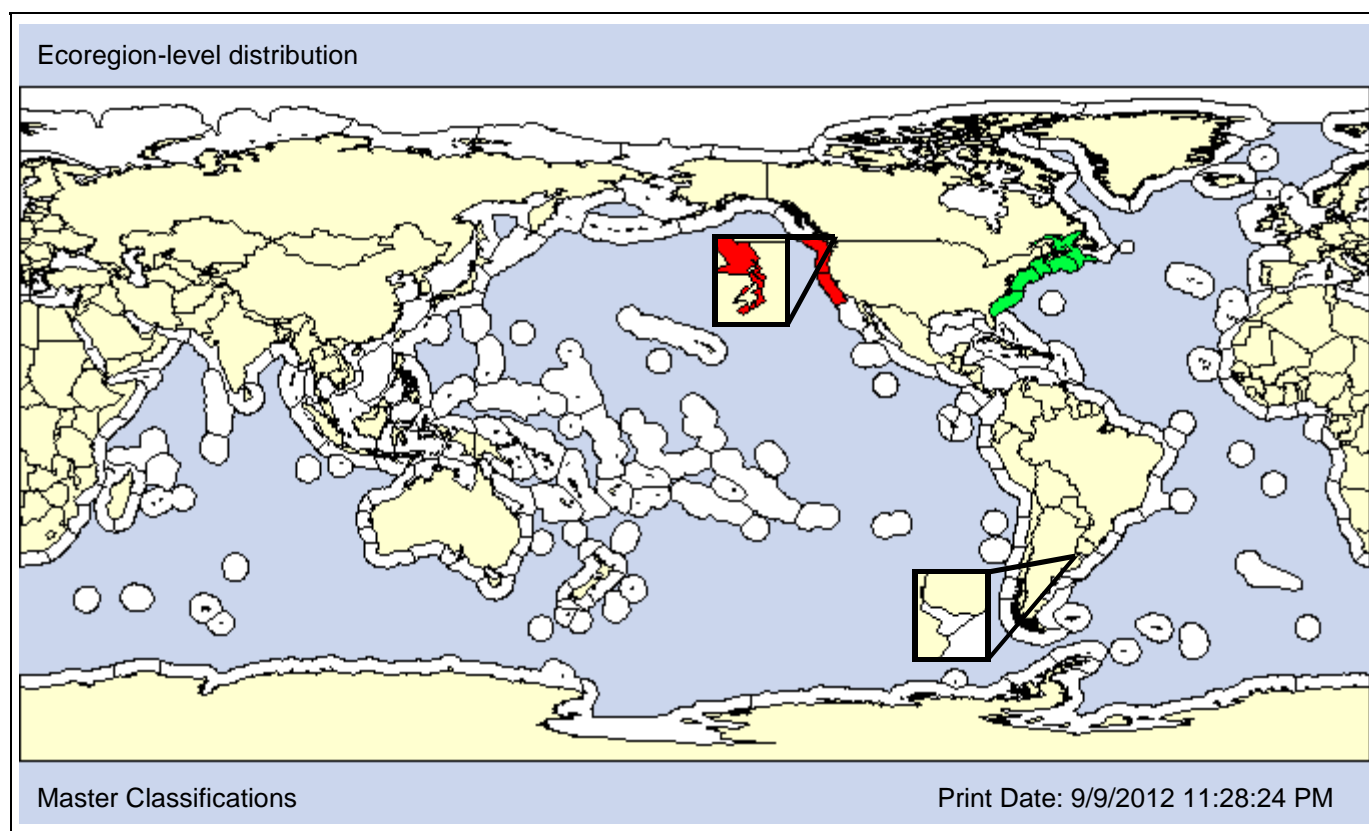
**Also Known As (Name - Type):**

Nassa obsoleta	Synonym
Nassarius obsoletus	Synonym

**Common Names:**

Eastern mud nassa
Eastern mudsnail

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1907

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA X	IR	X	A	P				
						AO X	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 13m] [Pref: 0 - 0.2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 90 - 90%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>					<b>O</b>						

**SALINITY [Obs: 10 - 32psu] [Pref: 28 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
			<b>X</b>	<b>X</b>					DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>								

**Taxon:** Gastropod

**Taxonomic Author:** Dall & Bartsch, 1909

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Pyramidelloidea

**Family:** Pyramidellidae

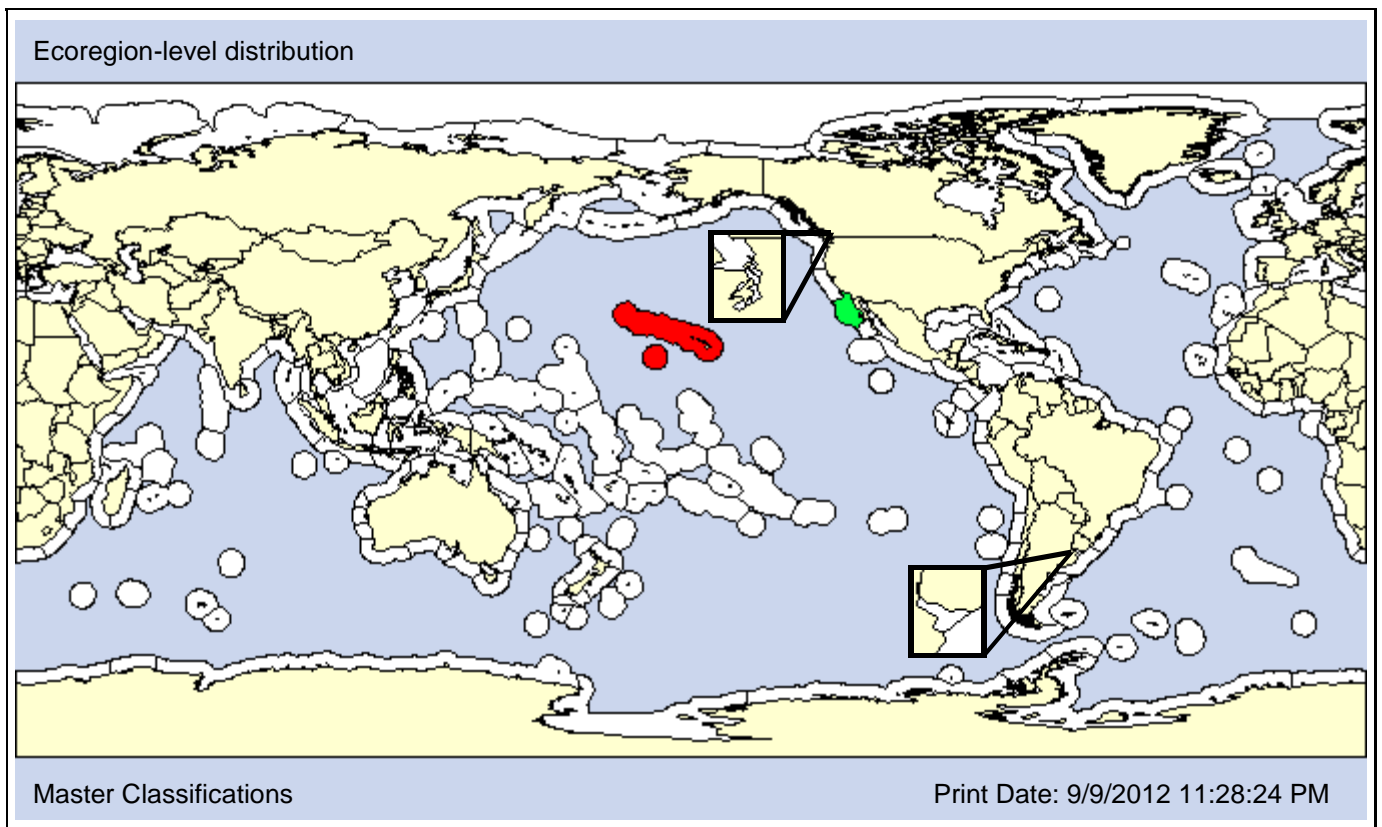
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Odostomia eucosmia	Synonym	
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1981 Native  
**Loc 1st record:** Kawaihae Harbor, Hawaii Native  
**Established:** Unknown Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
		X											

**DEPTH [Obs: 4.7 - 12m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 76%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O						

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					X	X							

**Taxon:** Gastropod

**Taxonomic Author:** Benson, 1842

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Naticoidea

**Family:** Naticidae

**Subfamily:** Polinicinae

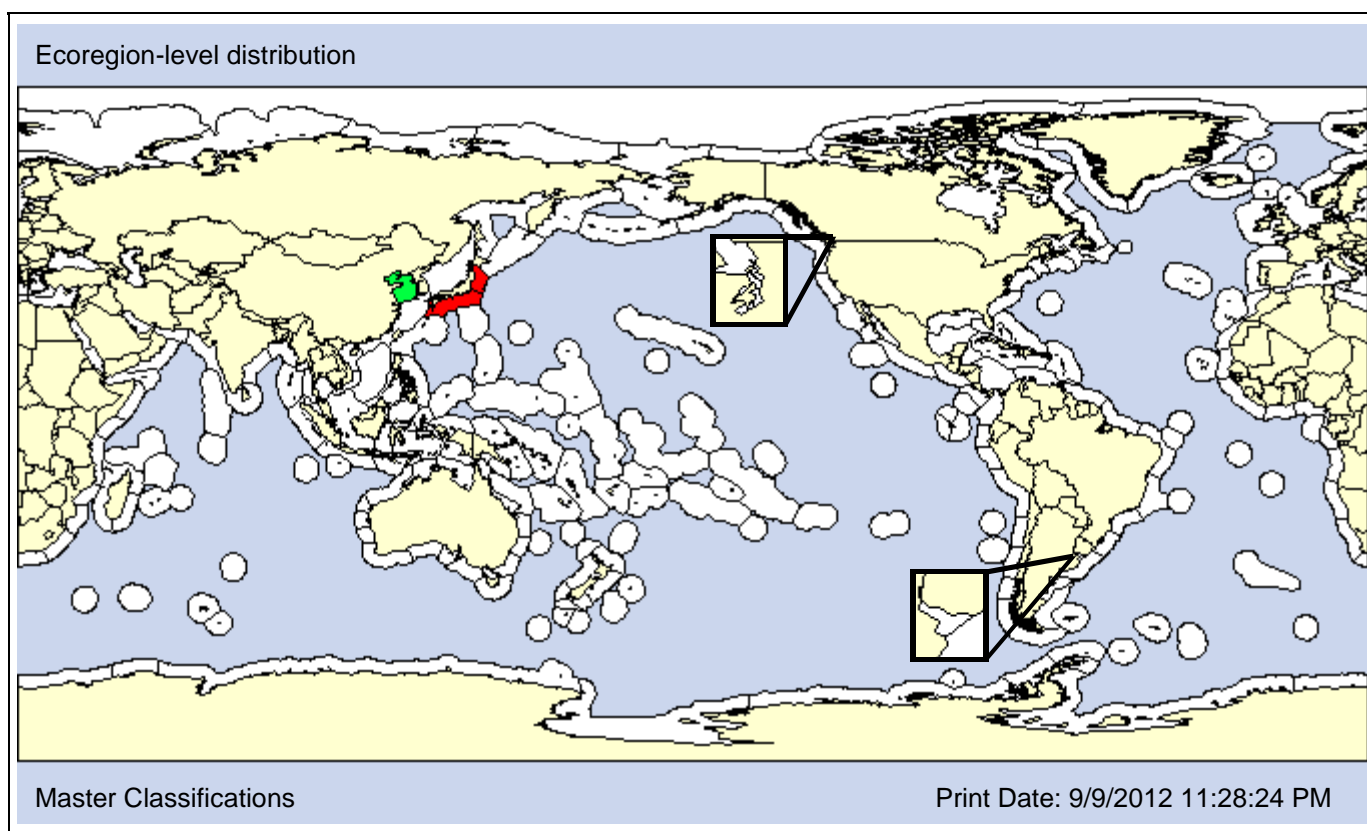
**Also Known As (Name - Type):**

Euspira fortunei	Synonym
Natica fortunei	Synonym
Natica gilva	Synonym
Natica tenuis	Synonym

**Common Names:**

--

**Type Locality:**



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red;">■</span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: cyan;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black;">■</span> Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** late 1980s

**Loc 1st record:** Shizuoka, Japan

**Established:** Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
						AO	PO								

Comments: *Laguncula pulchella* (= *Euspira fortunei*) is native to southern Japan, Korea and China but since 1999 it has occurred in northern Japan following the introduction of imported seed of *Venerupis philippinarum* (= *Ruditapes philippinarum*) from China or Korea.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Gastropod

**Taxonomic Author:** (Frauenfeld, 1863)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Risssoidea

**Family:** Hydrobiidae

**Subfamily:**

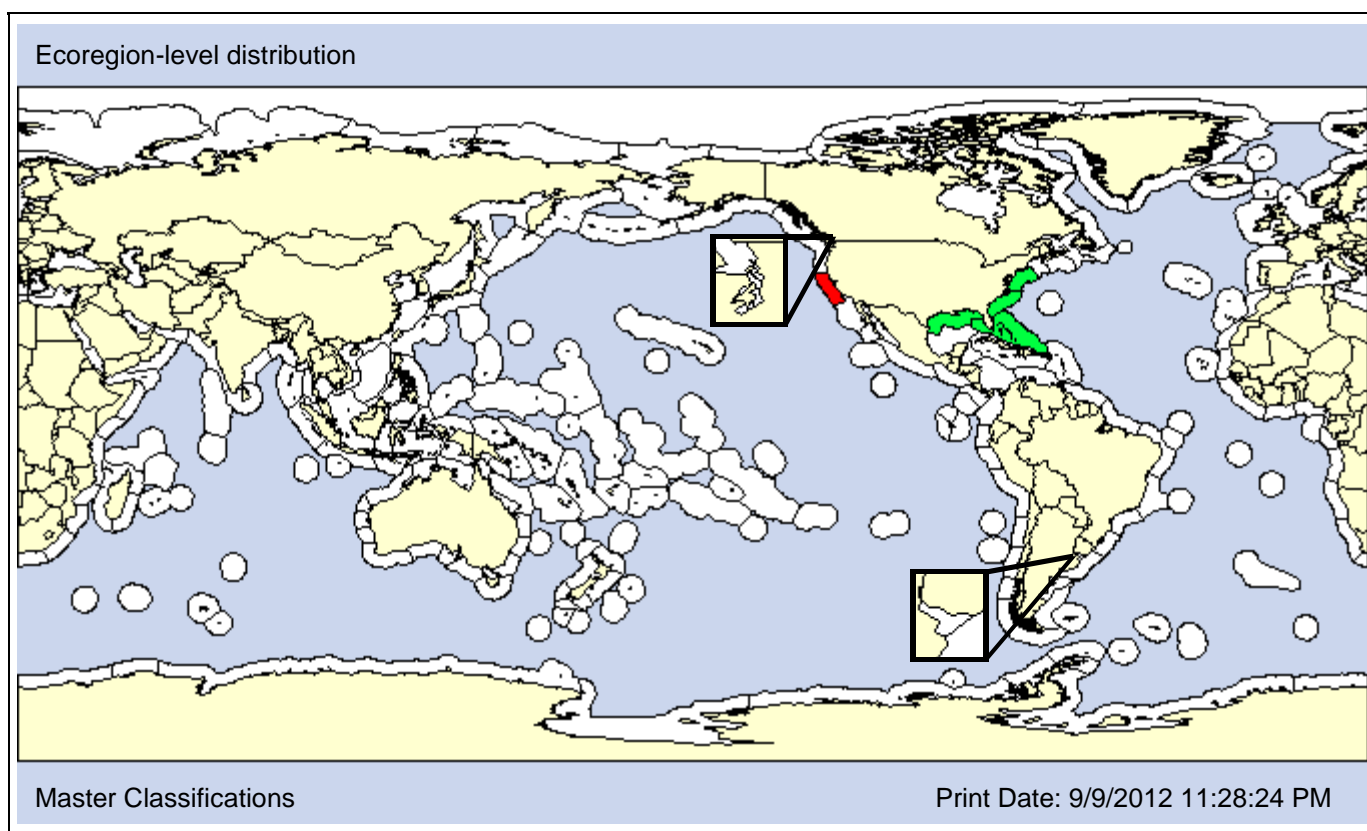
**Also Known As (Name - Type):**

Amnicola forsythi	Synonym
Amnicola oscitans	Synonym
Bythinella monroensis	Synonym
Hydrobia monroensis	Synonym

**Common Names:**

cockscomb hydrobe
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**Type Locality:** Lake Monroe, Volusia County, Florida, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1999  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	<b>AP X</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>	<b>X</b>				AO	PO				<b>X</b>					

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					
	<b>X</b>												

**DEPTH [Obs: 0 - 3m] [Pref: 0 - 0.25m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - 24psu] [Pref: 13.9 - 17.9psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>								



**Taxon:** Gastropod

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Littorinoidea

**Family:** Littorinidae

**Subfamily:**

**Also Known As (Name - Type):**

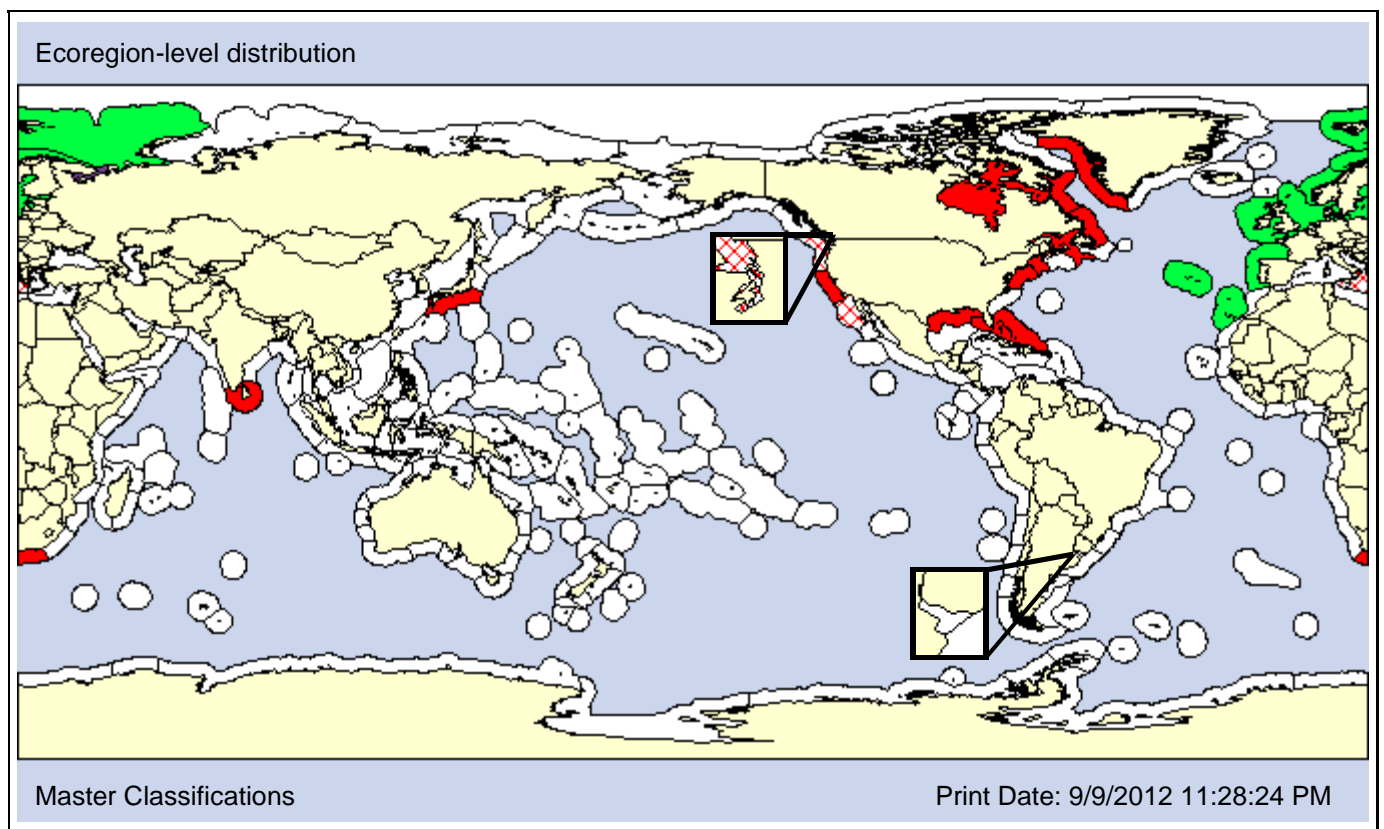
Littorina (Littorina) littorea  
Turbo littoreus

Convention  
Synonym

**Common Names:**

common periwinkle

**Type Locality:**



**Date 1st record:** 1970

1937

**Loc 1st record:** Enoshima, Japan

Puget Sound, WA

**Established:** Unknown

Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P	<b>X</b>	<b>X</b>		
<b>X</b>	<b>X</b>					<b>AO X</b>	PO								

Comments: *Littorina littorea* has been found on several occasions in the San Francisco Estuary, though it is not known whether they have established a reproducing population there or in the NEP in general.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X		
	X	X					X						

**DEPTH [Obs: 0 - 40m] [Pref: 0 - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	

**SALINITY [Obs: 10 - 32psu] [Pref: 25 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline P		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** (Olivi, 1792)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Littorinoidea

**Family:** Littorinidae

**Subfamily:**

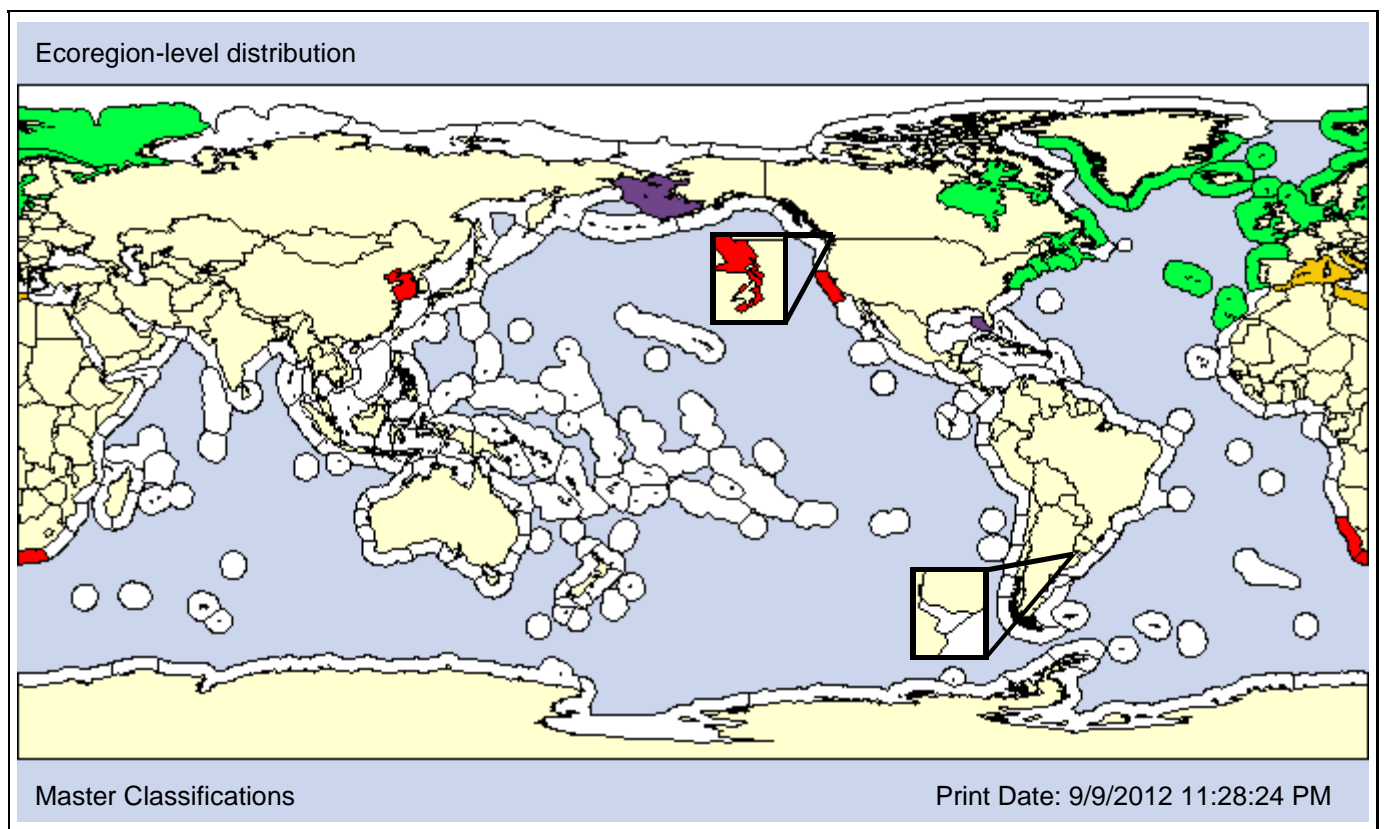
**Also Known As (Name - Type):**

Littorina castanea Deshayes in Deshayes & Milne Edwards,	Synonym
Littorina neglecta	Synonym
Littorina rudis	Synonym
Littorina tenebrosa	Synonym

**Common Names:**

Northern rough periwinkle  
rough periwinkle

**Type Locality:** Venice, Italy



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** Unknown

1993

**Loc 1st record:** Unknown

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P	<b>X</b>	<b>X</b>		
<b>X</b>	<b>X</b>					AO	PO								

Comments: Reports of the Atlantic *Littorina saxatilis* in Puget Sound, Washington need to be confirmed

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH	<b>X</b>				
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 2.8m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>			<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 5 - 33.4psu] [Pref: 24.6 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
		<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>	<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** (Müller, 1774)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Cerithioidea

**Family:** Thiaridae

**Subfamily:**

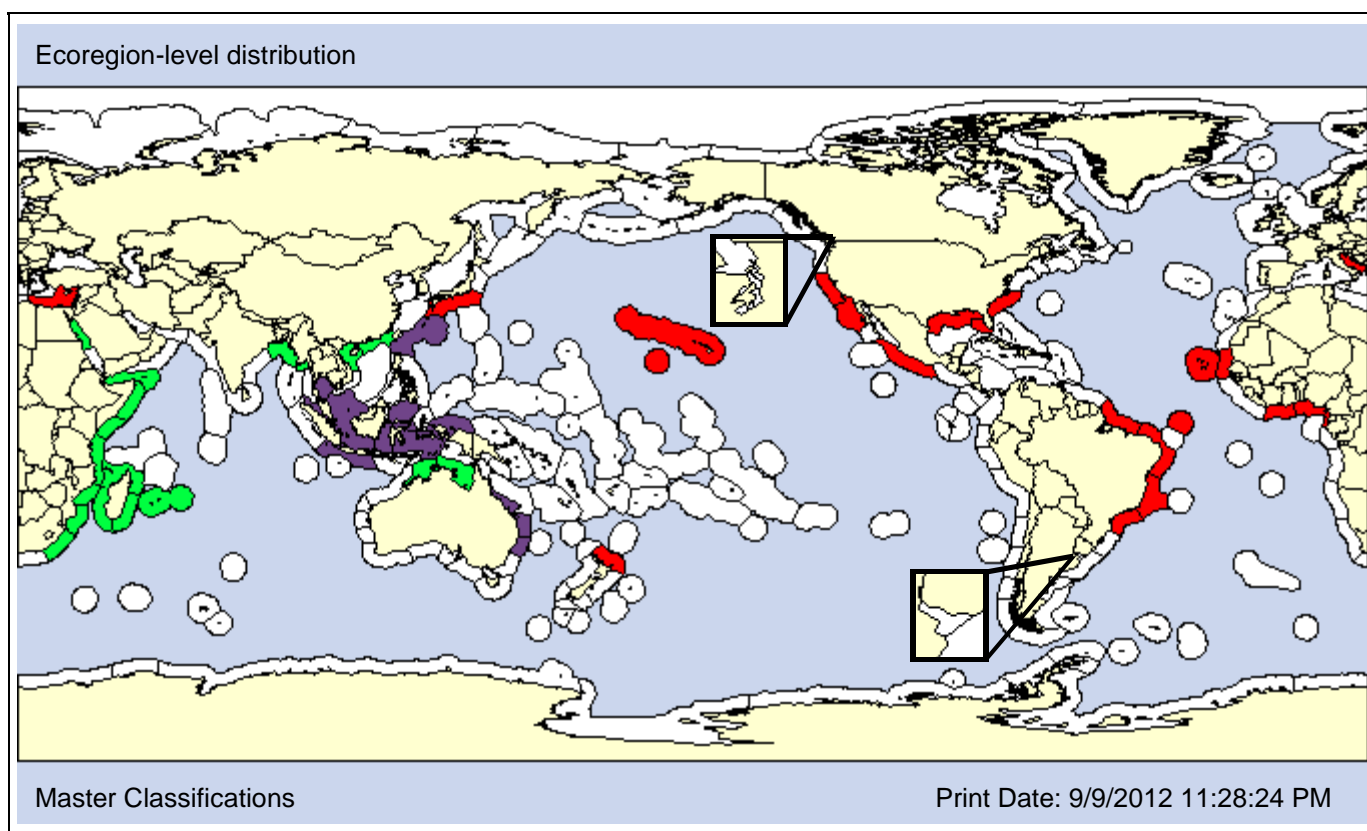
**Also Known As (Name - Type):**

Melanoides tuberculatus	Convention
Nerita tuberculata	Synonym
Thiara (Melanoides) tuberculata	Synonym
Thiara tuberculata	Synonym

**Common Names:**

red-rim melania
-----------------

**Type Locality:** Coromandel coast of India



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP

Hawaii

NEP

**Date 1st record:** Unknown

1994

1972

**Loc 1st record:** Japan

Oahu, Hawaii

Riverside County, California

**Established:** Yes

Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
						AO	PO			X	X				

Comments: *Melanoides tuberculata* is a freshwater snail though it may extend into estuarine waters. It is thought to be native to East Africa, Middle East, south-east Asian mainland, and northern Australia. It is introduced in the NEP (CANOD, 2009), Hawaii (Carlton and Eldredge, 2009), and Japan (Mito and Uesugi, 2004).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 2.5 - 22m] [Pref: - 2.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>	<b>O</b>					

**SALINITY [Obs: 0 - 33psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
			<b>X</b>			<b>X</b>			DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>								

**Taxon:** Gastropod

**Taxonomic Author:** (Draparnaud, 1801)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Pulmonata

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Ellobioidea

**Family:** Ellobiidae

**Subfamily:**

**Also Known As (Name - Type):**

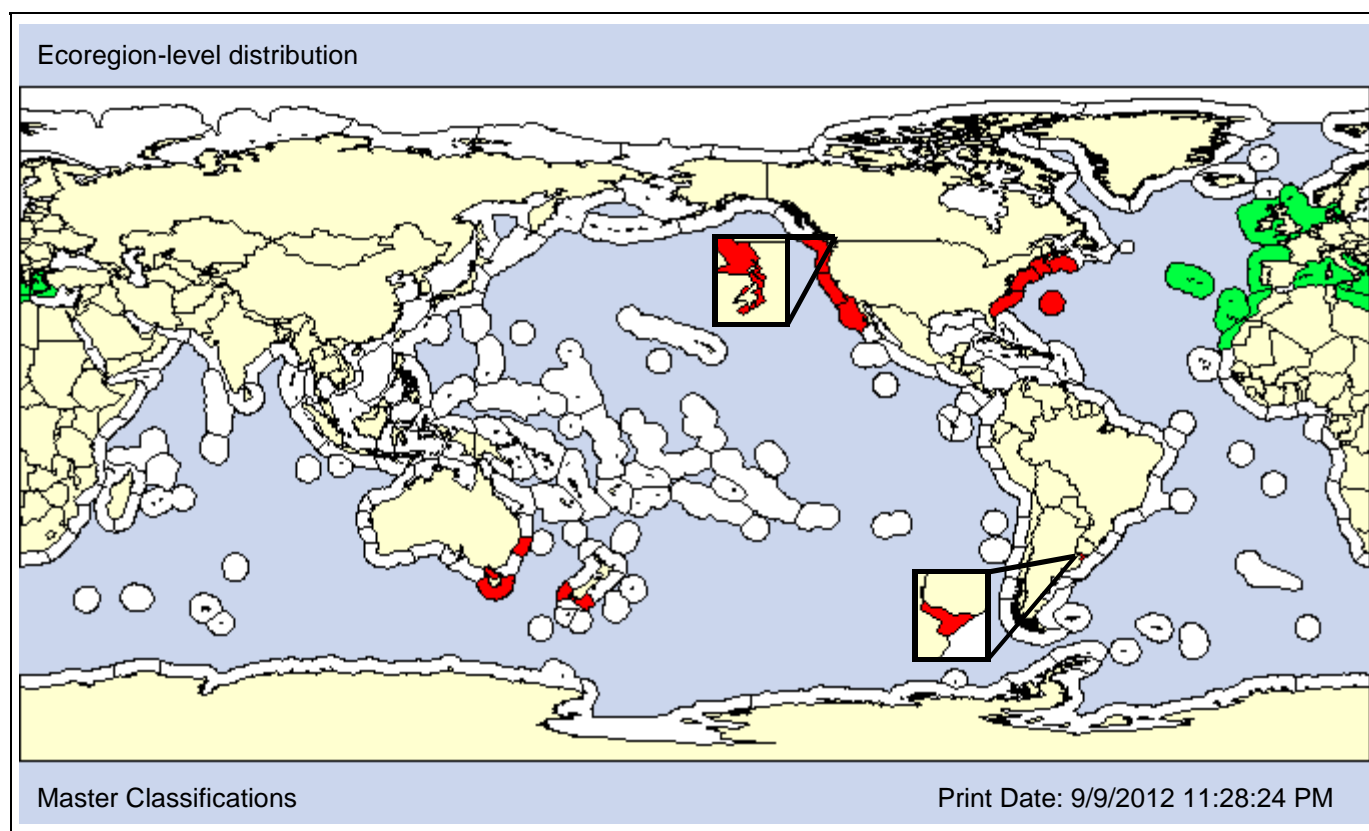
Alexia myosotis  
Auricula myosotis  
Melampus myostis  
Ovatella myosotis

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

European ovatella  
mouse-ear marshsnail  
mouse-ear ovatella  
salt marsh snail

**Type Locality:**



**Date 1st record:**

1871

**Loc 1st record:**

San Fransico Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
	<b>X</b>					<b>AO X</b>	PO			<b>X</b>				

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 67 - 93%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>		<b>O</b>				<b>P</b>

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>P</b>		<b>O</b>		<b>P</b>		

**SALINITY [Obs: 1 - 31psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Gastropod

**Taxonomic Author:** (Dunker, 1860)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Neogastropoda

**Suborder:**

**Infraorder:**

**Superfamily:** Buccinoidea

**Family:** Nassariidae

**Subfamily:**

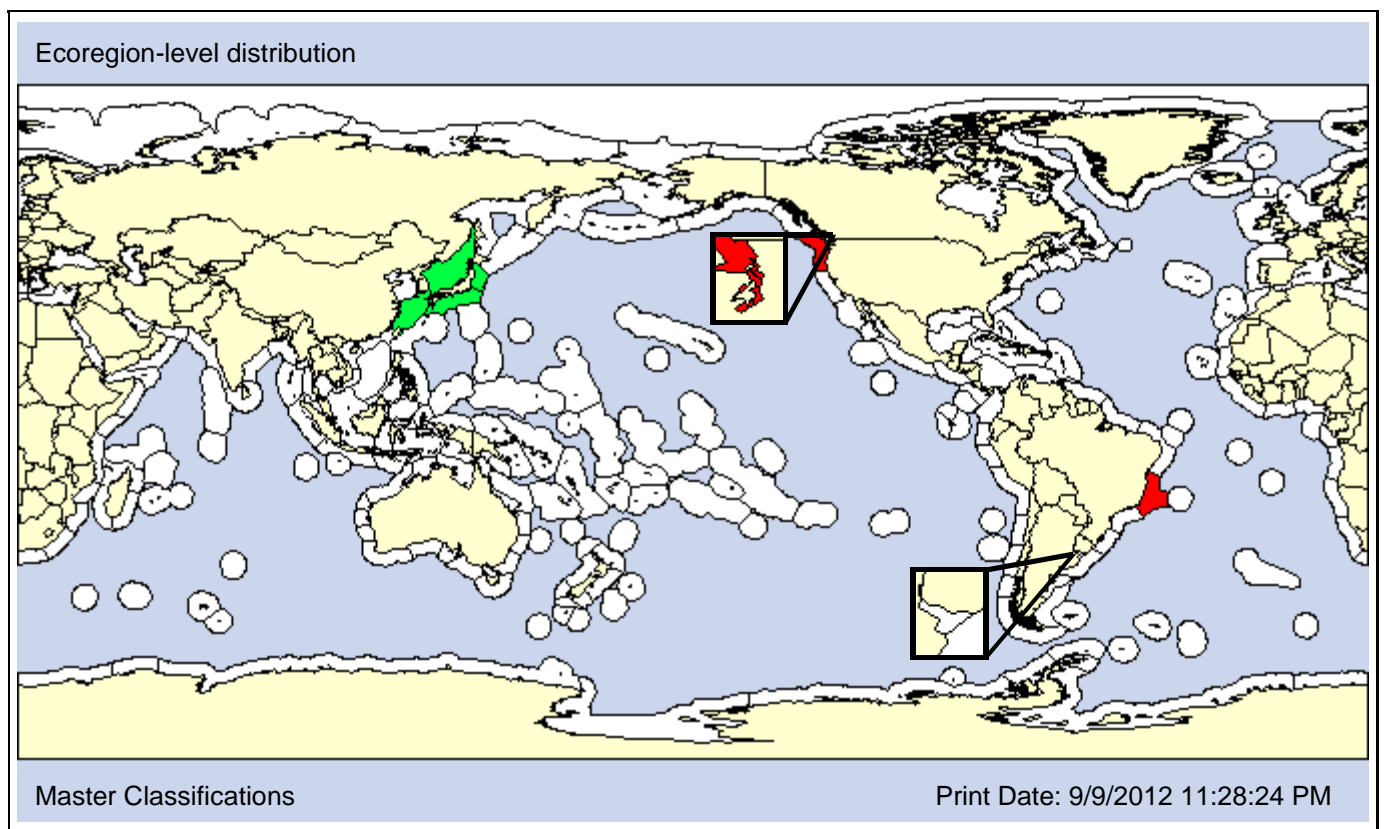
**Also Known As (Name - Type):**

Hima fratercula	Synonym
Hima fraterculus	Convention
Nassa fraterculus	Synonym
Nassa hypolia	Synonym

**Common Names:**

Japanese nassa
----------------

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1959

**Loc 1st record:** Native

Boundary Bay, Puget Sound

**Established:** Yes

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
						AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 10m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>											

**SALINITY [Obs: 25 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
					<b>X</b>				DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>								

**Taxon:** Gastropod

**Taxonomic Author:** (Philippi, 1851)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Neogastropoda

**Suborder:**

**Infraorder:**

**Superfamily:** Buccinoidea

**Family:** Nassariidae

**Subfamily:**

**Also Known As (Name - Type):**

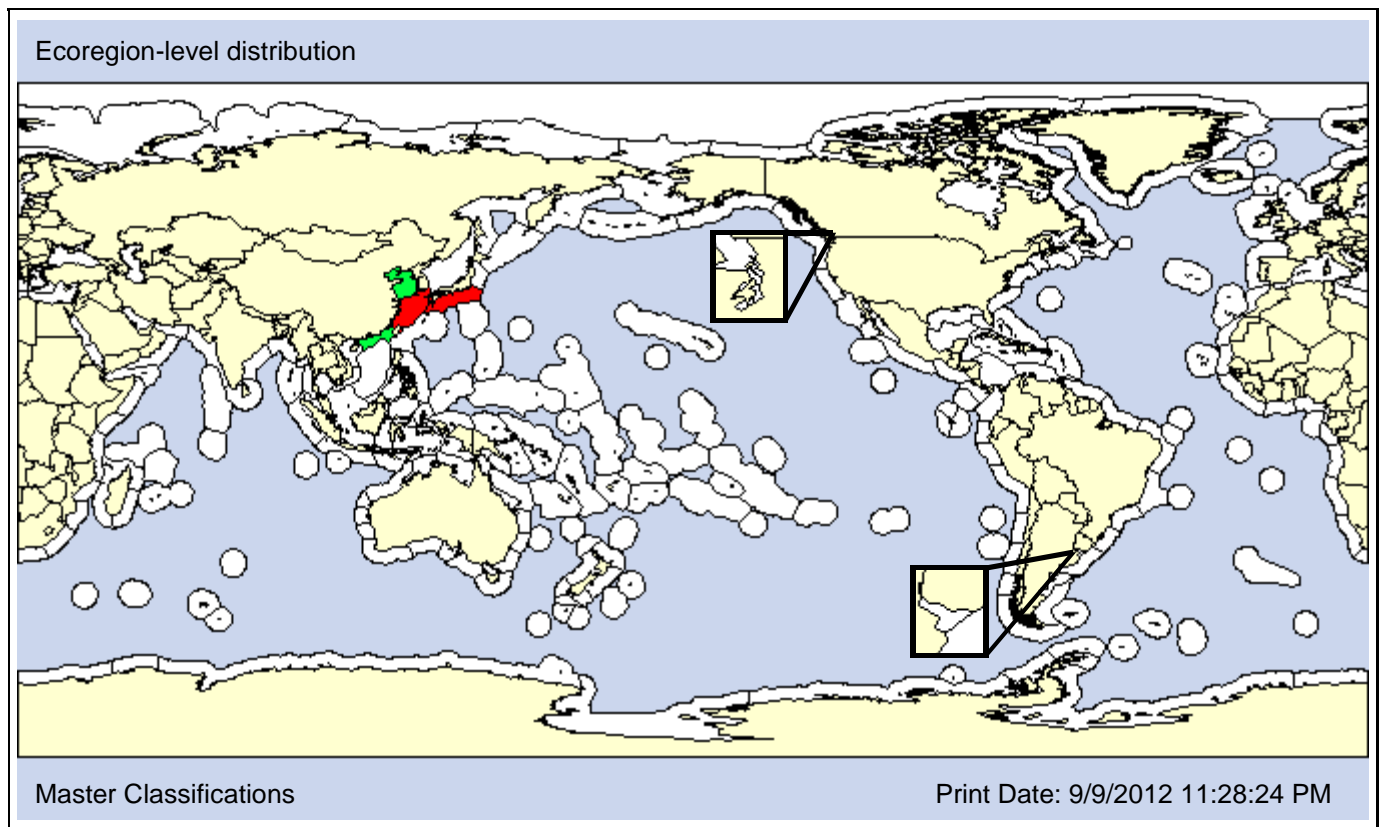
Buccinum sinarum  
Mitrella martensi of NWP authors  
Nassa semiplicata  
Nassarius (Tritonella) semiplicatus

Synonym  
Misidentified  
Synonym  
Synonym

**Common Names:**

Kara-mushiro

**Type Locality:**



**Date 1st record:** 2000

**Loc 1st record:** Ariake Inland Sea, Japan

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				X
						AO	PO								

Comments: *Nassarius sinarus* is native to China and Korea. It was introduced into eastern Japan with the importation of the clam *Venerupis philippinarum* (= *Ruditapes philippinarum*).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE** **X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b> <b>P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
					<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b> <b>X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Gastropod

**Taxonomic Author:** (Récluz, 1851)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Neogastropoda

**Suborder:**

**Infraorder:**

**Superfamily:** Muricoidea

**Family:** Muricidae

**Subfamily:** Ocenebrinae

**Also Known As (Name - Type):**

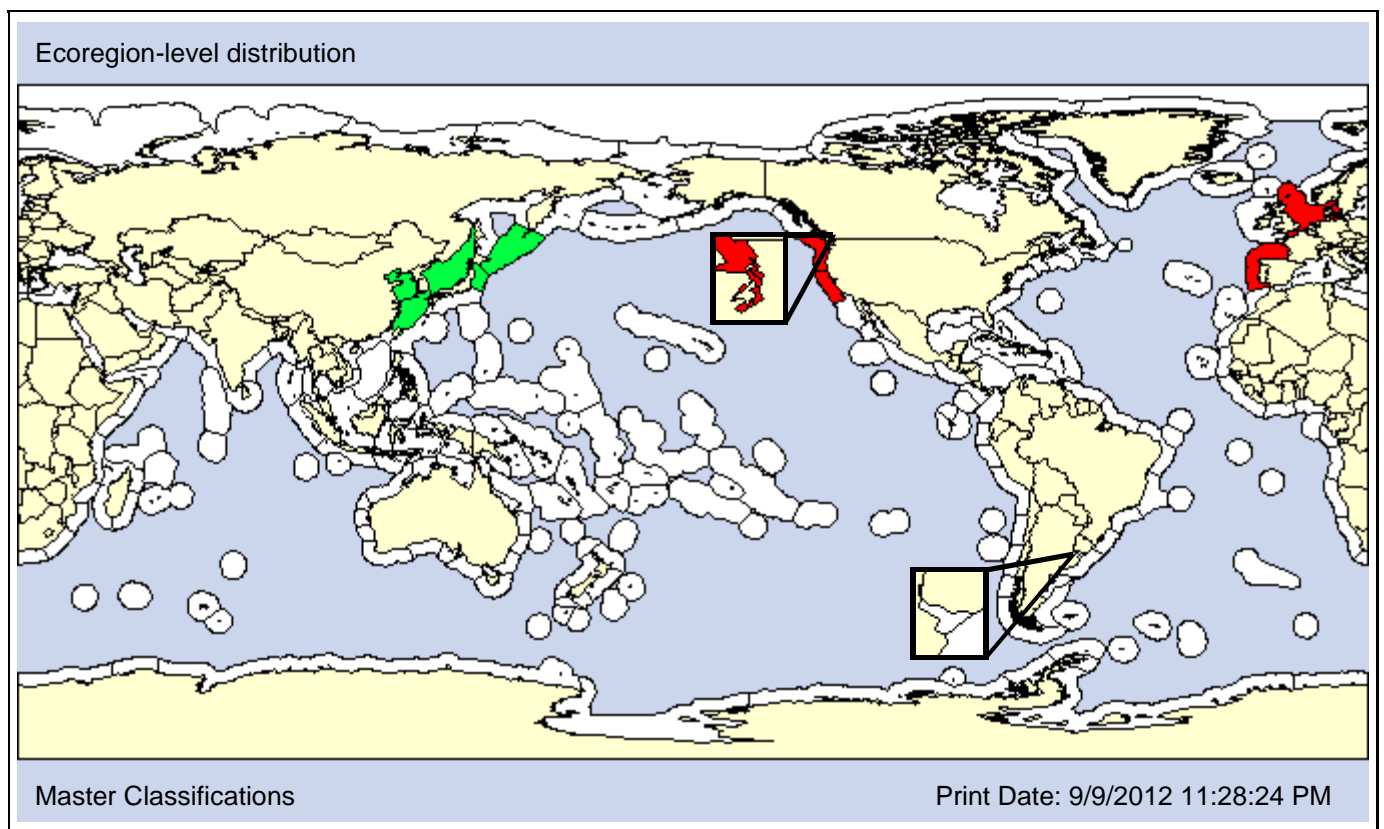
Ceratostoma inornatum  
 Ocenebra japonica  
 Ocinebrellus inornatus  
 Ocinebrina inornata

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Asian drill  
 Japanese dwarf triton  
 Japanese oyster drill  
 Japanese rocksnail

**Type Locality:**



**Date 1st record:** Native

1924

**Loc 1st record:** Native

Puget Sound, WA

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
						AO	PO X							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 2m] [Pref: 0 - 2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>		<b>O</b>	<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>											

**SALINITY [Obs: 19 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** (Say, 1812)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Pyramidelloidea

**Family:** Pyramidellidae

**Subfamily:**

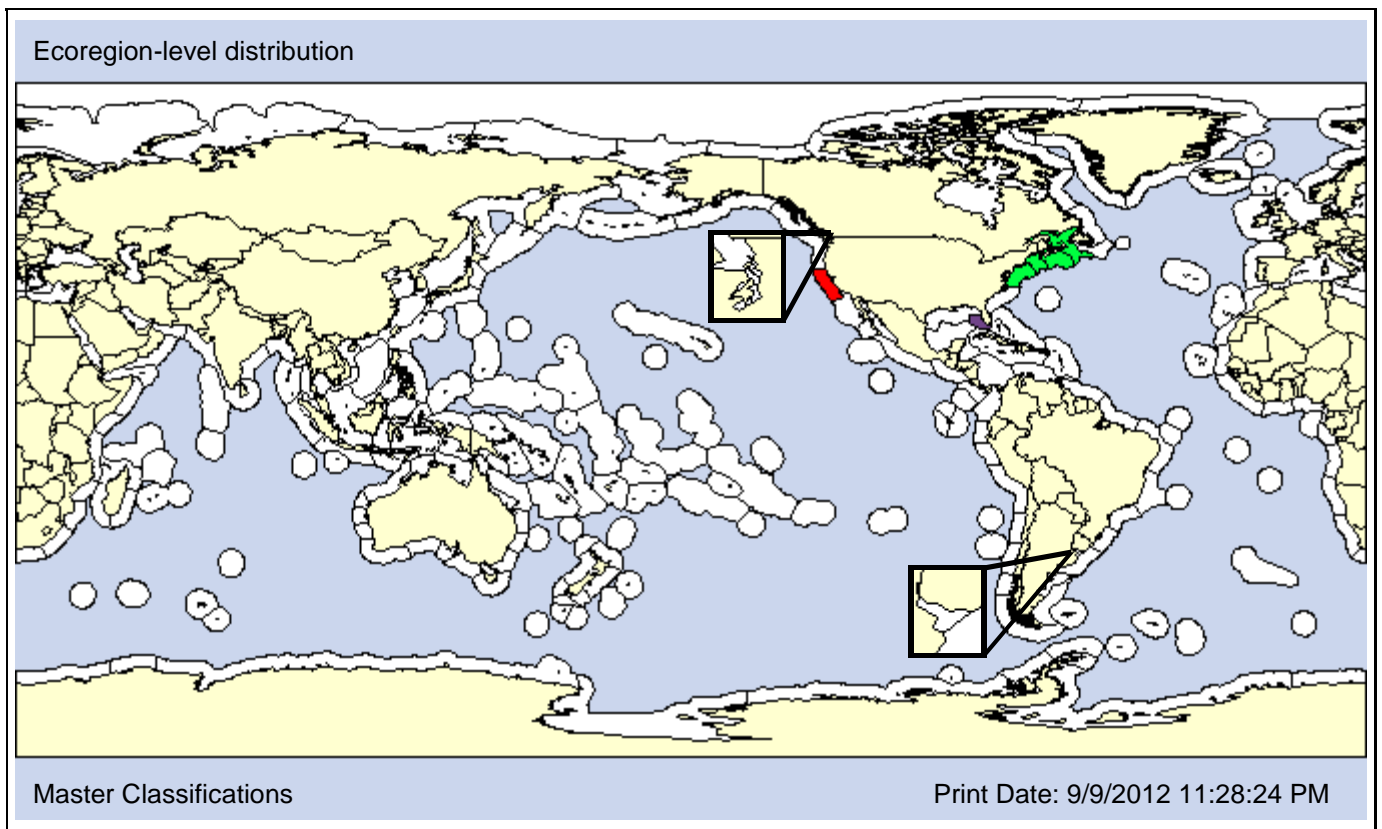
**Also Known As (Name - Type):**

Boonea bisuturalis	Synonym
Menestho bisuturalis	Synonym
Odostomia bisuturalis	Synonym
Turritella bisuturalis	Synonym

**Common Names:**

two-groove odostome
---------------------

**Type Locality:** Boston, Massachusetts, U.S.



**Date 1st record:**

1962

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>						<b>AO X</b>	PO								

Comments: *Odetta bisuturalis* (= *Boonea bisuturalis*) is an ectoparasite of the Atlantic oyster, *Crassostrea virginica*, and several other bivalves and gastropods. McLean (2007) lists *Odetta bisuturalis* as the valid name while WoRMS lists *Boonea bisuturalis* as the valid name.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 13.4m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 91 - 91%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>							<b>O</b>				

**SALINITY [Obs: 16 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Gastropod

**Taxonomic Author:** Baba, 1960

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Nudibranchia

**Suborder:** Euctenidiacea

**Infraorder:** Doridacea

**Superfamily:** Onchidoridoidea

**Family:** Goniodorididae

**Subfamily:**

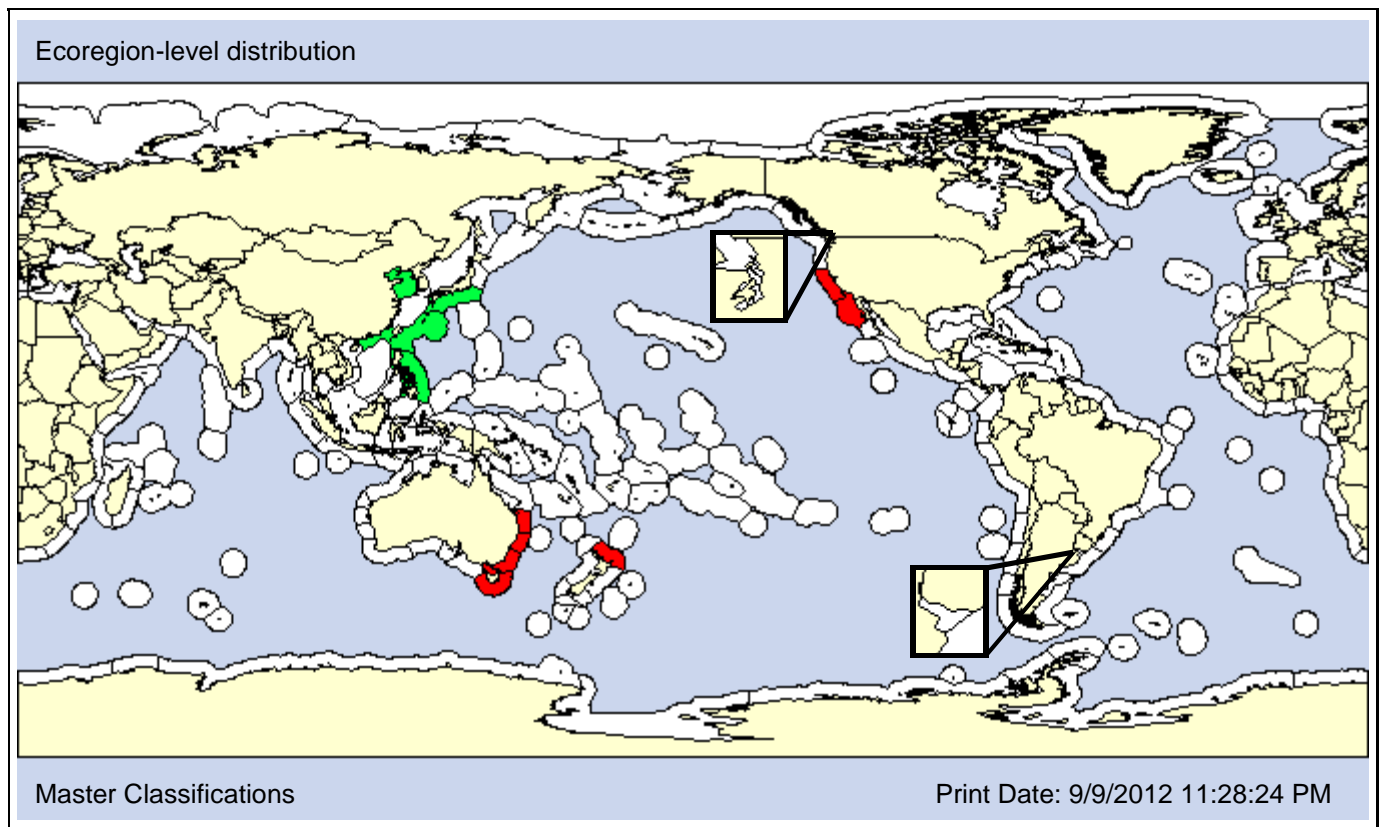
**Also Known As (Name - Type):**

Doris eolida	Ambiguous syn.
Okenia plana	Synonym

**Common Names:**

flat okenia
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**Type Locality:** Toba, Japan



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1950s collections

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO <b>X</b>									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X	X	X	
		X											

**DEPTH [Obs: 0 - 28.7m] [Pref: 0 - 12m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2.81 - 2.81%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O	O									P	P	P

**SALINITY [Obs: 32.55 - psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	
						O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X						X
					X	X							

**Taxon:** Gastropod

**Taxonomic Author:** Burn,1967

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Nudibranchia

**Suborder:** Euctenidiacea

**Infraorder:** Doridacea

**Superfamily:** Onchidoridoidea

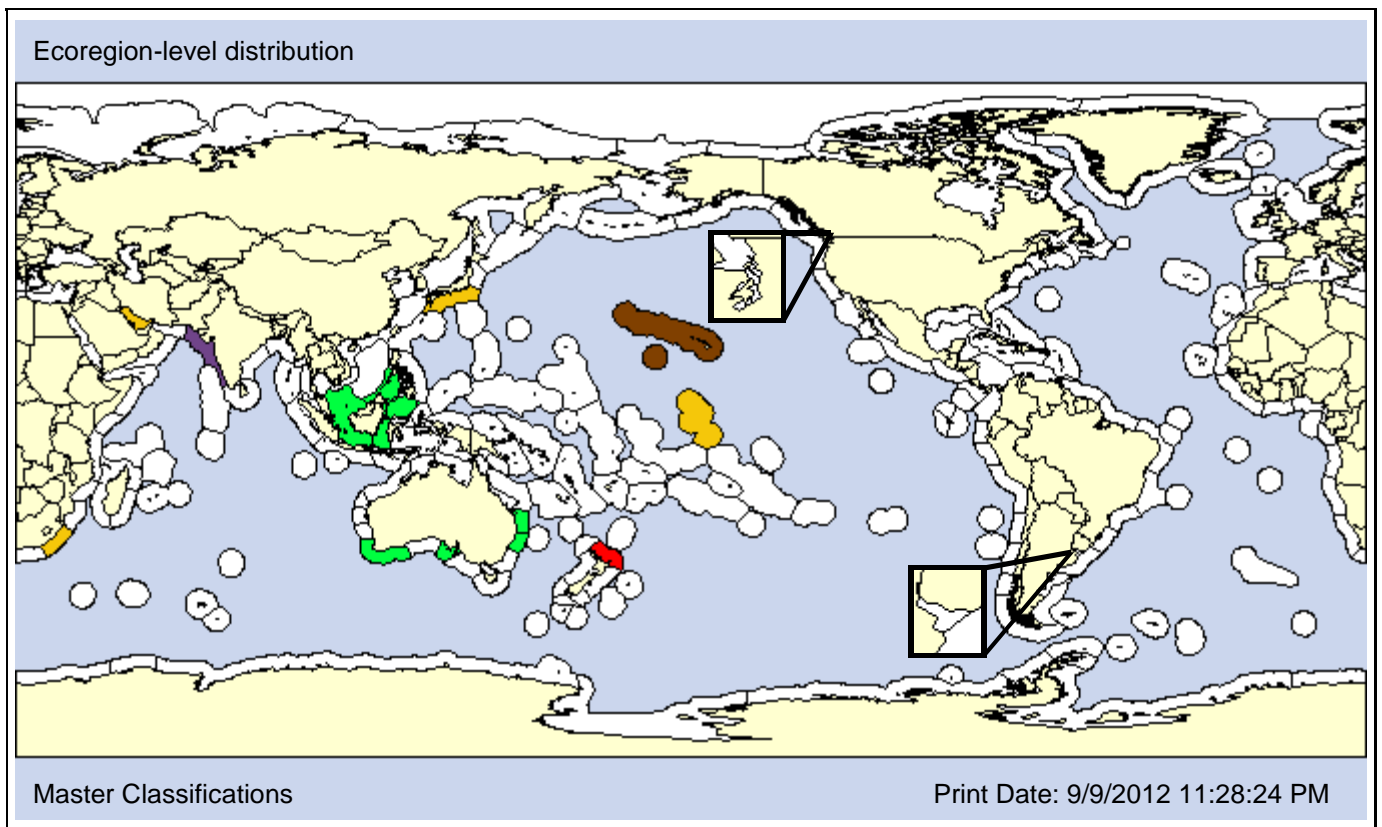
**Family:** Goniodorididae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Sydney Harbour, Australia



<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-style:dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:brown; border:1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; border:1px solid black;"></span> Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

**Date 1st record:** Unknown 1972  
**Loc 1st record:** Unknown Kaneohe Bay, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: The nudibranch *Okenia pellucida* is associated with the bryozoan, *Zoobotryon verticillatum*, on which it feeds and lays its egg masses. Carlton and Eldredge (2009) classify it as introduced in Hawai'i while Paulay (2011) considers it is cryptogenic because it is common in natural habitats. We classify this as a conflict.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated <b>X</b></b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE **X****

<b>R <b>P</b></b>	<b>HP</b>	<b>Biogenic <b>P</b></b>						<b>Artificial Substrate <b>P</b></b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish <b>O</b></b>						<b>Marine <b>P</b></b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual <b>X</b></b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic <b>X</b></b>							<b>Epibiotic <b>X</b></b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** (Dall & Bartsch, 1909)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Pyramidelloidea

**Family:** Pyramidellidae

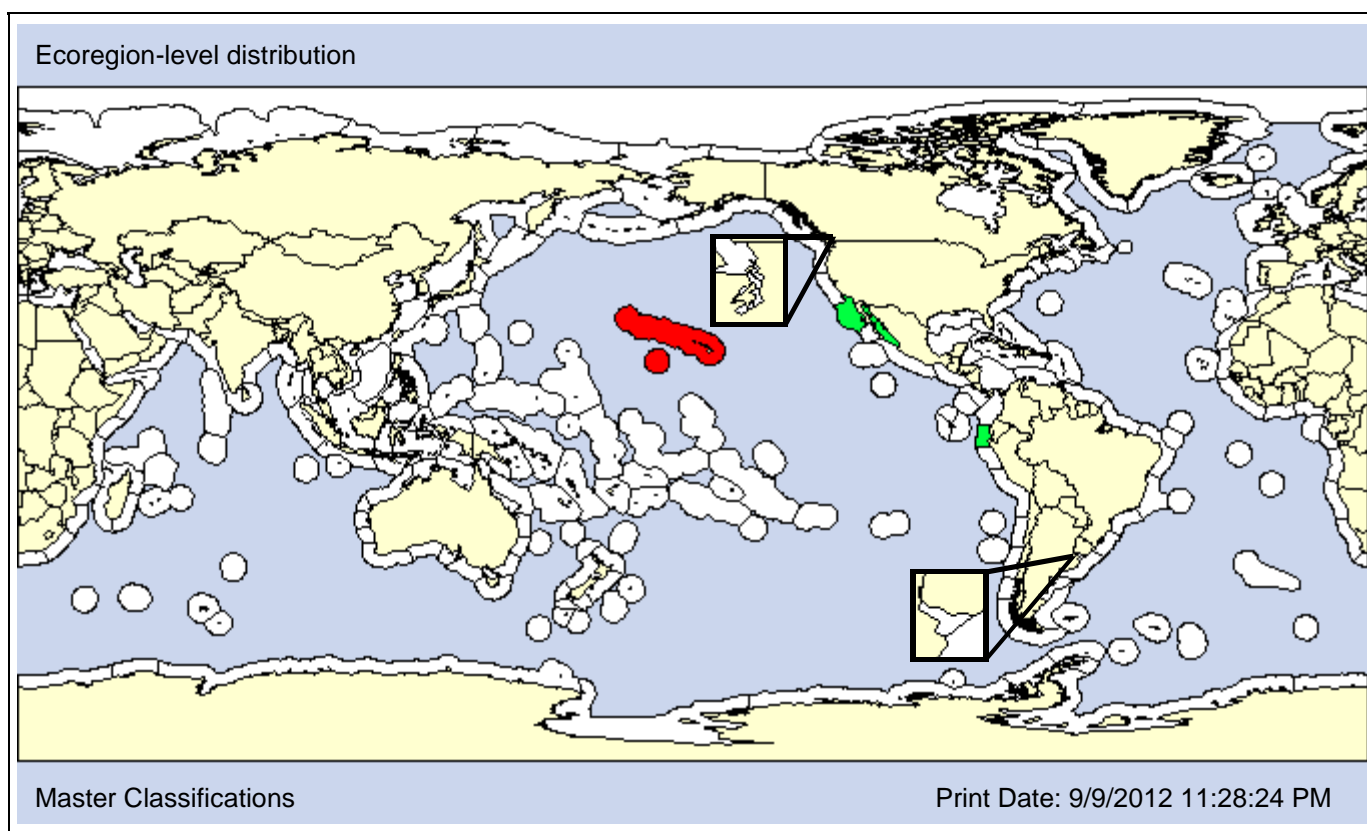
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Peristichia pedoroana	Misspelling	
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**Type Locality:** San Pedro, California, USA



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;">■</span> NIS Not Established	<span style="color: yellow;">■</span> Cryptogenic	<span style="color: cyan;">■</span> Transient	<span style="color: purple;">■</span> Unclassified	<span style="color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid gray; padding: 2px;">■</span> Unidentified
NWP			Hawaii			NEP	

**Date 1st record:**

1981

Native

**Loc 1st record:**

Kawaihae Harbor, Hawaii

Native

**Established:**

Unknown

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: The establishment of *Peristichia pedroana* in Hawaii is unknown (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
		X											

**DEPTH [Obs: 11 - 27m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Gastropod

**Taxonomic Author:** Suter, 1909

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Cephalaspidea

**Suborder:**

**Infraorder:**

**Superfamily:** Philinoidea

**Family:** Philinidae

**Subfamily:**

**Also Known As (Name - Type):**

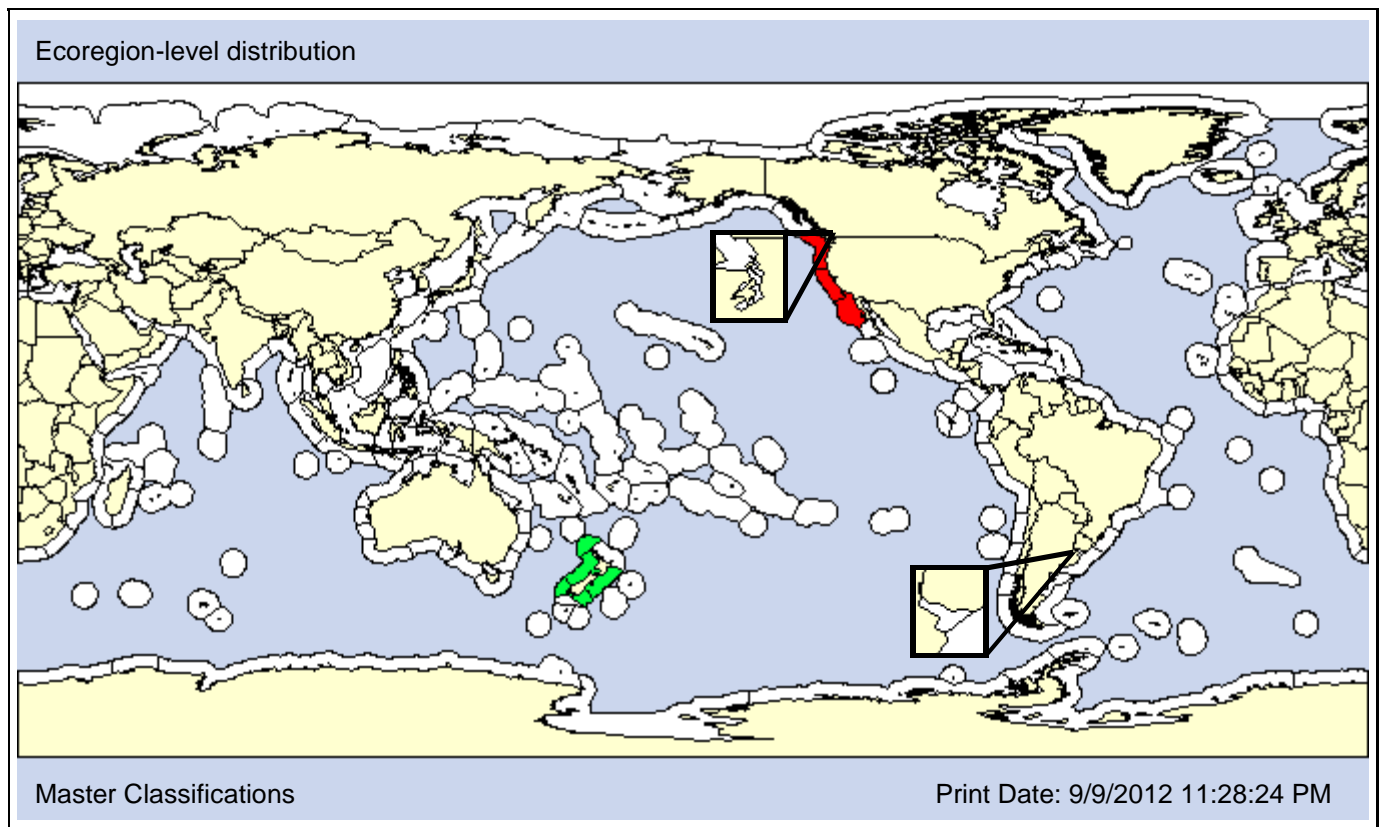
Philine auriformis? of Rudman, 1998

Synonym

**Common Names:**

ear-shaped Philine  
tortellini snail

**Type Locality:** New Zealand



**Date 1st record:**

1992

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X						AO	PO								

Comments: Rudman (1998) concluded that the "Philine auriformis" from California is not *Philine auriformis*. However, Behrens (2004) and Behrens and Hermosillo (2005) list *P. auriformis* as a valid species for the NEP. While recognizing the uncertainty, we list *P. auriformis* as introduced in the NEP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 305m] [Pref: 0 - 61m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 3 - 93%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>			<b>O</b>		

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 29.89 - 33.58psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								



**Taxon:** Gastropod

**Taxonomic Author:** Adams, 1854

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Cephalaspidea

**Suborder:**

**Infraorder:**

**Superfamily:** Philinoidea

**Family:** Philinidae

**Subfamily:**

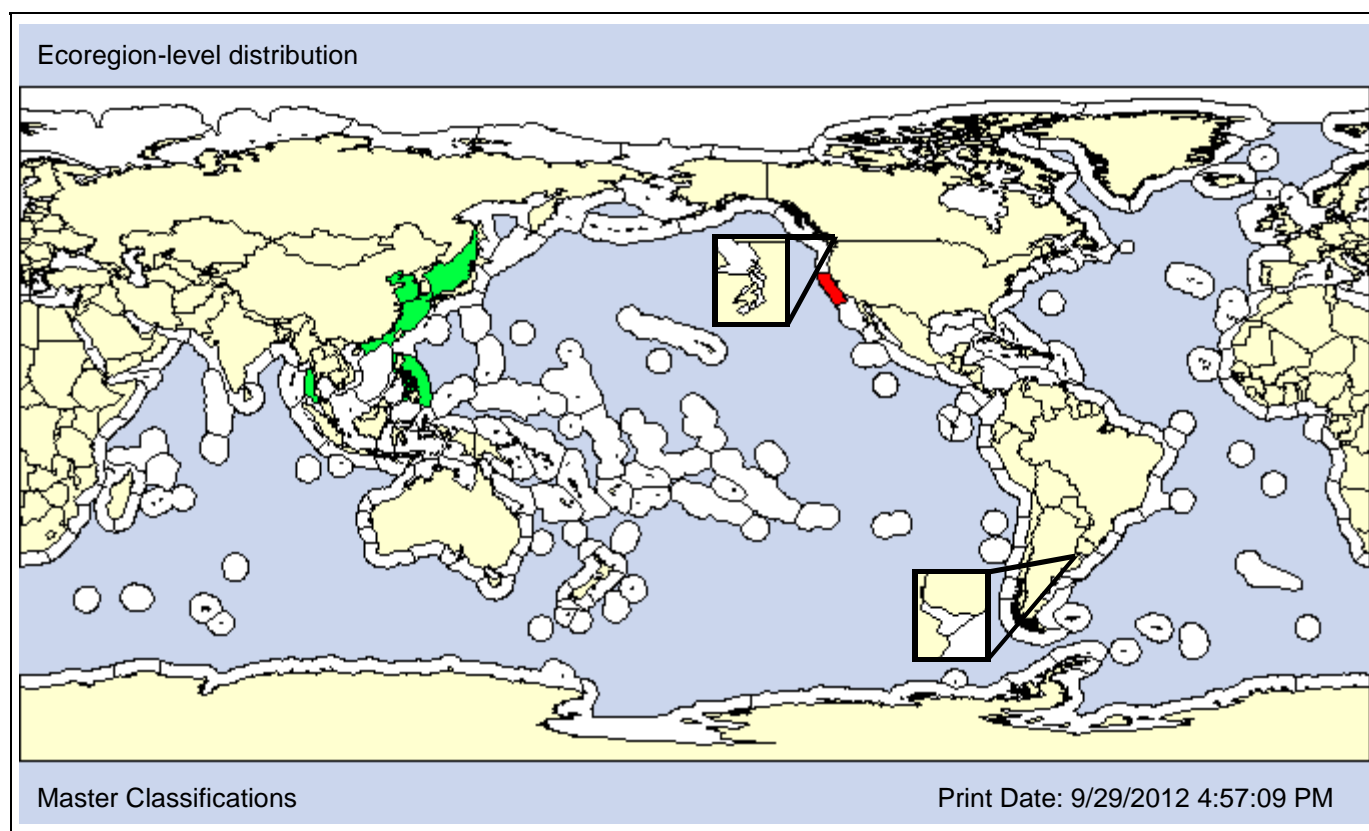
**Also Known As (Name - Type):**

Philine japonica  
 Philine orientalis? of Rudman, 1998  
 Philine sp. of Ruiz et al., 2000 in part?

Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1993

**Loc 1st record:** Native

Bodega Bay, California

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>						AO	PO X								

Comments: Price et al. (2011) synonymized *Philine japonica*, *P. argentata*, and *P. striatella* with *P. orientalis*. *P. orientalis* is native to the NWP and Central Indo-Pacific, and has been introduced into central California.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 684m] [Pref: 0 - 24m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>											

**SALINITY [Pref: 30 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Gastropod

**Taxonomic Author:** (Risbec, 1928)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Nudibranchia

**Suborder:** Dexiarchia

**Infraorder:** Aeolidida

**Superfamily:** Aeolidioidea

**Family:** Facelinidae

**Subfamily:**

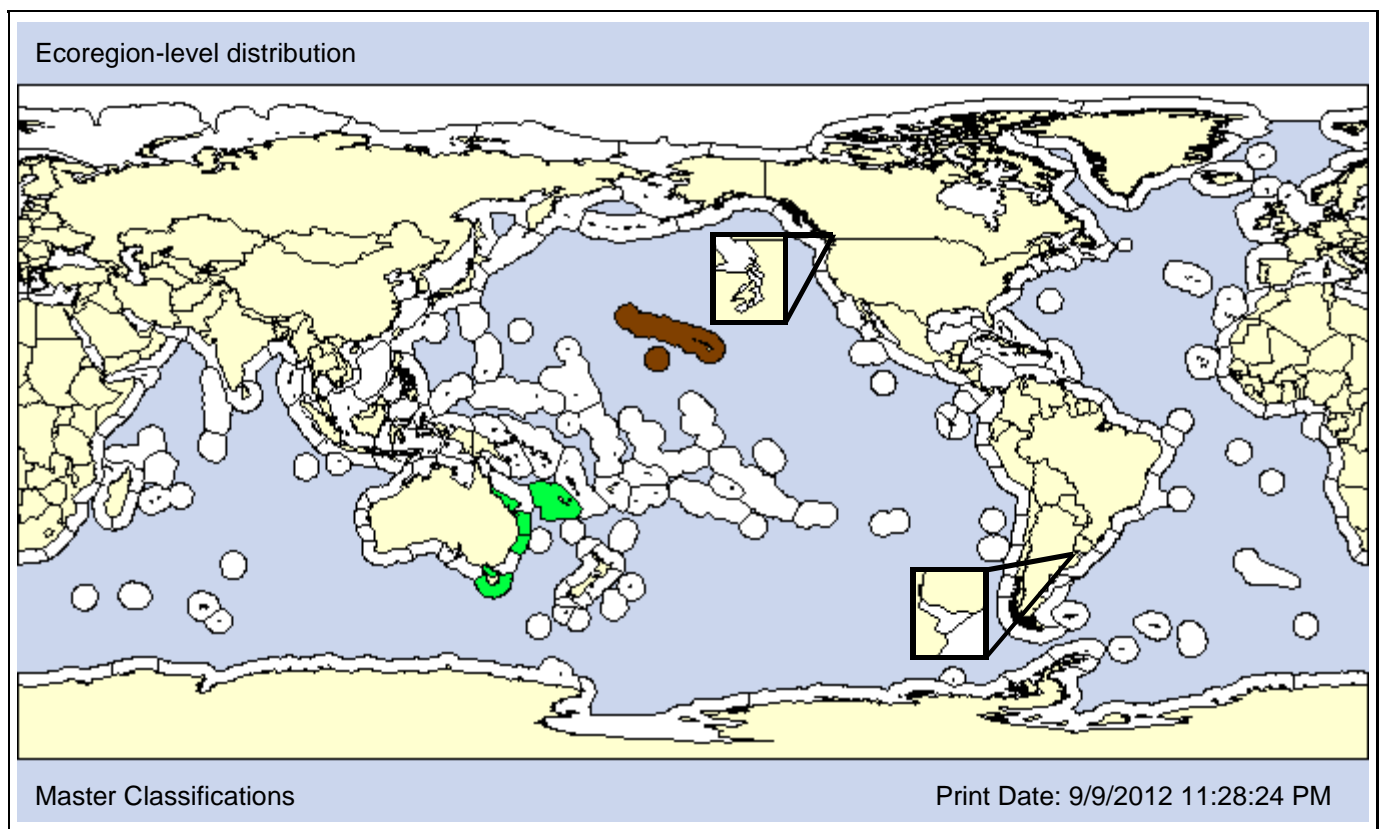
**Also Known As (Name - Type):**

Aeolidia poindimiei  
Phyllodesmium poindimieri

Synonym  
Misspelling

**Common Names:**

**Type Locality:**



**Date 1st record:** 1995  
**Loc 1st record:** Maui, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: According to Paulay (2011), the assumption of a nonindigenous status for *Phyllodesmium poindimiei* in Hawaii by Carlton and Eldredge (2009) is challenged by its host (*Carijoa riisei*) turning out to be potentially native rather than introduced. Thus, we list this as a conflict in Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		<b>X</b>		<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>											<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

# Potamopyrgus antipodarum

Species ID: 700

**Taxon:** Gastropod

**Taxonomic Author:** (Gray, 1843)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Risssooidea

**Family:** Hydrobiidae

**Subfamily:**

**Also Known As (Name - Type):**

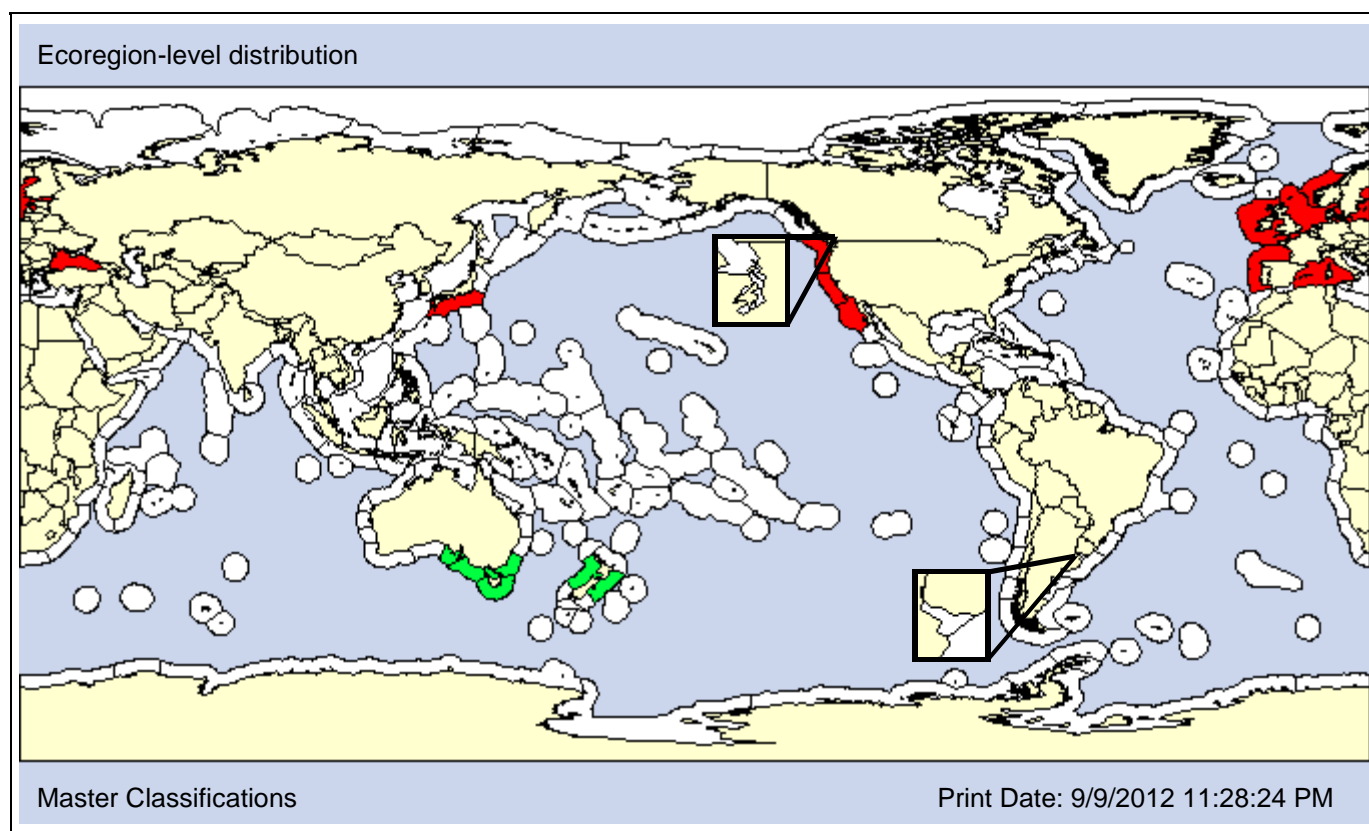
Amnicola antipodarum  
Hydrobia jenkinsi  
Potamopyrgus jenkinsi  
Potamopyrgus jenkinsii

Synonym  
Synonym  
Synonym  
Misspelling

**Common Names:**

Jenkin spire shell  
New Zealand mudsnail

**Type Locality:** New Zealand



**Date 1st record:** 1980s

1995 (estuarine occurrence)

**Loc 1st record:** Japan

Columbia River, WA

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P	X			
						AO	PO				X				

Comments: While usually found in freshwater the New Zealand mudsnail, *Potamopyrgus antipodarum*, also occurs in estuarine habitats.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH	<b>X</b>			<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 50m] [Pref: 1 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.07 - 89.05%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>						<b>O</b>

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - 26.4psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
			<b>X</b>		<b>X</b>				DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P		<b>X</b>		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	
					<b>X</b>	<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** (Pfeiffer, 1840)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Risssooidea

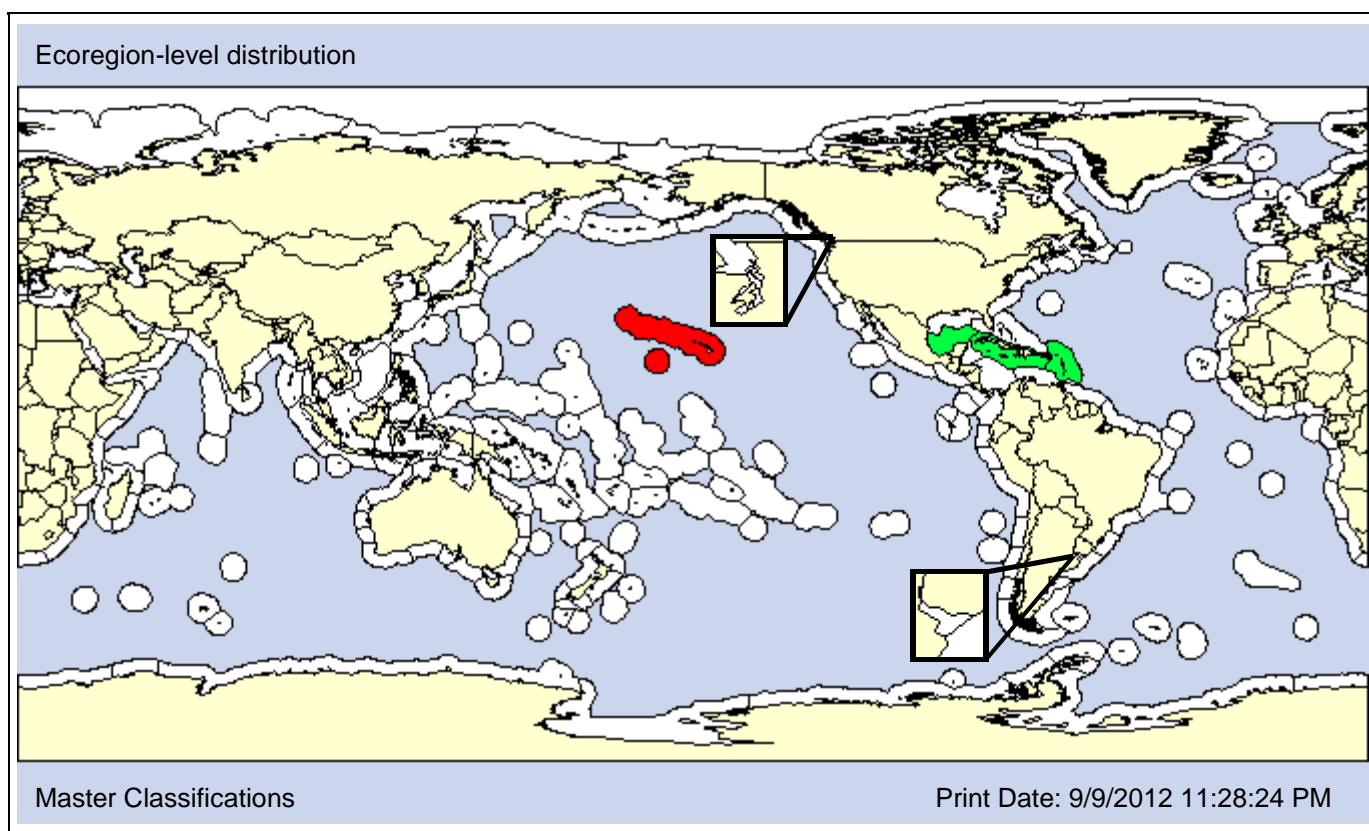
**Family:** Hydrobiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1998  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>						AO	PO								

Comments: *Pyrgophorus coronatus* is primarily a freshwater species, though it can occur in low salinity regions of estuaries.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>O</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH	<b>X</b>				

**DEPTH [Obs: 0 - 30m] [Pref: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 9psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>					

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>	<b>X</b>							



**Taxon:** Gastropod

**Taxonomic Author:** (Baba, 1930)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Nudibranchia

**Suborder:** Dexiarchia

**Infraorder:** Aeolidida

**Superfamily:** Aeolidioidea

**Family:** Facelinidae

**Subfamily:**

**Also Known As (Name - Type):**

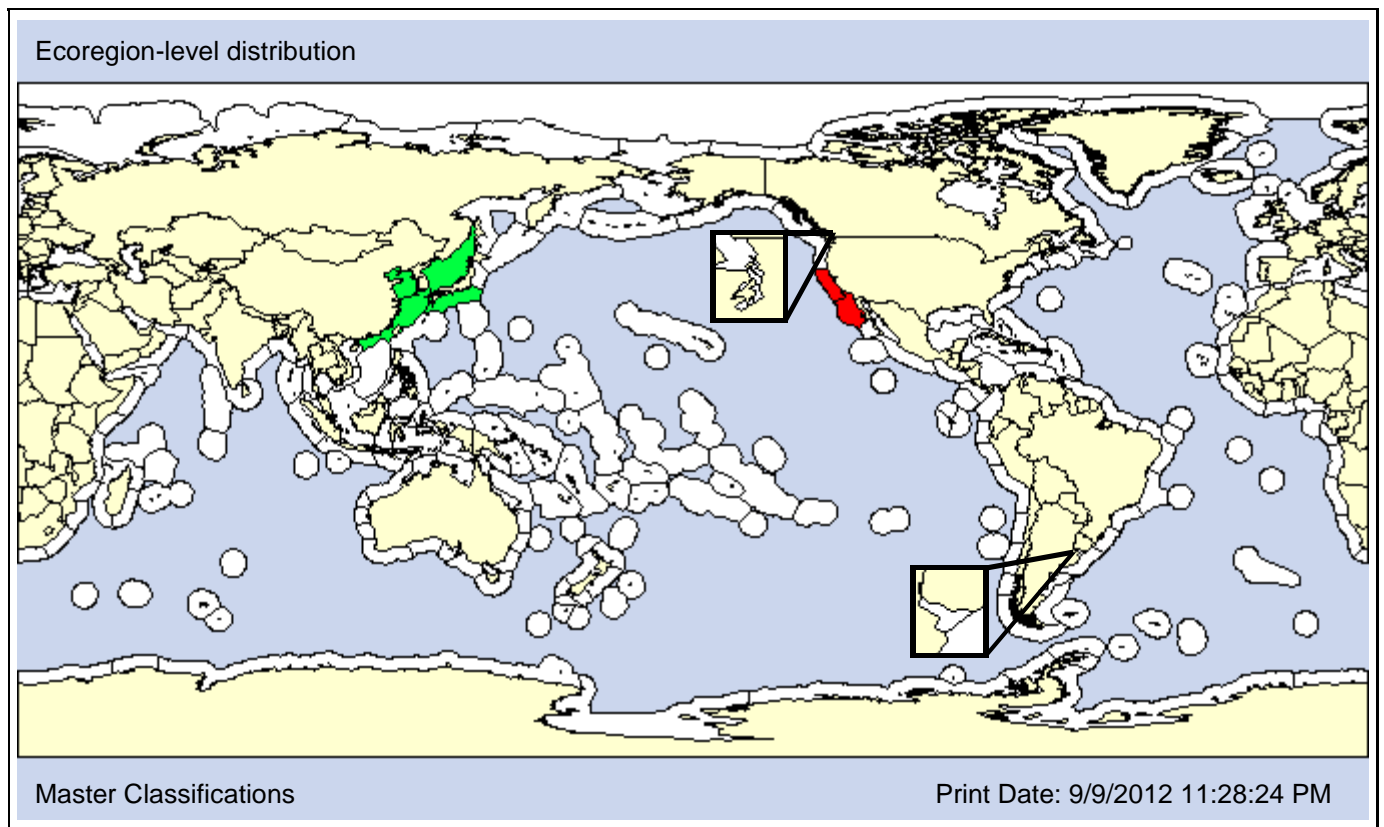
Hervia ceylonica

Synonym

**Common Names:**

Enosima aeolid  
white-tentacle Japanese aeolis  
white-tentacled Japanese aeolis

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1972

**Loc 1st record:** Native San Francisco Estuary, CA

**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO <b>X</b>									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 12m] [Pref: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Rissosoidea

**Family:** Hydrobiidae

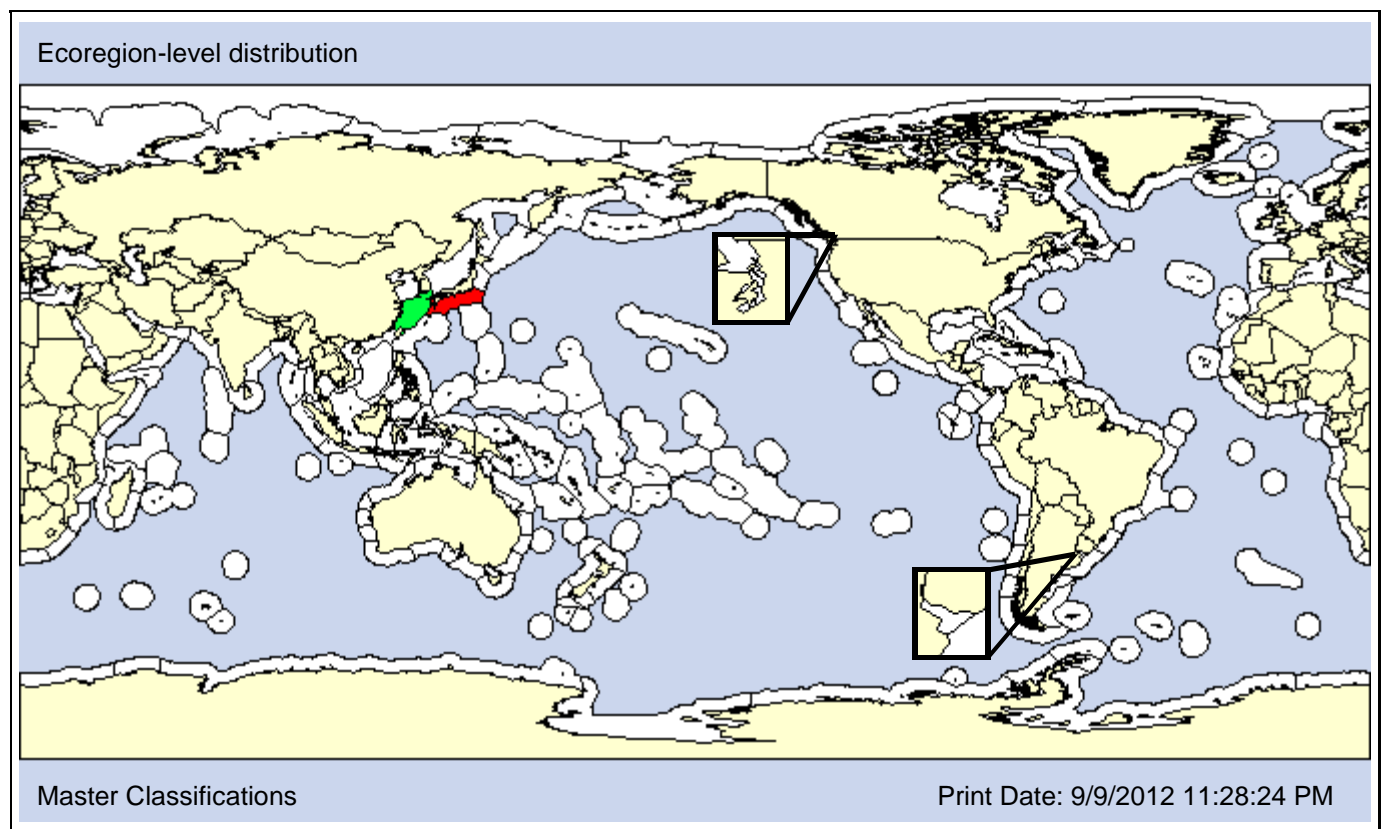
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Torai-mizugomatsubo

**Type Locality:** Japan



**Date 1st record:** 1997

**Loc 1st record:** Osaka Bay, Japan

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P				
						AO	PO								

Comments: *Stenothyra* sp. (Tamaki et al., 2002) is a hydrobiid snail that invaded the tide flats of the Ariake Inland Sea in Japan. It is thought to be an undescribed species from Korea (Fukuda, 2004) and may have been introduced along with seed clams of *Venerupis philippinarum* (= *Ruditapes philippinarum*) from Korea and China.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 4m] [Pref: 0 - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>		<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Gastropod

**Taxonomic Author:** (Lamarck, 1822)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Cerithioidea

**Family:** Thiaridae

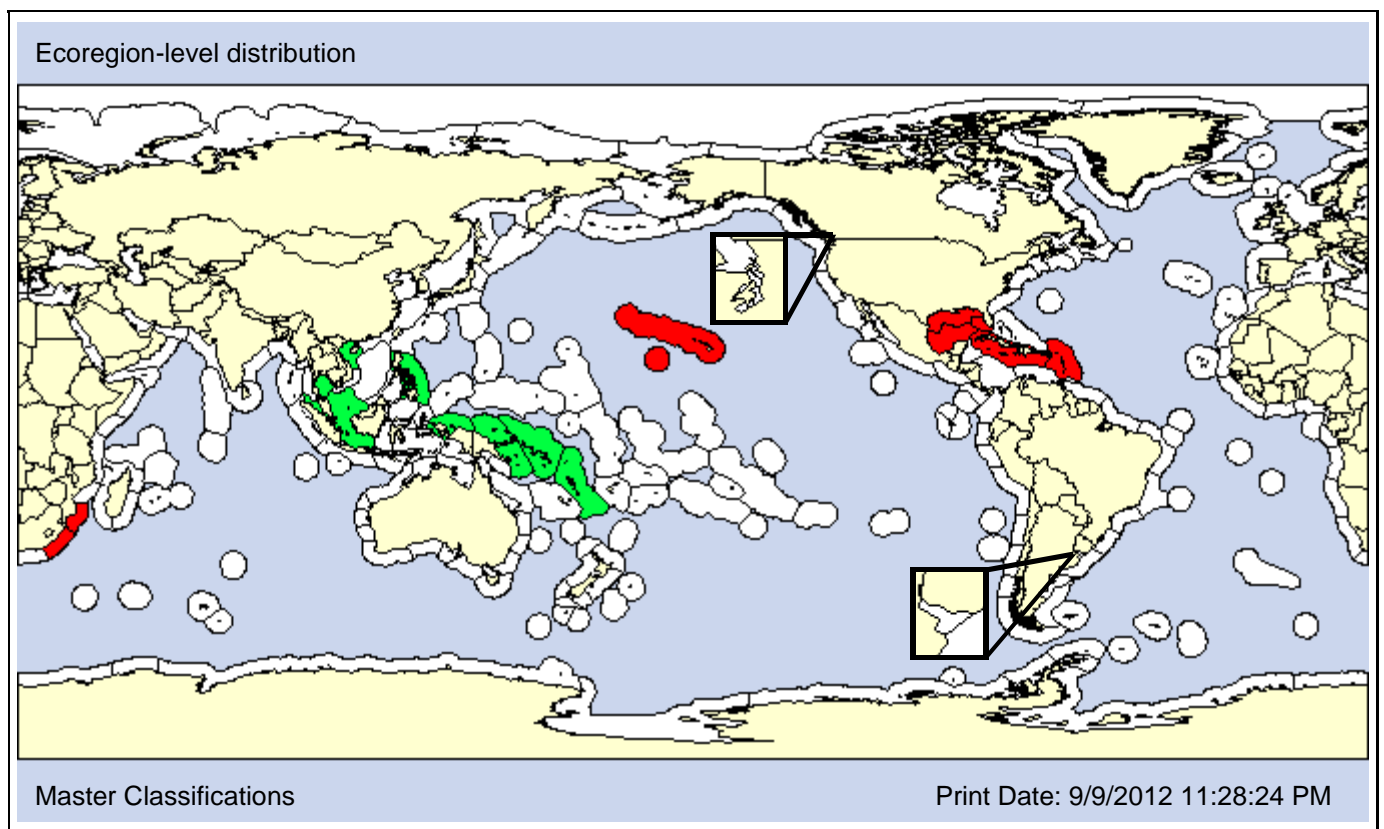
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Melania mauiensis	Synonym	quilted melania

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1856  
**Loc 1st record:** Maui, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
						AO	PO			X					

Comments: *Tarebia granifera* is a primarily a freshwater snail, though it can survive in salinities as high as 30 psu. Carlton and Eldredge (2009) consider the Indo-Pacific region as the probable native region.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH	<b>X</b>			<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>						

**SALINITY [Obs: 0 - 30psu] [Pref: 0 - 3psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>	<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** (Nordmann, 1845)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Heterobranchia

**Infraclass:** Opisthobranchia

**Superorder:**

**Order:** Nudibranchia

**Suborder:** Dexiarchia

**Infraorder:** Aeolidida

**Superfamily:** Fionoidea

**Family:** Tergipedidae

**Subfamily:**

**Also Known As (Name - Type):**

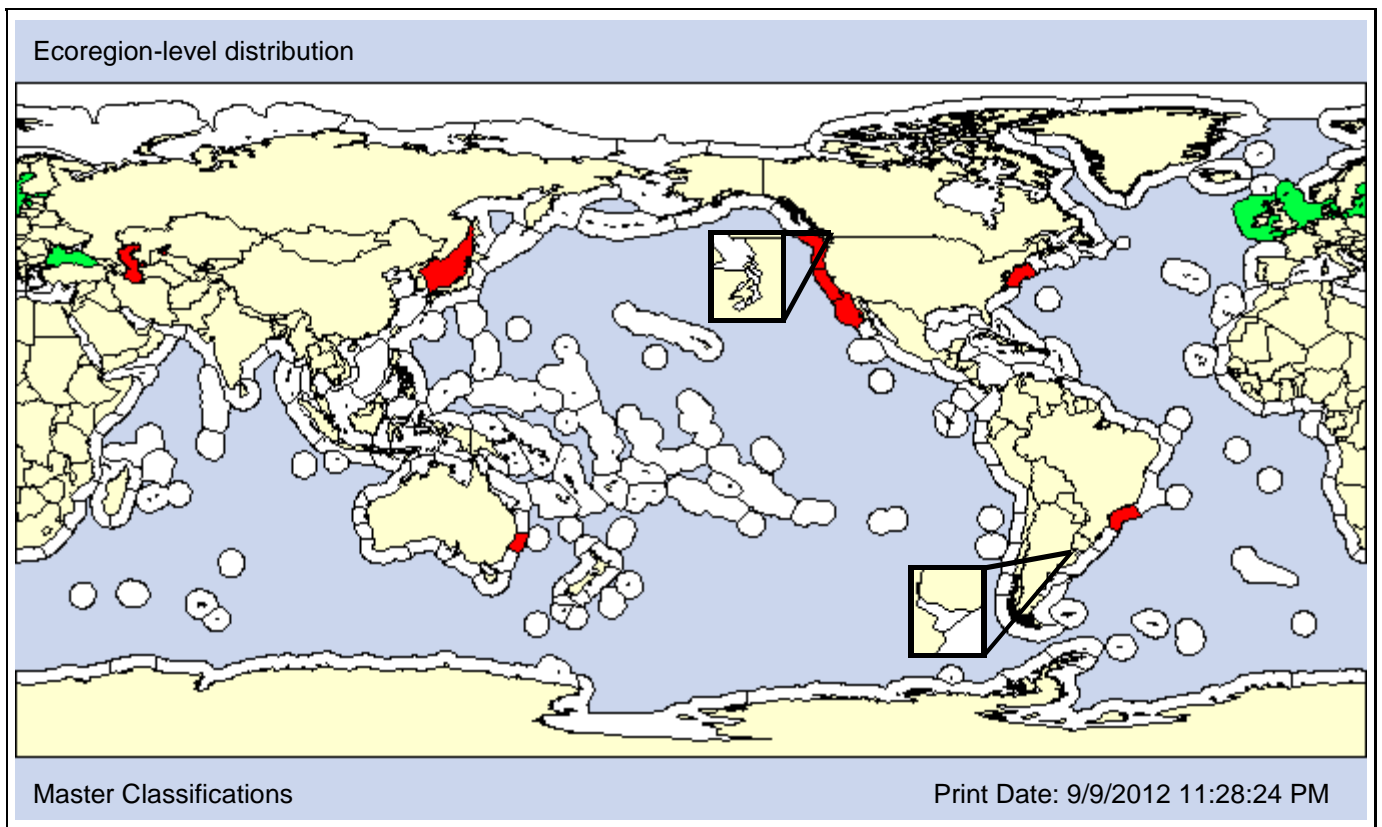
Embletonia pallida  
Eolis ventilabrum  
Tenellia pallida  
Tergipes adspersus

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

lagoon sea slug  
miniature aeolis  
spotted aeolid

**Type Locality:** Black Sea



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1995

1953

**Loc 1st record:** Vladivostok, Russia

San Francisco Estuary, CA

**Established:** Unknown

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: *Tenellia adspersa* occurs in the Mediterranean Sea and in the Baltic Sea at salinities as low as 1 psu.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>			<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 58m] [Pref: 0 - 34m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>					<b>O</b>	

**SALINITY [Obs: 1 - 50psu] [Pref: 5.3 - 18psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B <b>X</b>	LP-P <b>X</b>	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Gastropod

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Vermetoidea

**Family:** Vermetidae

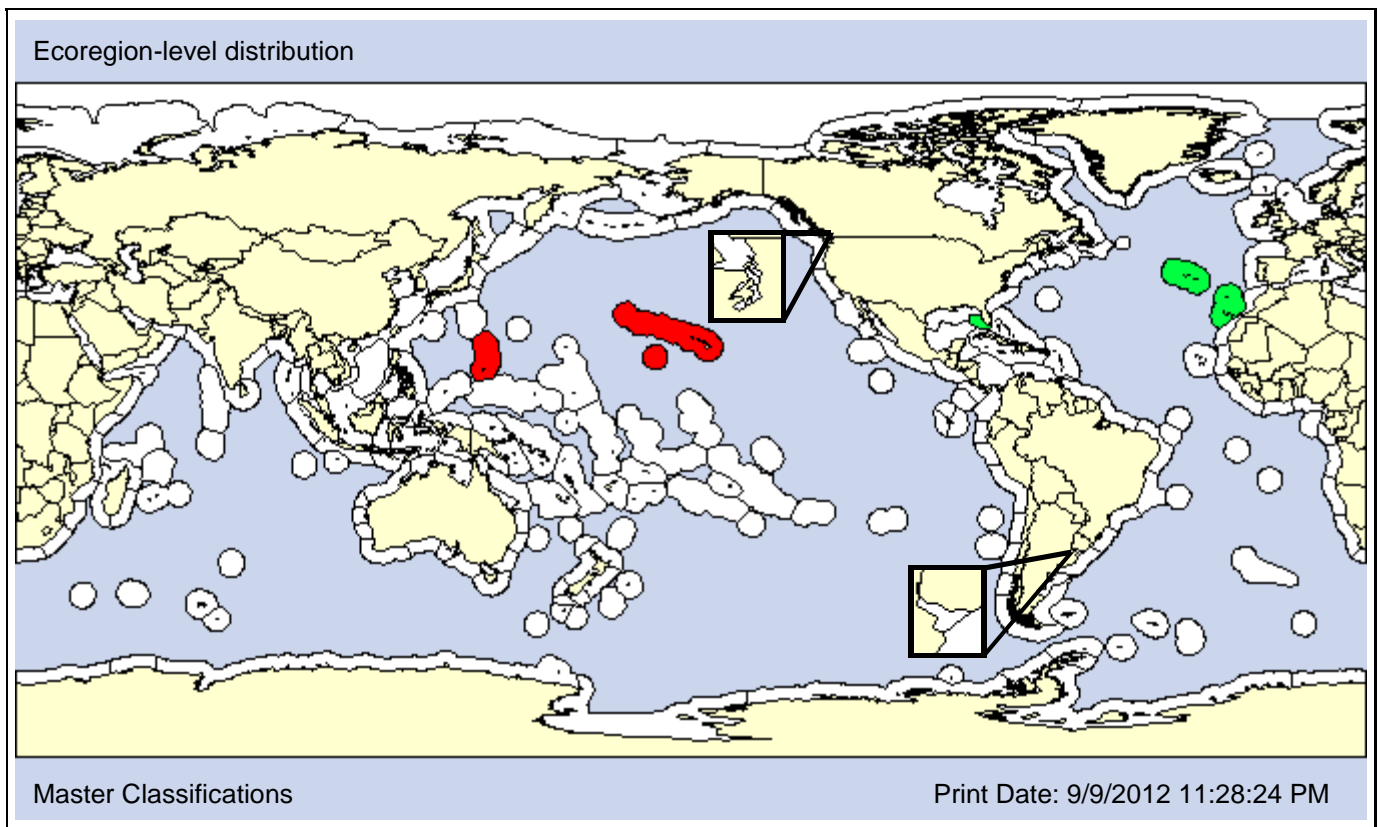
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Thylaeodus (?) sp. of (Carlton and Eldredge (2009))	Synonym	Hadfield's vermetid
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**Type Locality:** Hawaii, USA



■ Native
 ■ Nonindigenous
   NIS Not Established
   Cryptogenic
   Transient
   Unclassified
   Conflicting Classification
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1970  
**Loc 1st record:** Honolulu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: Carlton and Eldredge (2009) hypothesize that the *Thylaeodus* sp. in Hawaii is from the Atlantic, and may be *T. rugulosus*. Accordingly, we assume that this species is not native to the Pacific, and show the distribution of *T. rugulosus* in the Atlantic as a possible native range.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X		X	
	X	X											

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
					X	X							

**Taxon:** Gastropod

**Taxonomic Author:** (Crosse, 1863)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Vetigastropoda

**Infraclass:**

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:** Trochoidea

**Family:** Trochidae

**Subfamily:** Umboniinae

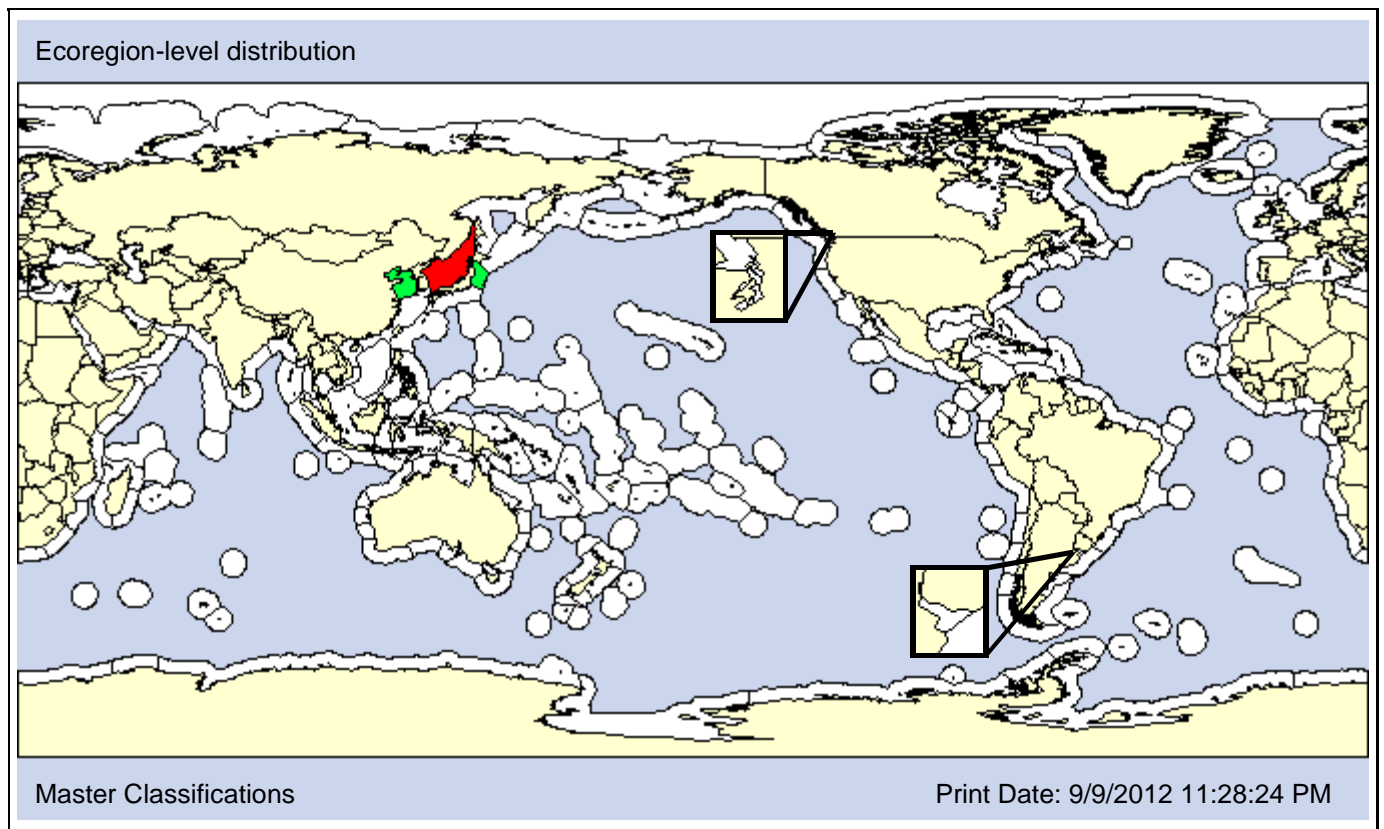
**Also Known As (Name - Type):**

Umbonium (Umbonium) thomasi	Convention

**Common Names:**

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**Type Locality:**



Master Classifications Print Date: 9/9/2012 11:28:24 PM

Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <2004

**Loc 1st record:** Peter the Great Bay, Russia

**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Umbonium thomasi*, is considered endemic to the Yellow Sea (Shin and Je, 2008) but introduced in Japan (Mito and Uesugi, 2004). However, it was listed as occurring in Hakodate, Japan in Pilsbry (1895). We tentatively list it as native in the Yellow Sea and Northeastern Honshu Ecoregions and introduced in the Sea of Japan.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 25m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Gastropod      **Taxonomic Author:** (Say, 1822)

**Kingdom:** Animalia      **Subkingdom:** Eumetazoa      **Phylum:** Mollusca

**Subphylum:**      **Superclass:**      **Class:** Gastropoda

**Subclass:** Caenogastropoda      **Infraclass:**      **Superorder:**

**Order:** Neogastropoda      **Suborder:**      **Infraorder:**

**Superfamily:** Muricoidea      **Family:** Muricidae      **Subfamily:** Ocenebrinae

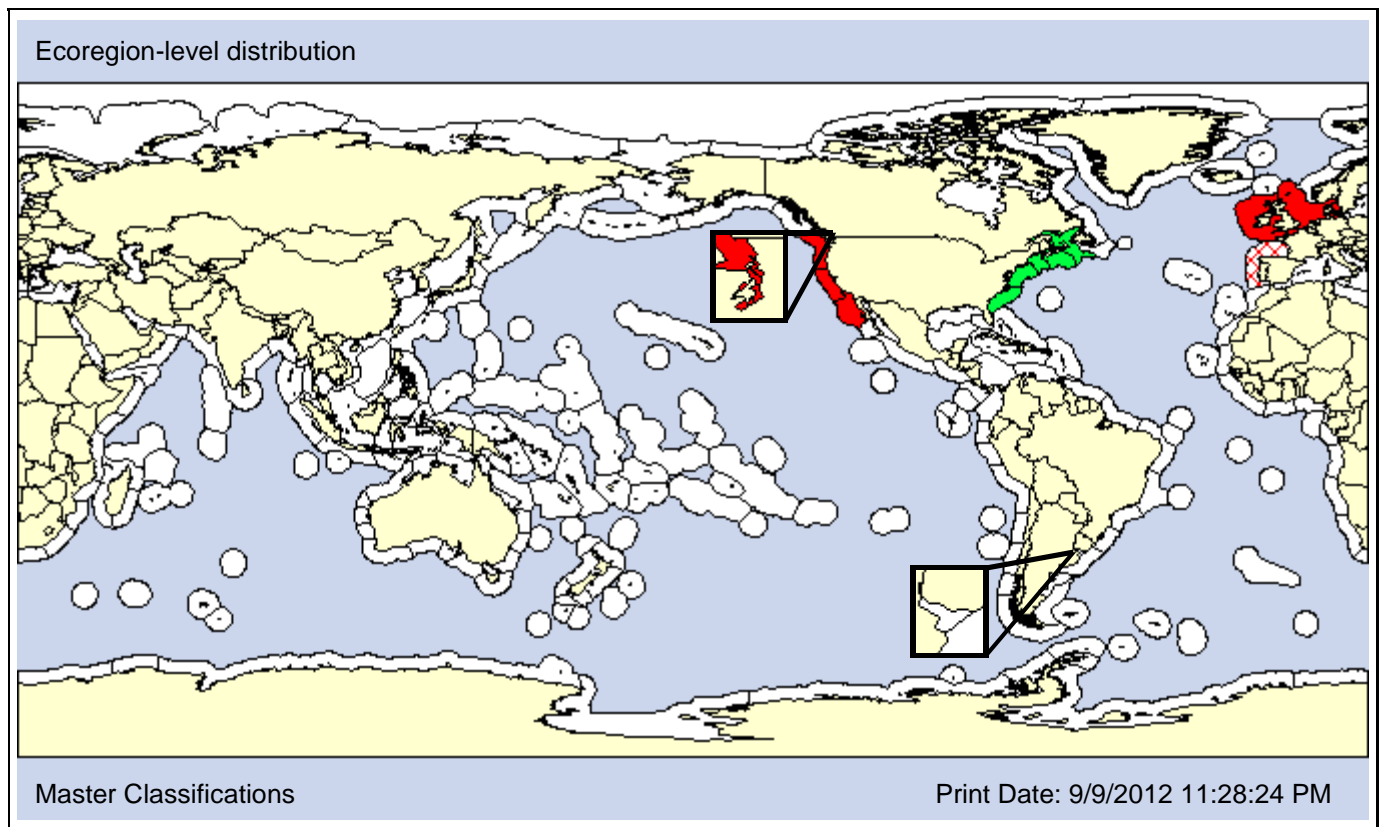
**Also Known As (Name - Type):**

Buccinum cinerea	Synonym
Buccinum plicosum of Gould, 1841	Synonym
Fusus cinereus	Synonym
Trophon cinerea	Synonym

**Common Names:**

Atlantic oyster drill
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**Type Locality:** Great Egg Harbor, New Jersey, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown      1890

**Loc 1st record:** Japan      San Francisco Estuary, CA

**Established:** Yes      Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
						<b>AO X</b>	PO								

Comments: Mito and Uesugi (2004) list *Urosalpinx cinerea* as an established alien species in Japan; however, we are not aware of the specific ecoregion(s) invaded.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X		
		<b>X</b>											

**DEPTH [Obs: 0 - 25m] [Pref: 0 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 48.39 - 58.71%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>											

**SALINITY [Obs: 11 - 36psu] [Pref: 12.5 - 26.5psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Gastropod

**Taxonomic Author:** Hadfield & Kay, 1972

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Mollusca

**Subphylum:**

**Superclass:**

**Class:** Gastropoda

**Subclass:** Caenogastropoda

**Infraclass:**

**Superorder:**

**Order:** Littorinimorpha

**Suborder:**

**Infraorder:**

**Superfamily:** Vermetoidea

**Family:** Vermetidae

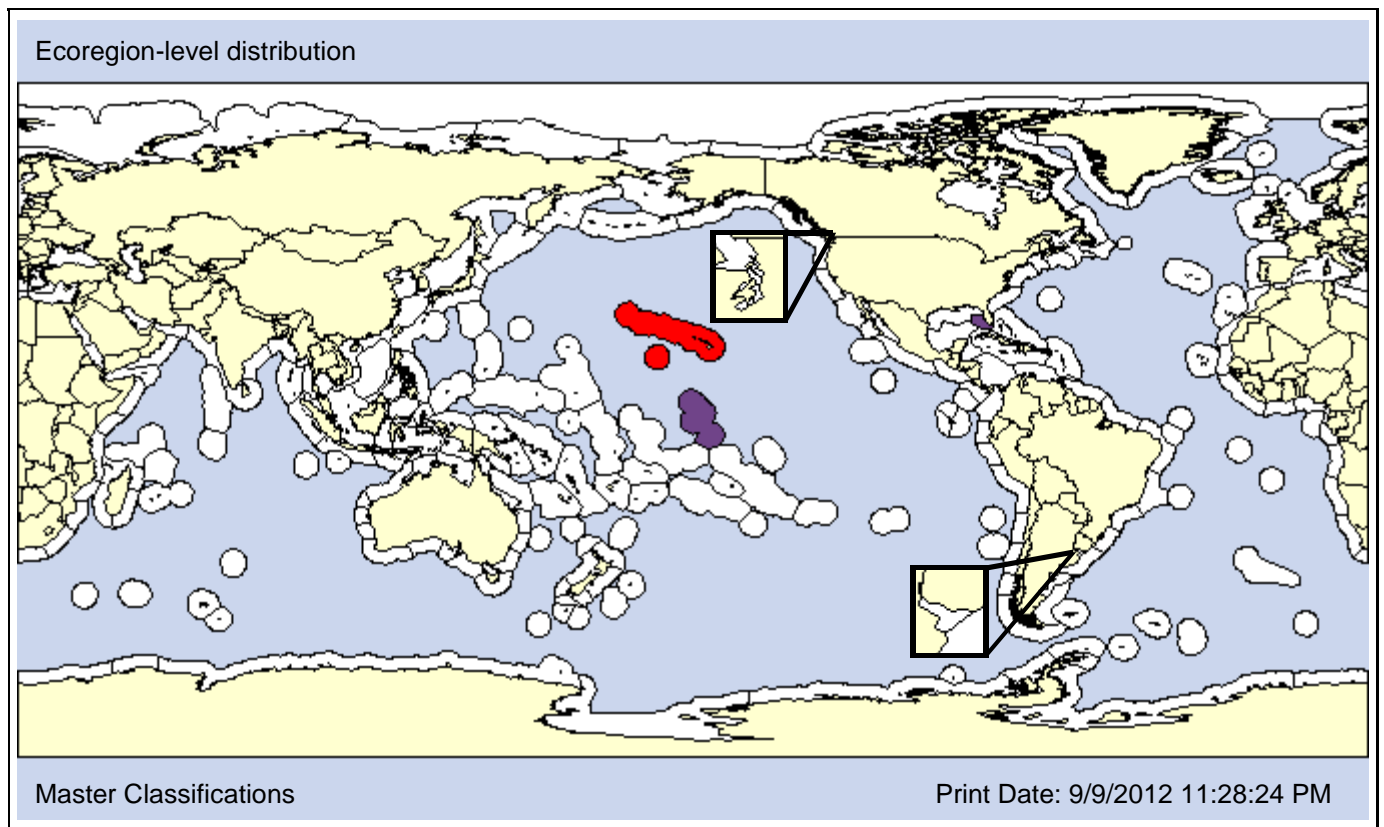
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Eualetes tulipa of Hawaiian authors	Synonym	
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

<1972

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: *Vermetus alii* is likely either from the Caribbean or from the subtropical Eastern Pacific (Carlton and Eldredge, 2009). It may be a synonym of *Eualetes tulipa*, which occurs in the Eastern Pacific and Western Atlantic.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>											<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Kingdom: Animalia**

**Phylum: Arthropoda**

**Class: Malacostraca**

**Superorder: Leptostraca**

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**Taxon:** Lepostracean

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Phyllocarida

**Infraclass:**

**Superorder:** Leptostraca

**Order:** Nebaliacea

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Nebaliidae

**Subfamily:**

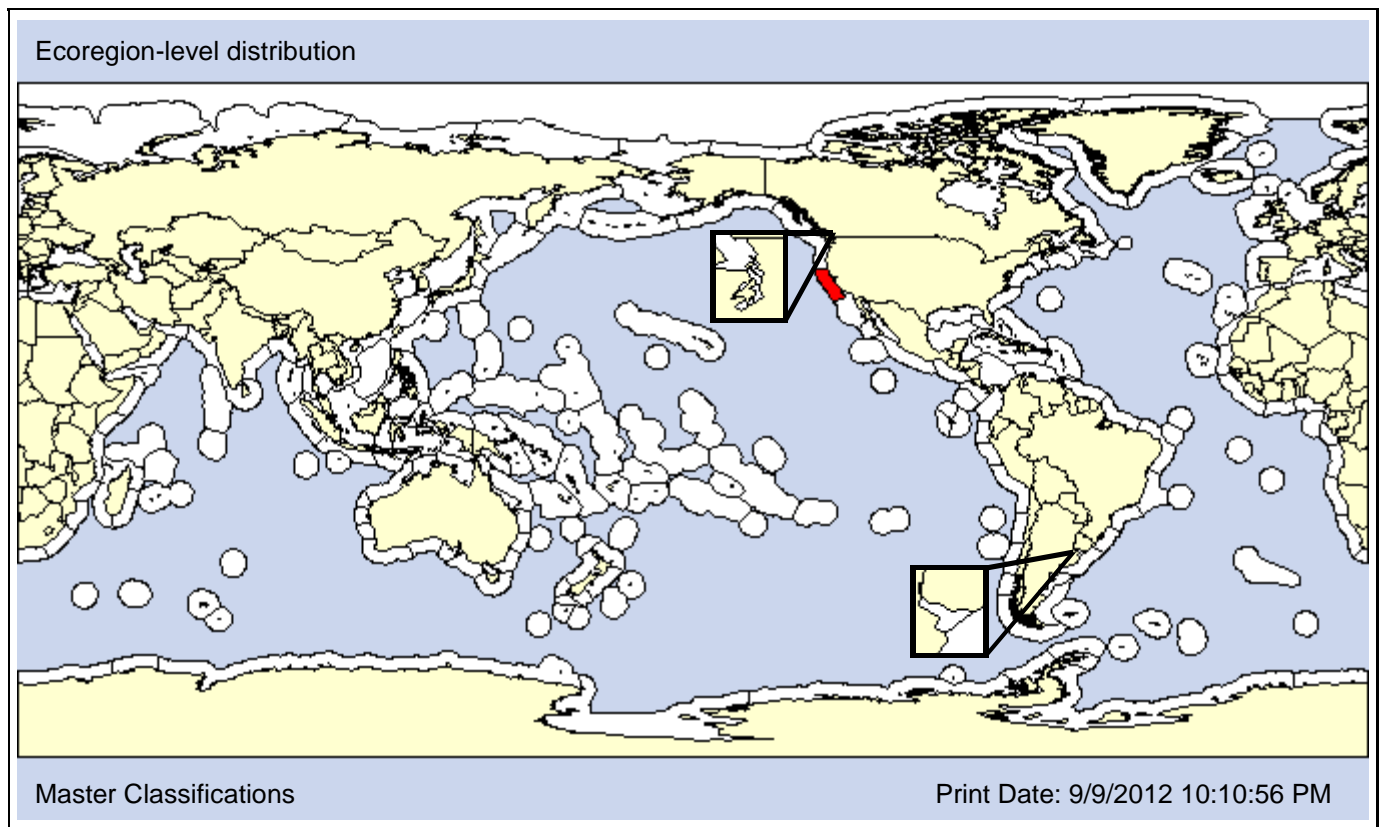
**Also Known As (Name - Type):**

Epinebalia sp. (Cohen and Carlton, 1995)	Synonym
Epinebalia sp. A LSM4	Synonym
Epinebalia sp. of Cohen and Carlton, 1995	Synonym
Nebalia sp. (Cohen and Carlton 1995)	Synonym

**Common Names:**

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**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1992

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Unknown

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments: An unidentified *Nebalia* (=Epinebalia) found in the San Francisco Estuary in 1992 is considered introduced. However, its establishment is uncertain.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					

**DEPTH [Obs: 0 - 6m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE** **X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b> <b>P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b> <b>X</b>	
					<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b> <b>X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

Kingdom: Animalia

Phylum: Arthropoda

Class: Malacostraca

Superorder: Peracarida

Order: Amphipoda

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**Taxon:** Amphipod

**Taxonomic Author:** Mills, 1964

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Ampeliscidae

**Subfamily:**

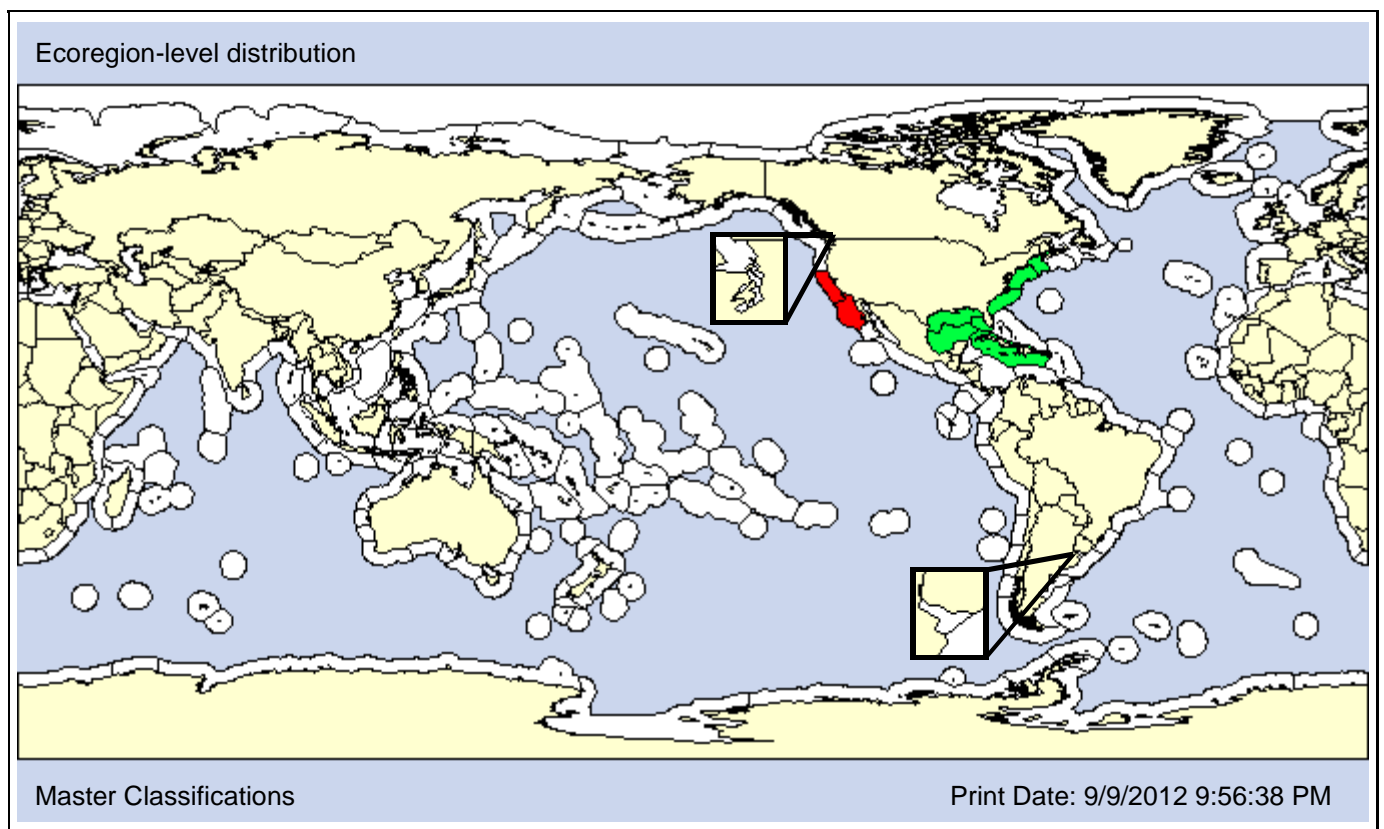
**Also Known As (Name - Type):**

Ampelisca milleri of NEP authors; not Barnard, 1954  
Photis californica of authors in part

Misidentified  
Misidentified

**Common Names:**

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

**Date 1st record:** 1954  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
<b>X</b>		<b>X</b>				<b>AO X</b>	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>		<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 60m] [Pref: 0 - 27m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 0 - 100%] [Pref % Fines: - 15.6%]**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	

**SALINITY [Obs: 4.5 - 35psu] [Pref: 10 - 25psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>
		<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		<b>X</b>
						<b>X</b>							



**Taxon:** Amphipod

**Taxonomic Author:** Bate, 1858

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Ampithoidae

**Subfamily:**

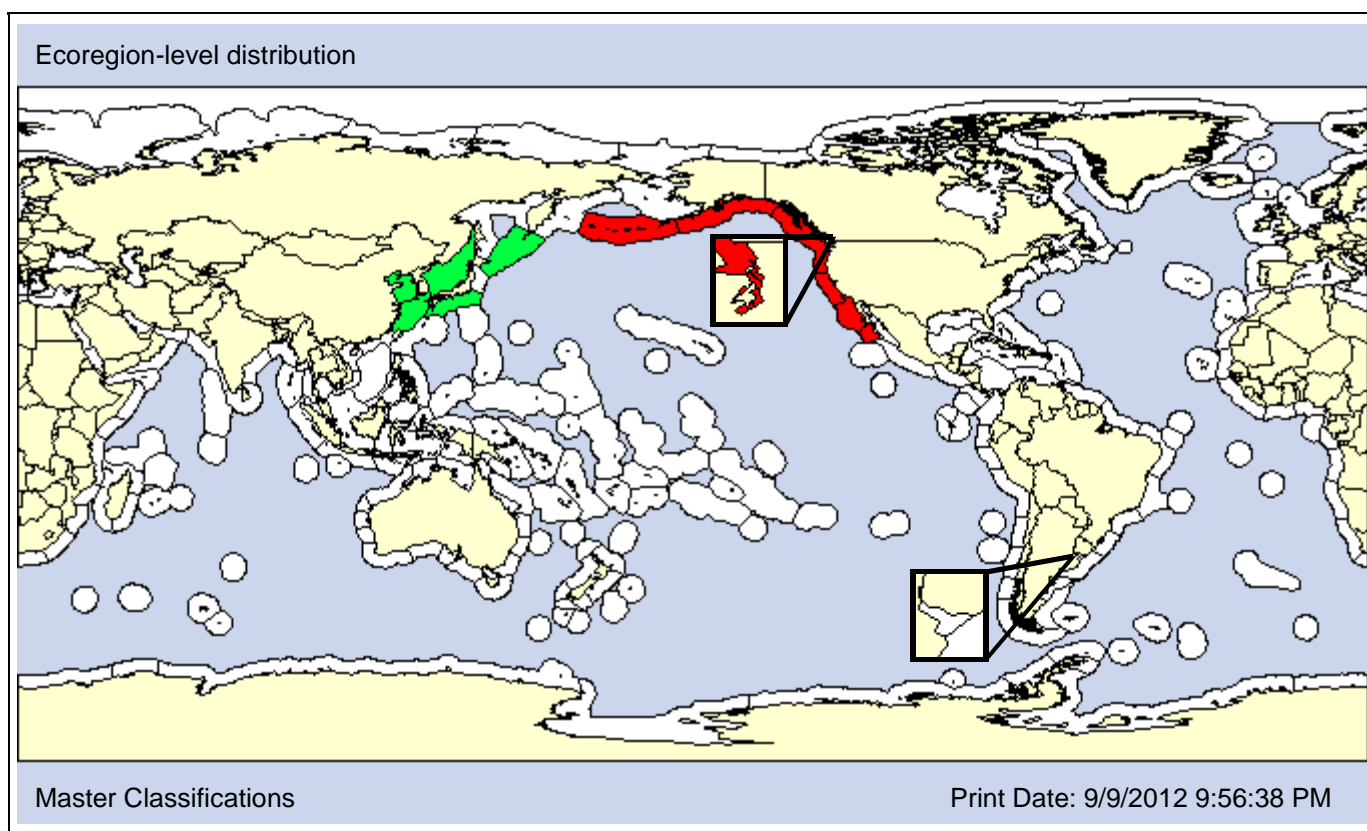
**Also Known As (Name - Type):**

Ampithoe japonica	Synonym
Ampithoe macrurus	Synonym
Ampithoe scitulus	Synonym
Dexamine scitulus	Synonym

**Common Names:**

--

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1954

**Loc 1st record:** Native

Oregon, USA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO <b>X</b>								

Comments: Chapman (2009) considers *Ampithoe lacertosa* introduced in the NEP because it only occurs on artificial substrata and introduced algae, and its abundance in Japan. He considers it is "probably" native to Asia. CANOD (2009) suggests it is "likely a native of NEP introduced to Japan." We tentatively use Chapman's classifications.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>	<b>X</b>	<b>X</b>
<b>X</b>	<b>X</b>	<b>X</b>					<b>X</b>						

**DEPTH [Obs: 0 - 24m] [Pref: 0 - 11m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 5.67 - 96.42%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>				<b>P</b>	<b>O</b>		<b>P</b>		<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 29 - 33.25psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
				<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Smith, 1873

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

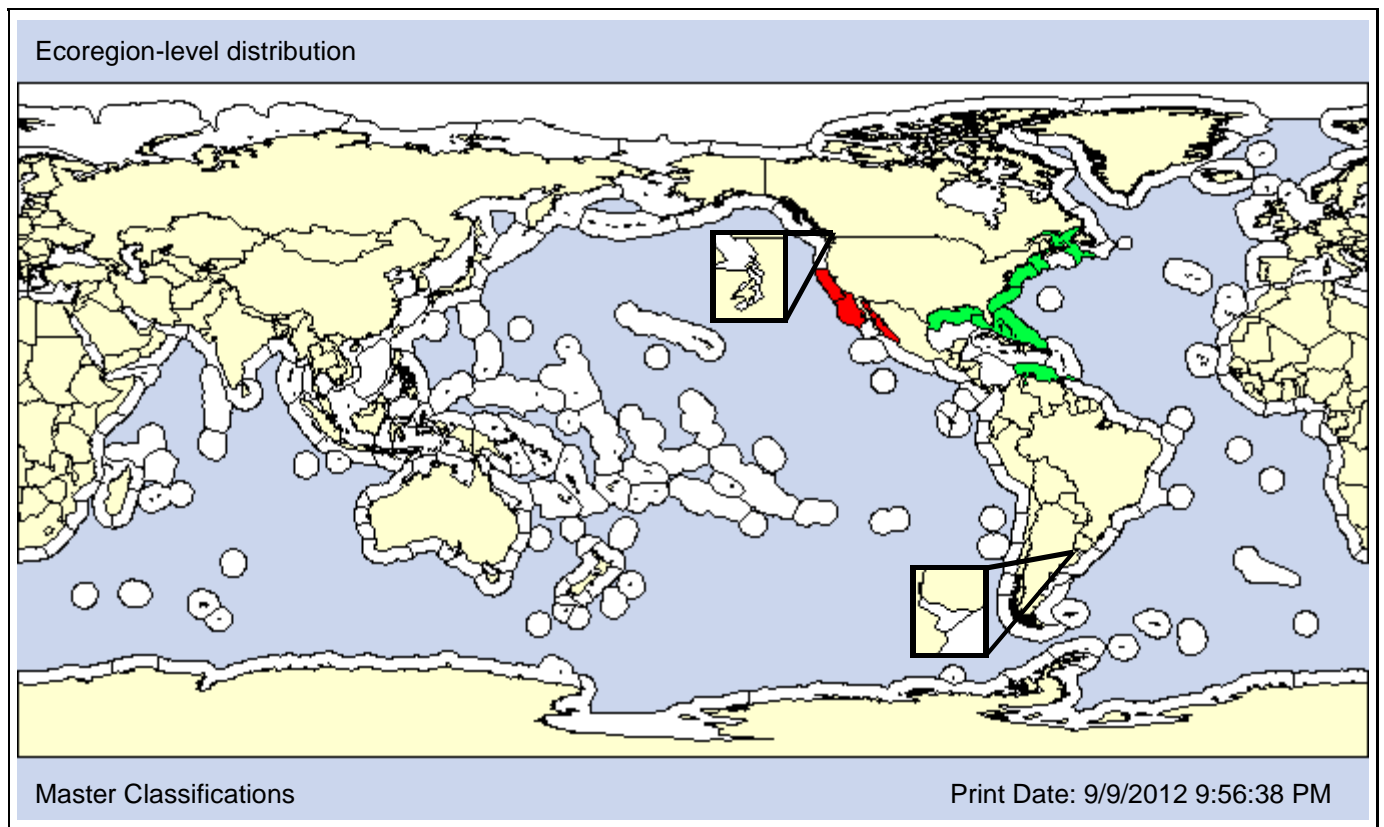
**Family:** Ampithoidea

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1949  
**Loc 1st record:** Newport Bay, California  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: *Ampithoe longimana* may receive protection from predators by accumulating toxins from algae it ingests (Hay et al., 1990).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH				<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 38m] [Pref: 0 - 10m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 51.73 - 57.58%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>					<b>O</b>	

**SALINITY [Obs: 29 - 35psu] [Pref: 30 - psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>	<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

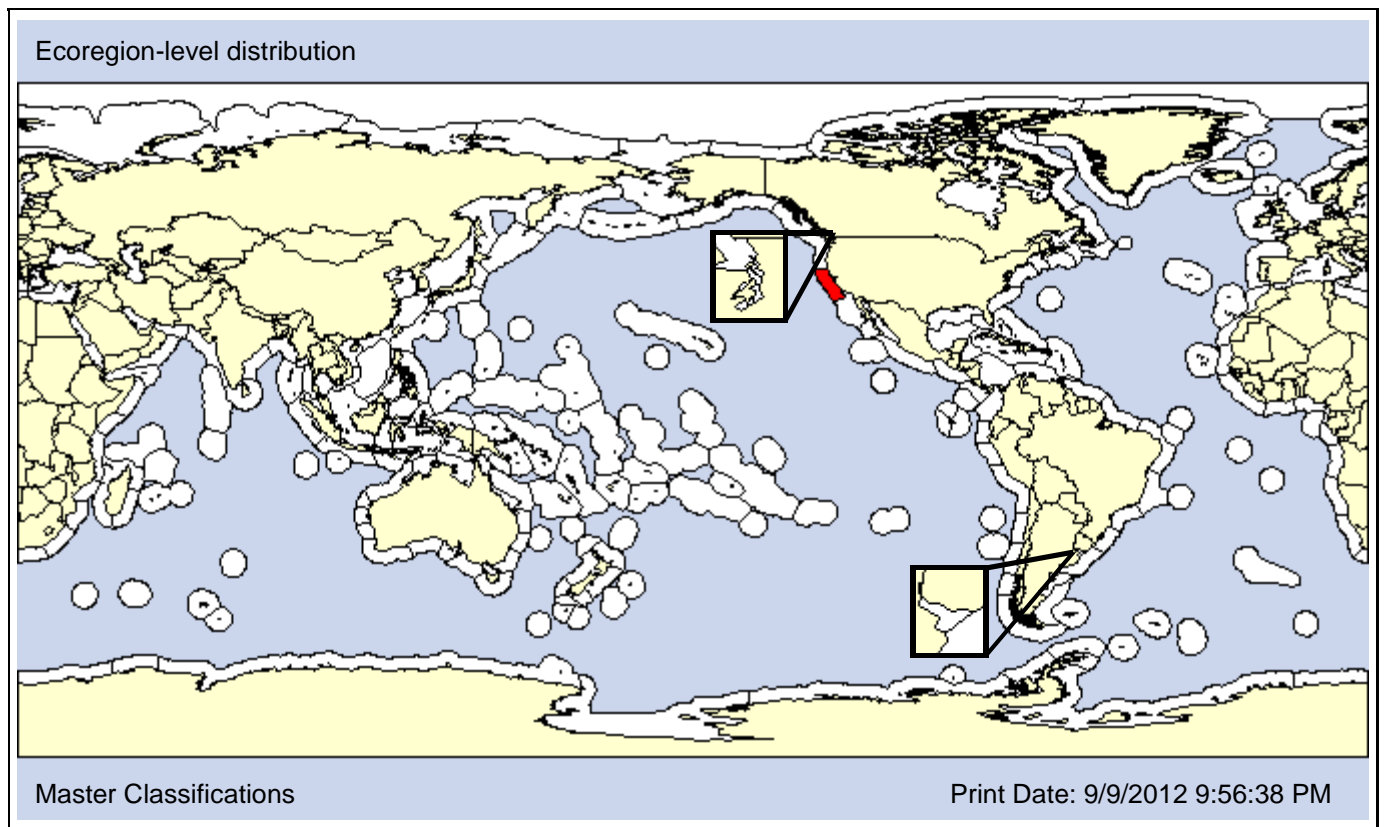
**Family:** Ampithoidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** California, USA



<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:lightcoral; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-style:dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:lightgrey; border:1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; background-color:white; border:1px solid black;"></span> Unidentified
		NWP		Hawaii		NEP	

**Date 1st record:** 1993-1994  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: "These Ampithoe appear genetically distinct from *A. lacertosa* and *A. valida* on the [U.S. Pacific] coast (John Darling) but this has not been followed through" (Chapman, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH <b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 1m] [Pref: 0 - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: 29 - 30psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Smith, 1873

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Ampithoidea

**Subfamily:**

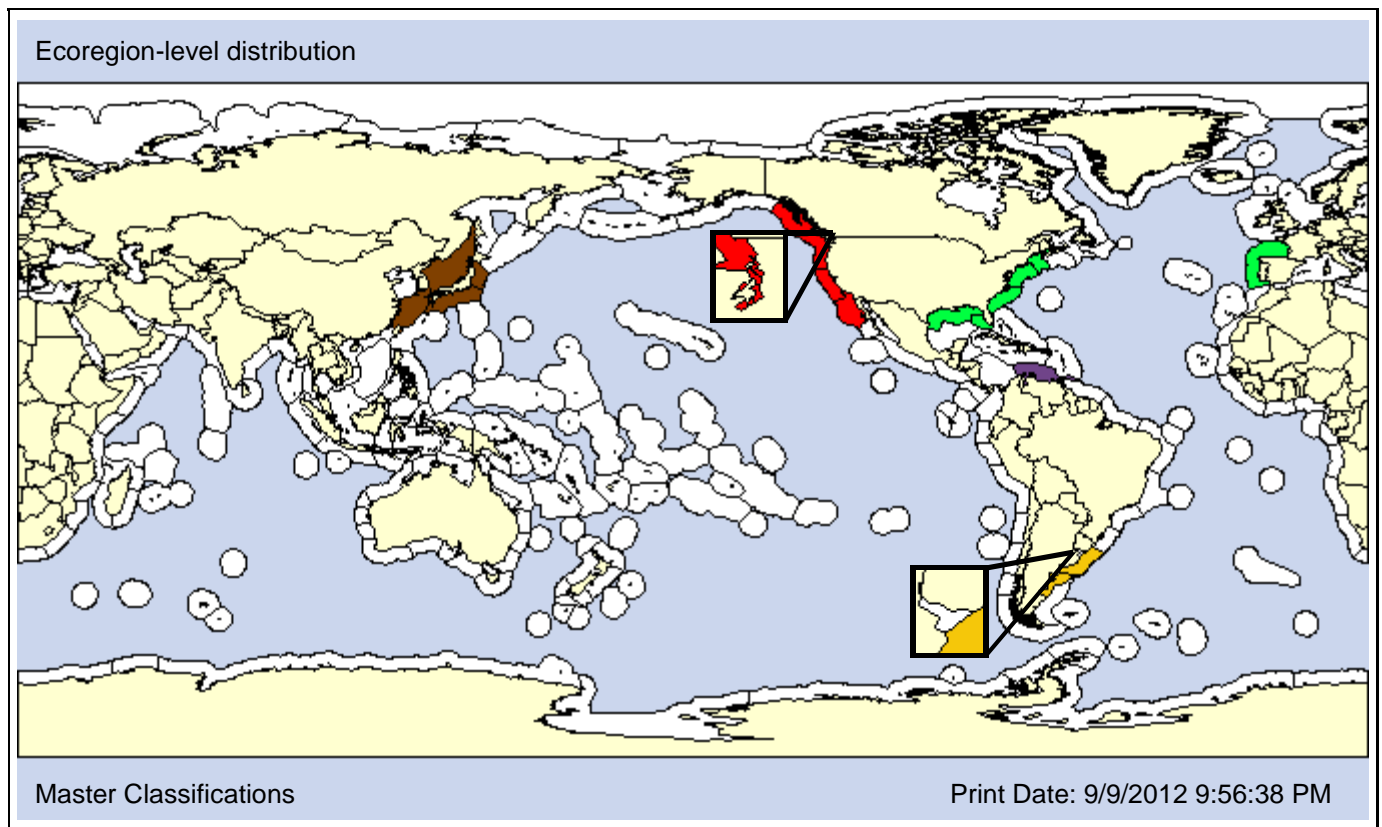
**Also Known As (Name - Type):**

Ampithoe shimizuensis  
Ampithoe valida shimizuensis

Synonym  
Convention

**Common Names:**

**Type Locality:**



**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Unknown

1941  
San Francisco Estuary, CA  
Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
<b>X</b>		<b>X</b>				<b>AO X</b>	PO							

Comments: Ampithoe valida is likely an Atlantic species that has been introduced into the Pacific (Chapman, 2007, Pilgram and Darling, 2010). However, Doi et al. (2001) classify it as cryptogenic in Japan since they state that its presence in Japan has not been verified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH				<b>X</b>	
	<b>X</b>						<b>X</b>						

**DEPTH [Obs: 0 - 30m] [Pref: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.7 - 96.33%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>		<b>O</b>			

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>		<b>O</b>		<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 24 - 35.5psu] [Pref: 29 - psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Amphipod

**Taxonomic Author:** Gurjanova, 1938

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Aoridae

**Subfamily:**

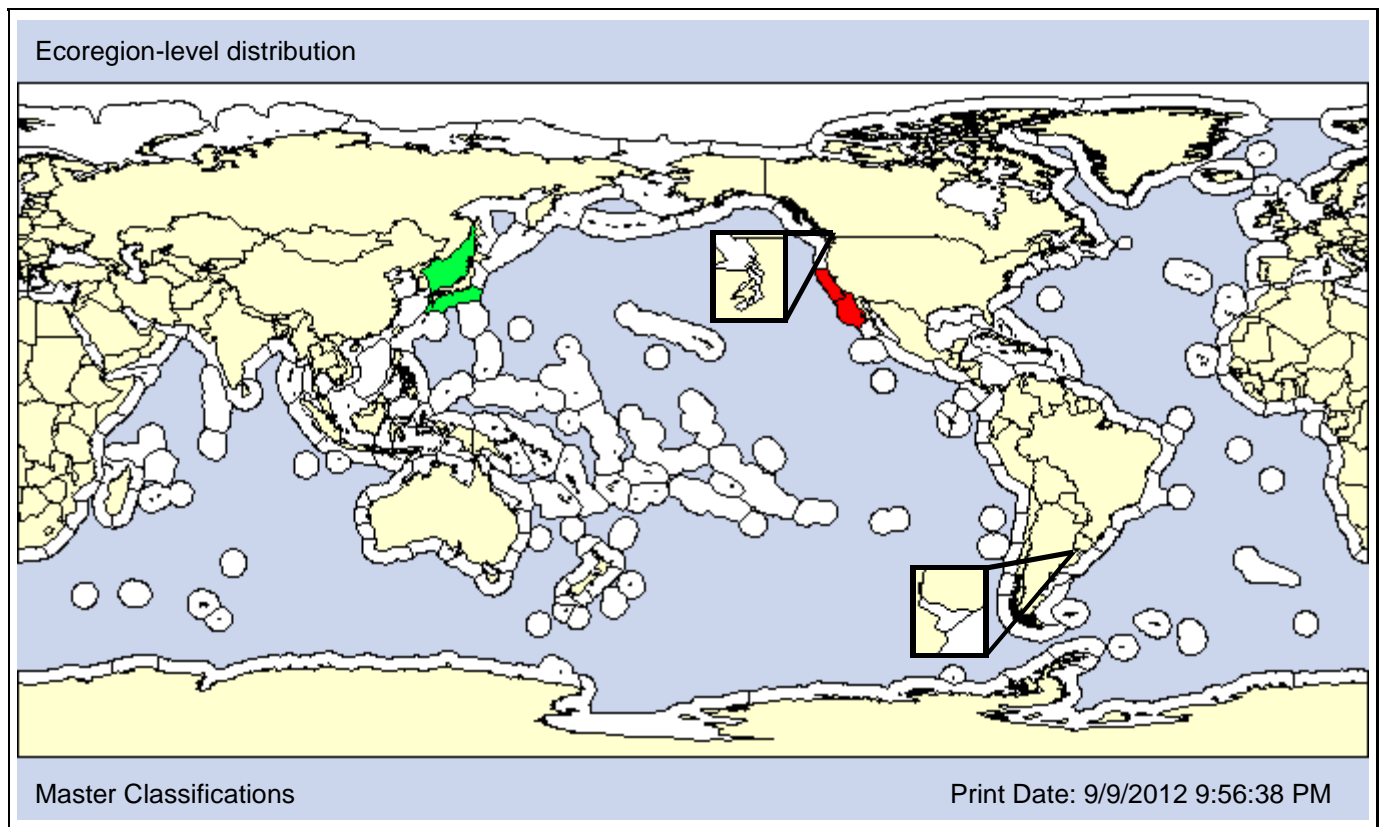
**Also Known As (Name - Type):**

Aora secunda  
Aoroides secunda

Synonym  
Convention

**Common Names:**

**Type Locality:**



**Date 1st record:** Native

1998

**Loc 1st record:** Native

Southern California

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 3.4m] [Pref: 0 - 2m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 25.01 - 26%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											<b>P</b>	<b>O</b>	<b>P</b>	

**SALINITY [Obs: 32.3 - 32.3psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF <b>X</b>				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					
			<b>X</b>								

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Czerniavskii, 1898

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Caprellidea

**Infraorder:** Caprellida

**Superfamily:** Caprelloidea

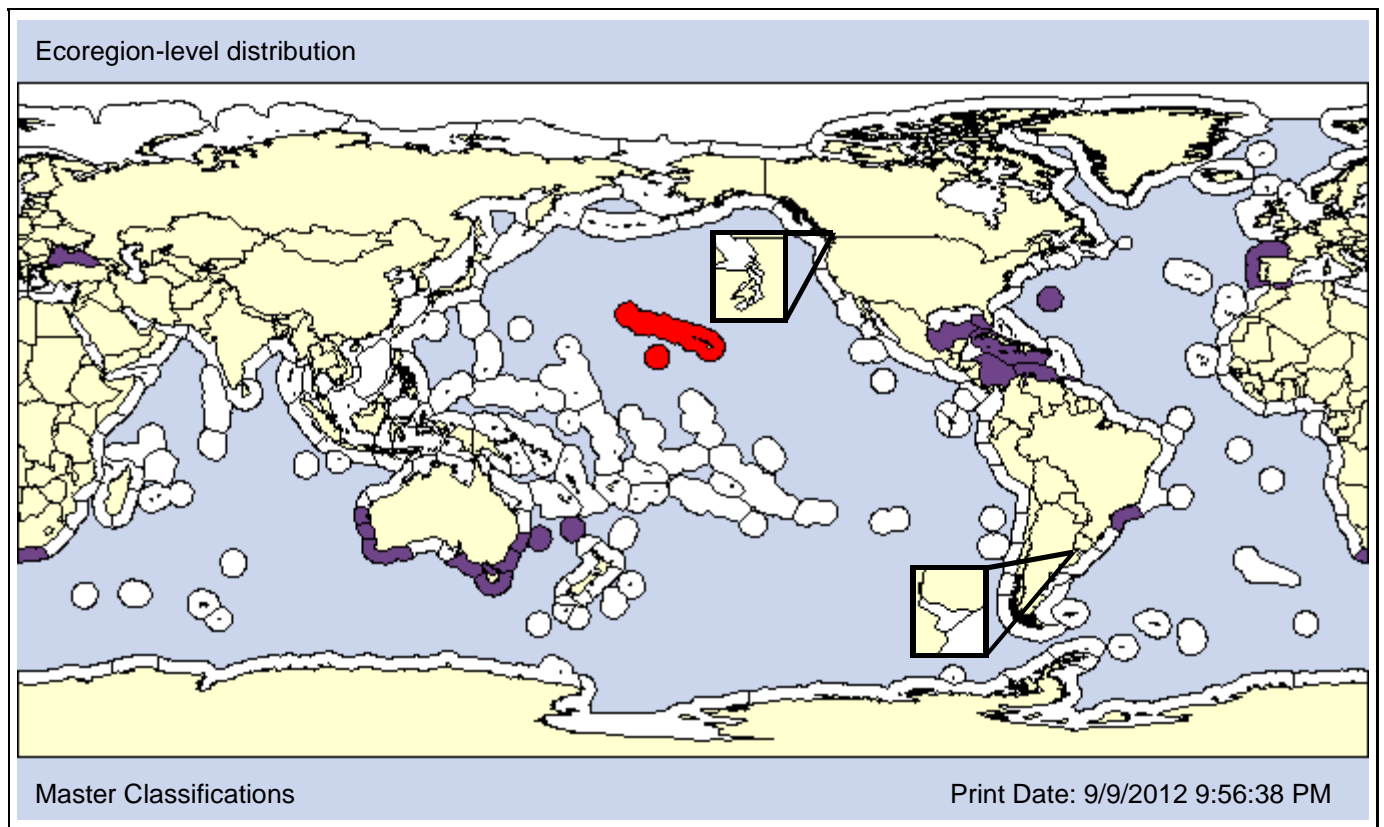
**Family:** Caprellidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Black Sea



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 1921  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: First described in the Black Sea, the native region of *Caprella danilevskii* is unknown. It has been found on a wide range of biotic substrates, including *Sargassum*. It has also been found on muddy substrates as deep as 2120 m in the Gulf of Mexico, perhaps due to sediment transport and turbidity currents (Winfield et al., 2006).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 2120m] [Pref: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 18 - 30psu] [Pref: 25 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Amphipod      **Taxonomic Author:** Mayer, 1890

**Kingdom:** Animalia      **Subkingdom:** Eumetazoa      **Phylum:** Arthropoda

**Subphylum:** Crustacea      **Superclass:**      **Class:** Malacostraca

**Subclass:** Eumalacostraca      **Infraclass:**      **Superorder:** Peracarida

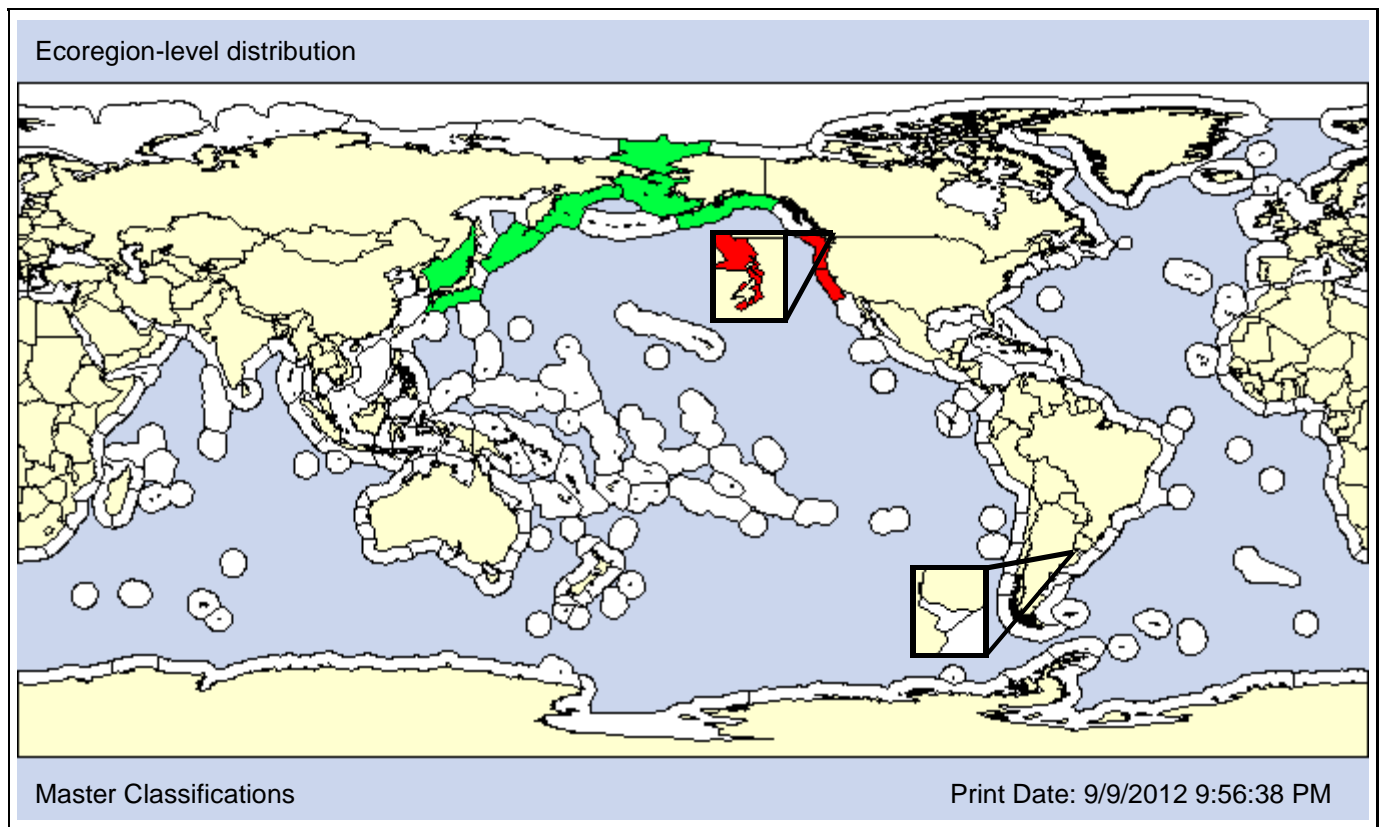
**Order:** Amphipoda      **Suborder:** Caprellidea      **Infraorder:** Caprellida

**Superfamily:** Caprelloidea      **Family:** Caprellidae      **Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** "Reise von China nach der Amurmündung"



Native   
  Nonindigenous   
  NIS Not Established   
  Cryptogenic   
  Transient   
  Unclassified   
  Conflicting Classification   
  Unidentified

**Date 1st record:** Native      1999

**Loc 1st record:** Native      Humboldt Bay, CA

**Established:** Yes      Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO <b>X</b>								

Comments: Watling and Carlton (2007) consider *Caprella drepanochir* as "probably introduced in ship fouling from Japan" in Coos Bay, though it appears to be native in Alaska. However, the taxonomy is uncertain (Chapman, pers. com.) and more detailed studies on its distribution along the NEP coast are needed.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
		<b>X</b>											

**DEPTH [Obs: 0 - 330m] [Pref: 1 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2.78 - 90.36%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	<b>O</b>

**SALINITY [Obs: 26.6 - 32.9psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Say, 1818

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Caprellidea

**Infraorder:** Caprellida

**Superfamily:** Caprelloidea

**Family:** Caprellidae

**Subfamily:**

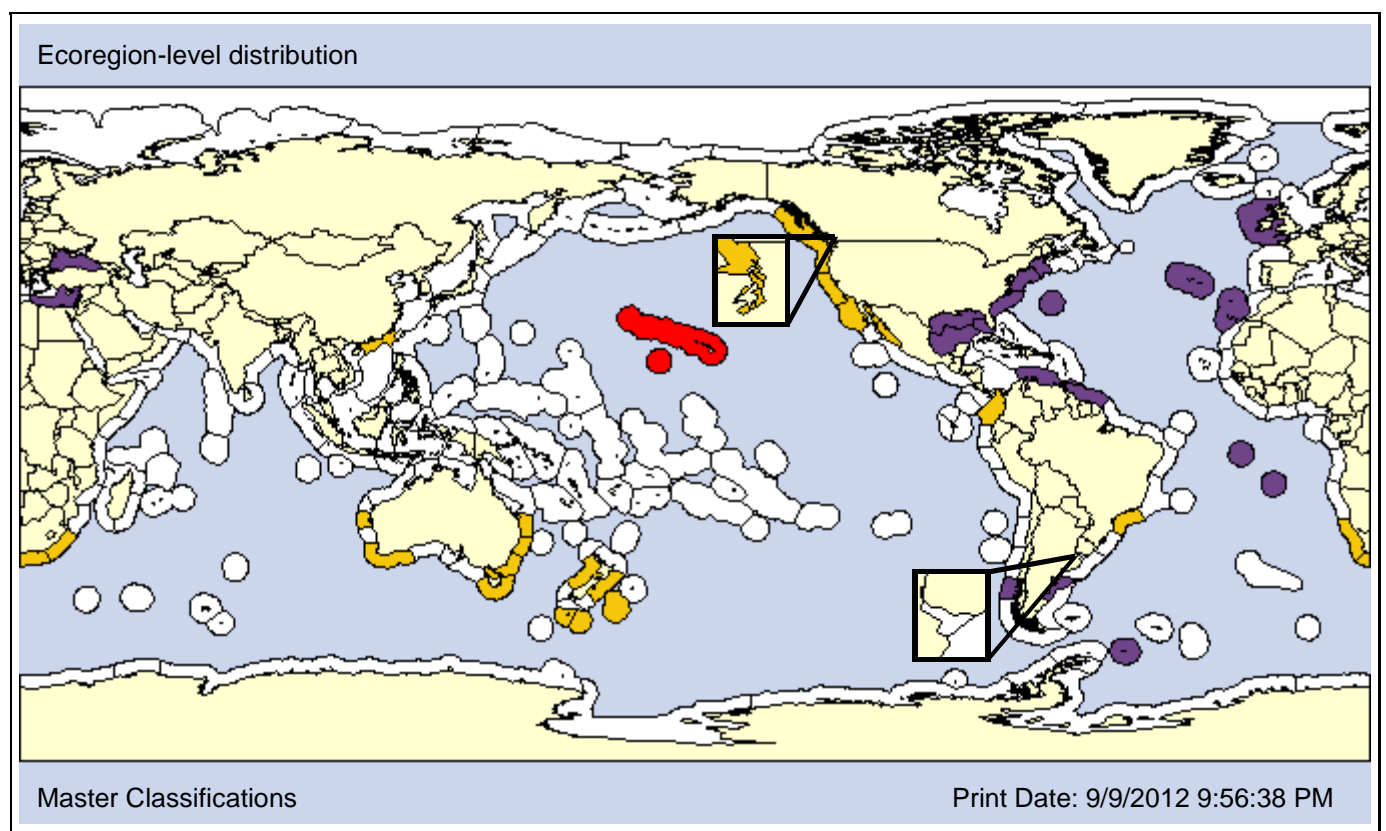
**Also Known As (Name - Type):**

Caprella aequilibra	Synonym
Caprella esmareckii	Synonym
Caprella januarii	Synonym
Caprella laticornis	Synonym

**Common Names:**

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**Type Locality:** South Carolina, USA



Master Classifications Print Date: 9/9/2012 9:56:38 PM

<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;"> </span> NIS Not Established	<span style="color: yellow;">■</span> Cryptogenic	<span style="color: cyan;">■</span> Transient	<span style="color: purple;">■</span> Unclassified	<span style="color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;"> </span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1890

1944

Unknown

**Loc 1st record:** Japan

Oahu, Hawaii

Unknown

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: Caprella equilibra likely consists of multiple species and its native range is unknown. However, Watling and Carlton (2007) suggest that at least part of its wide distribution "is doubtless due to transport on ship fouling." We use regional classifications when available and extrapolate those to province and or regional scales.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 3700m] [Pref: 0 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2.05 - 71.8%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>					<b>P</b>					<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 15 - 36psu] [Pref: - 33psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Amphipod

**Taxonomic Author:** Schurin, 1935

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Caprellida

**Superfamily:** Caprelloidea

**Family:** Caprellidae

**Subfamily:** Caprellinae

**Also Known As (Name - Type):**

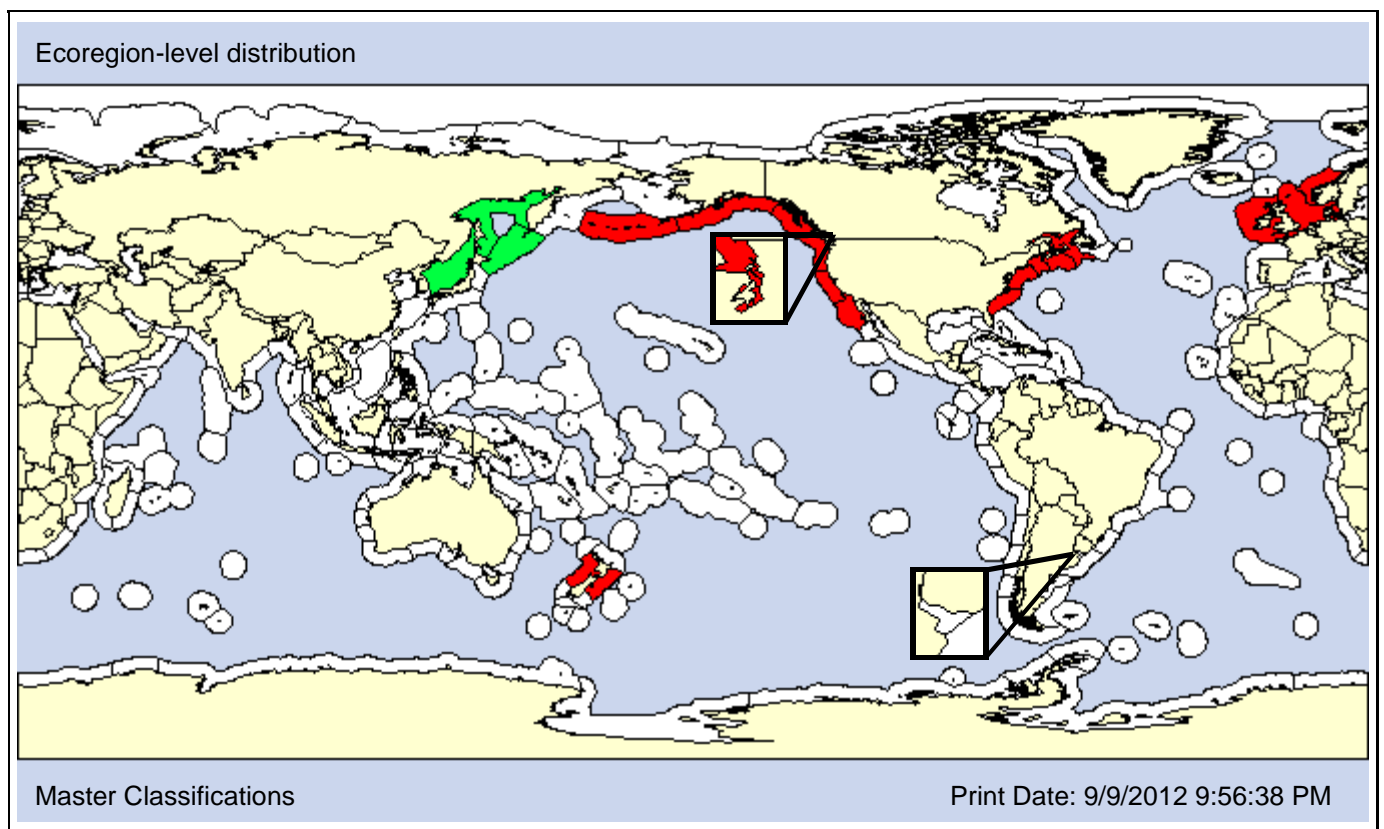
Caprella acanthogaster of NEP authors  
 Caprella cf acanthogaster of NEP authors  
 Caprella macho

Misidentified  
 Misidentified  
 Synonym

**Common Names:**

Japanese skeleton shrimp

**Type Locality:** Patrokl Bight, Peter the Great Bay, Russia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1973

**Loc 1st record:** Native

Humboldt Bay, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO <b>X</b>									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>
		<b>X</b>											

**DEPTH [Obs: 0 - 33m] [Pref: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 9.26 - 15.44%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>P</b>	<b>P</b>			<b>P</b>	<b>O</b>				<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 11 - 35psu] [Pref: 20 - 33psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Leach, 1814

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Caprellidea

**Infraorder:** Caprellida

**Superfamily:** Caprelloidea

**Family:** Caprellidae

**Subfamily:**

**Also Known As (Name - Type):**

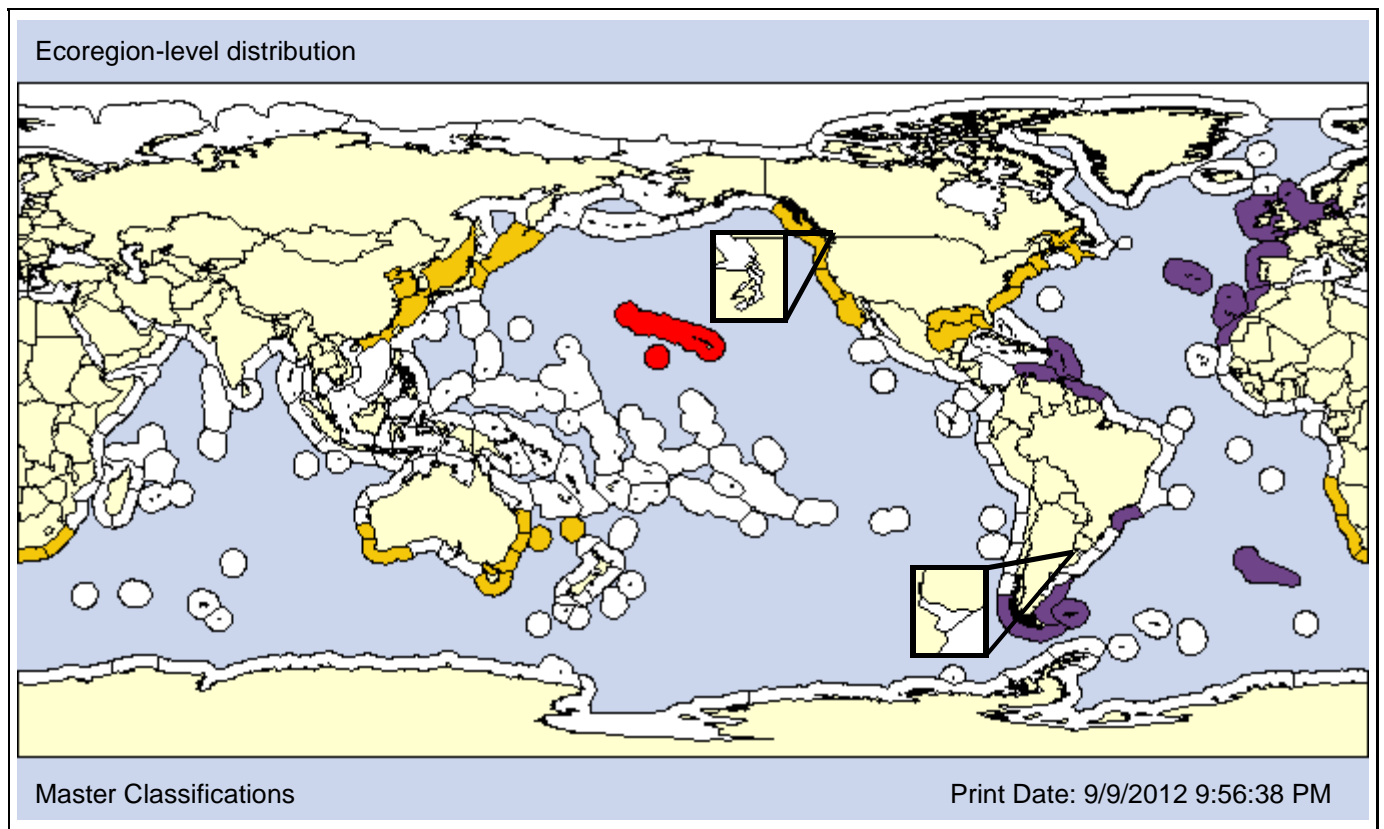
- Caprella (Rostrhicephala) penantis
- Caprella acutifrons Latreille, 1816
- Caprella neglecta
- Caprella neglecta barbigr

- Convention
- Synonym
- Synonym
- Synonym

**Common Names:**

--	--

**Type Locality:** Devonshire Coast, England



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP

Hawaii

NEP

**Date 1st record:** ca. 1890?

1921

Unknown

**Loc 1st record:** Japan

Oahu, Hawaii

Unknown

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: Caprella penantis likely consists of multiple species and its native range is unknown. Therefore, we use regional classifications when available and list it as unclassified elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 562m] [Pref: 0 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>						<b>O</b>					<b>O</b>	<b>O</b>

**SALINITY [Obs: 18 - 35psu] [Pref: - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Templeton, 1836

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Caprellida

**Superfamily:** Caprelloidea

**Family:** Caprellidae

**Subfamily:** Caprellinae

**Also Known As (Name - Type):**

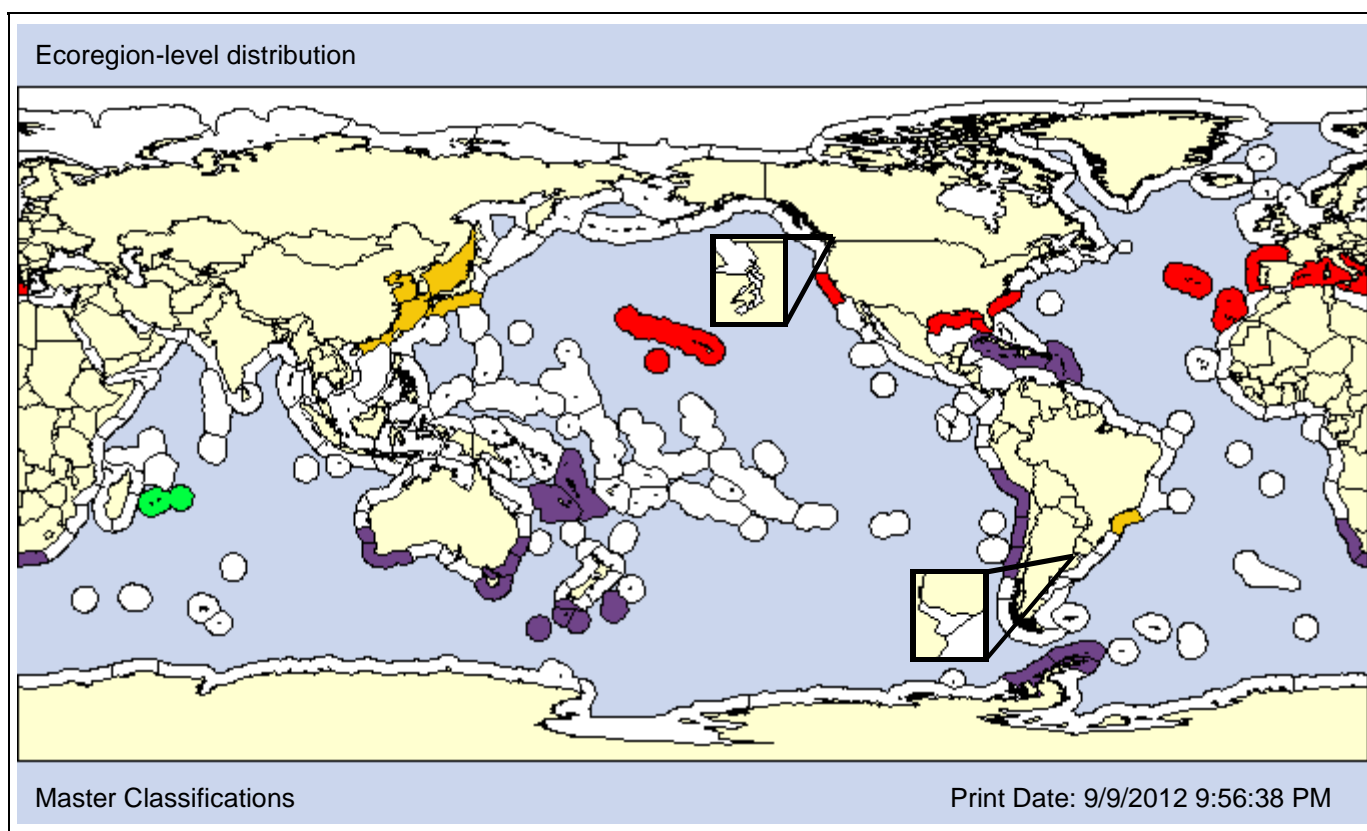
Caprella (Spinicephala) scaura diceros  
 Caprella (Spinicephala) scaura hamata  
 Caprella (Spinicephala) scaura typica  
 Caprella attenuata

Convention  
 Convention  
 Convention  
 Synonym

**Common Names:**

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**Type Locality:** Rivière Noire, Mauritius (Indian Ocean)



Master Classifications: NWP Hawaii NEP

Print Date: 9/9/2012 9:56:38 PM

**Date 1st record:** 1875 (Japan), 1929 (Pearl Harbor, Oahu, Hawaii), 1978 (San Francisco Estuary, CA)  
**Loc 1st record:** Japan, Pearl Harbor, Oahu, Hawaii, San Francisco Estuary, CA  
**Established:** Yes, Yes, Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: The native region of *Caprella scaura* s.s. may be the western Indian Ocean (Martinez and Adarraga, 2008); though global reports likely represent a species complex (Ashton, 2010). We use regional classifications when available, including an introduced status for the estuarine populations in the NEP (Watling and Carlton, 2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 17m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>				<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 29 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>		<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Mayer, 1903

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Caprellidea

**Infraorder:** Caprellida

**Superfamily:** Caprelloidea

**Family:** Caprellidae

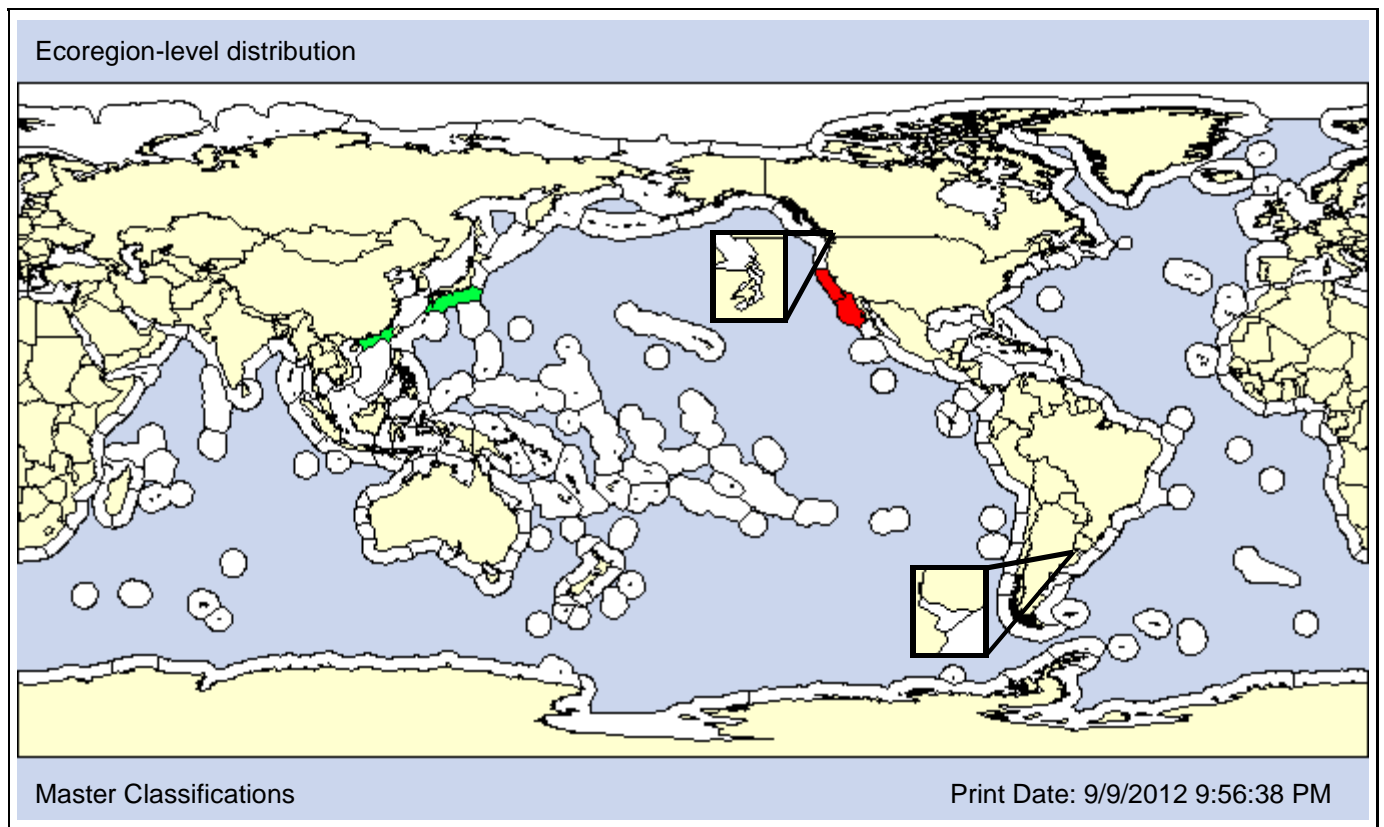
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Caprella tateyamensis	Synonym	
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

2000

**Loc 1st record:** Native

Long Beach Harbor, CA

**Established:** Yes

Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
<span style="color: red;">X</span>		<span style="color: red;">X</span>				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	

**DEPTH [Obs: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

R O	HP	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
						O							O	

**SALINITY [Obs: 16.4 - 34.5psu] [Pref: 31.5 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
			O	O	O				

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	
						X							



**Taxon:** Amphipod

**Taxonomic Author:** (Lilljeborg, 1865)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:** Lysianassoidea

**Family:** Uristidae

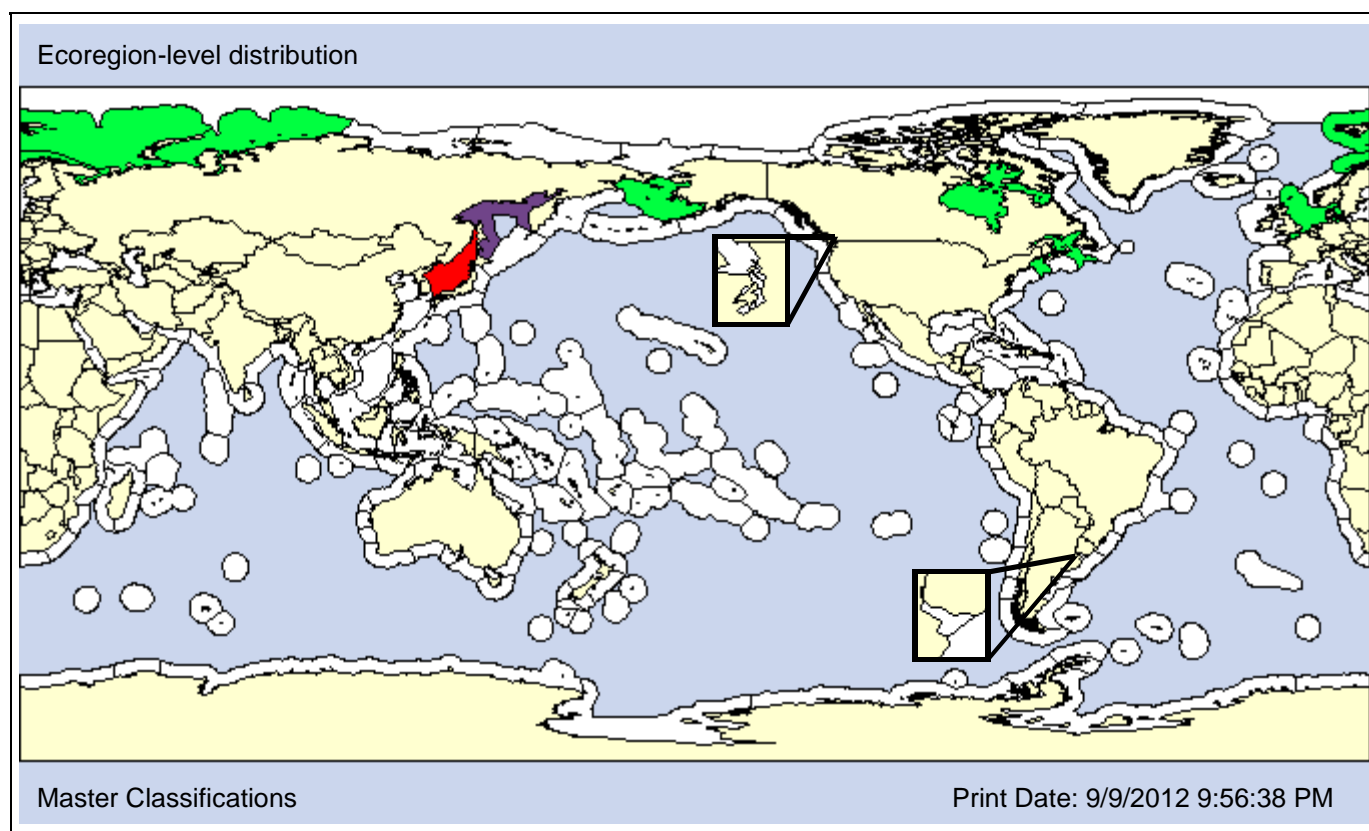
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Centromedon pumilis	Misspelling	
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**Type Locality:**



**Date 1st record:** <1994

**Loc 1st record:** Sea of Japan

**Established:** Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Centromedon pumilus* is widely distributed in the North Atlantic and Arctic. It has been reported from the Sea of Okhotsk and from a single sample in the Sea of Japan. We tentatively list it as introduced in the Sea of Japan based on Zvyagintsev et al. (2011), though it is possible that its occurrence there represents a southern transient event.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
				<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: - 403m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	<b>O</b>		

**Pelagic Depth**

Epipelagic			Meso		Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Amphipod

**Taxonomic Author:** (Giles, 1885)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Corophiidae

**Subfamily:** Protomedeiinae

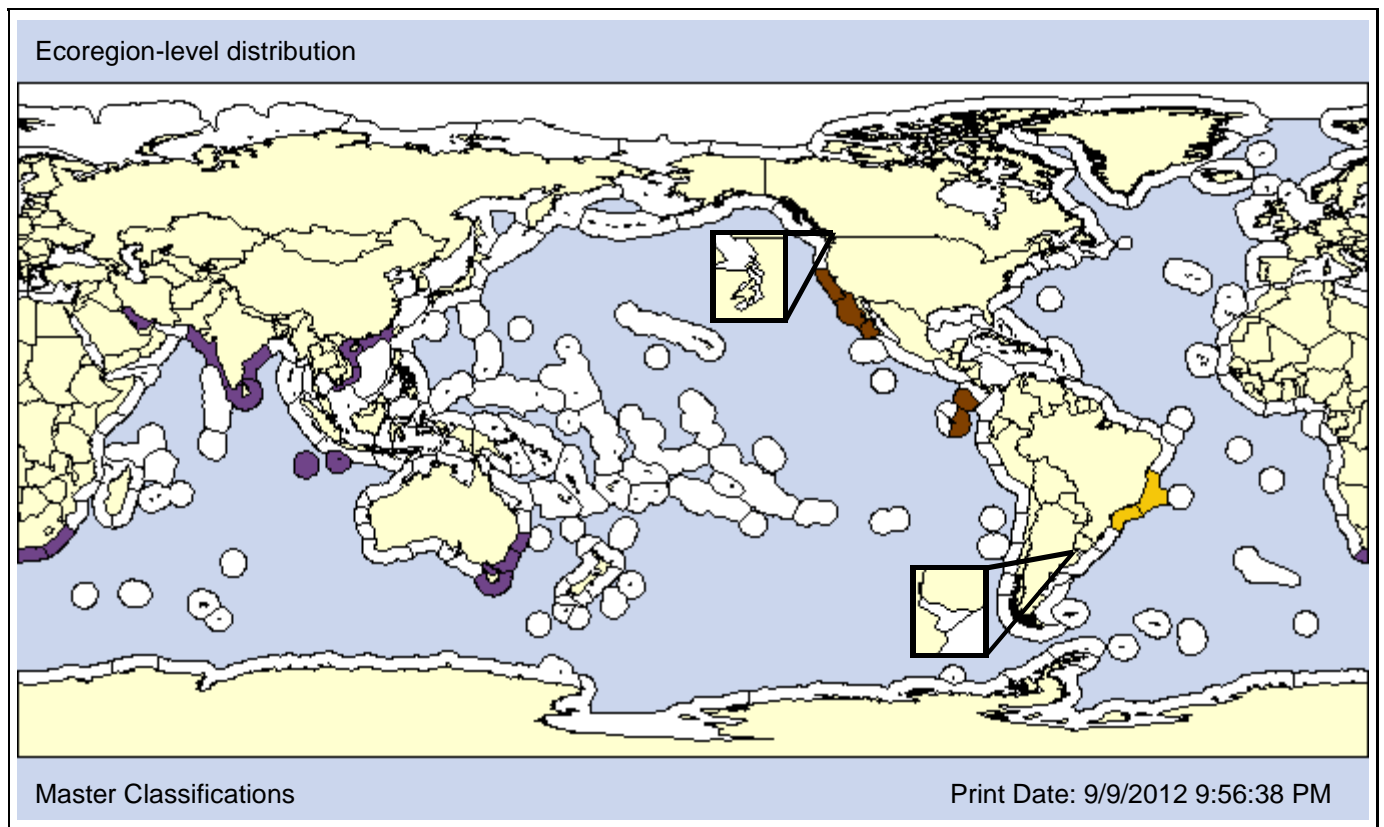
**Also Known As (Name - Type):**

Eurystheus monuropus	Synonym
Melita megacheles	Synonym

**Common Names:**

--

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

Unknown

**Loc 1st record:**

Unknown

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: Chapman (2009) considers *Cheiriphotis megacheles* a likely introduction in the Eastern Pacific while Chapman (2007) and CANOD (2009) classify it as cryptogenic and consider it a possible species complex. We treat this as a conflict, and consider it unclassified in South Africa and cryptogenic in Brazil.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated X			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X
		<b>X</b>						<b>X</b>				

**DEPTH [Obs: 0 - 110m] [Pref: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>O</b>	<b>P</b>					<b>O</b>	

**SALINITY [Obs: 5 - 35psu] [Pref: 30 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Philippi, 1839

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:** Cheluroidea

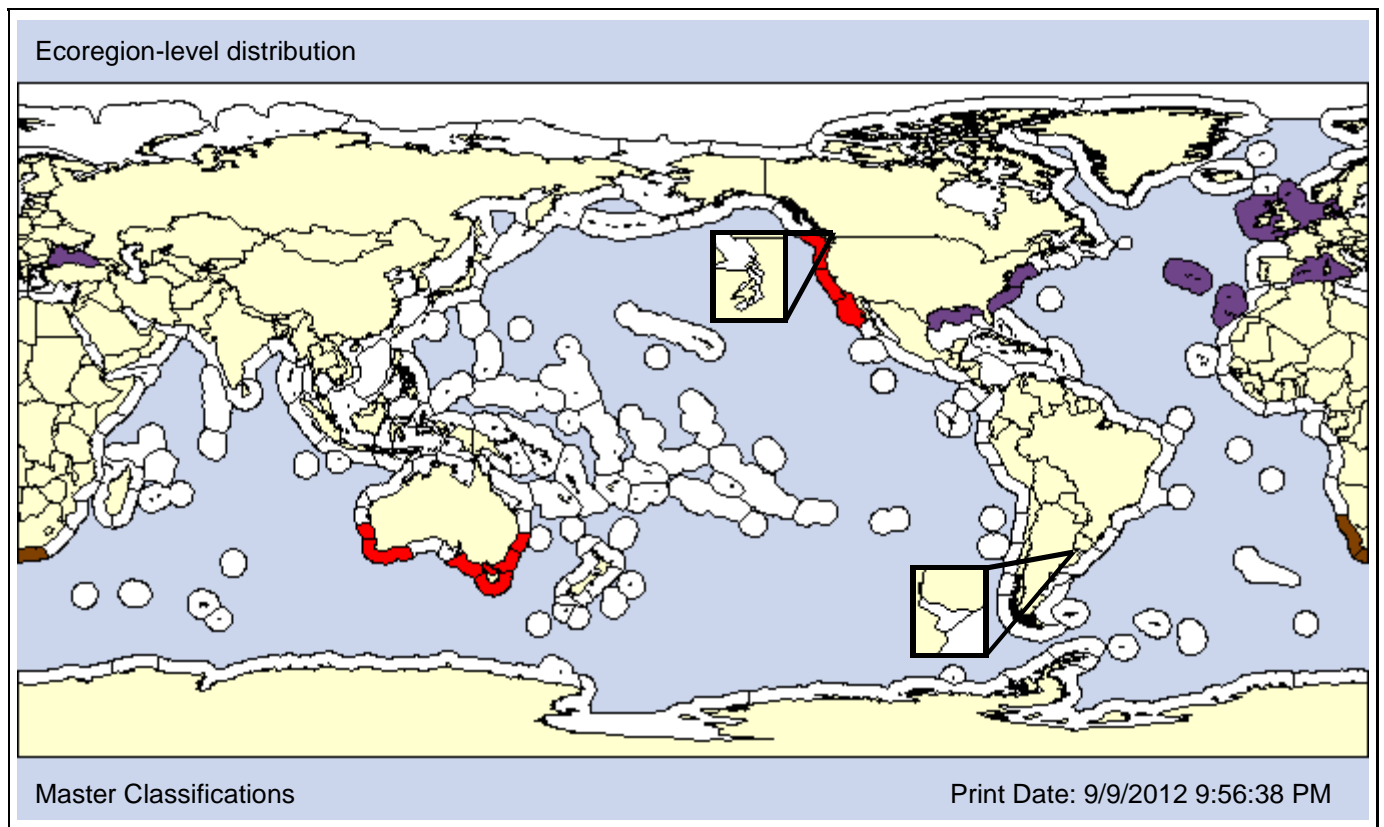
**Family:** Cheluridae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Trieste, Italy



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

**Date 1st record:**

1948

**Loc 1st record:**

San Fransico Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		<b>X</b>				AO	PO								

Comments: The amphipod *Chelura terebrans* lives in *Limnoria* burrows in wood. As with *Limnoria*, the native range of *C. terebrans* is unknown, though it has been classified as nonindigenous in certain regions based on the date of its discovery.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 1103m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 79.7 - 79.7%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>		<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 25 - 40psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>
					<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>	<b>X</b>				
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Chapman, 1988

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Corophiidae

**Subfamily:**

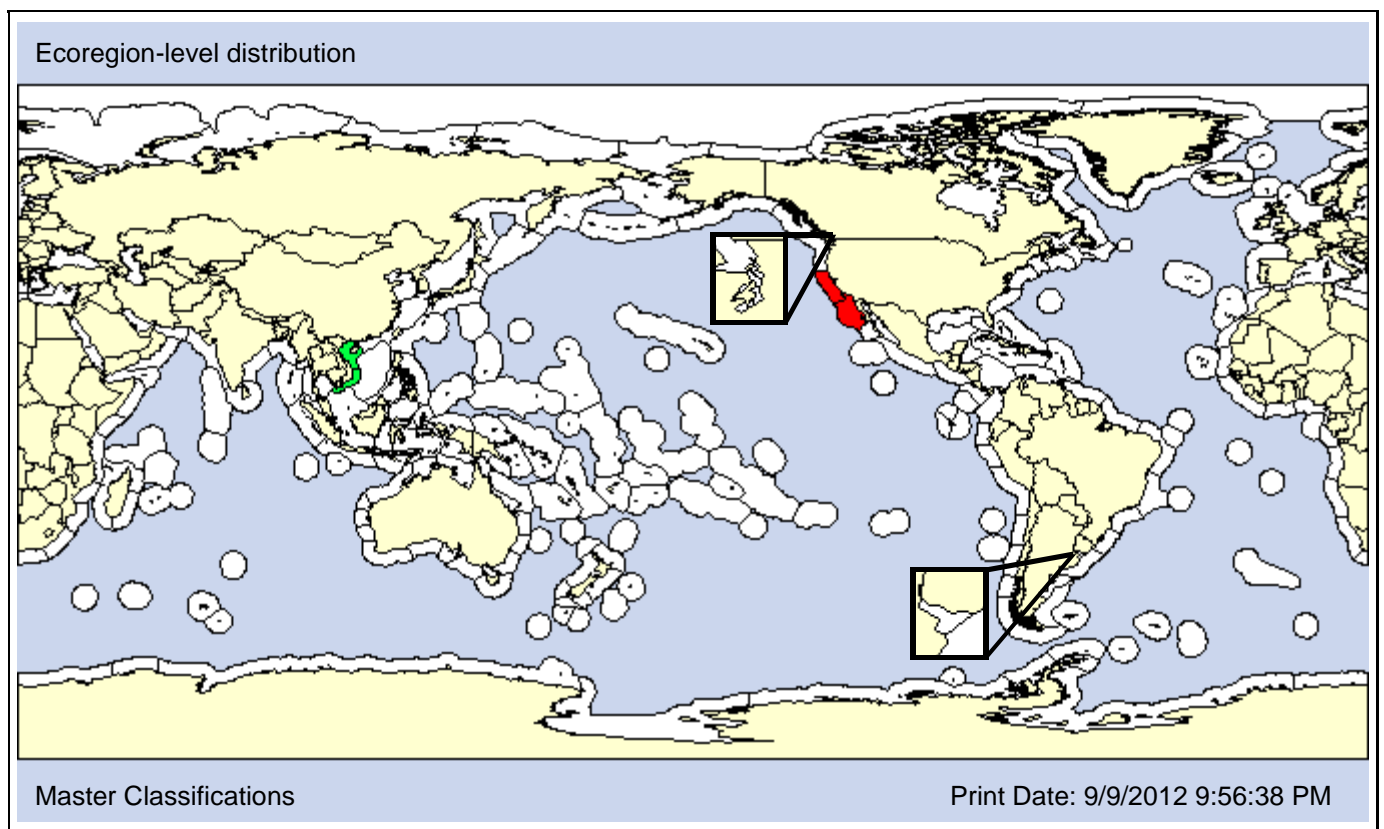
**Also Known As (Name - Type):**

Corophium sp. of Carlton 1979  
Sinocorophium alienense

Synonym  
Synonym

**Common Names:**

**Type Locality:** San Francisco Estuary, California, USA



**Date 1st record:**

1986

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
X		X				AO	PO							

Comments: Chapman (2007) states that *Corophium alienense* was introduced into the San Francisco Estuary from Asia during the Vietnam War. We assume that the native region includes both the Gulf of Tonkin and Southern Vietnam Ecoregions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		X			TP	RI-PH				X	
	X	X					X						

**DEPTH [Obs: 0 - 64m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 48.39 - 99.5%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O	P				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												O	O	

**SALINITY [Obs: 6 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline P		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	
		O	O	O	P	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		
						X							



# Corophium heteroceratum

Species ID: 775

**Taxon:** Amphipod

**Taxonomic Author:** Yu, 1938

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Corophiidae

**Subfamily:**

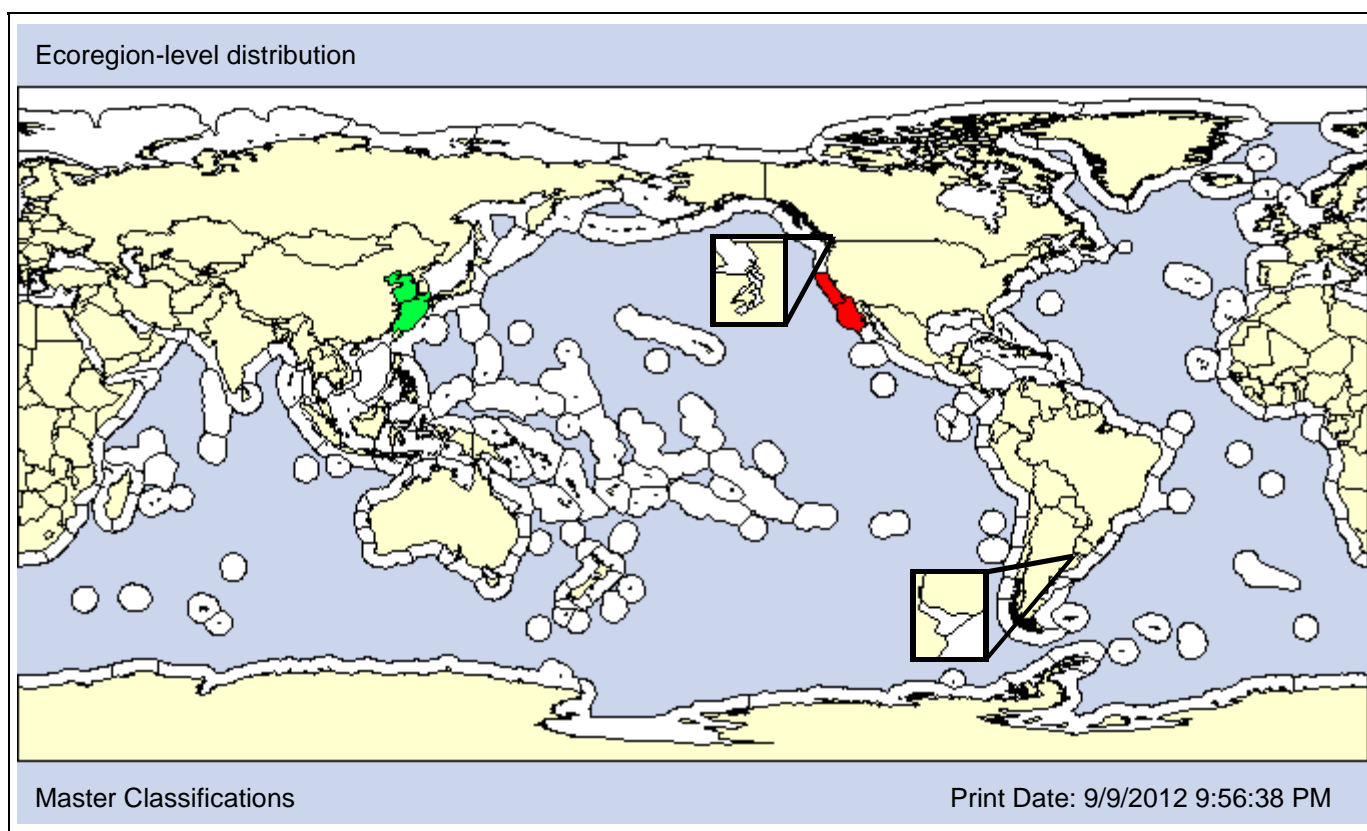
**Also Known As (Name - Type):**

Corophium (Sinocorophium) heteroceratum  
 Sinocorophium cf heteroceratum  
 Sinocorophium heteroceratum

Convention  
 Convention  
 Synonym

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1986  
**Loc 1st record:** Native San Fransico Estuary, CA  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 30m] [Pref: - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2.6 - 93.57%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 20 - 33.27psu] [Pref: 20 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline P		Polyhaline P		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Amphipod

**Taxonomic Author:** Costa, 1853

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Maeridae

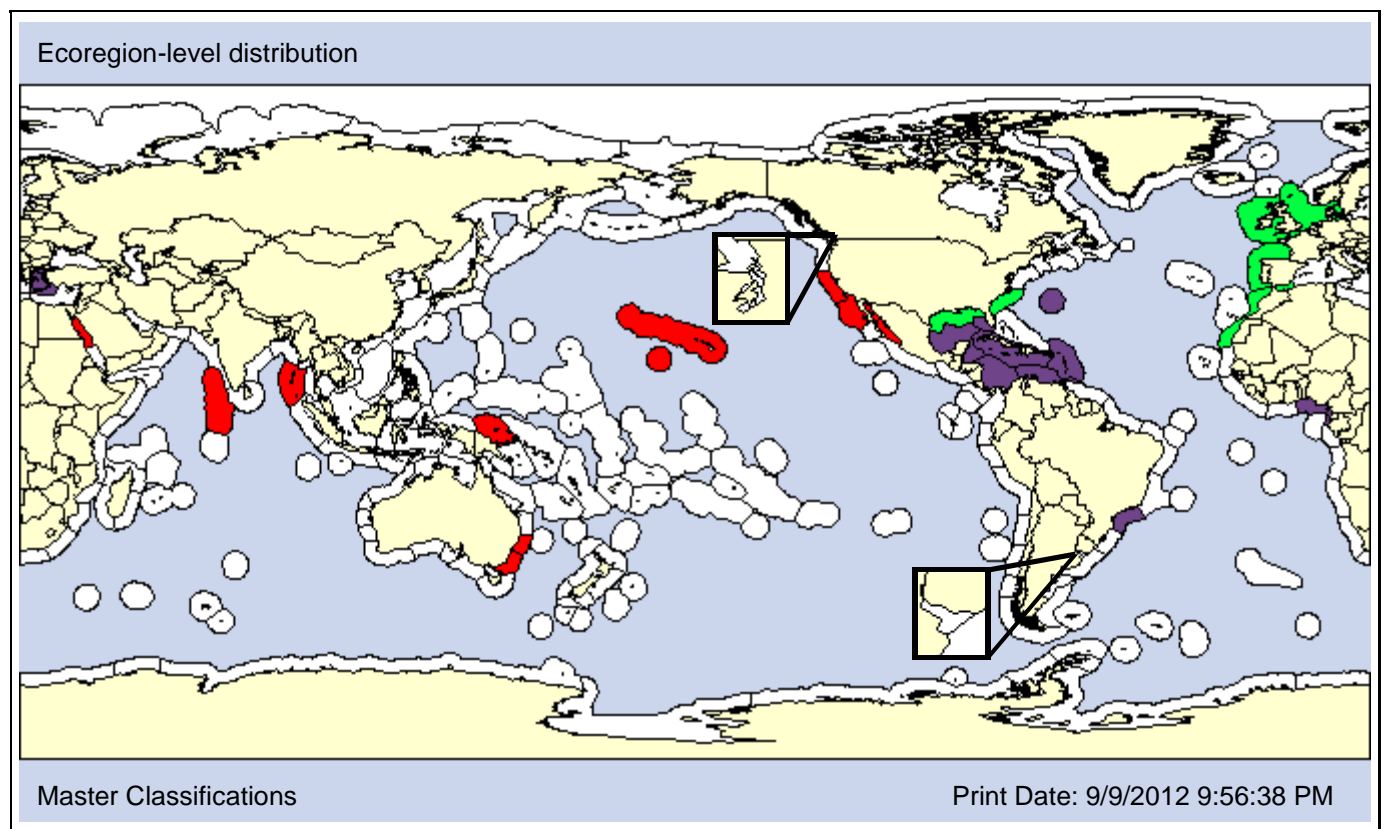
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Elasmopus 'rapax' of Carlton and Eldredge, 2009	Synonym	
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**Type Locality:**



**Date 1st record:**

1937

Unknown

**Loc 1st record:**

Kaneohe Bay, Hawaii

Unknown

**Established:**

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: Though it may represent a species complex, it is tentatively considered native in the north Atlantic and introduced in Hawaii (Carlton and Eldredge, 2009), the NEP (Chapman, 2007), and Australia (Sliwa et al., 2009). We treat it as introduced in the Pacific and Indian Ocean and unclassified in the Caribbean.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 419m] [Pref: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>			<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>						<b>O</b>				<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 29.3 - 35psu] [Pref: 30 - psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Cadien, 1996

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Oedicerotidae

**Subfamily:**

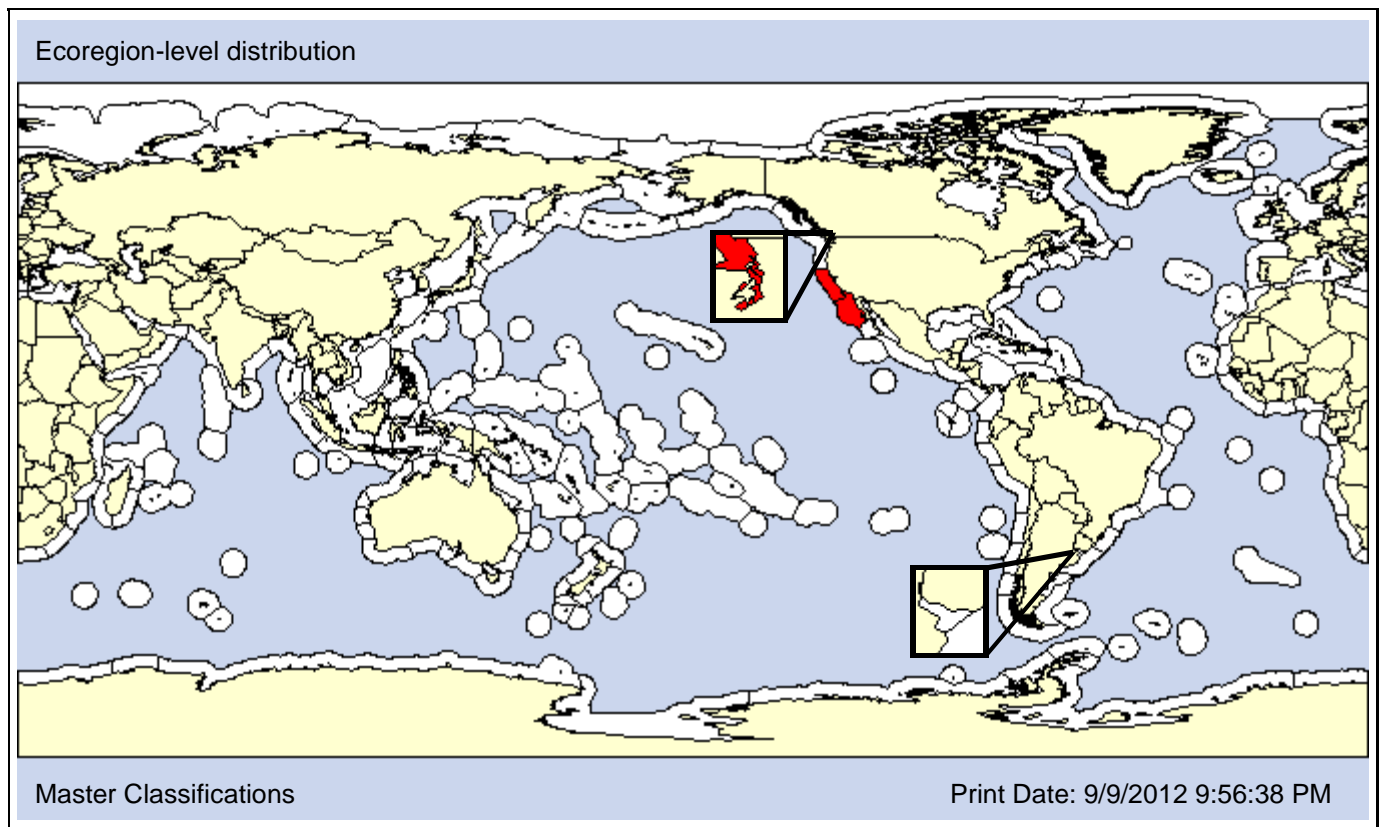
**Also Known As (Name - Type):**

Eochelidium cf. miraculum	Synonym
Eochelidium miraculum of NEP authors	Synonym
Eochelidium sp. A (SCAMIT)	Synonym
Eochelidium sp. cf. E. miraculum	Synonym

**Common Names:**

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**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1993

**Loc 1st record:** Native

Long Beach Harbor, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: The identify of the Eochelidium species in the NEP is unclear, however, the genus Eochelidium only occurs in the Western Pacific, and thus was likely introduced from Japan or Korea. We include the various provisional Eochelidium species reported in the NEP under this name.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
	<b>X</b>												

**DEPTH [Obs: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>		<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Amphipod

**Taxonomic Author:** (Dana, 1853)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Caprellida

**Superfamily:**

**Family:** Ischyroceridae

**Subfamily:**

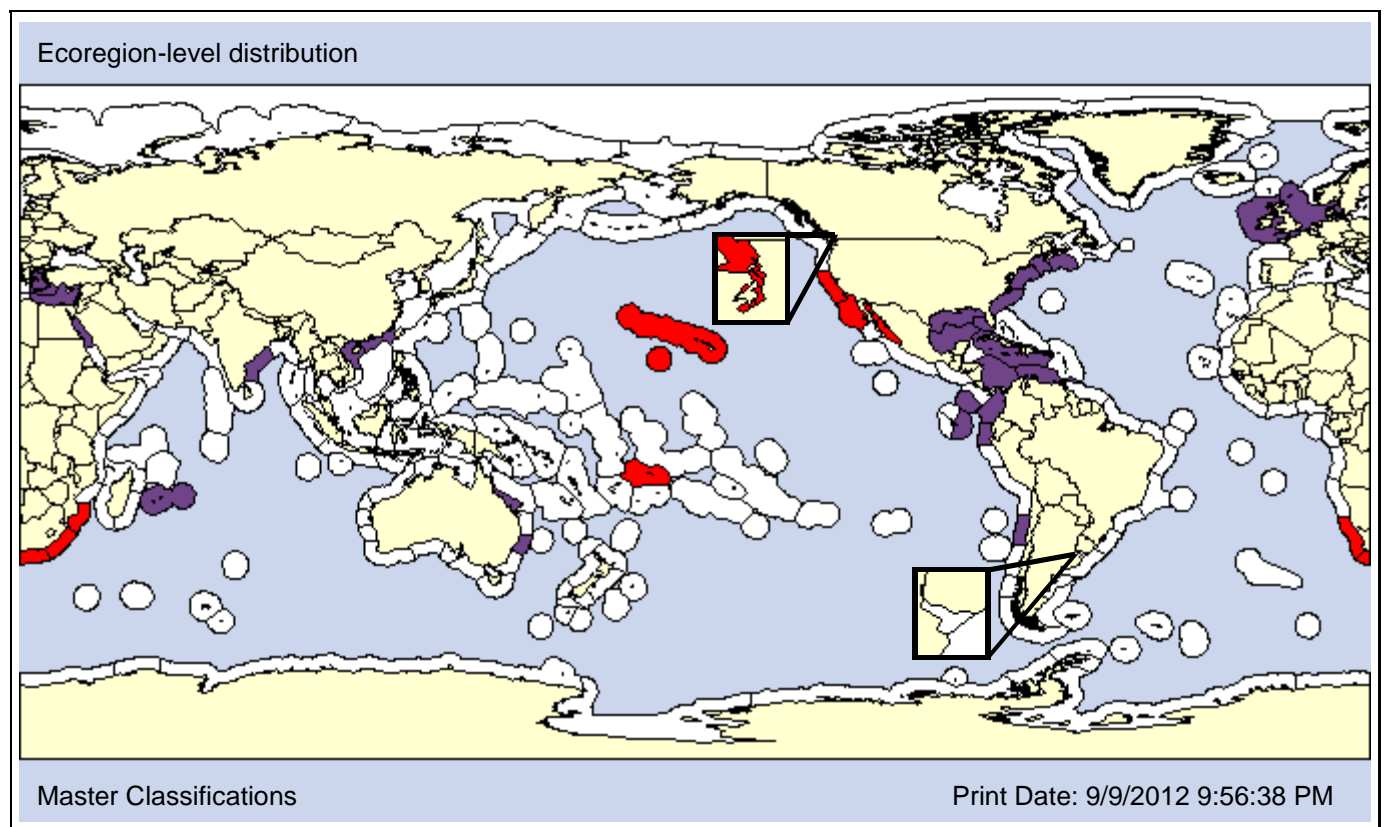
**Also Known As (Name - Type):**

Cerapus brasiliensis	Synonym
Erichthonius rapax	Synonym
Pyctilus brasiliensis	Synonym

**Common Names:**

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**Type Locality:** North Atlantic



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

**Date 1st record:**

1935

Unknown

**Loc 1st record:**

Kaneohe Bay, Hawaii

Unknown

**Established:**

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: In the NEP, the harbor and open-coast populations of *Erichthonius brasiliensis* likely represent different species, with the harbor species likely introduced (Chapman, 2007). It is considered an invader in Hawaii, Central Polynesia, and South Africa. In other regions, we list it as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>						<b>X</b>					

**DEPTH [Obs: 0 - 300m] [Pref: 1 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.8 - 96.3%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>				<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>								<b>Artificial Substrate P</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>P</b>	<b>O</b>			<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 28 - 39.42psu] [Pref: - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF <b>X</b>				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					
			<b>X</b>								

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>								<b>Epibiotic X</b>		
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Amphipod

**Taxonomic Author:** Bousfield, 1969

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Gammaridae

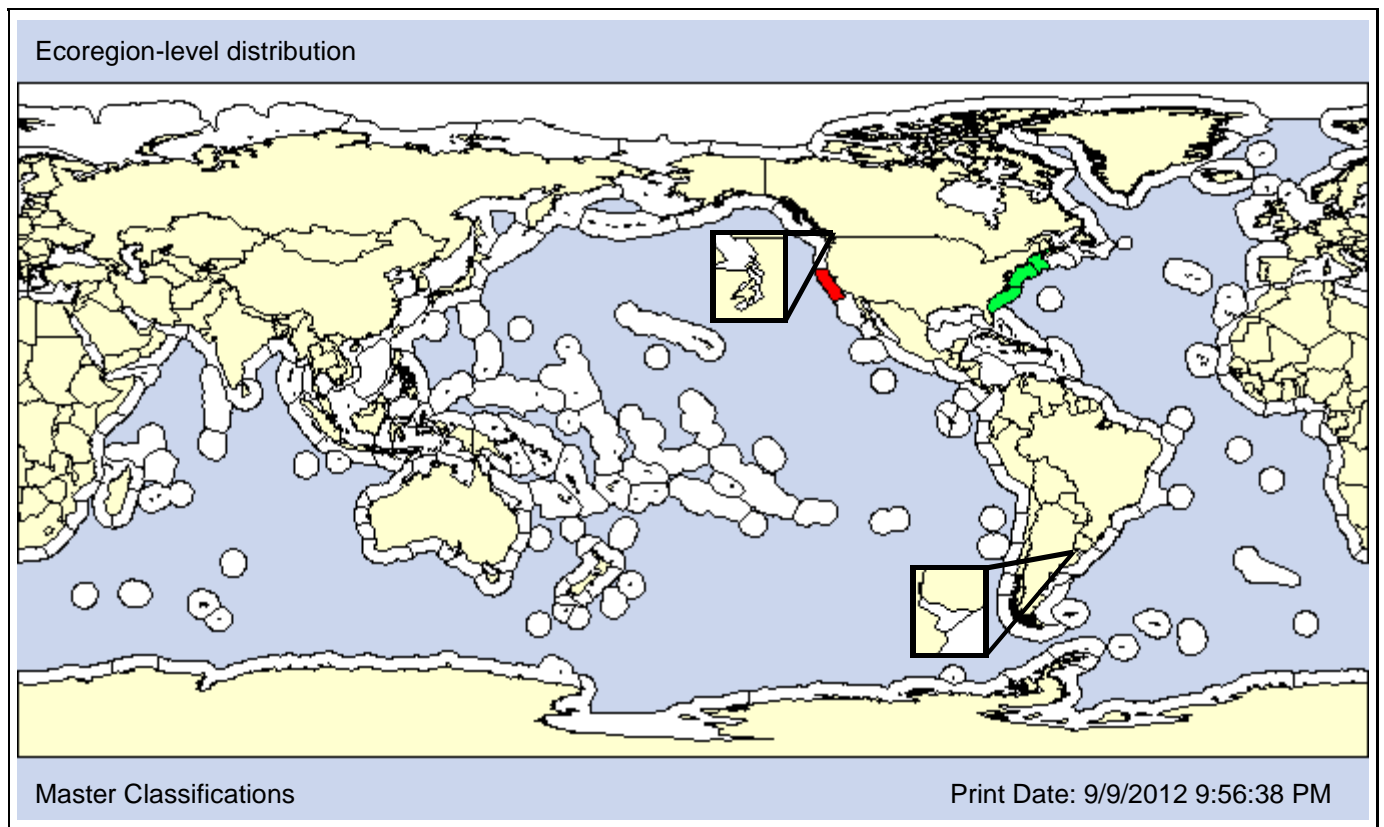
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Lagunogammarus setosus of NEP authors in part	Misidentified	
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1983  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments: *Gammarus daiberi* is native to the NWA, but it is considered introduced into the Hudson River in New York (USGS - NAS; Mills et al., 1996). It is benthic and semi-pelagic. In freshwater portions of the San Francisco Estuary, *G. daiberi* was abundant on both hyacinth and pennywort.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 5m] [Pref: 0.5 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>				<b>O</b>	<b>O</b>	

**SALINITY [Obs: 0 - 30psu] [Pref: 0.5 - 5psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	
			<b>X</b>										

**Taxon:** Amphipod

**Taxonomic Author:** (Say, 1818)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Gammaridae

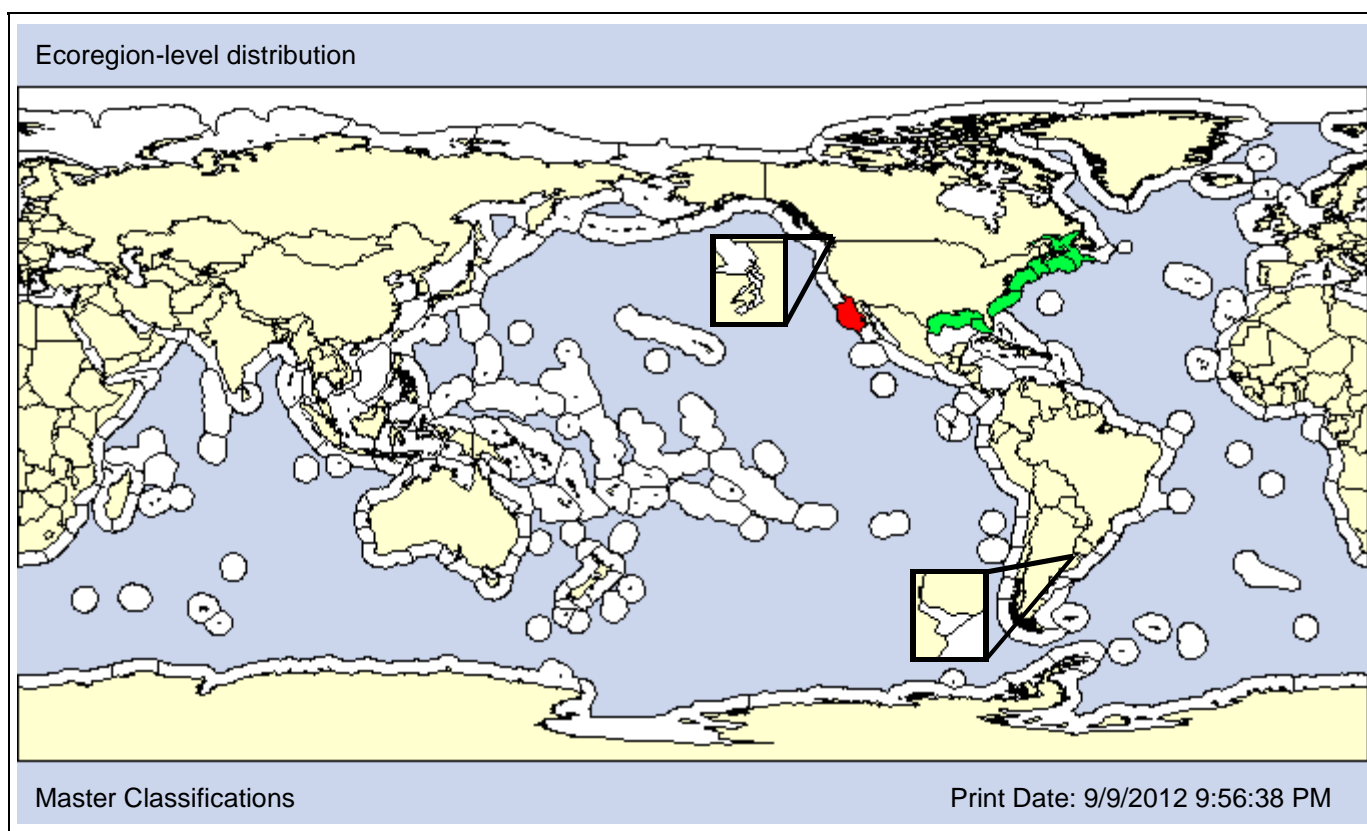
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Carinogammarus mucronatus	Synonym	
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1957

**Loc 1st record:**

Salton Sea, California

**Established:**

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P			X	
						AO	PO								

Comments: The amphipod *Gammarus mucronatus* is native to the estuaries and coastal ecosystems of the NWA. It has been introduced into the Salton Sea in California, an inland saline lake. It has not invaded the estuaries of the NEP, but we include it here to help identify potential coastal invaders.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>		

**DEPTH [Obs: 0 - 5m] [Pref: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>P</b>						

**SALINITY [Obs: 4 - 65psu] [Pref: 5 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
		<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Schellenberg, 1938

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

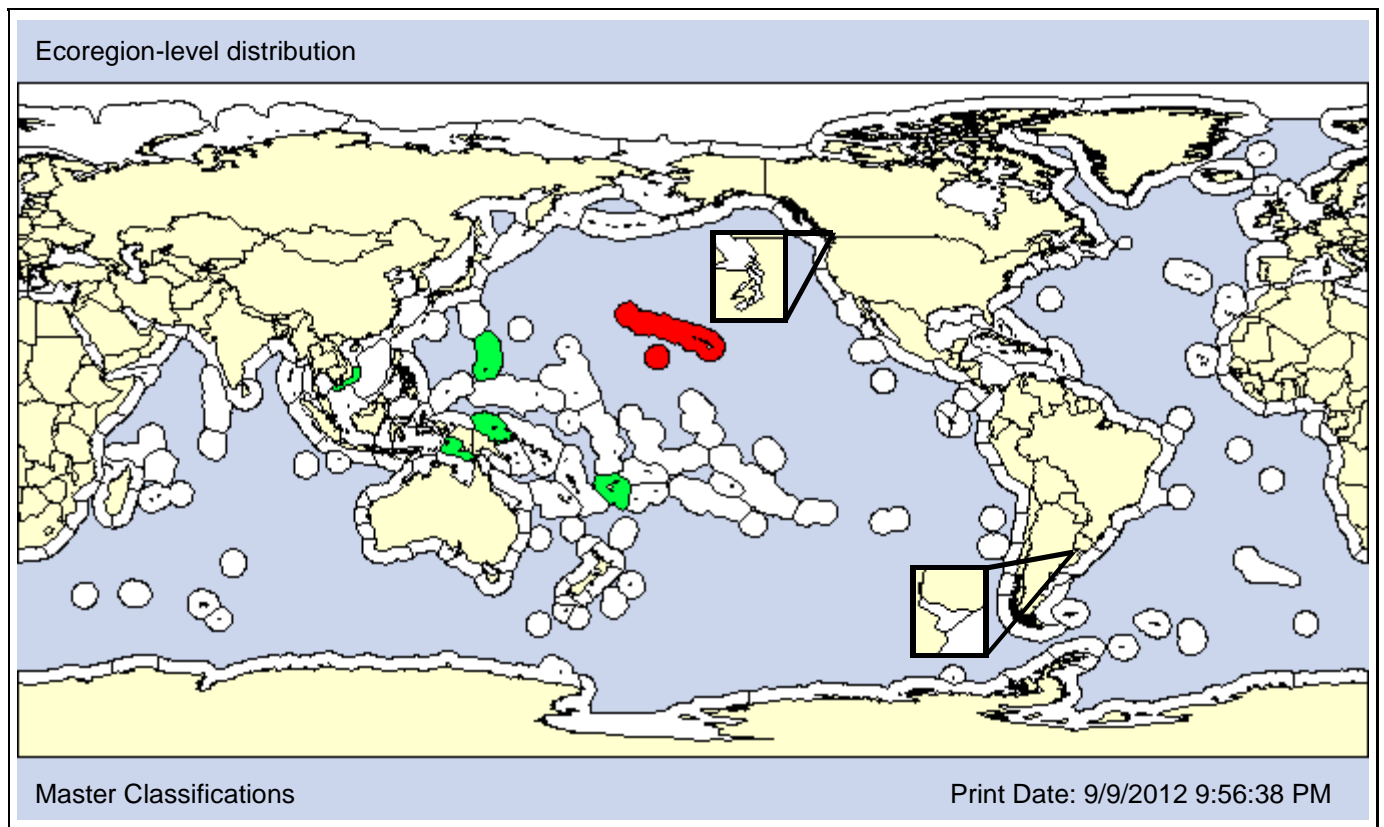
**Family:** Aoridae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Ralum, Bismarck Archipelago



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1996  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH				<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 100m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
						<b>P</b>

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>O</b>	<b>O</b>	

**SALINITY [Obs: 10 - psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
				<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	
					<b>X</b>	<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Stephenson, 1938

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

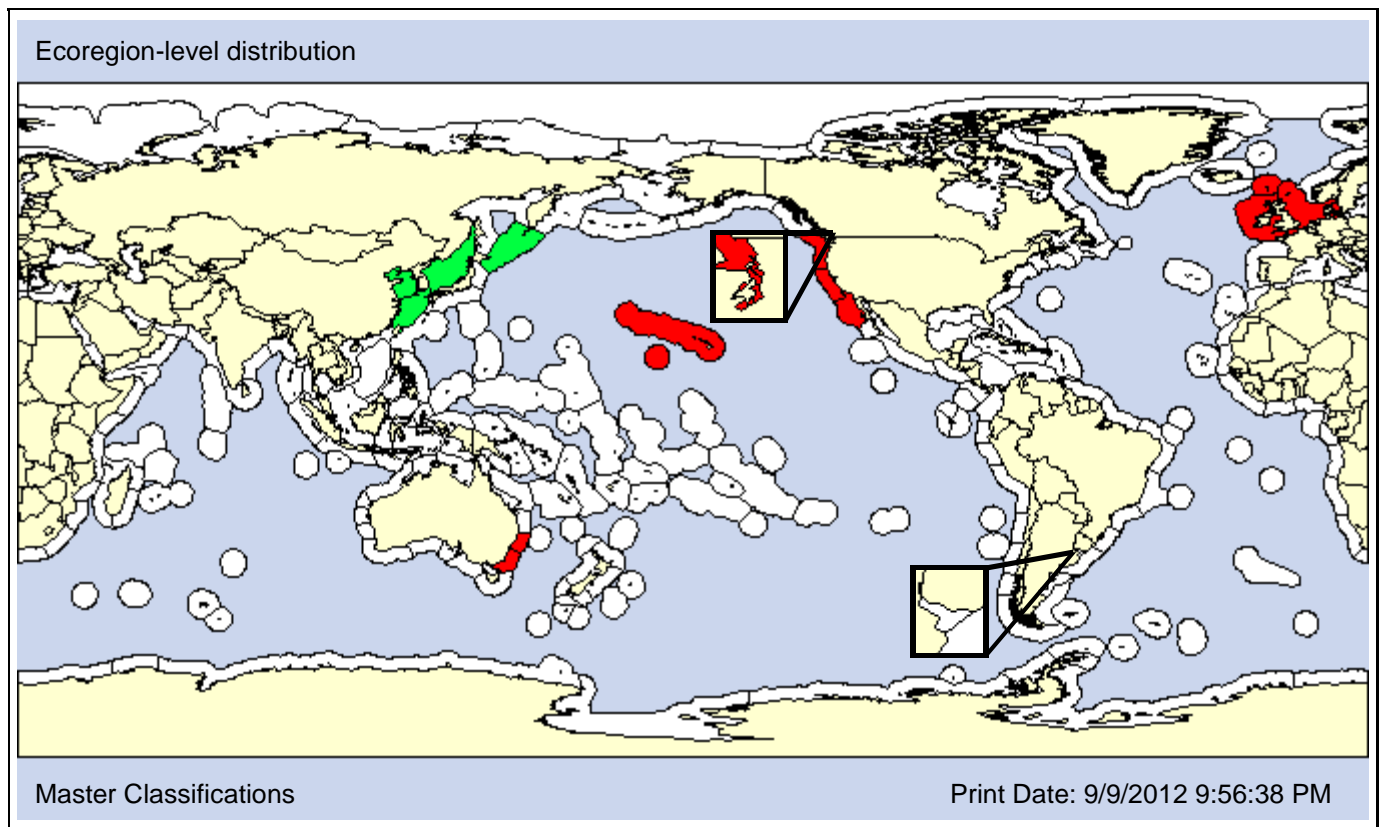
**Family:** Aoridae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



	Native		Nonindigenous		NIS Not Established		Cryptogenic		Transient		Unclassified		Conflicting Classification		Unidentified
					NWP				Hawaii						NEP

<b>Date 1st record:</b> Native	1992	1966
<b>Loc 1st record:</b> Native	Kaneohe, Hawaii	San Francisco Estuary, CA
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		X			TP	RI-PH	X		X	X	
	X	X											

**DEPTH [Obs: 0 - 20m] [Pref: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 0 - 100%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
P	P	P				

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O		P			O				O	O	

**SALINITY [Obs: 4.2 - 40psu] [Pref: 10 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline O		Mesohaline P		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	O	
		O	O	P	P	P			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			X	X		X		X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X	X	X
					X	X							



**Taxon:** Amphipod

**Taxonomic Author:** (Gurjanova, 1938)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Pleustidae

**Subfamily:**

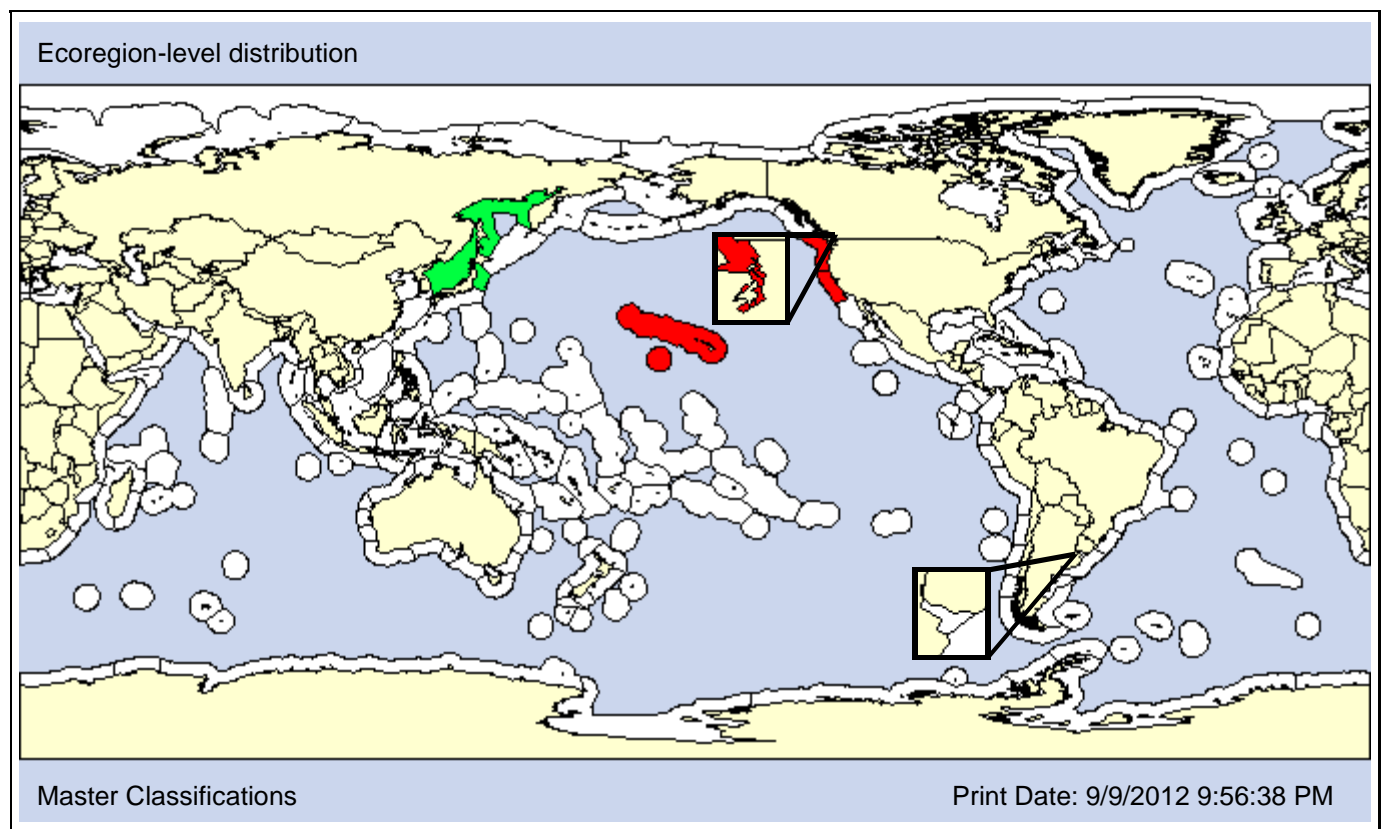
**Also Known As (Name - Type):**

Incisocalliope nipponensis	Synonym
Neopleustes derzhavini of authors in part	Partial synonym
Parapleustes derzhavini	Synonym
Parapleustes derzhavini makiki	Synonym

**Common Names:**

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**Type Locality:** Japan Sea



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

<b>Date 1st record:</b> Native	1967	1904
<b>Loc 1st record:</b> Native	Kaneohe Bay, Hawaii	San Francisco Estuary, CA
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
<span style="color: red;">X</span>		<span style="color: red;">X</span>				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K	
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 3m] [Pref: 0 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>				<b>O</b>	<b>O</b>					<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 6 - 33psu] [Pref: - 31psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** (Montagu, 1808)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Caprellida

**Superfamily:**

**Family:** Ischyroceridae

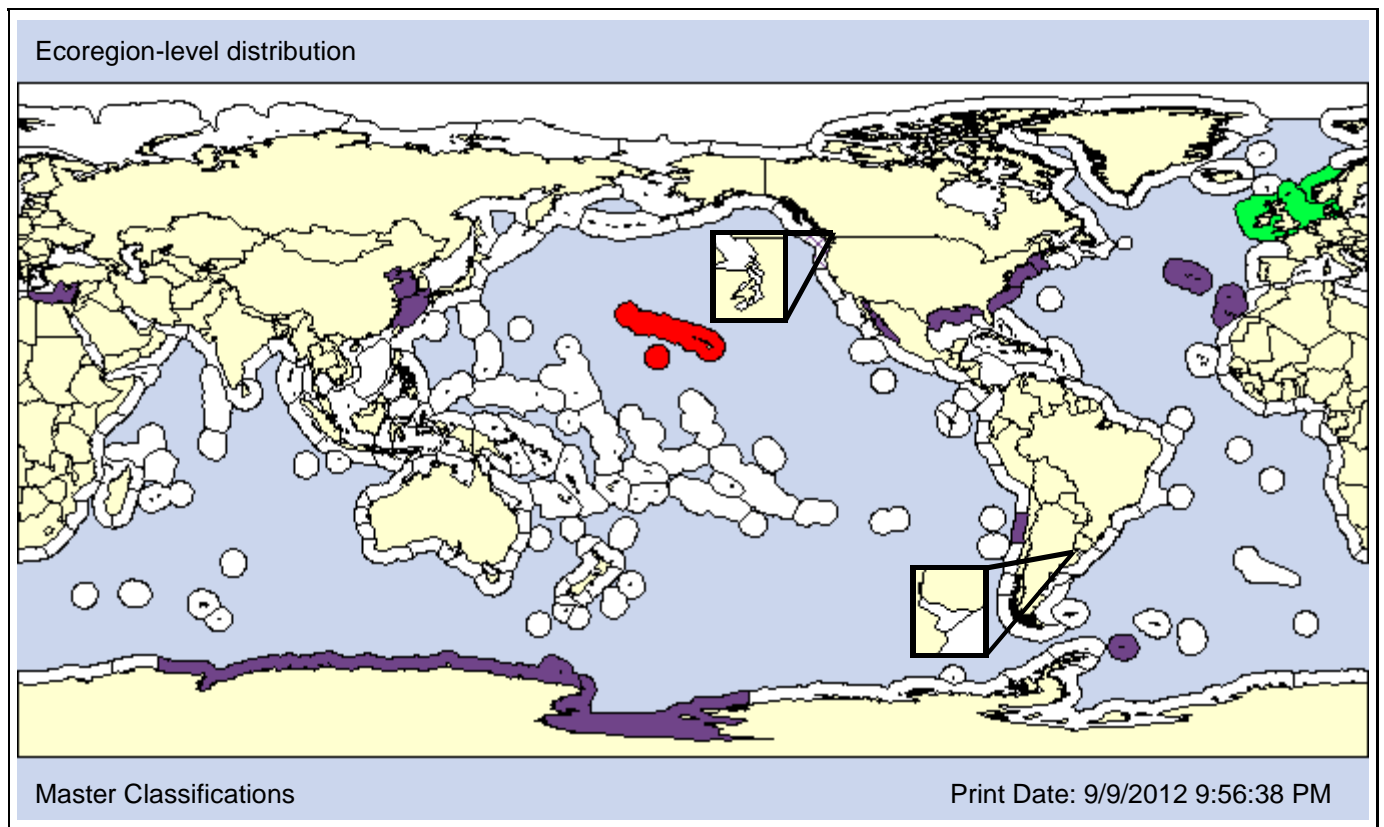
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Cancer (Gammarus) falcatus	Synonym	Scud
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**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

<b>Date 1st record:</b> Unknown	1997	1987
<b>Loc 1st record:</b> Unknown	Honolulu, Hawaii	Northern California
<b>Established:</b> Yes	Yes	No

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: According to Chapman (2009), "Jassa falcata was the default name given to most Jassa of the world until the work of Conlan (1990). Jassa falcata is presently recognized only in European harbors, but not clearly absent elsewhere." Therefore, we classify it as native in Europe, NIS in Hawaii, and unclassified elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 40m] [Pref: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>				<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 24 - 35psu] [Pref: 26 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
					<b>O</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Holmes, 1903

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Caprellida

**Superfamily:**

**Family:** Ischyroceridae

**Subfamily:**

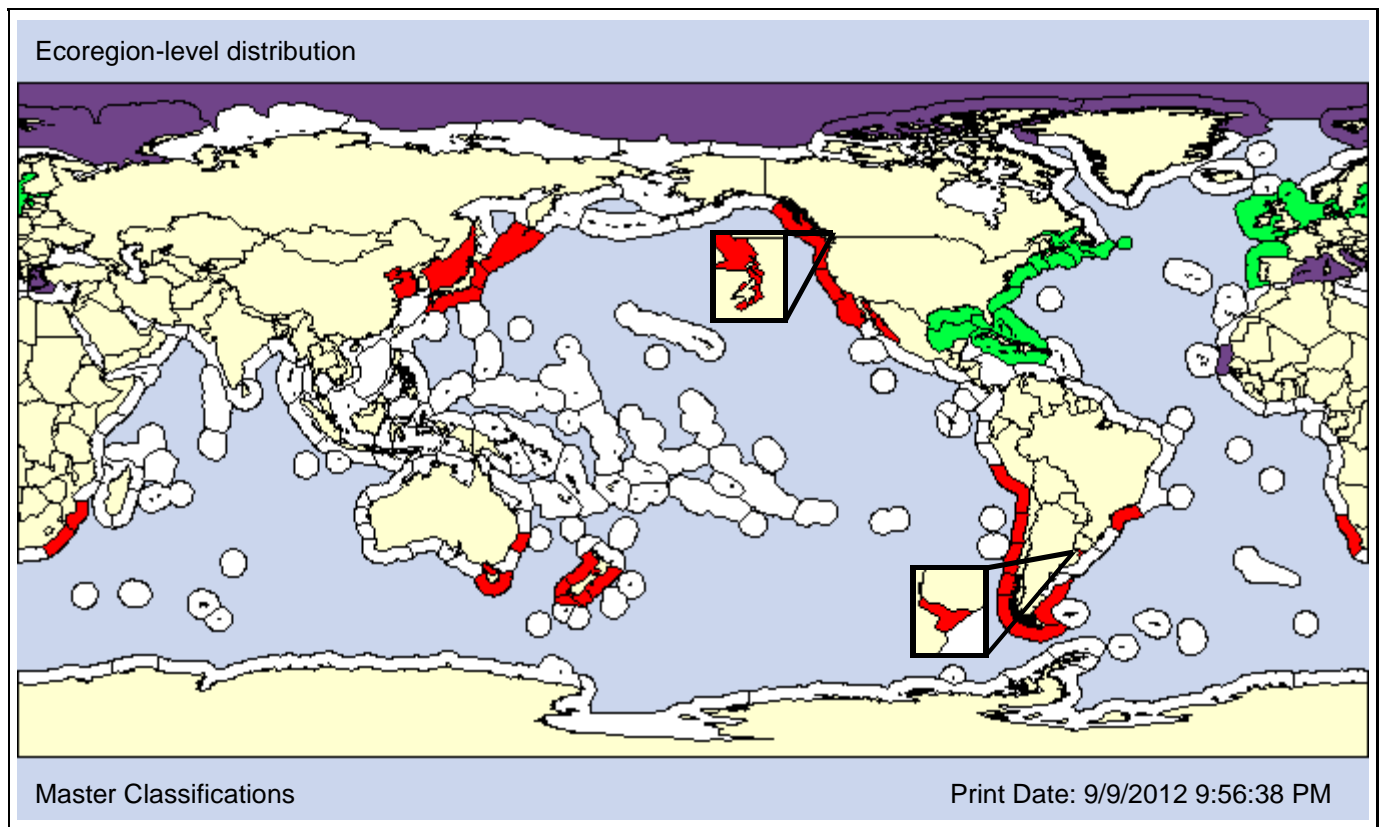
**Also Known As (Name - Type):**

Jassa falcata of authors in part; not (Montagu, 1808)

Misidentified

**Common Names:**

**Type Locality:**



**Date 1st record:** 1930s?

1938

**Loc 1st record:** Sea of Japan

Unknown

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments: Extreme broad distribution of *Jassa marmorata* limits confidence of its origin, such as the north Atlantic (Chapman, 2009), its putative native range. Genetic analysis by Pilgrim and Darling (2010) suggests that *J. marmorata* may consist of more than one species. The depth records >30 m are from the Arctic.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 4337m] [Pref: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 85.1 - 85.1%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>P</b>				<b>P</b>	<b>P</b>	<b>O</b>

**SALINITY [Obs: 10 - 35psu] [Pref: 24 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Conlan, 1990

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Caprellida

**Superfamily:**

**Family:** Ischyroceridae

**Subfamily:**

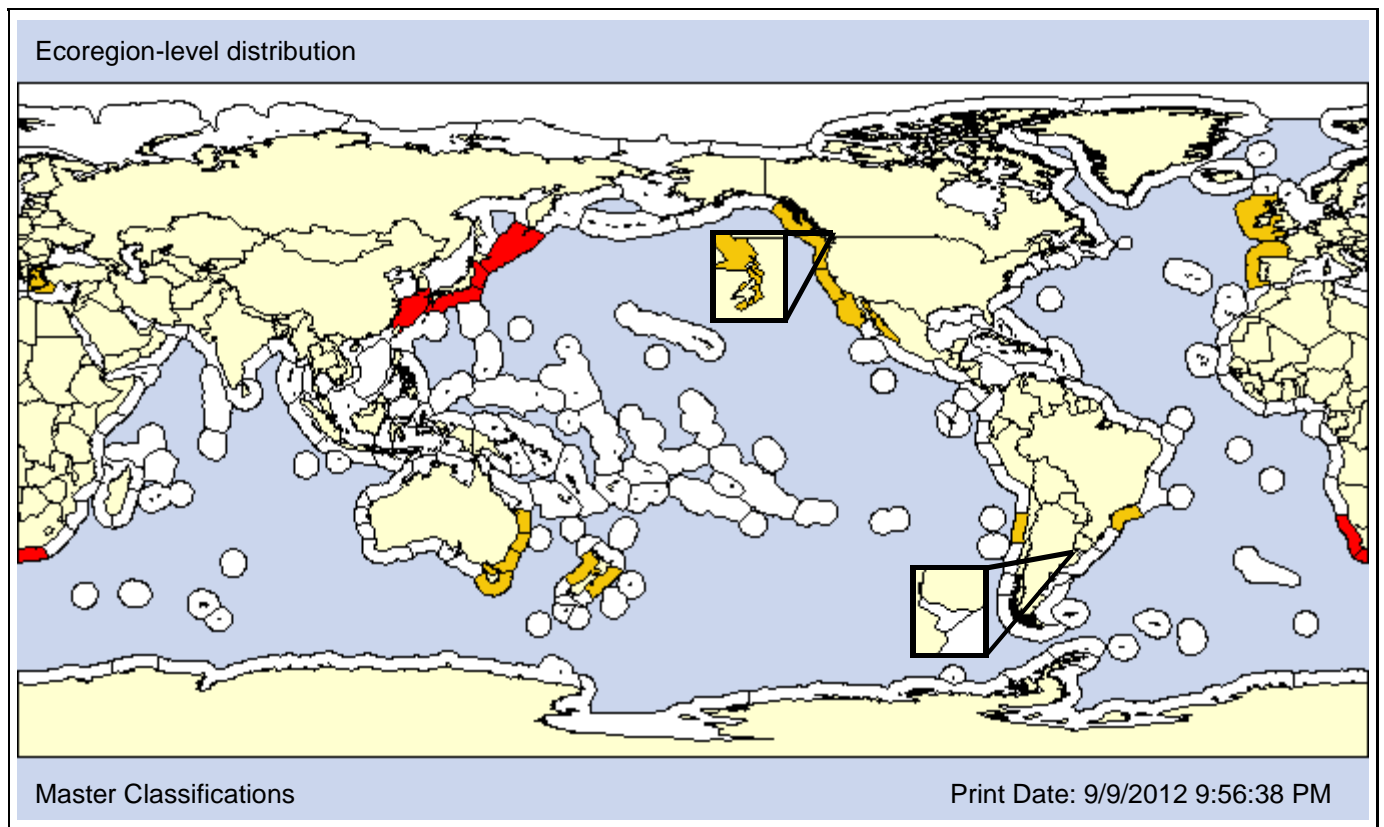
**Also Known As (Name - Type):**

Jassa falcata of NEP authors; not (Montagu, 1808)  
Podocerus odontonyx

Misidentified  
Synonym

**Common Names:**

**Type Locality:** Moss Landing Harbor, California, USA



**Date 1st record:** Unknown

**Loc 1st record:** Unknown

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: The global distribution of *Jassa slatteryi* is unclear. Doe et al. (2011) suggest it is native in the NEP. It is considered introduced in Japan (Doe et al., 2011) and South Africa (Mead et al., 2011) and cryptogenic in the NEP (CANOD, 2009) and Australia/New Zealand and the North and South Atlantic (Chapman, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH				<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 200m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 5.28 - 63.61%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>					<b>O</b>	<b>O</b>

**SALINITY [Obs: 30.4 - 39.42psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>
						<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	
						<b>X</b>							



**Taxon:** Amphipod

**Taxonomic Author:** (Shoemaker, 1934)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Corophiidae

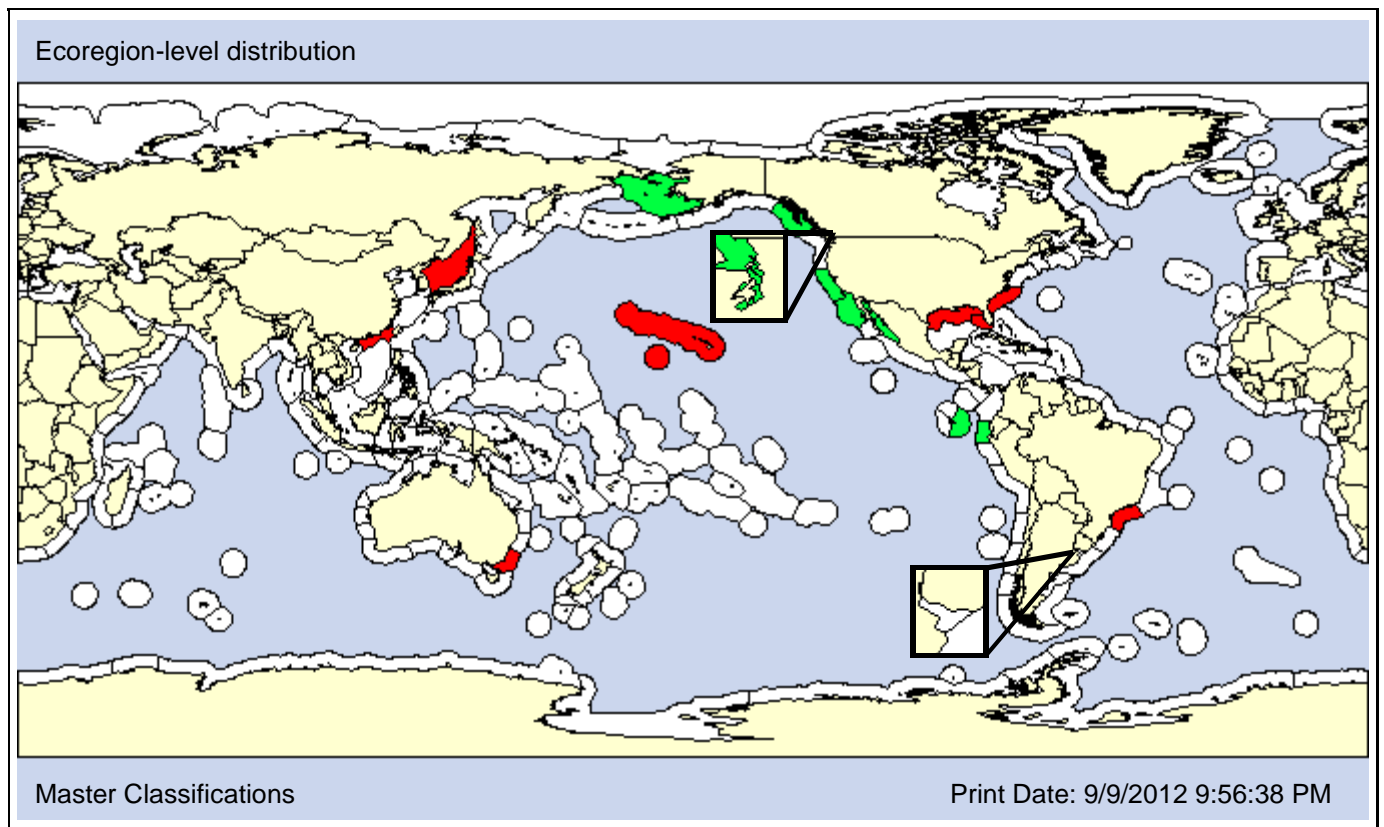
**Subfamily:** Corophiinae

**Also Known As (Name - Type):**

**Common Names:**

Corophium baconi	Synonym	
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**Type Locality:** north of Paita, Peru



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1997                                  1967                                  Native  
**Loc 1st record:** Sea of Japan                                  Kaneohe Bay, Hawaii                                  Native  
**Established:** Unknown                                  Yes                                  Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: According to Chapman (2009), *Laticorophium baconi* is "likely [an] eastern Pacific species introduced elsewhere but hard to believe all the records are correct." Assuming it is native to the NEP, we classify it as introduced in the Atlantic and the NWP while NIMPIS (2009) classifies it as introduced in Australia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O	O				

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic X
Unvegetated X		SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K	
UV-CS	UV-TF	UV-SUB	X			TP	RI-PH	X			X	
	X	X										

**DEPTH [Obs: 0 - 452m] [Pref: 0 - 55m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep	O		
			P	P			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 3.41 - 49.97%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
P	O					

**CONSOLIDATED SUBSTRATE X**

R P	HP	Biogenic P						Artificial Substrate P						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								O					O	P

**SALINITY [Obs: 29 - 34psu]**

Fresh	Brackish P				Marine P		Hyper	
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	
						P		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF X	
								X	DF-SUR X	DF-SUB

**REPRODUCTION**

Sexual X						Asexual				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic X			
PL	NE	SUB	DEM X		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X	X	
			X			X							

**Taxon:** Amphipod

**Taxonomic Author:** Barnard, 1965

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

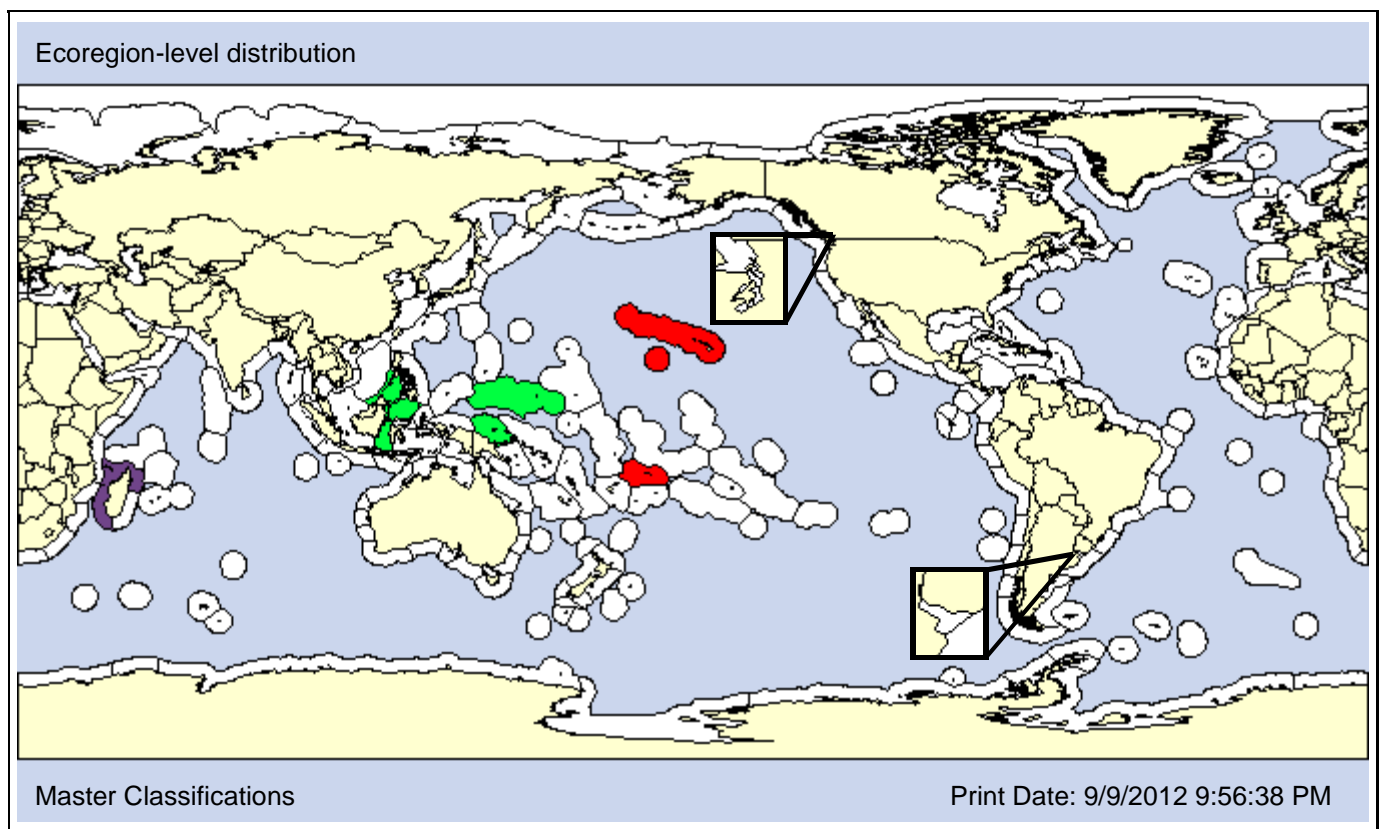
**Family:** Leucothoidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Ifaluk Atoll, Caroline Islands



<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-style:dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:lightgrey; border:1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; border:1px solid black;"></span> Unidentified
NWP			Hawaii		NEP		

**Date 1st record:**

1997

**Loc 1st record:**

Honolulu Harbor, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O	O				

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		X		X	

**DEPTH [Obs: 1 - 670m] [Pref: 3 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	O		
			P	P			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O											O	

**SALINITY [Obs: - 34psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

# Leucothoe spinicarpa Cmplx

Species ID: 2311

**Taxon:** Amphipod

**Taxonomic Author:** (Abildgaard, 1789)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Leucothoidae

**Subfamily:**

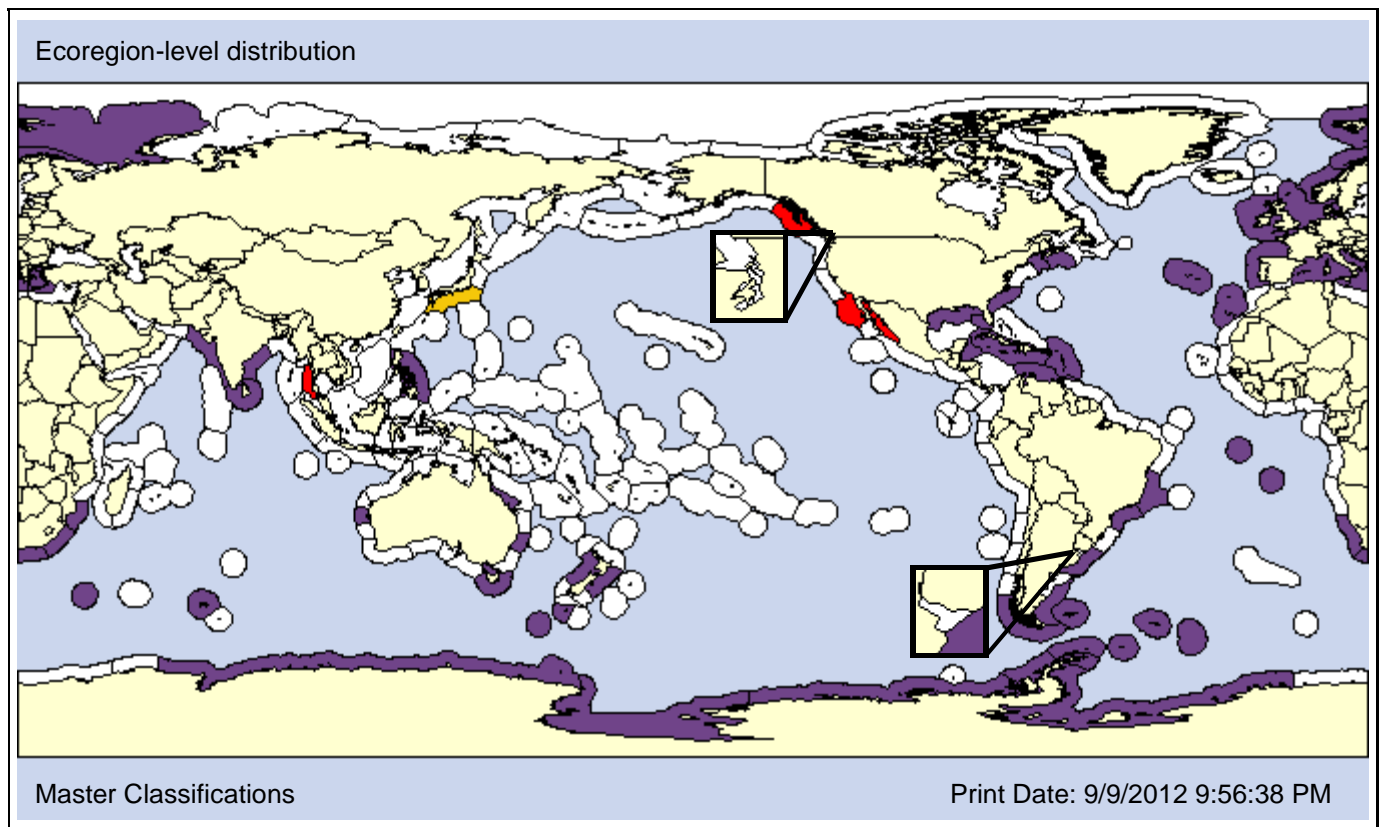
**Also Known As (Name - Type):**

Gammarus spinicarpus	Ambiguous syn.
Leucothoe (Leucothoe) spinicarpa	Ambiguous syn.
Leucothoe grandimanus	Ambiguous syn.
Leucothoe spinicarpa	Ambiguous syn.

**Common Names:**

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**Type Locality:** Skagerrak Sea, Denmark



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Yes

Unknown  
 Unknown  
 Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: The commensal *Leucothoe spinicarpa* is a species complex. Nonetheless Chapman (2007) lists it as NIS in the NEP because it is limited to introduced tunicates. Doi et al. (2011) and Chavanich et al. (2010) list it as cryptogenic in Japan and NIS in Thailand, respectively. Because of the uncertainties, we list it unclassified in other regions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O	O				

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	

**DEPTH [Obs: 0 - 1505m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep	O		
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
X									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H X		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	X									

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X

**Taxon:** Amphipod

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

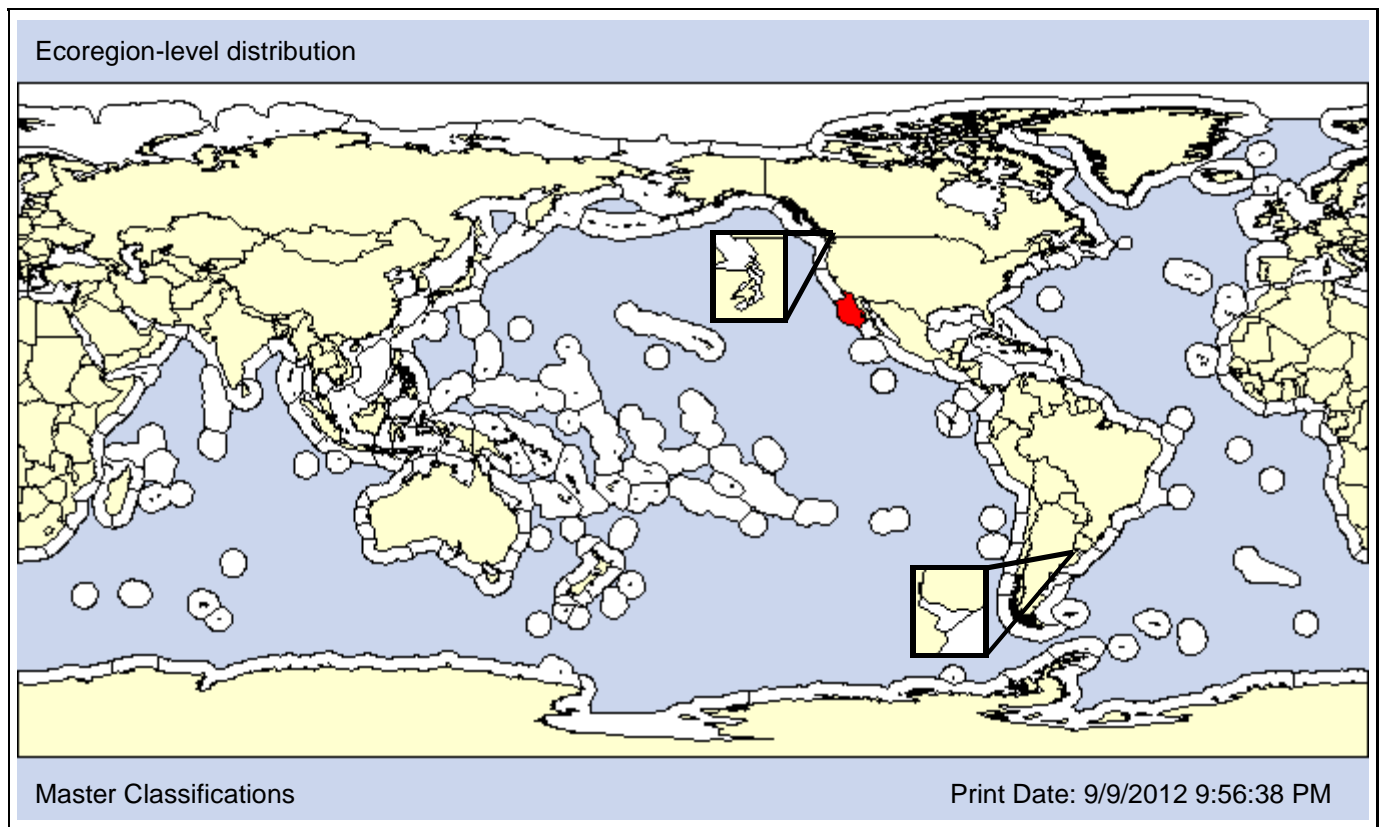
**Family:** Liljeborgiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



<span style="display:inline-block; width:15px; height:15px; background-color: #90EE90; border: 1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color: #FF0000; border: 1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color: #FFD700; border: 1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color: #ADD8E6; border: 1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color: #800080; border: 1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color: #8B4513; border: 1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 2000  
**Loc 1st record:** Southern California  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		<b>X</b>				AO	PO								

Comments: In 2000, an unidentified *Liljeborgia* was reported from several estuaries in Southern California (Cohen et al., 2002). Though not presently identified, it was unlikely to have been overlooked in previous amphipod surveys and thus appears to be a recent arrival. It is similar to *L. geminata* (Chapman 2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 3 - 9m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											<b>P</b>	<b>O</b>	<b>P</b>	

**SALINITY [Obs: 34 - 35.5psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Amphipod

**Taxonomic Author:** Smith, 1873

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Melitidae

**Subfamily:**

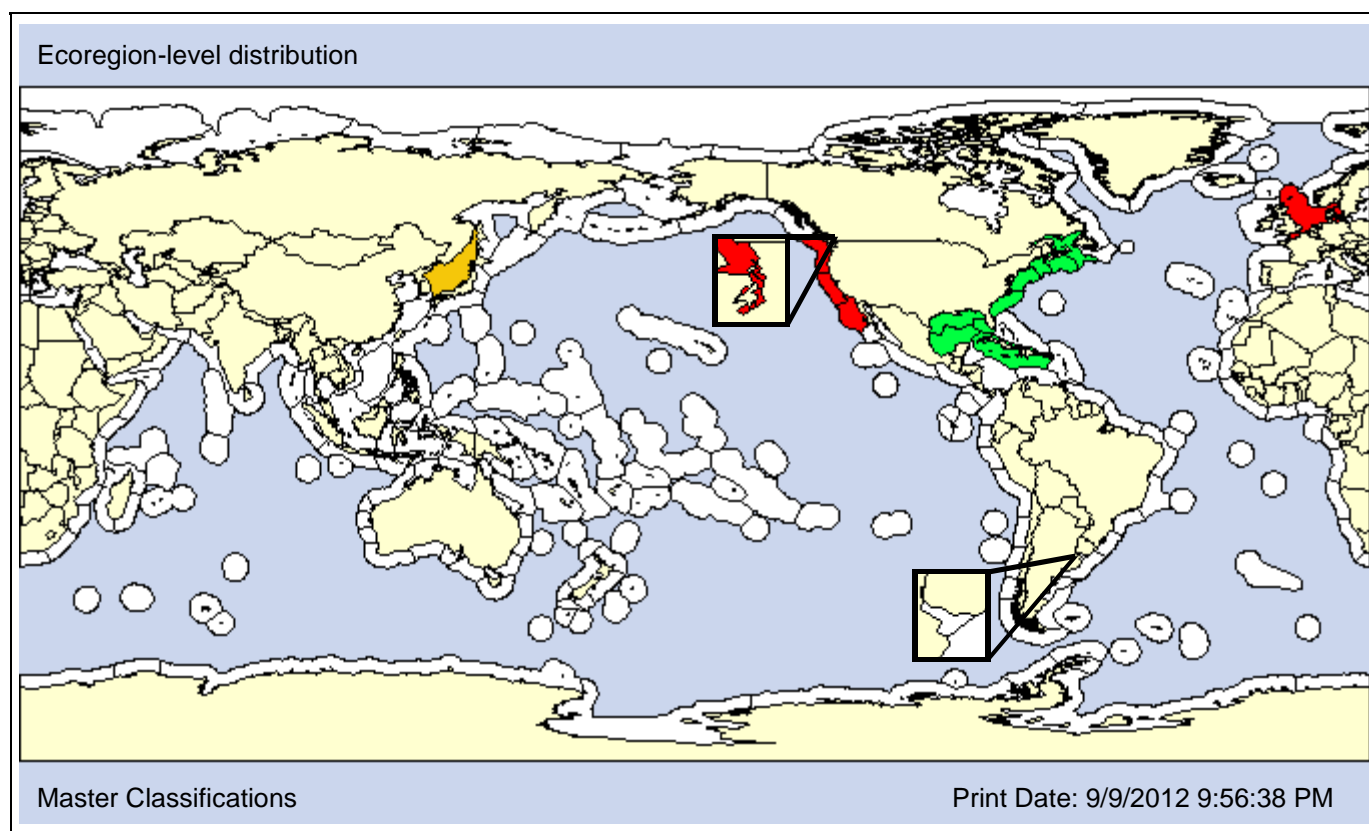
**Also Known As (Name - Type):**

Melita cf. nitida  
 Melita setiflagella? of Sytsma et al., 2004  
 Melita setiflagellata

Ambiguous syn.  
 Synonym  
 Ambiguous syn.

**Common Names:**

**Type Locality:**



**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Unknown

1938  
 San Francisco Estuary, CA  
 Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
<b>X</b>	<b>X</b>	<b>X</b>				<b>AO X</b>	PO							

Comments: The global classification of *Melita nitida* assumes it is native to the NWA (Chapman, 2007). However, *M. nitida* is "indistinguishable from the Asian *Melita setiflagellata*" (Chapman, 2007), and Doi et al. (2011) list it as cryptogenic in the NWP. Because of this uncertainty, we list it as cryptogenic in the NWP, using the distribution for *M. setiflagellata*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			X	X	
	X	X											

**DEPTH [Obs: 0 - 20m] [Pref: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.8 - 47%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			P		P								O	

**SALINITY [Obs: 0 - 30psu] [Pref: 3 - 20psu]**

<b>Fresh O</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline P		Mesohaline P		Polyhaline P		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	
		P	P	P	P	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X						X
					X	X							

**Taxon:** Amphipod

**Taxonomic Author:** Bulycheva, 1955

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Melitidae

**Subfamily:**

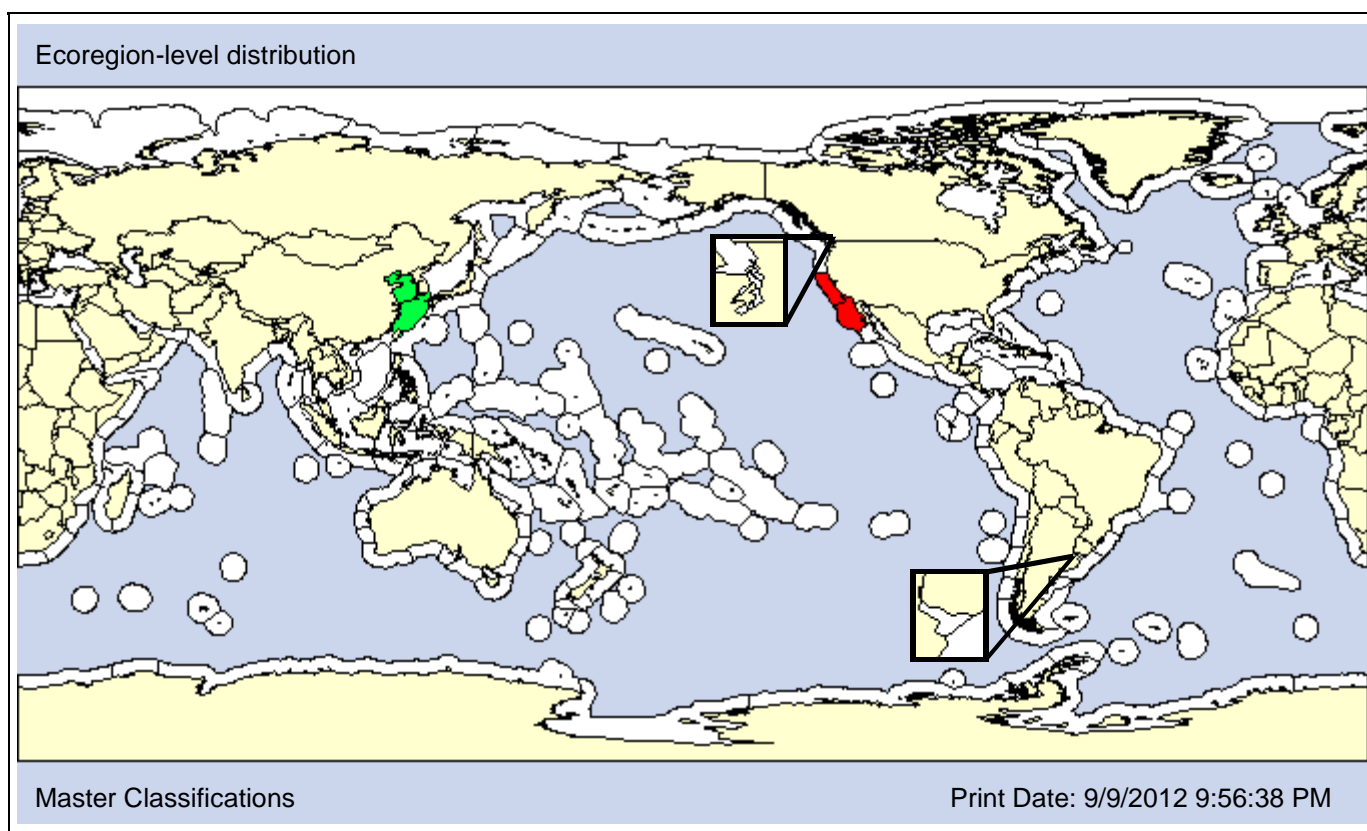
**Also Known As (Name - Type):**

**Common Names:**

Melita sp. of Cohen and Carlton, 1995

Synonym

**Type Locality:**



**Date 1st record:** Native

1993

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO <b>X</b>								

Comments: *Melita rylovae* was found in ballast water in Australia (Williams et al., 1988) but we are unaware of any reports of it from the wild in Australia. Chapman (2007) lists it as native to Asia though the 2009 PICES rapid assessment in Korea listed it as cryptogenic (PICES Working Group 21, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>	<b>X</b>	

**DEPTH [Obs: 1 - 10m] [Pref: 1 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>									<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

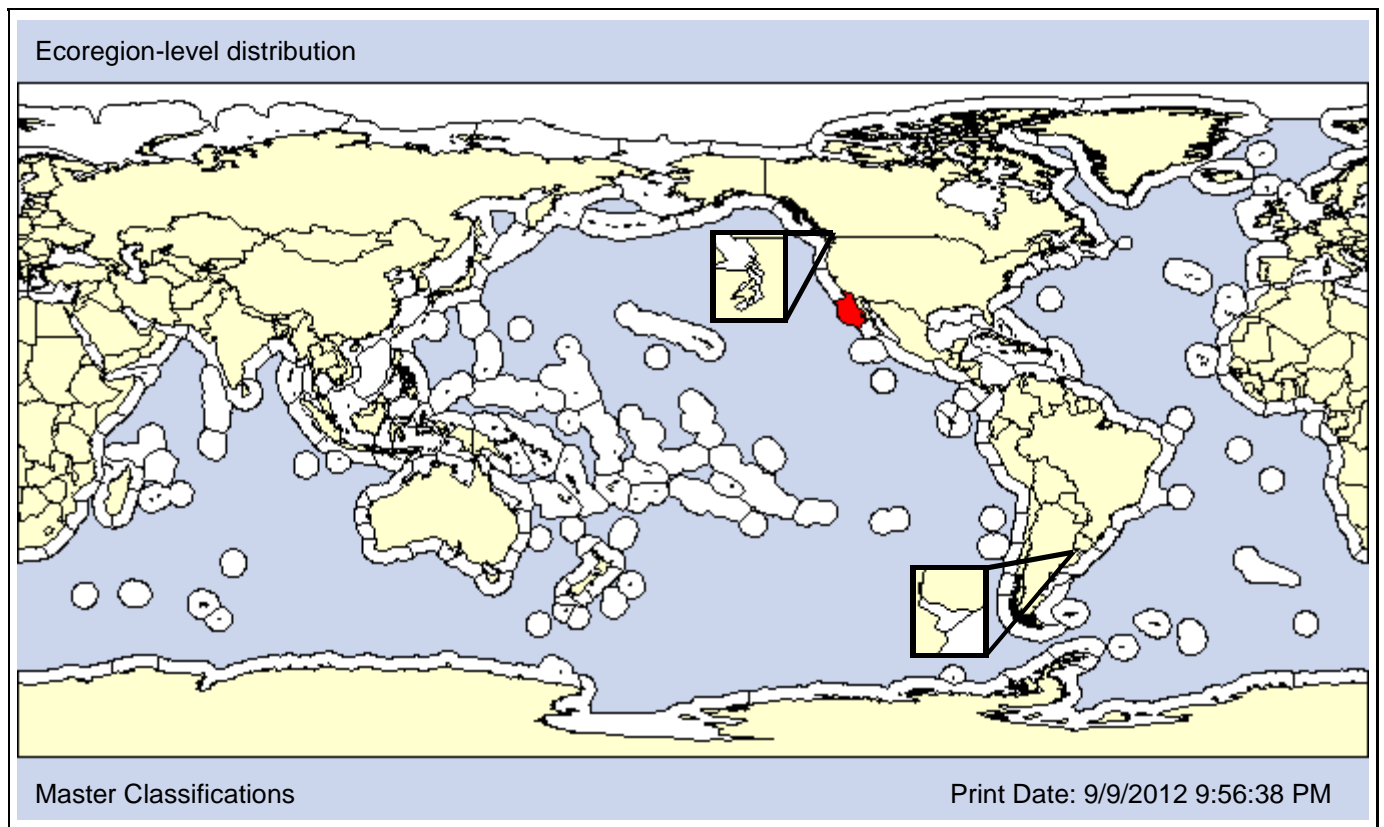
**Family:** Stenothoidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

2000

**Loc 1st record:**

Long Beach, CA

**Established:**

Unknown

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: An unknown *Metopella* species was found in a grabs in Southern California harbors in 2000 as part of a rapid assessment survey (Cohen et al., 2002).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 1.5 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 34 - 35psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

# Microdeutopus gryllotalpa

Species ID: 4971

**Taxon:** Amphipod

**Taxonomic Author:** Costa, 1853

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Aoridae

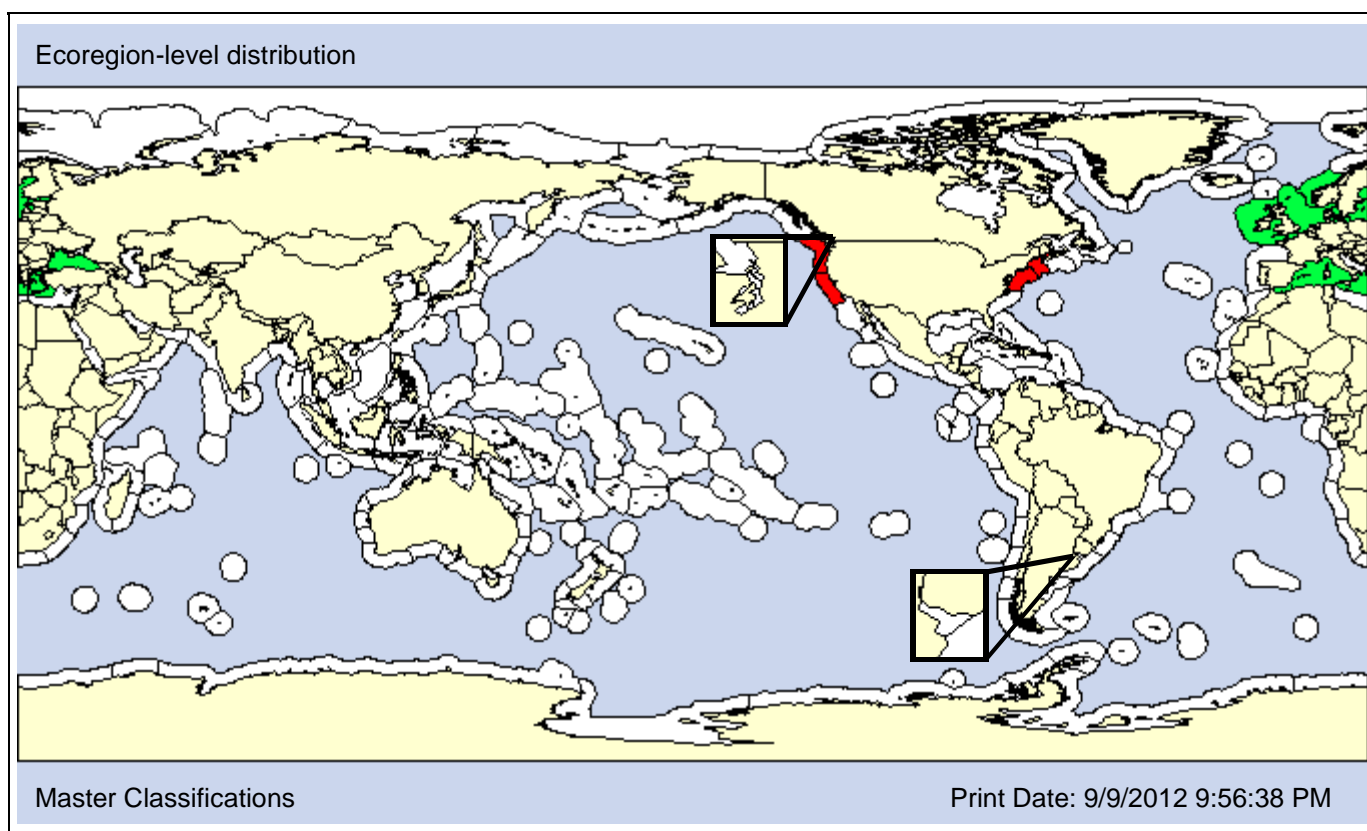
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Microdeuteropus minax	Synonym	
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**Type Locality:**



**Date 1st record:**

1980s

**Loc 1st record:**

Humboldt Bay, CA

**Established:**

Yes

## VECTORS

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 155m] [Pref: 0 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>					<b>P</b>		<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	

**SALINITY [Obs: 5 - 47psu] [Pref: 26 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P O</b>
			<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>					<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Amphipod

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Caprellida

**Superfamily:**

**Family:** Ischyroceridae

**Subfamily:**

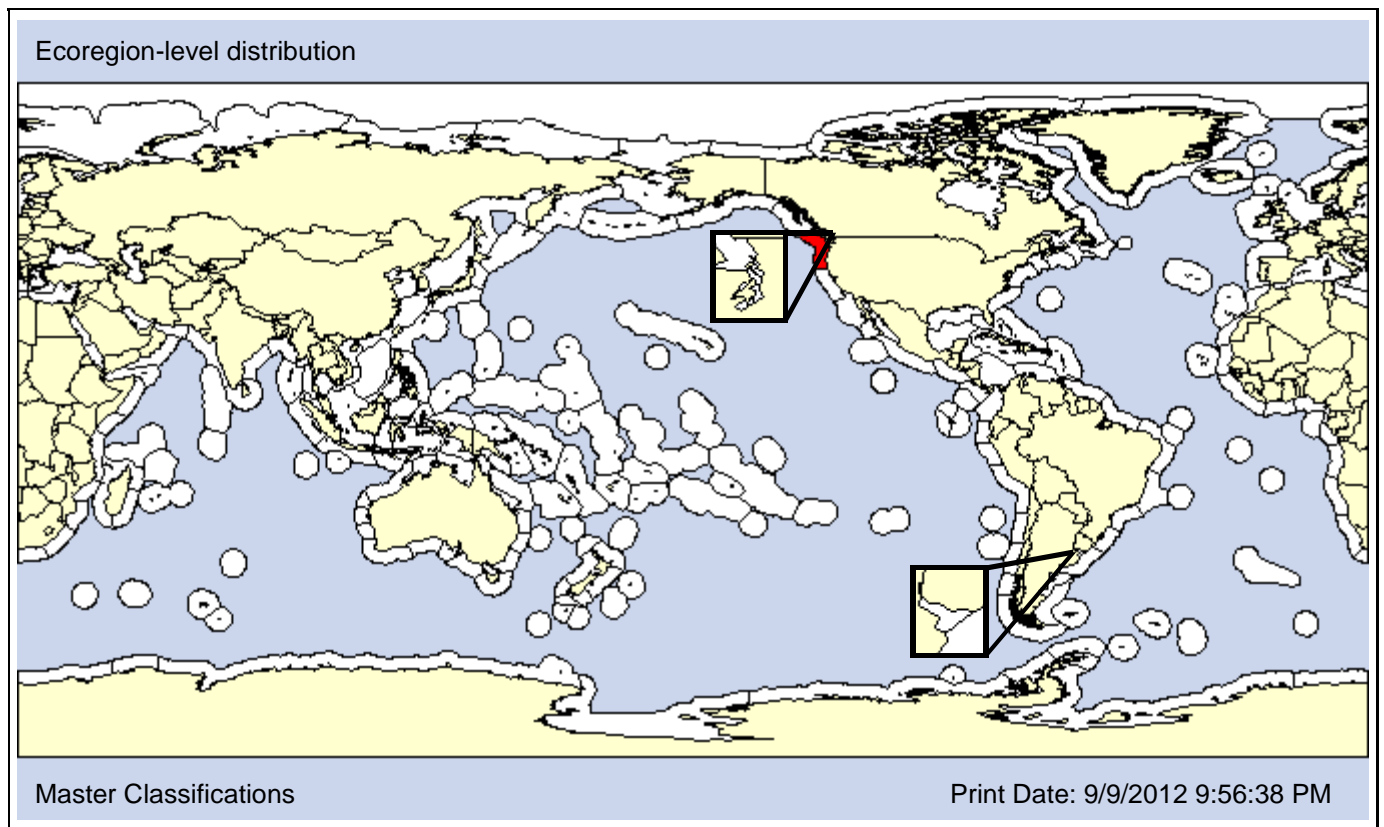
**Also Known As (Name - Type):**

**Common Names:**

[Empty box for Also Known As (Name - Type)]

[Empty box for Common Names]

**Type Locality:** Washington, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

2002

**Loc 1st record:**

Cape Alava Rock Shelf, WA

**Established:**

Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: An unidentified *Microjassa* species collected on a rock shelf off the coast of Washington is considered introduced by deRivera et al. (2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 32.7psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

# Monocorophium acherusicum

Species ID: 187

**Taxon:** Amphipod

**Taxonomic Author:** (Costa, 1853)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Corophiidae

**Subfamily:**

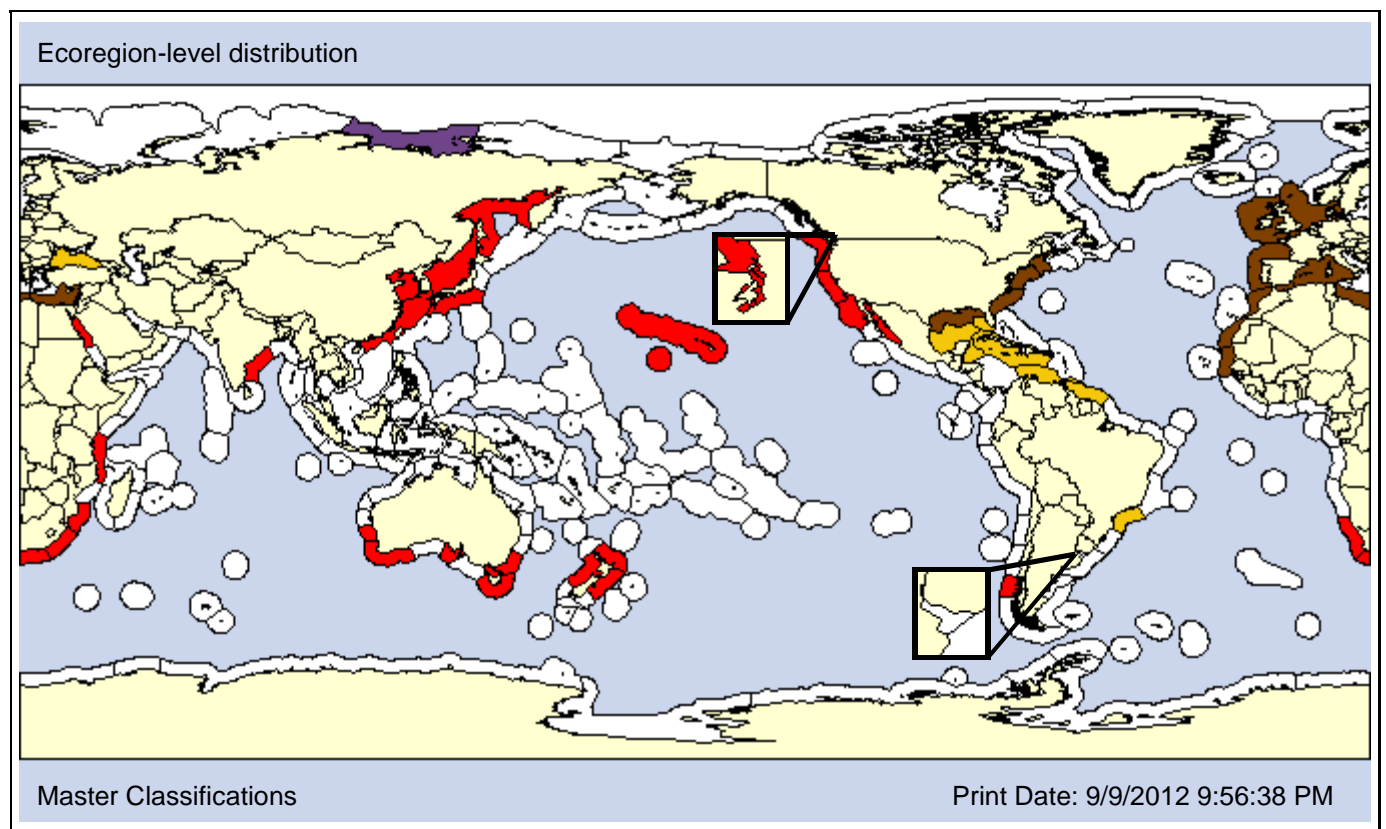
**Also Known As (Name - Type):**

Audouinia acherusica	Synonym
Corophium acherusicum	Synonym
Corophium contractum	Synonym
Corophium cylindricus	Synonym

**Common Names:**

--

**Type Locality:** Gulf of Naples, Italy



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 1955

1943

1905

**Loc 1st record:** Ariake Inland Sea, Japan

Waikiki, Hawaii

Yaquina Bay, Oregon

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments: Monocorophium acherusicum is native to the North Atlantic though there are conflicts as to the native region. Ruiz et al. (2011) list it as cryptogenic in the NWA while Doi et al. (2011) list it as native in the NWA. NIMPIS (2002q) lists it as native in the NEA while Olenin and Didžiulis (2009) list it as cryptogenic in the NEA.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 2620m] [Pref: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.8 - 100%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>					<b>O</b>				<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 10 - 39.42psu] [Pref: 15 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
				<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
								<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	<b>X</b>
			<b>X</b>			<b>X</b>							

# Monocorophium insidiosum

Species ID: 190

**Taxon:** Amphipod

**Taxonomic Author:** (Crawford, 1937)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Corophiidae

**Subfamily:**

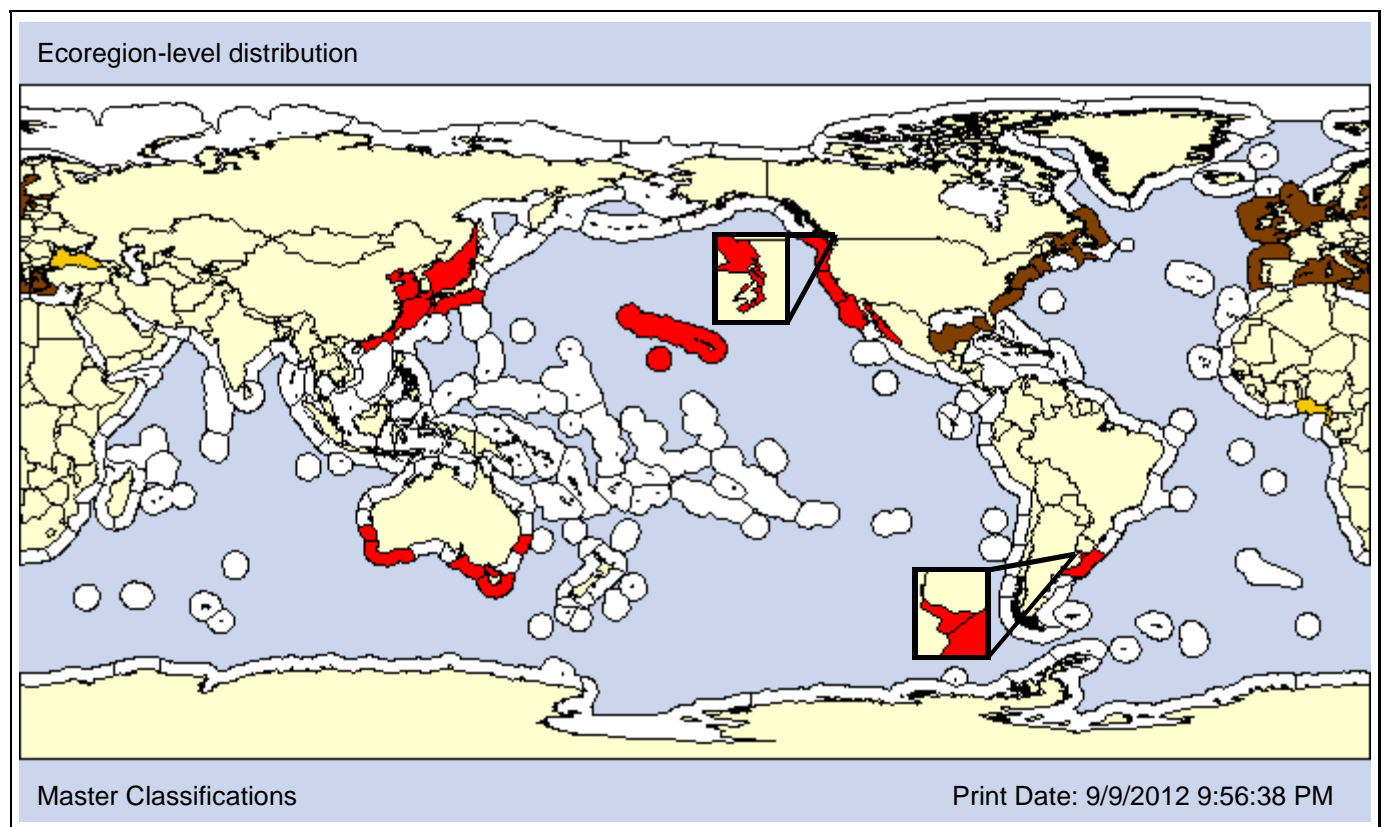
**Also Known As (Name - Type):**

Corophium insidiosum  
Corophium oaklandense  
Monocorophium oaklandense

Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:** Mill Bay, Plymouth, England



NWP

Hawaii

NEP

**Date 1st record:** 1955

1959

1915

**Loc 1st record:** Fukuyama Harbor, Japan

Hilo, Hawaii

Puget Sound, WA

**Established:** Yes

Yes

Yes

## VECTORS

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
X		X				AO X	PO							

Comments: *Monocorophium insidiosum* is native to the North Atlantic though there are conflicts as to the native region. Chapman (2009) classifies it as cryptogenic in the NEA while NIMPIS (2002x) classifies it as native. Ruiz et al. (2011) classify it as cryptogenic in the NWA while Carlton and Eldredge (2009) classify it as native in the NWA.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 1231m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.56 - 98%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>		<b>P</b>			<b>O</b>				<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 11 - 37psu] [Pref: 25 - 36psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>
			<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
			<b>X</b>					<b>X</b>	DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	<b>X</b>
			<b>X</b>			<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** (Stephensen, 1932)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Corophiidae

**Subfamily:**

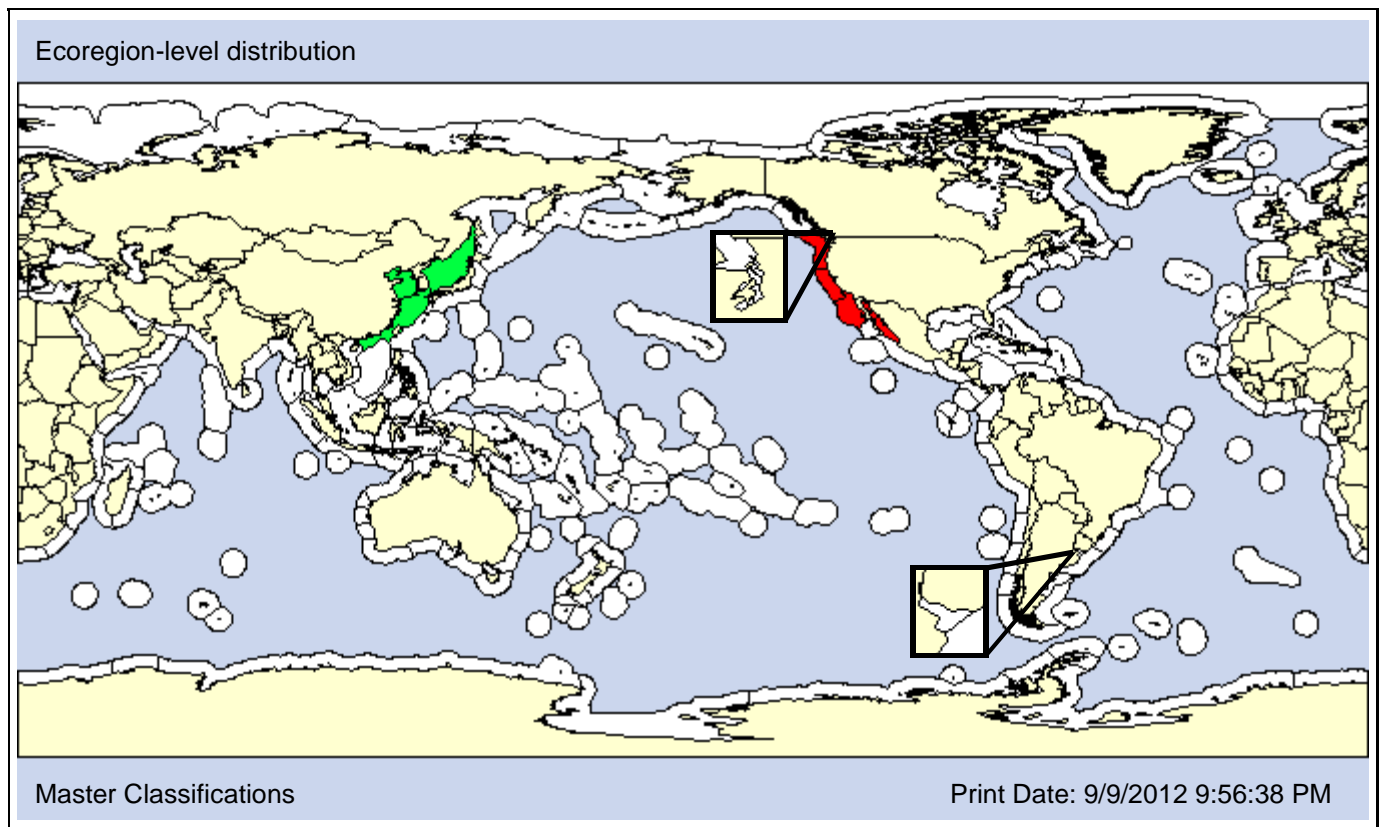
**Also Known As (Name - Type):**

Corophium (Monocorophium) cf uenoi  
 Corophium cf uenoi  
 Corophium uenoi

Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1946  
**Loc 1st record:** Native Newport Bay, California  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>					<b>X</b>						

**DEPTH [Obs: 0 - 49m] [Pref: 0 - 24m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2 - 89.3%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>O</b>			<b>O</b>	<b>O</b>	<b>O</b>	

**SALINITY [Obs: 26.6 - 35.04psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>					<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Amphipod

**Taxonomic Author:** Mayer, 1890

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Caprellidea

**Infraorder:** Caprellida

**Superfamily:** Caprelloidea

**Family:** Caprellidae

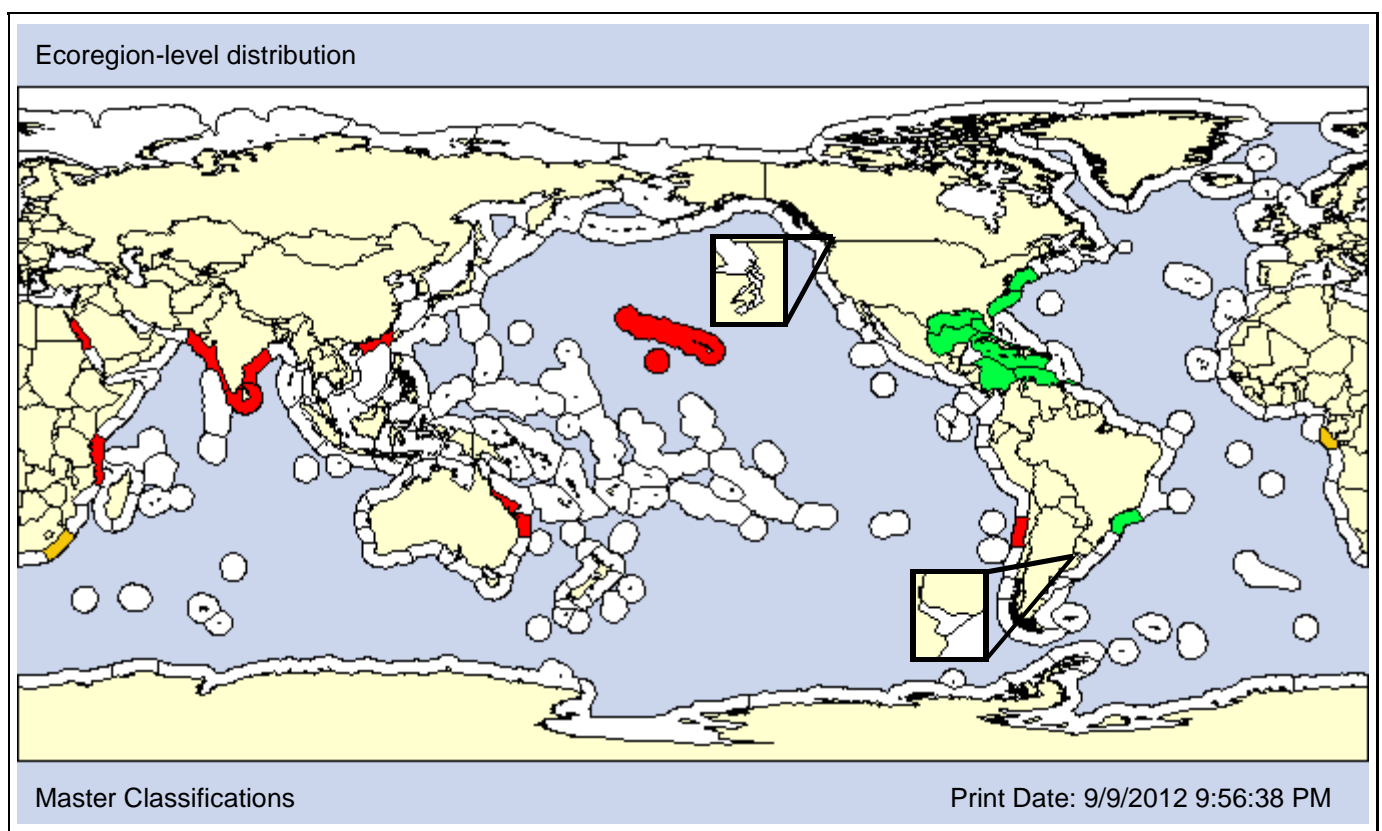
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Caprella nigra	Synonym	
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**Type Locality:** Rio de Janeiro, Brazil



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;"> </span> NIS Not Established	<span style="color: yellow;">■</span> Cryptogenic	<span style="color: cyan;">■</span> Transient	<span style="color: purple;">■</span> Unclassified	<span style="color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;"> </span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1937  
**Loc 1st record:** Honolulu Harbor, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: *Paracaprella pusilla* is introduced in Hawaii (Carlton and Eldredge, 2009) and cryptogenic in South Africa (Mead et al., 2011). Based on its original description from Brazil and extensive Caribbean distribution, we tentatively classify it as native in the West Tropical Atlantic region and introduced in the Pacific and Indian Oceans.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O	O				

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X		X		TP	RI-PH	X		X	X	
		X											

**DEPTH [Obs: 0 - 498m] [Pref: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	O		
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O		O	O		

**CONSOLIDATED SUBSTRATE X**

R O	HP	Biogenic P							Artificial Substrate O					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O	O	O			P	P				O	O

**SALINITY [Obs: 26 - 34psu]**

Fresh	Brackish P					Marine P		Hyper
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	
						P		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
				X	X				DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic X			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	X
						X							

**Taxon:** Amphipod

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:**

**Family:** Corophiidae

**Subfamily:**

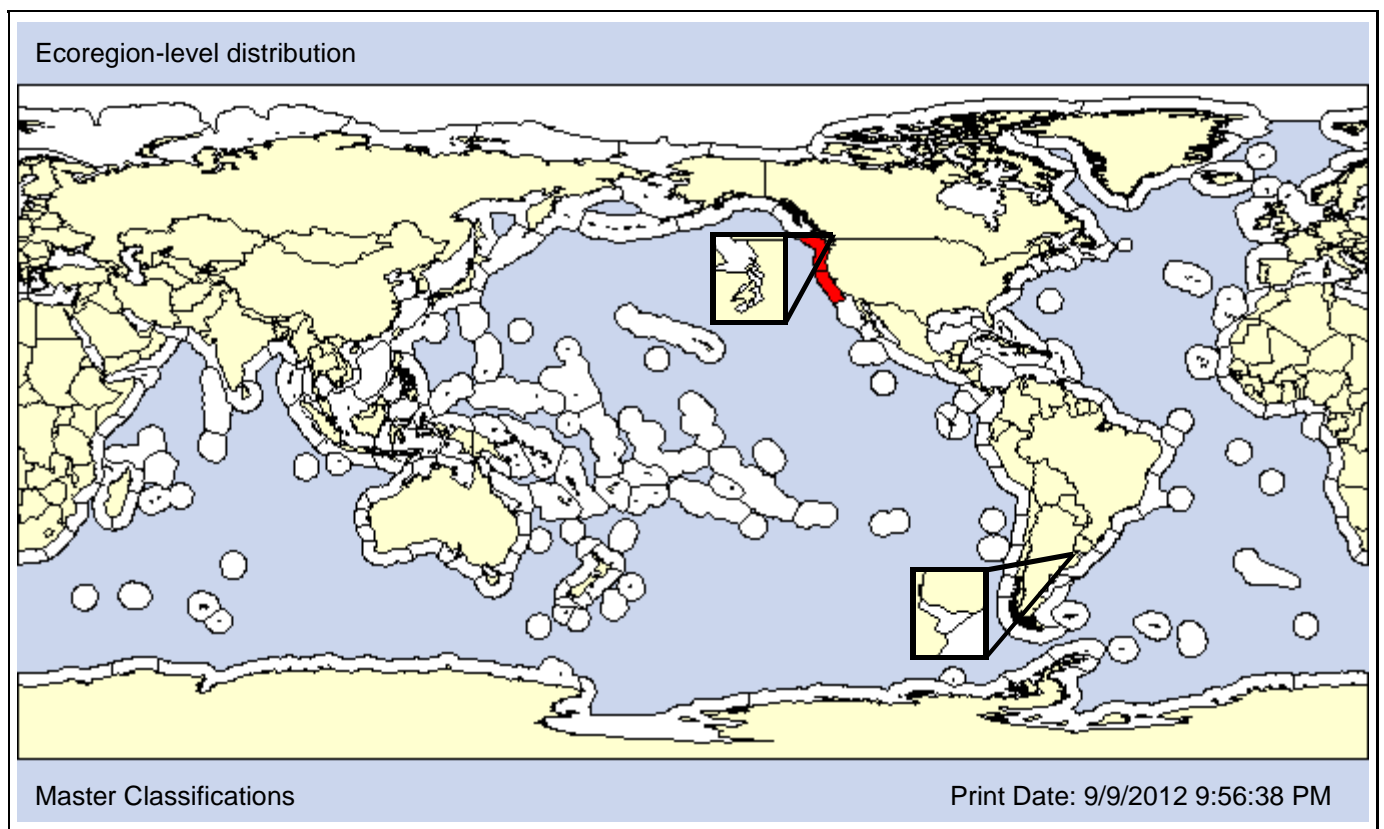
**Also Known As (Name - Type):**

Chaetocorophium lucasi of Boyd et al., 2002; not (Hurley, 1	Misidentified
Paracorophium lucasi of NEP authors	Synonym
Paracorophium sp A of NEP authors	Synonym
Paracorophium sp. (TNA 2001)	Synonym

**Common Names:**

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**Type Locality:** Northeast Pacific



**Date 1st record:**

2000

**Loc 1st record:**

Humboldt Bay, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: The Paracorophium in the NEP is introduced since this genus does not occur along the U.S. Pacific Coast. This species could be from New Zealand if it is *P. lucasi*, though it also could be from South America (Chapman, 2007 and 2009). Importation of logs from New Zealand is a likely vector if it is *P. lucasi*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 2m] [Pref: 0 - 2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 4.24 - 96.33%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: 32.9 - 35.3psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
						<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Amphipod

**Taxonomic Author:** Pasko, 1999

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Dexaminidae

**Subfamily:**

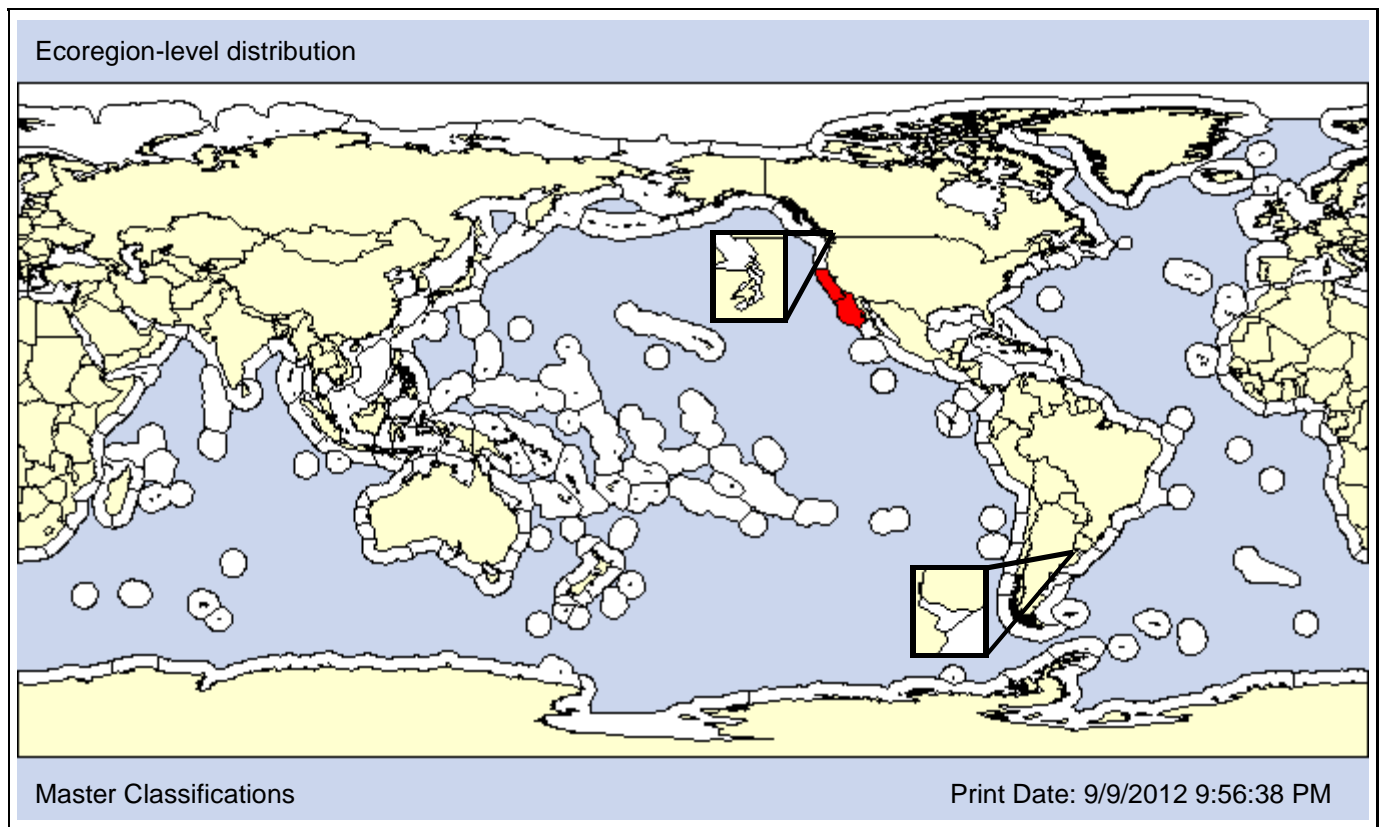
**Also Known As (Name - Type):**

Paradexamine cf churinga	Synonym
Paradexamine churinga of NEP authors	Synonym
Paradexamine sp. SD1	Synonym
Paradexamine sp. SD1 SCAMIT	Synonym

**Common Names:**

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**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1991  
**Loc 1st record:** Santa Catalina, California  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: An undescribed *Paradexamine* was discovered from Santa Catalina Island, California in 1991, “apparently having arrived from warmer waters on a yacht” (CANOD, 2009). It has since been found in the San Francisco Estuary and various Southern California harbors/estuaries.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 51m] [Pref: 1 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 6 - 96.3%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>								<b>Artificial Substrate O</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: 28.6 - 36.8psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF <b>X</b>				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					
			<b>X</b>								

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Leucothoidae

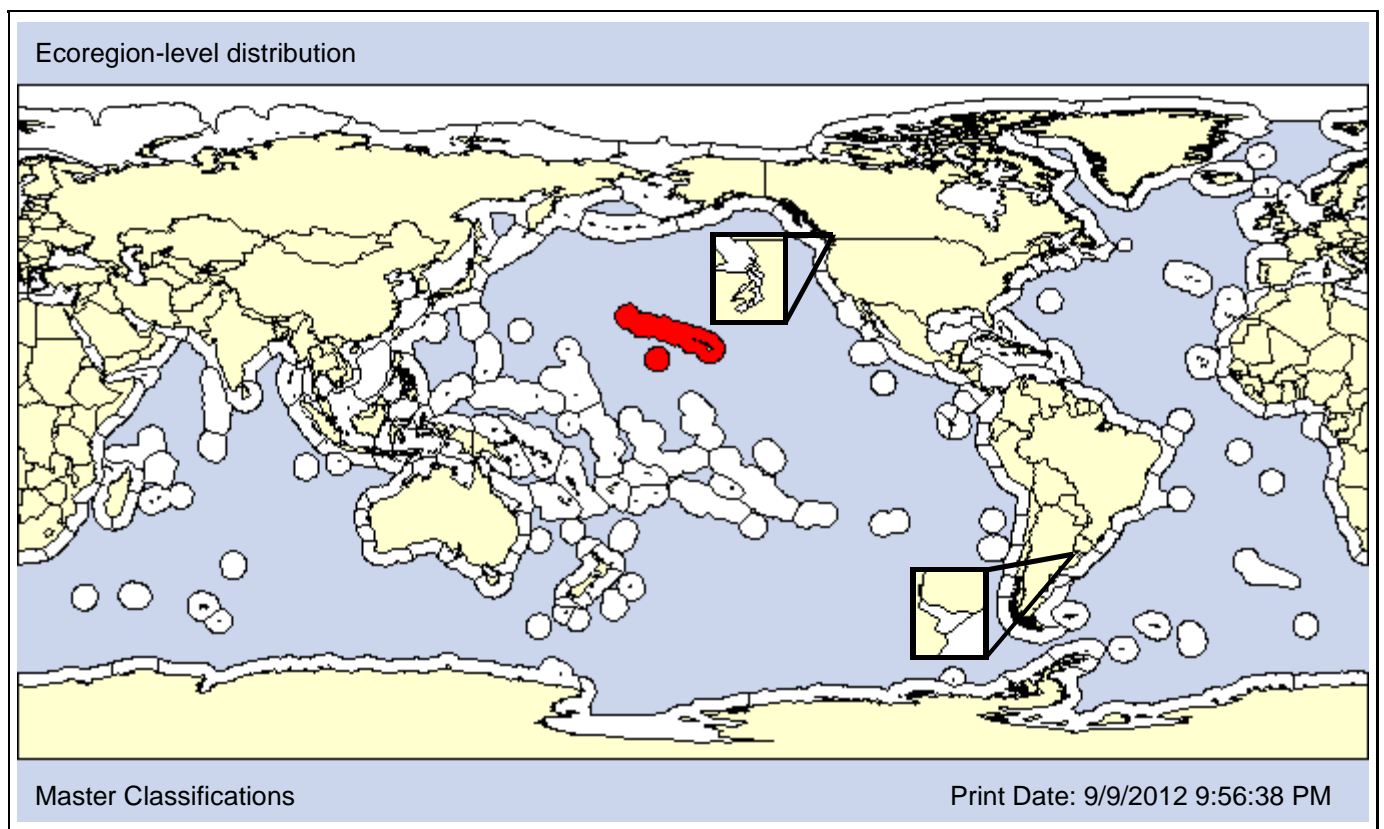
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Paraleucothoe flindersi of Hawaiian authors	Synonym	
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**Type Locality:** Hawaii, USA



**Date 1st record:**

1996

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: *Paraleucothoe* sp. (Carlton and Eldredge, 2009) is associated with sponges or ascidians. It is possibly of Indo-Pacific origin. It has previously been referred to as *P. flindersi* in Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X



**Taxon:** Amphipod

**Taxonomic Author:** (Dana, 1853)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Caprellida

**Superfamily:** Caprelloidea

**Family:** Podoceridae

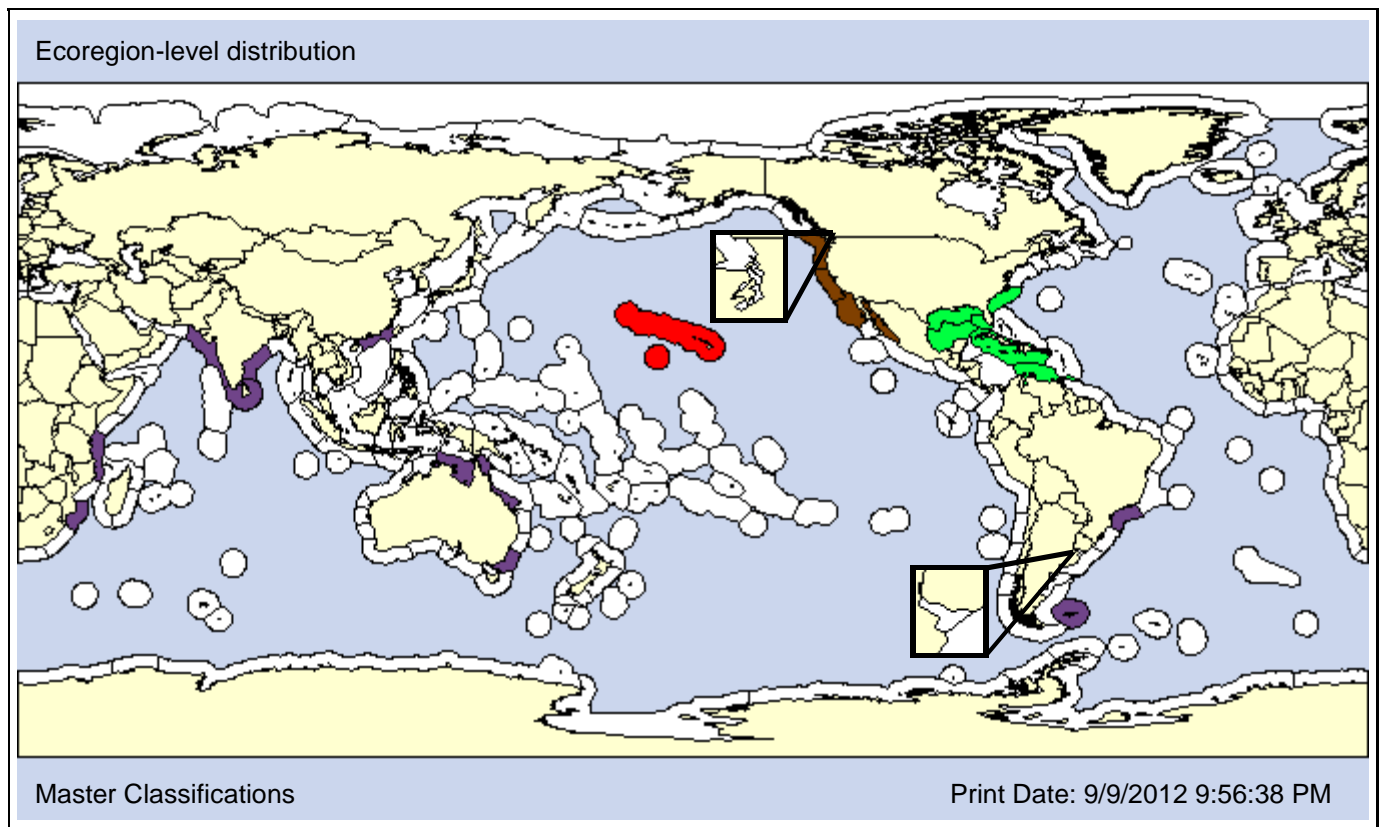
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Platophium brasiliense	Synonym	
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**Type Locality:**



**Date 1st record:**

1935

Unknown

**Loc 1st record:**

Kaneohe Bay, Hawaii

Unknown

**Established:**

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: Carlton and Eldredge (2009) tentatively treat *Podocerus brasiliensis* as native to the NWA and Chapman (2007) considers it a likely introduction in California. However, CANOD (2009) classifies it "cryptogenic-likely native". We treat it as native to the NWA, introduced in Hawaii, a conflict in the NEP, and unclassified elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH				<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 24m] [Pref: 0 - 24m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 0 - 78.8%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>		<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>				<b>P</b>	<b>P</b>

**SALINITY [Obs: 33 - 36.8psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Walker, 1904

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

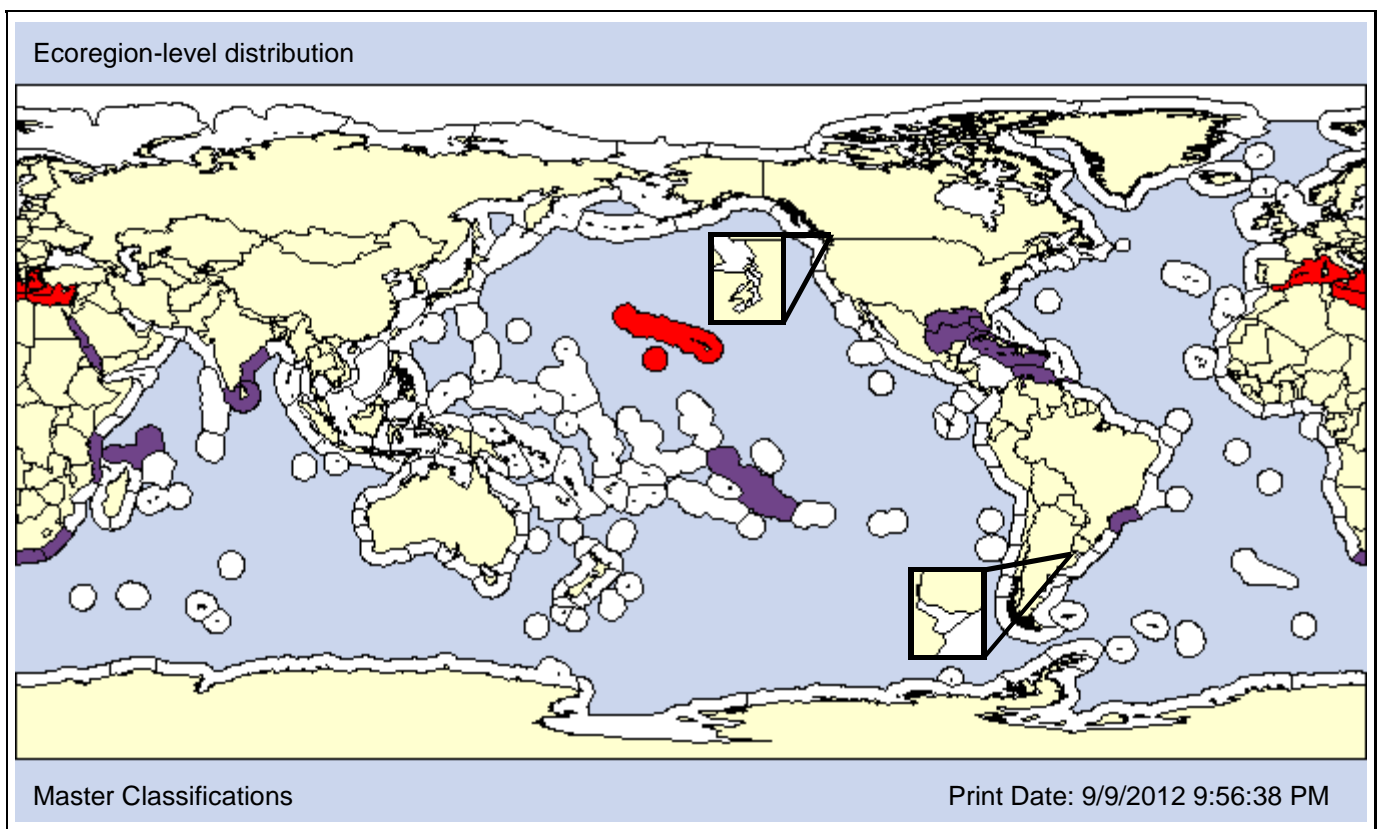
**Family:** Stenothoidae

**Subfamily:** Stenothoinae

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Ceylon (Sri Lanka)



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1935  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: The native region of *Stenothoe gallensis* is unknown, though it is considered introduced in Hawaii and the Mediterranean. It has been classified as NIS in southern Florida but, at this time, we list it as unclassified in the Caribbean.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH		<b>X</b>		<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 3635m] [Pref: - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>						<b>P</b>				<b>O</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 29 - 39.6psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod

**Taxonomic Author:** Dana, 1852

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Gammaridea

**Infraorder:** Gammarida

**Superfamily:**

**Family:** Stenothoidae

**Subfamily:**

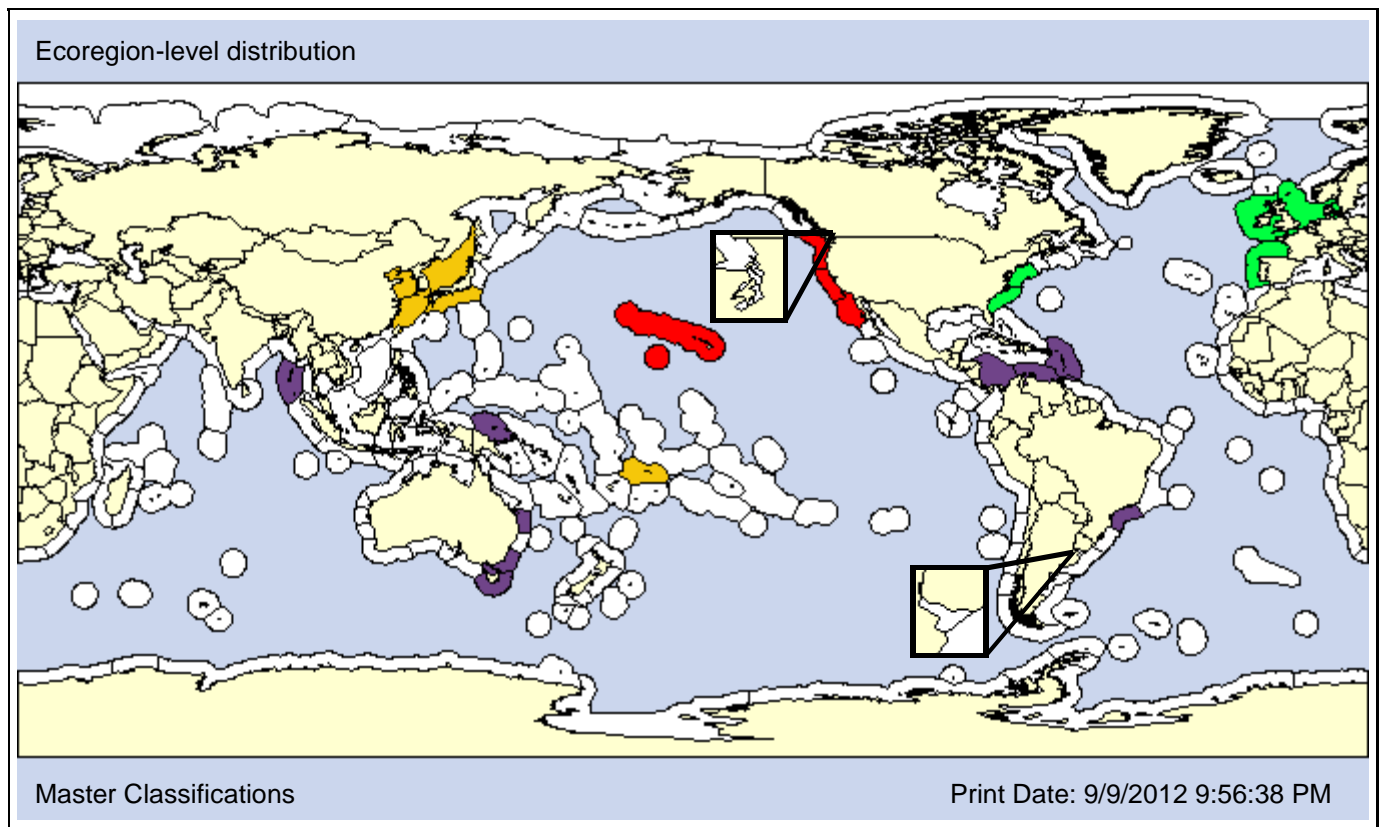
**Also Known As (Name - Type):**

Probolium polyprion	Synonym
Stenothoe assimilis	Synonym
Stenothoe megacheles	Synonym
Stenothoe ornata	Synonym

**Common Names:**

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**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

<b>Date 1st record:</b> 2007	<1924	1941
<b>Loc 1st record:</b> Yellow Sea	Oahu, Hawaii	San Francisco Estuary, CA
<b>Established:</b> Unknown	Yes	Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments: *Stenothoe valida* may be a species complex. We tentatively list it as native in the North Atlantic and introduced in Hawaii (Carlton and Eldredge, 2009), the harbor populations in the NEP as introduced (Chapman, 2007), and cryptogenic in the NWP (PICES Working Group 21, 2009) and Samoa (Coles et al., 2003).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>

**DEPTH [Obs: 0 - 27m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>										<b>P</b>	<b>O</b>	

**SALINITY [Obs: - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Amphipod      **Taxonomic Author:** (Bousfield & Carlton, 1967)

**Kingdom:** Animalia      **Subkingdom:** Eumetazoa      **Phylum:** Arthropoda

**Subphylum:** Crustacea      **Superclass:**      **Class:** Malacostraca

**Subclass:** Eumalacostraca      **Infraclass:**      **Superorder:** Peracarida

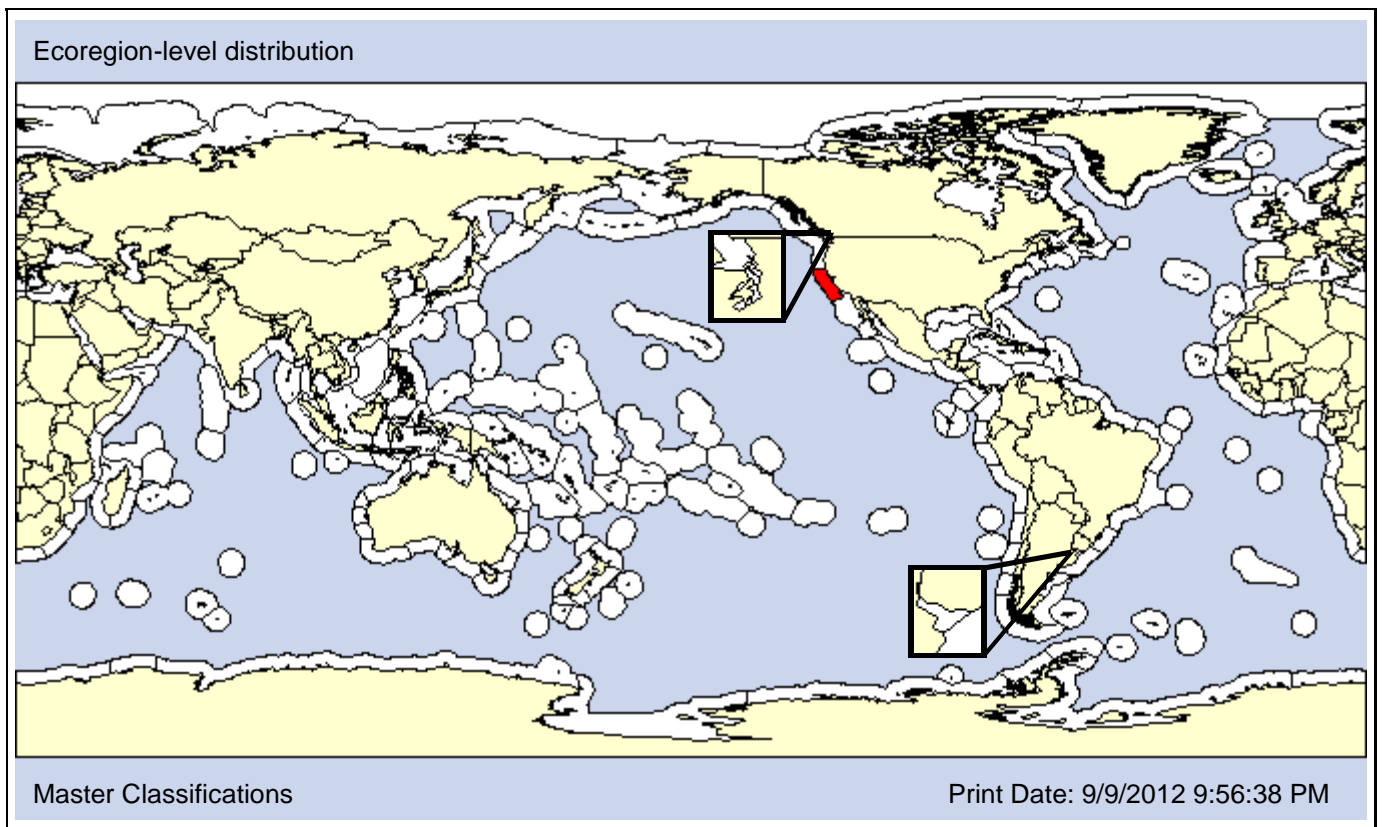
**Order:** Amphipoda      **Suborder:** Gammaridea      **Infraorder:** Talitrida

**Superfamily:** Talitroidea      **Family:** Talitridae      **Subfamily:**

**Also Known As (Name - Type):**

Orchestia chiliensis	Synonym	Common Names: shorehopper
Orchestia enigmatica	Synonym	

**Type Locality:**



Native   
  Nonindigenous   
  NIS Not Established   
  Cryptogenic   
  Transient   
  Unclassified   
  Conflicting Classification   
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1962

**Loc 1st record:** San Francisco Estuary, CA

**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
	<b>X</b>					AO	PO								

Comments: *Transorchestia enigmatica* is only known from the lagoon, Lake Merritt, in the San Francisco Estuary. It is a member of the *T. chiliensis* species group, known from Chile and New Zealand (although *enigmatica* remains unknown from either region). It was introduced in solid ballast, perhaps by ships carrying lumber (Chapman, 2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
<b>X</b>													

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>P</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								



**Taxon:** Amphipod

**Taxonomic Author:** (Calman, 1910)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Amphipoda

**Suborder:** Corophiidea

**Infraorder:** Corophiida

**Superfamily:** Cheluroidea

**Family:** Cheluridae

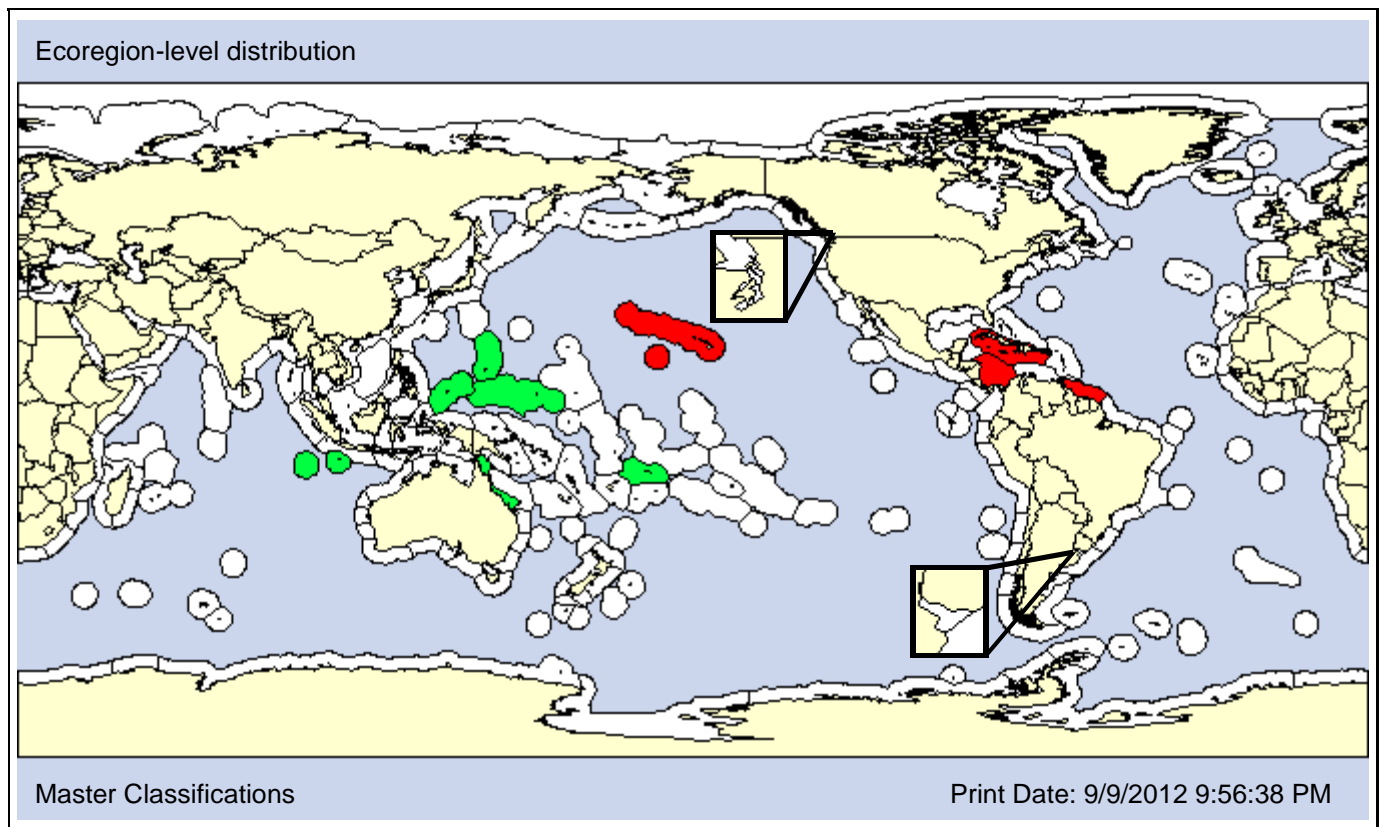
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Chelura insulae	Synonym	
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**Type Locality:** Christmas Island, Indian Ocean



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1924  
**Loc 1st record:** Honolulu Harbor, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: Carlton and Eldredge (2009) regard the wood-boring *Tropichelura insulae* as an Indo-Pacific species. Accordingly, we classify the records in the Caribbean as introduced likely through wooden-hulled ships.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>		<b>P</b>	<b>P</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					
						<b>X</b>							

Kingdom: Animalia

Phylum: Arthropoda

Class: Malacostraca

Superorder: Peracarida

Order: Cumacea

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**Taxon:** Cumacean

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Cumacea

**Suborder:**

**Infraorder:**

**Superfamily:**

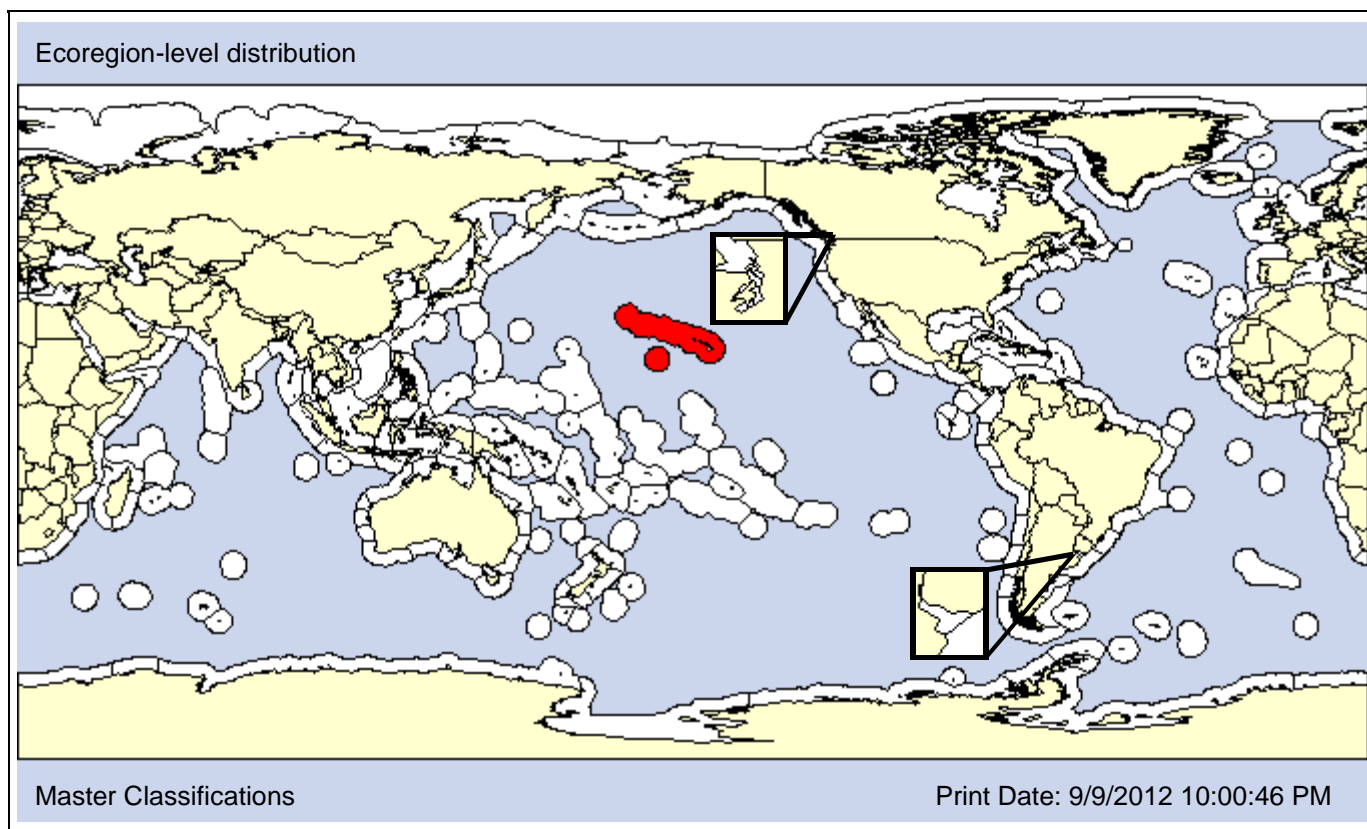
**Family:** Nannastacidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1996  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments: Cumaceans were previously unknown from the Hawaiian Islands (Carlton and Eldredge, 2009). Thus this undescribed *Nannastacus* collected in 1996 is considered introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 29 - 32psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
			<b>X</b>										

**Taxon:** Cumacean

**Taxonomic Author:** (Gamo, 1967)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Cumacea

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Leuconidae

**Subfamily:**

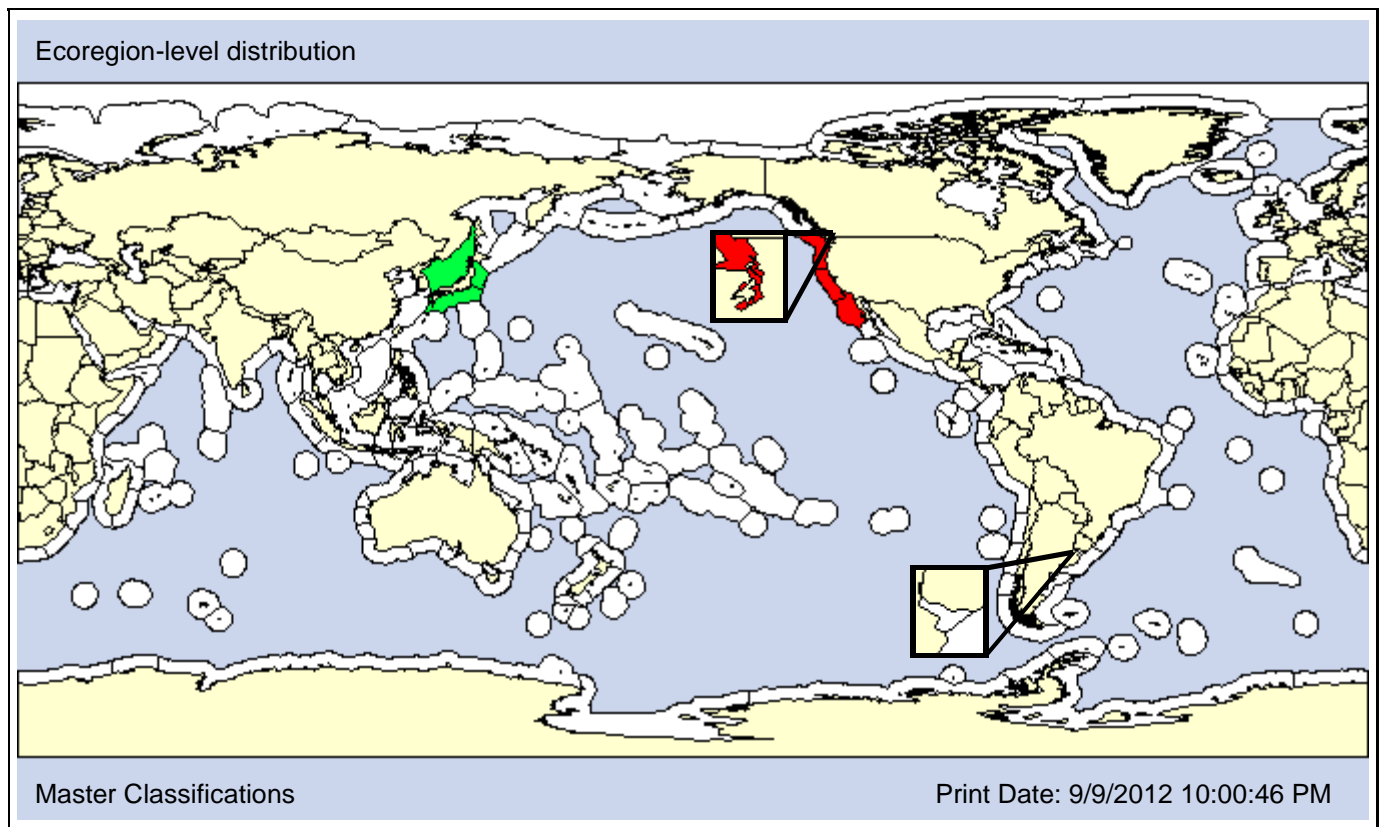
**Also Known As (Name - Type):**

Hemileucon comes of authors; not Calman, 1906  
Hemileucon hinumensis

Misidentified  
Synonym

**Common Names:**

**Type Locality:** Lake Hinuma, Honshu, Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1979

**Loc 1st record:** Native

Coos Bay, Oregon

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
<b>X</b>						AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 20m] [Pref: 0 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.7 - 100%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>O</b>						

**SALINITY [Obs: 1.2 - 32psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
				<b>X</b>					DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
			<b>X</b>		<b>X</b>								



**Taxon:** Cumacean

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Cumacea

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Nannastacidae

**Subfamily:**

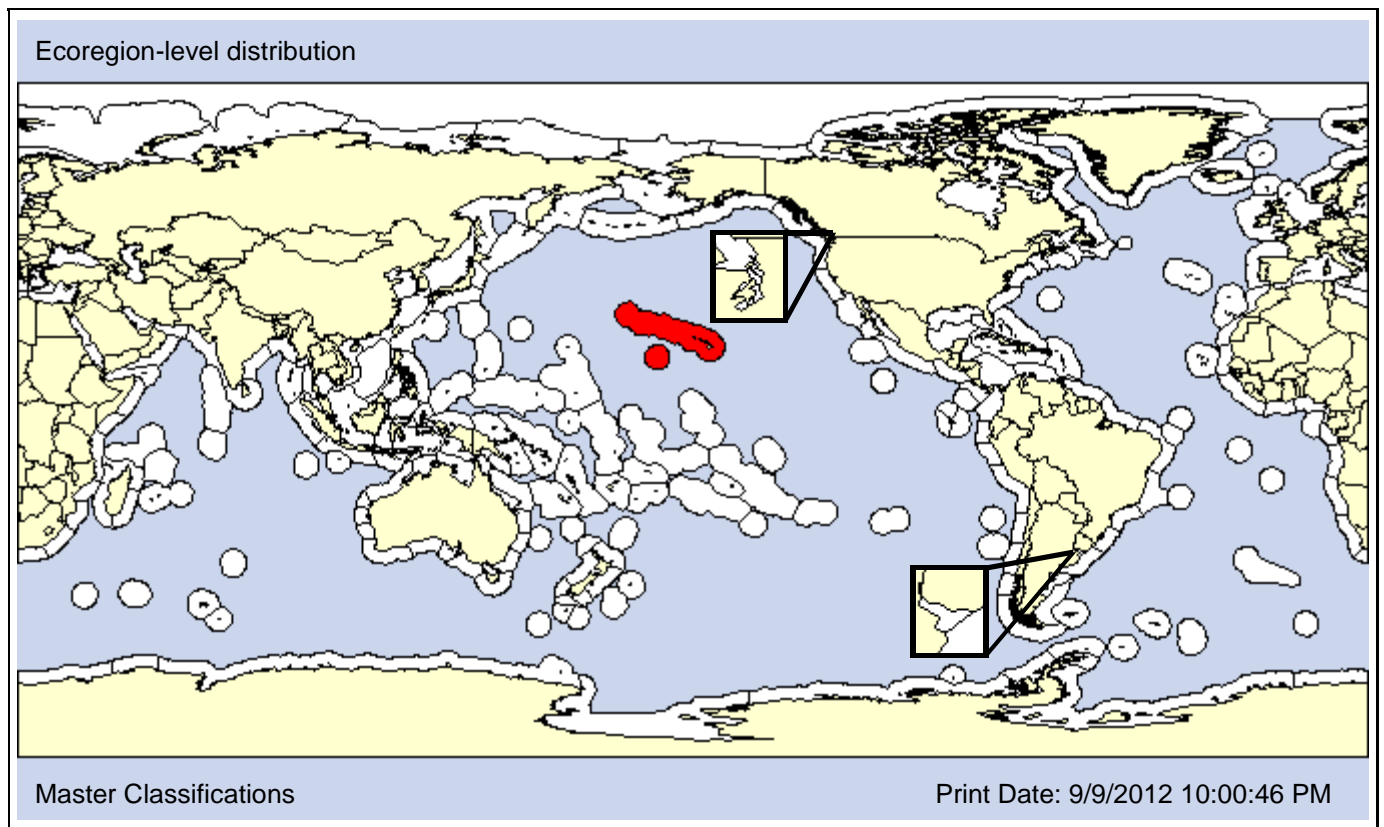
**Also Known As (Name - Type):**

**Common Names:**

[Empty box for Also Known As (Name - Type)]

[Empty box for Common Names]

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** <1996  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments: Cumaceans were previously unknown from the Hawaiian Islands (Carlton and Eldredge, 2009). Thus this undescribed *Scherocumella* collected from floats in Pearl Harbor sometime before 1996 is considered introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
														<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

Kingdom: Animalia

Phylum: Arthropoda

Class: Malacostraca

Superorder: Peracarida

Order: Isopoda

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**Taxon:** Isopod

**Taxonomic Author:** Budde-Lund, 1885

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Alloniscidae

**Subfamily:**

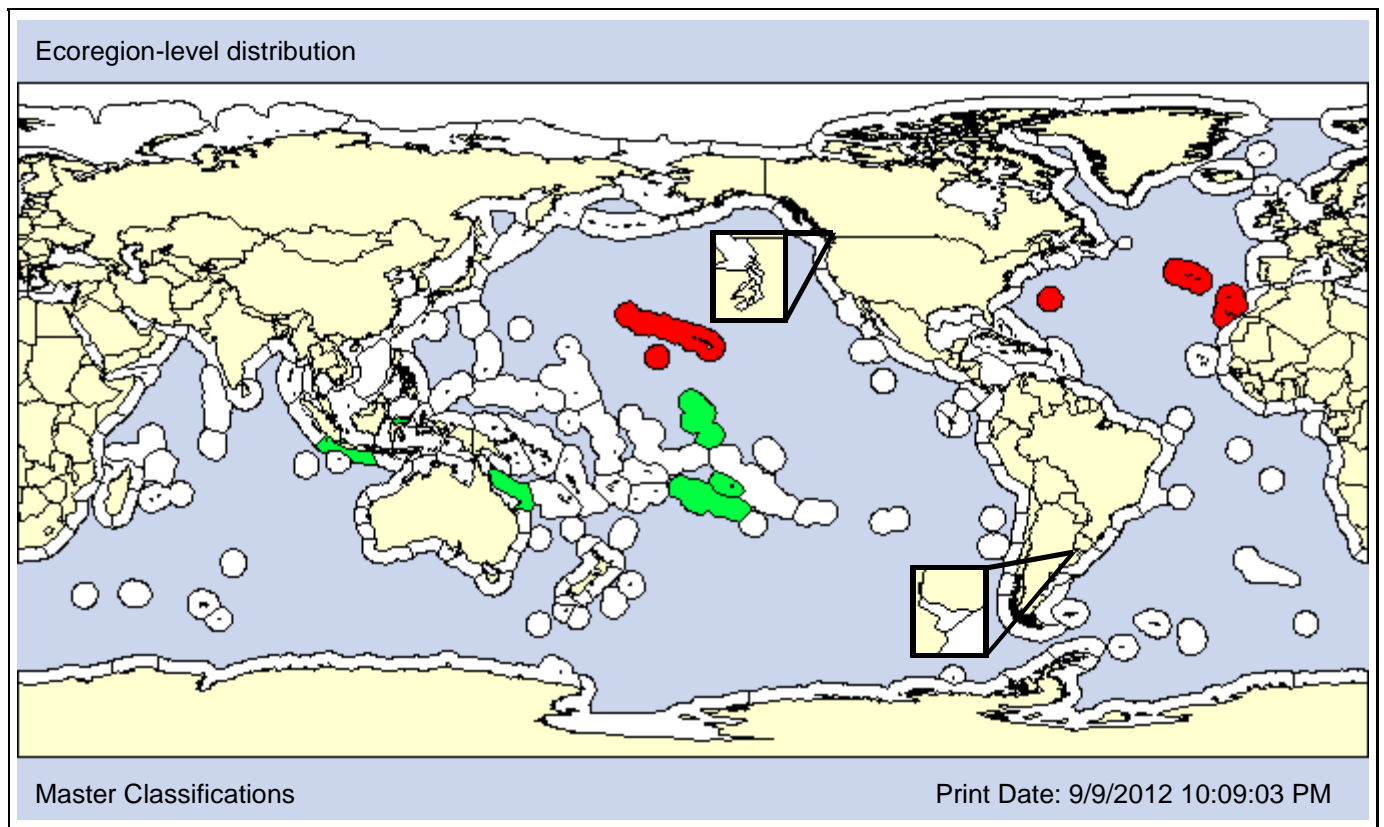
**Also Known As (Name - Type):**

Alloniscus brevis	Synonym
Alloniscus floresianus	Synonym
Anomaloniscus ovatus	Synonym
Anomaloniscus seychellarum	Synonym

**Common Names:**

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**Type Locality:** Hawaii, USA



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 1879  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
	<b>X</b>					AO	PO								

Comments: The isopod *Alloniscus oahuensis* occurs in the supralittoral zone under logs and debris. Although originally described from Hawaii in 1879, Taiti and Howarth (1996) consider it introduced into Hawaii and Carlton and Eldredge (2009) consider it native to other areas of the Indo-Pacific.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O				P	O		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		X	X		TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
P	P		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P				

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
			O	O	O				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						X			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X						
					X								

# Armadilloniscus ellipticus

Species ID: 100780

**Taxon:** Isopod

**Taxonomic Author:** (Harger, 1878)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Detonidae

**Subfamily:**

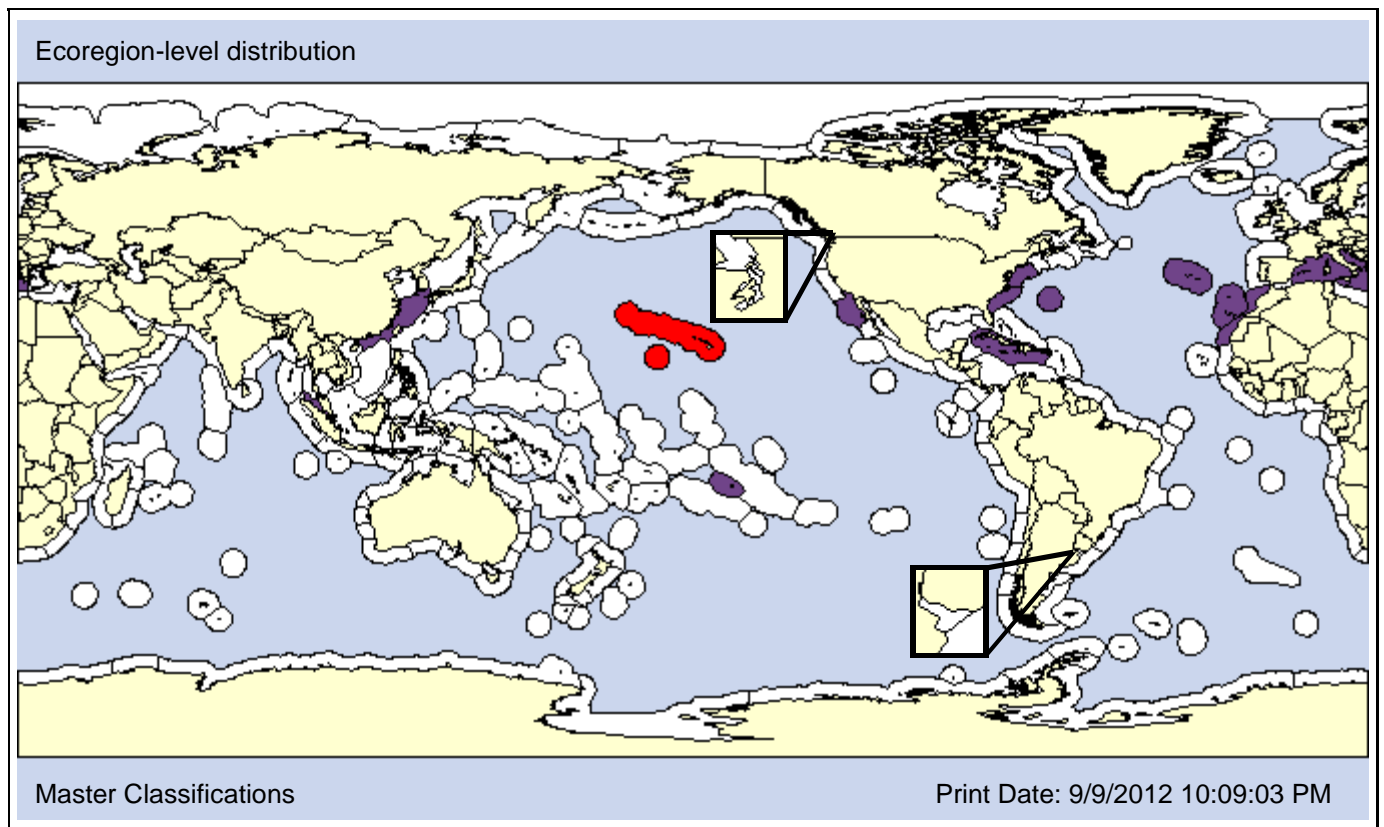
**Also Known As (Name - Type):**

Actoniscus ellipticus	Synonym
Armadilloniscus littoralis	Synonym
Armandilloniscus amakusaensis	Synonym
Armandilloniscus dalmatinus	Synonym

**Common Names:**

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**Type Locality:** Connecticut, USA



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii			NEP	

**Date 1st record:** Unknown

1985

Unknown

**Loc 1st record:** Unknown

Oahu, Hawaii

Unknown

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	AA		IR			A	P				
	<b>X</b>					AO	PO									

Comments: The isopod *Armadilloniscus ellipticus* occurs in the supralittoral zone under logs and debris as well as in the splash zone of jetties. The native range is unknown but is considered introduced into Hawaii (Taiti and Howarth, 1996).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O			P			

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
	X												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
O	P	O	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O			O		

**CONSOLIDATED SUBSTRATE X**

R O	HP	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P	O			

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
						X			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X						
					X	X							



**Taxon:** Isopod

**Taxonomic Author:** (Hooker, 1985)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Asellota

**Infraorder:**

**Superfamily:** Janiroidea

**Family:** Paramunnidae

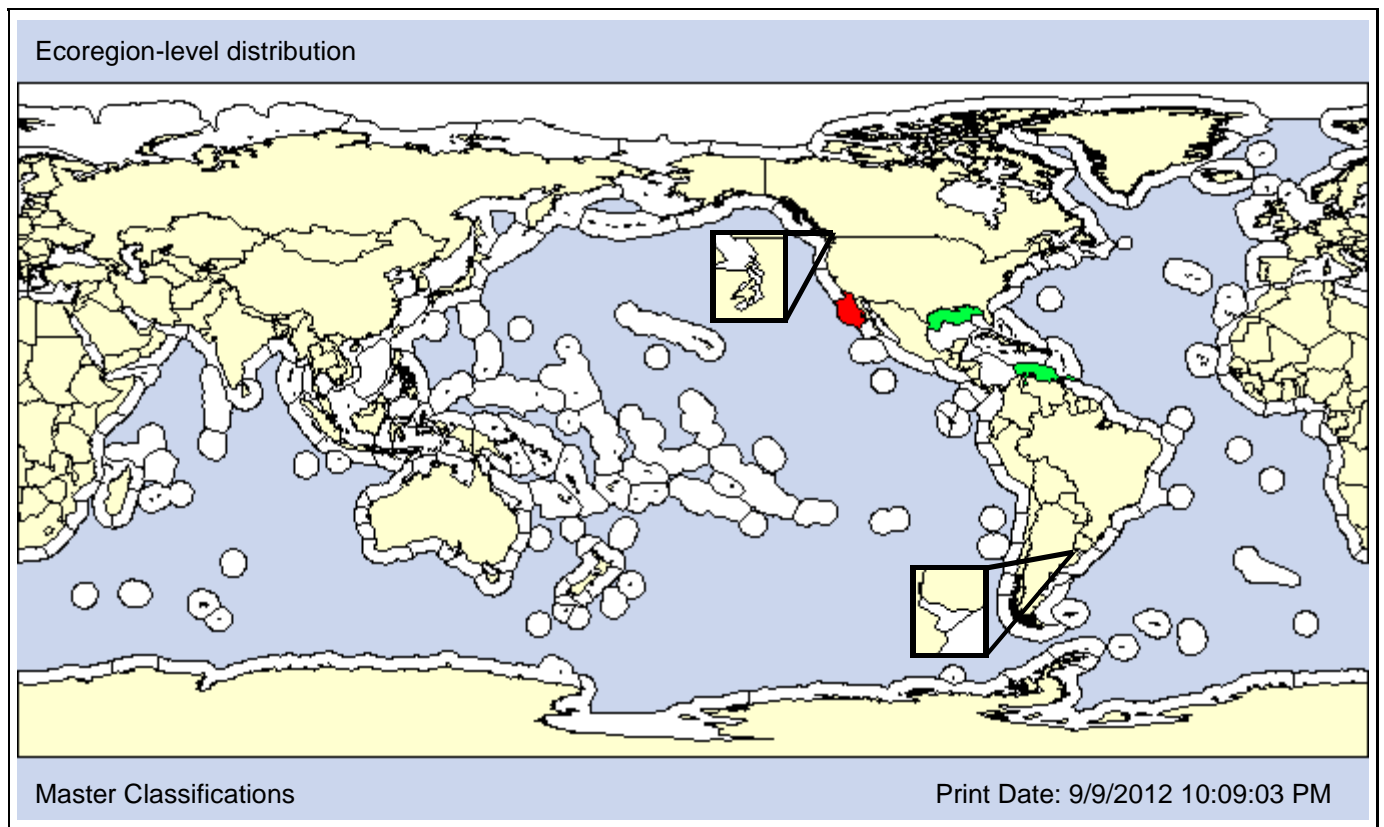
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Munnogonium wilsoni	Synonym	
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**Type Locality:** Gulf of Mexico



**Date 1st record:**

2001

**Loc 1st record:**

Los Angeles Harbor, CA

**Established:**

Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Boreosignum wilsoni* [= *Munnogonium wilsoni*] was reported as introduced in southern California by Fairey et al. (2002) and Foss et al. (2007). However, it is not listed in California by CANOD (2009). Therefore, it is listed as a NIS in the NEP with an uncertain population status.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O		O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		X											

**DEPTH [Obs: 4 - 55m] [Pref: 30 - 55m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P	P			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
						X			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					X								

**Taxon:** Isopod

**Taxonomic Author:** Taiti & Ferrara, 1991

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

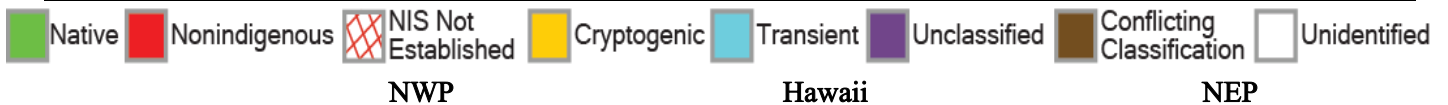
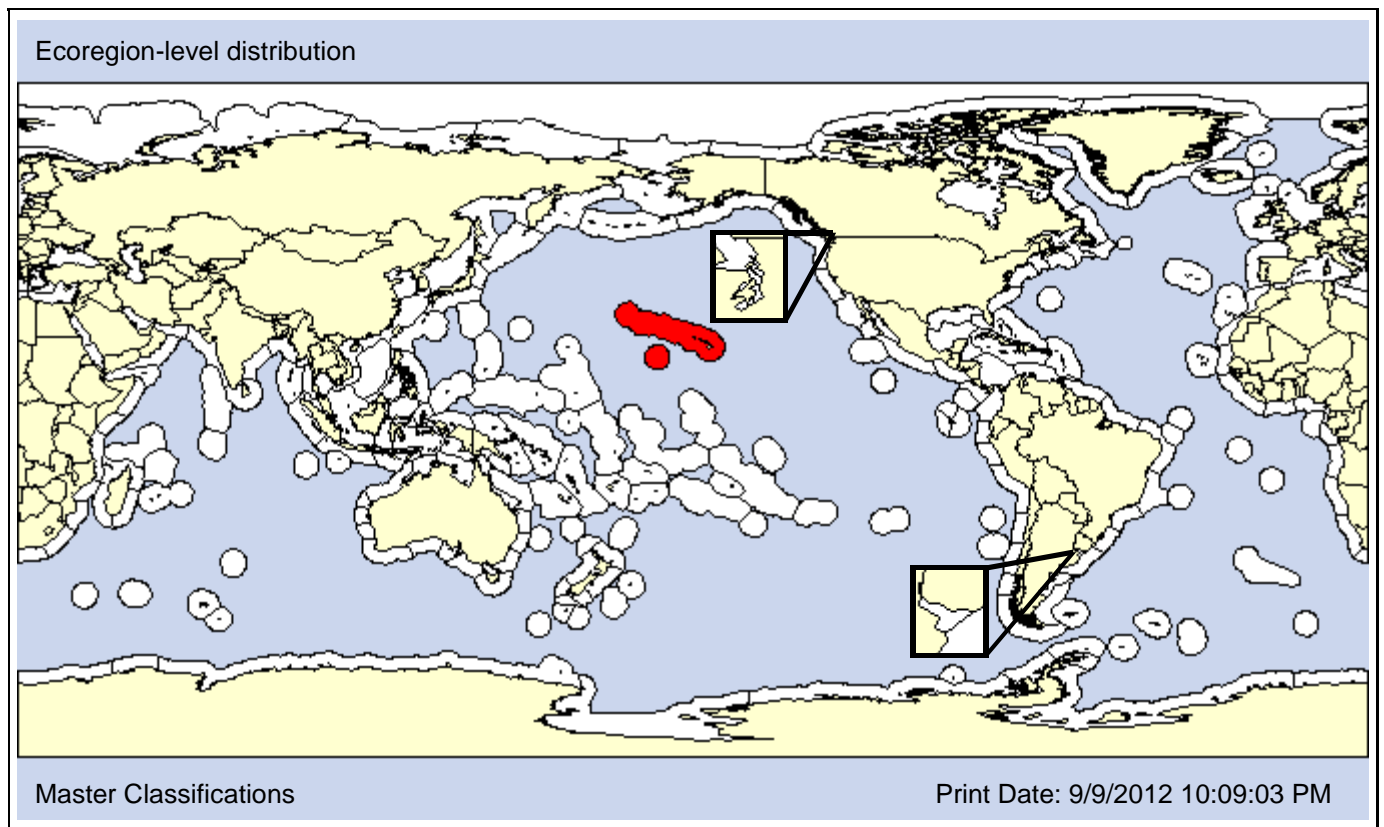
**Family:** Buddelundiellidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



**Date 1st record:** 1985  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
	<b>X</b>					AO	PO								

Comments: Only two species of *Buchnerillo* are known - *Buchnerillo litoralis* from the Mediterranean, Madeira, and Florida and *Buchnerillo oceanicus* from Somalia. Thus it is likely that the unidentified species in Hawaii is introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>O</b>			<b>O</b>			

**ECOSYSTEM**

Unconsolidated						Consolidated						Pelagic	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

R	HP	Biogenic						Artificial Substrate						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

Fresh	Brackish						Marine <b>O</b>		Hyper
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
									DF-SUR	DF-SUB

**REPRODUCTION**

Sexual <b>X</b>						Asexual				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic <b>X</b>							Epibiotic			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Isopod

**Taxonomic Author:** Menzies, 1951

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Asellota

**Infraorder:**

**Superfamily:** Janiroidea

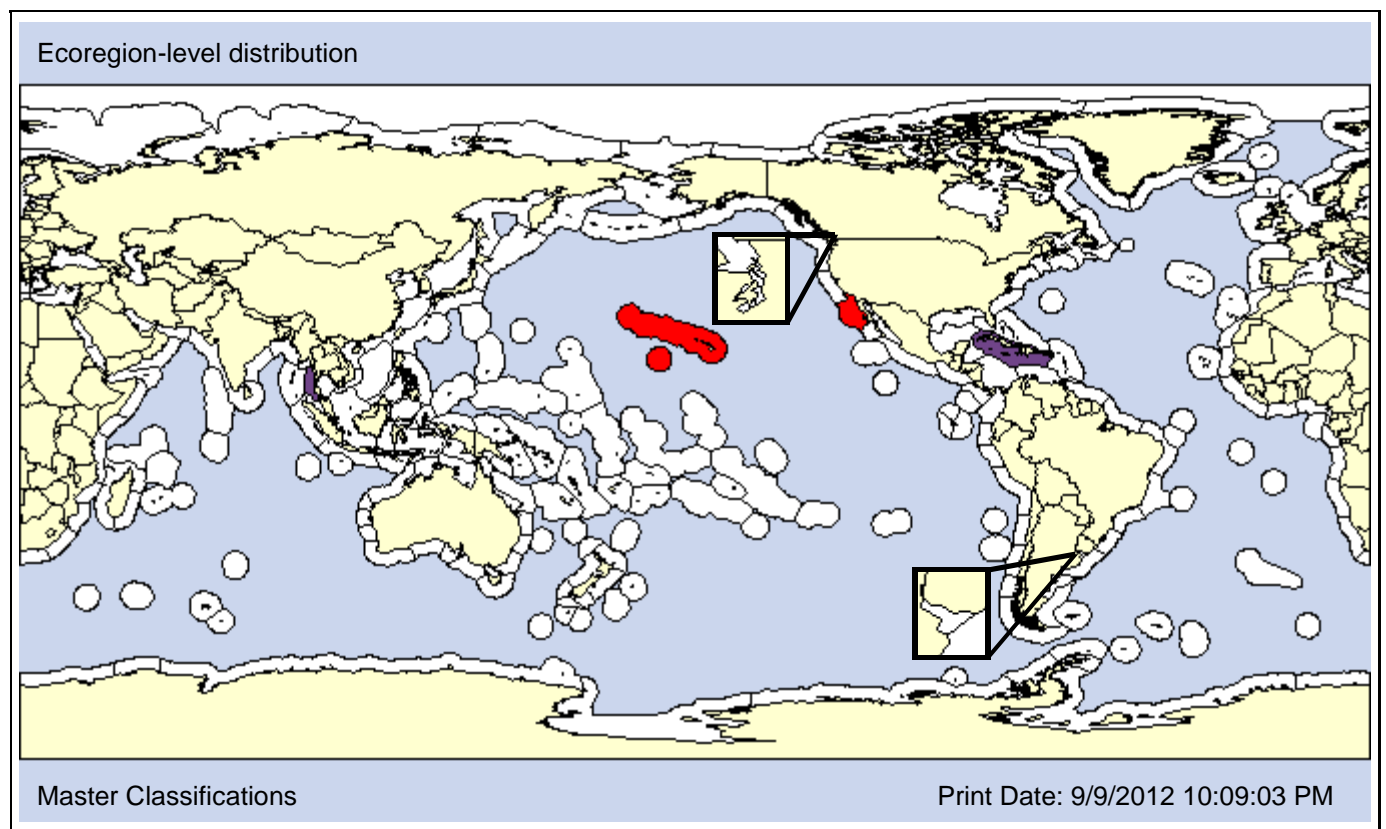
**Family:** Janiridae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Los Angeles, California, USA



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:**

1975

1950

**Loc 1st record:**

Oahu, Hawaii

Long Beach Harbor, CA

**Established:**

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		<b>X</b>				AO	PO								

Comments: The native range of *Caecijaera horvathi* is unknown, but CANOD (2009) considers it introduced in California and Carlton and Eldredge (2009) consider it introduced in Hawaii. It lives inside burrows excavated in wood by *Limnoria* species, and was likely introduced with *Limnoria tripunctata*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - 10m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>		<b>O</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					

**Taxon:** Isopod

**Taxonomic Author:** Shen, 1929

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Sphaeromatidea

**Infraorder:**

**Superfamily:** Sphaeromatoidea

**Family:** Sphaeromatidae

**Subfamily:**

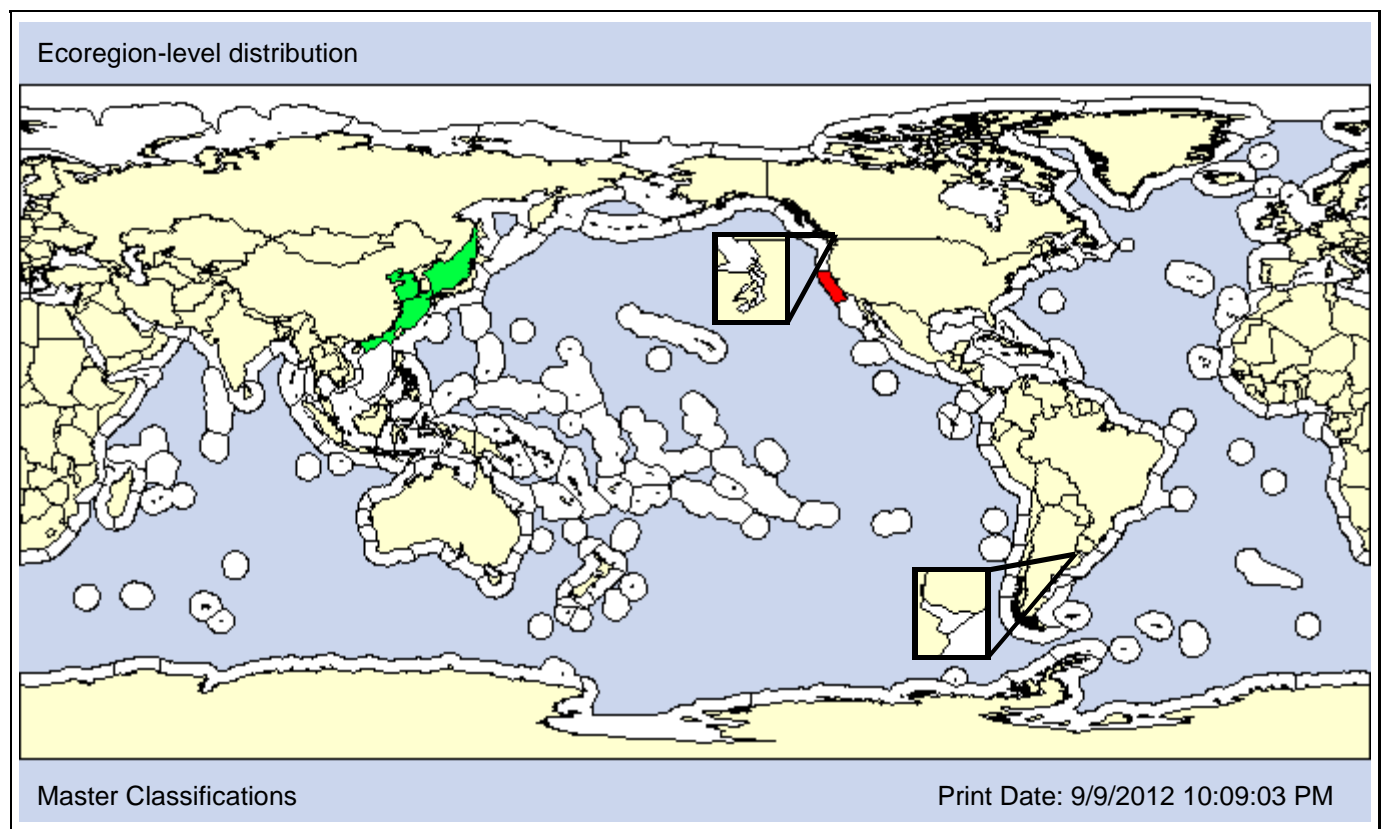
**Also Known As (Name - Type):**

Dynoidella conchicola  
Dynoides conchicola

Synonym  
Synonym

**Common Names:**

**Type Locality:** Peidaiho, China



**Date 1st record:** Native

1977

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: In the NEP, the Asian *Dynoides dentisinus* has only been recorded from the San Francisco Estuary.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 1m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>		<b>P</b>					<b>O</b>		<b>O</b>	

**SALINITY [Obs: 16.5 - 29psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Isopod

**Taxonomic Author:** (Hale, 1925)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Cymothoida

**Infraorder:**

**Superfamily:** Cymothooidea

**Family:** Cirolanidae

**Subfamily:**

**Also Known As (Name - Type):**

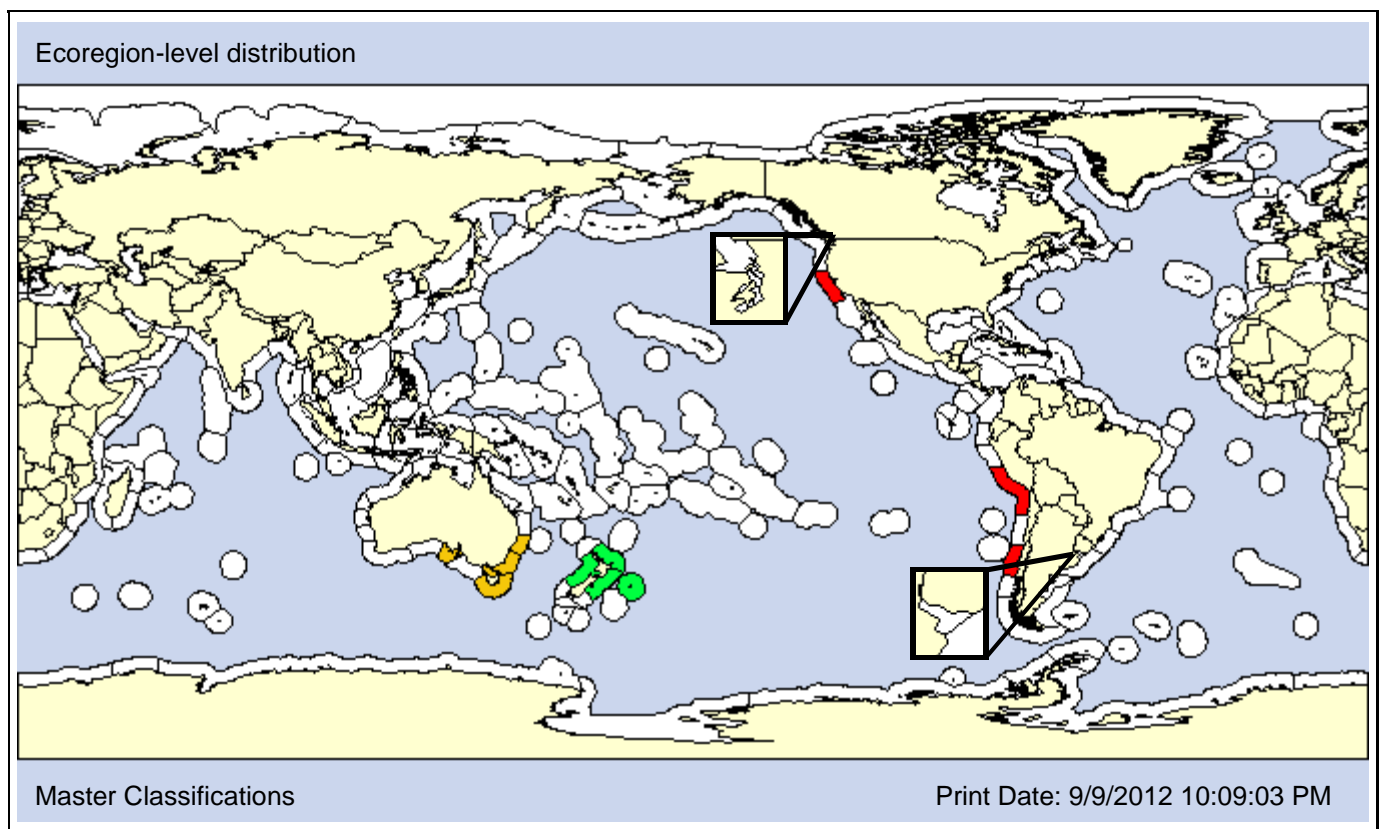
Cirolana arcuata  
Cirolana robusta

Synonym  
Synonym

**Common Names:**

slater (*Eurylana arcuata*)

**Type Locality:** New South Wales, Australia



**Date 1st record:**

1978

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: *Eurylana arcuata* (= *Cirolana arcuata*) is common in New Zealand and Chile but rare in Australia. We follow NIMPIS (2009) and assume that it is native to New Zealand and cryptogenic in Australia, and thus introduced in Chile. In the NEP, it has only been reported from the San Francisco Estuary, California.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
<b>X</b>	<b>X</b>	<b>X</b>					<b>X</b>						

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>		<b>O</b>	<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY [Obs: 16.9 - 31.2psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
			<b>O</b>	<b>O</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>				<b>X</b>		
					<b>X</b>	<b>X</b>							

**Taxon:** Isopod

**Taxonomic Author:** Coles et al., 2007

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Sphaeromatidea

**Infraorder:**

**Superfamily:** Sphaeromatoidea

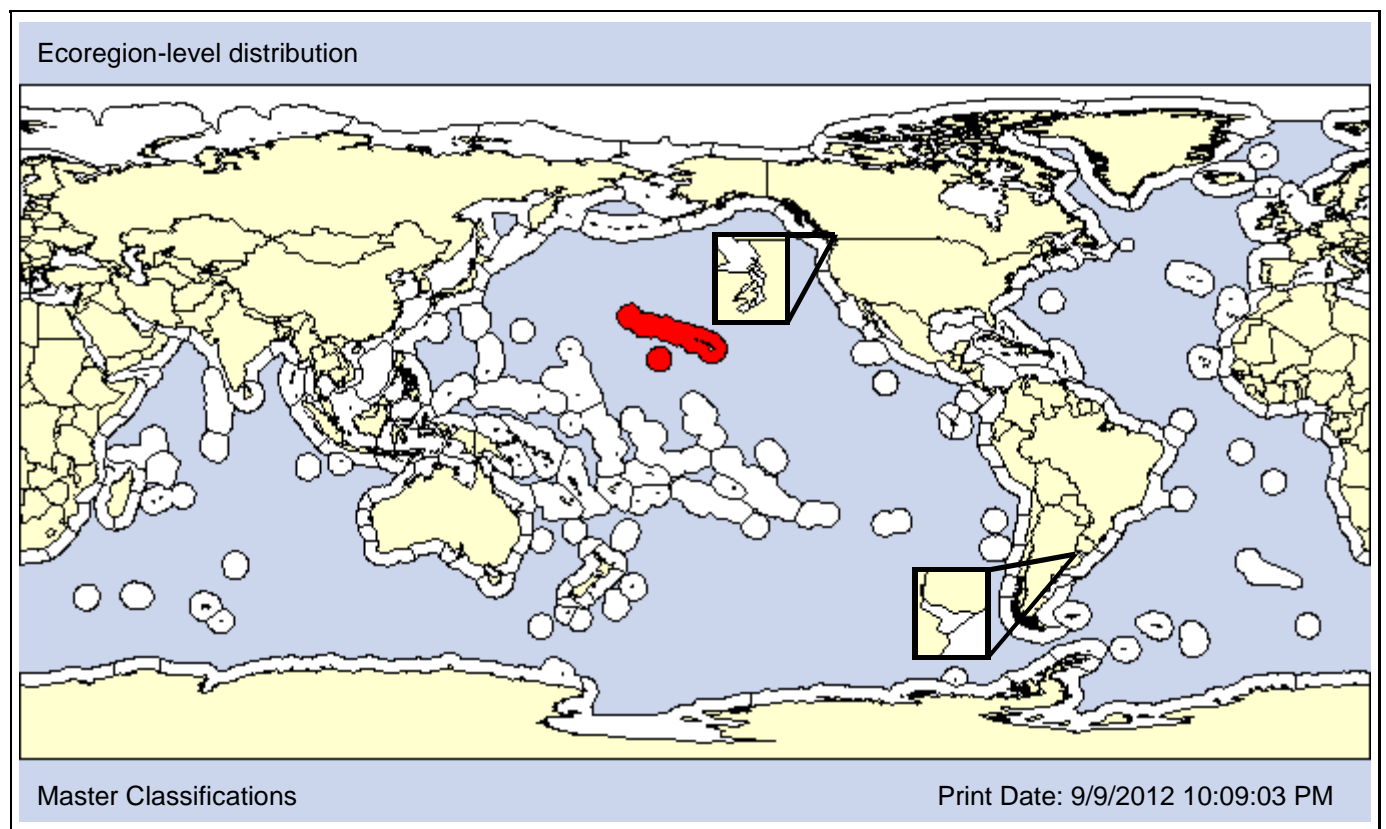
**Family:** Sphaeromatidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1996  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: Even though *Exosphaeroma* sp. has not been identified to species, it is considered nonindigenous in Hawaii because no *Exosphaeroma* or related genera occur naturally in Hawaii (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 2 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY [Obs: 32 - 34psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			X						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Isopod

**Taxonomic Author:** Hoestlandt, 1969

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Sphaeromatidea

**Infraorder:**

**Superfamily:** Sphaeromatoidea

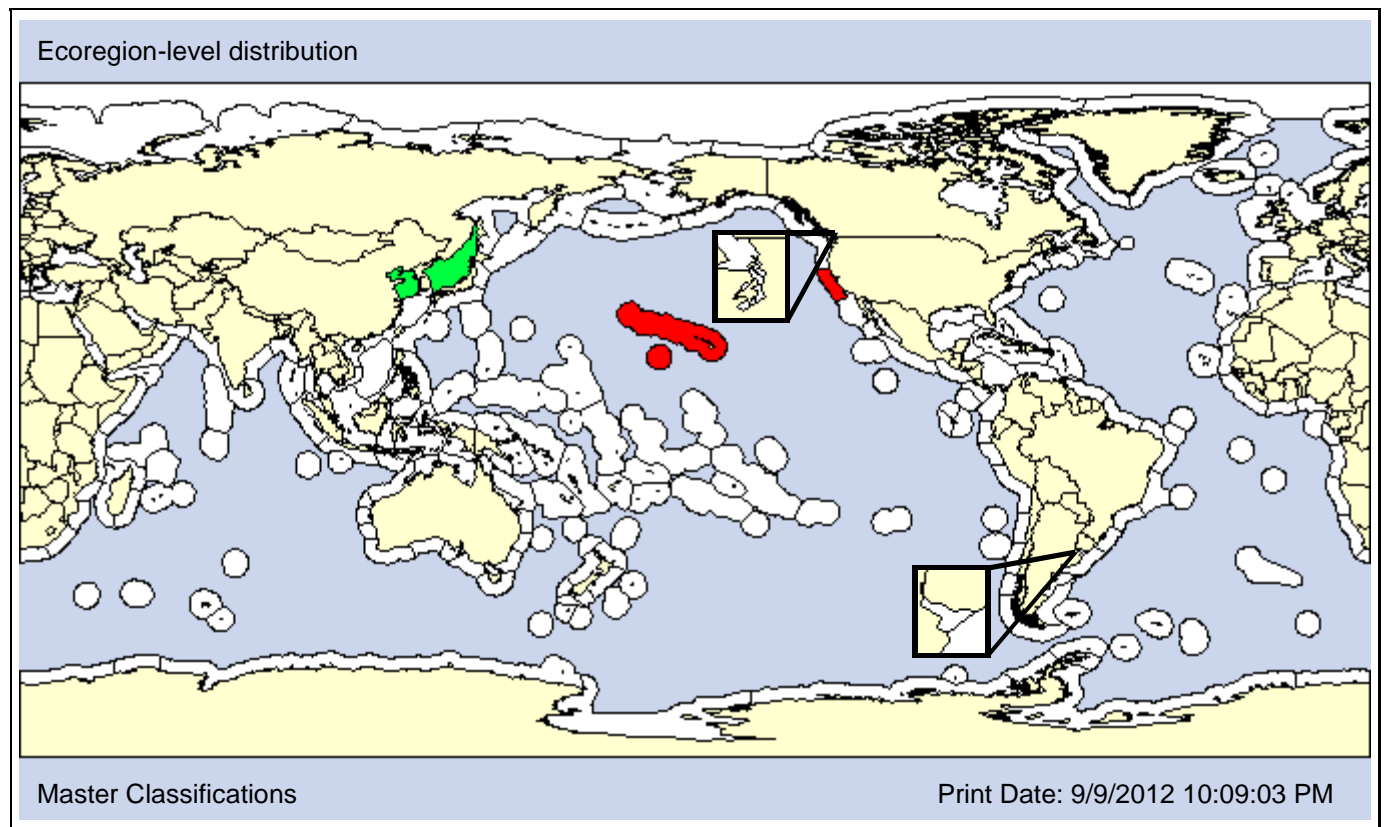
**Family:** Sphaeromatidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Korea



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1972 1952  
**Loc 1st record:** Native Maui, Hawaii Tomales Bay, California  
**Established:** Yes Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
	X	X											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	

**SALINITY [Obs: 15 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline P		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
			<b>X</b>			<b>X</b>			DF-SUR X	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Isopod

**Taxonomic Author:** (Kinahan, 1858)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Halophilosciidae

**Subfamily:**

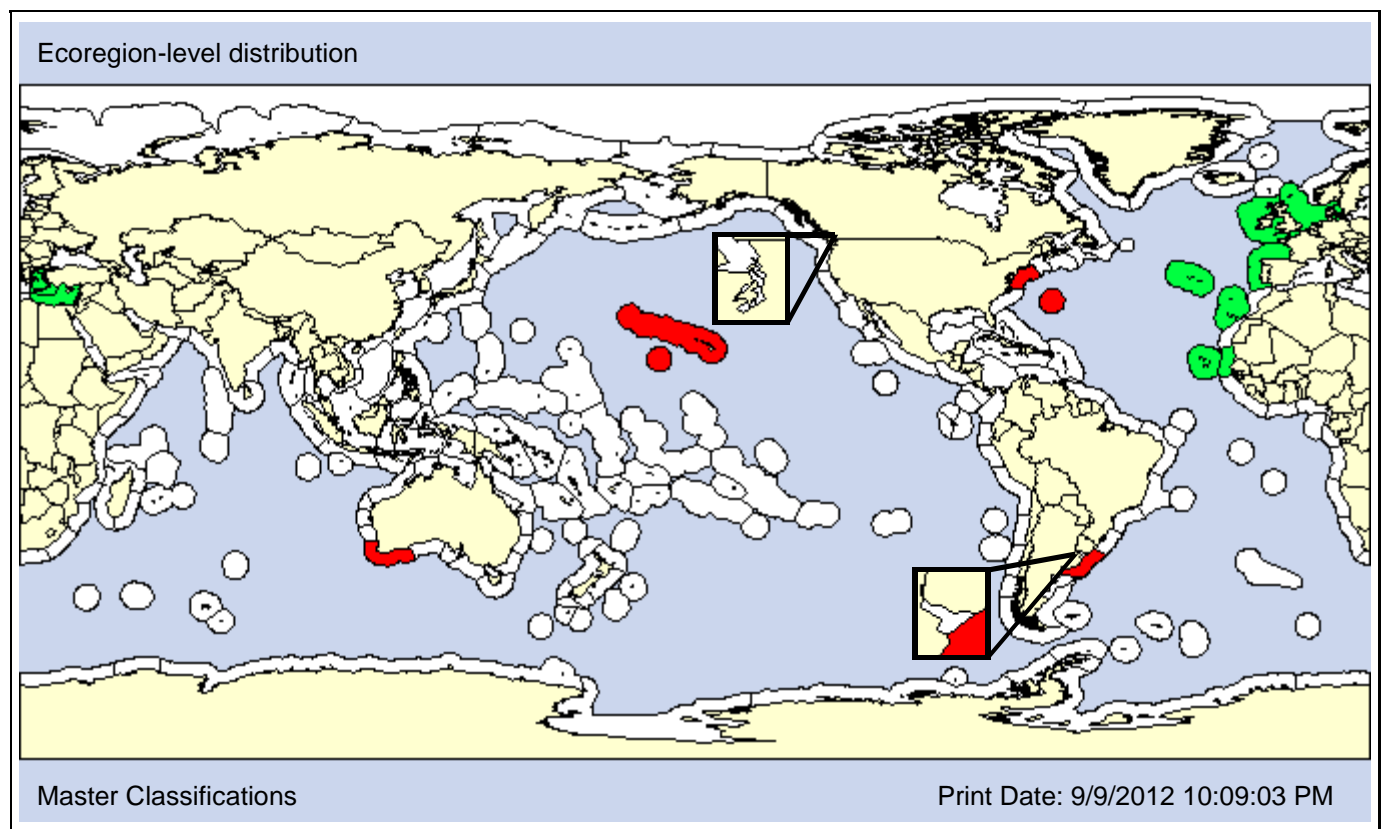
**Also Known As (Name - Type):**

Halophiloscia aristotelis	Synonym
Littorophiloscia bermudensis	Synonym
Philoscia aristotelis	Synonym
Philoscia bermudensis	Synonym

**Common Names:**

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**Type Locality:** Greece



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1997

**Loc 1st record:**

Midway Island, USA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
	X				AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>			<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>P</b>	<b>O</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 36psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>			<b>X</b>	<b>X</b>		DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	



**Taxon:** Isopod

**Taxonomic Author:** (Richardson, 1904)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Asellota

**Infraorder:**

**Superfamily:** Janiroidea

**Family:** Janiridae

**Subfamily:**

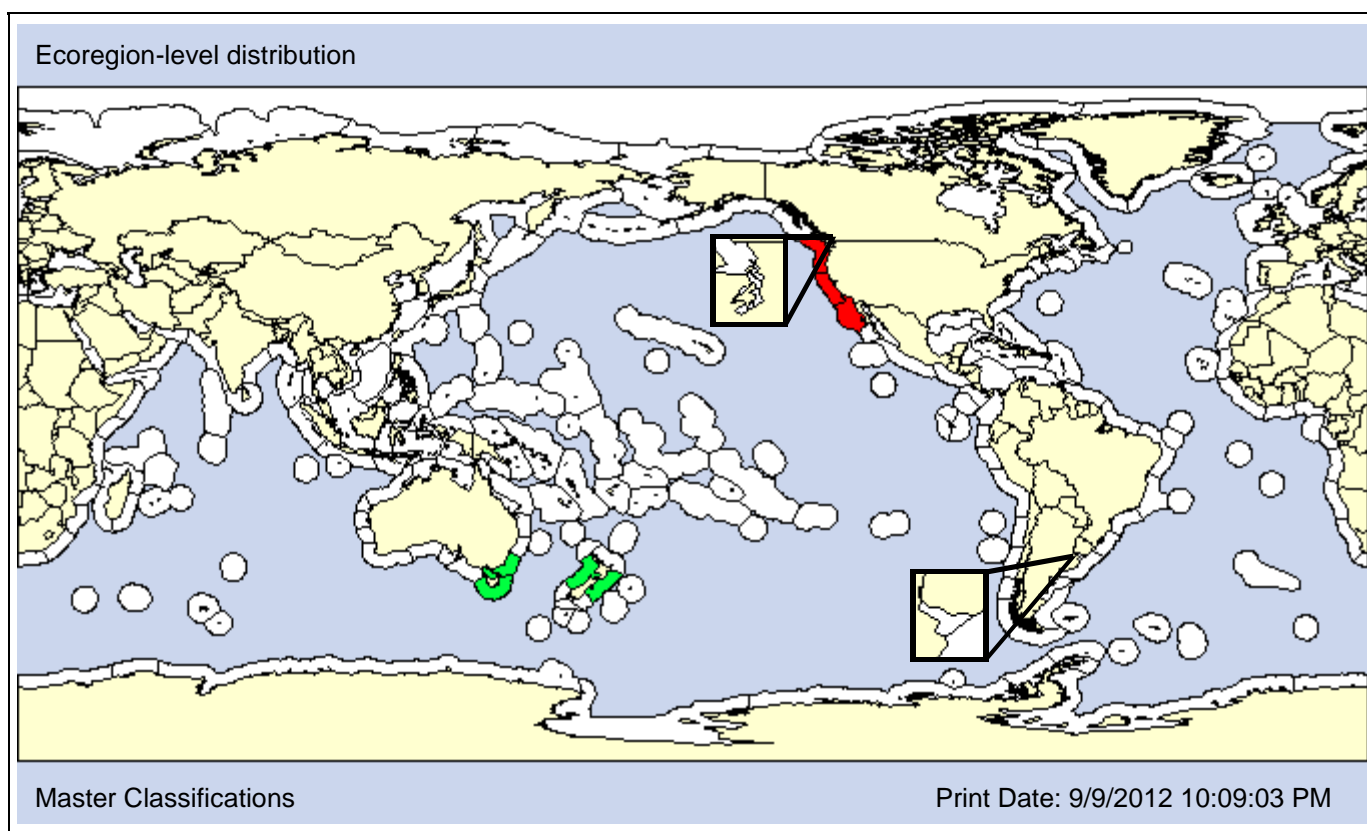
**Also Known As (Name - Type):**

Iais pubescens longistylis  
Janiropsis californica

Synonym  
Synonym

**Common Names:**

**Type Locality:** Sausalito, California, USA



**Date 1st record:**

1904

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Iais californica is a commensal on the wood-boring isopod Sphaeroma quoyanum. Presumably, it was introduced into the NEP along with Sphaeroma.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>		<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 5 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
					<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					<b>X</b>

**Taxon:** Isopod

**Taxonomic Author:** Roux, 1828

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Ligiidae

**Subfamily:**

**Also Known As (Name - Type):**

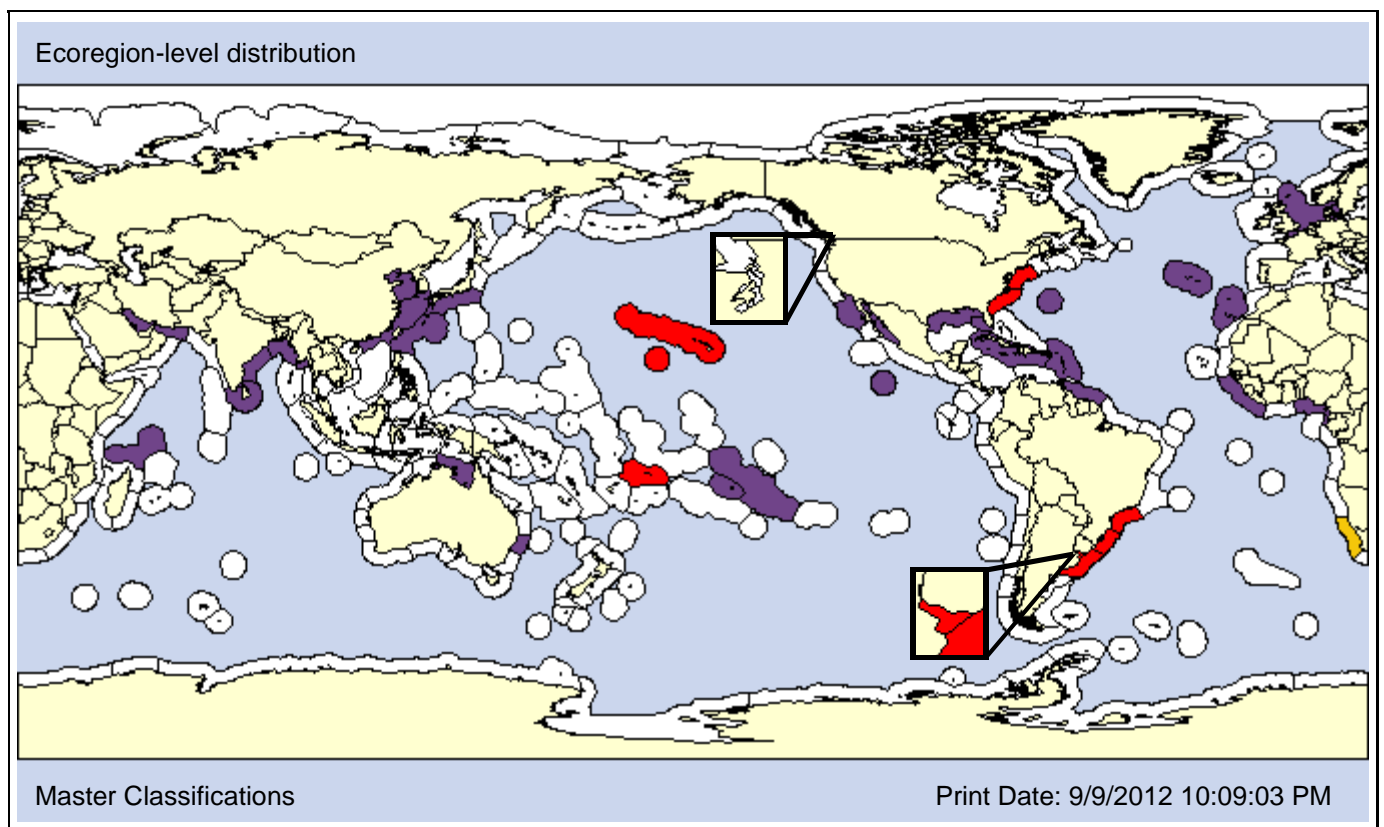
Ligia filicornis  
Ligia grandis  
Ligyda exotica  
Megaligia exotica

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

common beach slater  
sea roach  
slater (*Ligia exotica*)  
wharf roach

**Type Locality:**



NWP

Hawaii

NEP

**Date 1st record:** 1881

1996

1950

**Loc 1st record:** Kyushu Island, Japan

Hilo, Hawaii

San Pedro, California

**Established:** Yes

Yes

Unknown

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
	X	X				AO	PO								

Comments: NEMESIS states that the native region of *Ligia exotica* is the Indo-Pacific from Japan south to Madagascar and South Africa and not the Mediterranean. However, we follow Carlton and Eldredge (2009) and consider the native region to be unknown. We use regional classifications where available; else we list it as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>			<b>O</b>			<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>P</b>	<b>P</b>	<b>O</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>O</b>		<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 7 - 55psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>		<b>X</b>	<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						
						<b>X</b>							

**Taxon:** Isopod

**Taxonomic Author:** Holthuis, 1949

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Limnoriidea

**Infraorder:**

**Superfamily:** Limnorioidea

**Family:** Limnoriidae

**Subfamily:**

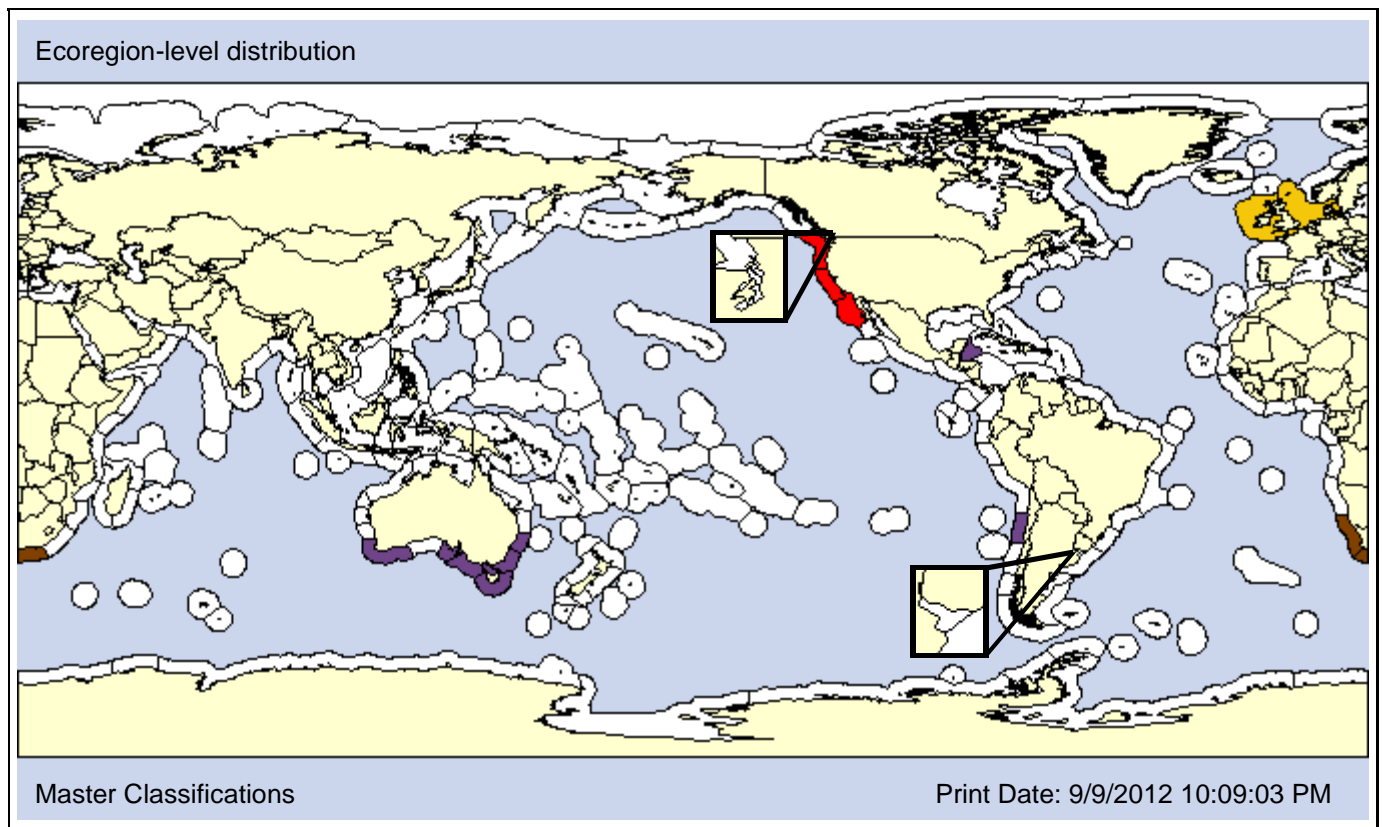
**Also Known As (Name - Type):**

Limnoria (Limnoria) quadripunctata	Convention
Limnoria lignorum of MacGinitie, 1935; not (Rathke, 1799)	Misidentified

**Common Names:**

gribble (Limnoria quadripunctata)

**Type Locality:** Holland, Netherlands



**Date 1st record:**

1873

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				X
		X				AO	PO								

Comments: CANOD (2009) suggests that the Black/Caspian Seas is the native range of *Limnoria quadripunctata*; however like many wood-boring species we consider the historical distribution unknown. We utilized regional classifications when available, list it as a conflict in South Africa, and unclassified elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 153m] [Pref: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>O</b>			<b>P</b>		<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 16 - 48psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>				<b>X</b>	

**Taxon:** Isopod

**Taxonomic Author:** Menzies, 1951

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Limnoriidea

**Infraorder:**

**Superfamily:** Limnorioidea

**Family:** Limnoriidae

**Subfamily:**

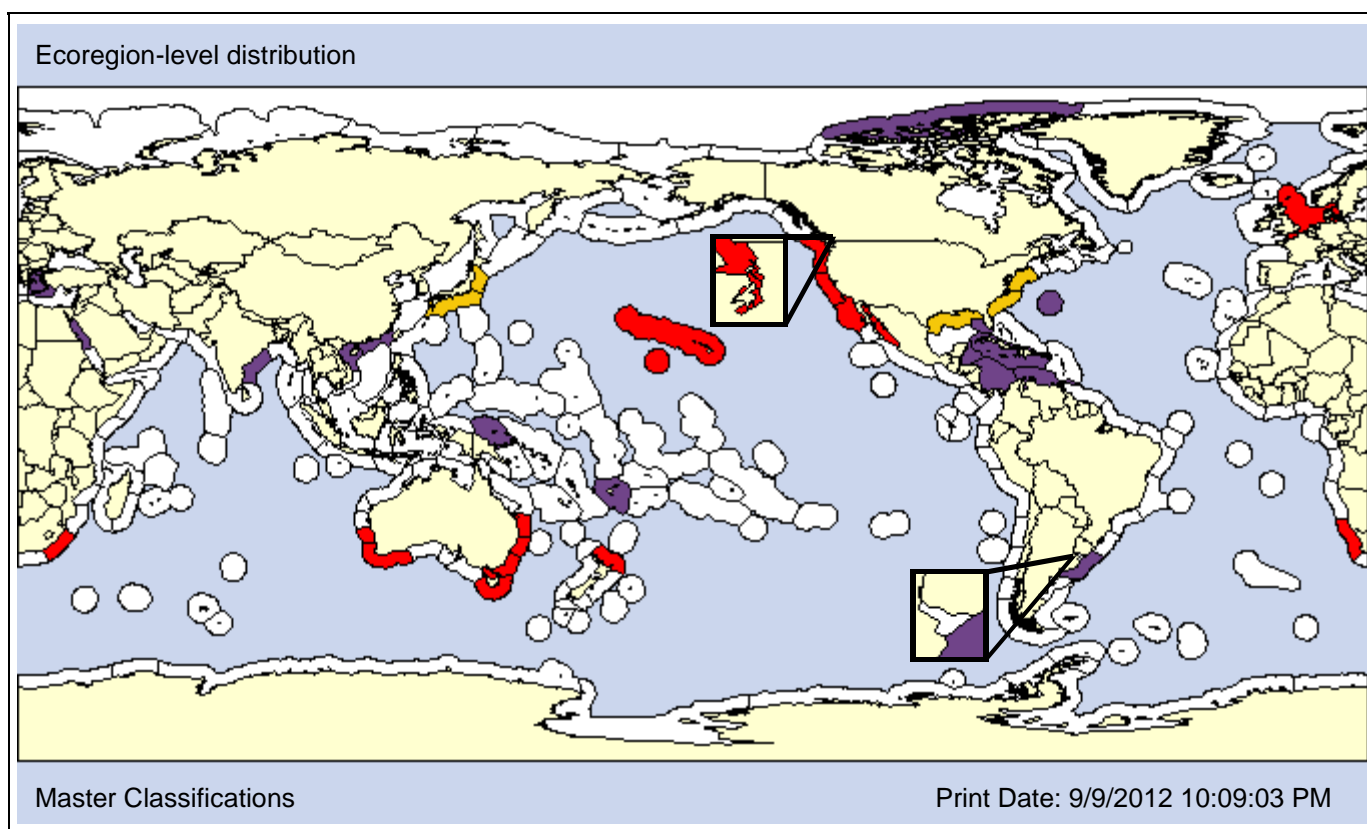
**Also Known As (Name - Type):**

Limnoria lignorum of pre-1957 Hawaiian authors	Misidentified
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**Common Names:**

gribble ( <i>Limnoria tripunctata</i> )
tripunctate gribble

**Type Locality:** San Diego, California, USA



Master Classifications Print Date: 9/9/2012 10:09:03 PM

■ Native  
 ■ Nonindigenous  
   NIS Not Established  
 ■ Cryptogenic  
 ■ Transient  
 ■ Unclassified  
 ■ Conflicting Classification  
   Unidentified

NWP

Hawaii

NEP

**Date 1st record:** 1943

1922

1871

**Loc 1st record:** Misaki, Japan

Pearl and Honolulu Harbors, HI

Los Angeles Harbor, CA

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P		<b>X</b>		
		<b>X</b>				AO	PO								

Comments: Like many wood-boring species, the native range of *Limnoria tripunctata* is unknown. We use regional classifications when available, and list it as unclassified in other areas. Besides boring in wooden ships, *L. tripunctata* may have been transported by boring into wooden crates used to transport Japanese oysters to North America.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - 7m] [Pref: 0 - 7m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>		<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 27 - 42psu] [Pref: 30 - 42psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper P</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					



**Taxon:** Isopod

**Taxonomic Author:** (Moore, 1901)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Philosciidae

**Subfamily:**

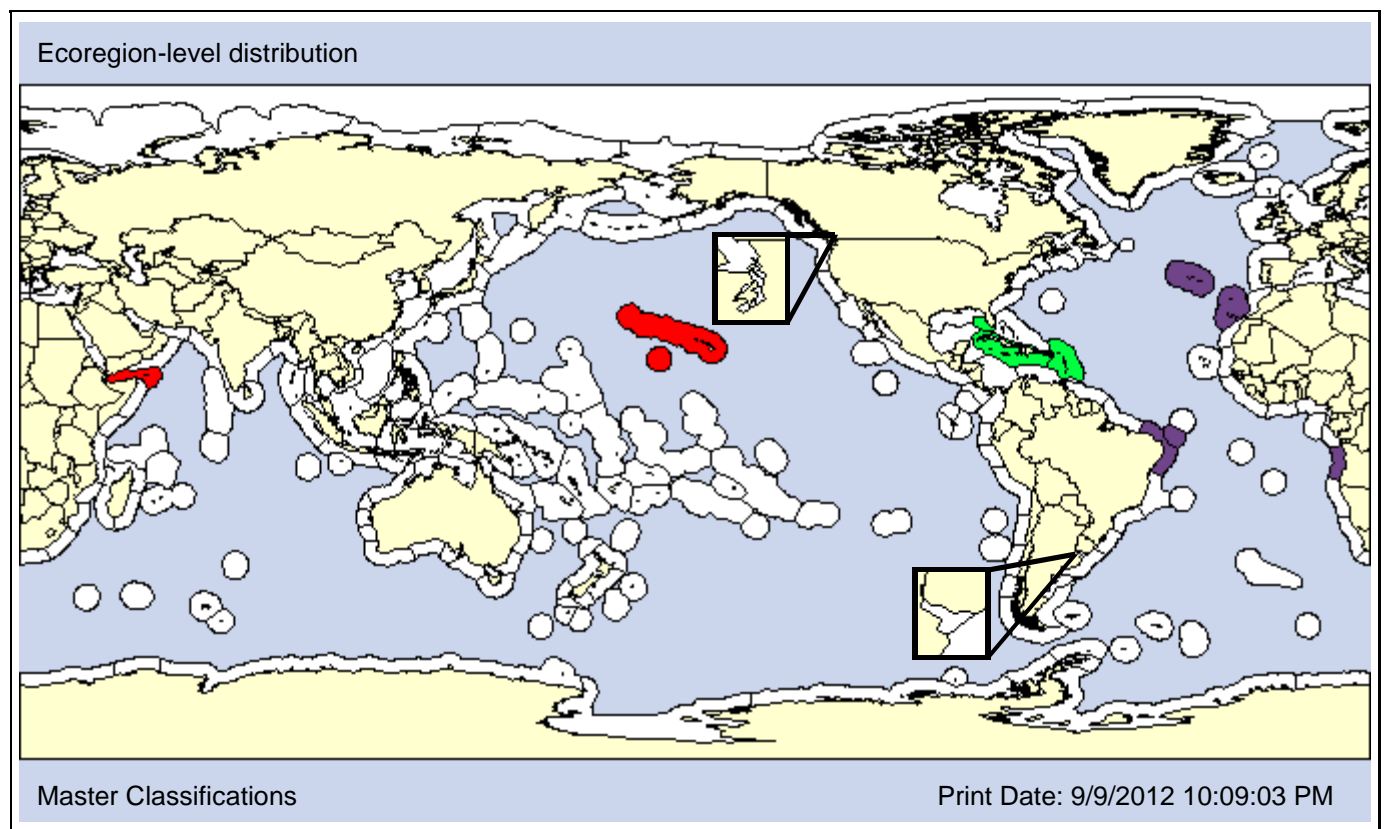
**Also Known As (Name - Type):**

Chaetophiloscia dartevellei	Synonym
Philoscia culebrae	Synonym
Philoscia dartevellei	Synonym
Philoscia miamiensis	Synonym

**Common Names:**

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**Type Locality:** Puerto Rico



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1984  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
X					AO	PO									

Comments: We consider the NWA and Caribbean as the possible native region for *Littorophiloscia culebrae* (see Carlton and Eldredge, 2009). It is a strictly littoral species found under debris on sandy and rocky shores.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>			<b>P</b>			<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>P</b>	<b>P</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>				

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						
					<b>X</b>	<b>X</b>							

**Taxon:** Isopod

**Taxonomic Author:** Carlton & Eldredge, 2009

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Cymothoida

**Infraorder:**

**Superfamily:** Anthuroidea

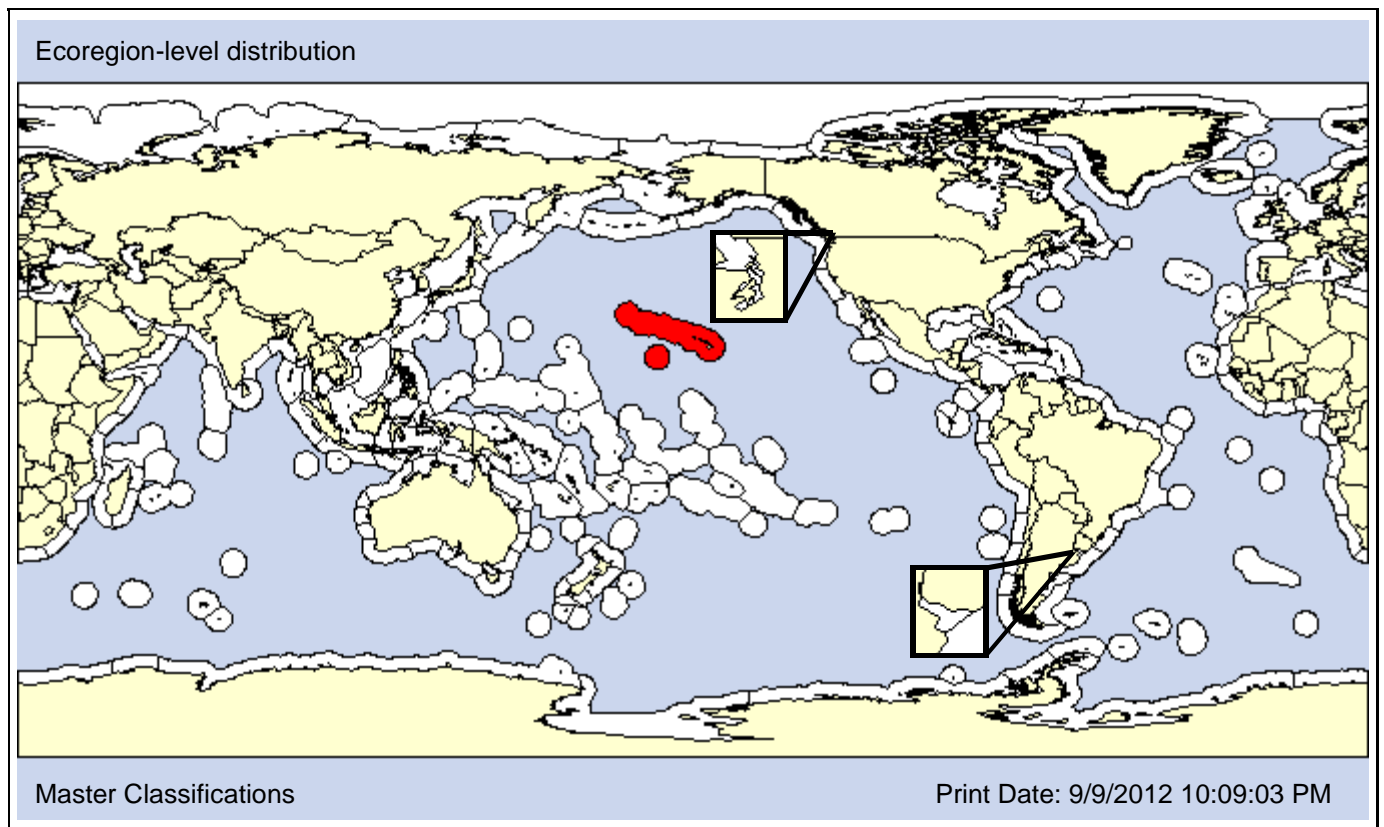
**Family:** Anthuridae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-style:dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:brown; border:1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; border:1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1996  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: Although the Hawaiian *Mesanthura* sp. has not been identified to species, it is considered nonindigenous because it is unlikely to have been missed in the surveys prior to 1996 (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - 6m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												O	O	

**SALINITY [Obs: - 33psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Isopod

**Taxonomic Author:** Chapman

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Asellota

**Infraorder:**

**Superfamily:** Janiroidea

**Family:** Munnidae

**Subfamily:**

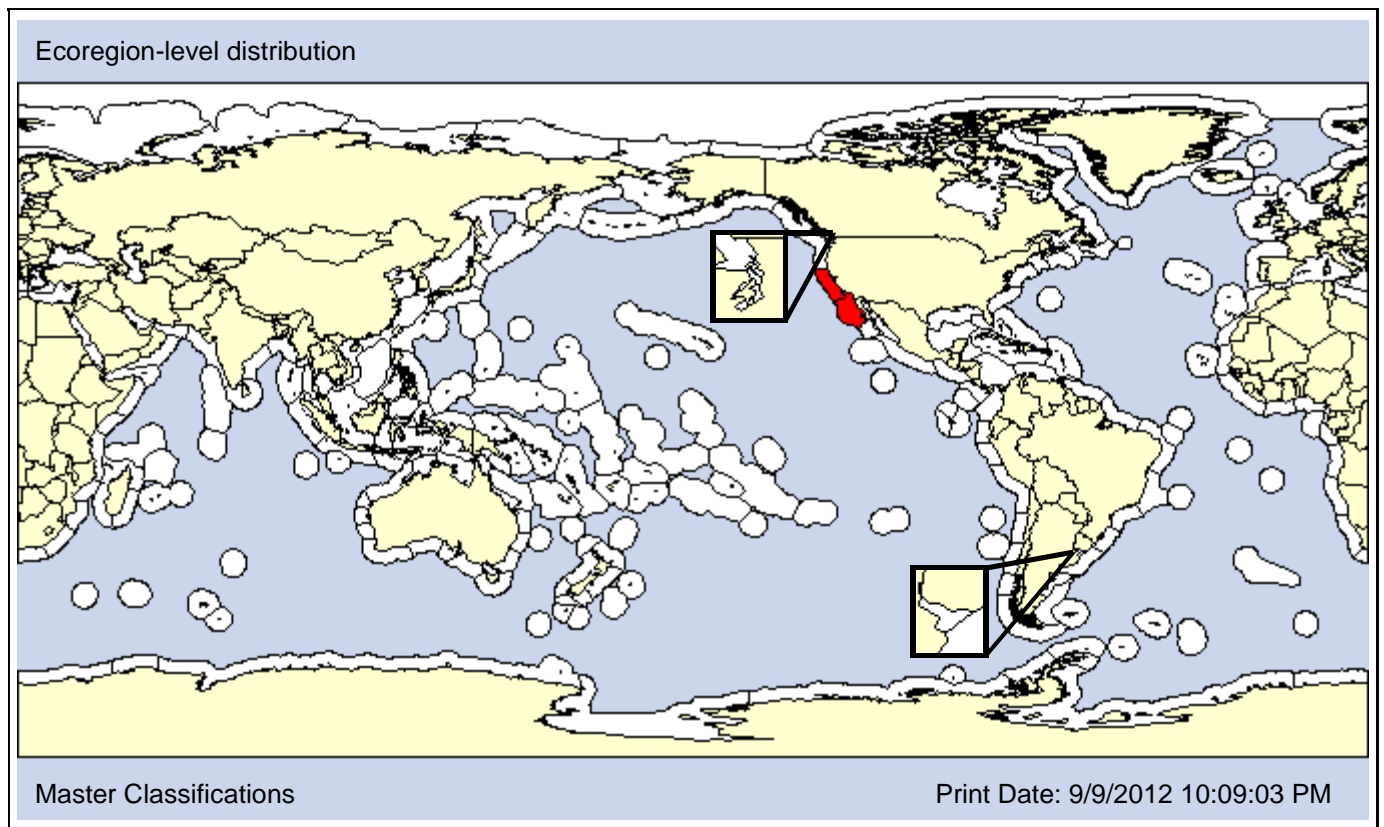
**Also Known As (Name - Type):**

Munna sp. 1 (Cohen et al., 1998)?  
 Uromunna sp. A SAFIT  
 Uromunna sp. A Wilson

Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** California, USA



**Date 1st record:**

1993-1994

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Unknown

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
X		X				AO	PO							

Comments: An unknown *Munna* species (= *Uromunna* sp.) was discovered in the San Francisco Estuary in 1993/1994. Establishment of this species is uncertain.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated <b>X</b></b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE **X****

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate <b>O</b></b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish <b>P</b></b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual <b>X</b></b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic <b>X</b></b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Isopod

**Taxonomic Author:** (Dollfus, 1895)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Platyarthridae

**Subfamily:**

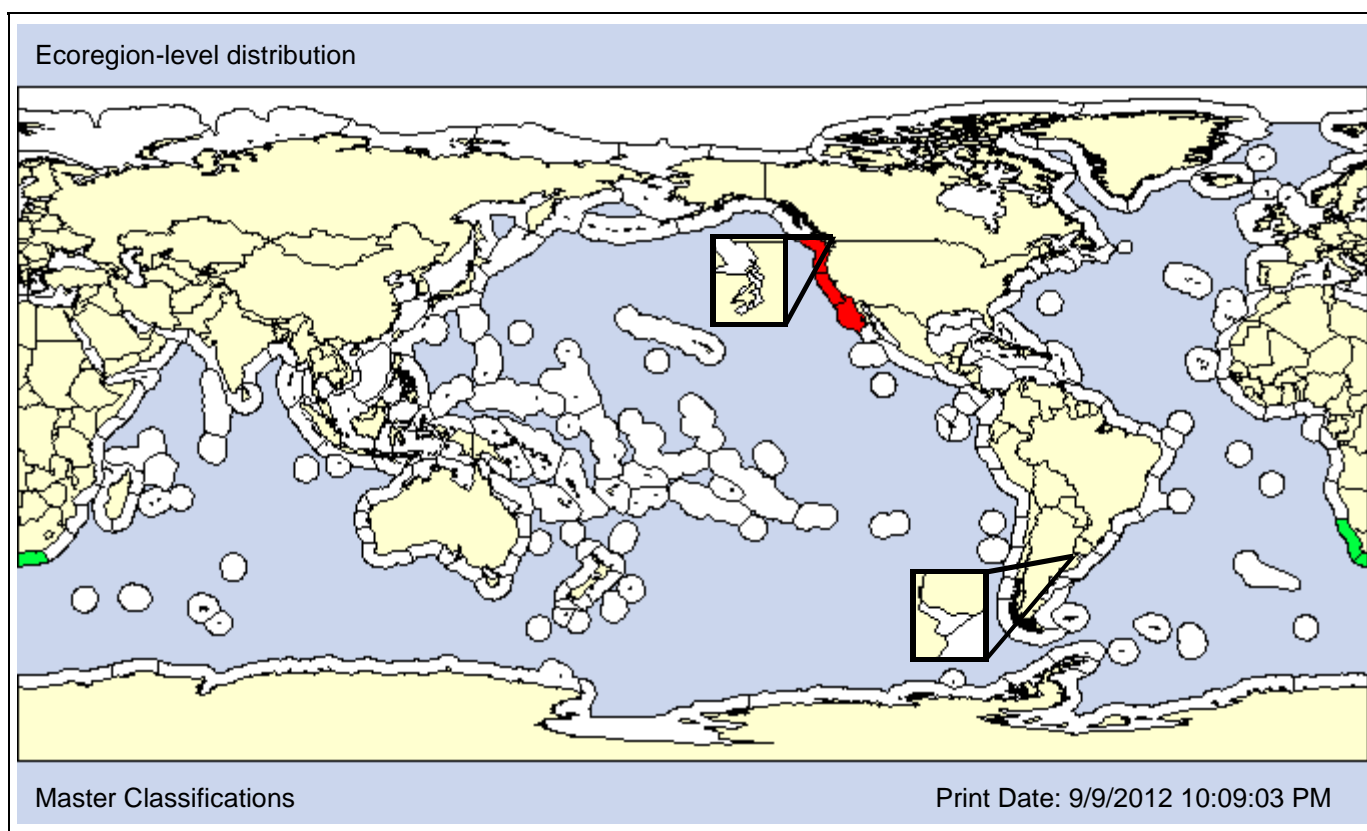
**Also Known As (Name - Type):**

Metoponorthus capensis  
 Porcellio littorina  
 Porcellionides capensis

Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** Namibia, South Africa



**Date 1st record:**

1936

**Loc 1st record:**

California

**Established:**

Yes

**VECTORS**

SH			MS	AF			ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
						AO	PO				X			

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>P</b>	<b>O</b>		<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
<b>X</b>	<b>X</b>												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>P</b>	<b>P</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>O</b>				

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh O</b>	<b>Brackish O</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						



**Taxon:** Isopod

**Taxonomic Author:** Taiti & Ferrara, 1991

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

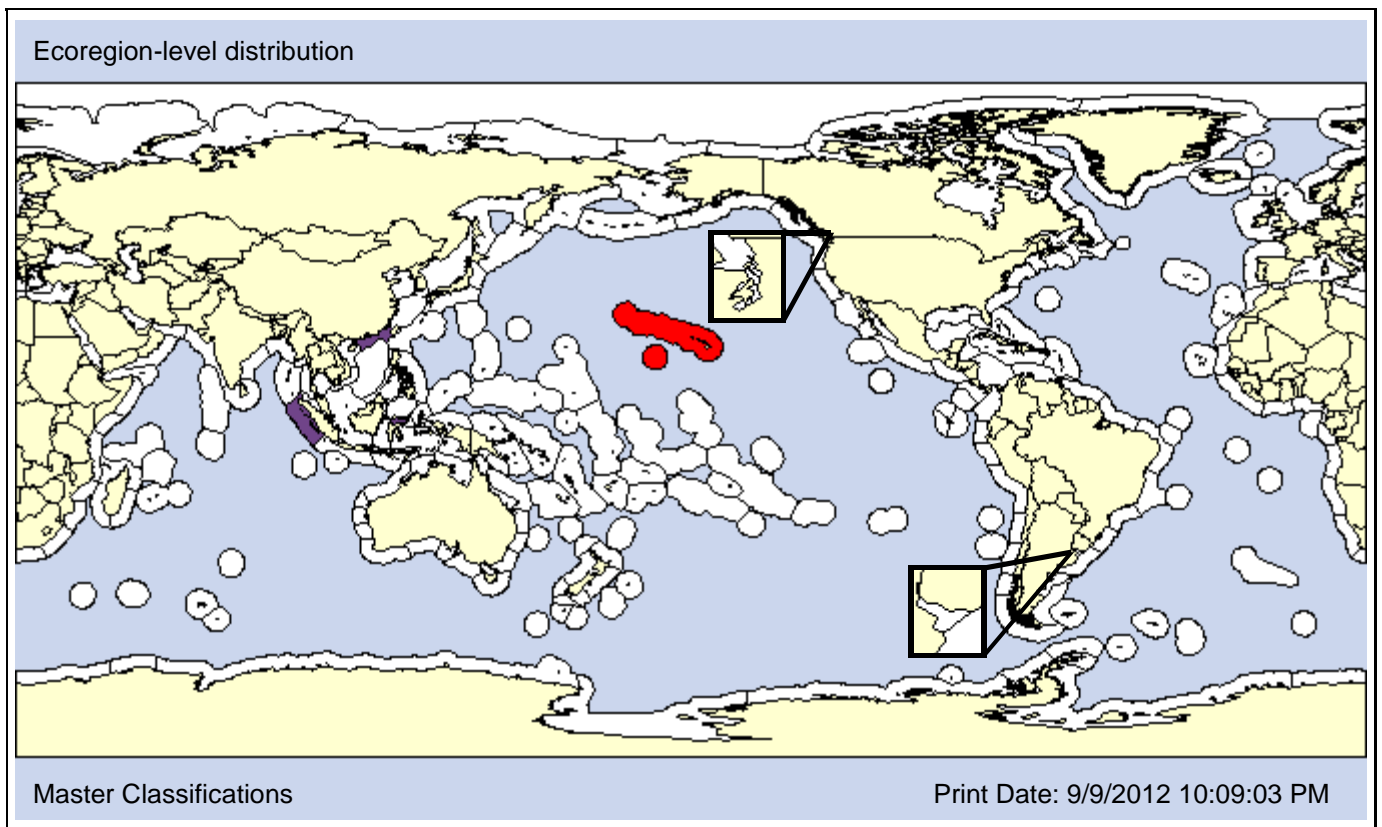
**Family:** Olibrinidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



<span style="display:inline-block; width:15px; height:15px; background-color: #4CAF50; border: 1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color: #F44336; border: 1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color: #FFEB3B; border: 1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color: #4DD0E1; border: 1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color: #9575CD; border: 1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color: #795548; border: 1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black;"></span> Unidentified
NWP			Hawaii			NEP	

**Date 1st record:** 1985  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
	<b>X</b>				AO	PO									

Comments: *Olibrinus truncatus* may be native to the Southern Hemisphere (Carlton and Eldredge, 2009). It is common in mangrove forests under stones and logs.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>			<b>O</b>			

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					
	<b>X</b>												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>P</b>	<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>	<b>P</b>				

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						
					<b>X</b>								

**Taxon:** Isopod

**Taxonomic Author:** Markham, 2004

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Cymothoida

**Infraorder:**

**Superfamily:** Bopyroidea

**Family:** Bopyridae

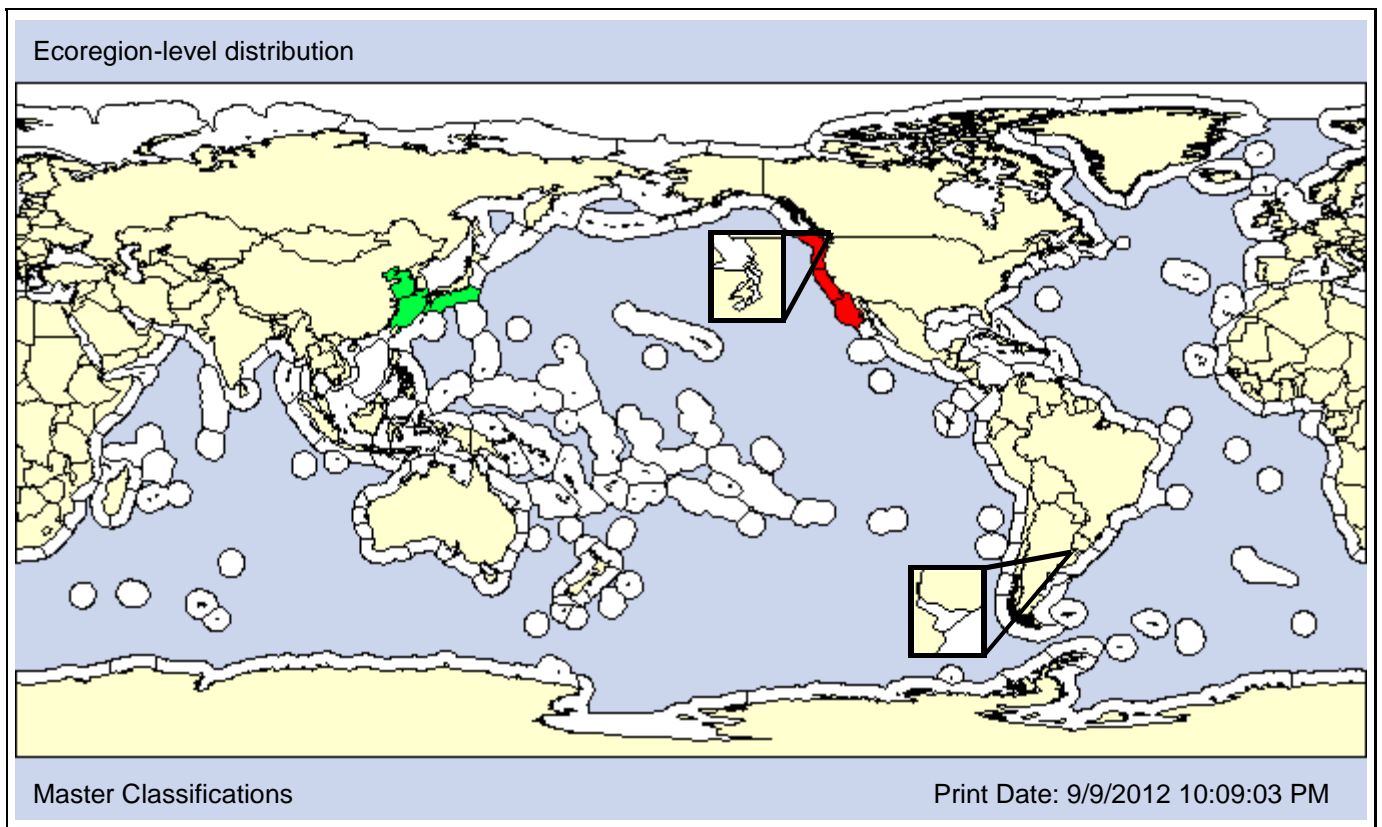
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Griffen's isopod

**Type Locality:** Yaquina Bay, Oregon, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Native

ca. 2000

**Loc 1st record:** Native

Yaquina Bay, Oregon

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments: There is disagreement as to whether *Orthione griffenis* is native, cryptogenic, or introduced in the NEP (e.g., Williams and An, 2009; Dumbauld et al., 2011). We believe the evidence is sufficient to classify this parasite of *Upogebia pugettensis* as NIS in the NEP and native to Asia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 2m] [Pref: 0 - 2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

# Paracerceis sculpta

Species ID: 610

**Taxon:** Isopod

**Taxonomic Author:** (Holmes, 1904)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Sphaeromatidea

**Infraorder:**

**Superfamily:** Sphaeromatoidea

**Family:** Sphaeromatidae

**Subfamily:**

**Also Known As (Name - Type):**

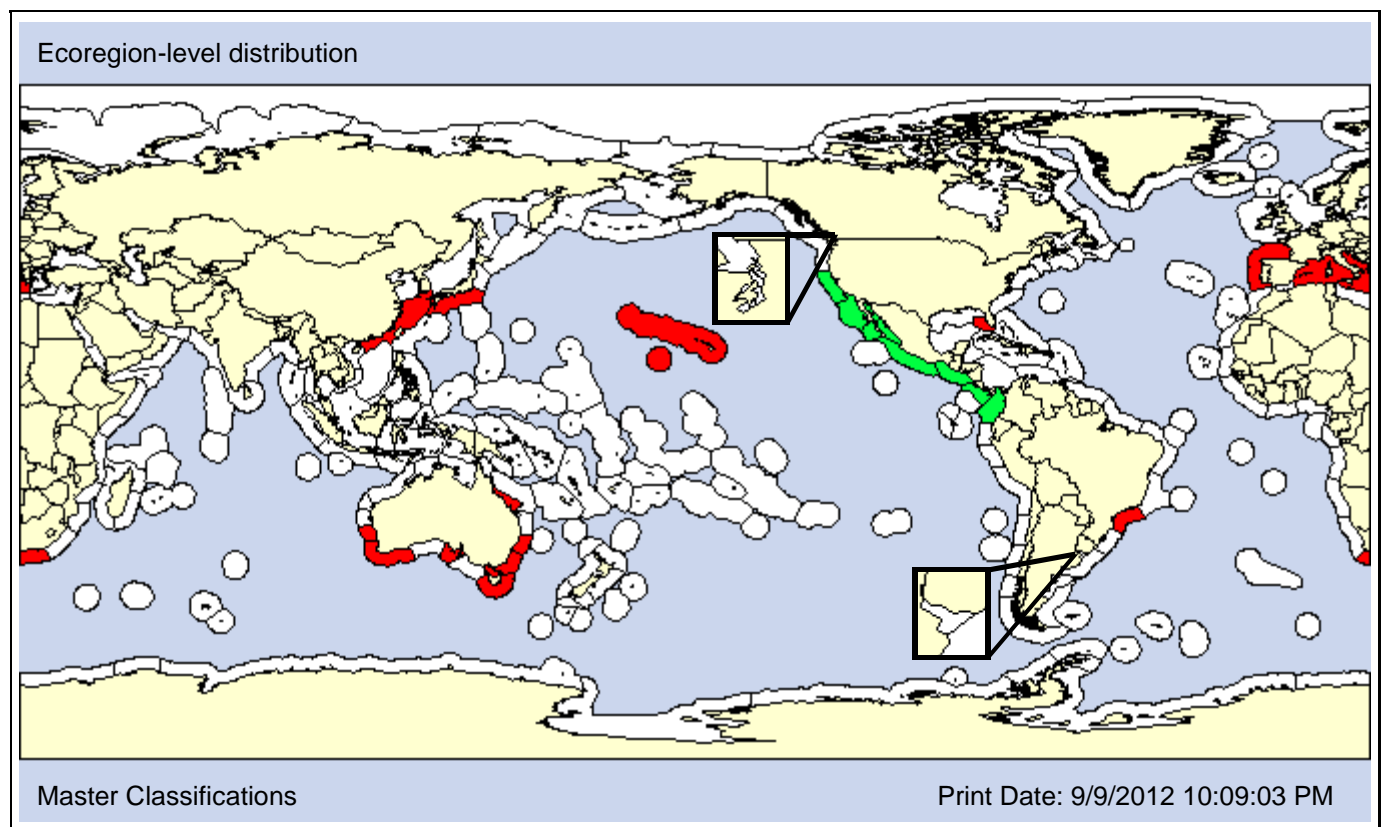
Cilicaea sculpta  
Dynamene sculpta  
Paracerceis angra  
Paracerceis japonica

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

sponge isopod  
Tsunoo-umisemi

**Type Locality:** San Clemente Island, California, USA



**Date 1st record:** 1986

1943

Native

**Loc 1st record:** Uwajima, Japan

Pearl and Hilo Harbors, Hawaii

Native

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>			<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 200m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 6.32 - 96.42%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
						<b>O</b>			<b>O</b>			<b>O</b>	<b>P</b>	<b>O</b>

**SALINITY [Obs: 28 - 46psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Isopod

**Taxonomic Author:** (Menzies, 1962)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Sphaeromatidea

**Infraorder:**

**Superfamily:** Sphaeromatoidea

**Family:** Sphaeromatidae

**Subfamily:**

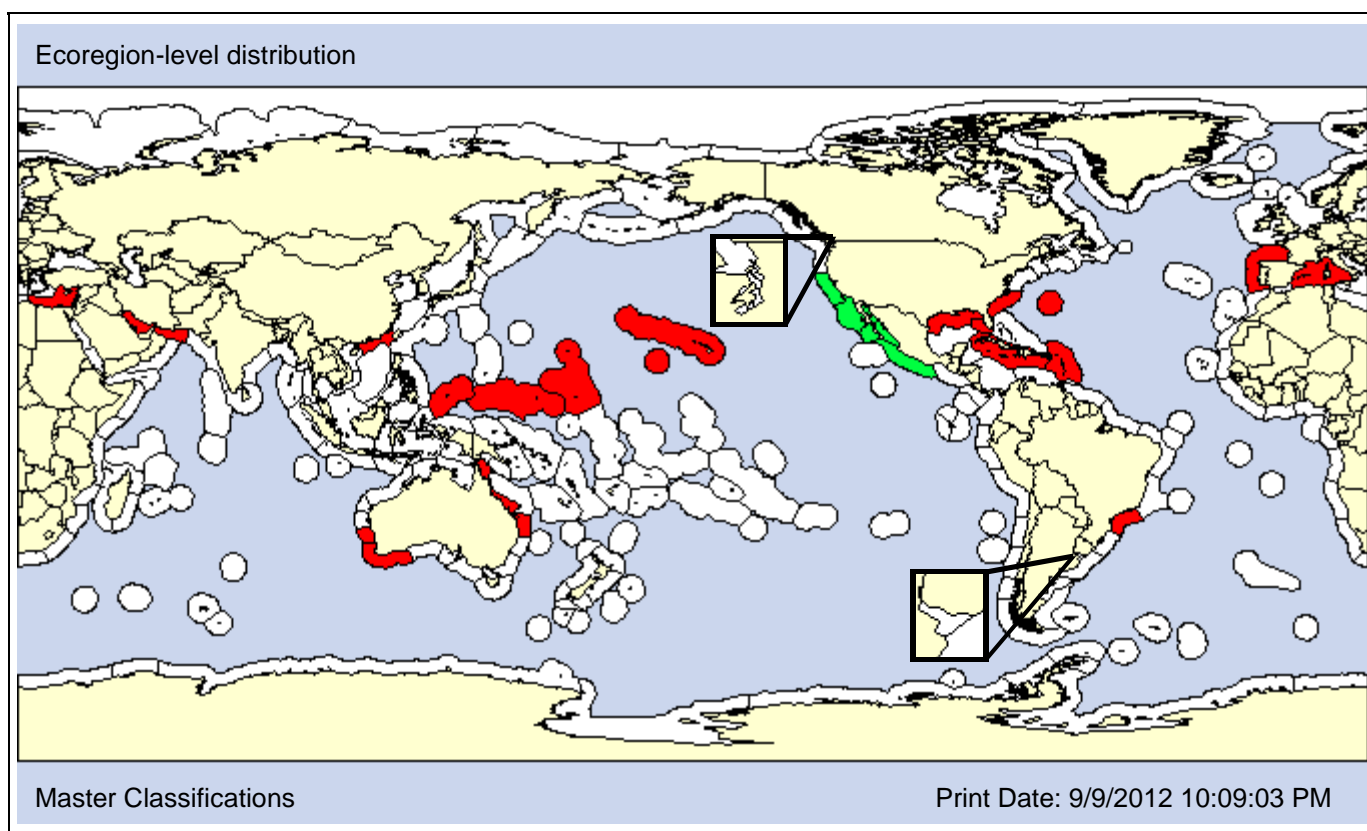
**Also Known As (Name - Type):**

Dynamenella diana  
Dynamenopsis diana

Synonym  
Synonym

**Common Names:**

**Type Locality:** Bahia de San Quintin, Mexico



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

**Date 1st record:** 2002    Native  
**Loc 1st record:** Kauai, Hawaii    Native  
**Established:** Yes    Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 30.48m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 51 - 52%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>P</b>						<b>P</b>	<b>O</b>		<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 13 - 38psu] [Pref: 31 - 38psu]**

<b>Fresh</b>	<b>Brackish O</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>
			<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>									

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Isopod

**Taxonomic Author:** (Calman, 1910)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Limnoriidea

**Infraorder:**

**Superfamily:** Limnorioidea

**Family:** Limnoriidae

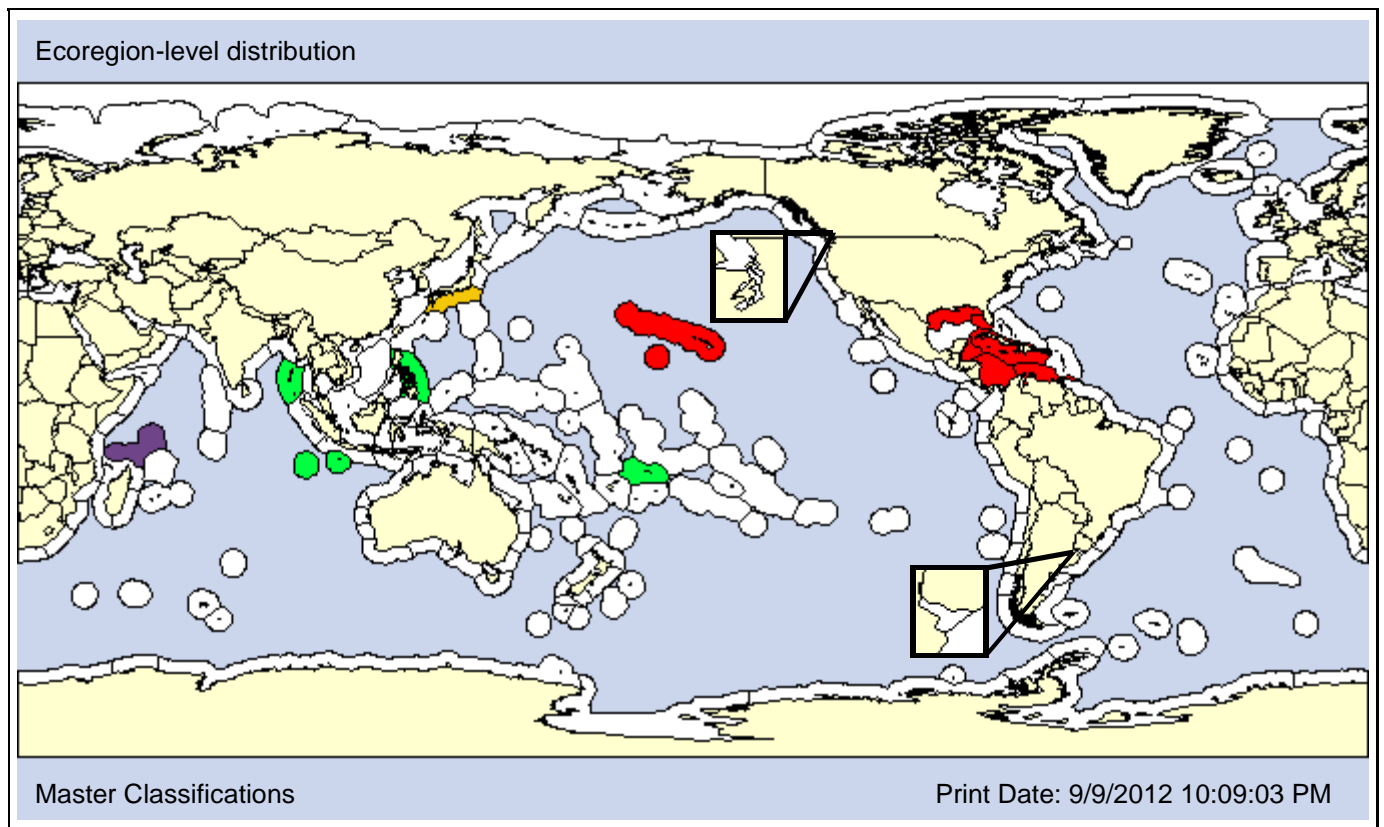
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Limnoria andrewsi	Synonym	
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**Type Locality:** Christmas Island, Australia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1943

1922

**Loc 1st record:** Japan

Honolulu and Kauai, Hawaii

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>	<b>X</b>				AO	PO									

Comments: Carlton and Eldredge (2009) consider the wood boring isopod, *Paralimnoria andrewsi*, to be introduced in the Atlantic and Hawaii, and "perhaps Japan as well."

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - 4m] [Pref: 0 - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P		P	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						X			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					

**Taxon:** Isopod

**Taxonomic Author:** Richardson, 1909

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Anthuridea

**Infraorder:** Cymothoidea

**Superfamily:** Anthuroidea

**Family:** Paranthuridae

**Subfamily:**

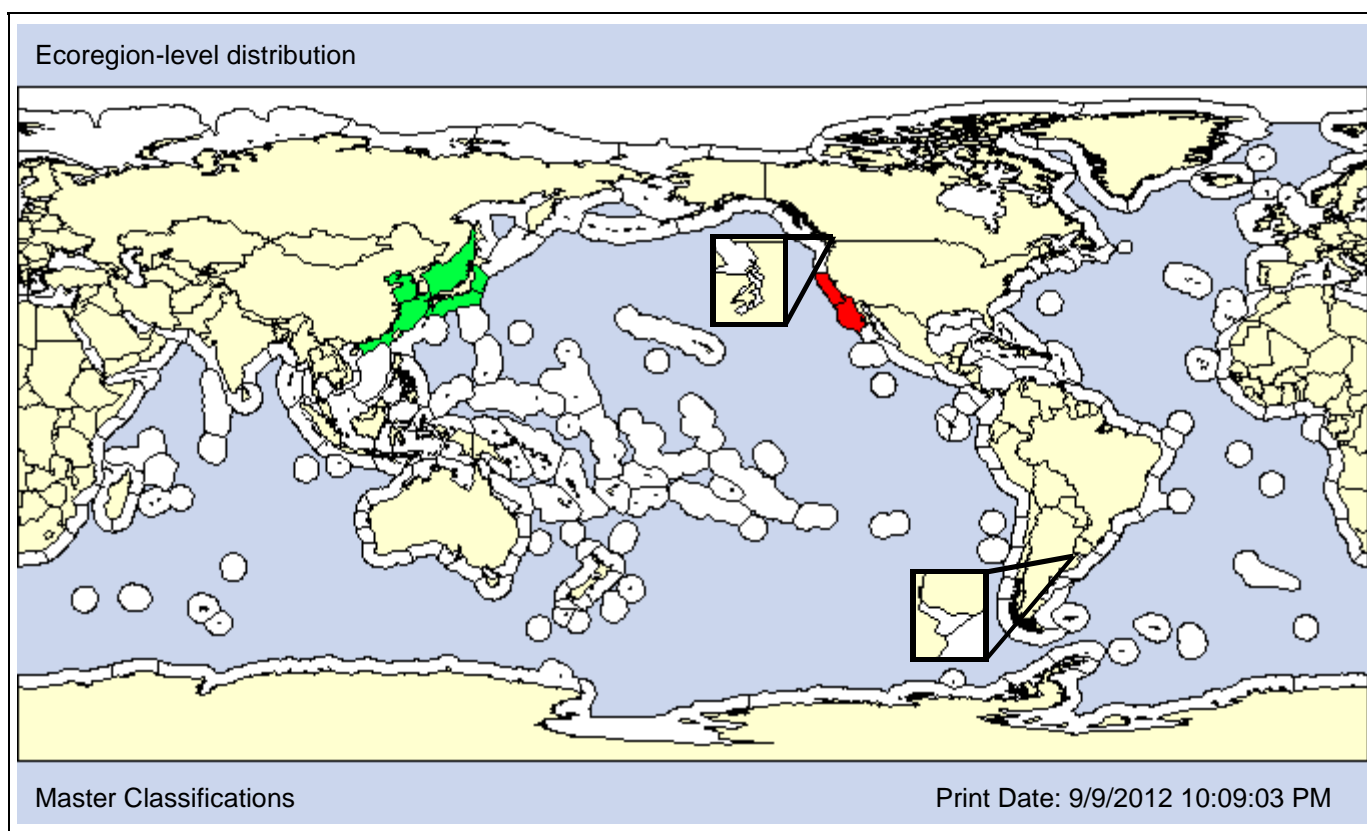
**Also Known As (Name - Type):**

Paranthura sp. (Cohen and Carlton, 1995)  
Paranthura sp. of Cohen and Carlton, 1995

Synonym  
Synonym

**Common Names:**

**Type Locality:** Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1993  
**Loc 1st record:** Native San Francisco Estuary, CA  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 15m] [Pref: 0 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>				<b>P</b>				<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 23 - 36.5psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
									DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Isopod

**Taxonomic Author:** Harrison & Holdich, 1982

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Sphaeromatidea

**Infraorder:**

**Superfamily:** Sphaeromatoidea

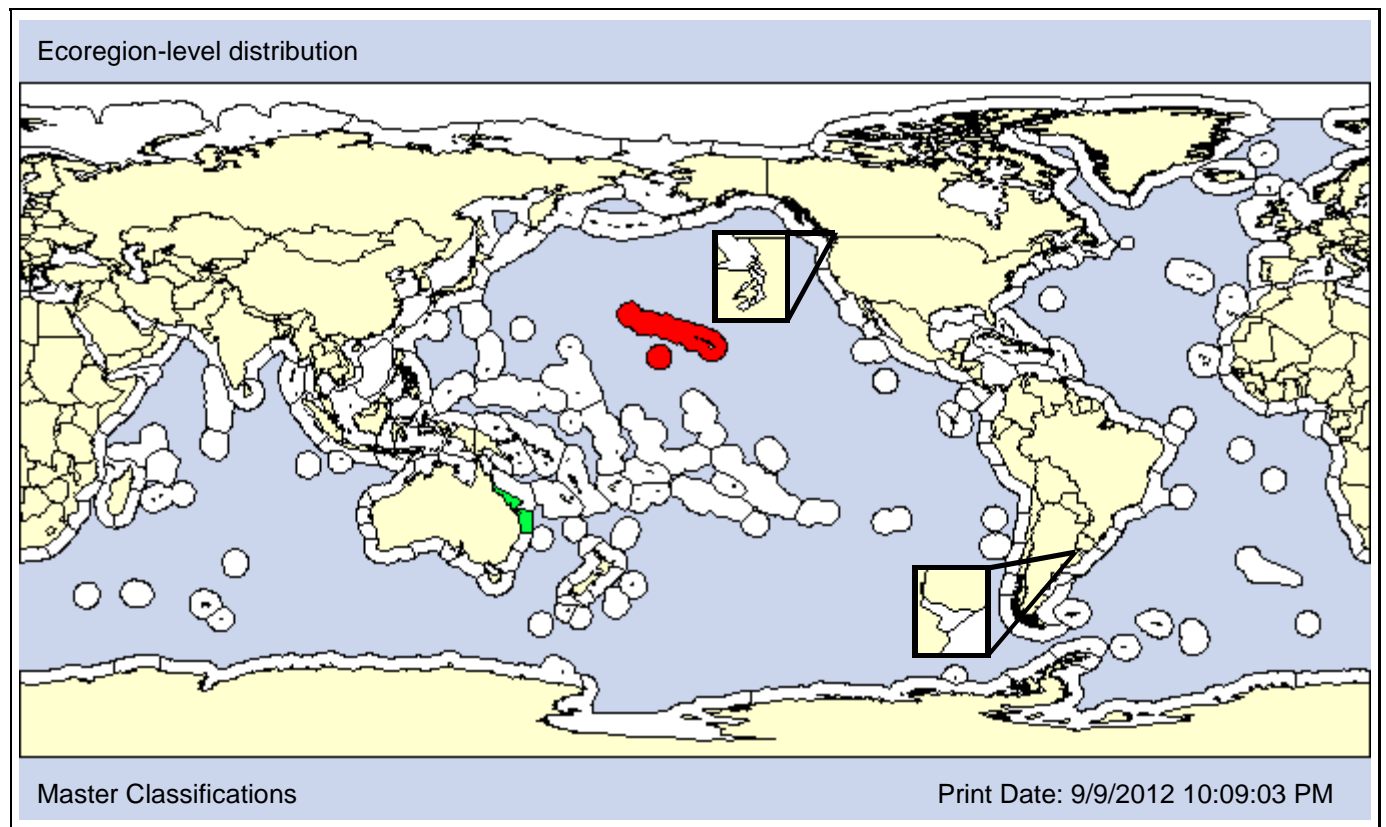
**Family:** Sphaeromatidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Queensland, Australia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 2002  
**Loc 1st record:** Kauai, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>								<b>Artificial Substrate P</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												O	O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			X						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Isopod

**Taxonomic Author:** Legrand, 1954

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Platyarthridae

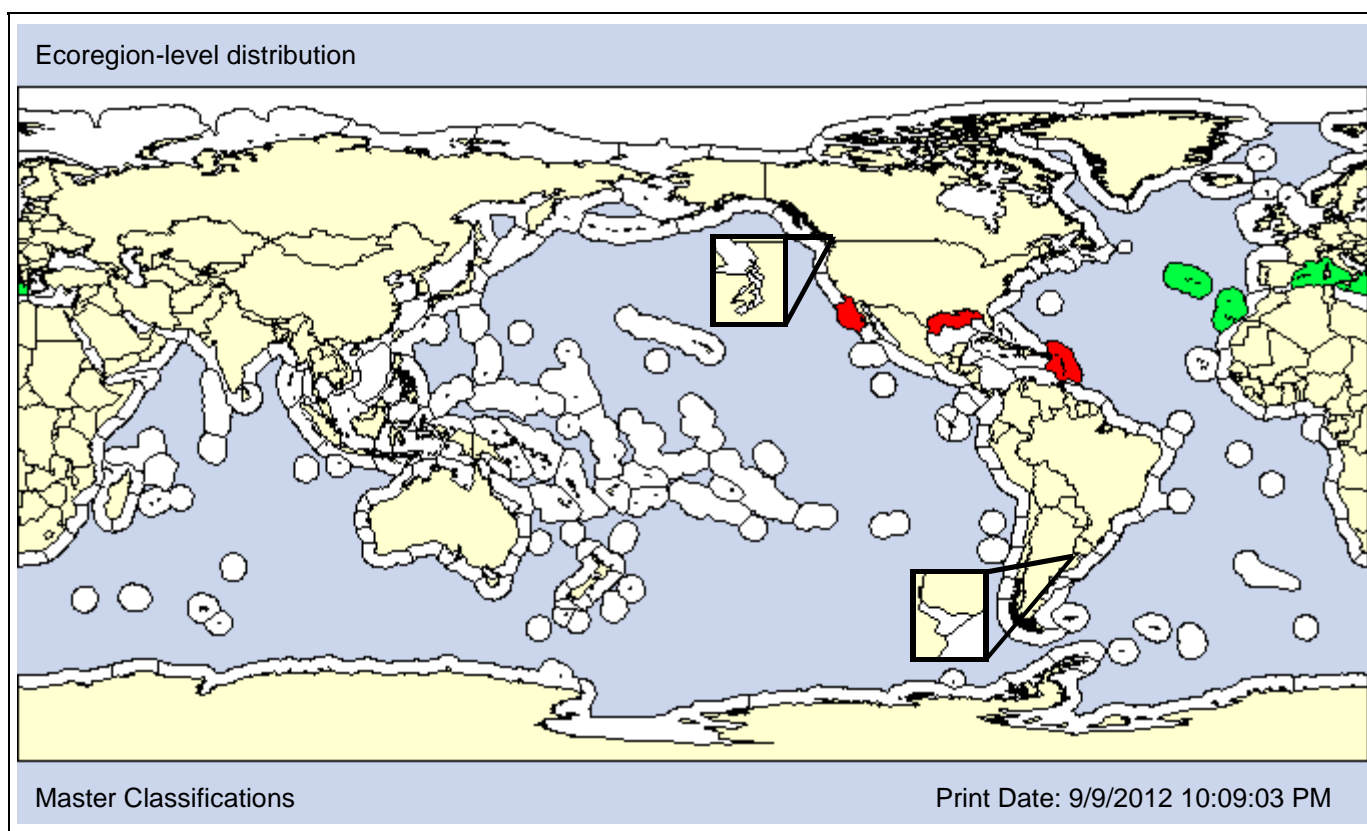
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Platyarthus schoebli aiasensis	Synonym	
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

before 1989

**Loc 1st record:**

**Established:**

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO				X				

Comments: *Platyarthus aiasensis* has been introduced into southern California and Texas from the Northeast Atlantic/Mediterranean. *P. aiasensis* is a terrestrial species that lives in ant nests (myrmecophile) and may occur in coastal fringes.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
					<b>O</b>			<b>P</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso		Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>			
		C	O	M	W	CA	K	RA	MAN	DW	R	P

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							



**Taxon:** Isopod

**Taxonomic Author:** Brandt, 1833

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Porcellionidae

**Subfamily:**

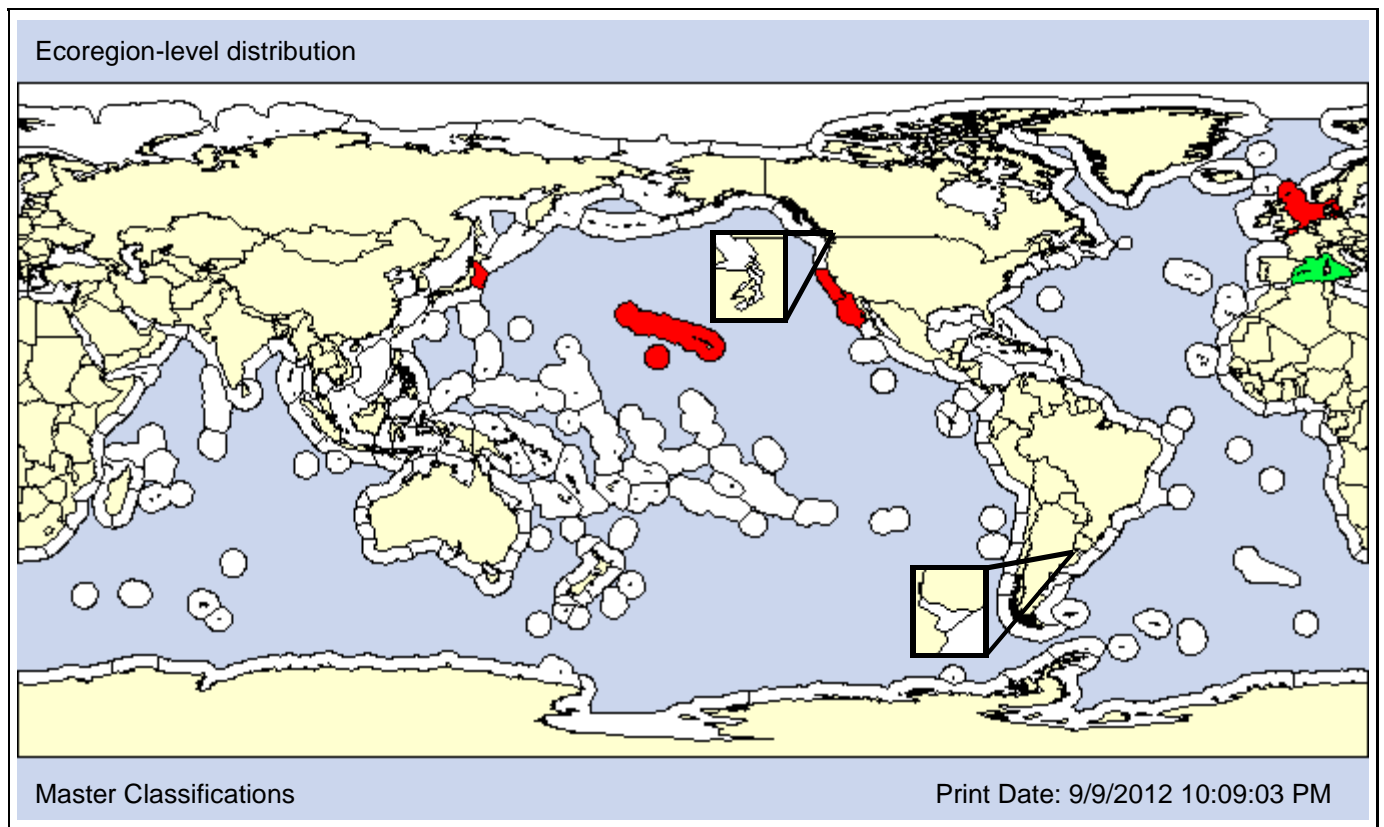
**Also Known As (Name - Type):**

Euporcellio dilatatus  
Porcellio spinicornis occidentalis

Synonym  
Synonym

**Common Names:**

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

<b>Date 1st record:</b> Unknown	1923	1908
<b>Loc 1st record:</b> Unknown	Puu Kamaoa, Hawaii	San Luis Obispo, California
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR	X		A	P			
	X					AO	PO					X			

Comments: *Porcellio dilatatus* is a terrestrial isopod though it may be found in the general vicinity of estuarine and coastal water bodies.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
					<b>O</b>			<b>P</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
<b>X</b>													

**DEPTH [Obs: 0 - 0m] [Pref: 0 - 0m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 19 - 71%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>				

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						
					<b>X</b>								

**Taxon:** Isopod

**Taxonomic Author:** Latreille, 1804

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Porcellionidae

**Subfamily:**

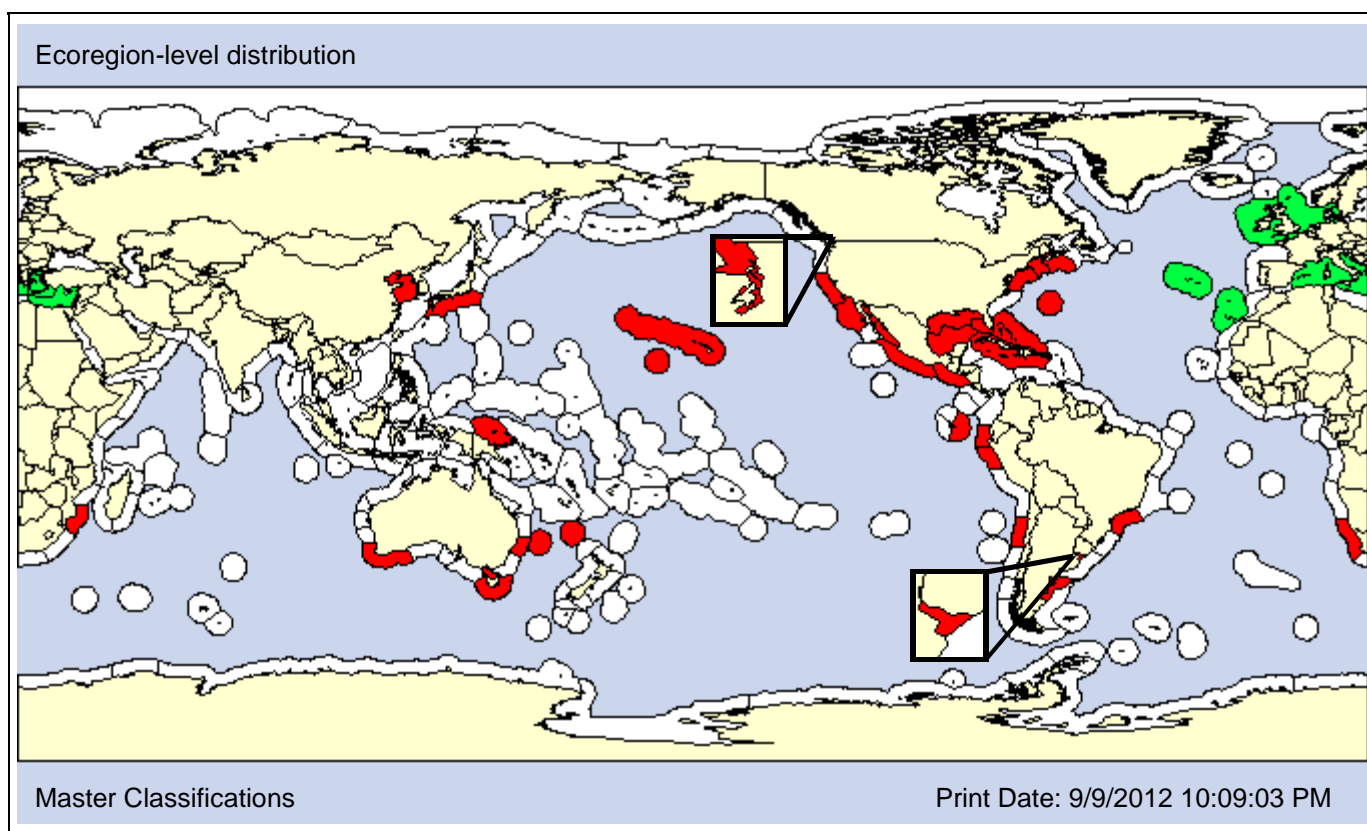
**Also Known As (Name - Type):**

Porcellio aztecus  
 Porcellio cubensis  
 Porcellio formosus  
 Porcellio interruptus

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:** Unknown 1927 1908  
**Loc 1st record:** Unknown Molokai and Maui, Hawaii Channel Islands, CA  
**Established:** Yes Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
	<b>X</b>					AO	PO				<b>X</b>				

Comments: *Porcellio laevis* is a terrestrial isopod that can be found in the coastal fringe, occasionally co-occurring with talidrid amphipods. It is considered a “cosmopolitan” species (Brusca et al., 2007) that is native to Europe and North Africa but that has invaded the NWP, NEP, Hawaii, and many other regions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
					<b>O</b>			<b>P</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>O</b>				

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>								<b>Epibiotic</b>		
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						
					<b>X</b>								

**Taxon:** Isopod

**Taxonomic Author:** Budde-Lund, 1885

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Porcellionidae

**Subfamily:**

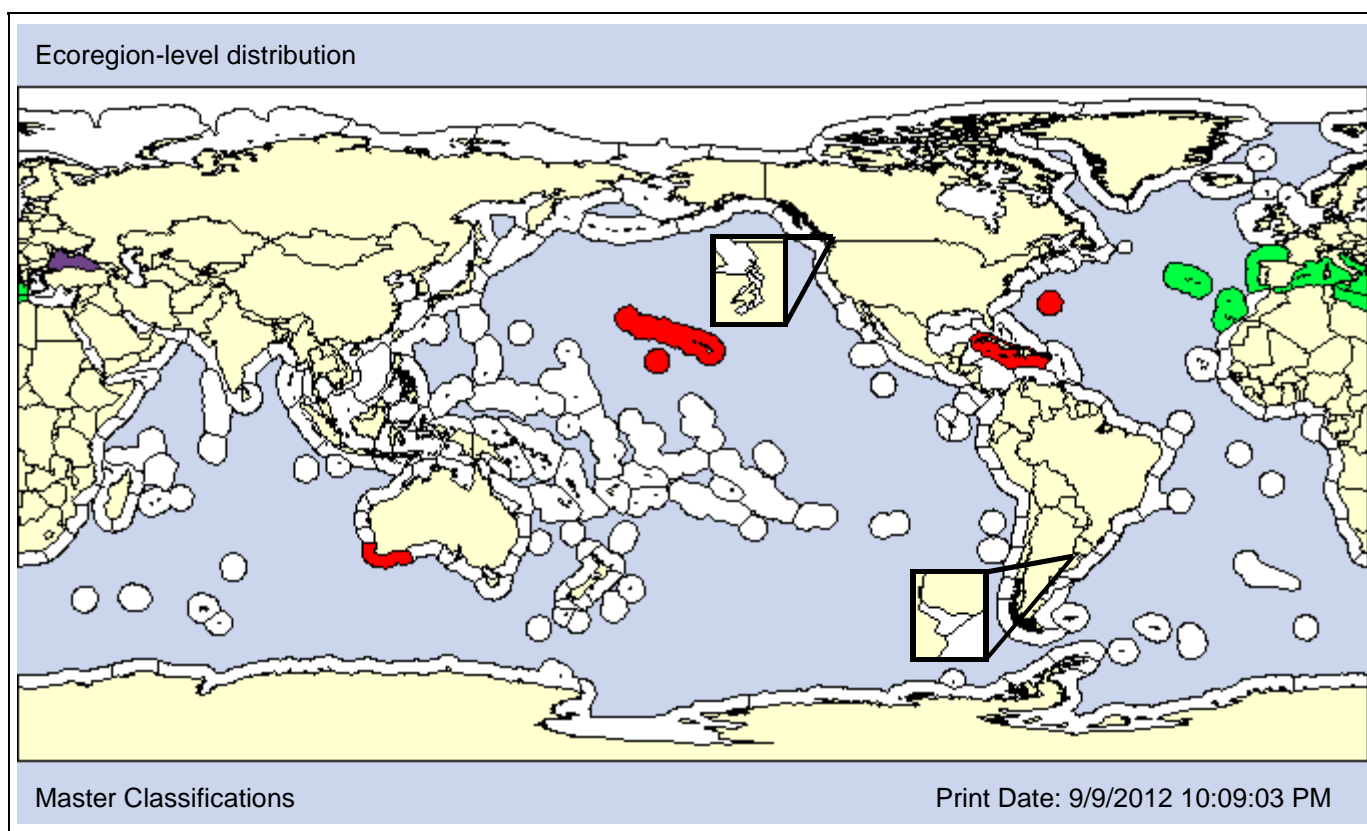
**Also Known As (Name - Type):**

Porcellio lamellatus lamellatus

Convention

**Common Names:**

**Type Locality:** NE Algeria



**Date 1st record:**

1973

**Loc 1st record:**

Kauai, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA	IR			A	P			
	<b>X</b>					AO	PO				<b>X</b>			

Comments: *Porcellio lamellatus* is a terrestrial isopod that can be found in the coastal fringe. It has been found in leaf litter, under debris, and in the vicinity of mangroves in the Hawaiian Islands.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
					<b>P</b>			<b>P</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>	<b>X</b>		TP	RI-PH					

**DEPTH [Obs: 0 - 0m] [Pref: 0 - 0m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>P</b>	<b>O</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					<b>P</b>

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>	<b>O</b>				

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>				<b>Marine</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>			<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	
					<b>X</b>								

**Taxon:** Isopod

**Taxonomic Author:** Latreille, 1804

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Oniscidea

**Infraorder:**

**Superfamily:**

**Family:** Porcellionidae

**Subfamily:**

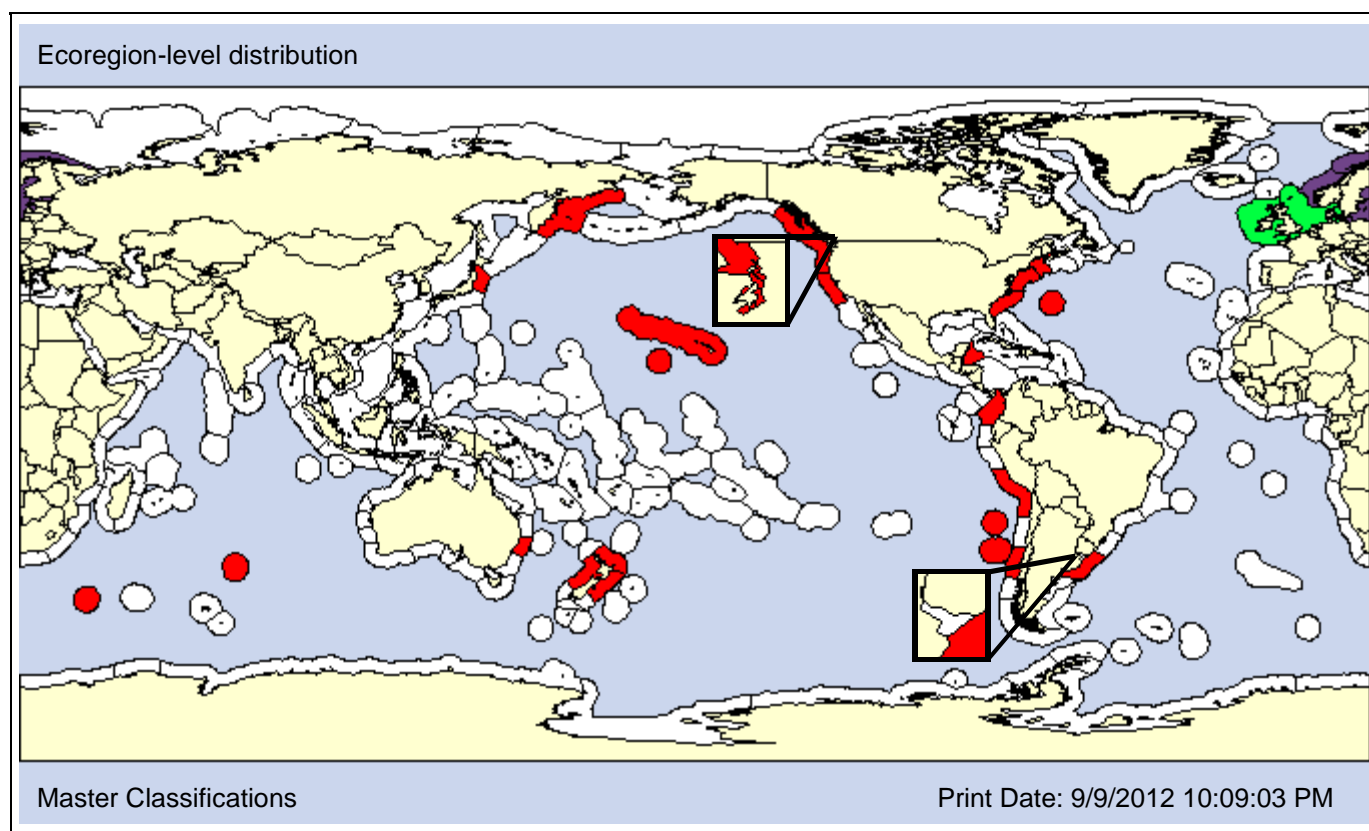
**Also Known As (Name - Type):**

Philoscia tuberculata	Synonym
Porcellio gemmulatus	Synonym
Porcellio montezumae	Synonym
Porcellio nigra	Synonym

**Common Names:**

woodlouse
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown                      1922                      Unknown  
**Loc 1st record:** Unknown                      Hawaii                      Unknown  
**Established:**    Yes                      Yes                      Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR	X		A	P			
	X					AO	PO					X			

Comments: *Porcellio scaber* is a terrestrial isopod though it may be found in the general vicinity of estuarine and coastal water bodies.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
					<b>O</b>			<b>P</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>P</b>			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso		Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>								<b>Artificial Substrate</b>			
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						



**Taxon:** Isopod

**Taxonomic Author:** Bruce & Wetzer, 2008

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Sphaeromatidea

**Infraorder:**

**Superfamily:** Sphaeromatoidea

**Family:** Sphaeromatidae

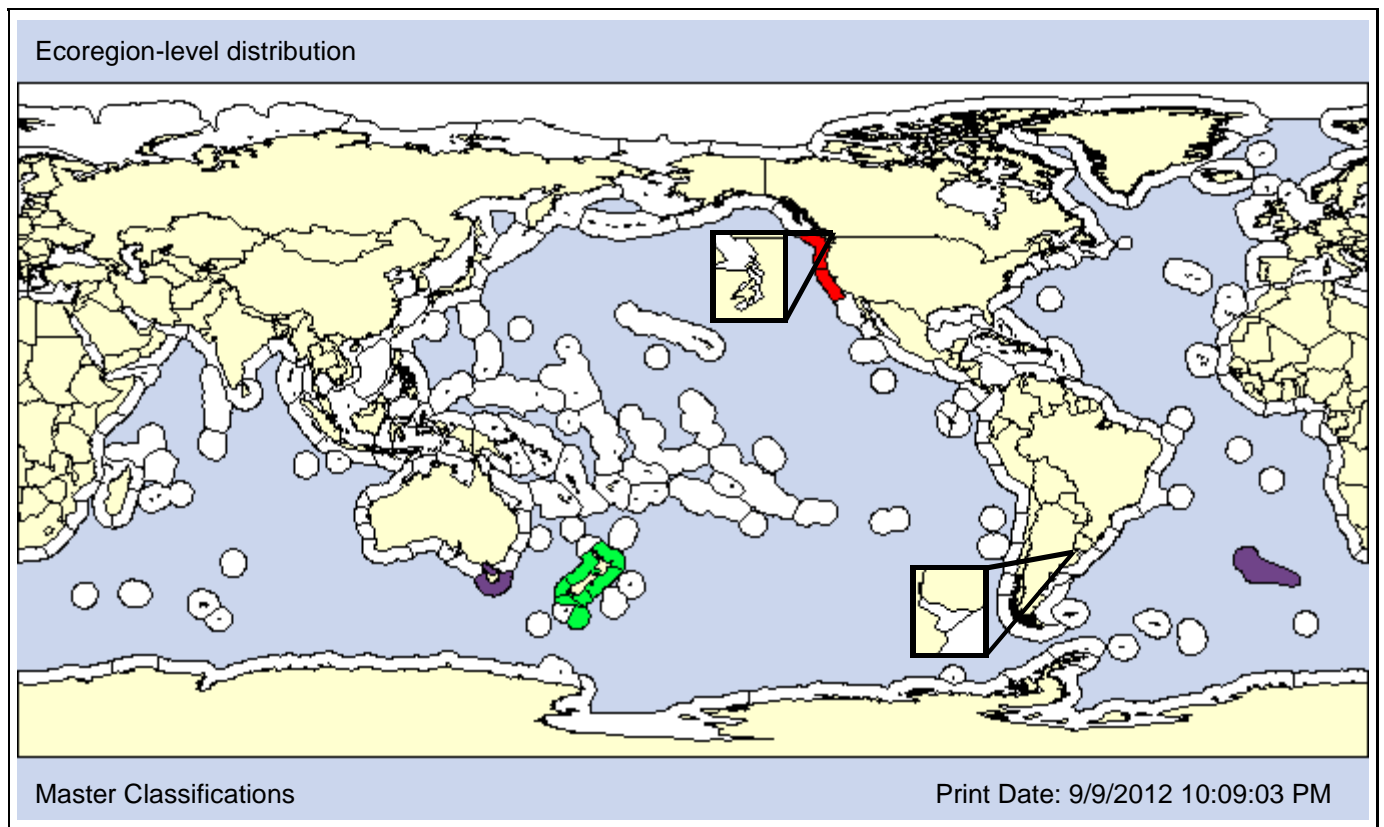
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Pseudosphaeroma campbellensis of Hurley and Jansen, 1977 Misidentified

**Type Locality:**



**Date 1st record:**

2000

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
X		X				AO	PO							

Comments: Pseudosphaeroma is a southern hemisphere genus that has been introduced into the San Francisco Estuary, California and Coos Bay, Oregon, presumably from New Zealand. The introduced species is not *P. campbellensis* (Bruce and Wetzer, 2008), and may be different from the species in Australia and Chile.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated <b>X</b></b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE **X****

<b>R</b>	<b>HP</b>	<b>Biogenic <b>O</b></b>						<b>Artificial Substrate <b>P</b></b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>O</b>		<b>O</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish <b>P</b></b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual <b>X</b></b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic <b>X</b></b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Isopod

**Taxonomic Author:** Milne-Edwards, 1840

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Sphaeromatidea

**Infraorder:**

**Superfamily:** Sphaeromatoidea

**Family:** Sphaeromatidae

**Subfamily:**

**Also Known As (Name - Type):**

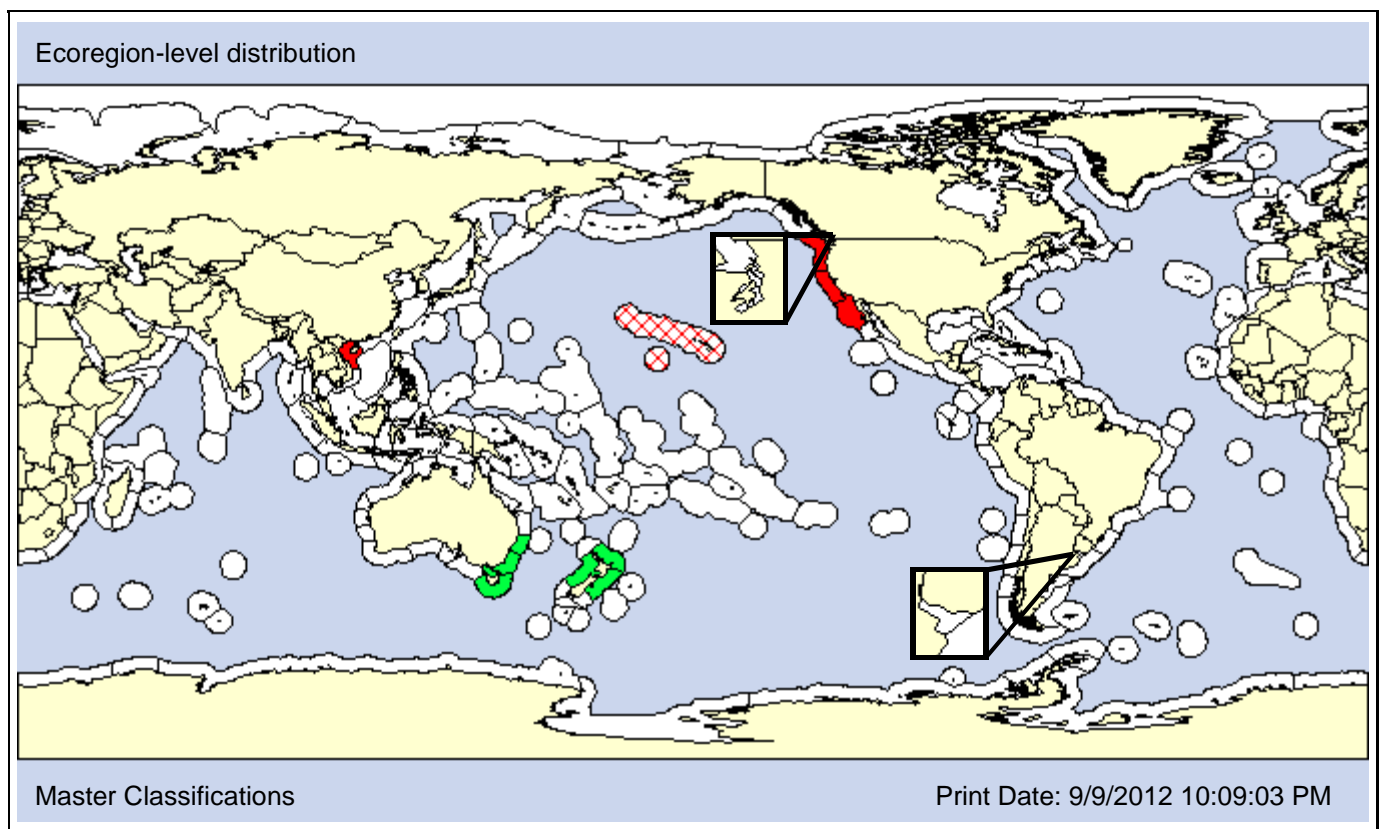
Sphaeroma pentodon  
Sphaeroma quoyanum

Synonym  
Synonym

**Common Names:**

pillbug (*Sphaeroma quoianum*)

**Type Locality:** Tasmania, Australia



**Date 1st record:**

ca. 1920

1883

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

San Francisco Estuary, CA

**Established:**

No

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: *Sphaeroma quoianum* burrows into peat, clay, decaying wood, sandstone, and even Styrofoam buoys. It was recorded once from Hawaii around 1920 but has not been collected since.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH	<b>X</b>			<b>X</b>	
	<b>X</b>												

**DEPTH [Obs: 0 - 2m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP O</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
					<b>O</b>					<b>P</b>		<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 3.8 - 43psu] [Pref: 5 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P O</b>
		<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>					<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					<b>X</b>
						<b>X</b>							

**Taxon:** Isopod

**Taxonomic Author:** Stebbing, 1905

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Sphaeromatidea

**Infraorder:**

**Superfamily:** Sphaeromatoidea

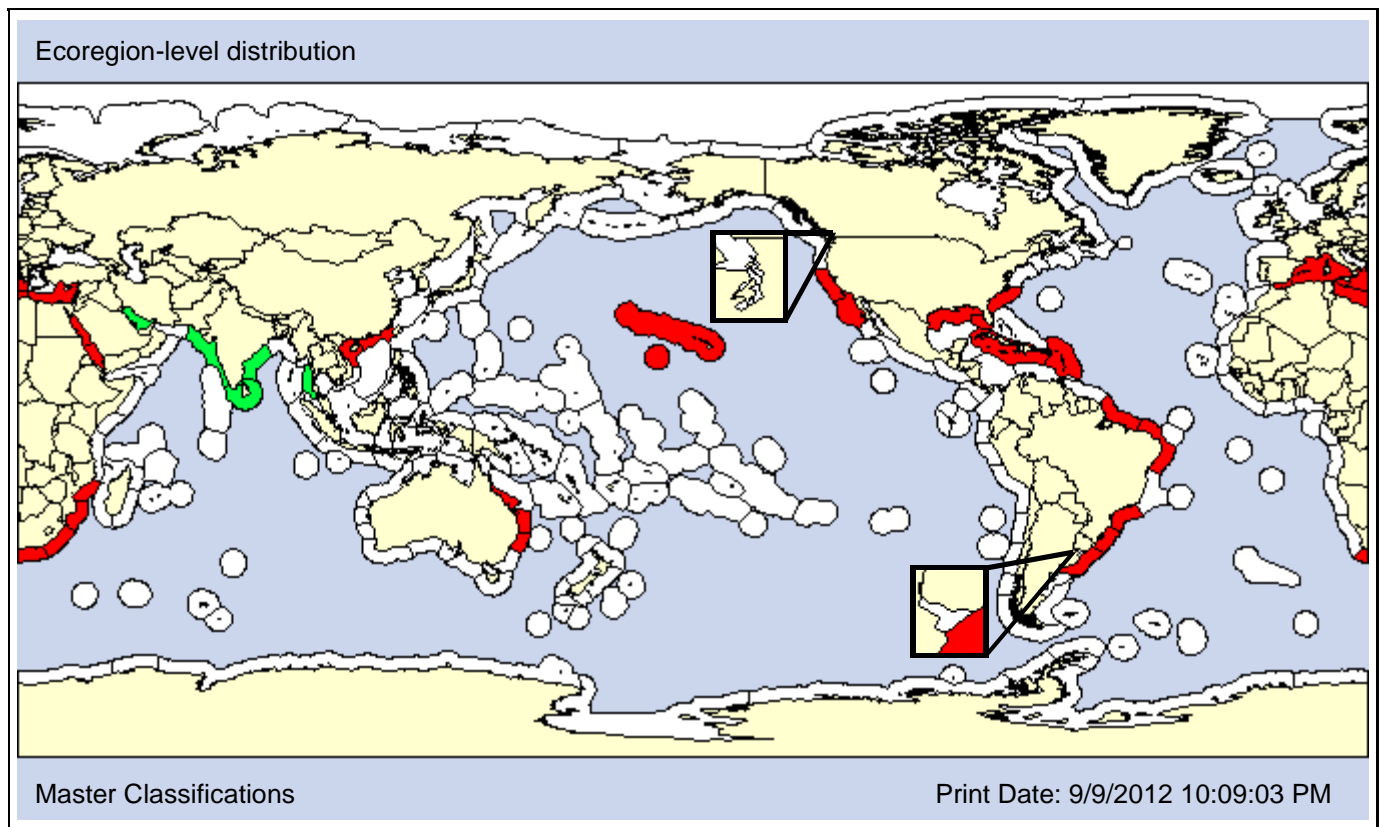
**Family:** Sphaeromatidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Sri Lanka



<span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></span> Native	<span style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></span> Nonindigenous	<span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></span> Cryptogenic	<span style="display: inline-block; width: 15px; height: 15px; background-color: lightblue; border: 1px solid black;"></span> Transient	<span style="display: inline-block; width: 15px; height: 15px; background-color: purple; border: 1px solid black;"></span> Unclassified	<span style="display: inline-block; width: 15px; height: 15px; background-color: brown; border: 1px solid black;"></span> Conflicting Classification	<span style="display: inline-block; width: 15px; height: 15px; background-color: white; border: 1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:**

1943

1973

**Loc 1st record:**

Hilo, Hawaii

San Diego Bay, CA

**Established:**

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 9m] [Pref: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>	<b>O</b>		<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 19.3 - 40psu] [Pref: 25 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>			<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	
						<b>X</b>							

**Taxon:** Isopod

**Taxonomic Author:** (Miers, 1881)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Isopoda

**Suborder:** Valvifera

**Infraorder:**

**Superfamily:**

**Family:** Idoteidae

**Subfamily:**

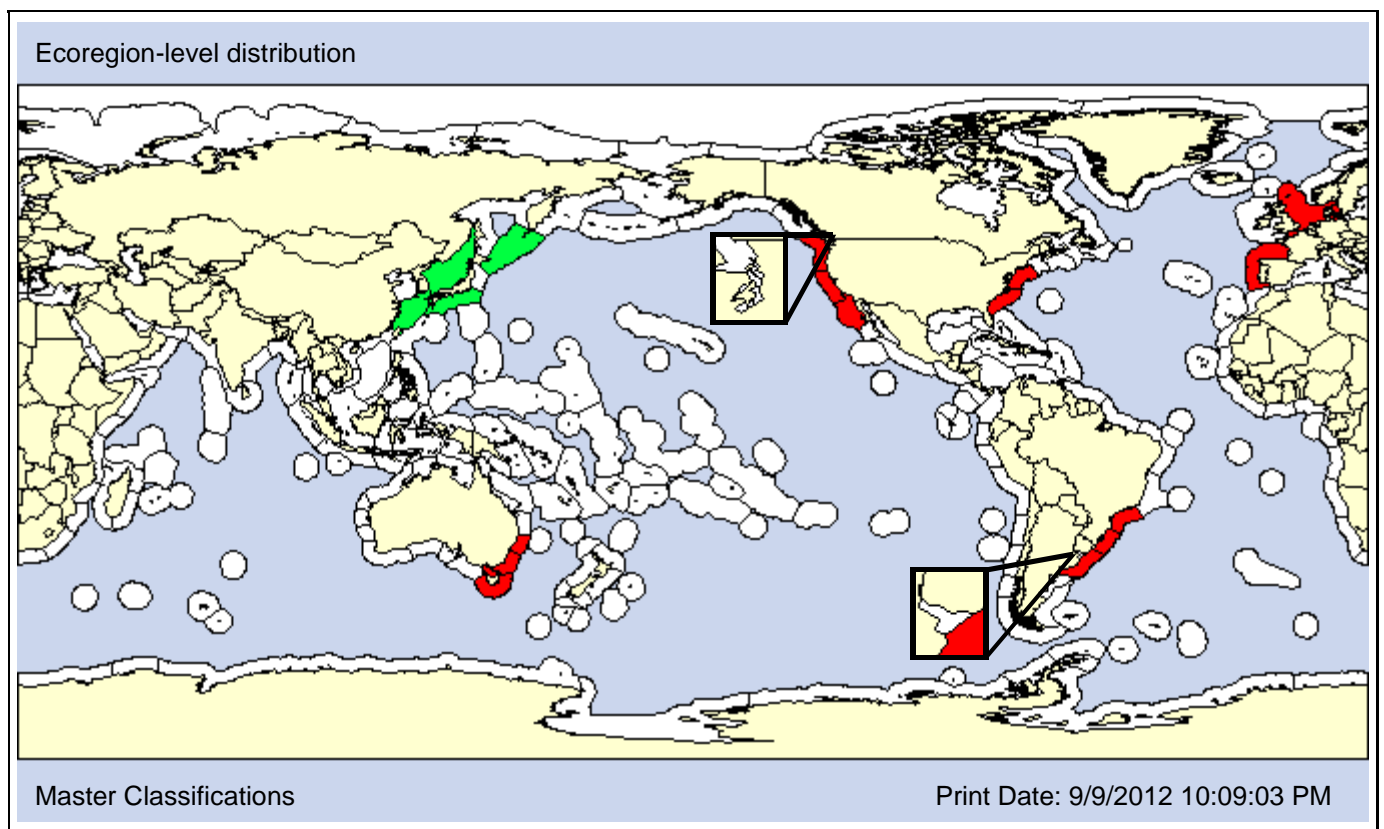
**Also Known As (Name - Type):**

Edotia laevidorsalis	Synonym
Synidotea grisea	Synonym
Synidotea keablei	Synonym
Synidotea laticauda	Synonym

**Common Names:**

--

**Type Locality:** Tateyama Bay, Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

<1897

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO <b>X</b>								

Comments: Chapman and Carlton (1991) synonymized *Synidotea laticauda* and *S. marplatensis* with the Japanese isopod *S. laevidorsalis*. Poore (1996) disagrees with this synonymy and does not consider *S. laevidorsalis* introduced into the NEP. We use the Chapman and Carlton classification until additional evidence becomes available.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			X	X	
		X											

**DEPTH [Obs: 0 - 17m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 5.49 - 96.55%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O	O				

**CONSOLIDATED SUBSTRATE X**

R O	HP	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O	O							O	P	O	P

**SALINITY [Obs: 0.1 - 31.85psu] [Pref: 20 - psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
	O	O	O	O	P	O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
			X	X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		X
						X							



Kingdom: Animalia

Phylum: Arthropoda

Class: Malacostraca

Superorder: Peracarida

Order: Mysida

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**Taxon:** Mysid

**Taxonomic Author:** Bowman & Orsi, 1992

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Mysida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Mysidae

**Subfamily:**

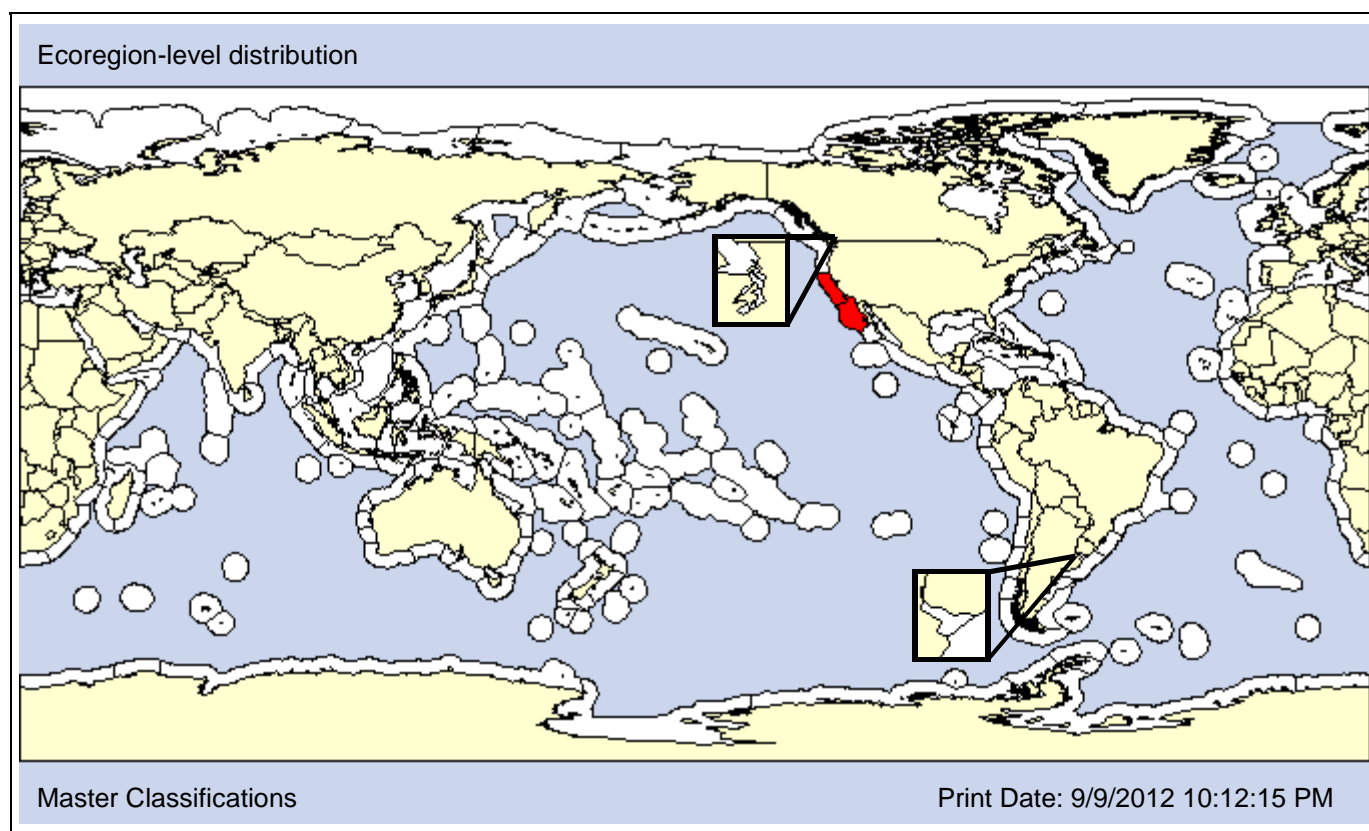
**Also Known As (Name - Type):**

**Common Names:**

Mysidopsis sp 1 of Phillips, 1987

Synonym

**Type Locality:** San Joaquin, San Francisco Estuary, California, USA



**Date 1st record:**

1977

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X						AO	PO								

Comments: *Deltamysis holmquistae* was originally described from the San Francisco Estuary. However, it is considered introduced because it was first found in 1977 even though zooplankton surveys had been taking place in the San Francisco Estuary since 1963. We assume it is epibenthic.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 1 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 19psu] [Pref: 1 - 2psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Mysid

**Taxonomic Author:** (Holmes, 1900)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Mysida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Mysidae

**Subfamily:**

**Also Known As (Name - Type):**

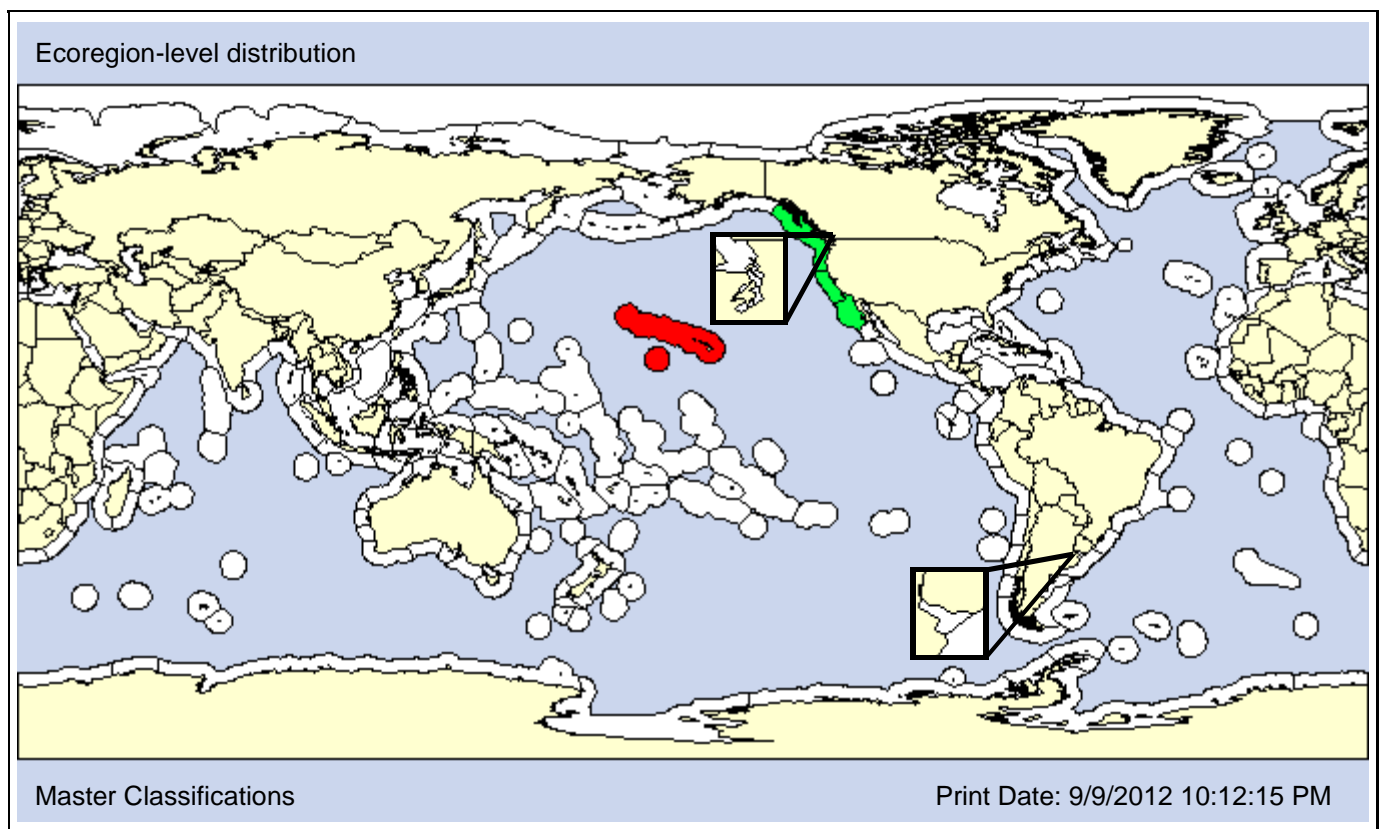
Acanthomysis costata  
Acanthomysis sculpta

Synonym  
Synonym

**Common Names:**

kelp forest mysid

**Type Locality:**



**Date 1st record:**

1967

Native

**Loc 1st record:**

Waikiki, Hawaii

Native

**Established:**

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X						AO	PO								

Comments: *Holmesimysis costata* occurs in a variety of habitats, including in the canopies of the giant kelp, *Macrocystis pyrifera*, on the U.S. Pacific coast.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					<b>X</b>
<b>X</b>		<b>X</b>											

**DEPTH [Obs: 0 - 6.4m] [Pref: - 3m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 9.64 - 9.64%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							<b>P</b>	<b>O</b>						

**SALINITY [Obs: 15 - 36psu] [Pref: 30 - 36psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>								

# Hyperacanthomysis longirostris

Species ID: 1085

**Taxon:** Mysid

**Taxonomic Author:** (li, 1936)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Mysida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Mysidae

**Subfamily:**

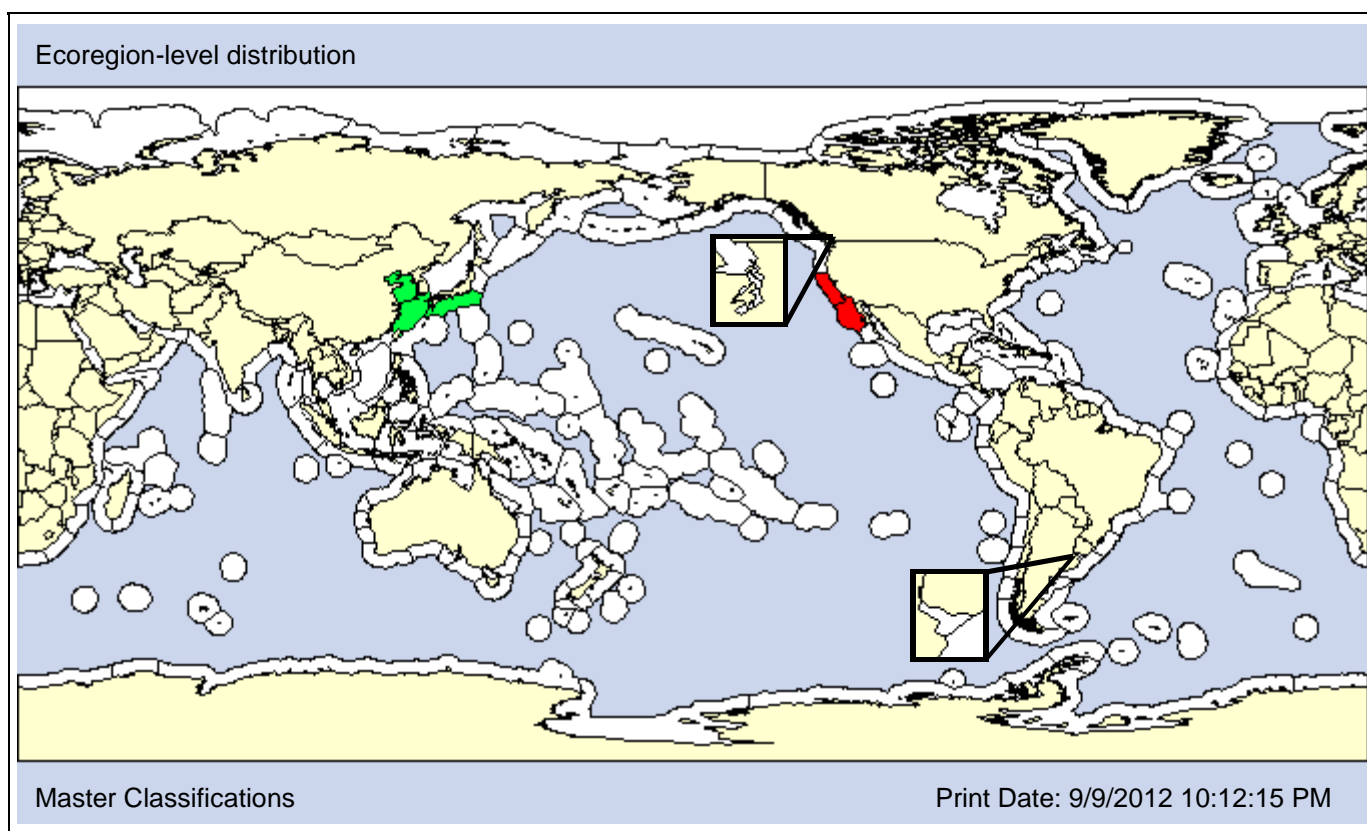
**Also Known As (Name - Type):**

Acanthomysis bowmani  
 Acanthomysis longirostris  
 Acanthomysis sp. (Cohen and Carlton, 1995)

Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:** Native

1993

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X						AO	PO								

Comments: The mysid *Hyperacanthomysis longirostris* (= *Acanthomysis bowmani*) is classified as NIS in the NEP based on its relatively recent discovery in the San Francisco Estuary.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - 6m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 20psu] [Pref: 1 - 10psu]**

<b>Fresh O</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							



**Taxon:** Mysid

**Taxonomic Author:** Nakazawa, 1910

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Mysida

**Suborder:**

**Infraorder:**

**Superfamily:**

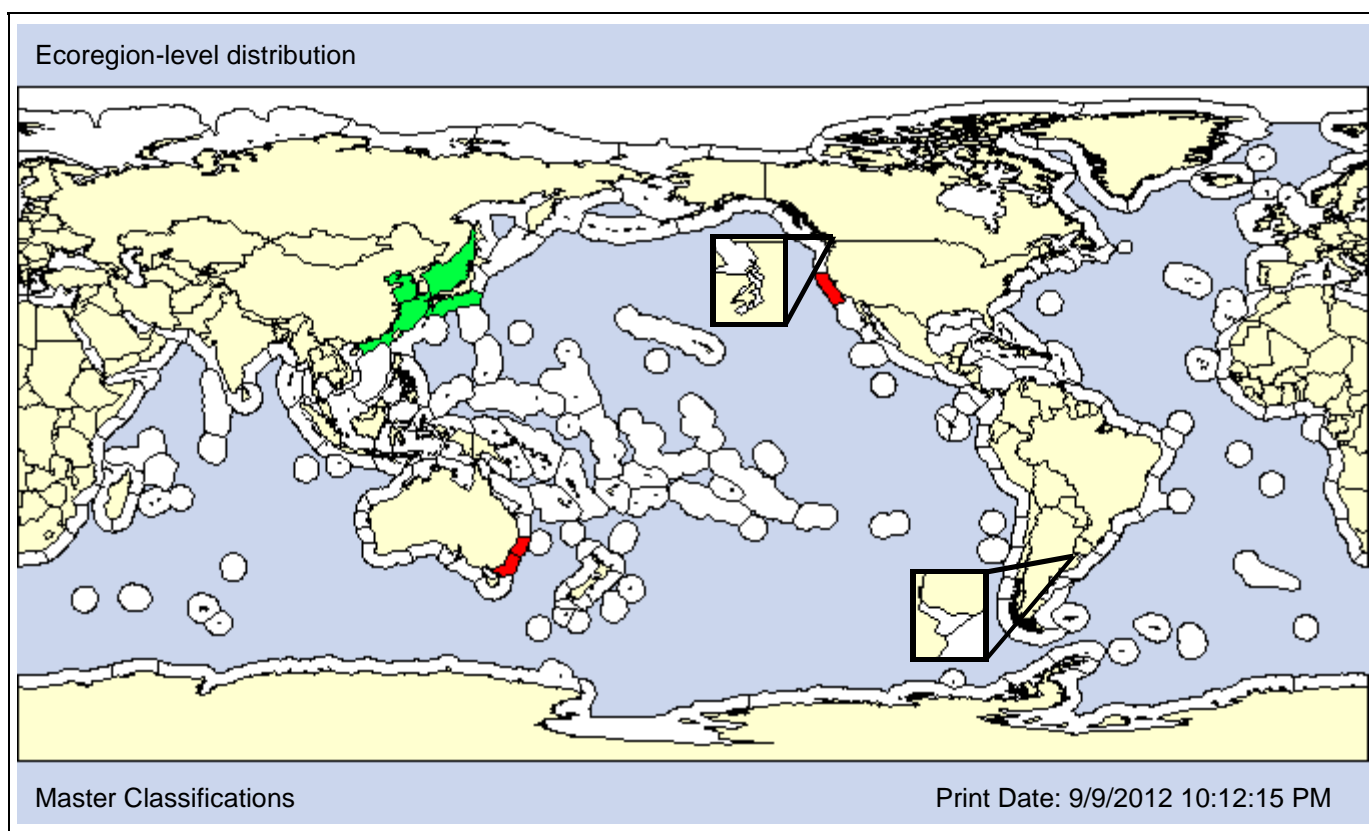
**Family:** Mysidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

2004

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

Unconsolidated						Consolidated						Pelagic <b>X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: - 6m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

R	HP	Biogenic								Artificial Substrate				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 10 - 20psu] [Pref: 10 - 20psu]**

Fresh	Brackish <b>P</b>						Marine		Hyper
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
		<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

Sexual <b>X</b>							Asexual				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

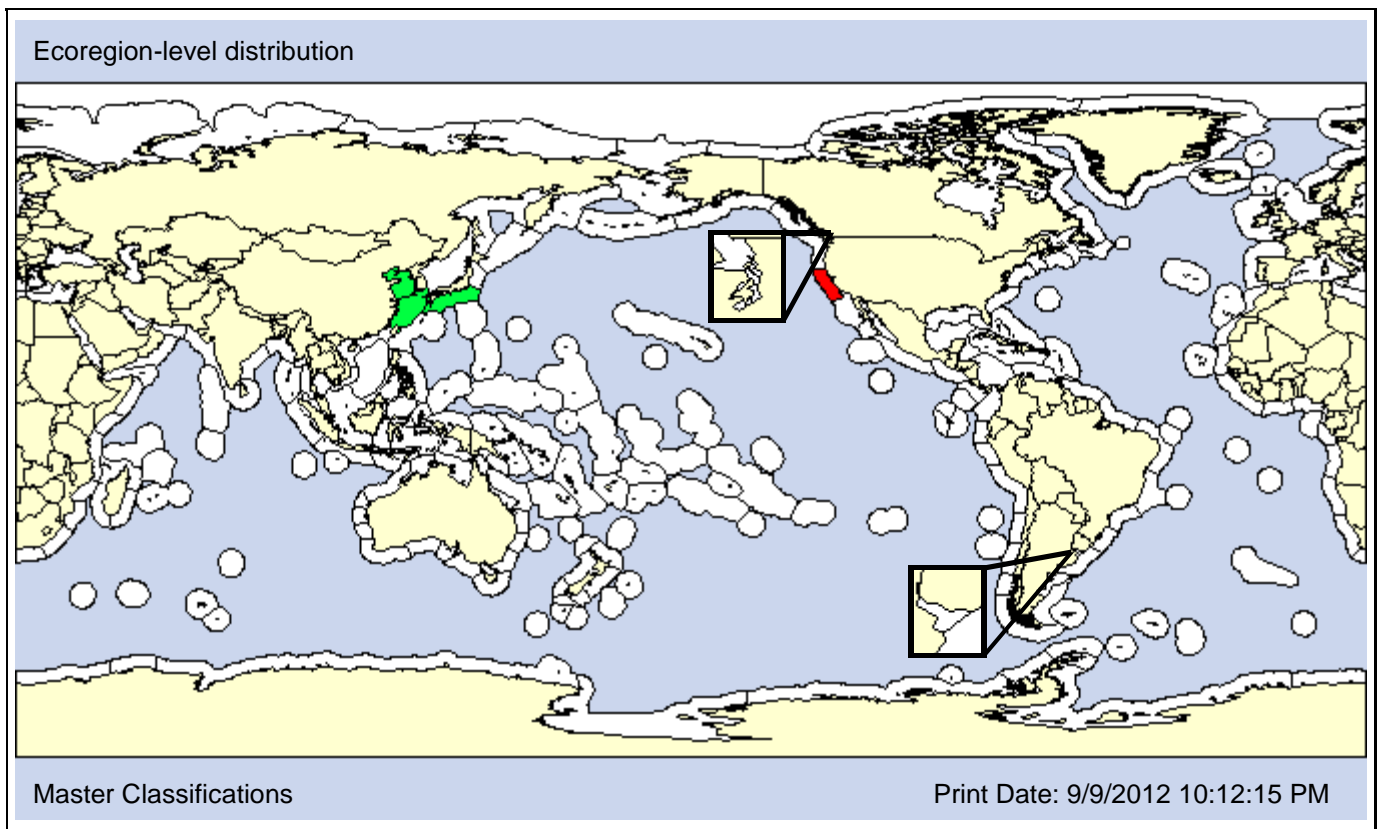
Pelagic <b>X</b>			Benthic							Epibiotic			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

<b>Taxon:</b> Mysid	<b>Taxonomic Author:</b> (Ii, 1964)	
<b>Kingdom:</b> Animalia	<b>Subkingdom:</b> Eumetazoa	<b>Phylum:</b> Arthropoda
<b>Subphylum:</b> Crustacea	<b>Superclass:</b>	<b>Class:</b> Malacostraca
<b>Subclass:</b> Eumalacostraca	<b>Infraclass:</b>	<b>Superorder:</b> Peracarida
<b>Order:</b> Mysida	<b>Suborder:</b>	<b>Infraorder:</b>
<b>Superfamily:</b>	<b>Family:</b> Mysidae	<b>Subfamily:</b>

**Also Known As (Name - Type):**

Acanthomysis aspera	Synonym	Common Names:

**Type Locality:** Kojima Bay, Japan



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		<b>NWP</b>	<b>Hawaii</b>		<b>NEP</b>		

**Date 1st record:** Native 1992  
**Loc 1st record:** Native San Francisco Estuary, CA  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X						AO	PO								

Comments: *Orientomysis aspera* (= *Acanthomysis aspera*) is an Asian brackish water mysid that invaded the San Francisco Estuary in 1992. It appears to have an epibenthic life style.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 1 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 4 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
		<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Mysid

**Taxonomic Author:** (Ii, 1964)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Mysida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Mysidae

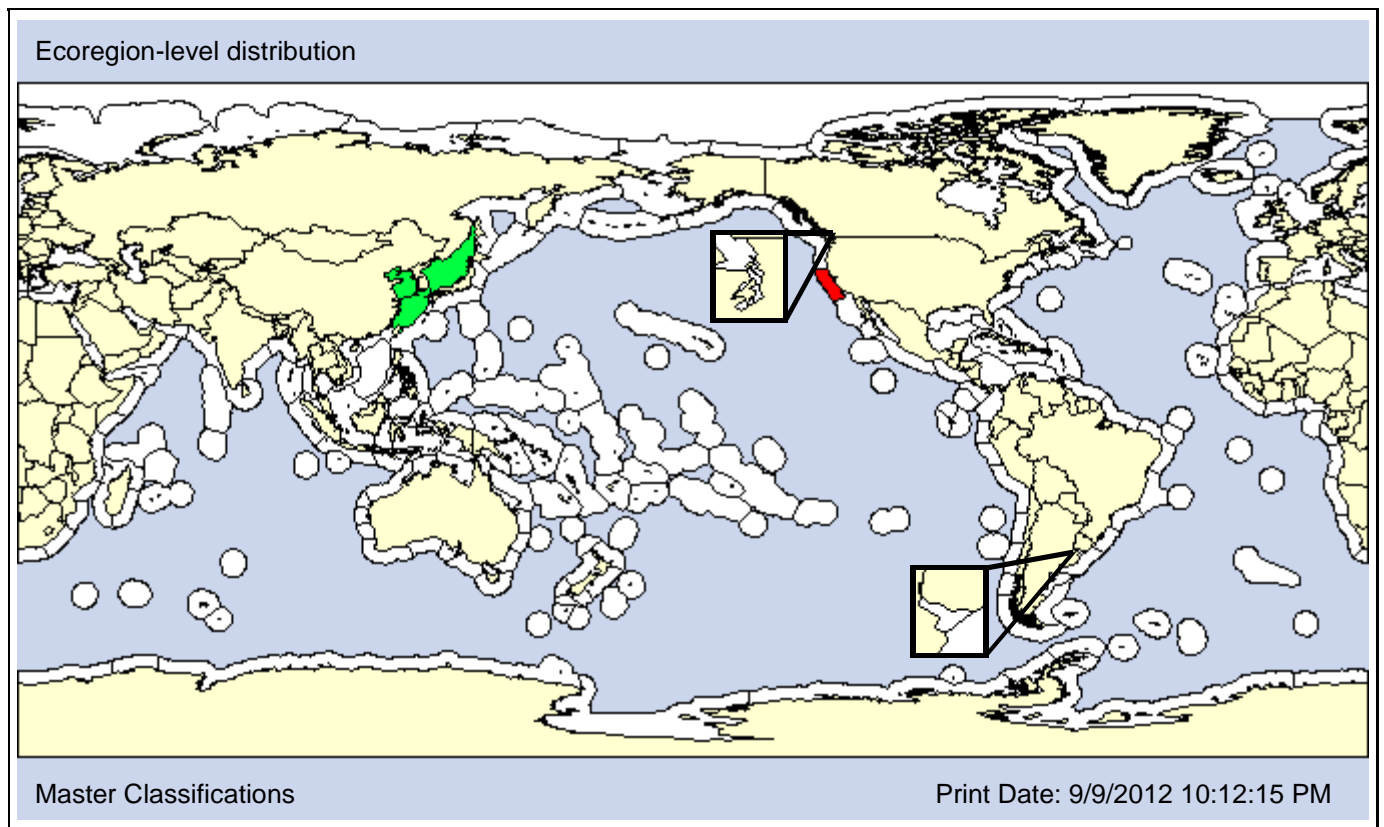
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Acanthomysis hwanhaiensis	Synonym	
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**Type Locality:** Kaishu Bay, North Korea



**Date 1st record:** Native 1997

**Loc 1st record:** Native San Fransico Estuary, CA

**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA	IR			A	P			
<b>X</b>						AO	PO							

Comments: *Orientomysis hwanhaiensis* (= *Acanthomysis hwanhaiensis*) is an Asian brackish water mysid that invaded the San Francisco Estuary in 1997. It appears to have an epibenthic life style. It is rare in the San Francisco Estuary.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>		<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 9.8 - 30.4psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

Kingdom: Animalia

Phylum: Arthropoda

Class: Malacostraca

Superorder: Peracarida

Order: Tanaidacea

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**Taxon:** Tanaid

**Taxonomic Author:** Muir, 1997

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Tanaidacea

**Suborder:** Apseudomorpha

**Infraorder:**

**Superfamily:** Apseuidoidea

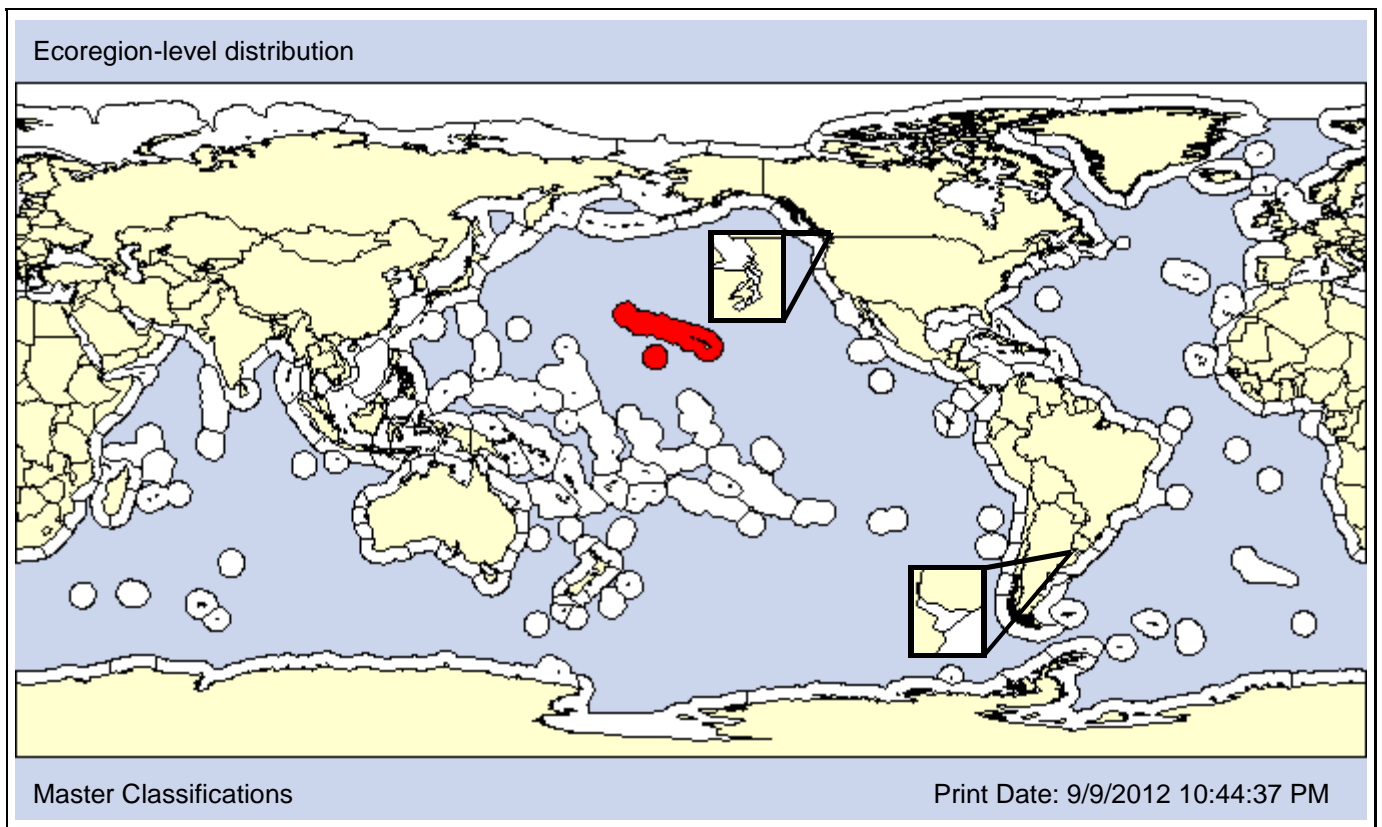
**Family:** Apseudidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-style:dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:brown; border:1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; border:1px solid black;"></span> Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

**Date 1st record:** 1996  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: The undescribed *Apseudes* in Hawaii most closely resembles the Japanese *Apseudes nipponicus* but there are sufficient differences to consider it a different species. Given that it was not observed in earlier surveys, it is considered introduced (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: - 29m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	O

**SALINITY [Obs: - 30.5psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Tanaid

**Taxonomic Author:** (Boone, 1923)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Peracarida

**Order:** Tanaidacea

**Suborder:** Apseudomorpha

**Infraorder:**

**Superfamily:** Apseuidoidea

**Family:** Parapseudidae

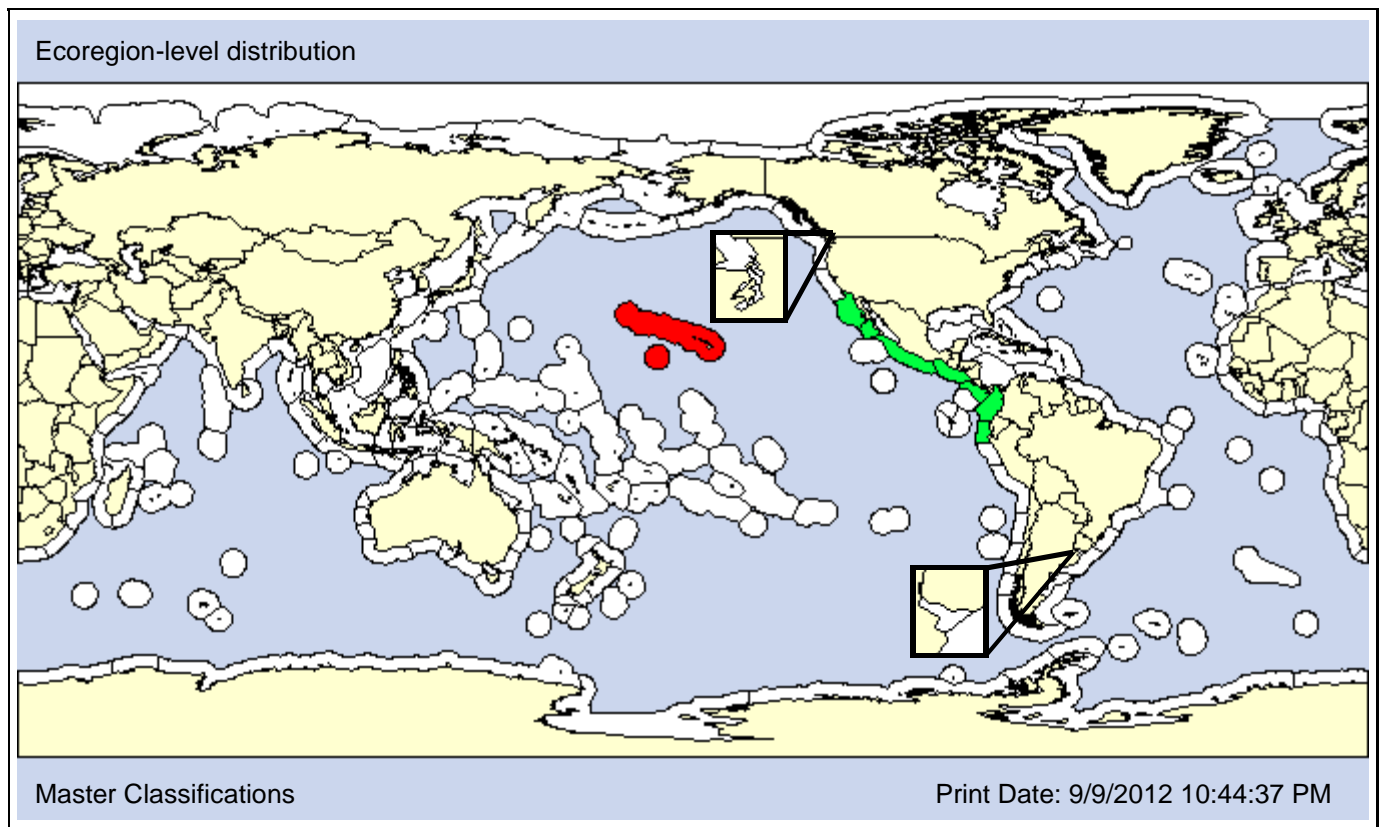
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Dalapseudes pedispinis	Synonym	
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**Type Locality:**



**Date 1st record:**

1996

Native

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

Native

**Established:**

Yes

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X		X	

**DEPTH [Obs: 0.25 - 12.8m] [Pref: 0.25 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O											O	

**SALINITY [Obs: - 34psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		X	X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Tanaid **Taxonomic Author:** (Richardson 1901)

**Kingdom:** Animalia **Subkingdom:** Eumetazoa **Phylum:** Arthropoda  
**Subphylum:** Crustacea **Superclass:** **Class:** Malacostraca  
**Subclass:** Eumalacostraca **Infraclass:** **Superorder:** Peracarida  
**Order:** Tanaidacea **Suborder:** Tanaidomorpha **Infraorder:**  
**Superfamily:** Tanaoidea **Family:** Tanaidae **Subfamily:**

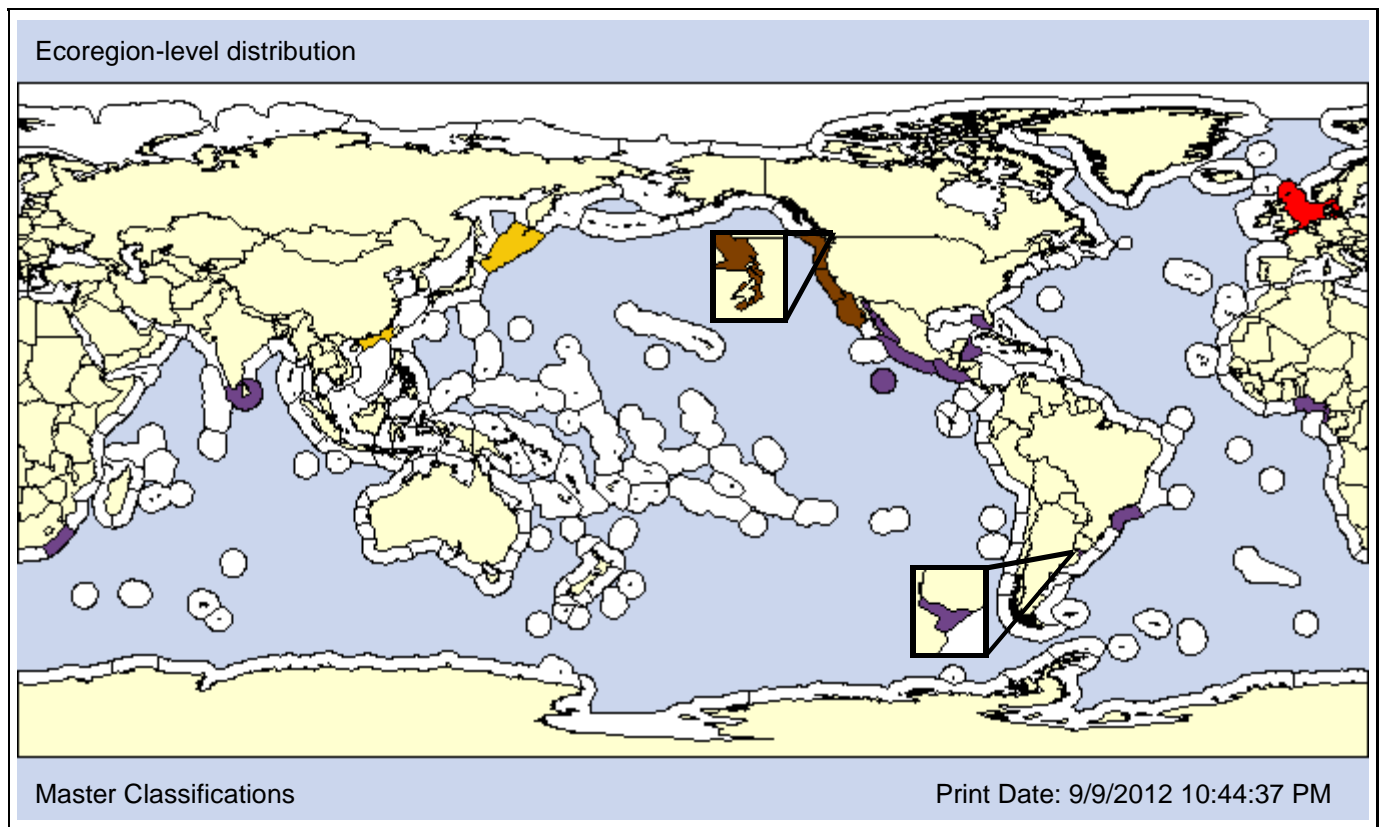
**Also Known As (Name - Type):**

Sinelobus sp. (Cohen and Carlton 1995)	Ambiguous syn.
Sinelobus sp. (Cohen, 2007)	Ambiguous syn.
Sinelobus sp. of NEP authors	Ambiguous syn.
Sinelobus stanfordi complex	Convention

**Common Names:**

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**Type Locality:** Clipperton Island, France



Master Classifications Print Date: 9/9/2012 10:44:37 PM

<span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></span> Native	<span style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></span> Nonindigenous	<span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></span> Cryptogenic	<span style="display: inline-block; width: 15px; height: 15px; background-color: cyan; border: 1px solid black;"></span> Transient	<span style="display: inline-block; width: 15px; height: 15px; background-color: purple; border: 1px solid black;"></span> Unclassified	<span style="display: inline-block; width: 15px; height: 15px; background-color: brown; border: 1px solid black;"></span> Conflicting Classification	<span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** before 1938 1943  
**Loc 1st record:** Unknown Unknown  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO <b>X</b>								

Comments: *Sinelobus stanfordi* is considered an “Unresolved Complex” by CANOD (2009) which notes that its presence in the NEP may represent a natural range extension from the south. However, Cohen (2007) classifies it as introduced in central California. It has been classified as cryptogenic in Japan (Doi et al., 2011).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>					<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 1.5m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.7 - 90%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>								<b>Artificial Substrate P</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>		<b>P</b>				<b>O</b>			<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 0 - 27.68psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
						<b>X</b>			DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>								<b>Epibiotic X</b>		
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	
						<b>X</b>							

Kingdom: Animalia

Phylum: Arthropoda

Class: Malacostraca

Superorder: Eucarida

Order: Decapoda

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**Taxon:** Decapod

**Taxonomic Author:** (Edmondson, 1931)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Xanthoidea

**Family:** Panopeidae

**Subfamily:**

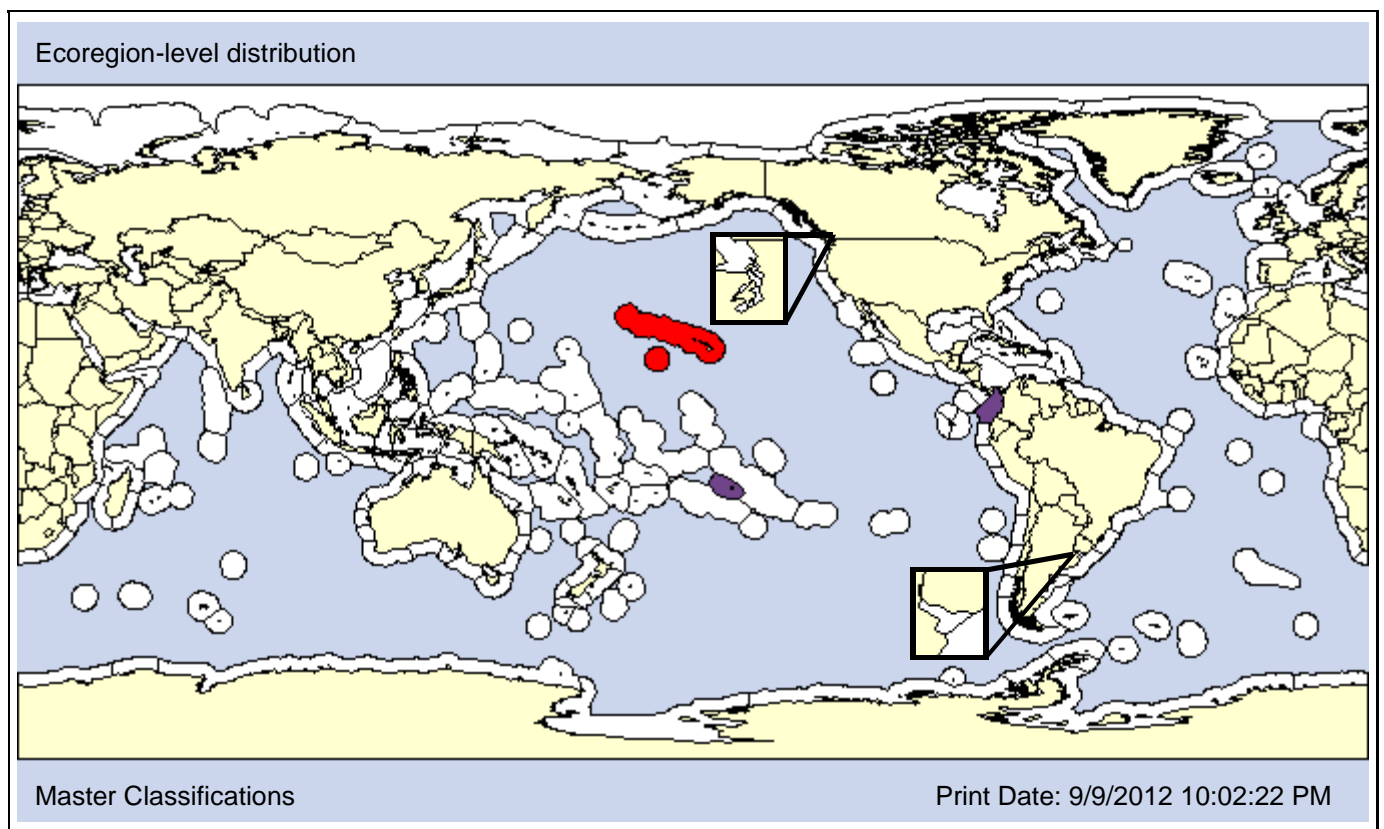
**Also Known As (Name - Type):**

Acantholobulus mirafloresensis re:Felder and Martin, 2003	Ambiguous syn.
Neopanope sp.? of Edmondson, 1931	Ambiguous syn.
Panopeus mirafloresensis re:Felder and Martin, 2003	Ambiguous syn.
Panopeus pacificus	Synonym

**Common Names:**

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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1929

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: It is not certain whether *Acantholobulus pacificus* is native to the Indo-Pacific, Tropical Eastern Pacific or Tropical Western Atlantic (see Felder and Martin, 2003; Paulay, 2011). While Carlton and Eldredge (2009) tentatively assign its native range to the Tropical Eastern Pacific, we list it as unclassified in areas outside Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0.25 - 13m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>P</b>	<b>P</b>

**SALINITY [Obs: 25 - 35psu] [Pref: - 32psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>	<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Decapod

**Taxonomic Author:** Rathbun, 1896

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Portunoidea

**Family:** Portunidae

**Subfamily:** Portuninae

**Also Known As (Name - Type):**

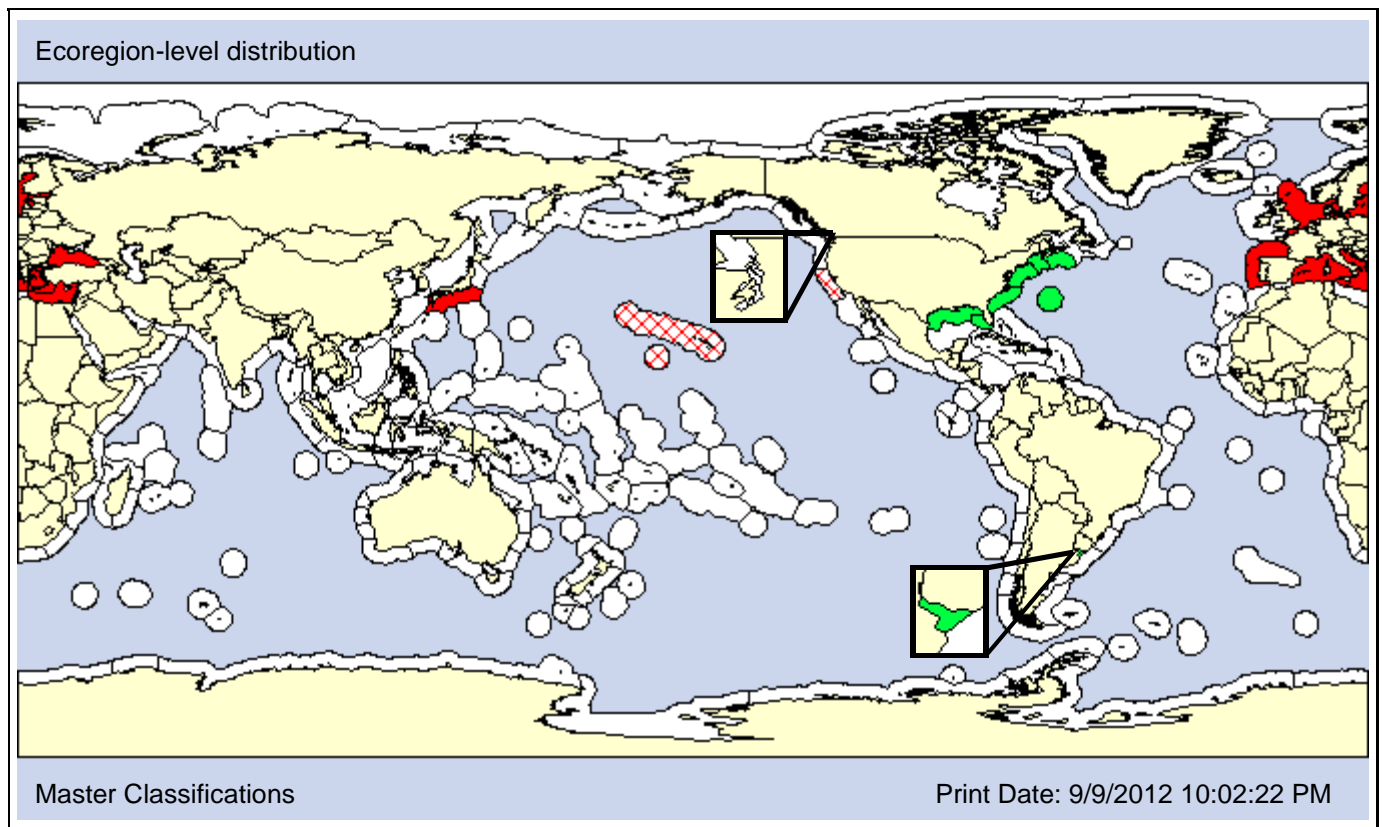
Callinectes sapidus acutidens  
Portunus diacantha

Convention  
Synonym

**Common Names:**

Blå svømmekrabbe  
blauwe krab  
blauwe zwemkrab  
blue crab

**Type Locality:**



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

NWP

Hawaii

NEP

**Date 1st record:** 1975

1985

1897

**Loc 1st record:** Lake Hamana, Japan

Kaneohe Bay, Hawaii

San Francisco Estuary, CA

**Established:** Unknown

No

No

**VECTORS**

SH X			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P		X		
X				X		AO	PO	X							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 90m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>					<b>P</b>						

**SALINITY [Obs: 3 - 35psu] [Pref: 20 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>
		<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>	<b>X</b>								

**Taxon:** Decapod

**Taxonomic Author:** Nardo, 1847

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Portunoidea

**Family:** Portunidae

**Subfamily:**

**Also Known As (Name - Type):**

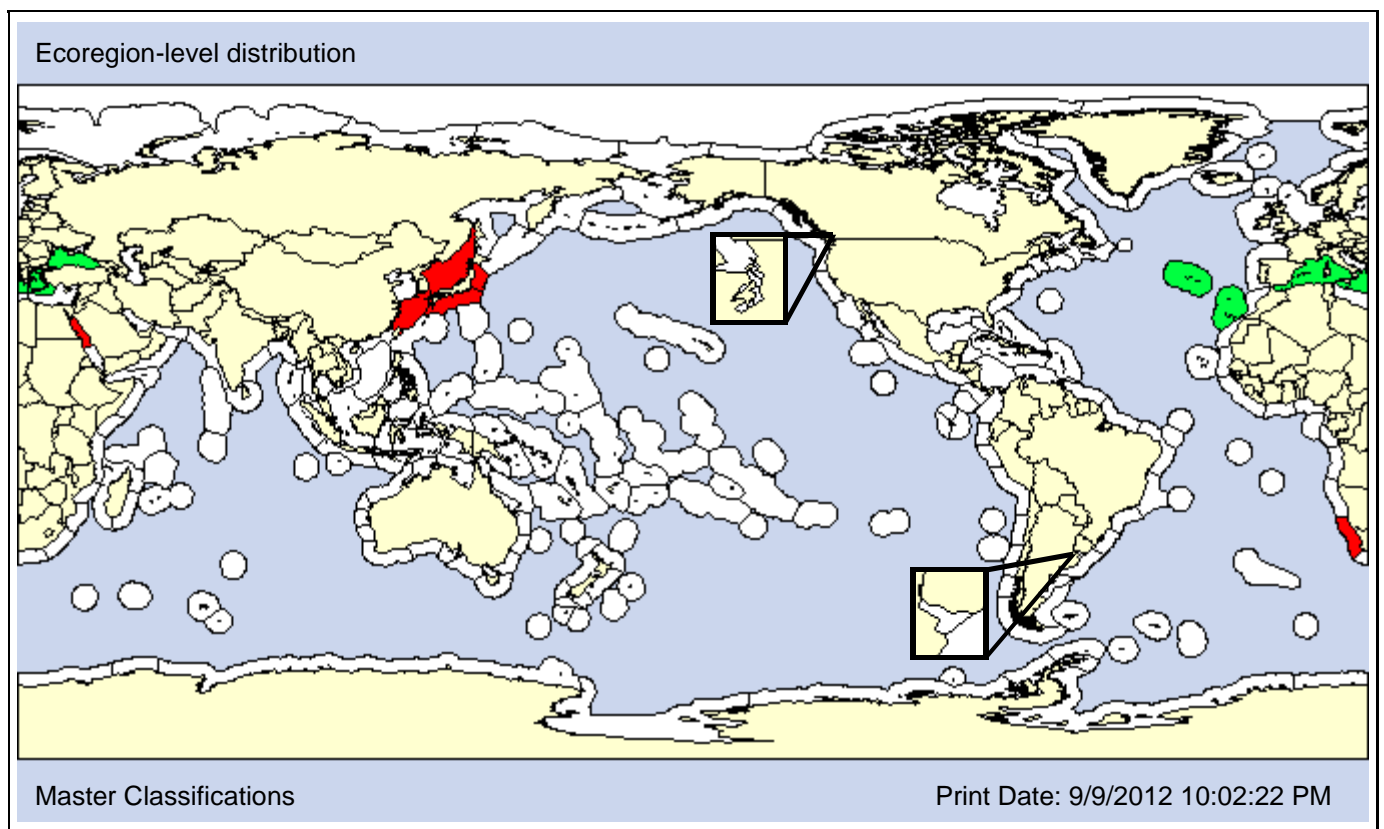
Carcinus maenas aestuarii  
 Carcinus mediterraneus  
 Portunus menoides

Synonym  
 Synonym  
 Synonym

**Common Names:**

Chichukai-midorigani  
 Mediterranean green crab

**Type Locality:**



**Date 1st record:** 1984

**Loc 1st record:** Tokyo Bay, Japan

**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: Japanese populations represent hybrids between the European *Carcinus maenas* and the Mediterranean *C. aestuarii* (Darling et al., 2008). The non-native *Carcinus* in South Africa may represent *C. maenas*, *C. aestuarii*, both species, or a hybrid of the two (Carlton and Cohen, 2003), and Mead et al. (2011) does not list *C. maenas* in South Africa.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X				TP	RI-PH	X		X	X	
	X	X											

**DEPTH [Obs: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				O									O	

**SALINITY [Obs: 4.4 - 38psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	O	
		O	O	O	O	O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X	X	X			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X						
					X	X							

**Taxon:** Decapod

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Portunoidea

**Family:** Portunidae

**Subfamily:**

**Also Known As (Name - Type):**

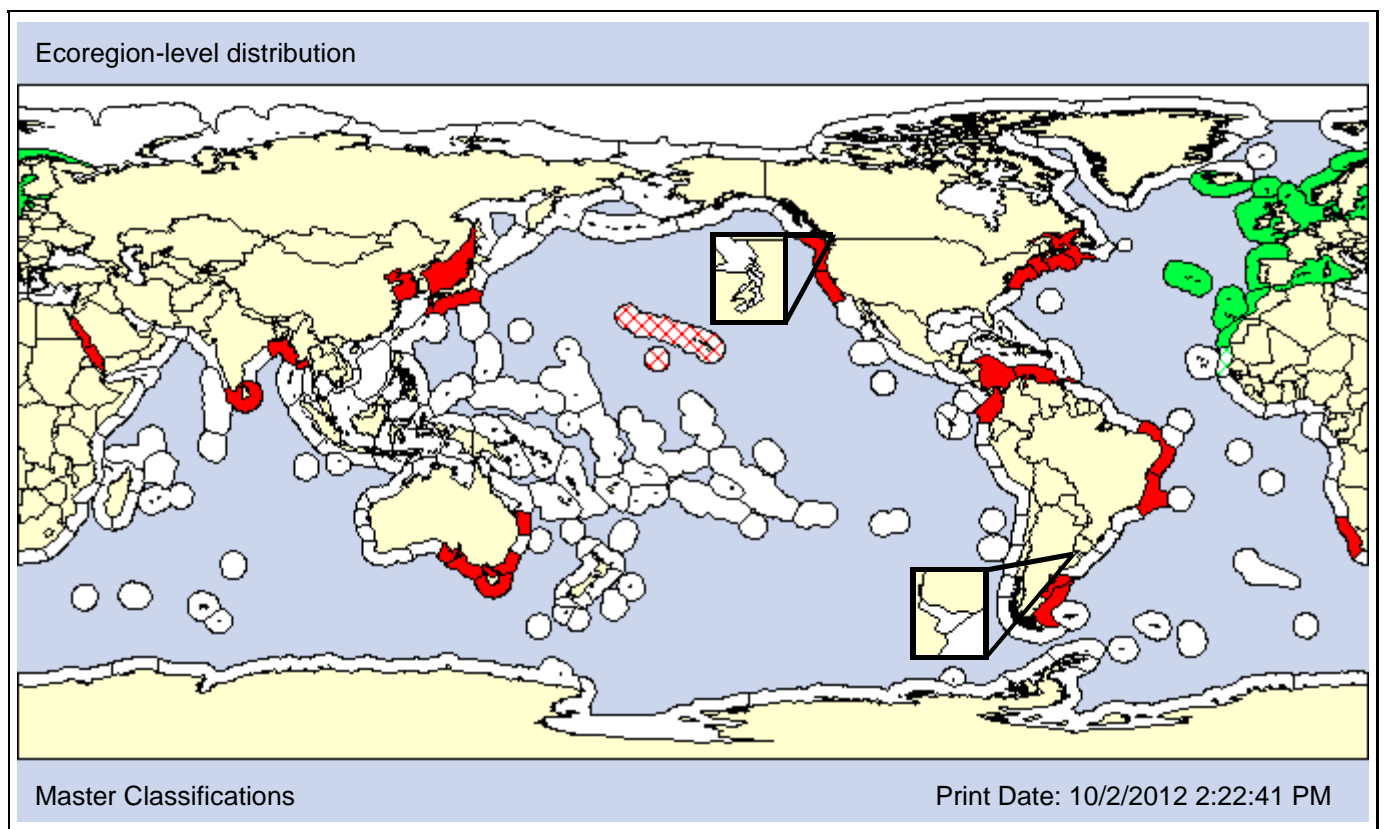
Cancer granarius  
 Cancer maenas  
 Cancer pygmeus  
 Cancer rhomboidalis

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

European green crab  
 European shore crab  
 green crab

**Type Locality:** Marstrand, west coast of Sweden



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

<b>Date 1st record:</b> 1984	1873	1989
<b>Loc 1st record:</b> Tokyo Bay, Japan	Honolulu, Hawaii	Estero Americano, California
<b>Established:</b> Yes	No	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P	<b>X</b>	<b>X</b>		
<b>X</b>						AO	PO								

Comments: Japanese populations represent hybrids between the European *Carcinus maenas* and the Mediterranean *C. aestuarii* (Darling et al., 2008).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>					<b>X</b>						

**DEPTH [Obs: 0 - 200m] [Pref: 0 - 60m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>		<b>O</b>	<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>								<b>O</b>			

**SALINITY [Obs: 1.4 - 54psu] [Pref: 13 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							



**Taxon:** Decapod

**Taxonomic Author:** (De Man, 1895)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Ocypodoidea

**Family:** Camptandriidae

**Subfamily:**

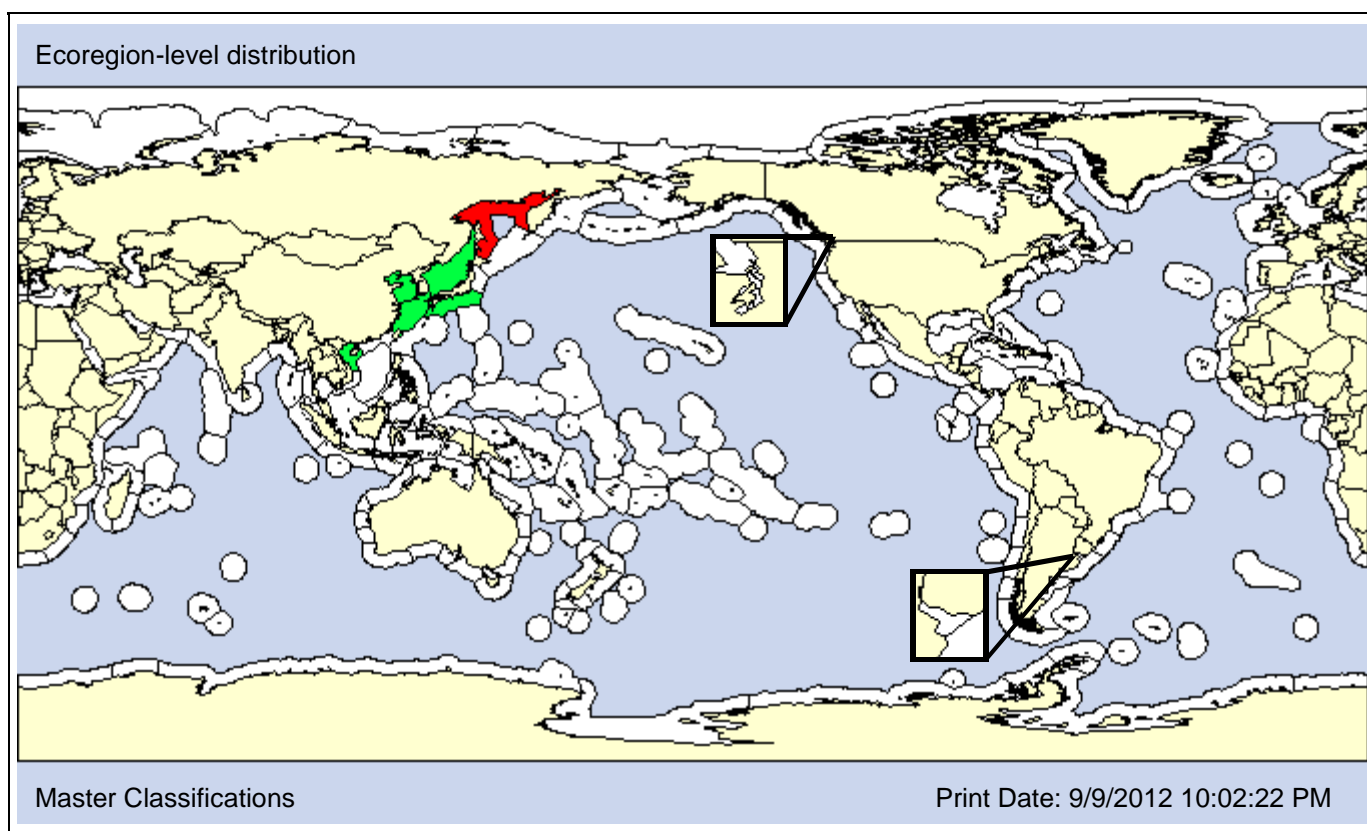
**Also Known As (Name - Type):**

Deiratonotus cristatus  
Paracleistostoma cristatum

Convention  
Synonym

**Common Names:**

**Type Locality:** Tokyo Bay, Japan



**Date 1st record:** 1998

**Loc 1st record:** Sakhalin Island, Russia

**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Deiratonotus cristatum* [= *Paracleistostoma cristatum*] is an "Asian subtropical-tropical species." It was first found in the estuaries of southern Sakhalin Island in 1998 and is considered introduced into the Sea of Okhotsk by Zvyagintsev et al. (2011) though this may represent a natural transient range extension.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>	<b>X</b>		TP	RI-PH					
	<b>X</b>												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>		<b>P</b>			<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>	<b>O</b>					

**SALINITY [Obs: 0 - 22psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Decapod

**Taxonomic Author:** Milne Edwards, 1853

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Grapsoidea

**Family:** Varunidae

**Subfamily:** Varuninae

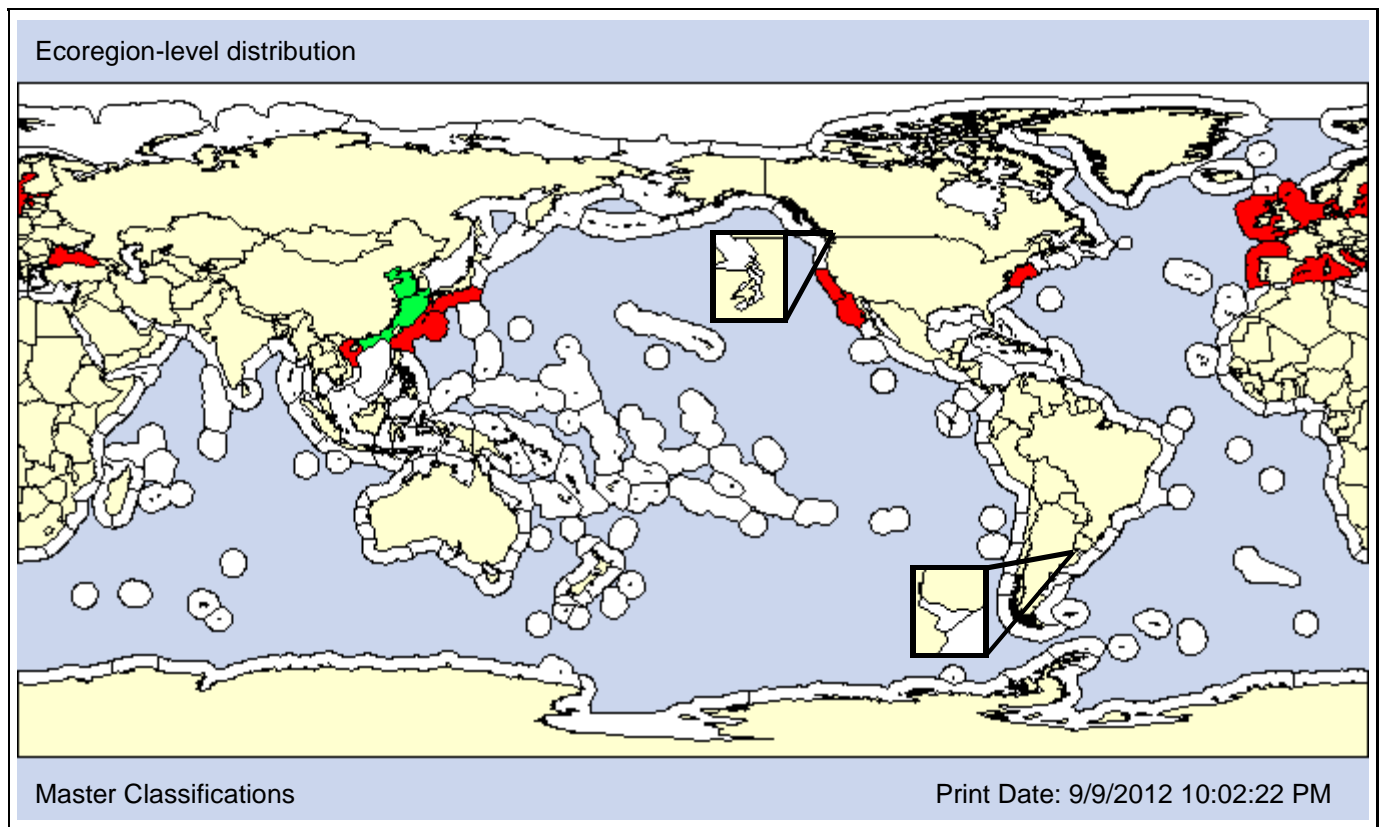
**Also Known As (Name - Type):**

Eriocheir sinensis f. acutifrons	Synonym
Eriocheir sinensis f. rostratus	Synonym
Eriocheir sinensis f. rotundifrons	Synonym
Eriocheir sinensis f. trilobata	Synonym

**Common Names:**

Chinese mitten crab
mitten crab

**Type Locality:**



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1999 (introduced)

1994

**Loc 1st record:** Japan (introduced)

San Fransico Estuary, CA

**Established:** Unknown

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P		X		
X						AO	PO	X							

Comments: *Eriocheir sinensis* is native to northern and eastern China, as well as western Korea. According to Iwasaki (2006), the Chinese mitten crab was introduced into Japan around 1999, while Takeda and Koizumi (2005) reported it from Tokyo Bay in 2004. It is not known if it became established in Japan.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>					<b>P</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 16.8m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 33psu] [Pref: 0 - 25psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					
				<b>X</b>	<b>X</b>								

# Exopalaemon carinicauda

Species ID: 3360

**Taxon:** Decapod

**Taxonomic Author:** (Holthuis, 1950)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Caridea

**Superfamily:** Palaemonoidea

**Family:** Palaemonidae

**Subfamily:**

**Also Known As (Name - Type):**

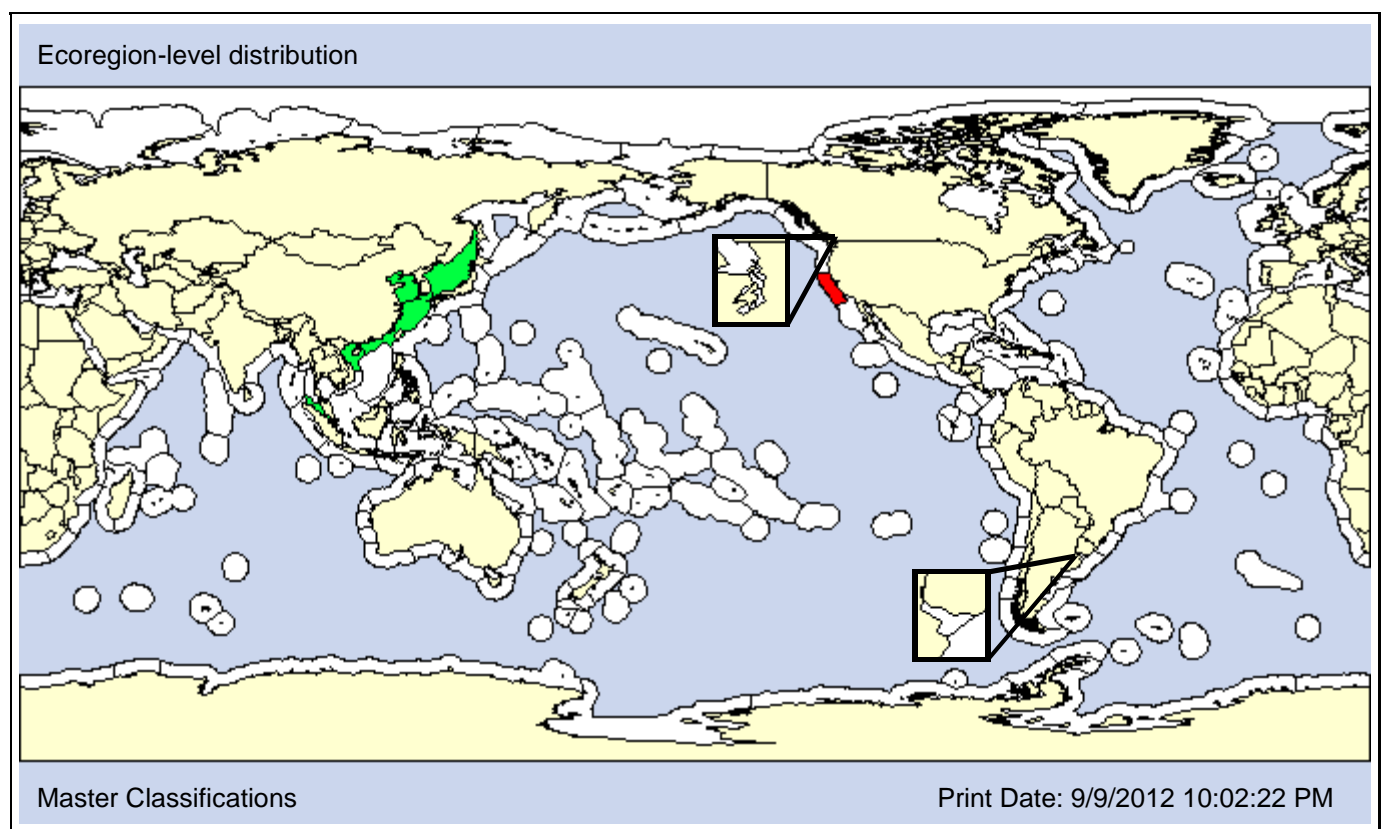
Exopalaemon sp. (Cohen and Carlton, 1995)  
Leander carinatus  
Palaemon carinicauda

Synonym  
Synonym  
Synonym

**Common Names:**

ridgetail prawn

**Type Locality:** China



**Date 1st record:** Native

1993

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Unknown

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P		X		
X						AO	PO	X						

Comments: Establishment of *Exopalaemon carinicauda* in the NEP is uncertain.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 26m] [Pref: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>O</b>						

**SALINITY [Obs: 2 - 28psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
				<b>X</b>	<b>X</b>								

**Taxon:** Decapod

**Taxonomic Author:** (Osbeck, 1765)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Dendrobranchiata

**Infraorder:**

**Superfamily:** Penaeoidea

**Family:** Penaeidae

**Subfamily:**

**Also Known As (Name - Type):**

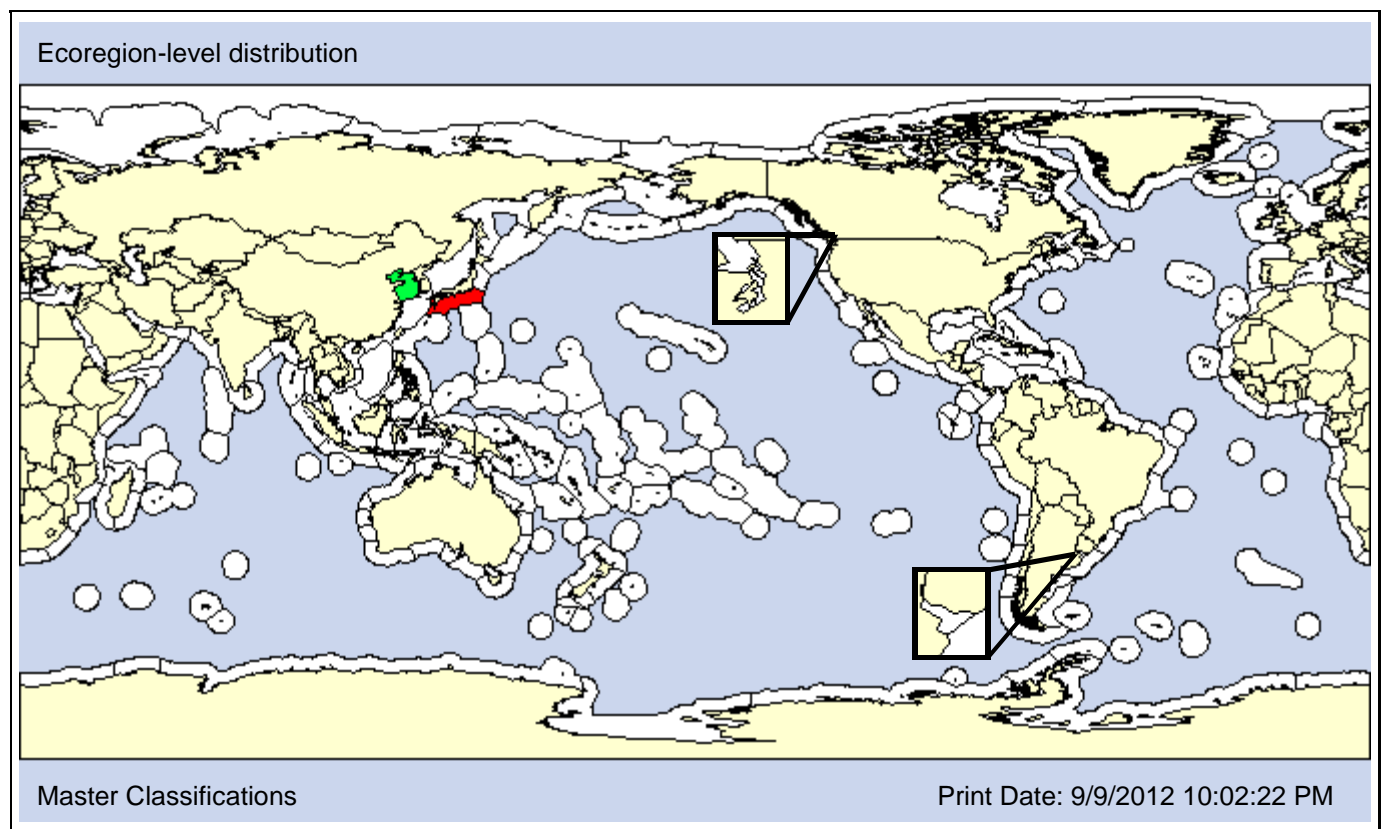
Cancer chinensis  
 Penaeus (Fenneropenaeus) chinensis  
 Penaeus chinensis  
 Penaeus orientalis

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Chinese fleshy prawn  
 Chinese white prawn  
 fleshy prawn

**Type Locality:**



**Date 1st record:** 1965 (introduced)

**Loc 1st record:** Japan (introduced)

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: Fenneropenaeus chinensis (= Penaeus orientalis, P.chinensis) is endemic to the Yellow Sea. It has been introduced into Japan for aquaculture, though it is not known if it is established in the wild.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 90 - 180m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 2 - 22psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM X		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>	<b>X</b>								



# Fenneropenaeus merguensis

Species ID: 100670

**Taxon:** Decapod

**Taxonomic Author:** (De Man, 1888)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Dendrobranchiata

**Infraorder:**

**Superfamily:** Penaeoidea

**Family:** Penaeidae

**Subfamily:**

**Also Known As (Name - Type):**

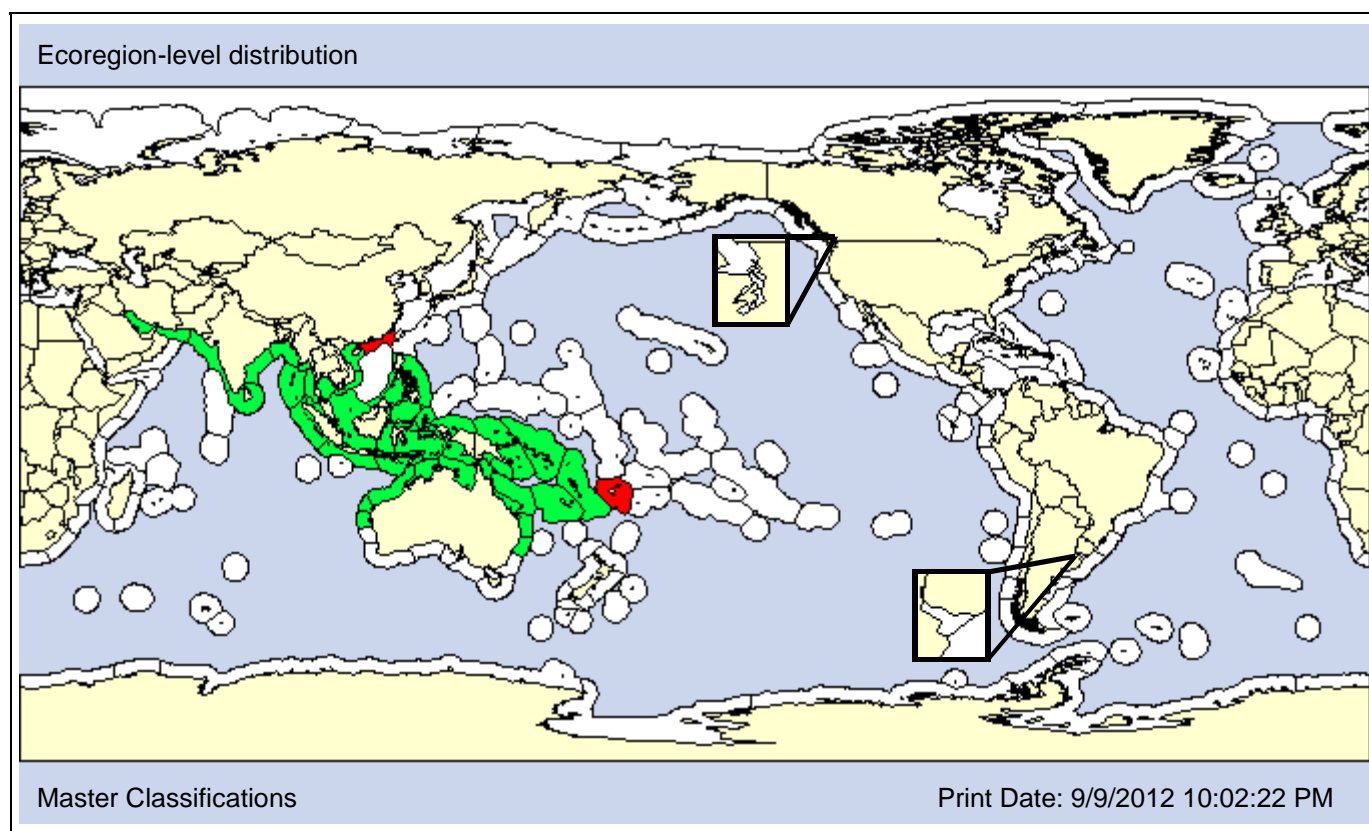
Penaeus indicus merguensis  
Penaeus merguensis

Synonym  
Synonym

**Common Names:**

banana prawn

**Type Locality:**



**Date 1st record:**

**Loc 1st record:**

**Established:**

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X	X	AO	PO								

Comments: Fenneropenaeus merguensis (=Penaeus merguensis) became established in estuarine areas in Fiji after being introduced from Tahiti in 1974-1975 (Eldredge, 1994). Additionally, it is stocked in southern China (Chavanich et al., 2010), though it is not known if it has established wild populations.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 10 - 55m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>					

**SALINITY [Obs: 15 - 33psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
				<b>X</b>	<b>X</b>								

# *Glabropilumnus seminudus*

Species ID: 122857

**Taxon:** Decapod

**Taxonomic Author:** (Miers, 1884)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Pilumnoidea

**Family:** Pilumnidae

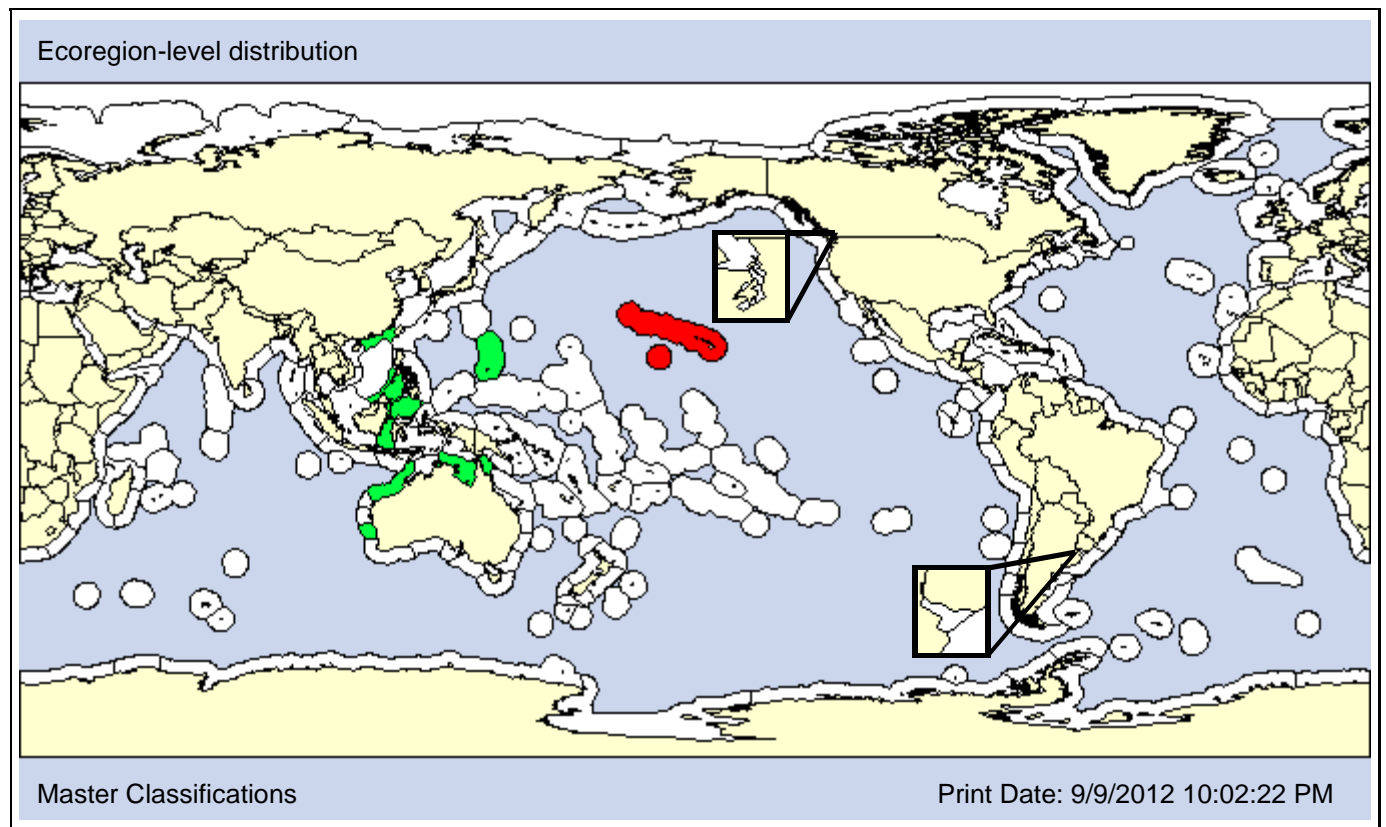
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Pilumnus seminudus	Synonym	hairy crab
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**Type Locality:** Thursday Island, Australia



**Date 1st record:**

2003

**Loc 1st record:**

Molokai and Maui, Hawaii

**Established:**

Yes

### VECTORS

SH <b>X</b>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
<b>X</b>		<b>X</b>				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		X		X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O										O	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Decapod

**Taxonomic Author:** Milne Edwards, 1837

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Macrura Reptantia

**Infraorder:** Astacidea

**Superfamily:** Nephropoidea

**Family:** Nephropidae

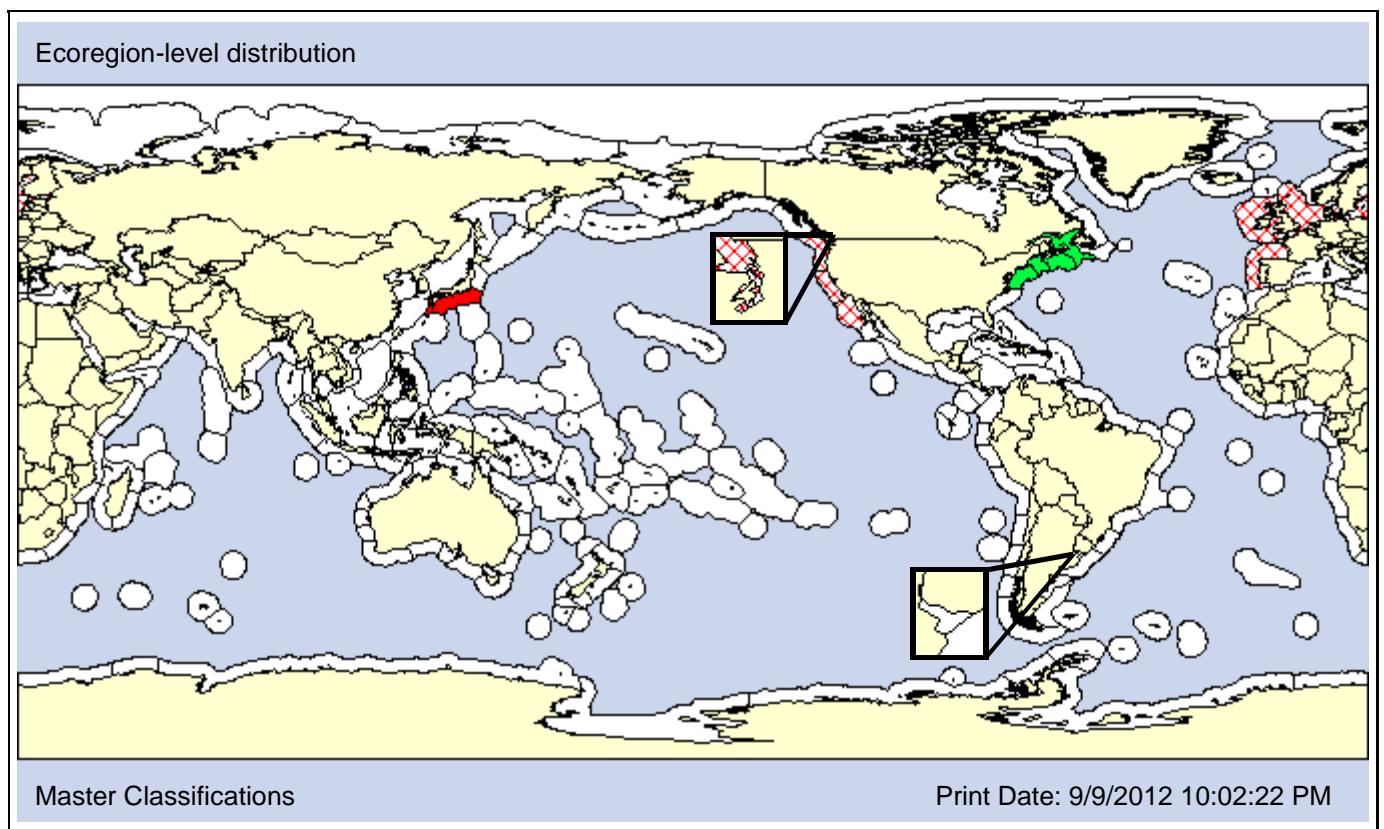
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

American lobster

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1914

1874

**Loc 1st record:** Japan

San Francisco Estuary, CA

**Established:** Unknown

No

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P		X		
				X		AO	PO								

Comments: The American lobster, *Homarus americanus*, has been released into the wild several times in Japan, though it is not known if it has become established. It has been released several times on the U.S./Canadian Pacific Coast and reported in Europe, though it is not established in either of these regions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X				
		<b>X</b>											

**DEPTH [Obs: 0 - 700m] [Pref: 5 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											<b>P</b>			

**SALINITY [Obs: 10.5 - 32psu] [Pref: 25 - 31.8psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline P		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>	<b>X</b>							

**Taxon:** Decapod

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Macrura Reptantia

**Infraorder:** Astacidea

**Superfamily:** Nephropoidea

**Family:** Nephropidae

**Subfamily:**

**Also Known As (Name - Type):**

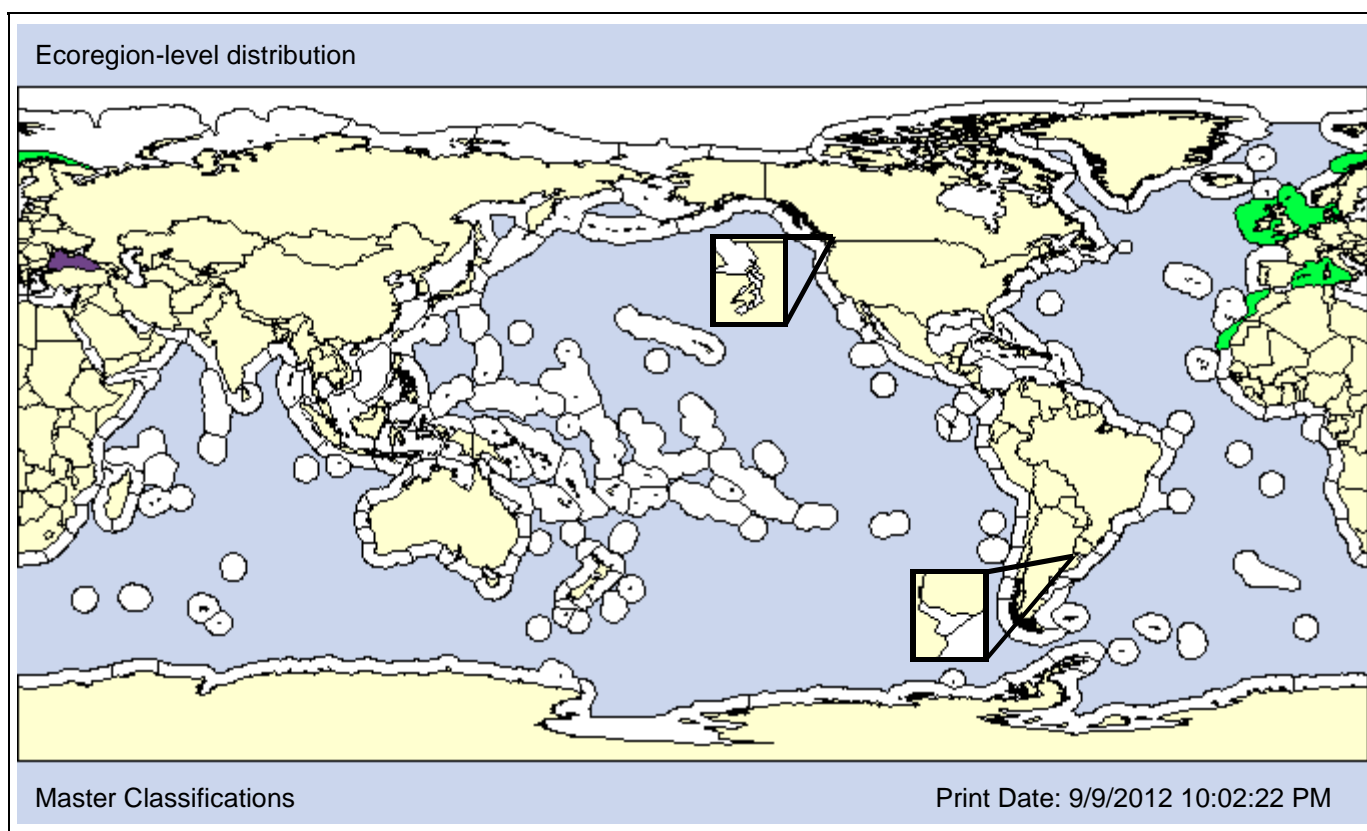
Cancer gammarus  
Homarus vulgaris

Synonym  
Synonym

**Common Names:**

common lobster  
European lobster

**Type Locality:** west coast of Sweden



**Date 1st record:** 1978

**Loc 1st record:** Japan

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: *Homarus gammarus* was introduced into Japan in 1978 (Iwasaki, 2006), however the exact location is unknown nor whether it became established.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X				
		X											

**DEPTH [Obs: 0 - 700m] [Pref: 16 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep	O		
			P	P			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O						

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											O			

**SALINITY [Obs: 13.6 - 35psu] [Pref: 26 - psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline P		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	
			O	O	P			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			X	X	X				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					X	X							



**Taxon:** Decapod

**Taxonomic Author:** Milne-Edwards, 1872

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Majoidea

**Family:** Epialtidae

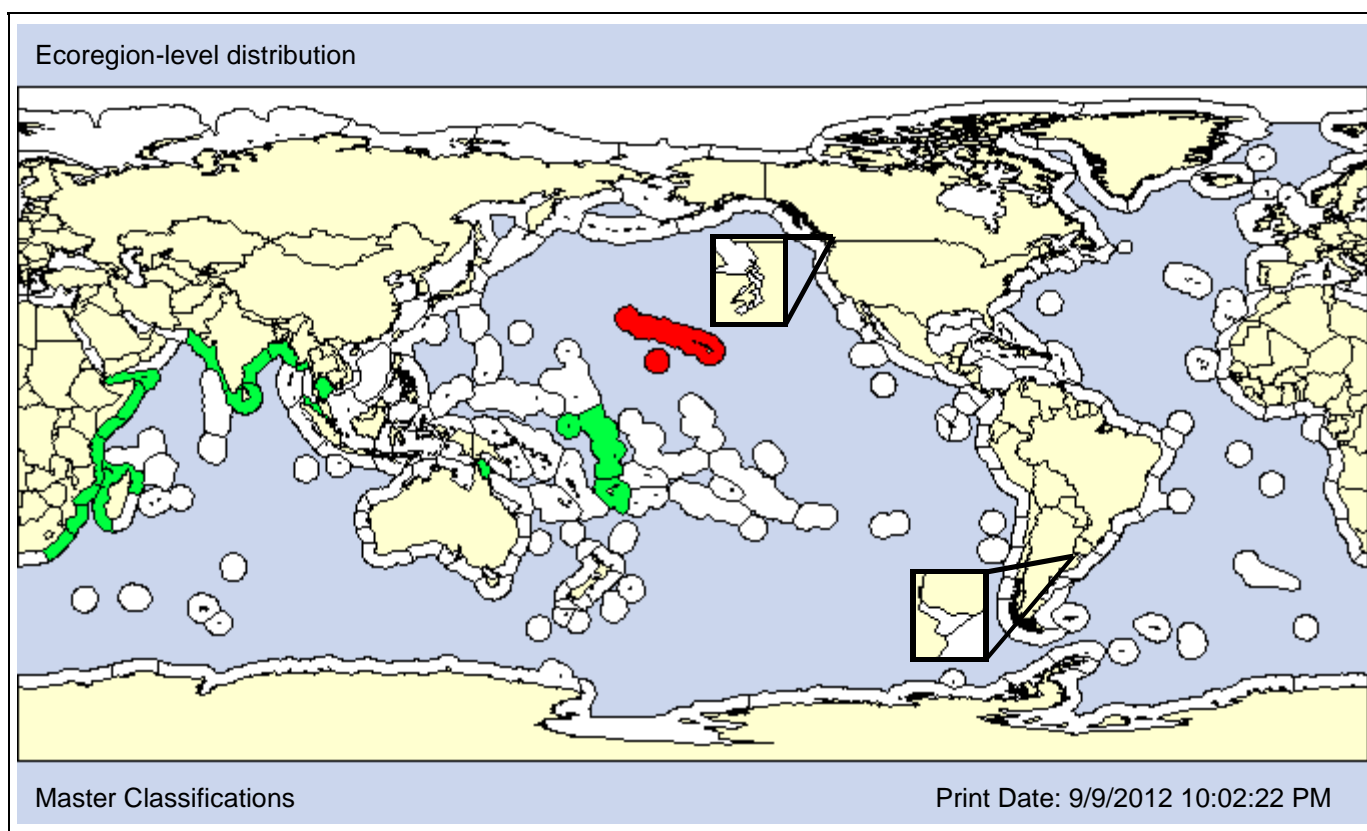
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

spiny spider crab

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 2006  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 9 - 124m] [Pref: 22 - 123m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>P</b>			<b>P</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>	<b>X</b>							

**Taxon:** Decapod

**Taxonomic Author:** (Stimpson, 1871)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Dendrobranchiata

**Infraorder:**

**Superfamily:** Penaeoidea

**Family:** Penaeidae

**Subfamily:**

**Also Known As (Name - Type):**

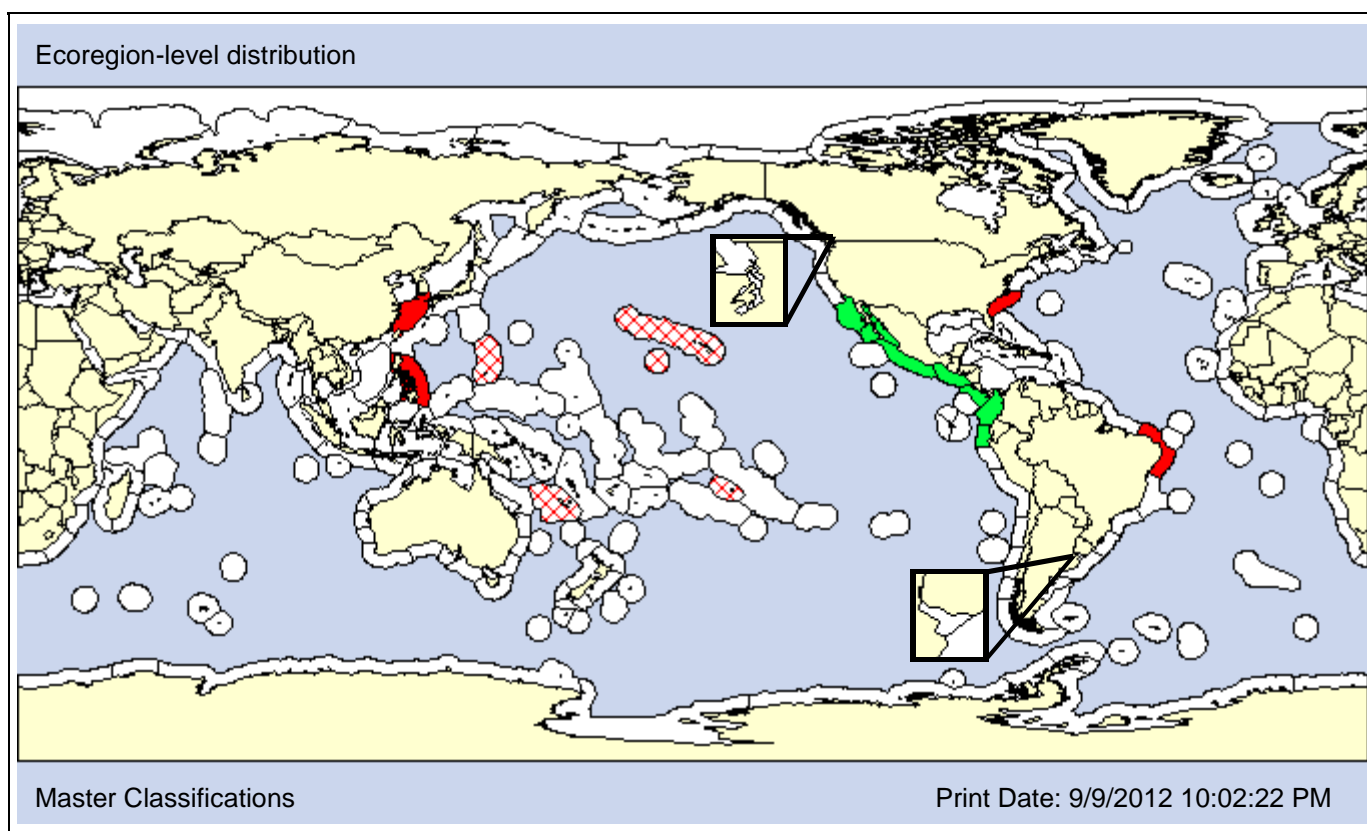
Penaeus (Litopenaeus) stylirostris  
Penaeus stylirostris

Synonym  
Synonym

**Common Names:**

blue shrimp  
camarón azul  
Western blue shrimp

**Type Locality:** Panama



■ Native   
 ■ Nonindigenous   
 ■ NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
 ■ Unidentified

<b>Date 1st record:</b> 1999	1970s	Native
<b>Loc 1st record:</b> China	Hawaii	Native
<b>Established:</b> Unknown	No	Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: *Litopenaeus stylirostris* has been imported for aquaculture into China, Taiwan, Thailand, Indonesia, and the Pacific Islands (Funge-Smith and Briggs, 2003). It is unknown whether it has become established in the wild in any of these areas. It was also introduced into Hawaii and Guam but did not become established.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 45m] [Pref: 0 - 27m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 25 - 36psu] [Pref: - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>
						<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
						<b>X</b>			DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P <b>X</b>				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>	<b>X</b>								

**Taxon:** Decapod

**Taxonomic Author:** (Boone, 1931)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Dendrobranchiata

**Infraorder:**

**Superfamily:** Penaeoidea

**Family:** Penaeidae

**Subfamily:**

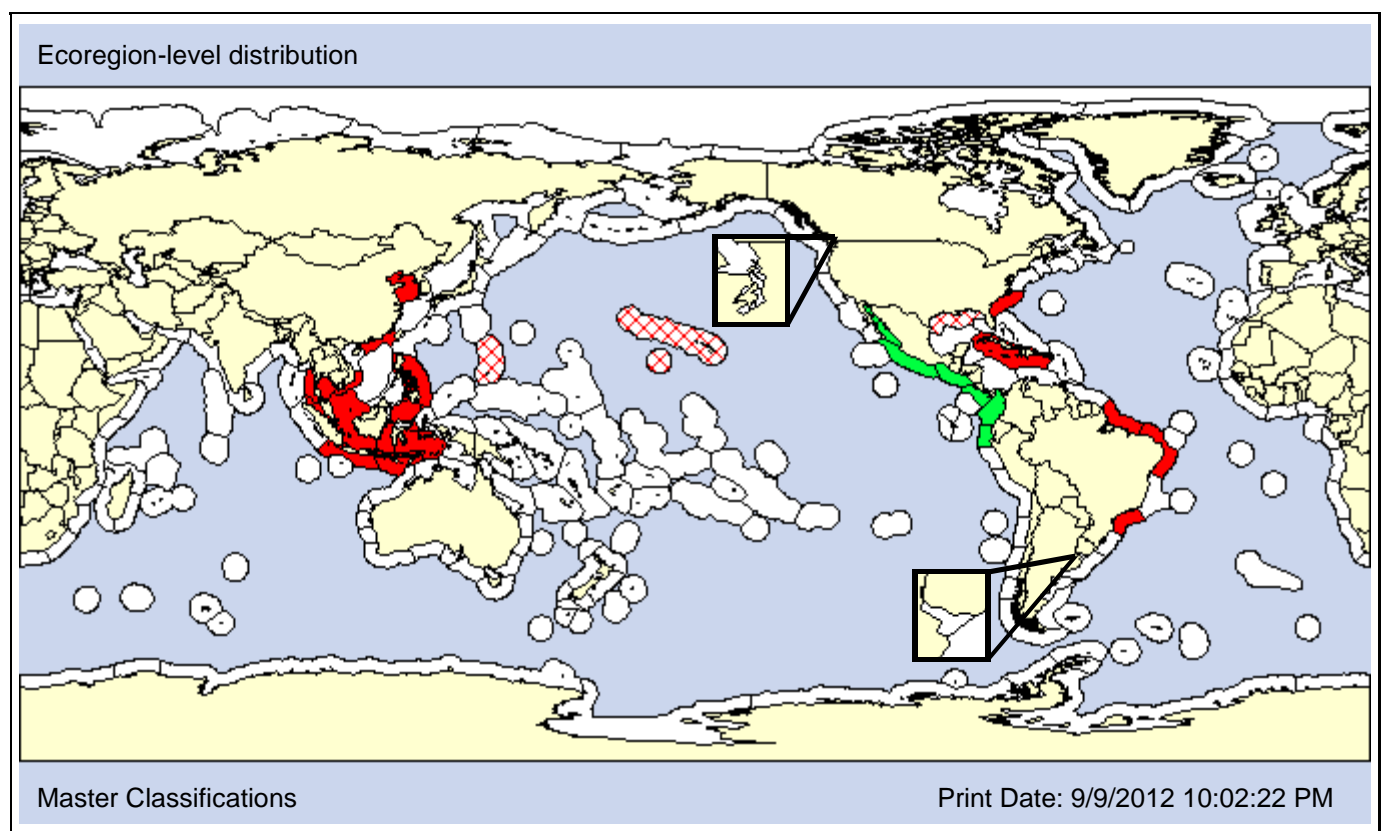
**Also Known As (Name - Type):**

Penaeus vannamei	Synonym

**Common Names:**

camarón patiblanco  
 Pacific white shrimp (*Litopenaeus vannamei*)  
 West Coast white shrimp  
 whiteleg shrimp

**Type Locality:** Gulf of Panama, Panama



■ Native  
 ■ Nonindigenous  
 ■ NIS Not Established  
 ■ Cryptogenic  
 ■ Transient  
 ■ Unclassified  
 ■ Conflicting Classification  
 ■ Unidentified

<b>Date 1st record:</b> 1988	1970s	Native
<b>Loc 1st record:</b> China	Hawaii	Native
<b>Established:</b> Unknown	No	Yes

**VECTORS**

SH			MS	AF <span style="color: red;">X</span>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: *Litopenaeus vannamei* has been imported for aquaculture into China, Taiwan, Thailand, Vietnam, Philippines, Malaysia, Indonesia, India, and the Pacific Islands (Funge-Smith and Briggs, 2003). It is unknown whether it has become established in the wild in any of these areas.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 72m] [Pref: 1.5 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>					

**SALINITY [Obs: 0.5 - 40psu] [Pref: 10 - 15psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
				<b>X</b>	<b>X</b>								

**Taxon:** Decapod

**Taxonomic Author:** (Fabricius, 1798)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Caridea

**Superfamily:** Palaemonoidea

**Family:** Palaemonidae

**Subfamily:**

**Also Known As (Name - Type):**

Palaemon ornatus

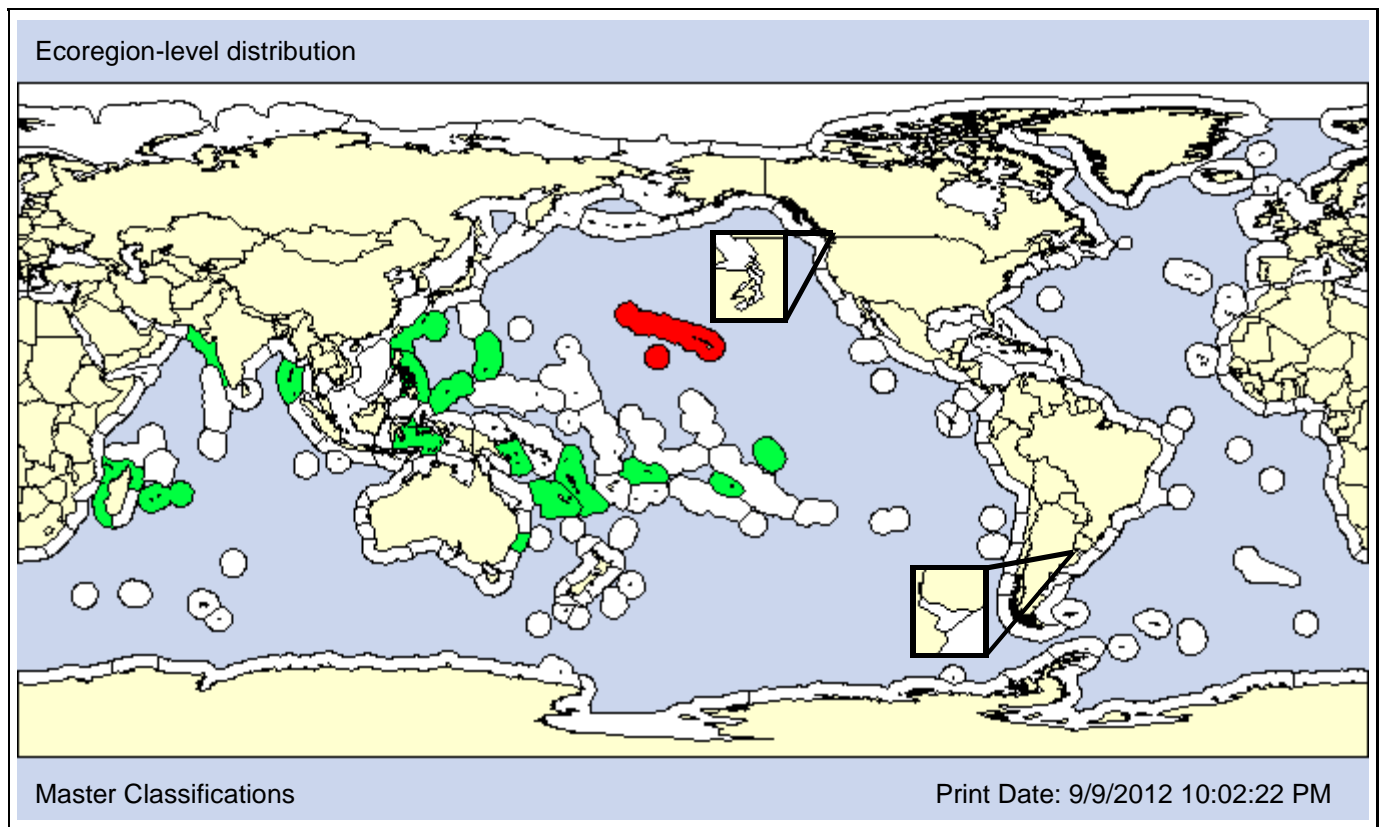
Synonym

**Common Names:**

Monkey River prawn

Tahitian prawn

**Type Locality:** India



**Date 1st record:** 1956  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: *Macrobrachium lar* is primarily a freshwater shrimp, though adults may occur at salinities up to 3 psu and the larvae may occur in brackish and fully marine waters.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>					<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 3psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>	<b>X</b>	<b>X</b>							



# Macrobrachium rosenbergii

Species ID: 222023

**Taxon:** Decapod

**Taxonomic Author:** (De Man, 1879)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Caridea

**Superfamily:** Palaemonoidea

**Family:** Palaemonidae

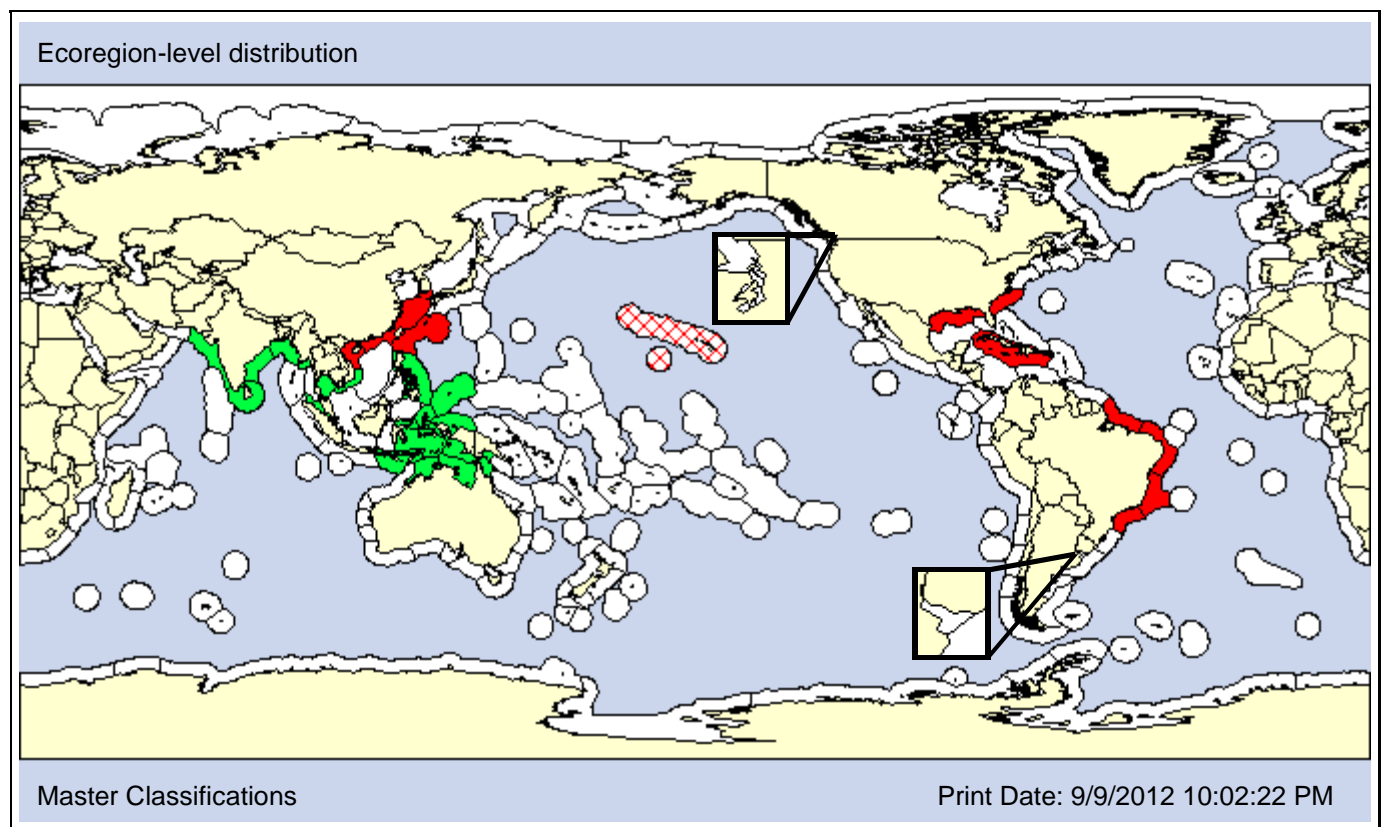
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

giant freshwater prawn  
giant river prawn

**Type Locality:**



**Date 1st record:** Unknown

1965

**Loc 1st record:** Unknown

Hawaii

**Established:** Unknown

No

### VECTORS

SH			MS	AF <b>X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				<b>X</b>		AO	PO								

Comments: *Macrobrachium rosenbergii* is a freshwater prawn though the females migrate to brackish water to spawn. It is native to the Central Indo-Pacific and has been introduced into China and at least 42 other countries for aquaculture. It is not known if it is established in the wild in China or the NWP; it did not become established in Hawaii.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 1.2 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 25psu] [Pref: 0 - 2psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>	<b>X</b>								

**Taxon:** Decapod

**Taxonomic Author:** (Bate, 1888)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Dendrobranchiata

**Infraorder:**

**Superfamily:** Penaeoidea

**Family:** Penaeidae

**Subfamily:**

**Also Known As (Name - Type):**

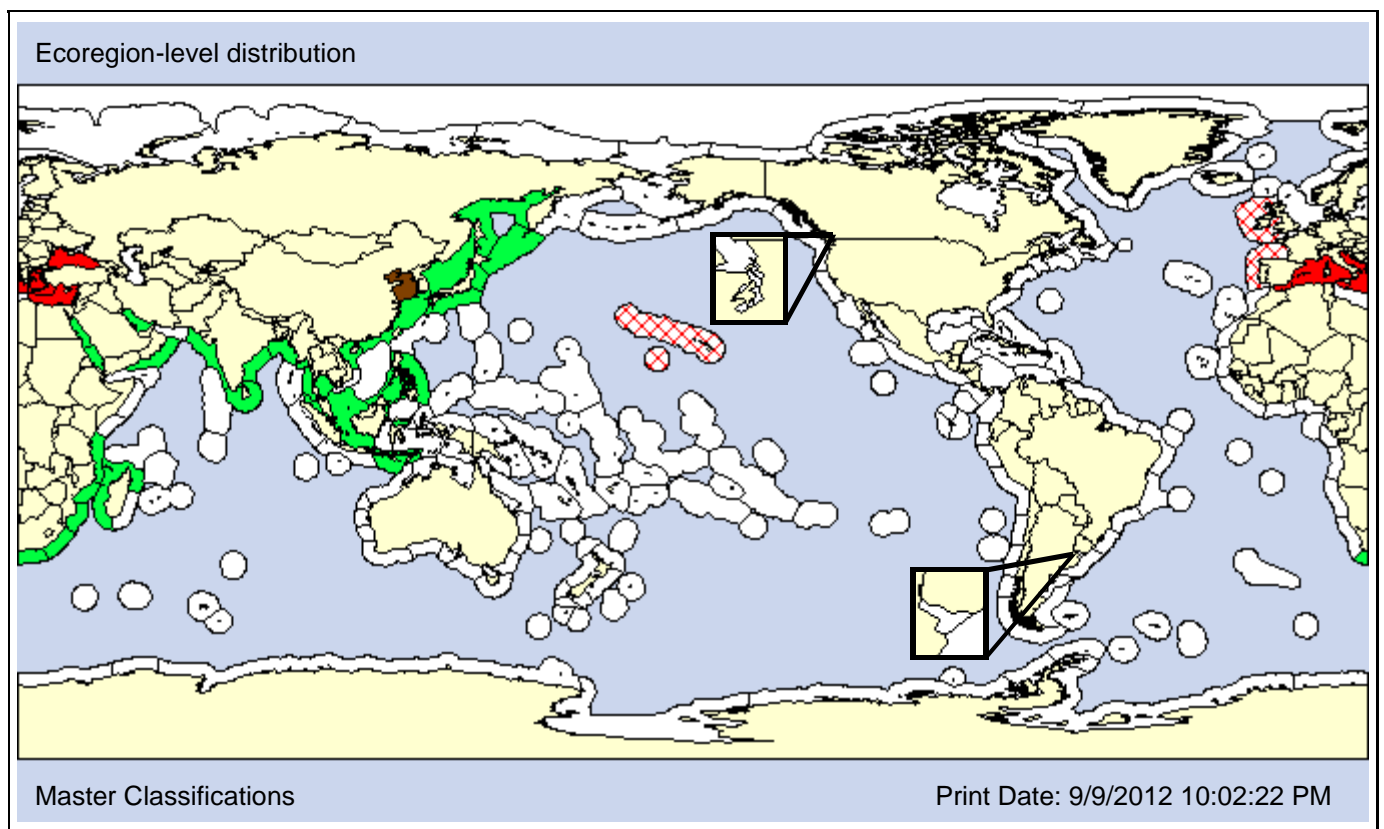
Penaeus canaliculatus japonicus  
 Penaeus japonicus  
 Penaeus pulchricaudatus

Synonym  
 Synonym  
 Synonym

**Common Names:**

Kuruma ebi  
 kuruma prawn  
 kuruma shrimp  
 Saimaki ebi (juveniles)

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1994  
**Loc 1st record:** Yellow Sea  
**Established:** Yes

1970s  
 Hawaii  
 No

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				
					X	AO	PO							

Comments: The Yellow Sea Project (UNDP/GEF, 2007) lists *Marsupenaeus japonicus* as intentionally introduced into the Yellow Sea. Because it may also occur naturally in the Yellow Sea, we list this as a conflict. It was introduced into Hawaii but did not become established, though it is established in the Mediterranean (Zenetos et al., 2010).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 100m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
						<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>	<b>X</b>								

**Taxon:** Decapod

**Taxonomic Author:** (Dana, 1852)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Cancroidea

**Family:** Cancridae

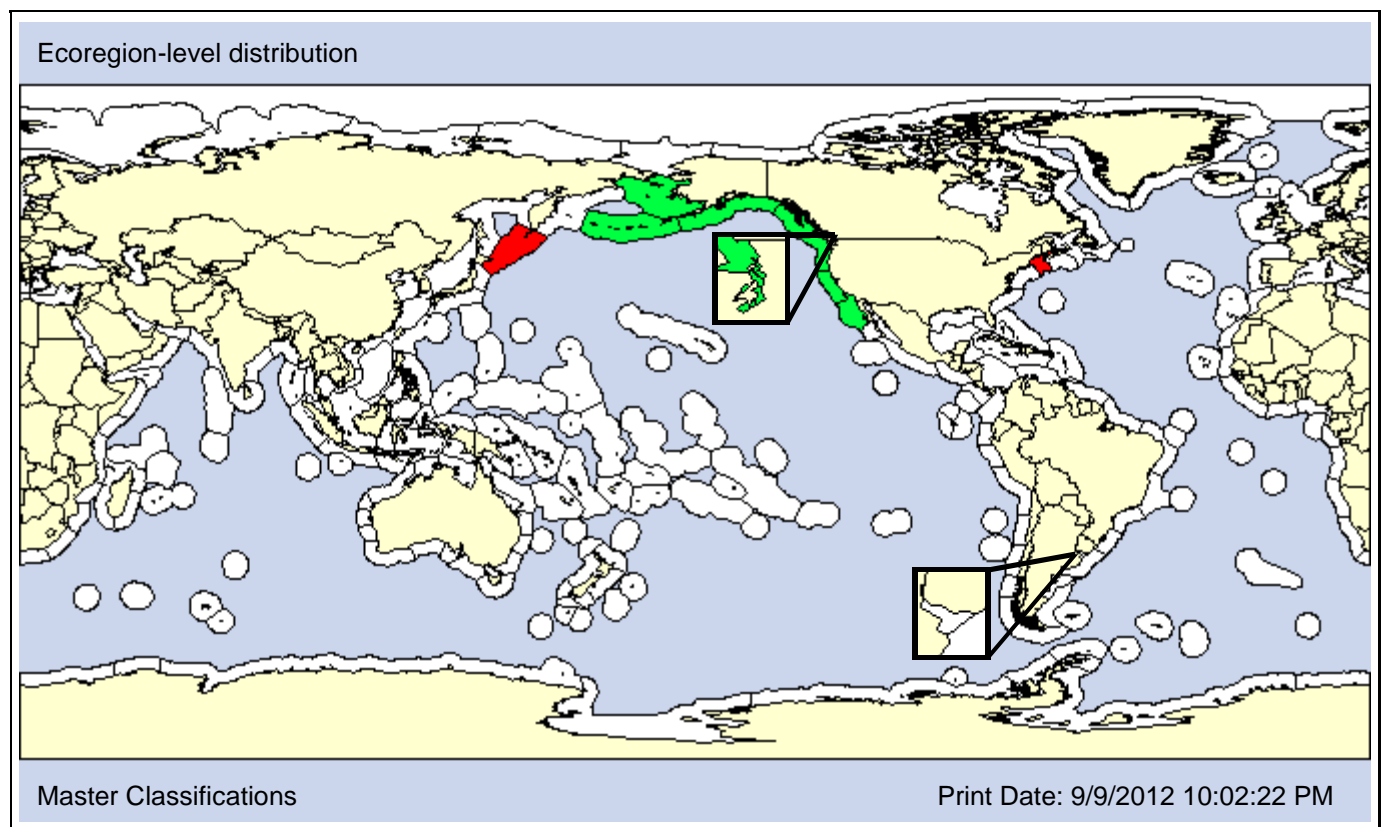
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Cancer magister	Synonym	America-ícho-gani Dungeness crab
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**Type Locality:** San Francisco Estuary, California, USA



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii			NEP	

**Date 1st record:** 1979

Native

**Loc 1st record:** Japan

Native

**Established:** Unknown

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>					<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR			A	P				
<b>X</b>				<b>X</b>		AO	PO	<b>X</b>								

Comments: *Metacarcinus magister* (= *Cancer magister*) has been found in Japan, but it is not known if it is established in the NWP. More recently it has been reported from Massachusetts Bay, USA but again it is not known whether it is established.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>				
	<b>X</b>	<b>X</b>					<b>X</b>						

**DEPTH [Obs: 0 - 750m] [Pref: 0 - 230m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.87 - 90.36%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>						

**SALINITY [Obs: 10 - 33.43psu] [Pref: 25 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
					<b>O</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>	<b>X</b>							

**Taxon:** Decapod

**Taxonomic Author:** (Fulton & Grant, 1902)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Dromioidea

**Family:** Dromiidae

**Subfamily:**

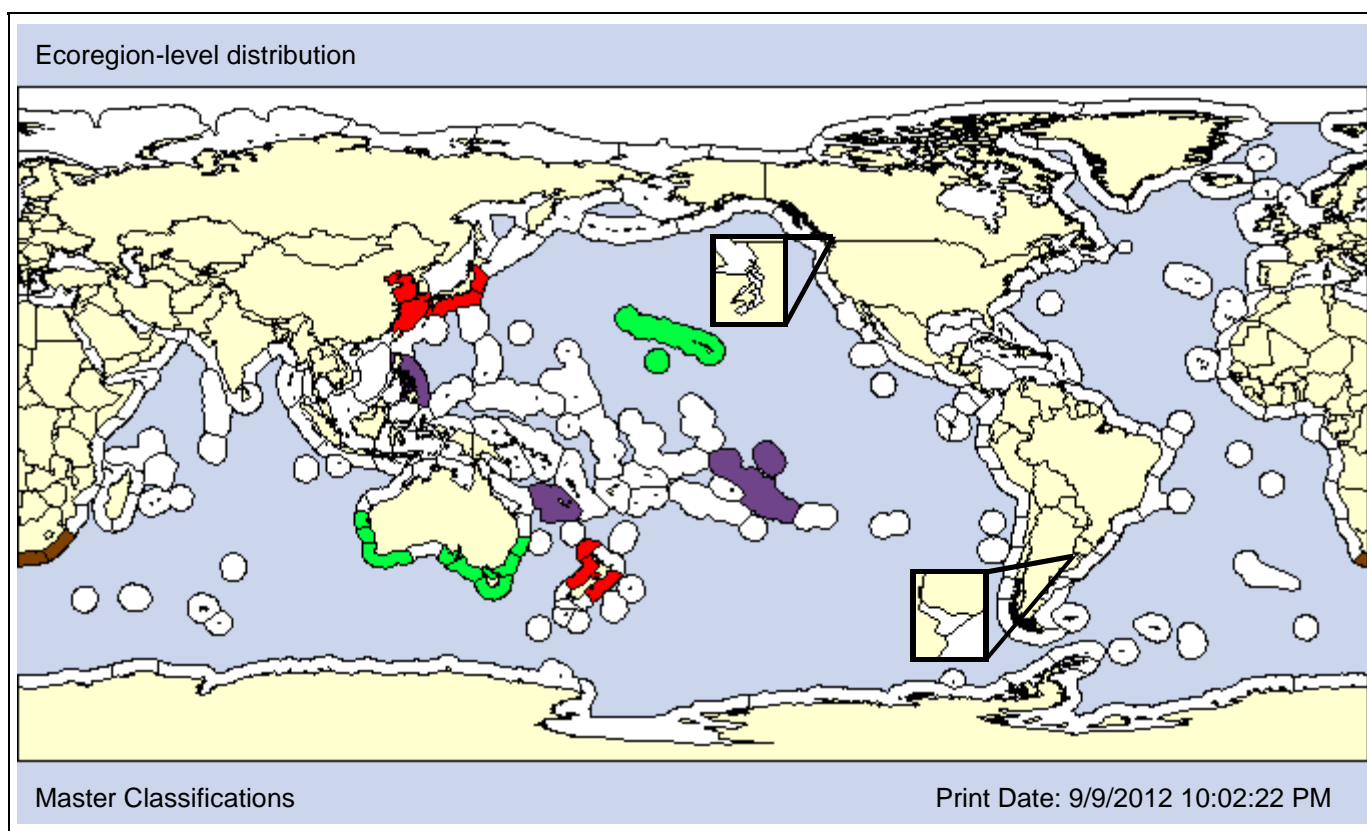
**Also Known As (Name - Type):**

Cryptodromia wilsoni	Synonym
Dromia pseudogibbosa	Synonym
Dromia wilsoni	Synonym
Petalomera wilsoni	Synonym

**Common Names:**

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**Type Locality:** Port Phillip Heads, Australia



**Date 1st record:** Unknown Native  
**Loc 1st record:** Unknown Native  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: *Metadromia wilsoni* is considered native to Australia and Hawaii and introduced into New Zealand (Cranfield et al., 1998a; Inglis et al., 2008a), the Dalian region of China (Clarke et al., 2004), and Japan and South Africa (Cranfield et al., 1998a). However, Mead et al. (2011) did not include it in their list of NIS in South Africa.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 520m] [Pref: - 100m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>O</b>	

**SALINITY [Obs: - 35psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Decapod

**Taxonomic Author:** (Hombron & Jacquinot, 1846)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Grapsoidea

**Family:** Grapsidae

**Subfamily:**

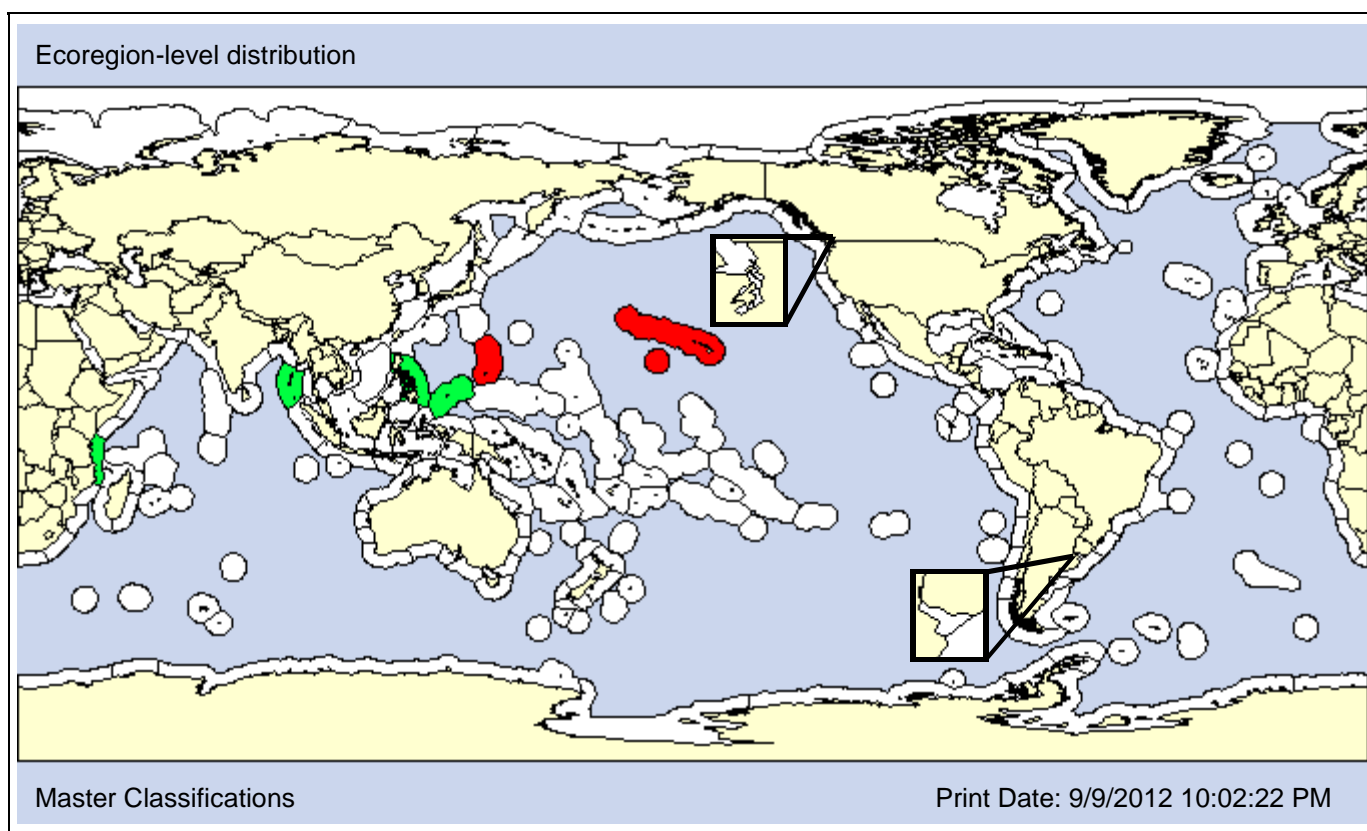
**Also Known As (Name - Type):**

Eurycarcinus oceanicus  
Grapsus (Grapsus) sulcifer  
Grapsus oceanicus

Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 2006  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: *Metopograpsus oceanicus* is considered introduced in Hawaii and Guam (Paulay, 2007). It occurs in the upper intertidal and supralittoral zone on karstic shores, seawalls, and mangroves.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	<b>P</b>	<b>O</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>P</b>	<b>P</b>	<b>O</b>	<b>P</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	
						<b>X</b>							

**Taxon:** Decapod

**Taxonomic Author:** (De Man, 1887)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Grapsoidea

**Family:** Sesarmidae

**Subfamily:**

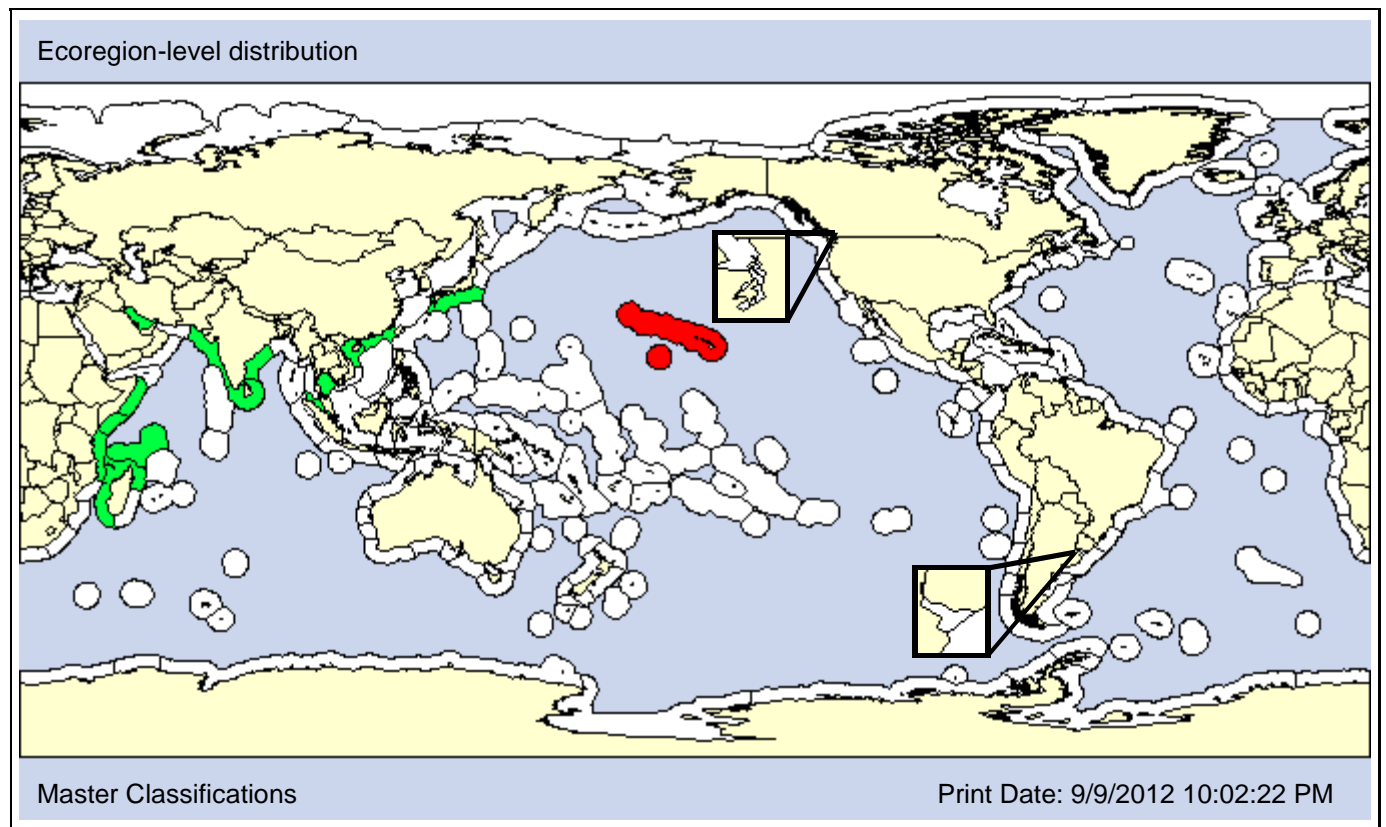
**Also Known As (Name - Type):**

Nanosesarma gordonii	Synonym
Sesarma (Sesarma) gordonii	Synonym
Sesarma barbimanum	Synonym
Sesarma minutum	Synonym

**Common Names:**

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**Type Locality:** Edam Island near Jakarta, Indonesia.



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1996  
**Loc 1st record:** Native Pearl Harbor, Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 20m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>O</b>					<b>P</b>	<b>P</b>		<b>O</b>	<b>O</b>		

**SALINITY [Obs: 5 - 32psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
					<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Decapod

**Taxonomic Author:** Rathbun, 1907

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Grapsoidea

**Family:** Grapsidae

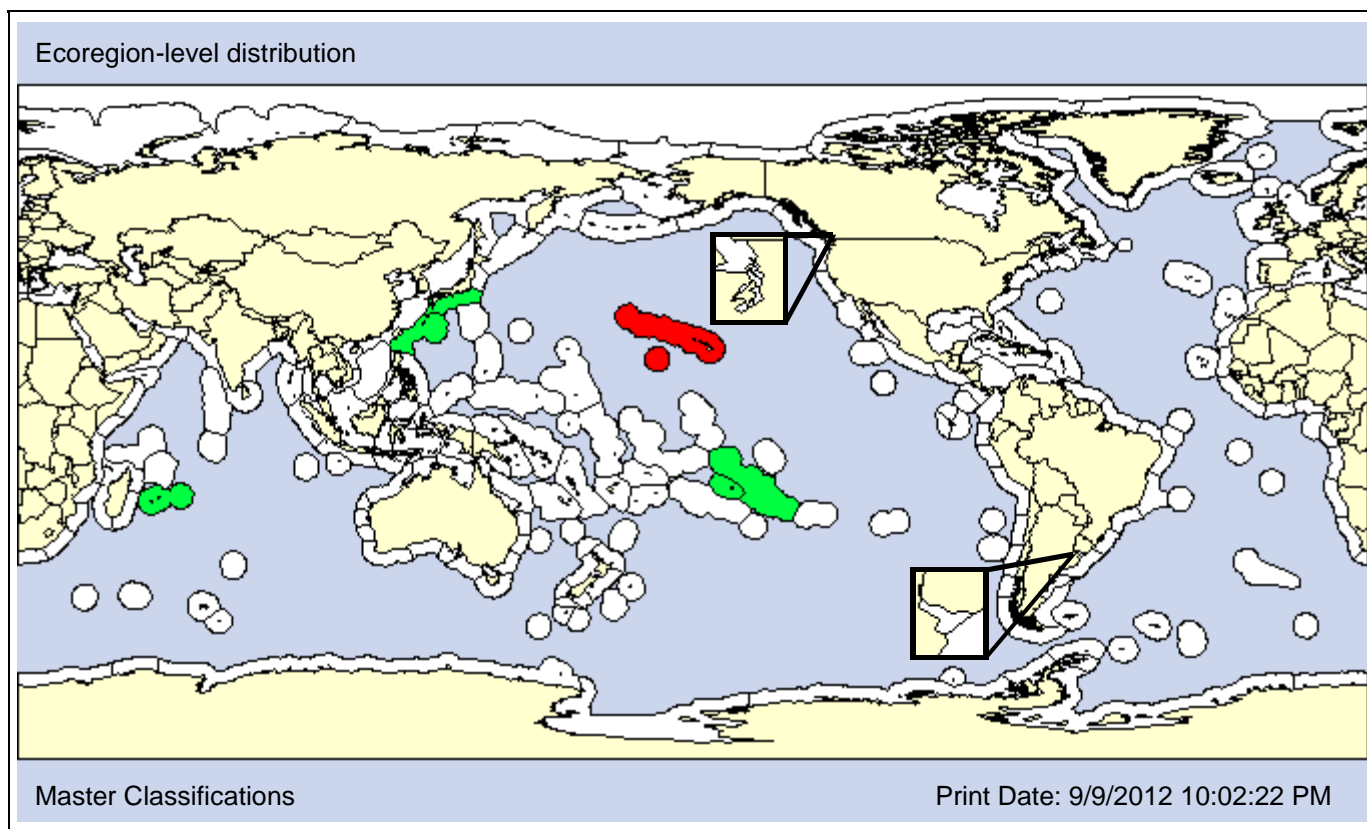
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Polynesian grapsid crab

**Type Locality:** Tuamotu, French Polynesia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Native 1996  
**Loc 1st record:** Native Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		<b>X</b>			

**DEPTH [Obs: 0 - 10m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>												

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Decapod

**Taxonomic Author:** Rathbun, 1902

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Caridea

**Superfamily:** Palaemonoidea

**Family:** Palaemonidae

**Subfamily:**

**Also Known As (Name - Type):**

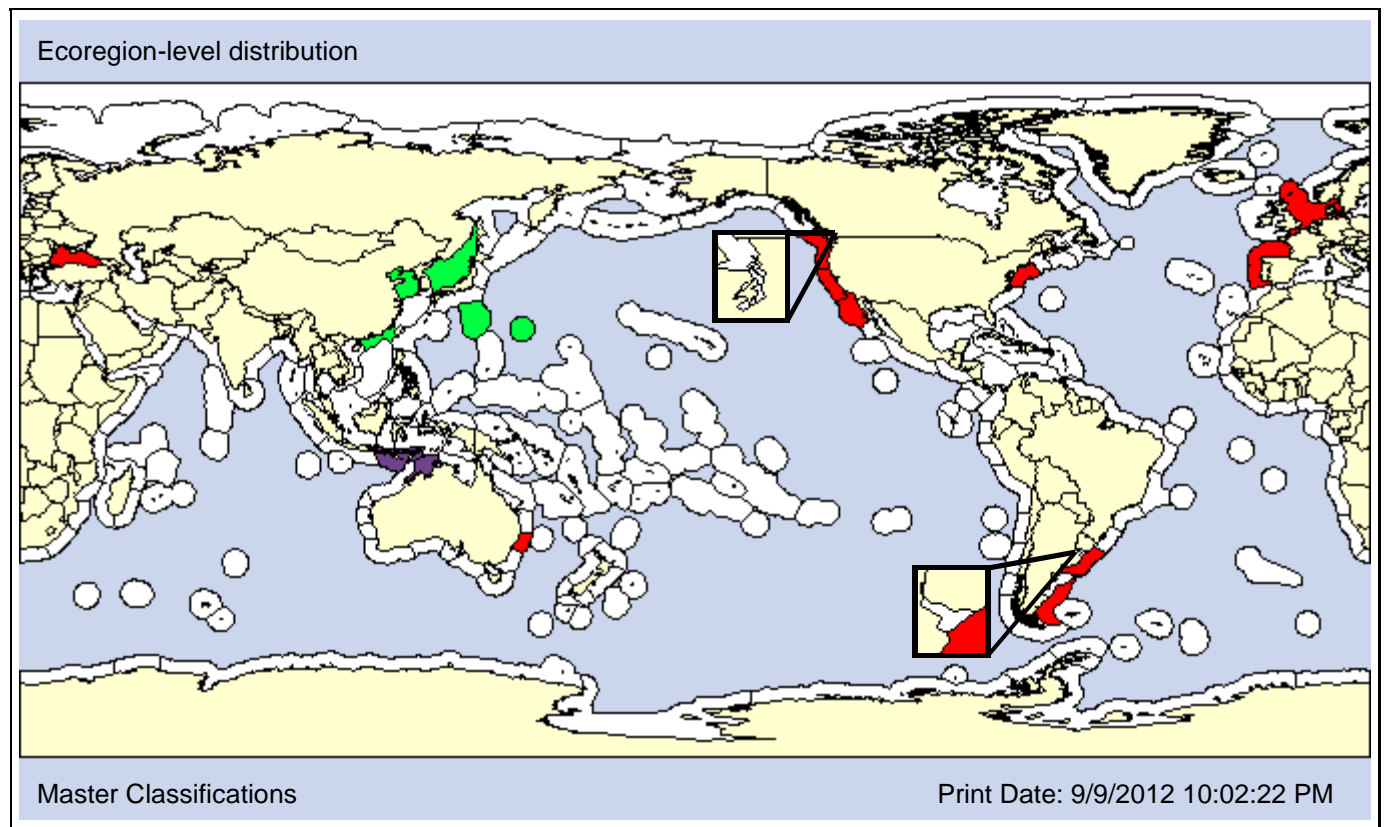
Leander macrodactyla  
Leander macrodactylus

Synonym  
Synonym

**Common Names:**

Korean shrimp  
Oriental shrimp

**Type Locality:** Aomiri, Rikuoku, Japan



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		<b>NWP</b>	<b>Hawaii</b>		<b>NEP</b>		

**Date 1st record:** Native

1957

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P	X	X		
X						AO	PO								

Comments: The Asian prawn *Palaemon macrodactylus* is native to Japan and Korea while the Chinese and Taiwanese records might belong to different species (Micu and Nita, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	
	X	X											

**DEPTH [Obs: 0 - 8m] [Pref: 0 - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				P		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												P		P

**SALINITY [Obs: 1 - 35psu] [Pref: 3 - 10psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline P		Mesohaline P		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
	O	P	P	P	O	O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM X		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				X	X	X							



**Taxon:** Decapod

**Taxonomic Author:** Desbonne, 1867

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Xanthoidea

**Family:** Panopeidae

**Subfamily:**

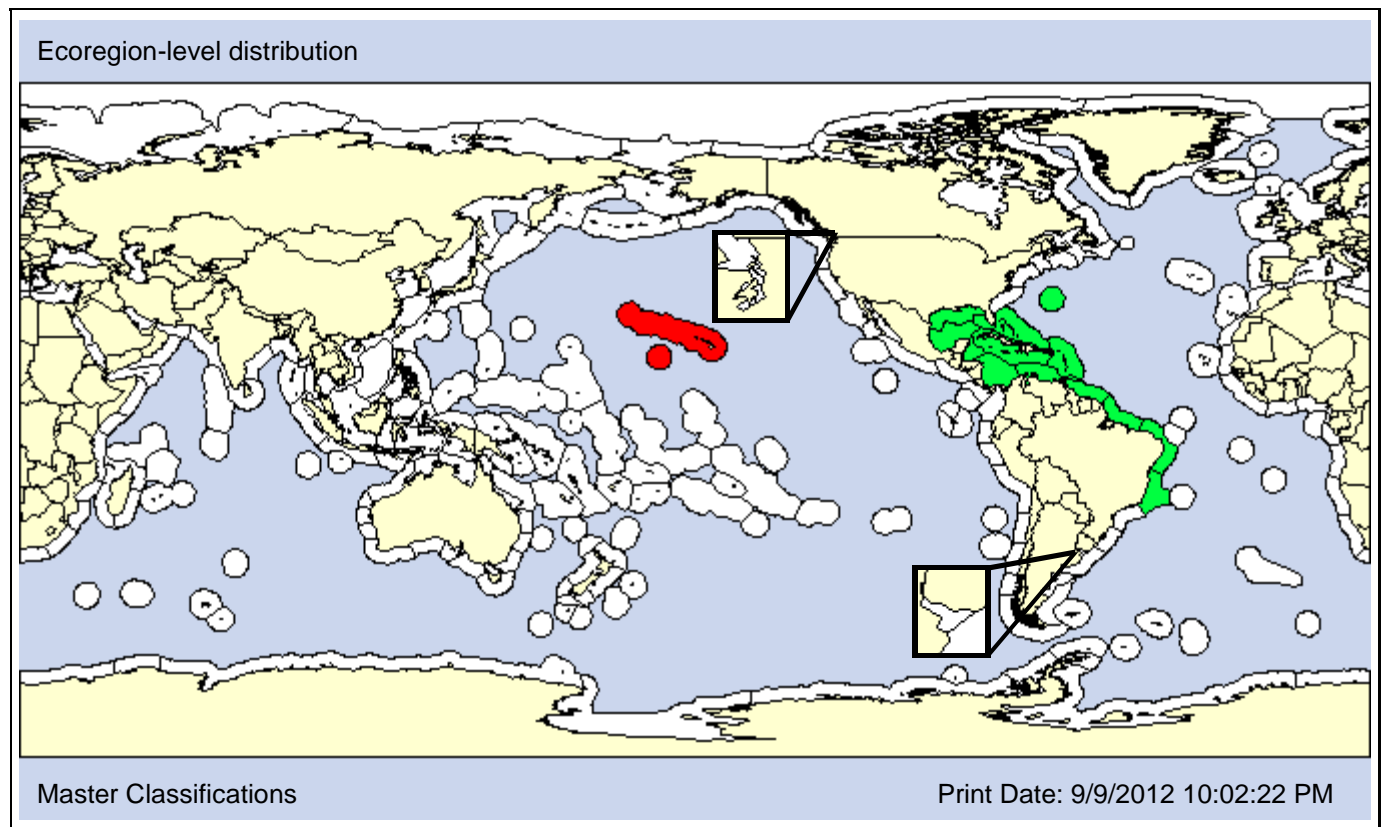
**Also Known As (Name - Type):**

Eupanopeus herbstii var. minax	Synonym
Panopeus crassus	Synonym
Panopeus herbstii granulosis	Synonym
Panopeus herbstii of authors, not of H. Milne Edwards, 1834	Misidentified

**Common Names:**

knotfinger mud crab
---------------------

**Type Locality:** Guadeloupe, France (Lesser Antilles)



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1947  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
<span style="color: red;">X</span>		<span style="color: red;">X</span>				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 10m] [Pref: 0 - 2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
		<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>								<b>Artificial Substrate O</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>		<b>O</b>	<b>O</b>		<b>O</b>	<b>O</b>				<b>O</b>	

**SALINITY [Obs: 2 - 28psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Decapod

**Taxonomic Author:** Edmondson, 1931

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Pilumnoidea

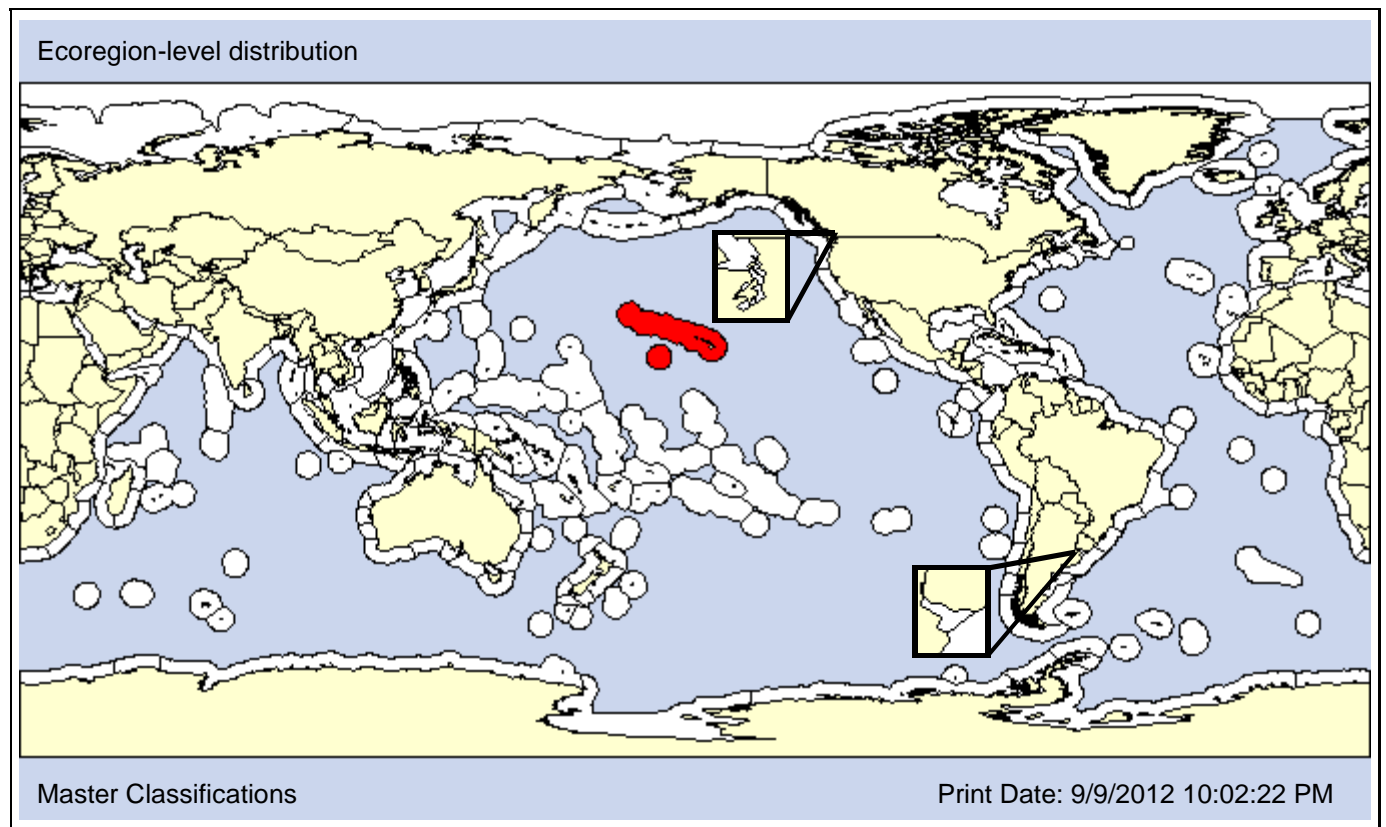
**Family:** Pilumnidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1929

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: *Pilumnus oahuensis* was originally described from Hawaii but is considered introduced because of its restriction to harbors and association with fouling communities. It has not been reported from any other locations in the Pacific.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0.15 - 3.25m] [Pref: 0.15 - 3.25m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Decapod

**Taxonomic Author:** (Lockington, 1877)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Majoidea

**Family:** Inachoididae

**Subfamily:**

**Also Known As (Name - Type):**

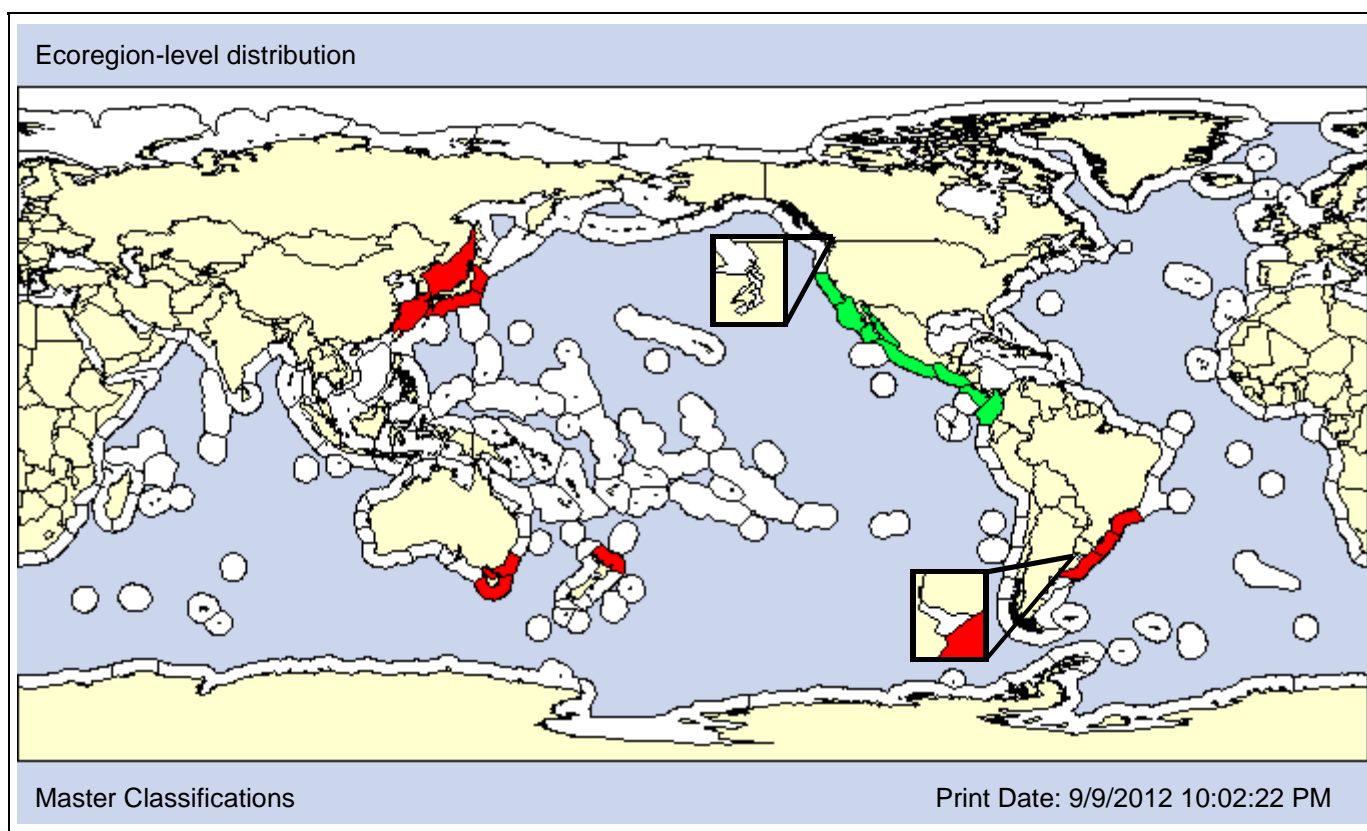
?Inachoides brevirostrum  
 Dasygyius tuberculatus  
 Inachus tuberculata  
 Inachus tuberculatus

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Ikkaku-kumogani  
 spider crab (*Pyromaia tuberculata*)  
 tuberculate pear crab

**Type Locality:** San Diego Bay, California, USA



**Date 1st record:** 1970

Native

**Loc 1st record:** Miura Peninsula, Japan

Native

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	
	X	X											

**DEPTH [Obs: 0 - 425m] [Pref: - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2 - 97.9%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>			<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>O</b>	

**SALINITY [Obs: 31 - 35psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						
					<b>X</b>	<b>X</b>							

# Rhithropanopeus harrisii

Species ID: 1094

**Taxon:** Decapod

**Taxonomic Author:** (Gould, 1841)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Xanthoidea

**Family:** Panopeidae

**Subfamily:** Panopeinae

**Also Known As (Name - Type):**

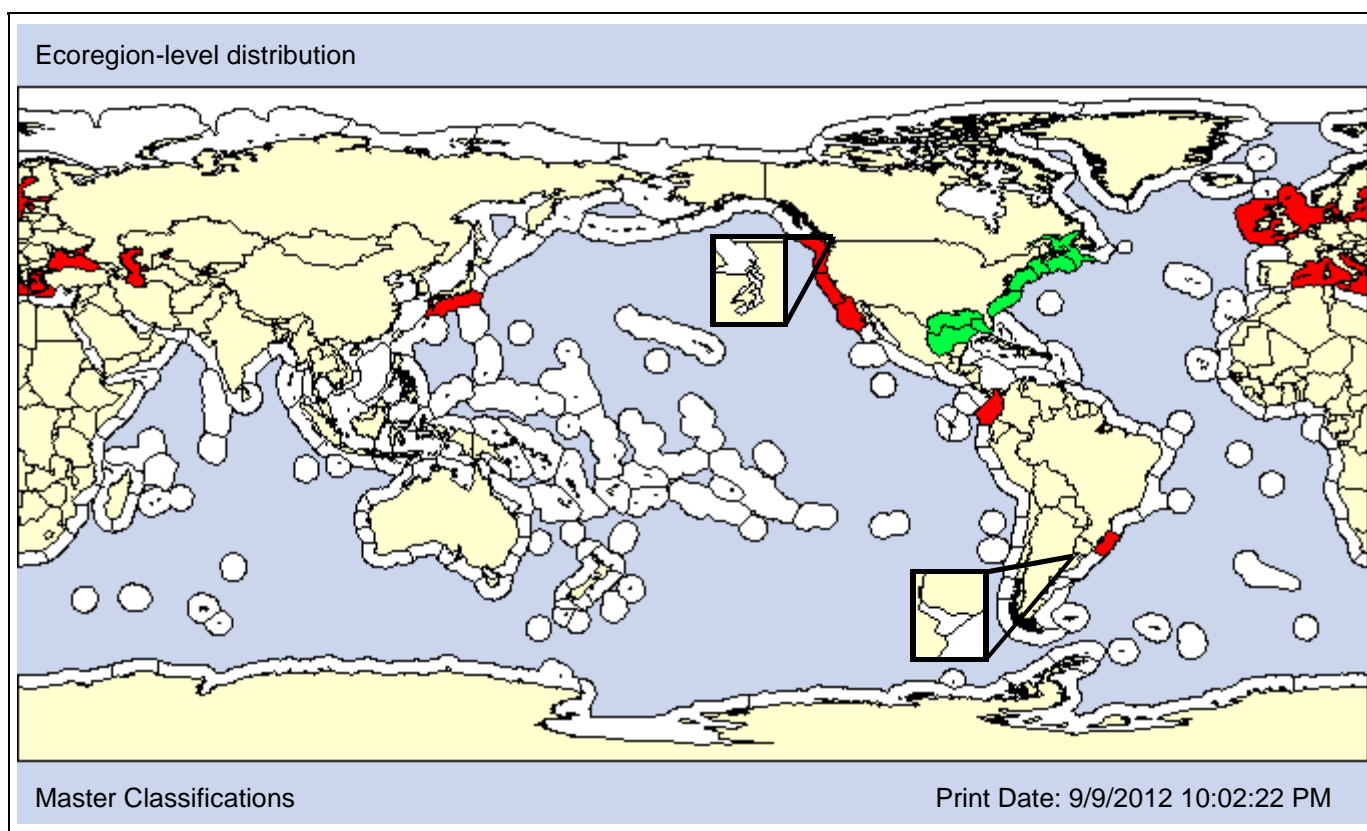
Heteropanope tridentata  
 Pilumnus harrisii  
 Pilumnus tridentatus  
 Rhithropanopeus harrisii tridentatus

Synonym  
 Synonym  
 Synonym  
 Convention

**Common Names:**

brackish-water crab  
 Harris mud crab  
 Minato-ogigani

**Type Locality:** Charles River, Massachusetts, USA



**Date 1st record:** 2006

1937

**Loc 1st record:** Nagoya Port, Japan

San Fransico Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
X		X				AO X	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
	X	X											

**DEPTH [Obs: 0 - 37m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
P	P	O		O		

**CONSOLIDATED SUBSTRATE X**

R P	HP	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			P	P									O	

**SALINITY [Obs: 0.4 - 40psu] [Pref: 15 - 25psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline P		Mesohaline P		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	O	
	P	P	P	P	P	O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
			X	X		X			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
	X			LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
					X	X							



**Taxon:** Decapod

**Taxonomic Author:** (Forskål, 1775)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Eumalacostraca

**Infraclass:**

**Superorder:** Eucarida

**Order:** Decapoda

**Suborder:** Pleocyemata

**Infraorder:** Brachyura

**Superfamily:** Portunoidea

**Family:** Portunidae

**Subfamily:**

**Also Known As (Name - Type):**

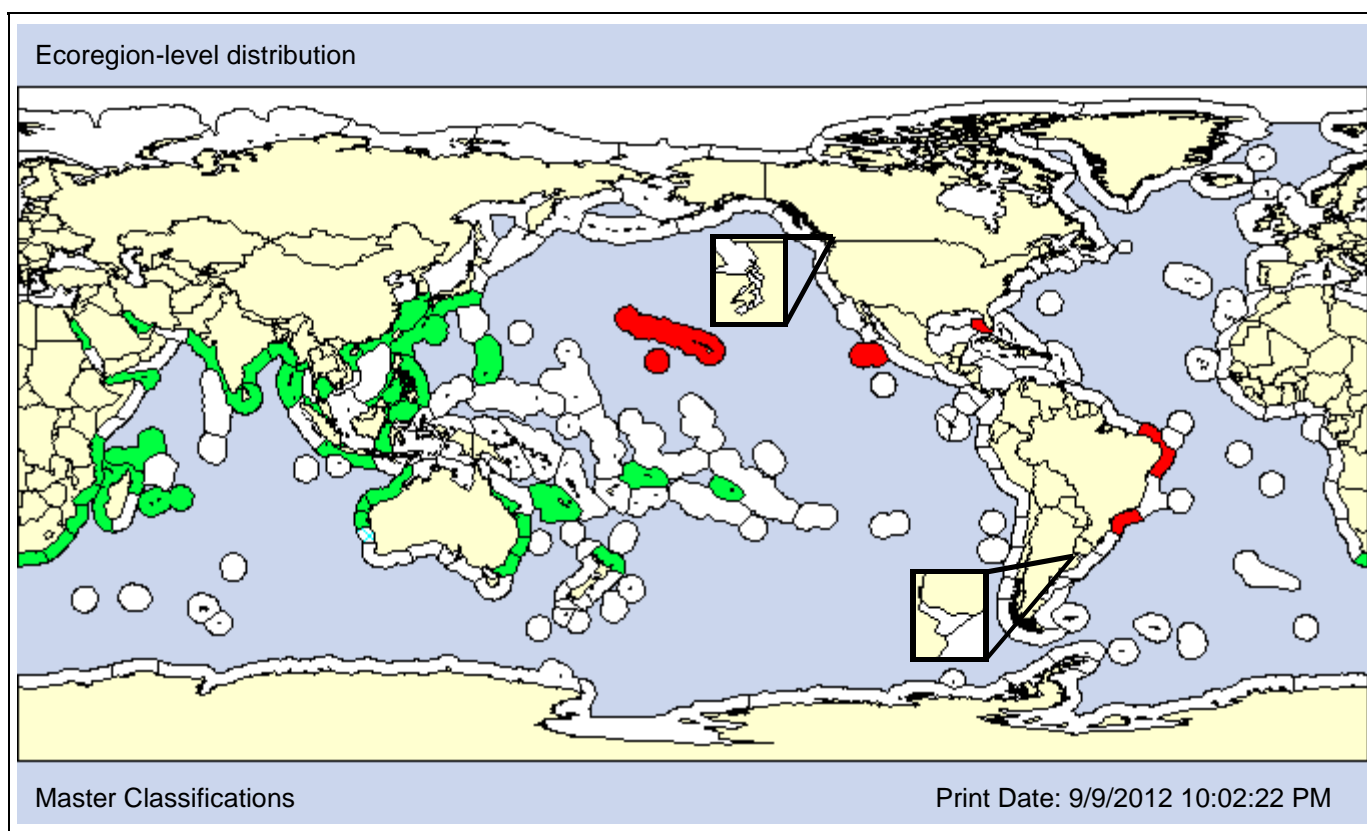
Achelous crassimanus  
Cancer olivaceus  
Cancer serrata  
Cancer serratus

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

giant mud crab  
mangrove crab (*Scylla serrata*)  
red crab  
serrate swimming crab

**Type Locality:** Jidda, Saudi Arabia (Red Sea)



**Date 1st record:** Native

1926

**Loc 1st record:** Native

Kaneohe Bay, Hawaii

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
				X	X	AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 67m] [Pref: 21 - 35m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>		<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>					

**SALINITY [Obs: 10 - 50psu] [Pref: 20 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>	<b>X</b>	
				<b>X</b>	<b>X</b>								

**Kingdom: Animalia**

**Phylum: Arthropoda**

**Class: Malacostraca**

**Subclass: Hoplocarida**

**Order: Stomatopoda**

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# Gonodactylaceus falcatus

Species ID: 123401

**Taxon:** Stomatopod

**Taxonomic Author:** (Forskål, 1775)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Malacostraca

**Subclass:** Hoplocarida

**Infraclass:**

**Superorder:**

**Order:** Stomatopoda

**Suborder:** Unipeltata

**Infraorder:**

**Superfamily:** Gonodactyloidea

**Family:** Gonodactylidae

**Subfamily:**

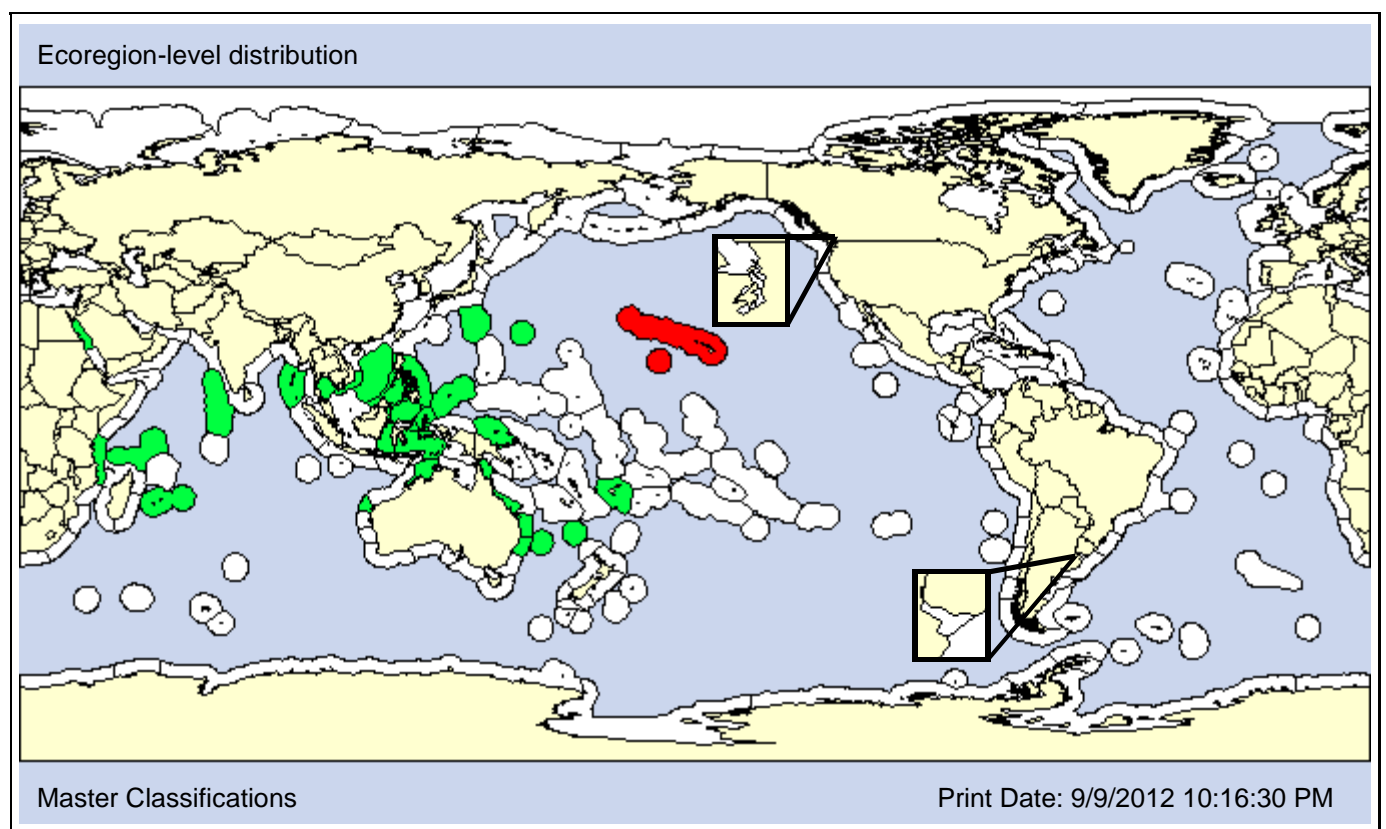
**Also Known As (Name - Type):**

Gonodactylus aloha	Synonym
Gonodactylus falcatus	Synonym
Gonodactylus insularis	Synonym
Gonodactylus mutatus of Barber and Erdmann, 2000; not La	Misidentified

**Common Names:**

Philippine mantis shrimp

**Type Locality:** Djeddah, Red Sea (neotype)



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;">■</span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: lightblue;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;">■</span> Unidentified
NWP			Hawaii		NEP		

**Date 1st record:**

1954

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF</b>				ID	RE	<b>AP</b>		REC	SF	HR	O	
BW	SB	HF		S/R	AE	AA		IR			A	P				
<b>X</b>		<b>X</b>				AO	PO									

Comments: Carlton and Eldredge (2009) consider the Indo-West Pacific as the native region of *Gonodactylaceus falcatus*. It has been found on as part of fouling community on a semi-submersible oil platform in Singapore (Yeo et al., 2010).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 107.5m] [Pref: - 18m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>		<b>O</b>	<b>P</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>				<b>O</b>							<b>O</b>	

**SALINITY [Obs: 32 - 35psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Kingdom: Animalia**  
**Phylum: Arthropoda**  
**Class: Maxillopoda**  
**Subclass: Copepoda**

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**Taxon:** Copepod

**Taxonomic Author:** Shen & Lee, 1963

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Gymnoplea

**Order:** Calanoida

**Suborder:**

**Infraorder:**

**Superfamily:**

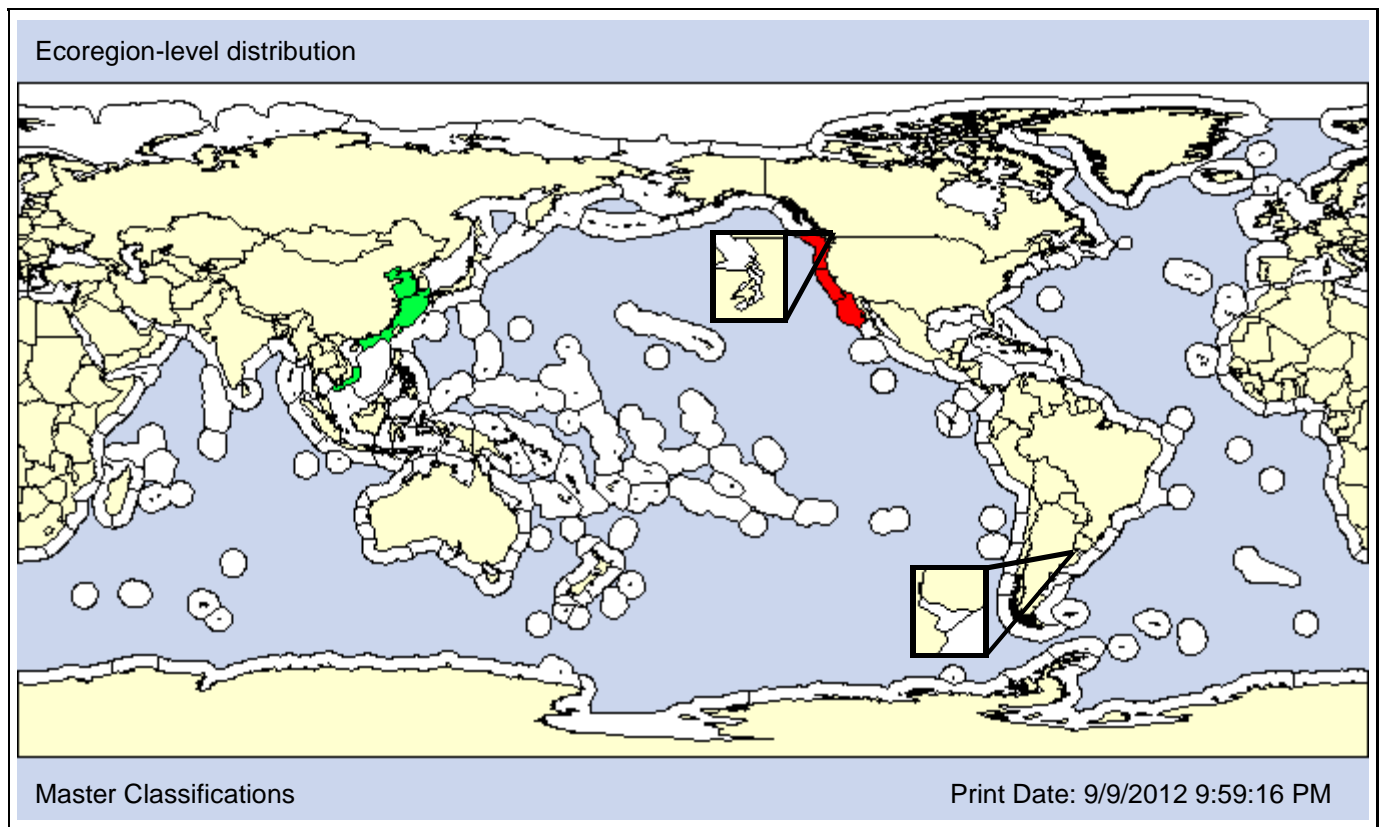
**Family:** Acartiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Kwantung Province, China



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1993

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - 18m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		<b>P</b>	Meso		Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep					
<b>O</b>	<b>P</b>						

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 25psu] [Pref: 2.5 - 8.6psu]**

<b>Fresh O</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P <b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Copepod

**Taxonomic Author:** Roubal, Armitag, & Rohde, 1983

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Podoplea

**Order:** Siphonostomatoida

**Suborder:**

**Infraorder:**

**Superfamily:**

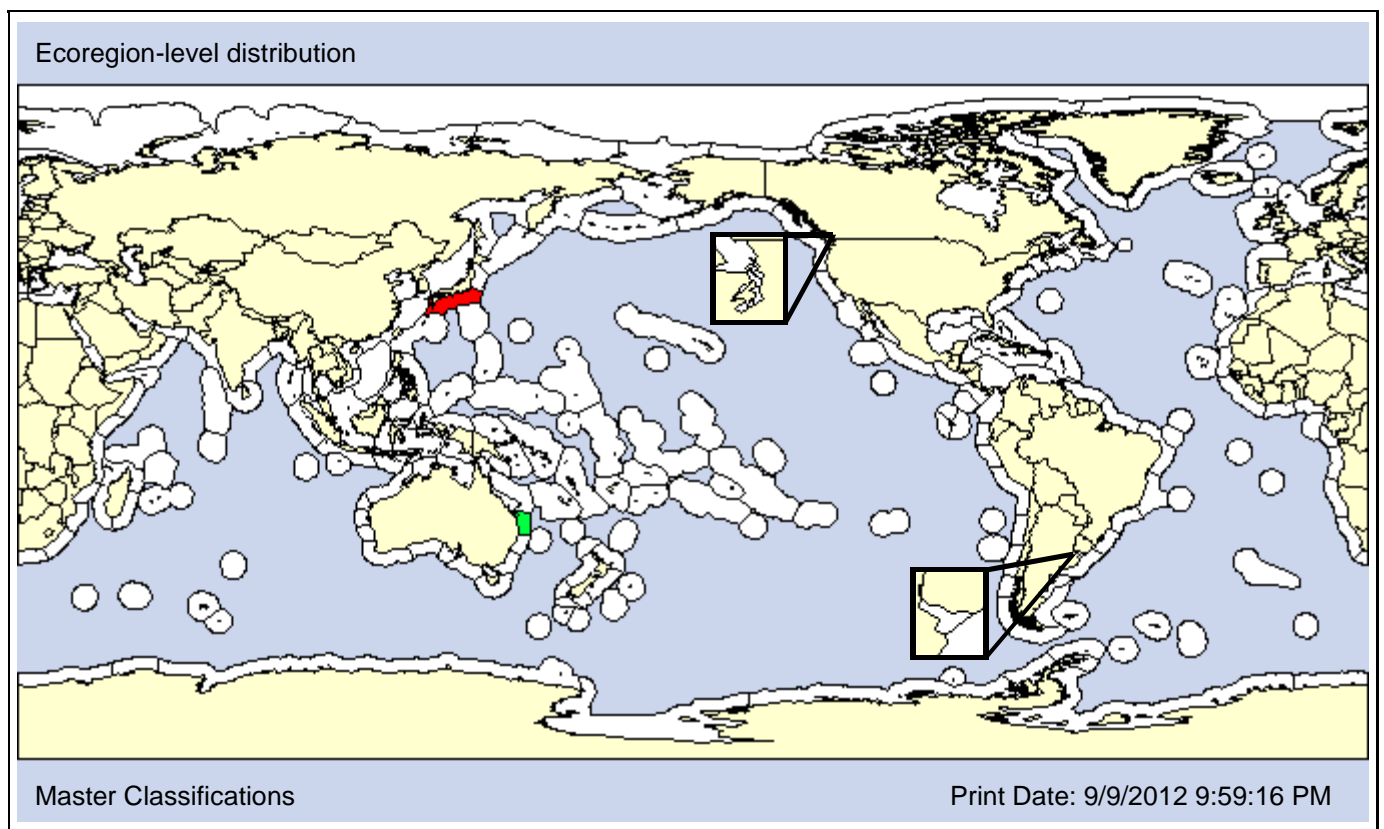
**Family:** Caligidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



**Date 1st record:** 1999

**Loc 1st record:** Aquaculture facility Oita, Japan

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P				
						AO	PO								

Comments: *Caligus sclerotinosus* is an ectoparasite on the red seabream, *Pagrus major*, that was described from Australia. It was found in an aquaculture facility in Japan in 1999. It is not known if it has become established in the wild but one specimen was found in plankton samples near a fish farm in 2006.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		<b>P</b>	Meso		Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep					
<b>O</b>	<b>P</b>						

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

**Taxon:** Copepod

**Taxonomic Author:** Jakubisiak, 1933

**Kingdom:** Animalia  
**Subphylum:** Crustacea  
**Subclass:** Copepoda  
**Order:** Harpacticoida  
**Superfamily:**

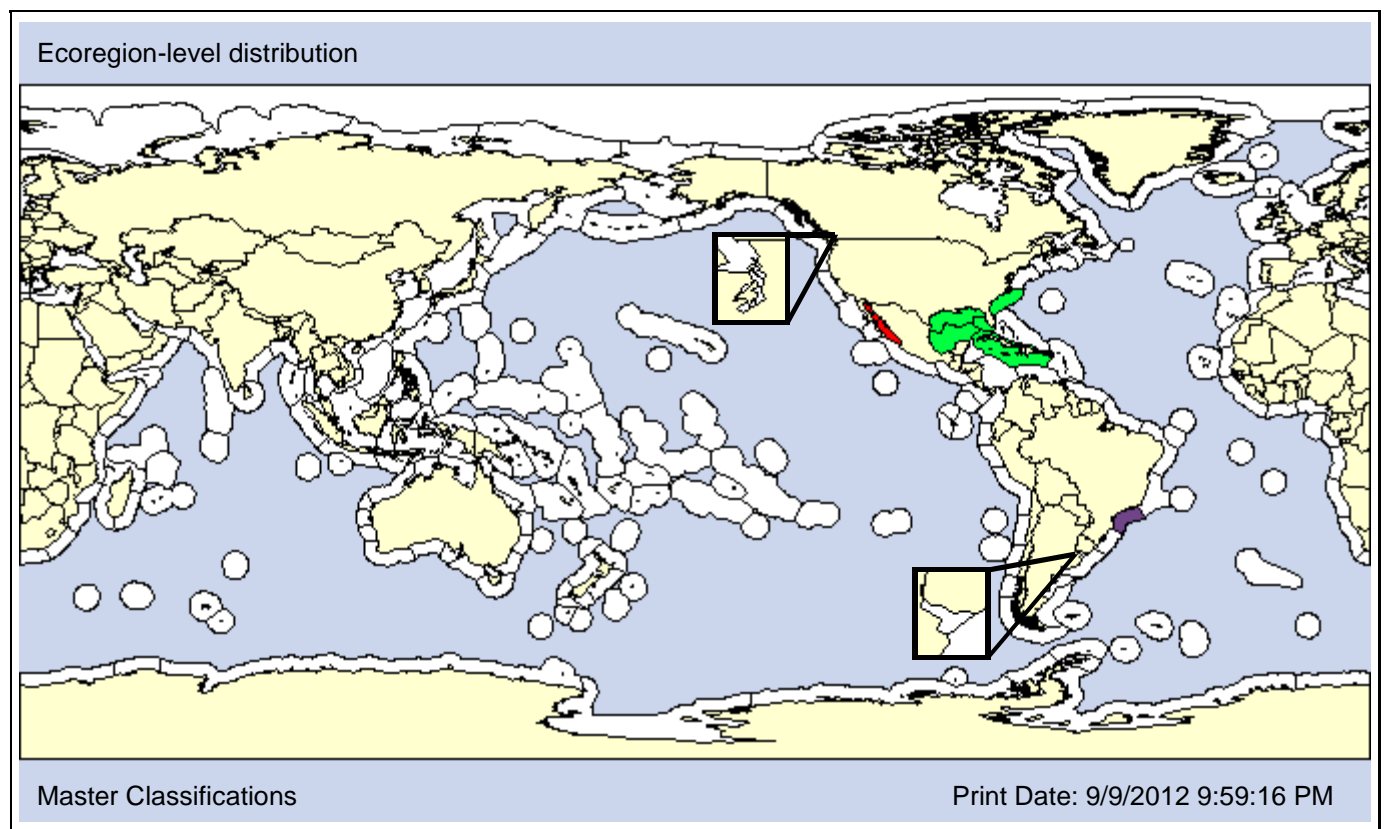
**Subkingdom:** Eumetazoa  
**Superclass:**  
**Infraclass:** Neocopepoda  
**Suborder:**  
**Family:** Cletodidae

**Phylum:** Arthropoda  
**Class:** Maxillopoda  
**Superorder:** Podoplea  
**Infraorder:**  
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Cuba



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1991  
**Loc 1st record:** Sinaloa, Mexico  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE** **X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b> <b>O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b> <b>X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Copepod

**Taxonomic Author:** (Poppe, 1880)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Gymnoplea

**Order:** Calanoida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Temoridae

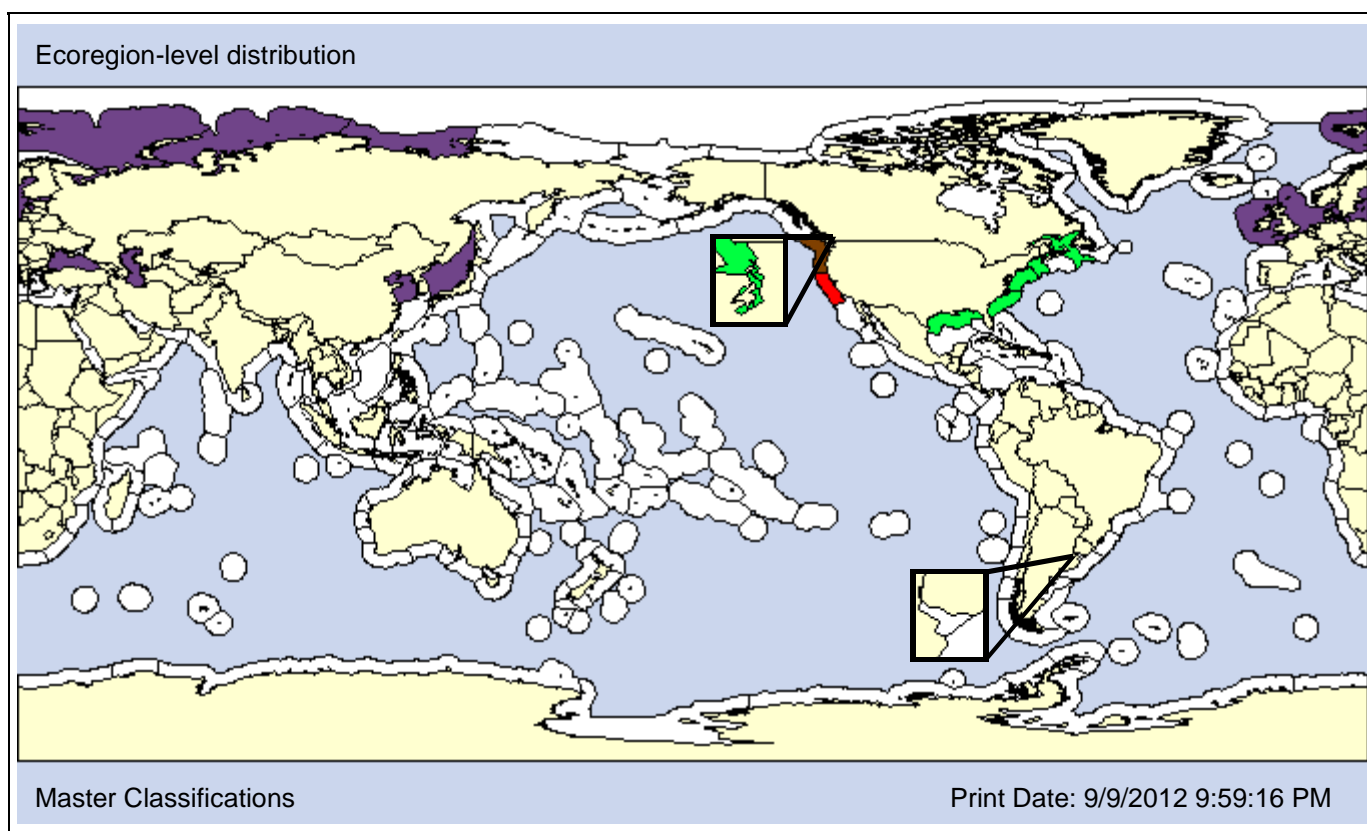
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Eurytemora affinis	Ambiguous syn.	
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Unknown

1913  
 San Francisco Estuary, CA  
 Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
<b>X</b>						<b>AO X</b>	PO							

Comments: *Eurytemora affinis* is a species complex. Its distribution in the NEP is based on Lee's (2000) distribution of the introduced Atlantic clade, which occurs in the San Francisco Estuary and Grays Harbor, and the native Pacific clade, which occurs in the Columbia River, Chehalis River, and British Columbia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>							<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 40psu] [Pref: 0 - 8psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							



**Taxon:** Copepod

**Taxonomic Author:** (Brehm, 1924)

**Kingdom:** Animalia  
**Subphylum:** Crustacea  
**Subclass:** Copepoda  
**Order:** Harpacticoida  
**Superfamily:**

**Subkingdom:** Eumetazoa  
**Superclass:**  
**Infraclass:** Neocopepoda  
**Suborder:** Oligoarthra  
**Family:** Harpacticidae

**Phylum:** Arthropoda  
**Class:** Maxillopoda  
**Superorder:** Podoplea  
**Infraorder:**  
**Subfamily:**

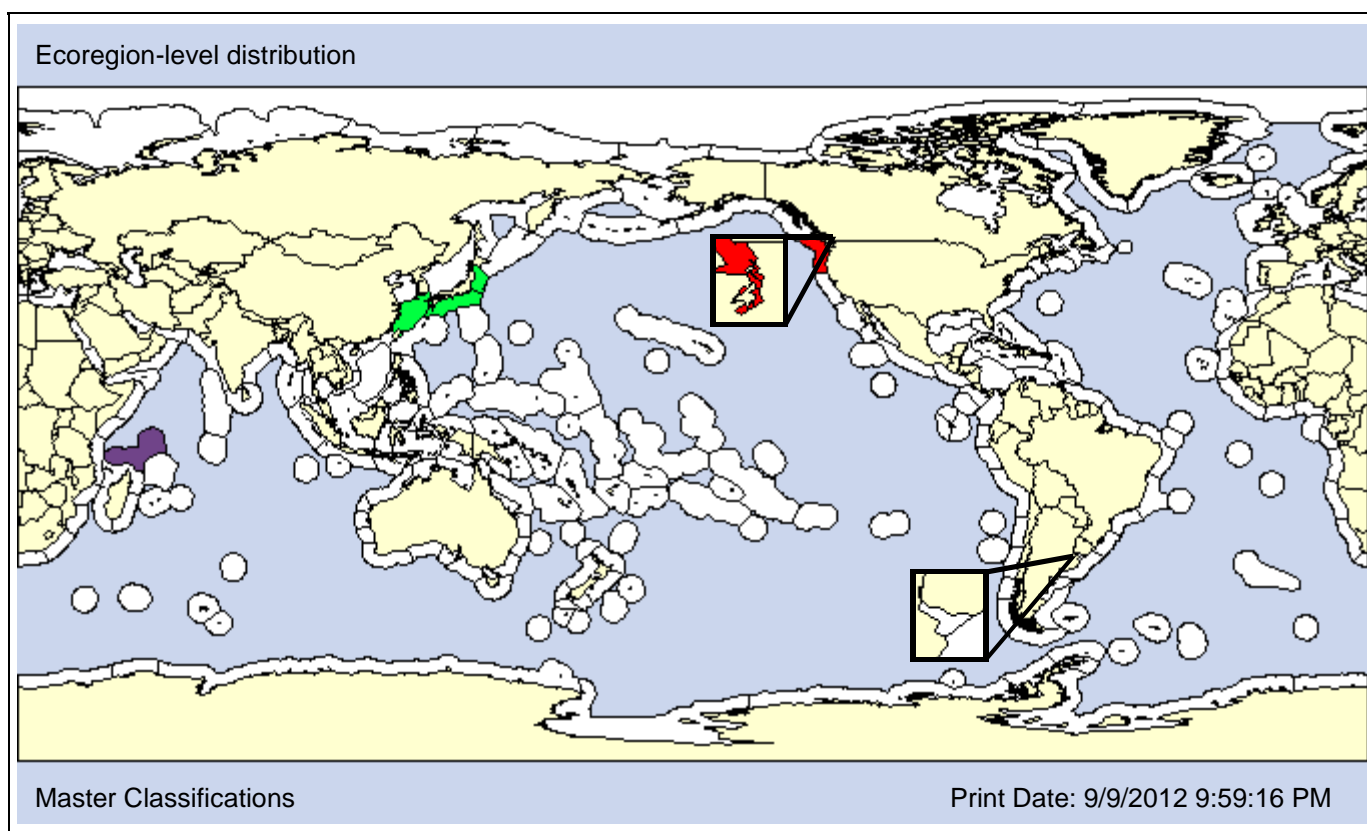
**Also Known As (Name - Type):**

Handieliu paradoxa	Synonym
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**Common Names:**

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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

2000

**Loc 1st record:** Native

Klamath + Samish River, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP X</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO				<b>X</b>					

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH				<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>					<b>O</b>	

**SALINITY [Obs: 0 - 15psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Copepod

**Taxonomic Author:** (Burkhardt, 1912)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Podoplea

**Order:** Cyclopoida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Oithonidae

**Subfamily:**

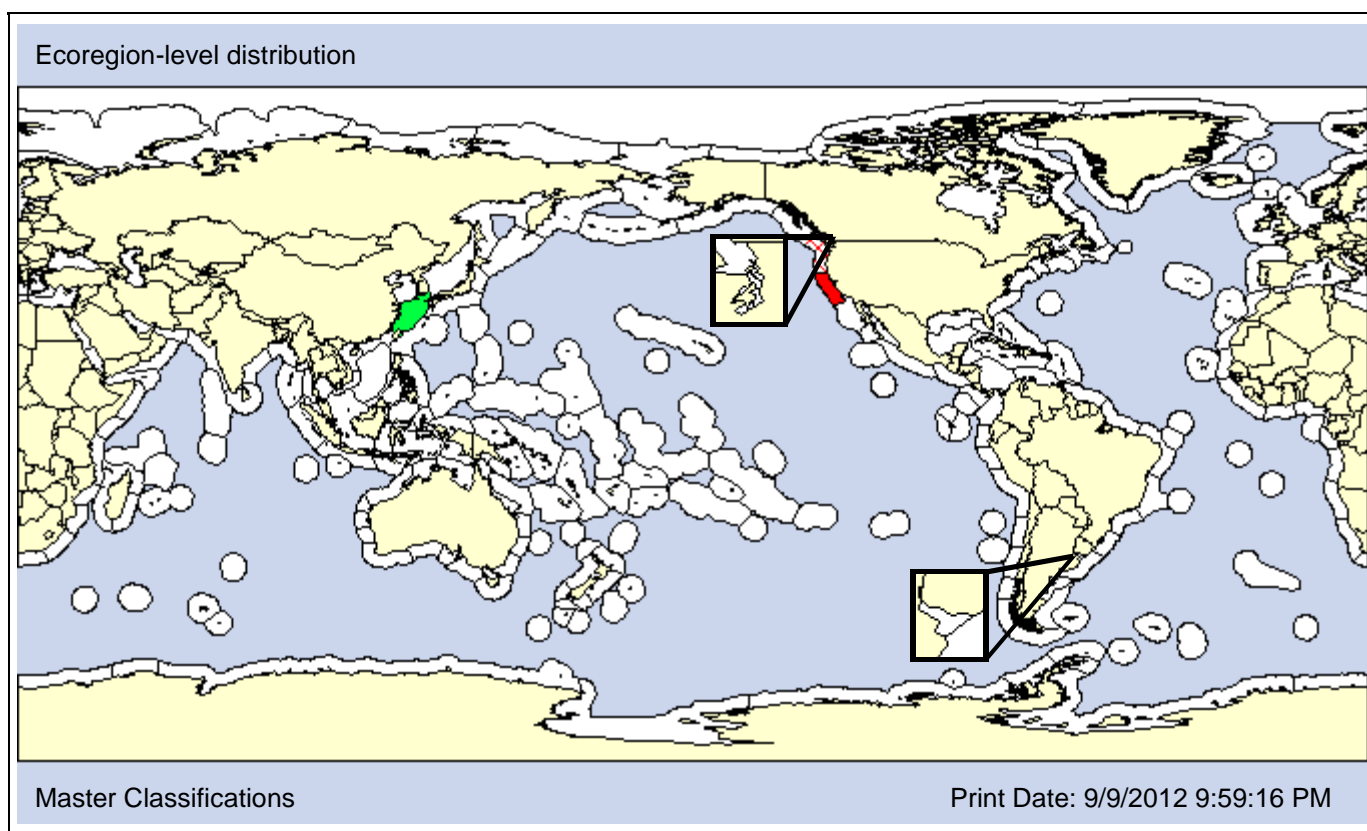
**Also Known As (Name - Type):**

Oithona (*Limnoithona*) sinensis  
Oithona sinensis

Synonym  
Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:** Native

1979

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				
<b>X</b>						AO	PO							

Comments: *Limnoithona sinensis* was present in the Columbia River in the early 1980s but has since disappeared (Cordell et al., 2008). It was abundant in the upper San Francisco Estuary from 1979 until 1993 but has declined, and perhaps gone extinct after the introduction of *L. tetraspina*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep					
<b>O</b>	<b>P</b>						

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 1.2psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>							

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Copepod

**Taxonomic Author:** Zhang & Li, 1976

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Podoplea

**Order:** Cyclopoida

**Suborder:**

**Infraorder:**

**Superfamily:**

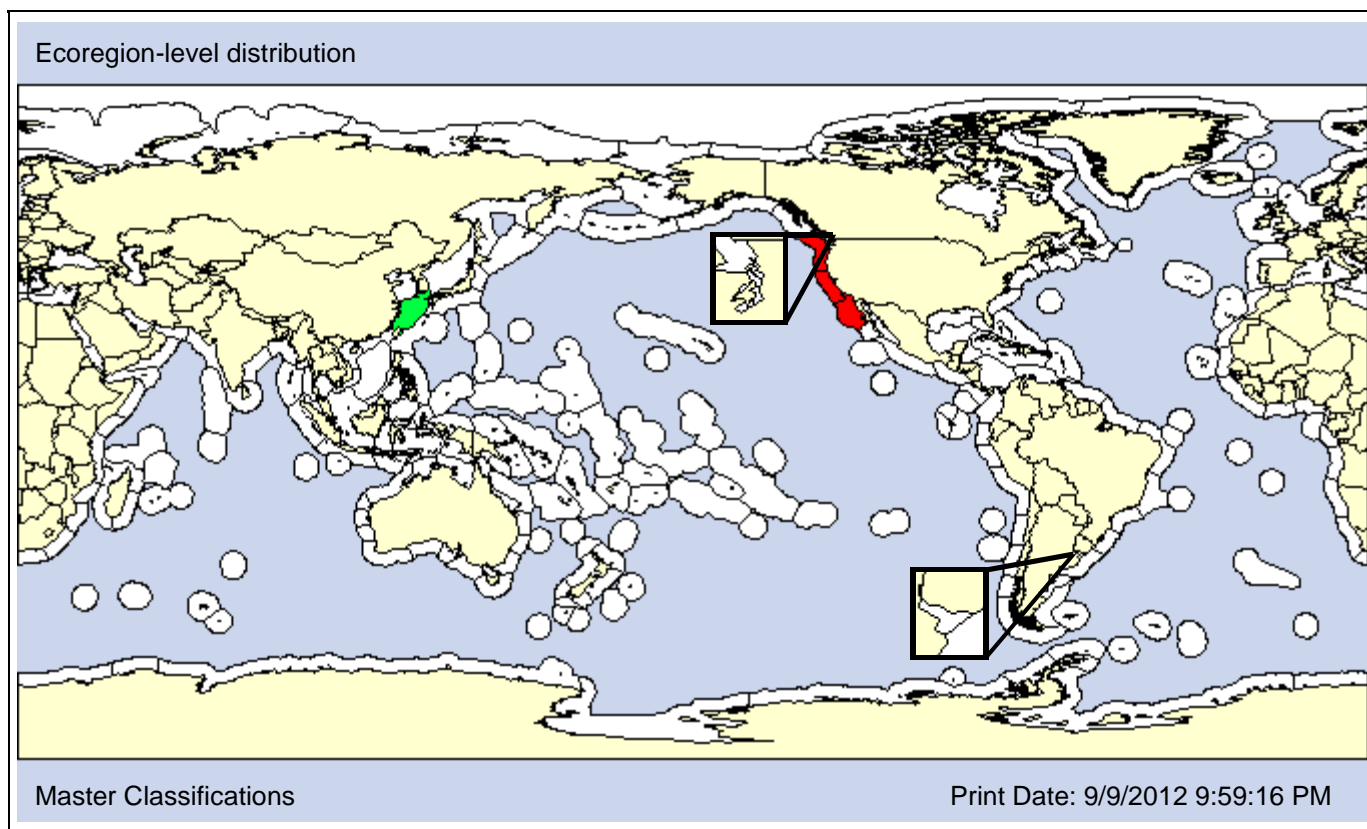
**Family:** Oithonidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1993

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 1 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 1 - 28psu] [Pref: 1 - 3psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Copepod

**Taxonomic Author:** Mori, 1935

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Podoplea

**Order:** Poecilostomatoida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Mytilicolidae

**Subfamily:**

**Also Known As (Name - Type):**

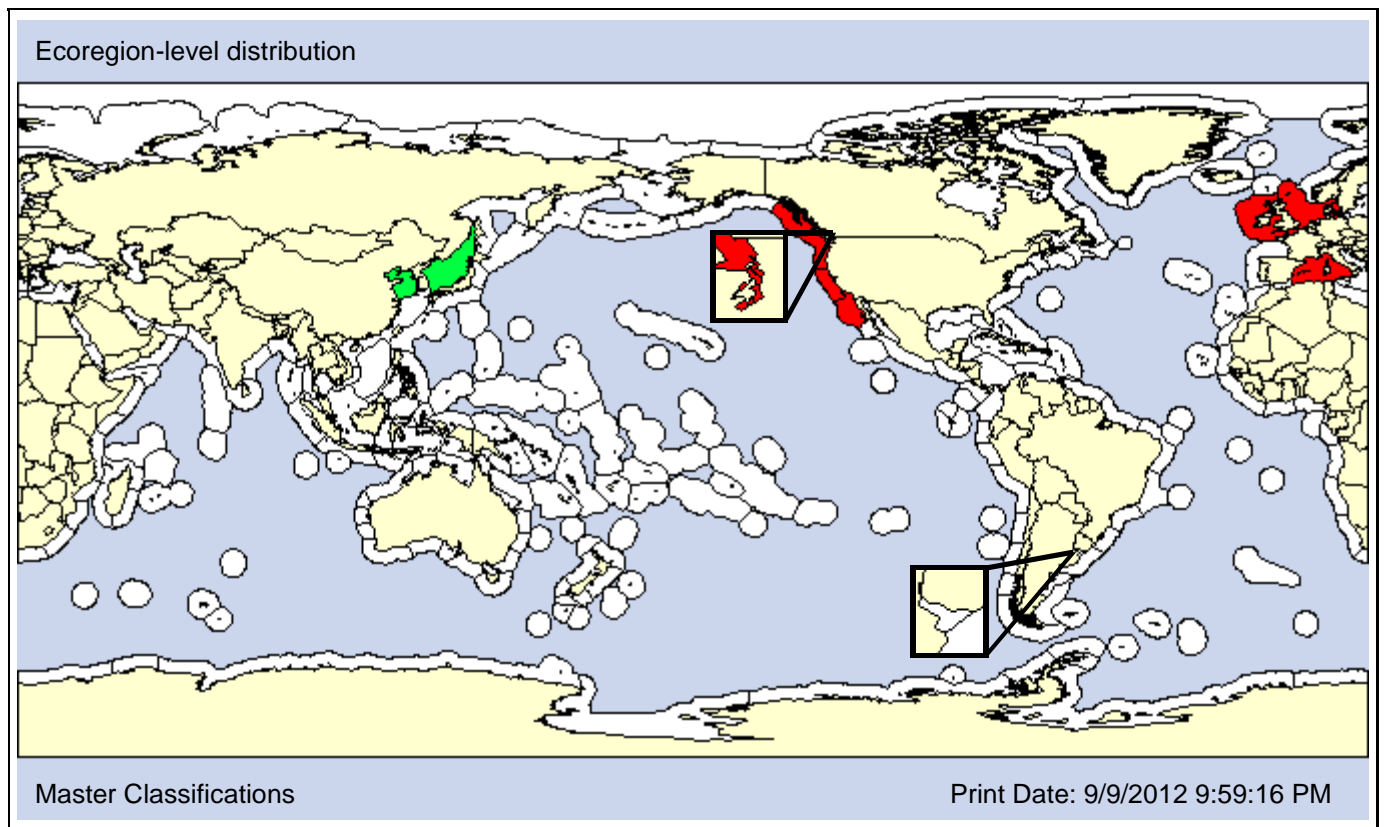
Mytilicola ostreae

Synonym

**Common Names:**

oyster redworm  
red worm

**Type Locality:** Sea of Japan, Japan



**Date 1st record:** Native

1938

**Loc 1st record:** Native

Willapa Bay, Washington

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
						AO	PO X								

Comments: *Mytilicola orientalis* is an intestinal parasite of bivalves such as mussels (*Mytilus* spp.) and oysters (*Crassostrea* spp.). It was likely introduced with importation of the Japanese oyster, *Crassostrea gigas*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>P</b>								<b>O</b>		<b>O</b>	

**SALINITY [Obs: 1.2 - 32psu] [Pref: 29 - 32psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>



# Neotachidius triangularis

Species ID: 11691

**Taxon:** Copepod

**Taxonomic Author:** (Shen & Tai, 1963)

**Kingdom:** Animalia  
**Subphylum:** Crustacea  
**Subclass:** Copepoda  
**Order:** Harpacticoida  
**Superfamily:**

**Subkingdom:** Eumetazoa  
**Superclass:**  
**Infraclass:** Neocopepoda  
**Suborder:** Oligoarthra  
**Family:** Tachidiidae

**Phylum:** Arthropoda  
**Class:** Maxillopoda  
**Superorder:** Podoplea  
**Infraorder:**  
**Subfamily:**

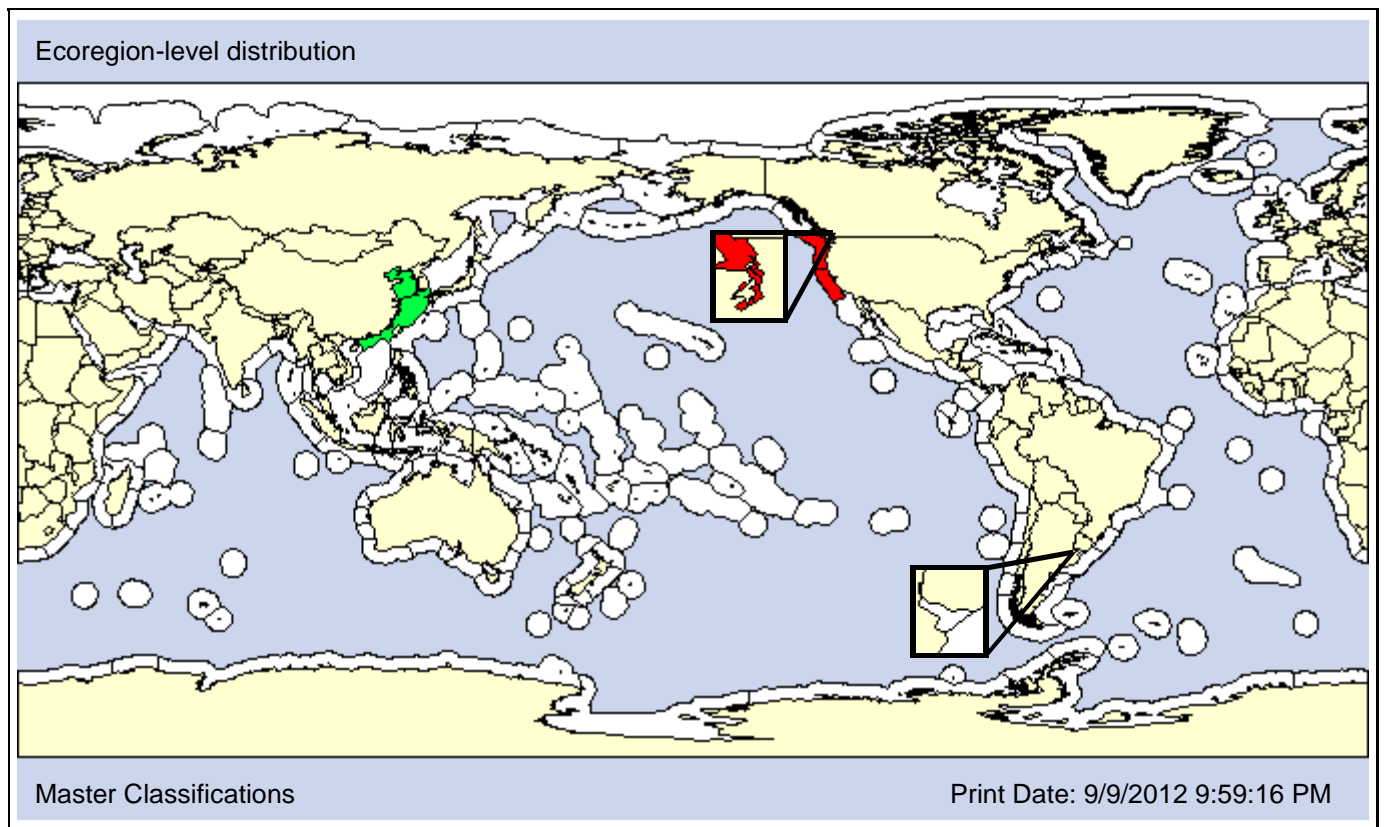
**Also Known As (Name - Type):**

Tachidius (Neotachidius) triangularis  
 Tachidius triangularis

Synonym  
 Synonym

**Common Names:**

**Type Locality:** Pearl River, China



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

<1982

**Loc 1st record:** Native

Nanaimo, British Columbia

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>	<b>O</b>	<b>O</b>		<b>O</b>	<b>O</b>

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
			<b>X</b>		<b>X</b>								

**Taxon:** Copepod

**Taxonomic Author:** Ferrari & Orsi, 1984

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Podoplea

**Order:** Cyclopoida

**Suborder:**

**Infraorder:**

**Superfamily:**

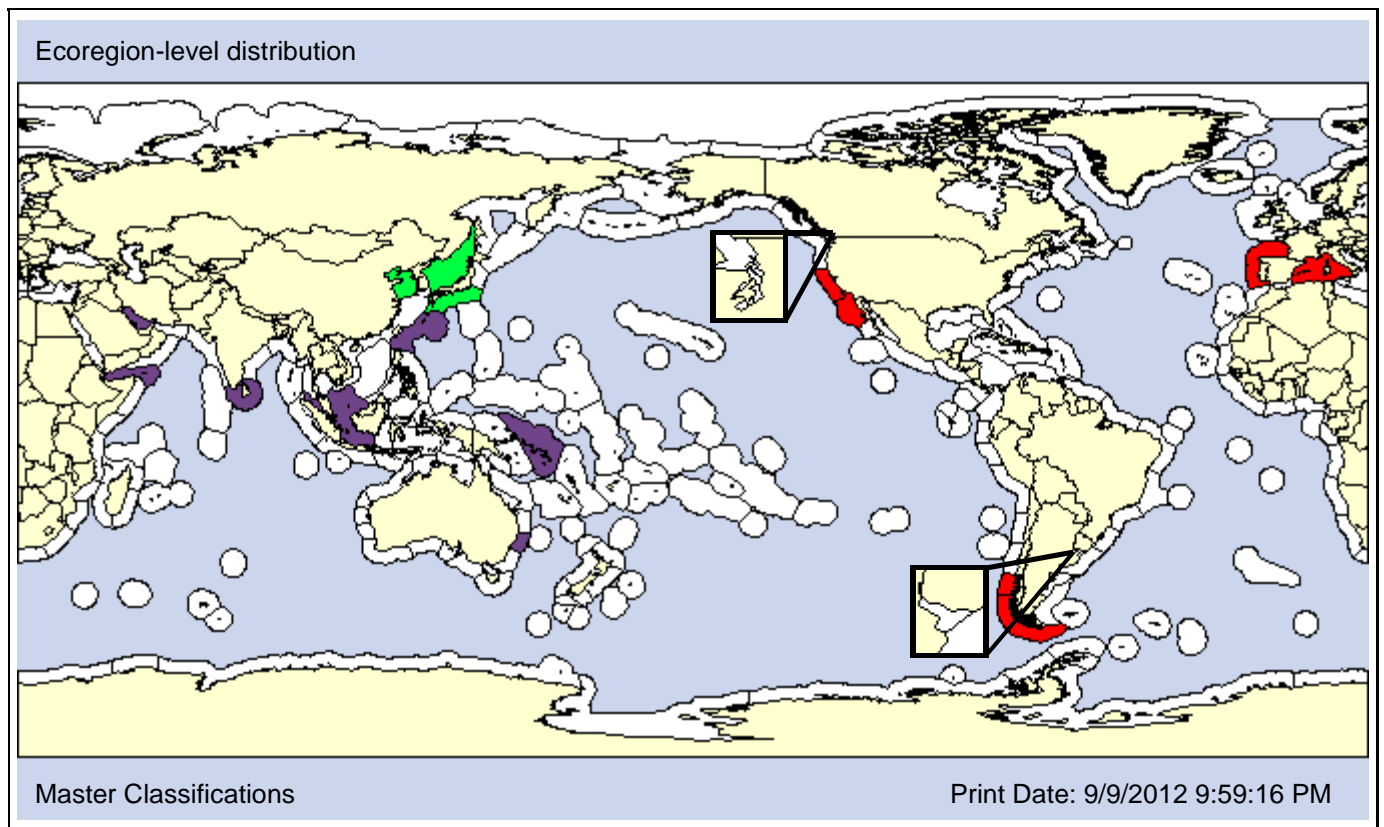
**Family:** Oithonidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** San Francisco Estuary, California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1963

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - 23m] [Pref: 5 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 12 - 32.3psu] [Pref: 28 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>O</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Copepod

**Taxonomic Author:** (Thorell, 1859)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Podoplea

**Order:** Cyclopoida

**Suborder:**

**Infraorder:**

**Superfamily:**

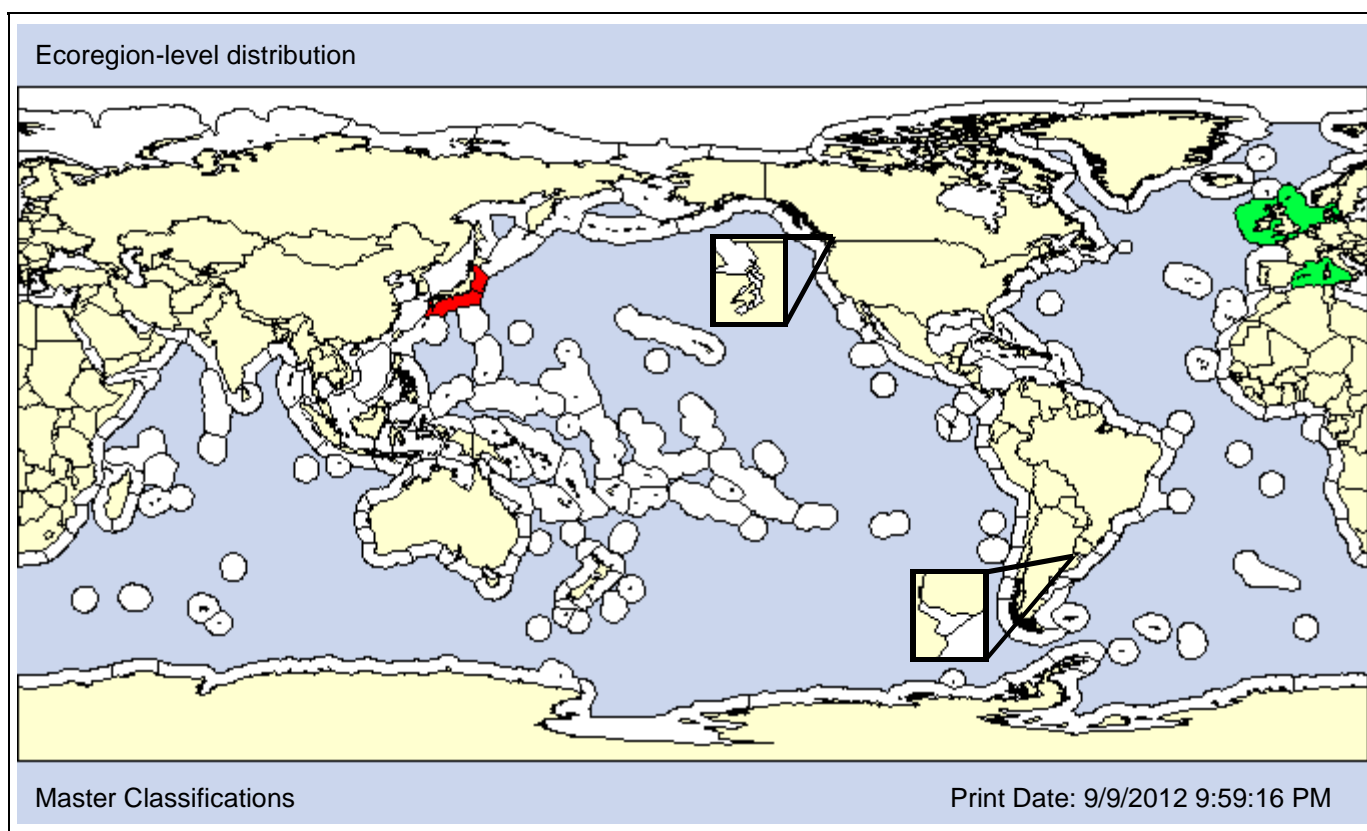
**Family:** Notodelphyidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



**Date 1st record:** 1960

**Loc 1st record:** Miyagi, Japan

**Established:** Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		<b>X</b>				AO	PO								

Comments: *Pachypygus gibber* is a parasitic copepod that lives on solitary ascidians. In Japan, hosts were *Styela plicata* and *Cnemidocarpa areolata* (both native to Japan) and the introduced North Atlantic *Ciona intestinalis* (Doi et al., 2011). Because it has not been reported from Japan since 1962, we list its establishment as unknown.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

**Taxon:** Copepod

**Taxonomic Author:** Mielke, 1983

**Kingdom:** Animalia  
**Subphylum:** Crustacea  
**Subclass:** Copepoda  
**Order:** Harpacticoida  
**Superfamily:**

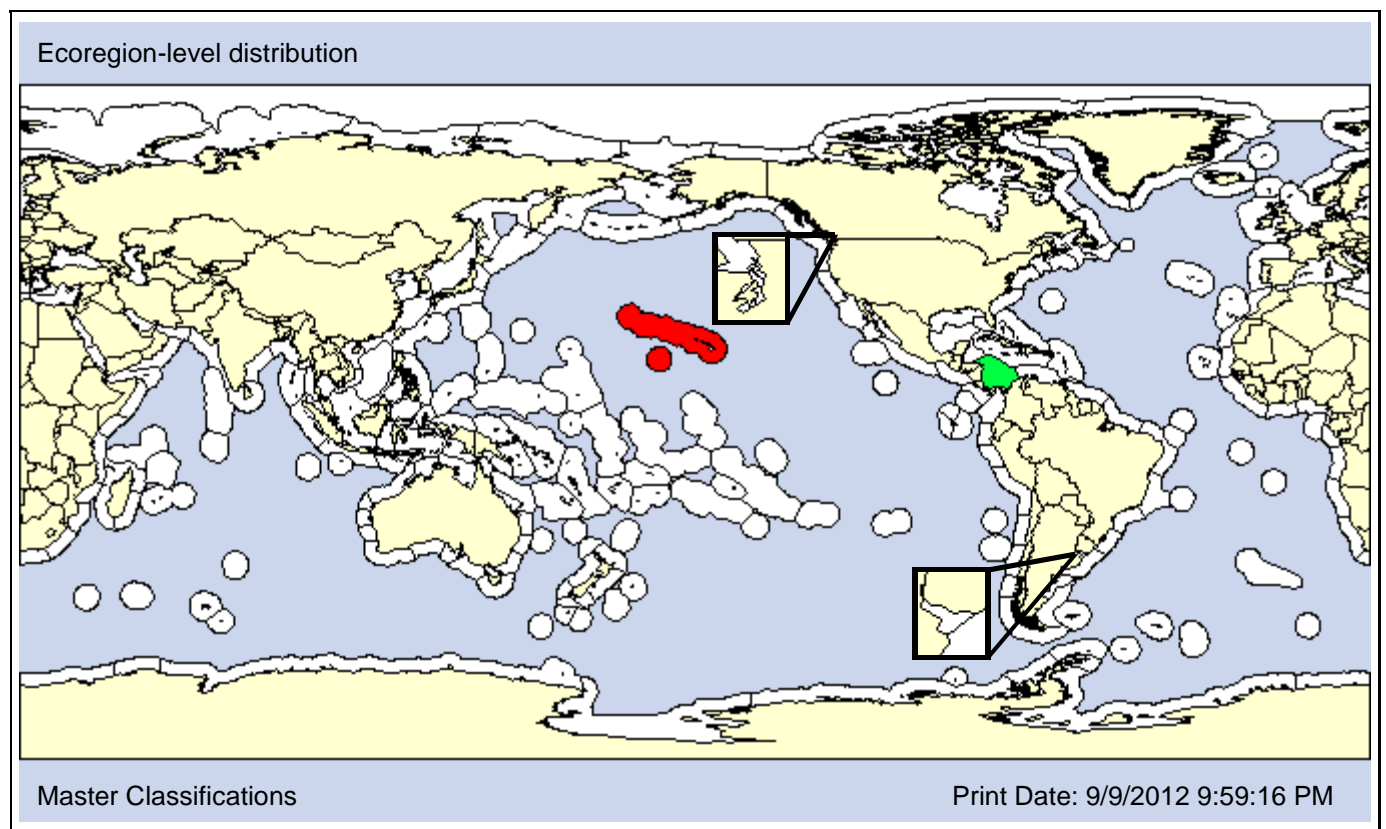
**Subkingdom:** Eumetazoa  
**Superclass:**  
**Infraclass:** Neocopepoda  
**Suborder:**  
**Family:** Leptopontiidae

**Phylum:** Arthropoda  
**Class:** Maxillopoda  
**Superorder:** Podoplea  
**Infraorder:**  
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Panama (Caribbean)



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1979  
**Loc 1st record:** Kauai, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
	X					AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
X													

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	P					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 34psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					X		



**Taxon:** Copepod

**Taxonomic Author:** (Poppe & Richard, 1890)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Gymnoplea

**Order:** Calanoida

**Suborder:**

**Infraorder:**

**Superfamily:**

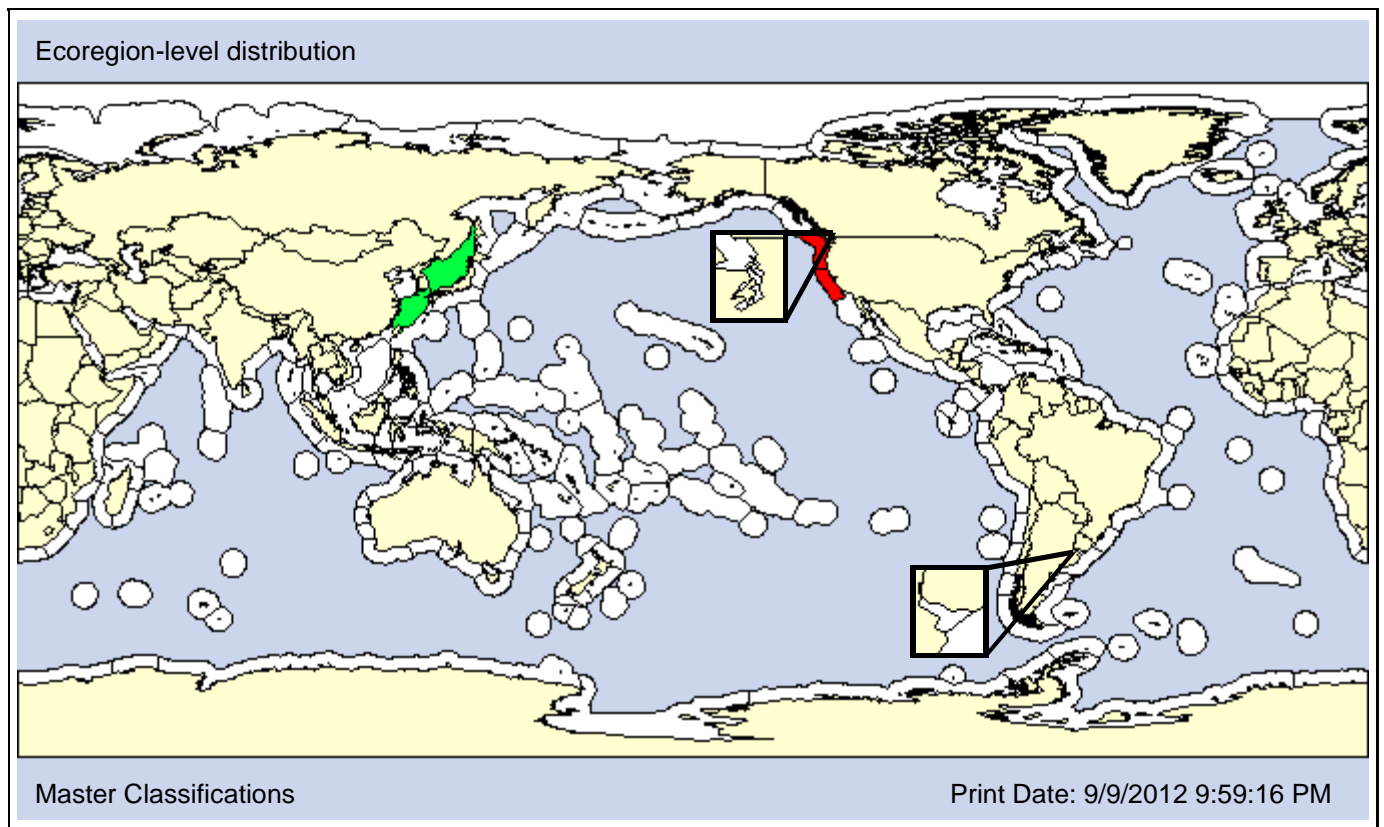
**Family:** Pseudodiaptomidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1987

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 1 - 20m] [Pref: 1 - 5.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 33 - 69%]**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 11psu] [Pref: 0.2 - psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Copepod

**Taxonomic Author:** Burckhardt, 1913

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Gymnoplea

**Order:** Calanoida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Pseudodiaptomidae

**Subfamily:**

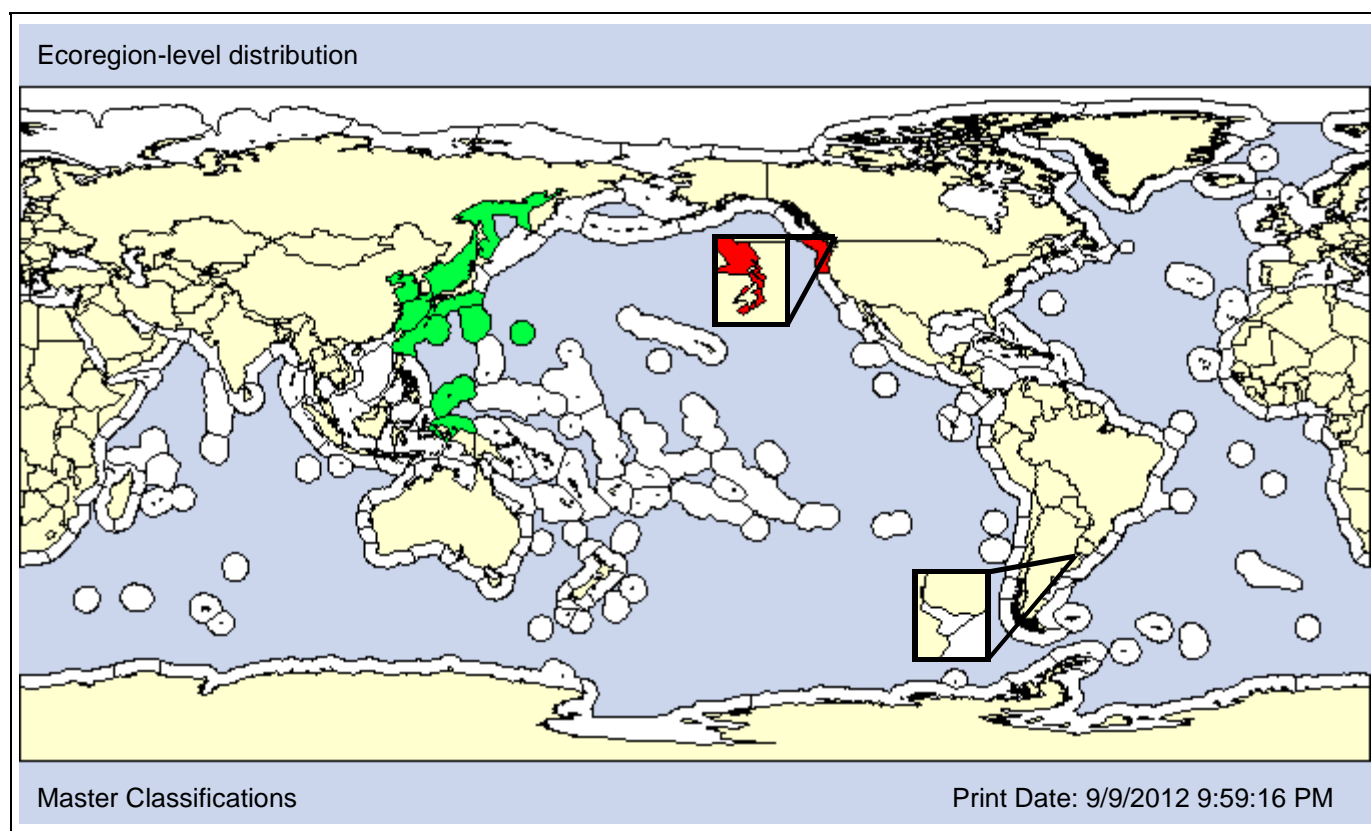
**Also Known As (Name - Type):**

**Common Names:**

[Empty box for Also Known As (Name - Type)]

[Empty box for Common Names]

**Type Locality:**



**Date 1st record:** Native 1990

**Loc 1st record:** Native Columbia River, WA

**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X						AO	PO								

Comments: *Pseudodiaptomus inopinus* is an Asian calanoid copepod that has been introduced into estuaries in the NEP, with maximum abundances in freshwater to mesohaline salinities (Cordell et al., 2010). However, *P. inopinus* has also been reported from offshore samples taken in a 1977 survey in the Indo-Pacific (see OBIS).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>		<b>O</b>	<b>O</b>	<b>O</b>		<b>P</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - 177m] [Pref: 2 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - 8psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

# *Pseudodiaptomus marinus*

Species ID: 1124

**Taxon:** Copepod

**Taxonomic Author:** Sato, 1913

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Gymnoplea

**Order:** Calanoida

**Suborder:**

**Infraorder:**

**Superfamily:**

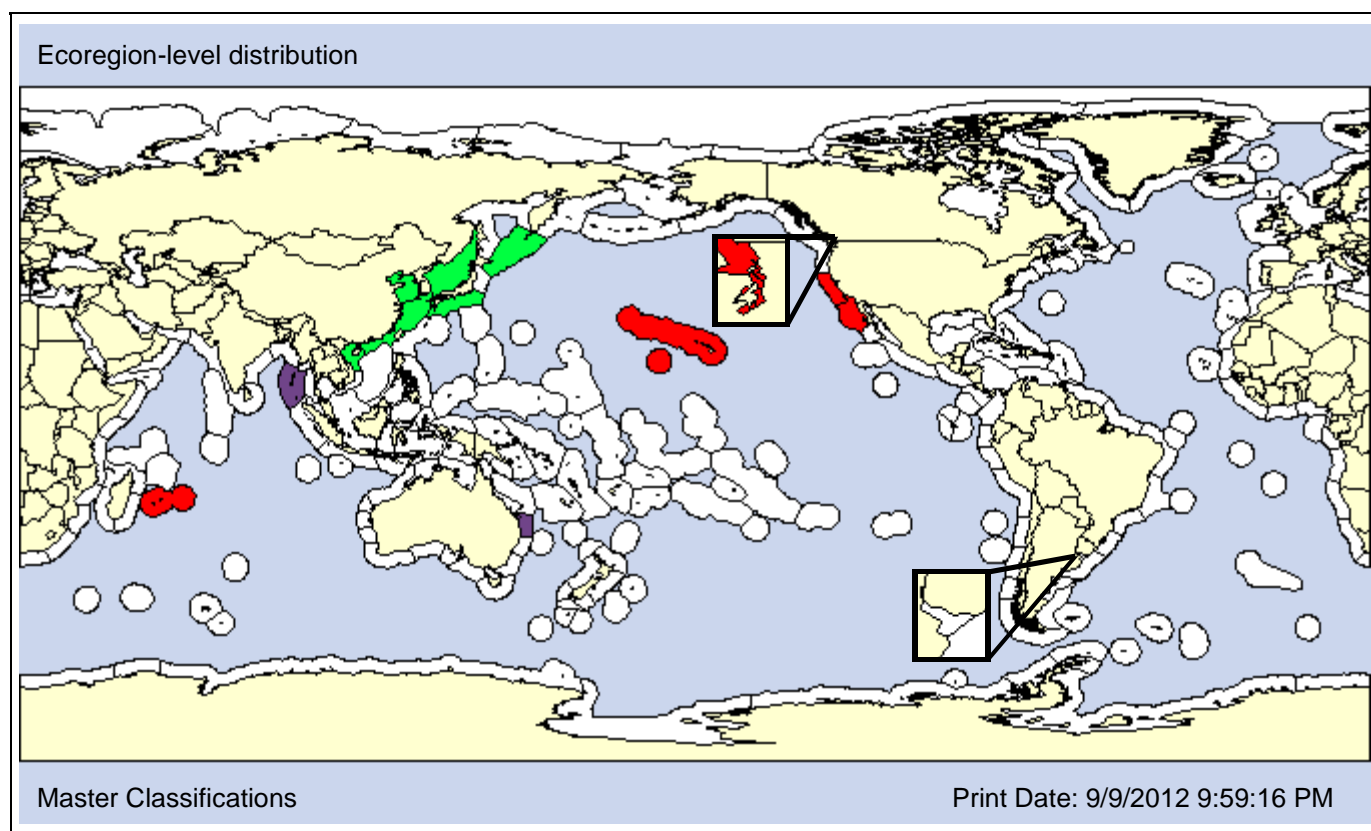
**Family:** Pseudodiaptomidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hokkaido, Japan



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii		NEP	

<b>Date 1st record:</b> Native	1964	1986
<b>Loc 1st record:</b> Native	Oahu, Hawaii	San Diego and Mission Bay, CA
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>						AO	PO								

Comments: *Pseudodiaptomus marinus* is a "demersal" copepod introduced into the NEP, Hawaii, and Madagascar region from Asia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 1 - 8.5m] [Pref: 4 - 8.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 15 - 32.3psu] [Pref: 15 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>P</b>	<b>P</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Copepod

**Taxonomic Author:** (Raffaele & Monticelli, 1885)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Podoplea

**Order:** Poecilostomatoida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Myicolidae

**Subfamily:**

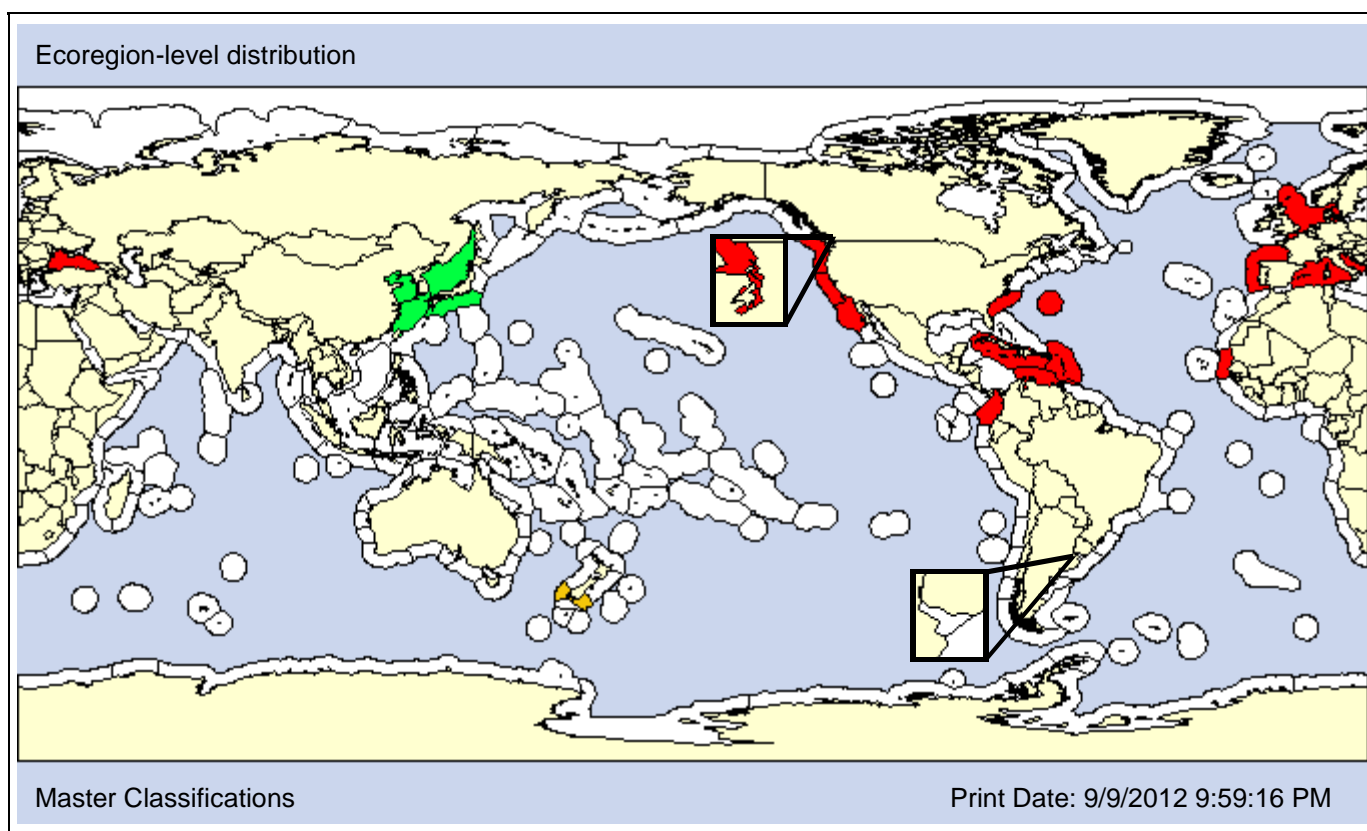
**Also Known As (Name - Type):**

Anthessius spinosus  
Lichomolgus spinosus  
Midicola anomalocardiae  
Midicola levis

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:** Native

1985

**Loc 1st record:** Native

Unknown

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X		IR		A	P				
						AO	PO X								

Comments: *Pseudomyicola spinosus* [= *P. ostreae*] parasitizes the mantle cavity of more than 50 species of bivalves including *Mytilus*, clams, and oysters. It was likely introduced with the importation of the Japanese oyster, *Crassostrea gigas*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>	<b>P</b>								<b>O</b>	<b>O</b>	

**SALINITY [Obs: 25 - psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>



**Taxon:** Copepod

**Taxonomic Author:** (Sars, 1906) Huys, 2009

**Kingdom:** Animalia  
**Subphylum:** Crustacea  
**Subclass:** Copepoda  
**Order:** Harpacticoida  
**Superfamily:**

**Subkingdom:** Eumetazoa  
**Superclass:**  
**Infraclass:** Neocopepoda  
**Suborder:** Oligoarthra  
**Family:** Miraciidae

**Phylum:** Arthropoda  
**Class:** Maxillopoda  
**Superorder:** Podoplea  
**Infraorder:**  
**Subfamily:**

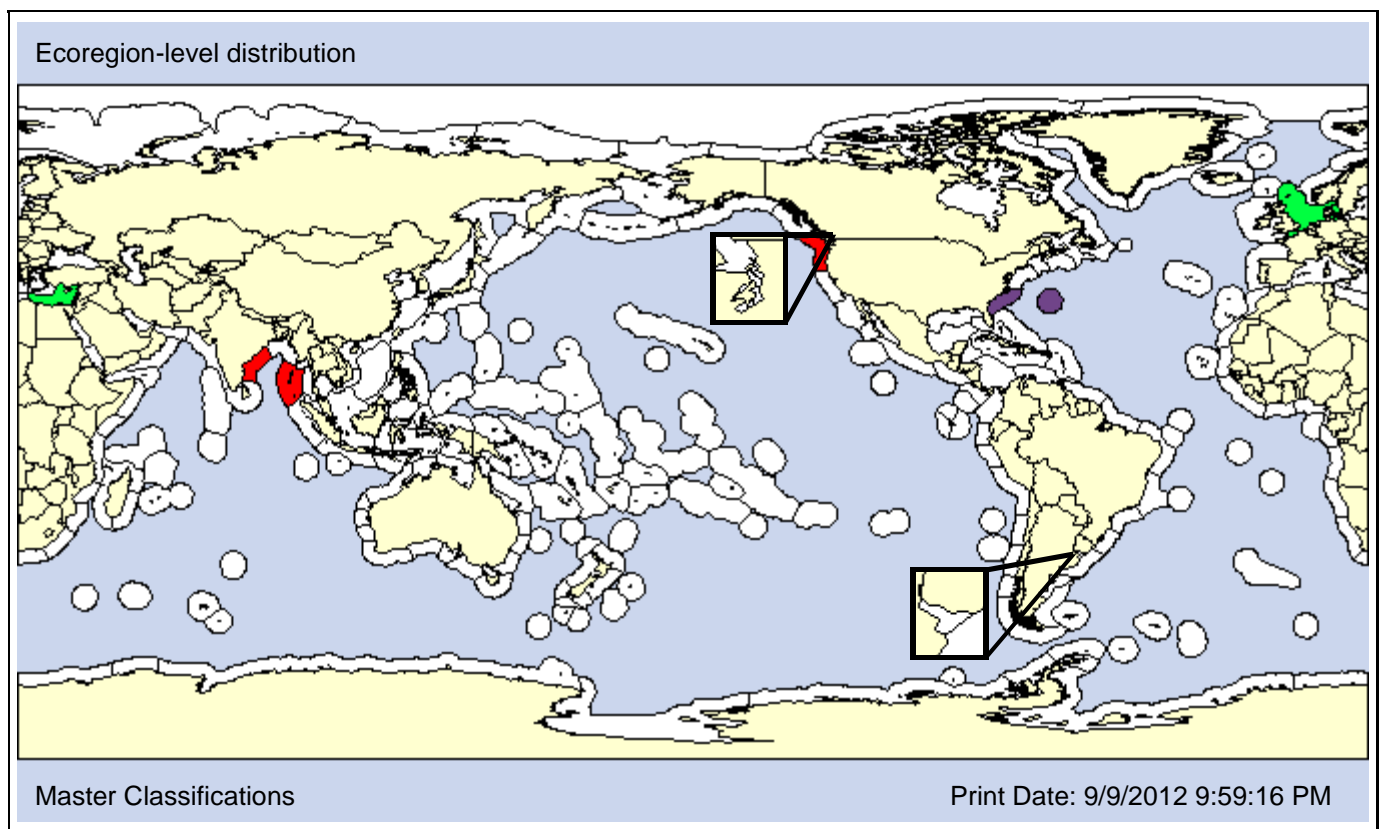
**Also Known As (Name - Type):**

Amphiascus parvus	Synonym

**Common Names:**

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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

Unknown

**Loc 1st record:**

Unknown

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									

Comments: *Sarsamphiascus parvus* [= *Amphiascus parvus*] is a European harpacticoid that invaded the NEP (Cordell, 2007). Because the *S. parvus* reported from Argentina and the Red Sea are not identical to Sar's original description (Ueda and Nagai, 2005), their distributions are not shown.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0 - 16m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE** **X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b> <b>O</b>						<b>Marine</b> <b>O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b> <b>X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Taxon:** Copepod

**Taxonomic Author:** (Brehm, 1909)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Gymnoplea

**Order:** Calanoida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Centropagidae

**Subfamily:**

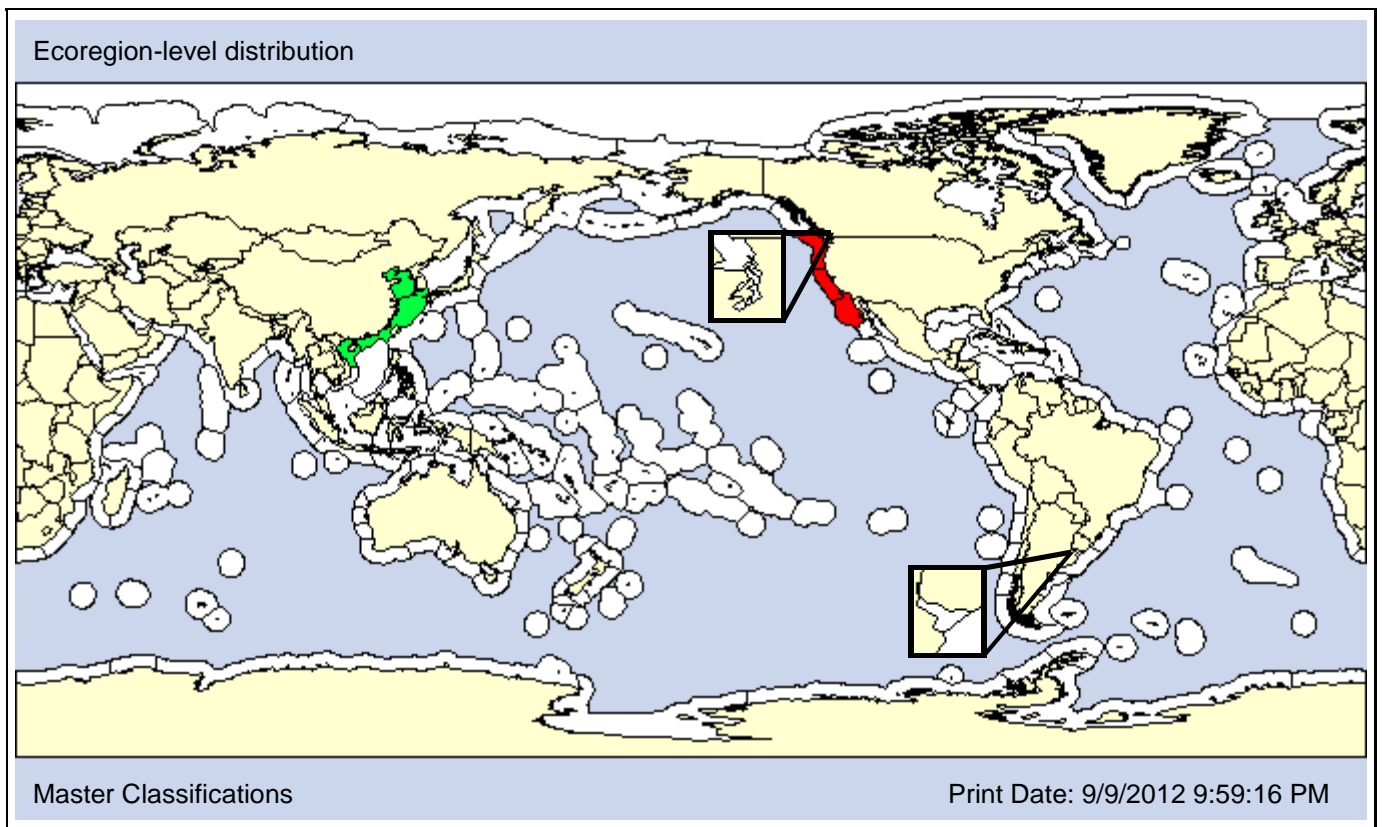
**Also Known As (Name - Type):**

Limnocalanus sinensis doerrii  
Sinocalanus mystrophorus

Synonym  
Synonym

**Common Names:**

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1978  
**Loc 1st record:** Native San Francisco Estuary, CA  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P				
X						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 1 - 12.7m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 14.8psu] [Pref: 0 - 0.5psu]**

<b>Fresh P</b>	<b>Brackish P</b>				<b>Marine</b>		<b>Hyper</b>	
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>				<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Copepod

**Taxonomic Author:** Ohtsuka & Hiromi, 1987

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Gymnoplea

**Order:** Calanoida

**Suborder:**

**Infraorder:**

**Superfamily:**

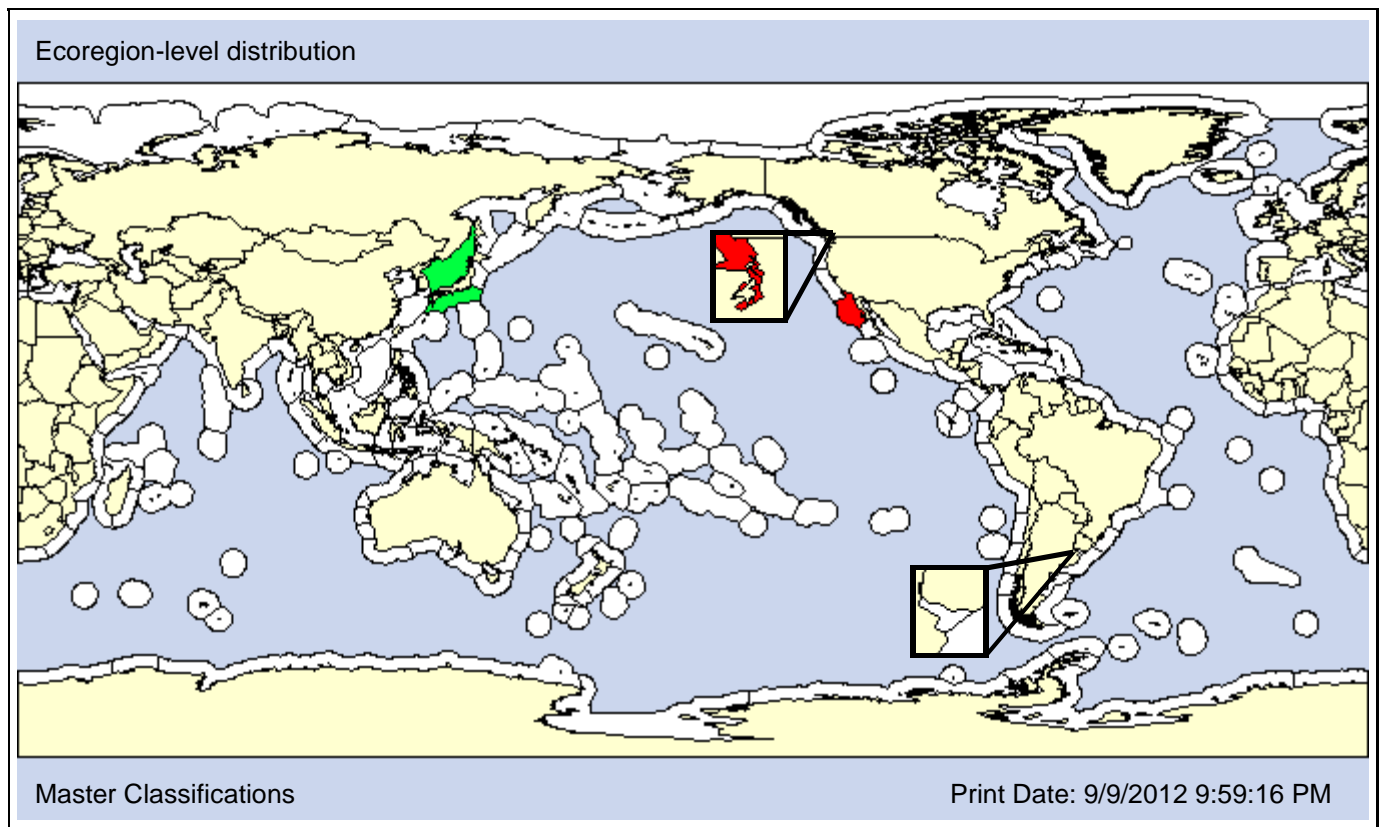
**Family:** Stephidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Sea of Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1998

**Loc 1st record:** Native Puget Sound, WA

**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments: *Stephos pacificus* is an epibenthic copepod introduced into the NEP from Asia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 6 - 7m] [Pref: 6 - 7m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 25 - 32.8psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>			<b>X</b>							

*Stephos sp. (Ruiz et al. 2000)*

Species ID: 3370

**Taxon:** Copepod

**Taxonomic Author:** Cordell, 1999

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Gymnoplea

**Order:** Calanoida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Stephidae

**Subfamily:**

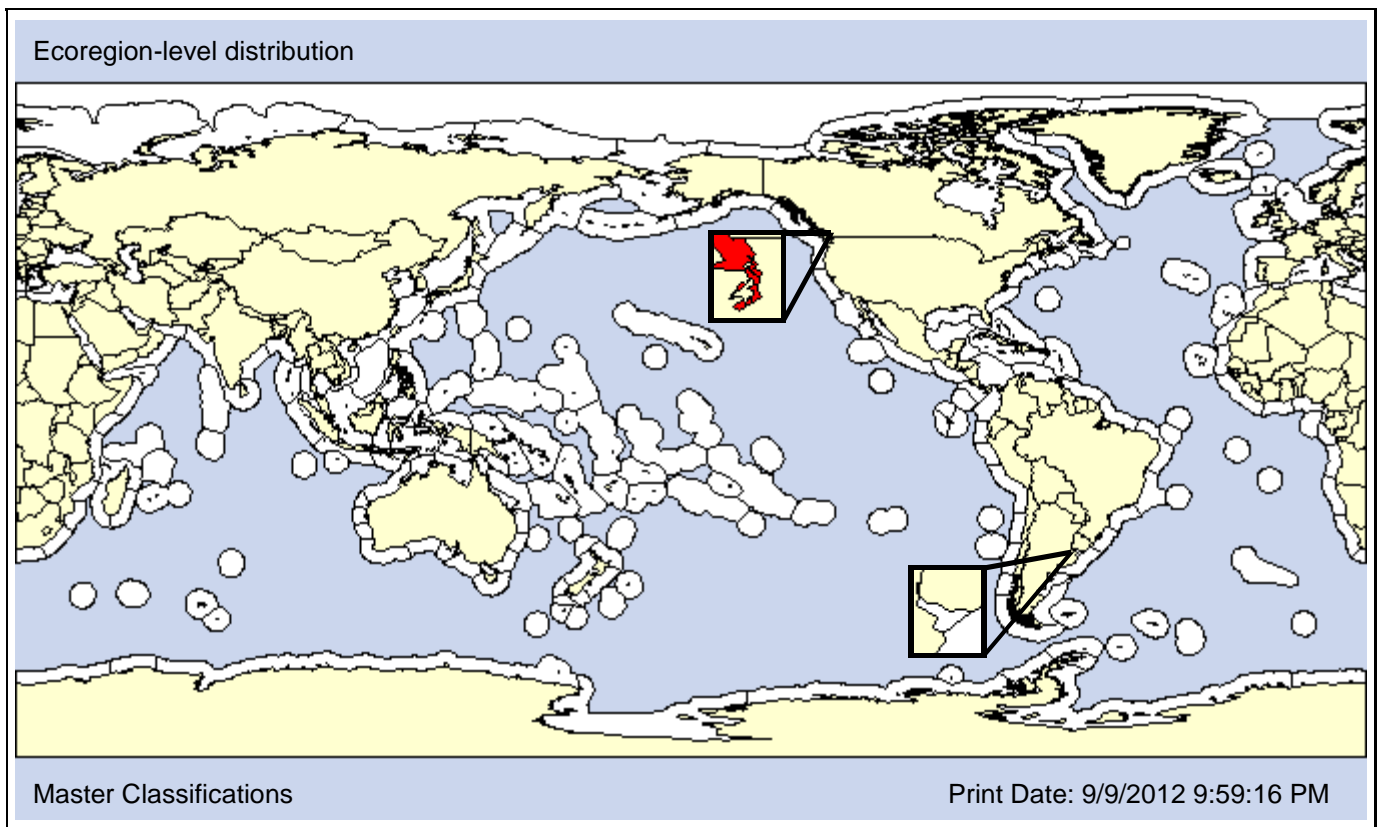
**Also Known As (Name - Type):**

**Common Names:**

[Empty box for Also Known As (Name - Type)]

[Empty box for Common Names]

**Type Locality:** Washington, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1998

**Loc 1st record:**

Puget Sound, WA

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X						AO	PO								

Comments: Ruiz et al. (2000) listed an unidentified *Stephos* as introduced into the NEP in 1998 in Puget Sound, Washington. We assume it is epibenthic similar to *Stephos pacificus*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic O		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep			
	O				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	
						O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM X		SUR X		UR	B	N	SF	IN	EPP	EPZ
		X	BP	EPS	EPU	EPC							
			X		X								



**Taxon:** Copepod

**Taxonomic Author:** Wilson, 1942

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Copepoda incertae sedis

**Superorder:**

**Order:**

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:**

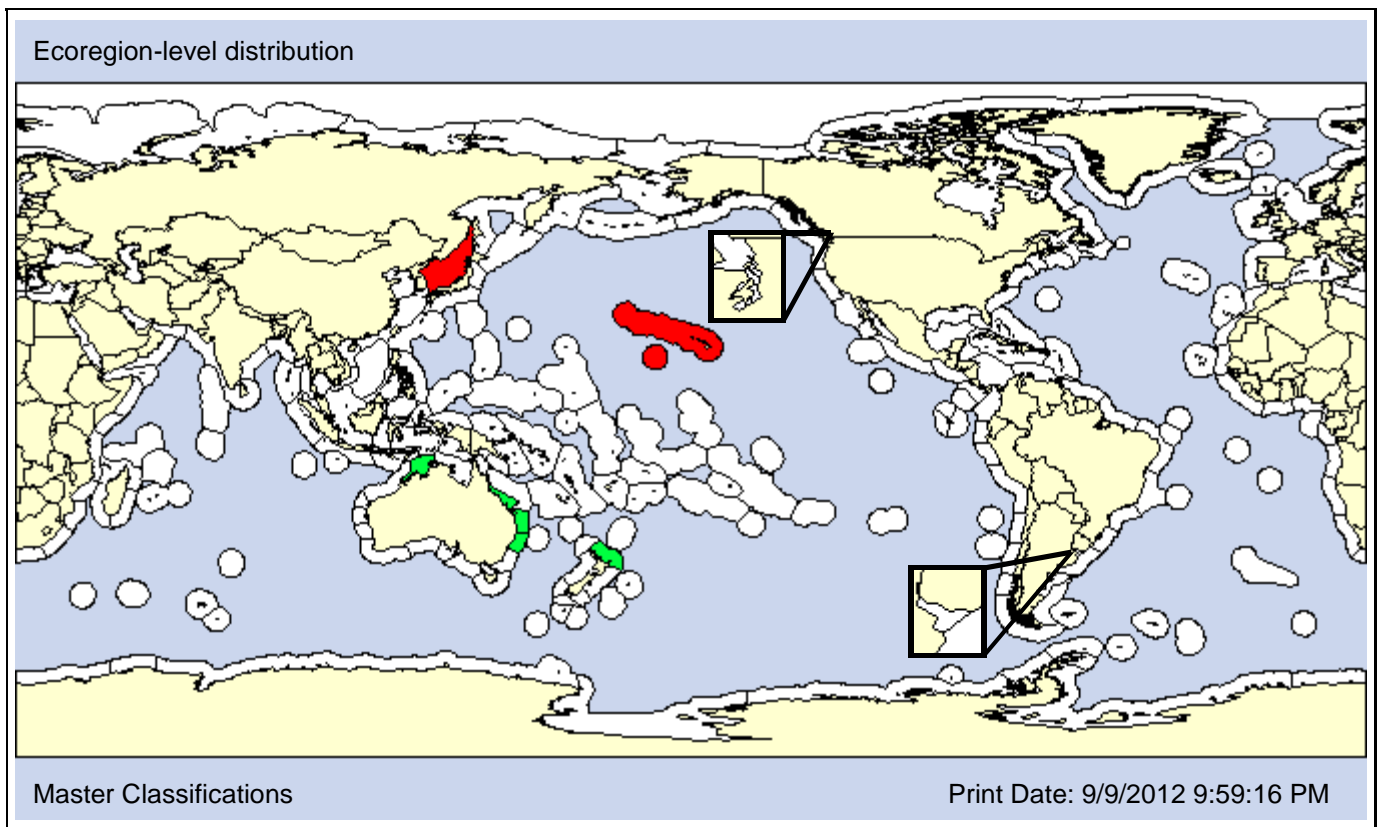
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Teredicola typicus	Convention	
Teredo milleri of Edmondson, 1942	Misidentified	

**Type Locality:** Honolulu, Hawaii, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1971

1939

**Loc 1st record:** Japan

Honolulu Harbor, Hawaii

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: *Teredicola typica* is a parasitic copepod living in the infrabranchial cavity of several species of shipworms (*Teredo*, *Bankia*, and *Lyrodus*). Carlton and Eldredge (2009) suggest it may be native to the Southern Hemisphere. Thus, we tentatively classify populations in Australia and New Zealand as native and those in Japan as introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
X									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					X

# Tortanus dextrilobatus

Species ID: 2567

**Taxon:** Copepod

**Taxonomic Author:** Chen & Zhang, 1965

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Copepoda

**Infraclass:** Neocopepoda

**Superorder:** Gymnoplea

**Order:** Calanoida

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Tortanidae

**Subfamily:**

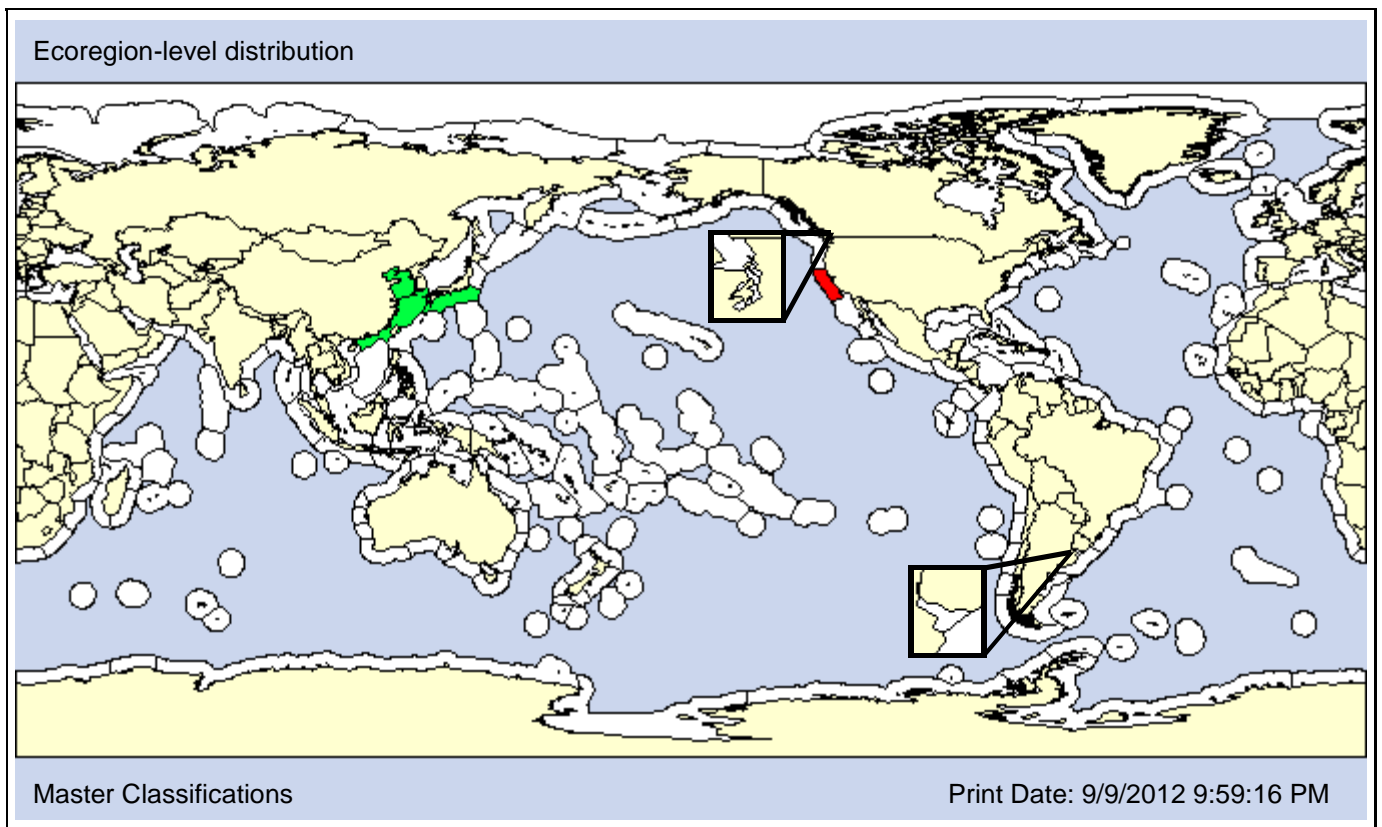
**Also Known As (Name - Type):**

Tortanus (Eutortanus) dextrilobatus  
Tortanus sp. of Cohen and Carlton, 1995

Convention  
Synonym

**Common Names:**

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1993

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
<span style="color: red;">X</span>						AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0.05 - 12m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 2 - 33psu] [Pref: 14 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Kingdom: Animalia**

**Phylum: Arthropoda**

**Class: Maxillopoda**

**Subclass: Thecostraca**

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**Taxon:** Barnacle

**Taxonomic Author:** (Darwin, 1854)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

**Also Known As (Name - Type):**

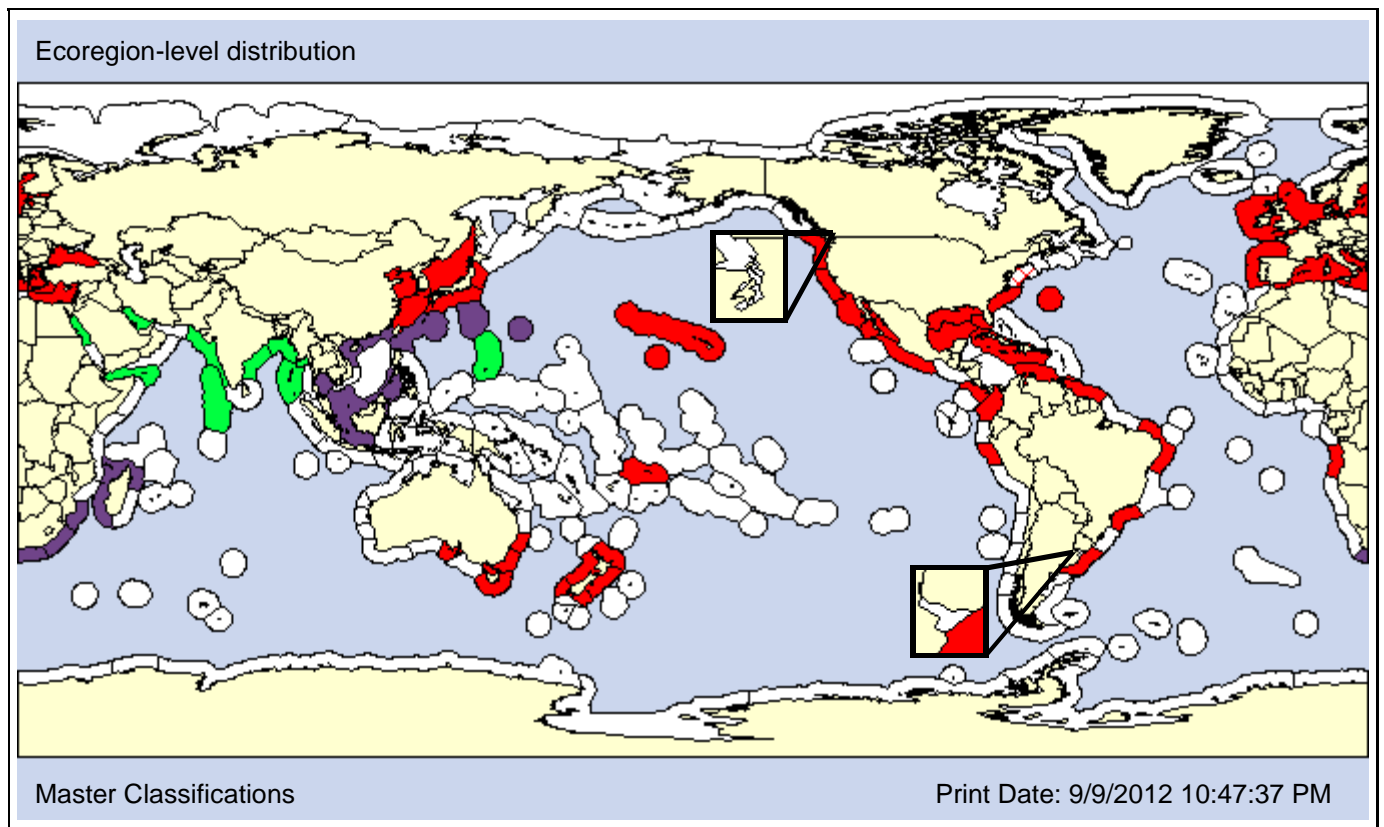
Amphibalanus amphitrite amphitrite  
 Balanus amphitrite  
 Balanus amphitrite amphitrite  
 Balanus amphitrite denticulata

Convention  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Amphitrite's rock barnacle  
 Purple acorn barnacle  
 striped barnacle  
 Tatejima-fujitsubo

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

<b>Date 1st record:</b> 1933	1902	1914
<b>Loc 1st record:</b> Honshu Island, Japan	Honolulu Harbor, Hawaii	Los Angeles Harbor, CA
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	<b>PO X</b>								

Comments: Boundaries between native and invaded ecoregions of *Amphibalanus amphitrite* are unclear. According to Zabin (2009), it is native to Indian Ocean, though fossils have been found in Guam (Paulay et al., 2002). We use regional classifications when available, listing ecoregions bordering native and invaded ecoregions as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 4177m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>	<b>O</b>	
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>O</b>					<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 2 - 36psu] [Pref: 10 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b> <b>O</b>
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P <b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Barnacle

**Taxonomic Author:** (Gould, 1841)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

**Also Known As (Name - Type):**

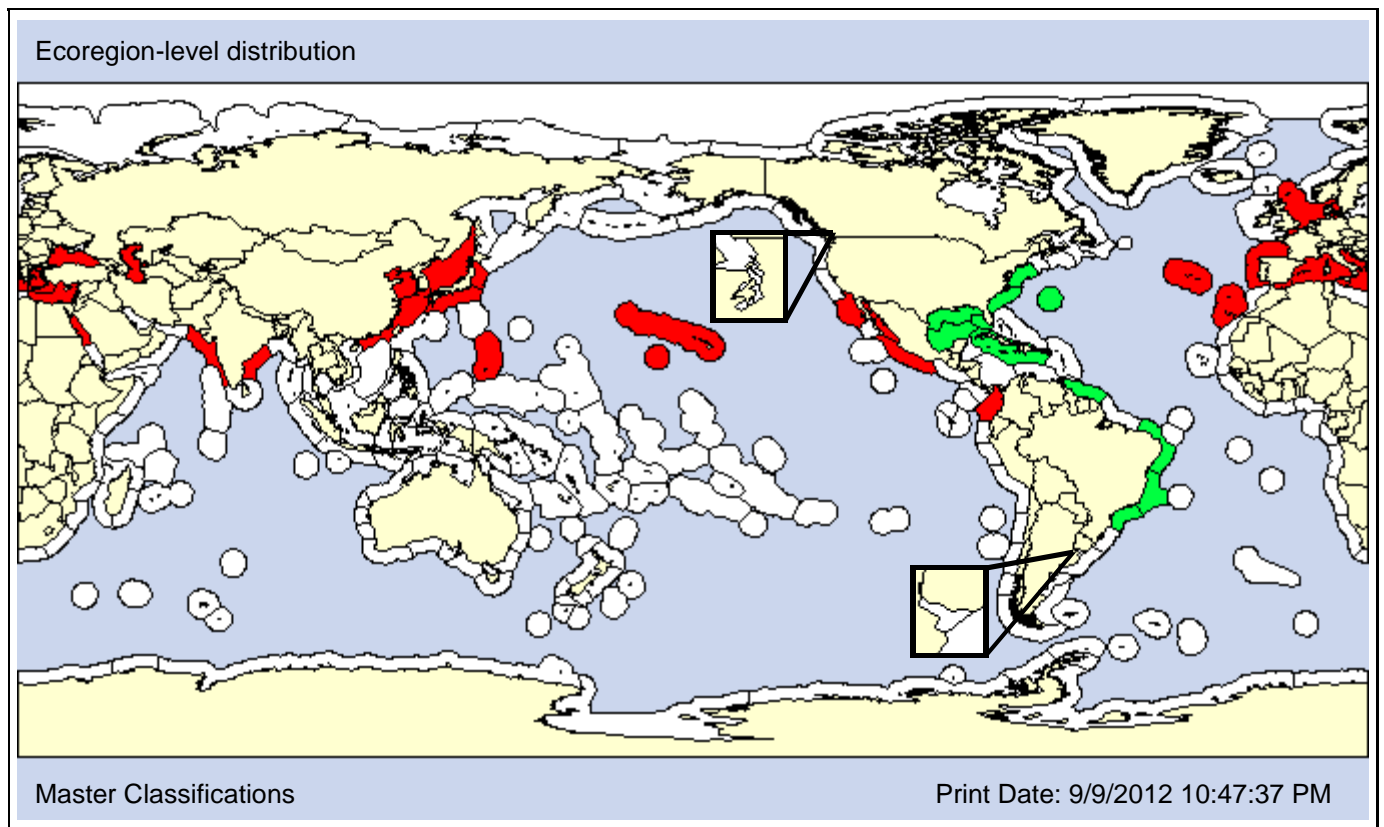
Balanus democraticus  
 Balanus ebumeus  
 Balanus eburneus

Synonym  
 Misspelling  
 Synonym

**Common Names:**

Amerika-fujitsubo  
 ivory barnacle

**Type Locality:** Boston Bay, Massachusetts, USA



Master Classifications Print Date: 9/9/2012 10:47:37 PM

Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP

Hawaii

NEP

**Date 1st record:** 1950

1929

1959

**Loc 1st record:** Yokosuka, Japan

Pearl Harbor, Oahu, Hawaii

Gulf of California, Mexico

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments: Although not reported from Southern California until 2000 (CANOD, 2009), the Western Atlantic barnacle, *Amphibalanus eburneus*, had been reported from the Gulf of Mexico in 1959 (Henry and Mclaughlin, 1975).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 37m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>O</b>						<b>O</b>	<b>P</b>		<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

# Amphibalanus improvisus

Species ID: 3012004

**Taxon:** Barnacle

**Taxonomic Author:** (Darwin, 1854)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

**Also Known As (Name - Type):**

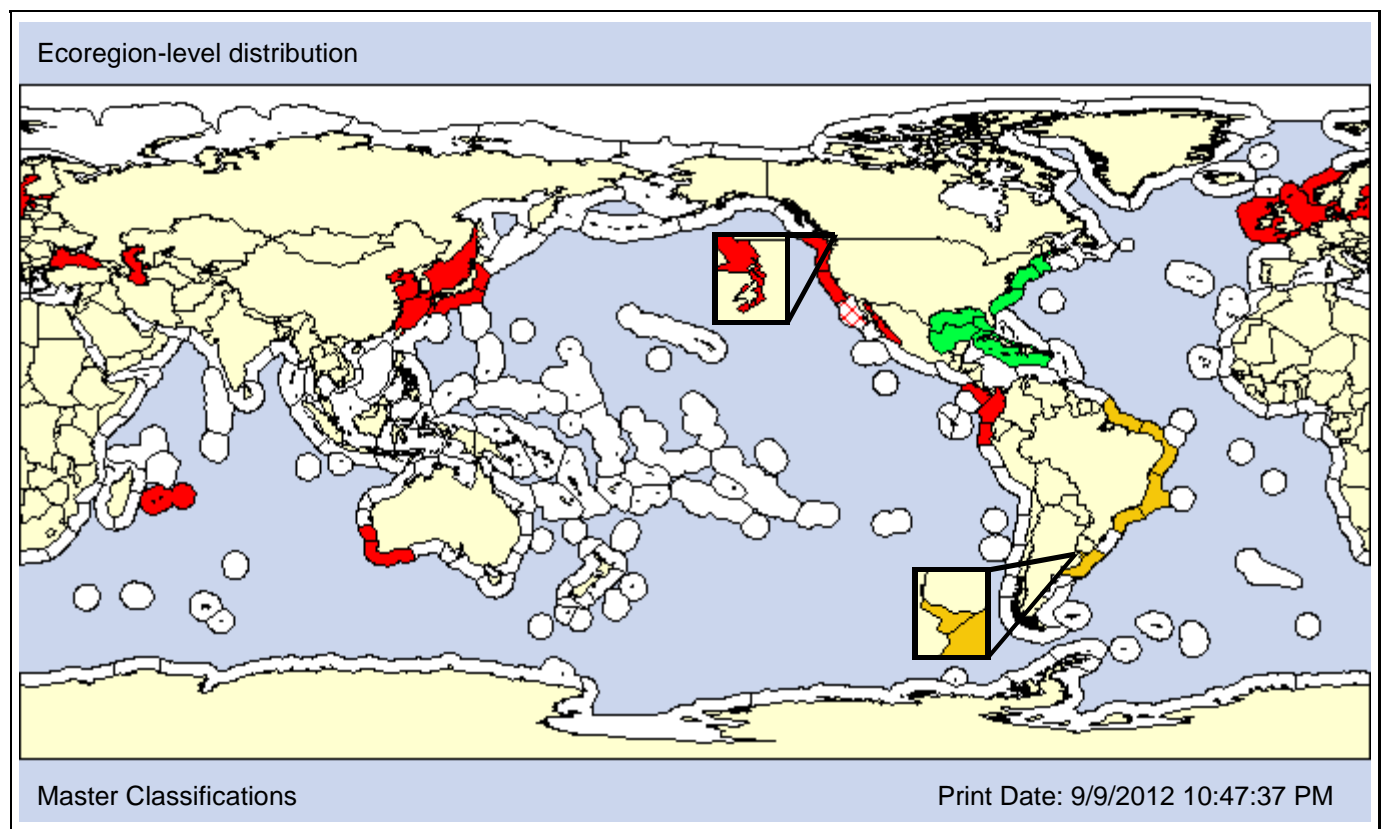
Balanus improvisus

Synonym

**Common Names:**

acorn barnacle (Amphibalanus improvisus)  
bay barnacle  
Yoroppa-fujitsubo

**Type Locality:** not designated



**Date 1st record:** 1952

1853

**Loc 1st record:** Ago Bay, Japan

San Francisco Estuary, CA

**Established:** Yes

Yes

## VECTORS

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>				<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 90m] [Pref: 0 - 6m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 2.81 - 56.58%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>P</b>							<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>

**SALINITY [Obs: 0 - 40psu] [Pref: 6 - 30psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>			<b>X</b>							

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							

**Taxon:** Barnacle

**Taxonomic Author:** (Utinomi, 1967)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

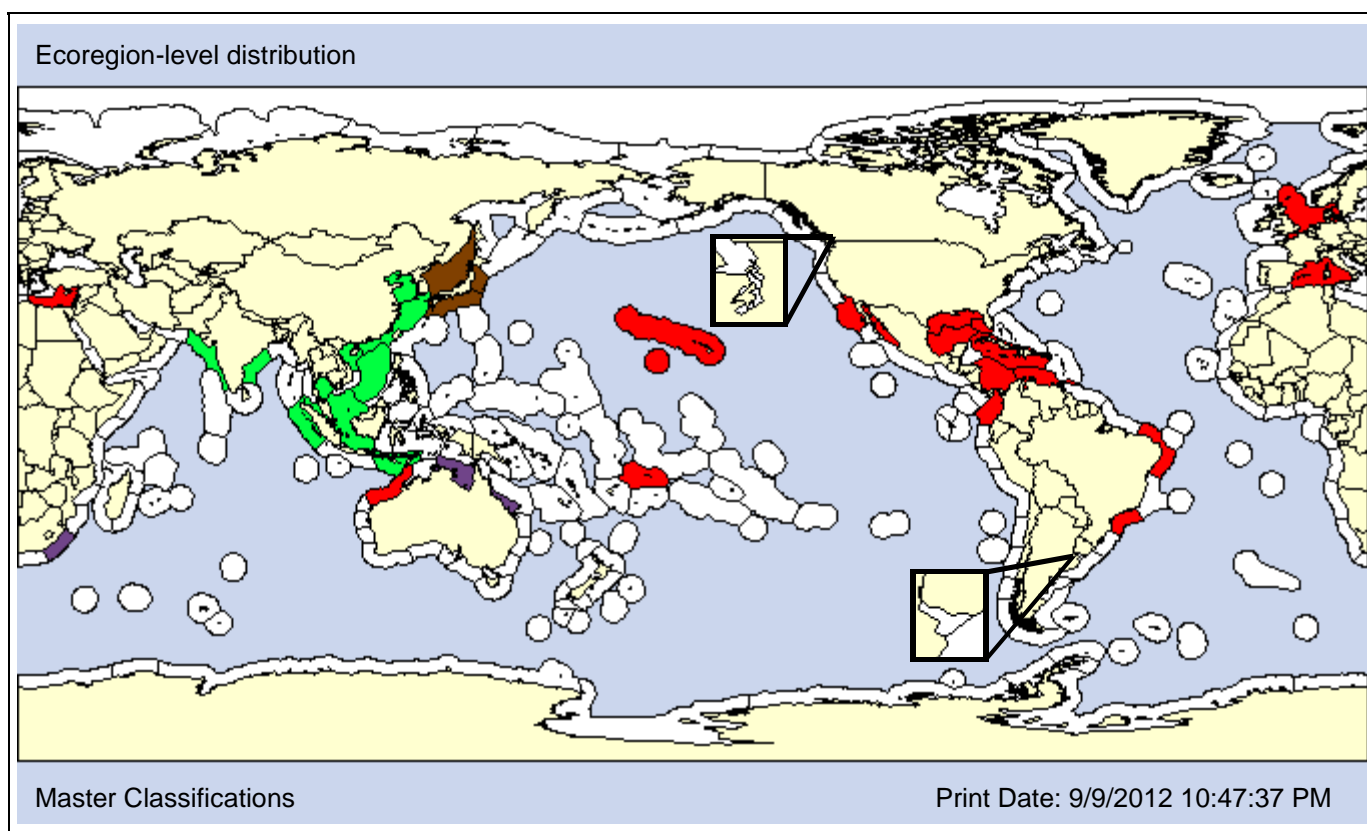
**Also Known As (Name - Type):**

Balanus reticulatus  
Balanus reticulatus

Misspelling  
Synonym

**Common Names:**

**Type Locality:**



NWP

Hawaii

NEP

**Date 1st record:** 1934

1929

1984

**Loc 1st record:** Japan

Oahu, Hawaii

Mazatlan, Mexico

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: *Amphibalanus reticulatus* was considered native in Japan (Iwasaki, 2006); however Doi et al. (2011) list it as cryptogenic. We classify it as a conflict in the ecoregions boarding mainland Japan and native in the Western and Central Indo-Pacific with the exception of Australia where it is introduced (Jones, 2004) or unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 22m] [Pref: 0 - 15m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>						<b>P</b>	<b>P</b>			<b>P</b>	

**SALINITY [Obs: 11 - 36psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

# Amphibalanus subalbidus

Species ID: 101882

**Taxon:** Barnacle

**Taxonomic Author:** (Henry, 1973)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

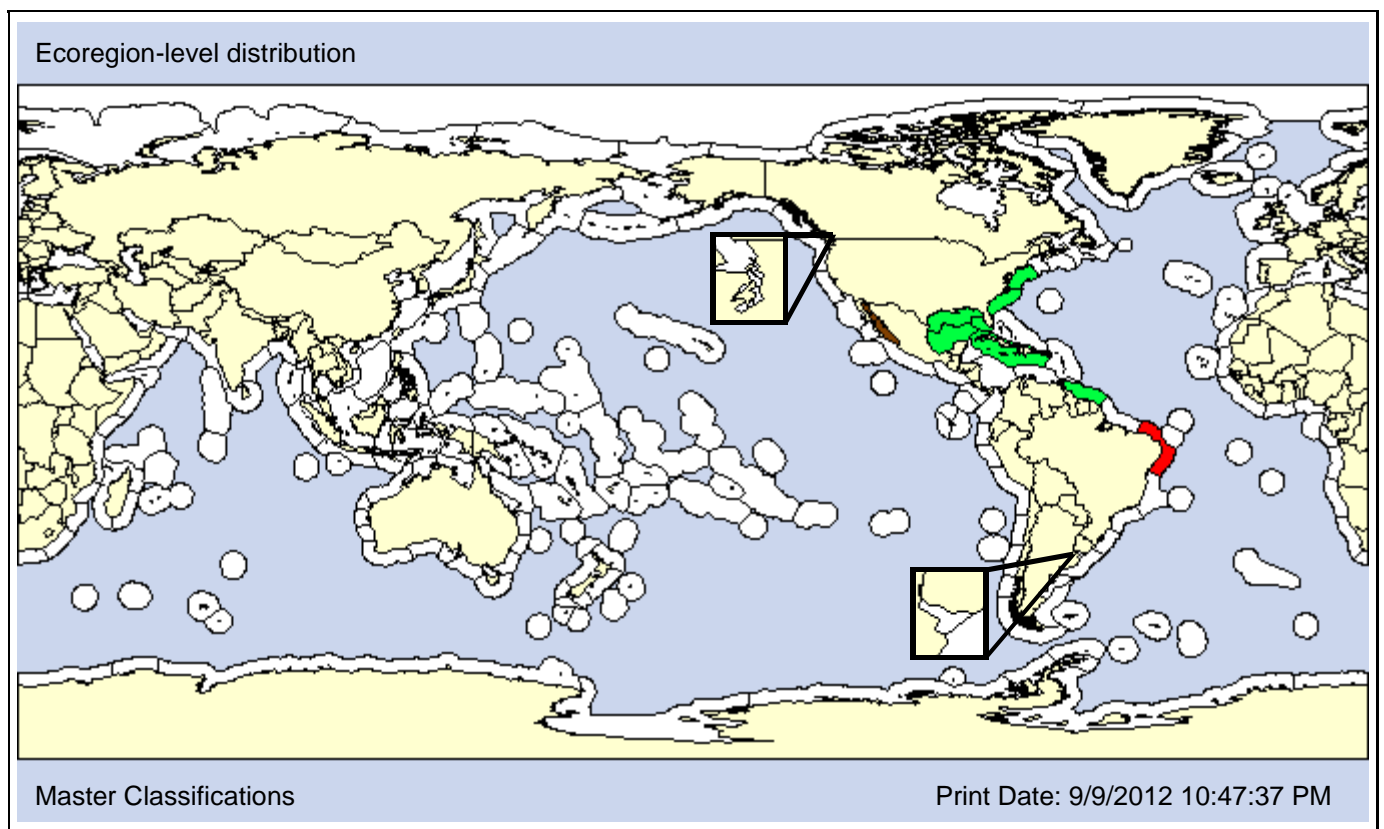
**Also Known As (Name - Type):**

Balanus amphitrite pallidus; not Darwin, 1854  
Balanus subalbidus

Partial synonym  
Synonym

**Common Names:**

**Type Locality:** Lake Pontchartrain, Louisiana



**Date 1st record:**

1989

**Loc 1st record:**

Gulf of California, Mexico

**Established:**

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X				A	P				
						AO	PO								

Comments: Van Syoc (1992, Proc. San Diego Soc. Nat. Hist. 12:1-7) concluded that the Amphibalanus subalbidus in the Gulf of California constitute a relict population from a Mio-Pliocene amphi-American distribution. However, Carlton et al. (2011) argue that the A. subalbidus in the Gulf of California are not native, perhaps introduced with shrimp mariculture operations. We treat this as a conflict.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>	<b>O</b>				<b>O</b>

**SALINITY [Obs: 0 - psu]**

<b>Fresh O</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>						

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							



# Amphibalanus variegatus

Species ID: 3011999

**Taxon:** Barnacle

**Taxonomic Author:** (Darwin, 1854)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

**Also Known As (Name - Type):**

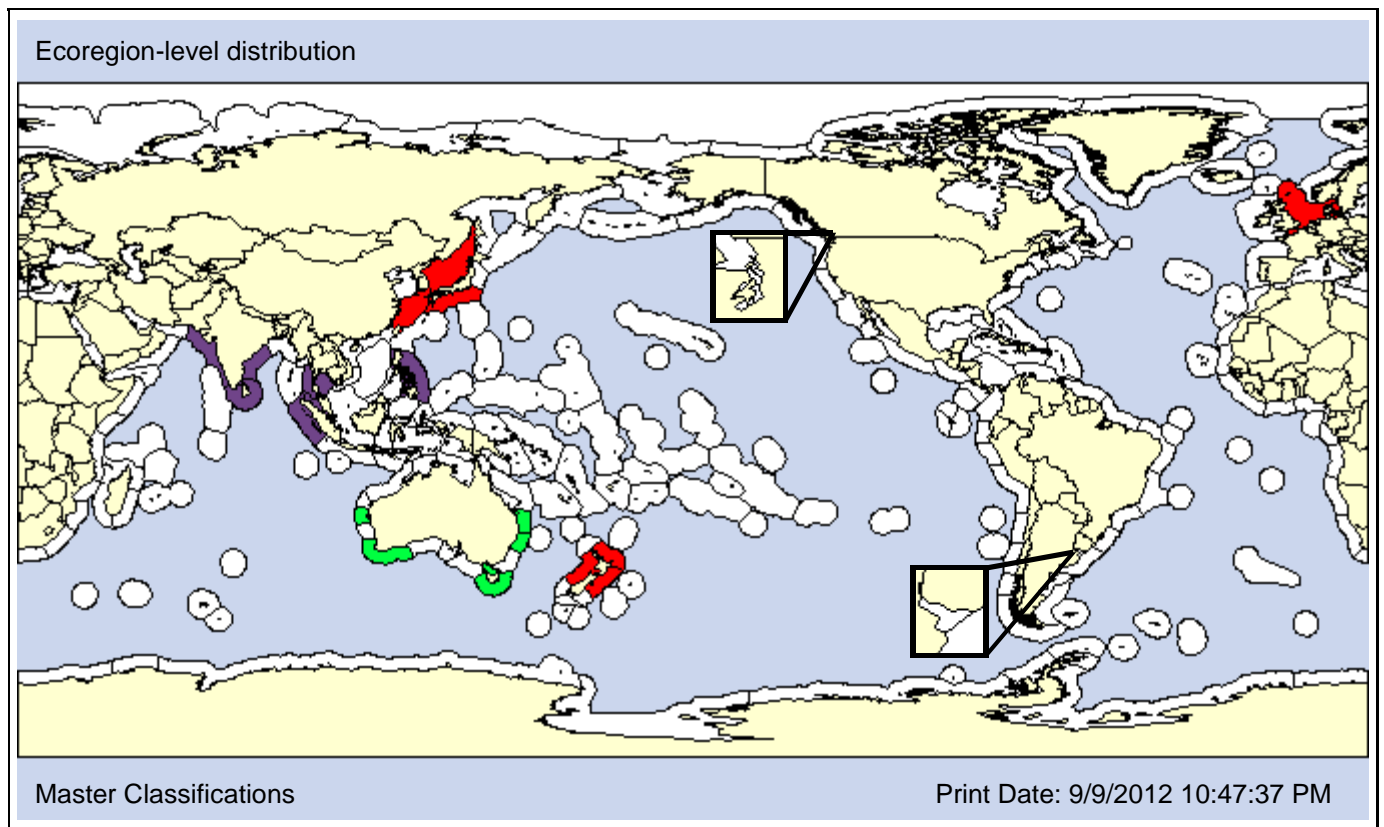
Balanus amphitrite var. cirratus of Darwin, 1854  
 Balanus amphitrite var. variegatus of Darwin, 1854  
 Balanus amphitrite variegatus  
 Balanus variegatus

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Amime-fujitsu

**Type Locality:** Sydney, Australia



**Date 1st record:** 1935

**Loc 1st record:** Kumamoto Prefecture, Japan

**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments: The barnacle *Amphibalanus variegatus* is considered introduced in Japan (Iwasaki, 2006) and New Zealand (Cranfield et al., 1998a) while Dafforn et al. (2009) and others classify it as native to Australia. We list the Central and Western Indo-Pacific regions as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 3m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>								<b>Artificial Substrate P</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>							<b>O</b>		<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: - 32psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF <b>X</b>				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					
			<b>X</b>								

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Barnacle

**Taxonomic Author:** (Darwin, 1854)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

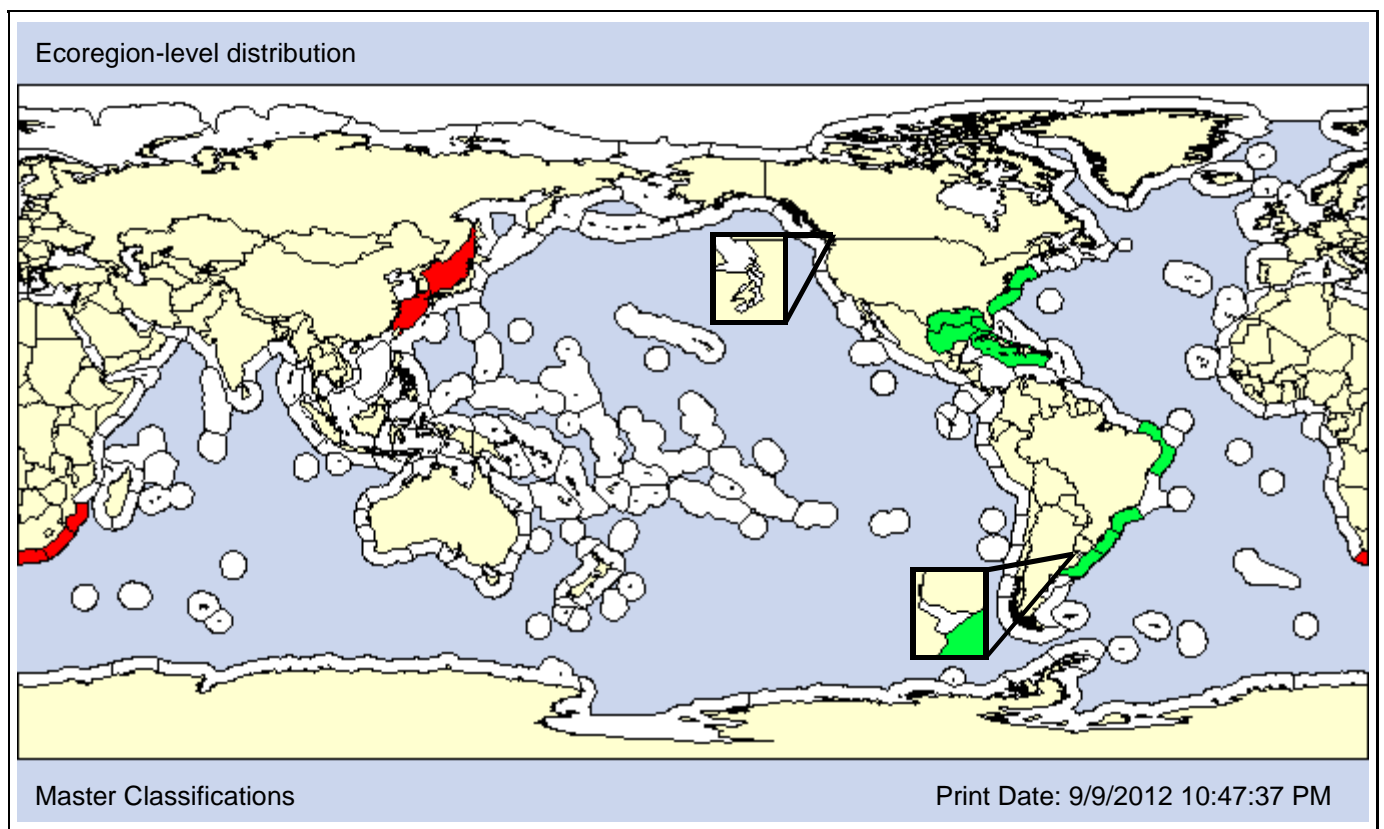
**Also Known As (Name - Type):**

Balanus amphitrite niveus	Synonym
Balanus amphitrite var. venustus	Synonym
Balanus amphitrite venustus	Synonym
Balanus venustus	Synonym

**Common Names:**

Akashima-fujitsubo
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**Type Locality:**



**Date 1st record:** 1967

**Loc 1st record:** Wakasa Bay, Japan

**Established:** Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR			A	P			
		<b>X</b>				AO	PO								

Comments: Mead et al. (2011) consider that the "tropical and subtropical western North Atlantic" is the native region for *Amphibalanus venustus*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>P</b>	<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH <b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 135m] [Pref: - 62m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
											<b>O</b>	<b>O</b>	<b>O</b>	

**SALINITY [Obs: 28 - 36psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						<b>X</b>
						<b>X</b>							

# *Amphibalanus zhujiangensis*

Species ID: 170123

**Taxon:** Barnacle

**Taxonomic Author:** (Ren, 1989)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

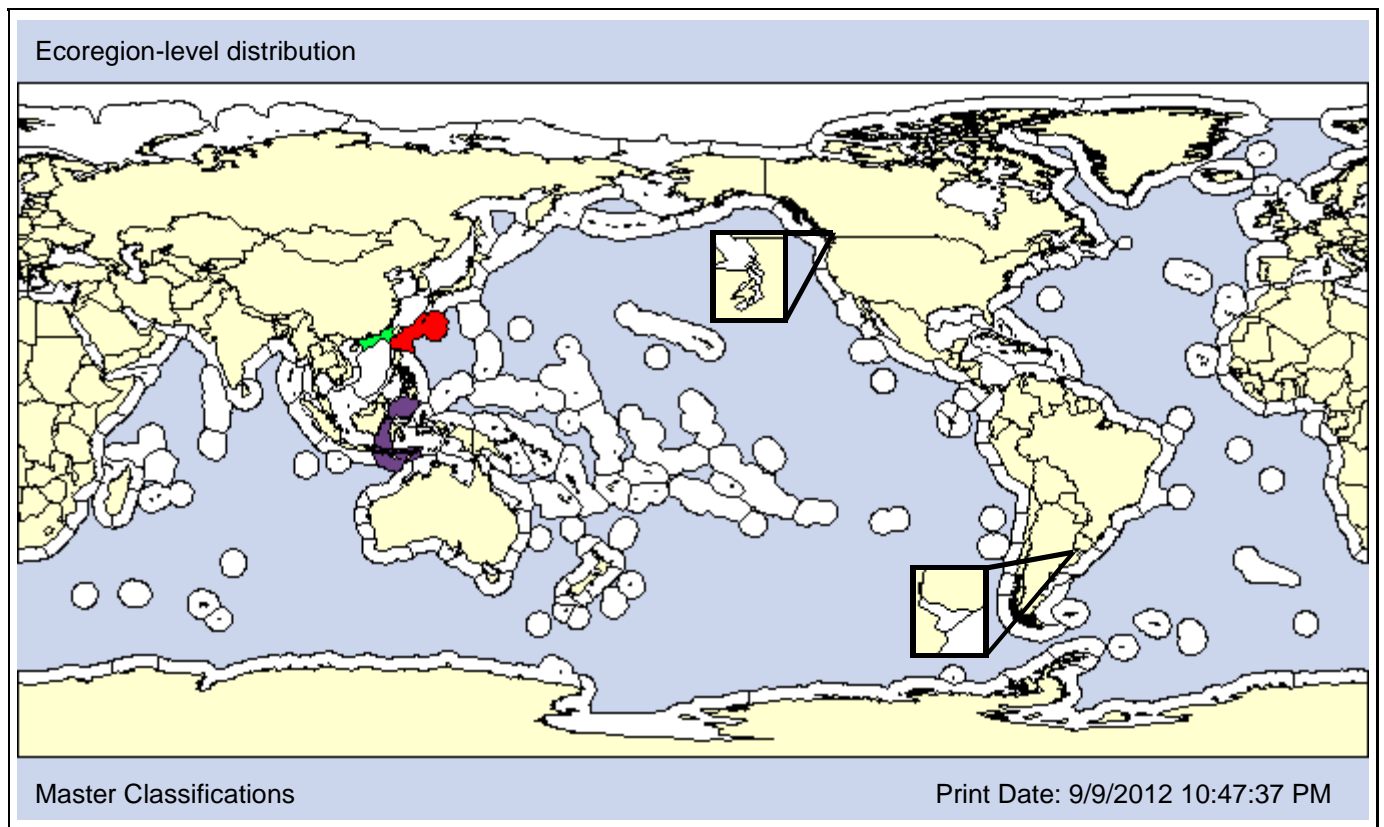
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Balanus zhujiangensis	Synonym	
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**Type Locality:** Zhujiang River, China



**Date 1st record:** 1997

**Loc 1st record:** Gushikawa River, Japan

**Established:** Yes

## VECTORS

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: *Amphibalanus zhujiangensis* was recently described from the Zhujiang River, in the South China Sea, and was then found on Okinawa Island, Japan in 1997, where it is considered introduced (Doi et al., 2011). It was subsequently found in various locations in the Central Indo-Pacific, which we list as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - 1m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	P

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Barnacle

**Taxonomic Author:** Darwin, 1854

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

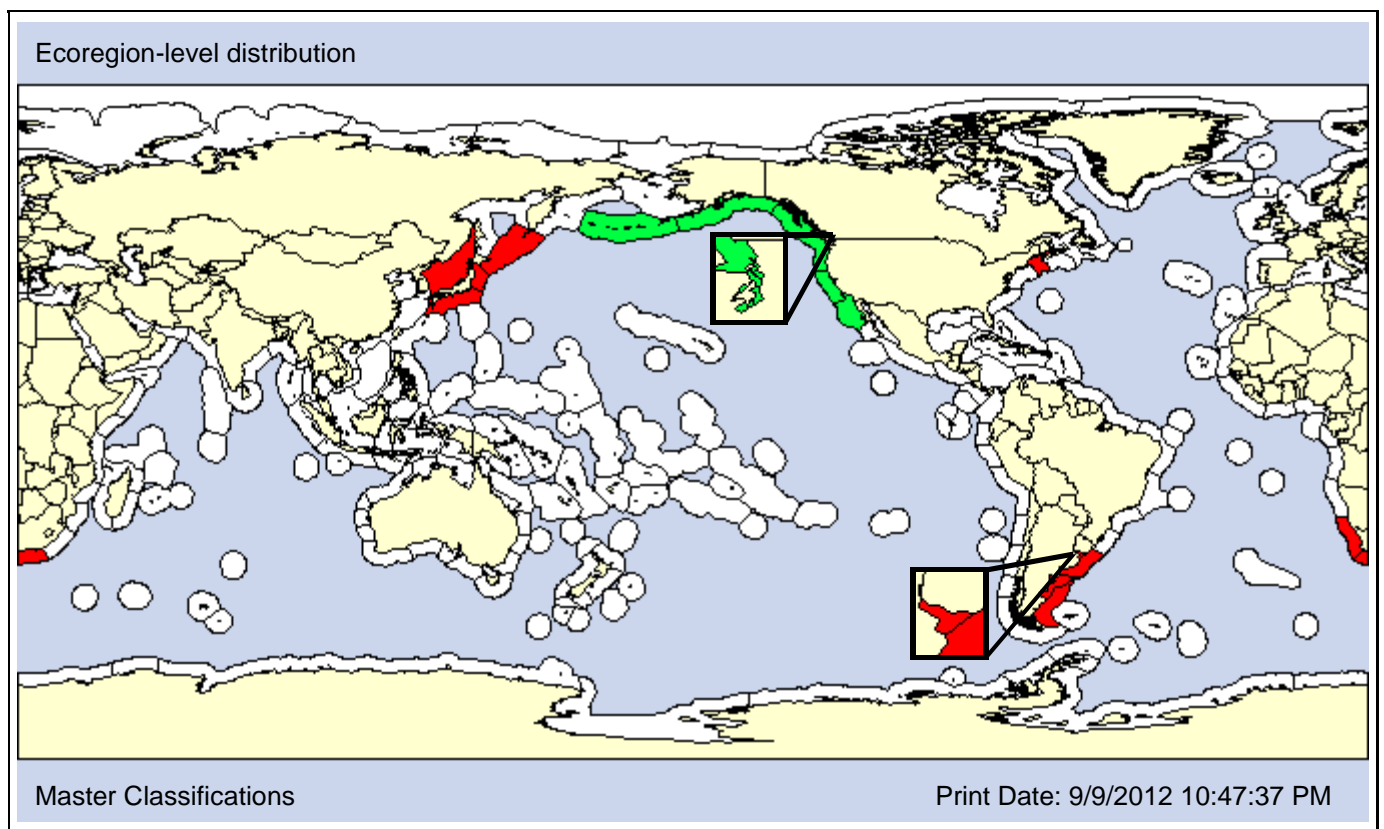
**Also Known As (Name - Type):**

Amphibalanus glandula	Synonym

**Common Names:**

common acorn barnacle
Kita-amerika-fujitsubo

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 2000

Native

**Loc 1st record:** Ofunato, Iwate, Japan

Native

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 45.5m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 0.65 - 90.05%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>	<b>P</b>				<b>O</b>		<b>P</b>		<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 30 - 31psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Barnacle

**Taxonomic Author:** Bruguière, 1789

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

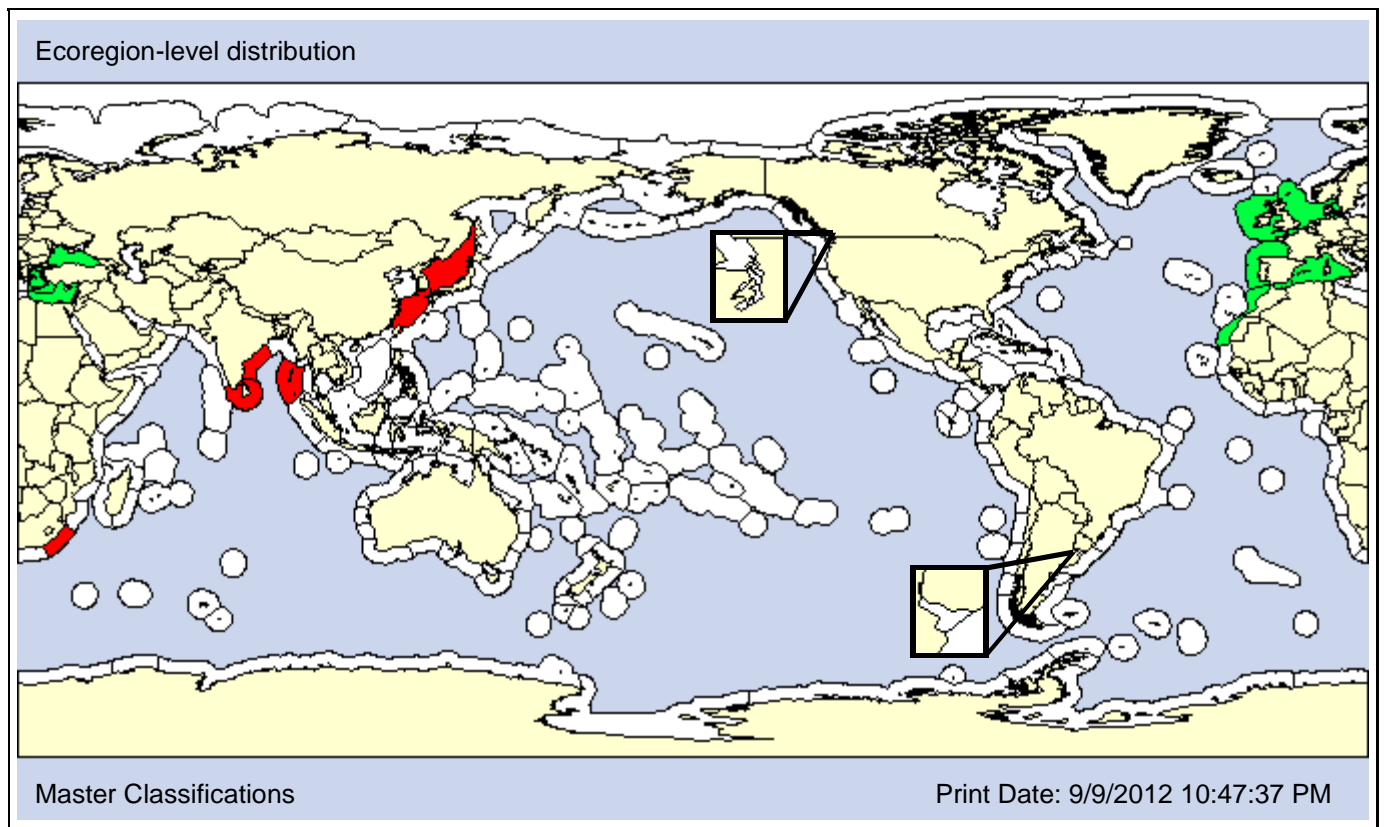
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

volcano barnacle

**Type Locality:**



**Date 1st record:** 2006

**Loc 1st record:** Korea (Sea of Japan)

**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: *Balanus perforatus* is an "eastern Atlantic warm water species" (Kerckhof and Cattrijsse, 2001) that has been introduced into Korea (Seo and Lee, 2008; Kim and Hong, 2010). It has also been reported from the Western Indo-Pacific and South Africa; we assume it is introduced in both these regions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 20m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>O</b>								<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Barnacle

**Taxonomic Author:** Dando & Southward, 1980

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Chthamaloidea

**Family:** Chthamalidae

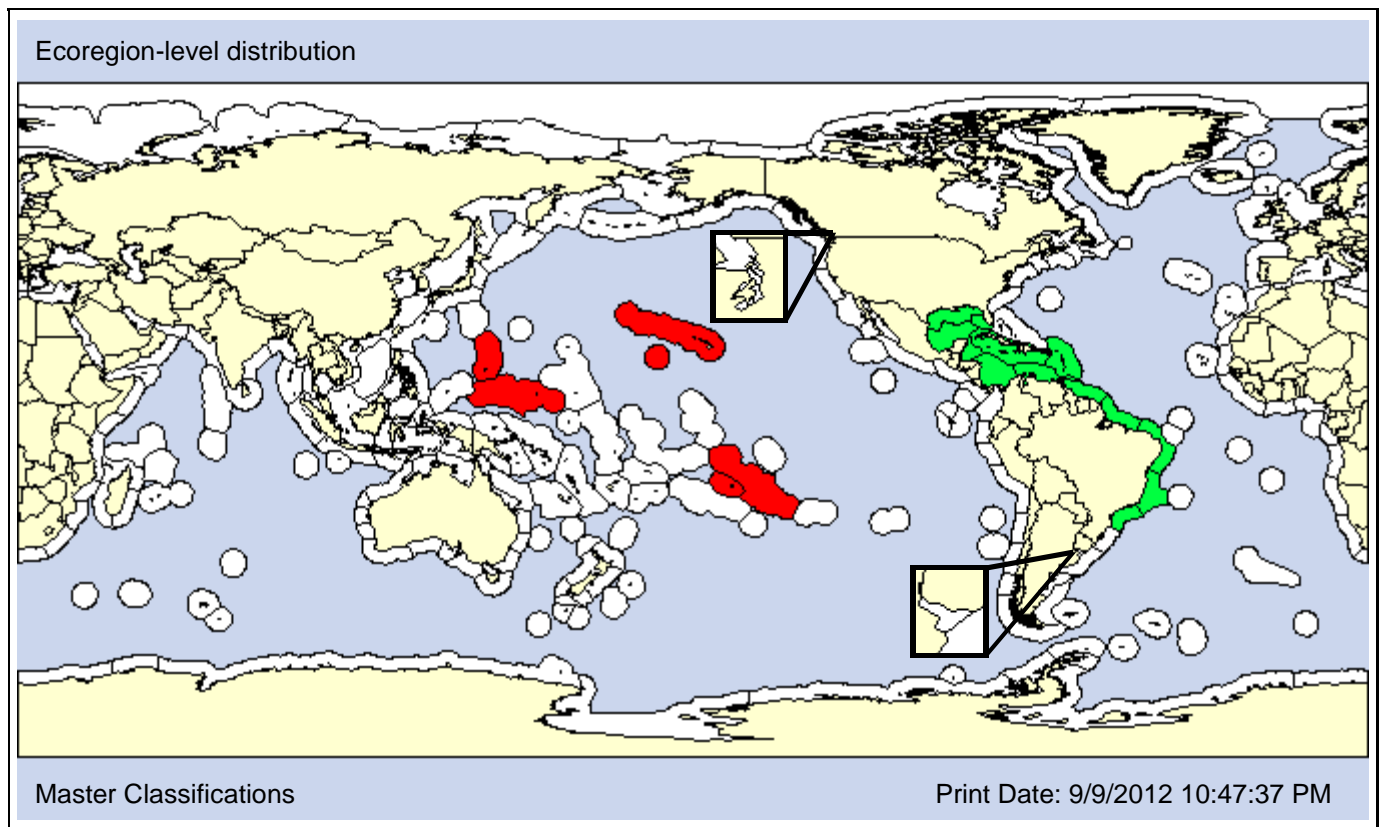
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Caribbean barnacle  
Proteus' rock barnacle

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1993  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: The high intertidal barnacle, *Chthamalus proteus*, was introduced into Hawaii presumably via hull fouling. *C. proteus* was present on barges that have entered various ports in California, Oregon, and Washington, but it has not yet become established in the NEP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - 3m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
	<b>P</b>	<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>P</b>			<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 11 - 36psu] [Pref: 22 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

# Megabalanus coccopoma

Species ID: 110005

**Taxon:** Barnacle

**Taxonomic Author:** (Darwin, 1854)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

**Also Known As (Name - Type):**

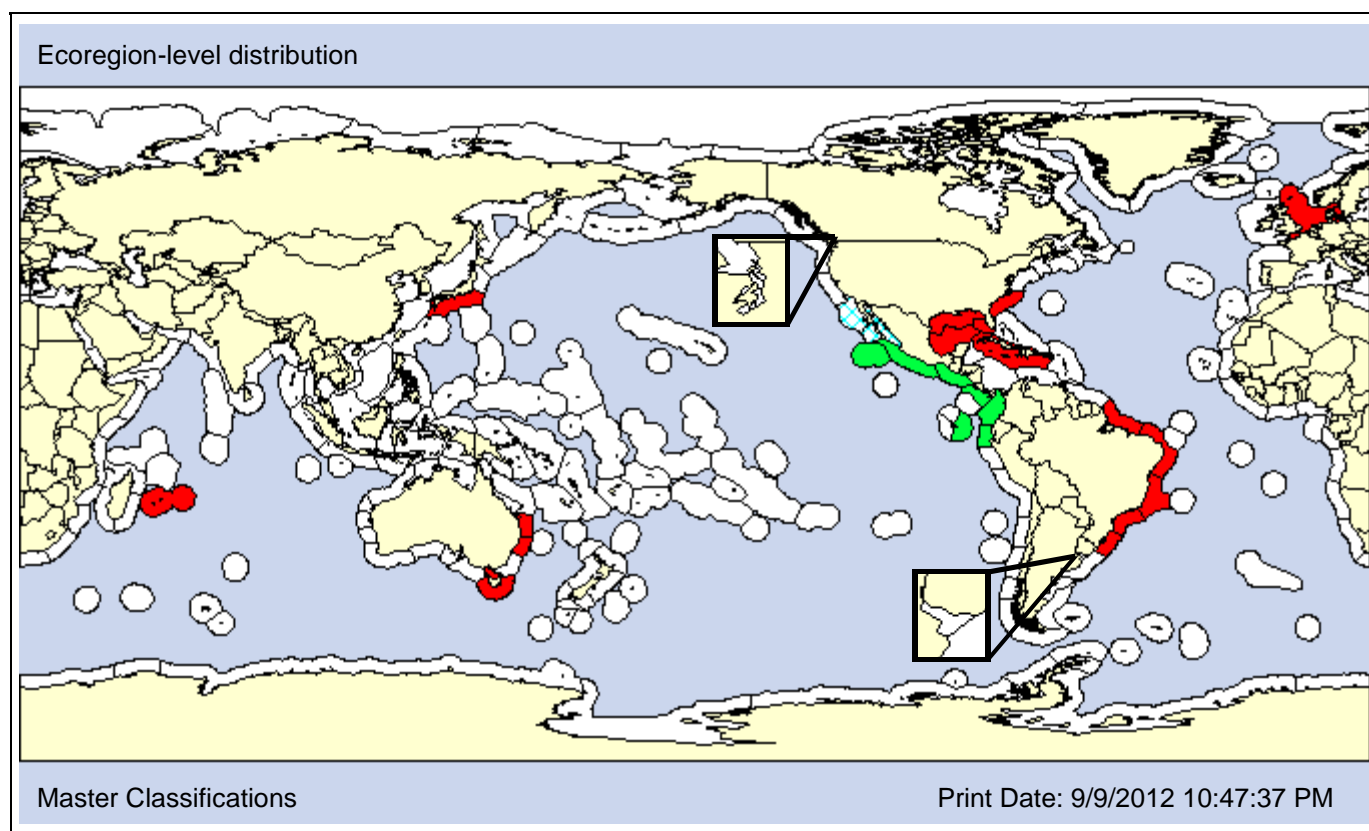
Balanus tintinnabulum coccopoma  
 Balanus tintinnabulum var. coccopoma

Synonym  
 Synonym

**Common Names:**

titan acorn barnacle

**Type Locality:** Pacific Panama



**Date 1st record:** 2000

1982

**Loc 1st record:** Kobe Port, Hyogo, Japan

San Diego, CA

**Established:** Yes

No

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				X
X		X				AO	PO								

Comments: Megabalanus coccopoma is native to the Tropical Eastern Pacific, and has invaded Japan, the Atlantic, and Indo-Pacific. This tropical barnacle showed up off of San Diego, California after the 1982-1983 El Nino but did not become established (Newman and McConnaughey, 1987), and we assume it is not established in the Gulf of California.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	P						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	

**DEPTH [Obs: 0 - 7m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	P

**SALINITY [Obs: 16 - 32psu] [Pref: - 32psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
			O	O	O				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

# Megabalanus tintinnabulum

Species ID: 2011637

**Taxon:** Barnacle

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

**Also Known As (Name - Type):**

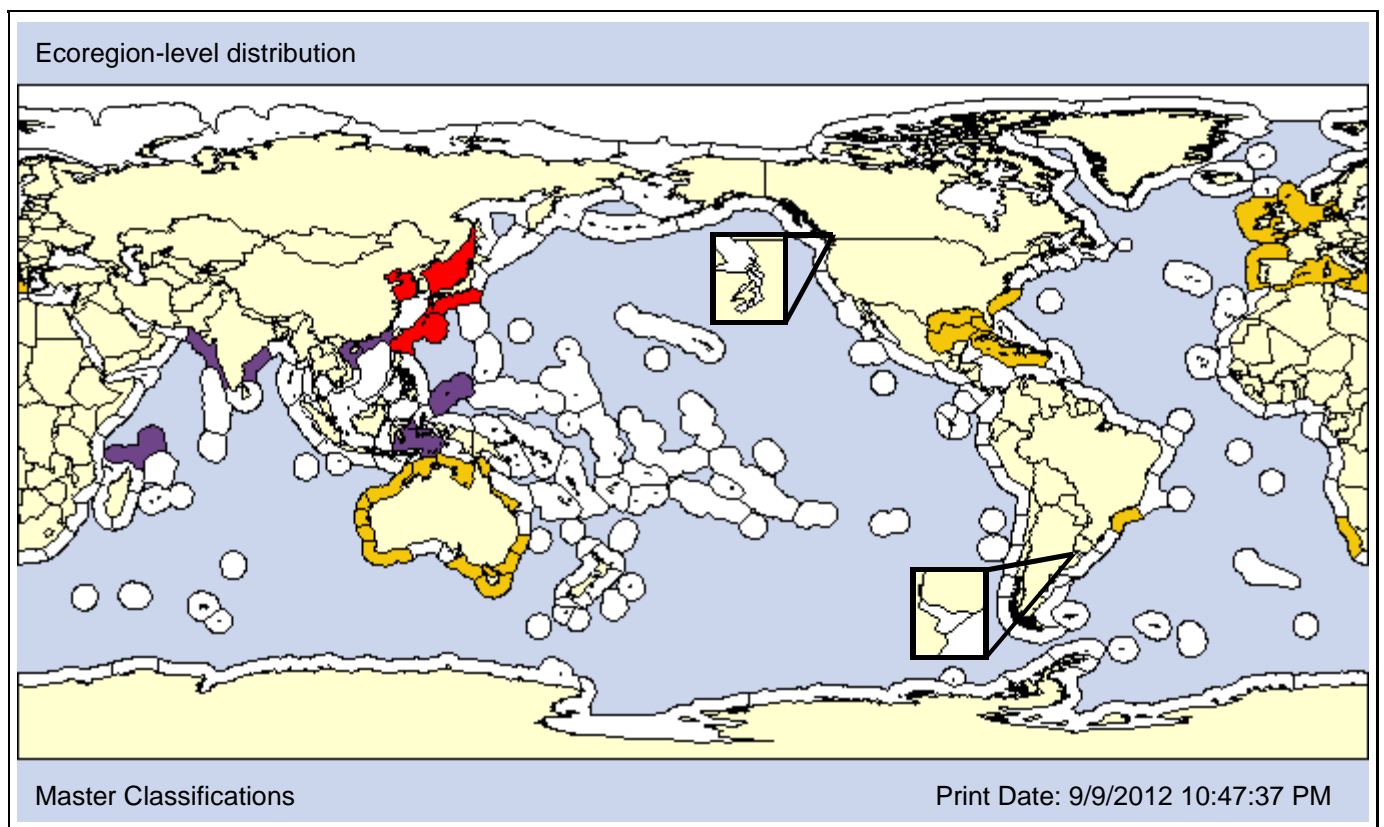
Balanus tintinnabuliformis laevis  
 Balanus tintinnabulum  
 Balanus tintinnabulum antillensis  
 Balanus tintinnabulum communis

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

acorn barnacle (*Megabalanus tintinnabulum*)

**Type Locality:** Amboina, Indonesia (lectotype)



**Date 1st record:** Unknown  
**Loc 1st record:** Osaka Bay, Japan  
**Established:** Unknown

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR		A	P				
X		X				AO	PO							

Comments: The distribution of *Megabalanus tintinnabulum* is confused by many of its subspecies being elevated to species. We tentatively classify it as introduced in Japan (Mito and Uesugi, 2004) and cryptogenic in Australia (NIMPIS) and the Atlantic (Carlton et al., 2011); other authors consider it introduced in Europe, Brazil, and Australia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 40m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>O</b>						<b>O</b>		<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Barnacle

**Taxonomic Author:** (Darwin, 1834)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Maxillopoda

**Subclass:** Thecostraca

**Infraclass:** Cirripedia

**Superorder:** Thoracica

**Order:** Sessilia

**Suborder:** Balanomorpha

**Infraorder:**

**Superfamily:** Balanoidea

**Family:** Balanidae

**Subfamily:**

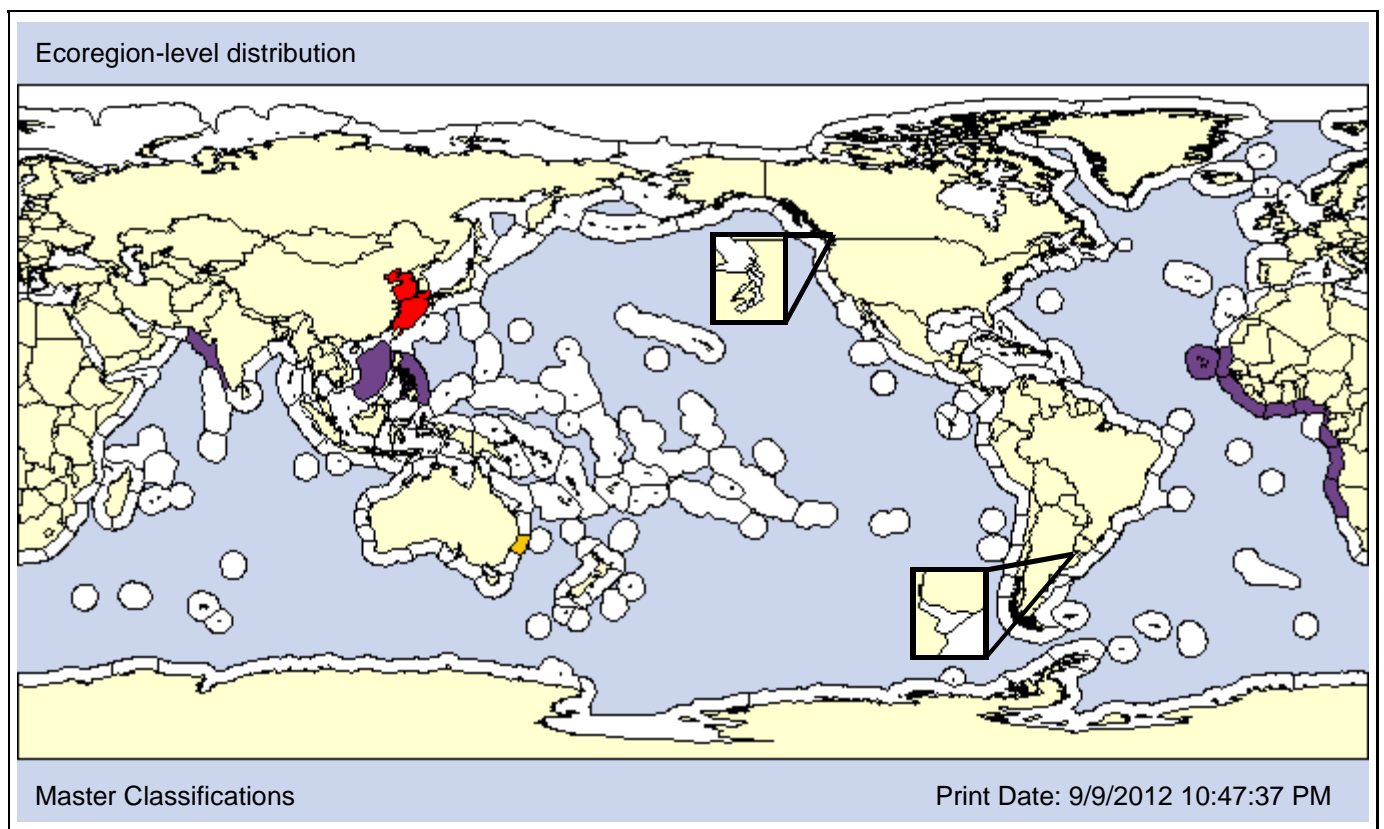
**Also Known As (Name - Type):**

Balanua (Megabalanus) tintinnabulum zebra  
 Balanus tintinnabulum var. zebra  
 Balanus tintinnabulum zebra  
 Megabalanus tintinnabulum zebra

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** Unknown



**Date 1st record:** Unknown

**Loc 1st record:** Unknown

**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: *Megabalanus zebra* is a wide-spread species whose native range is unknown. Mito and Uesugi (2004) list it as introduced in Japan, while Clarke et al. (2004), in the GloBallast Report list it as cryptogenic in the Dalian region of China. We tentatively list it as NIS in the NWP pending further analysis.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X	X	

**DEPTH [Obs: 0 - 16.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O									P	P	P

**SALINITY [Obs: 33 - 35psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							

Kingdom: Animalia

Phylum: Arthropoda

Class: Ostracoda

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# Aspidoconcha limnoriae

Species ID: 1545

**Taxon:** Ostracod

**Taxonomic Author:** de Vos, 1953

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Ostracoda

**Subclass:** Podocopa

**Infraclass:**

**Superorder:**

**Order:** Podocopida

**Suborder:** Cytherocopina

**Infraorder:**

**Superfamily:** Cytheroidea

**Family:** Xestoleberididae

**Subfamily:**

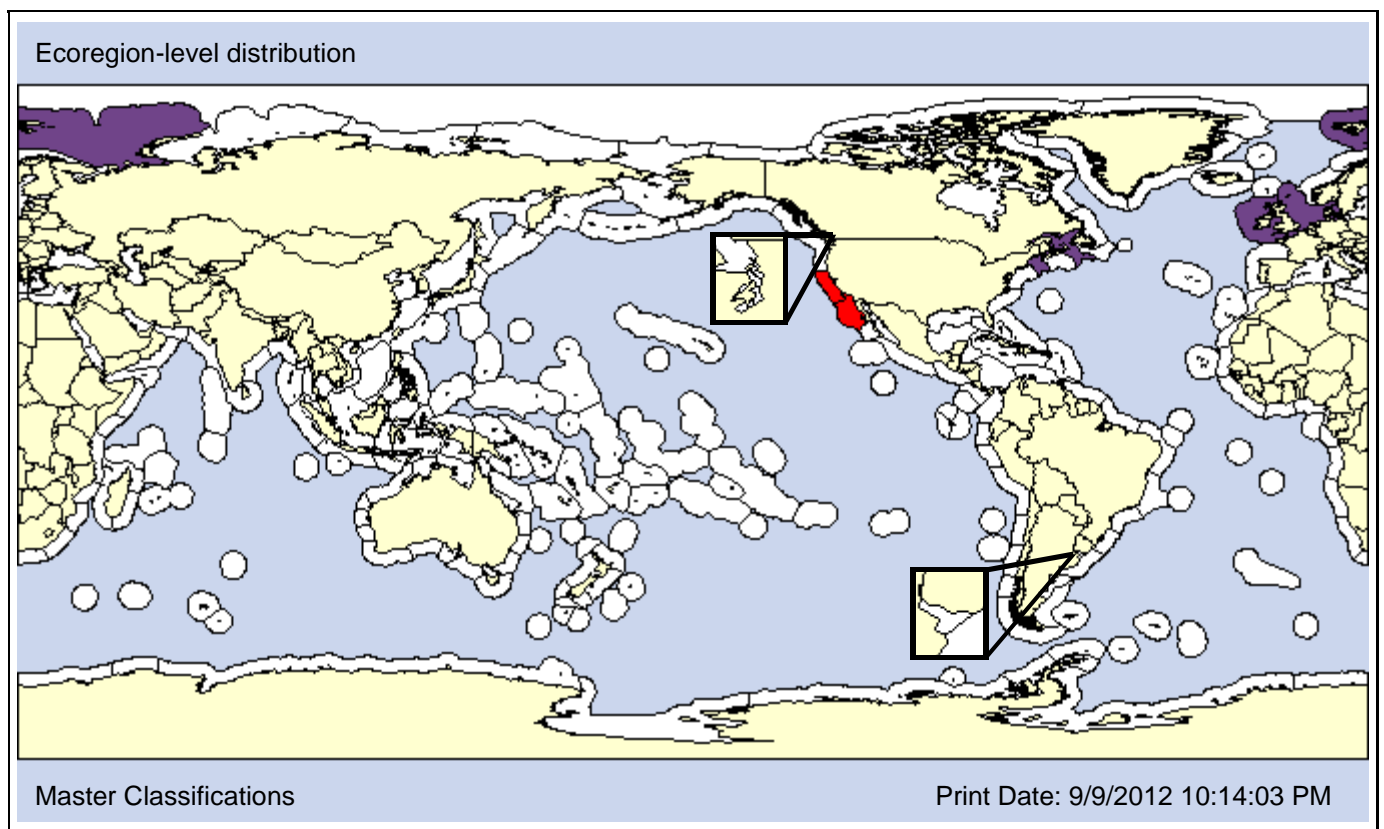
**Also Known As (Name - Type):**

Aspidoconca limnoriae  
Aspidoconcha limnoria

Misspelling  
Misspelling

**Common Names:**

**Type Locality:** Zandvoorst, Netherlands



**Date 1st record:**

1953

**Loc 1st record:**

San Diego Bay, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				X
		X				AO	PO								

Comments: In the NEP, *Aspidoconcha limnoriae* is associated with the non-native wood gribble *Limnoria tripunctata* and thus is considered NIS in the Eastern Pacific. Because of the uncertain origins of wood borers such as *Limnoria*, we consider *A. limnoriae* as unclassified in other regions until additional information becomes available.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										P		O	O	

**SALINITY [Obs: 25 - 33psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
X									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		X					X

**Taxon:** Ostracod

**Taxonomic Author:** (Cushman, 1906)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Ostracoda

**Subclass:** Myodocopa

**Infraclass:**

**Superorder:**

**Order:** Myodocopida

**Suborder:** Myodocopina

**Infraorder:**

**Superfamily:** Sarsielloidea

**Family:** Sarsiellidae

**Subfamily:** Sarsiellinae

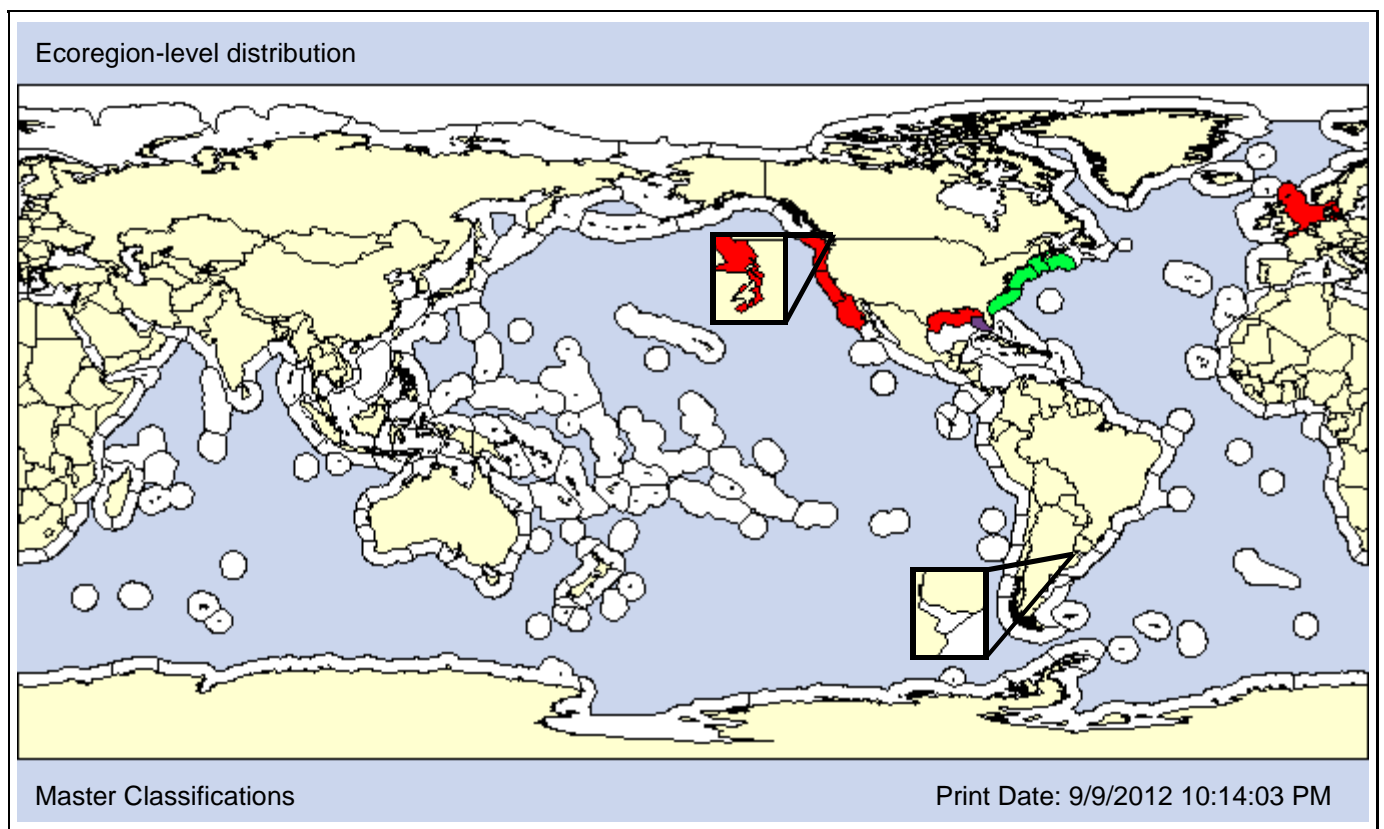
**Also Known As (Name - Type):**

Eusarsiella americana	Synonym
Sarsiella americana	Synonym
Sarsiella tricostata	Synonym
Sarsiella zostericola	Synonym

**Common Names:**

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**Type Locality:** Woods Hole, Massachusetts, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1953

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
						<b>AO X</b>	PO							

Comments:

## REGIME

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>						

## ECOSYSTEM

Unconsolidated <b>X</b>						Consolidated <b>X</b>						Pelagic	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

DEPTH [Obs: 0 - 103.8m] [Pref: 0 - 38m]

## Benthic Depth

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

## Pelagic Depth

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

UNCONSOLIDATED SUBSTRATE [Obs % Fines: 1.8 - 96.55%] **X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

CONSOLIDATED SUBSTRATE **X**

<b>R</b>	<b>HP</b>	Biogenic <b>O</b>						Artificial Substrate						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>											

SALINITY [Obs: 25.5 - 42psu] [Pref: 29 - 35psu]

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>P</b>			

## TROPHIC LEVEL AND FEEDING

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

## REPRODUCTION

Sexual <b>X</b>						Asexual				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

## EARLY DEVELOPMENT

## JUVENILE DEVELOPMENT/DISPERSAL

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

## HABITAT ASSOCIATION

Pelagic			Benthic <b>X</b>							Epibiotic <b>X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		<b>X</b>



**Taxon:** Ostracod

**Taxonomic Author:** De Vos & Stock, 1956

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Ostracoda

**Subclass:** Podocopa

**Infraclass:**

**Superorder:**

**Order:** Podocopida

**Suborder:** Cytherocopina

**Infraorder:**

**Superfamily:** Cytheroidea

**Family:** Cytheridae

**Subfamily:**

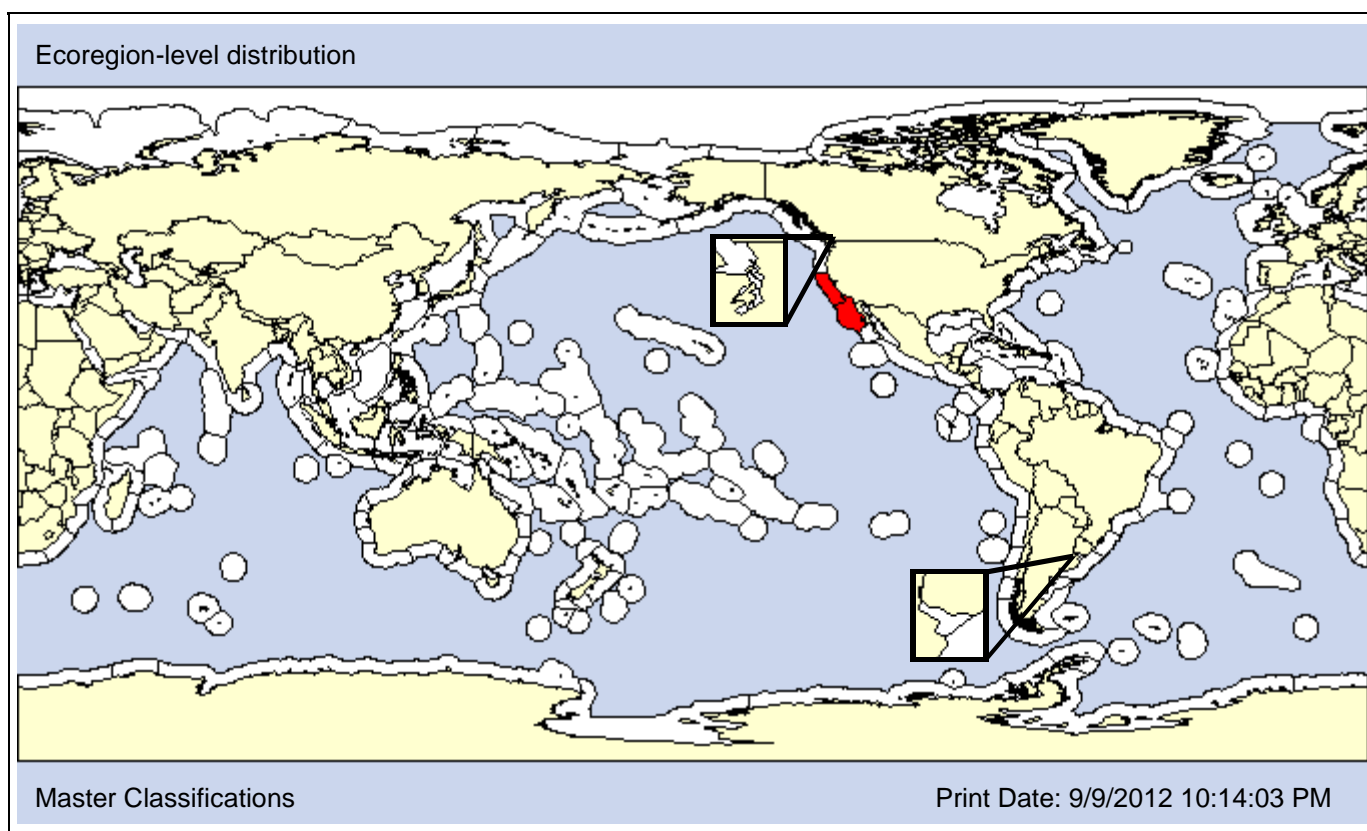
**Also Known As (Name - Type):**

**Common Names:**

[Empty box for Also Known As (Name - Type)]

[Empty box for Common Names]

**Type Locality:** San Diego Bay, California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1953

**Loc 1st record:**

San Diego Bay, CA

**Established:**

Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				X
		X				AO	PO								

Comments: *Redekea californica* is assumed to be NIS in the NEP because it is a commensal/parasite on the non-native gribble *Limnoria tripunctata*. Its native region is not known. Since it is unclear whether *R. californica* has been reported from the NEP recently, we consider its establishment as unknown.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - 2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>		<b>O</b>	<b>O</b>	

**SALINITY [Obs: 25 - 33psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					<b>X</b>

# Spinileberis quadriaculeata

Species ID: 1547

**Taxon:** Ostracod

**Taxonomic Author:** (Brady, 1880)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Crustacea

**Superclass:**

**Class:** Ostracoda

**Subclass:** Podocopa

**Infraclass:**

**Superorder:**

**Order:** Podocopida

**Suborder:** Cytherocopina

**Infraorder:**

**Superfamily:** Cytheroidea

**Family:** Cytheridae

**Subfamily:**

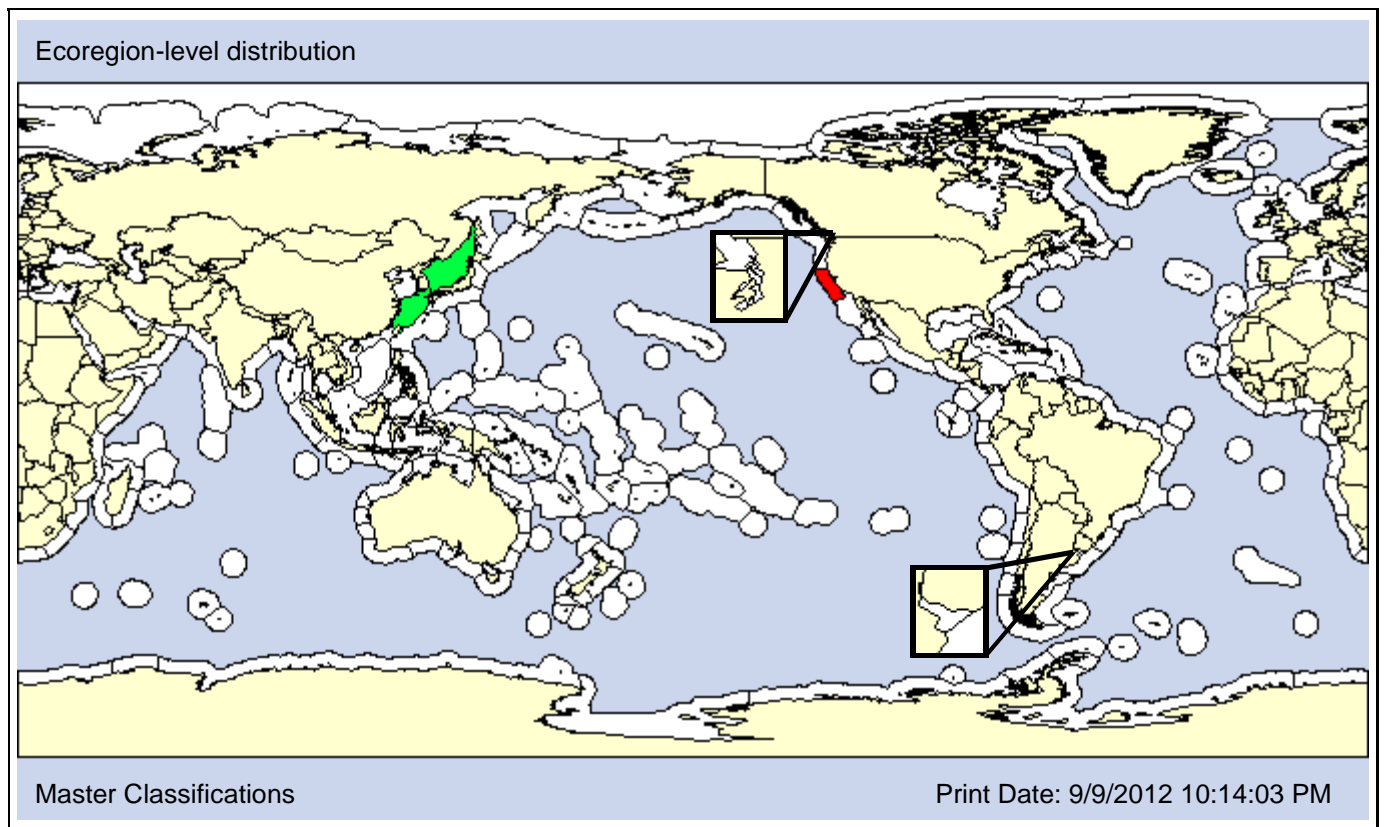
**Also Known As (Name - Type):**

Cythere quadriaculeata  
Spinileberis hyalina  
Spinileberis hyalinus

Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:** Native

about 1965

**Loc 1st record:** Native

Tomales Bay, California

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
						AO	PO X							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>		
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 50m] [Pref: 1.5 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>											

**SALINITY [Obs: 18 - 32psu] [Pref: 20 - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
			<b>O</b>	<b>P</b>	<b>P</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		

**Kingdom: Animalia**

**Phylum: Arthropoda**

**Subphylum: Chelicerata**

**Class: Pycnogonida**

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**Taxon:** Pycnogonid

**Taxonomic Author:** Hilton, 1942

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:**

**Infraorder:**

**Superfamily:**

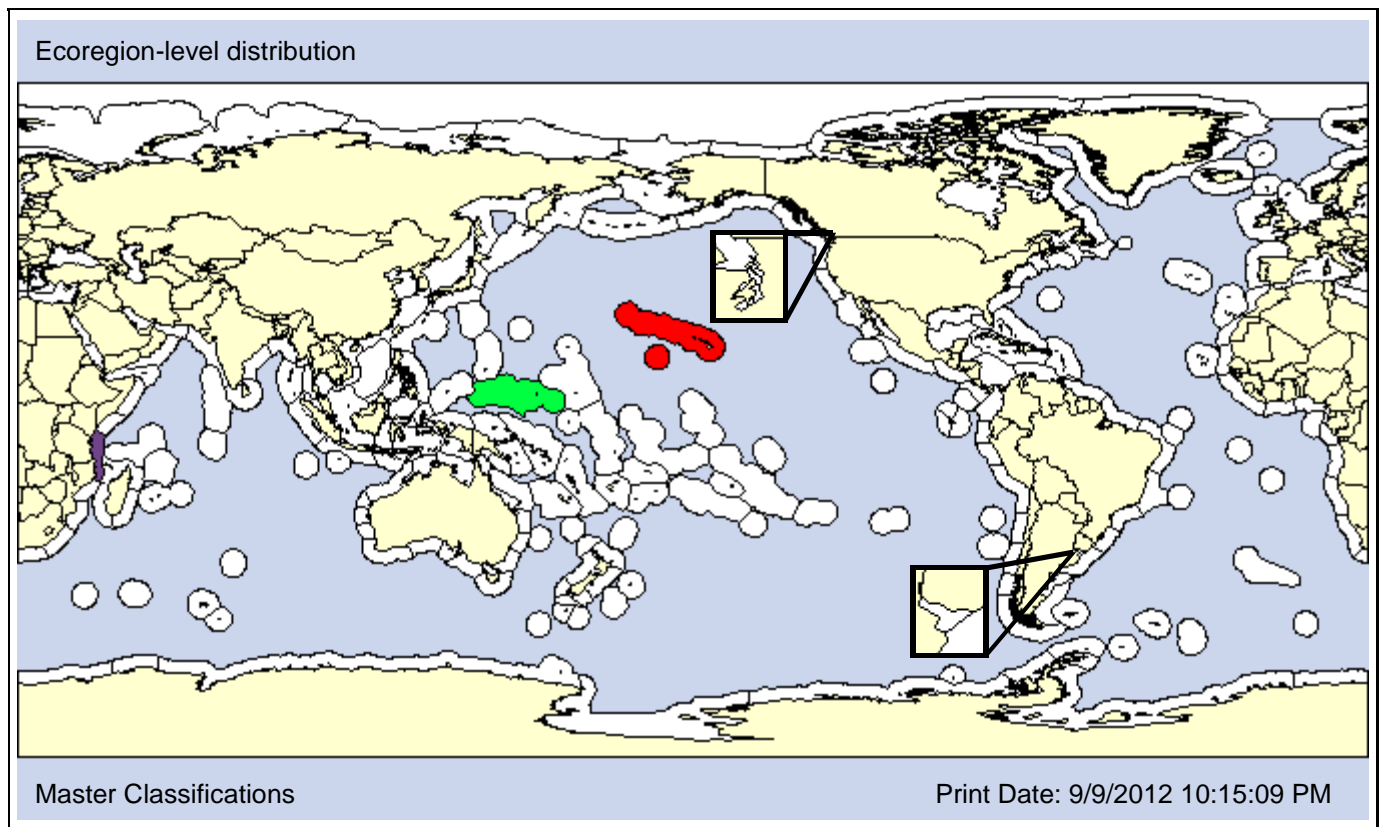
**Family:** Ammotheidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Oahu, Hawaii, USA (Waikiki Aquarium)



<span style="display:inline-block; width:15px; height:15px; background-color: #4CAF50; border: 1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color: #F44336; border: 1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color: #FFEB3B; border: 1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color: #4DD0E1; border: 1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color: #9575CD; border: 1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color: #795548; border: 1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black;"></span> Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 1930  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
<span style="color: red;">X</span>		<span style="color: red;">X</span>				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: 0 - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY [Obs: - 34psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							



# Anoplodactylus arescus

Species ID: 122855

**Taxon:** Pycnogonid

**Taxonomic Author:** du Bois-Reymond Marcus, 1959

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:**

**Infraorder:**

**Superfamily:**

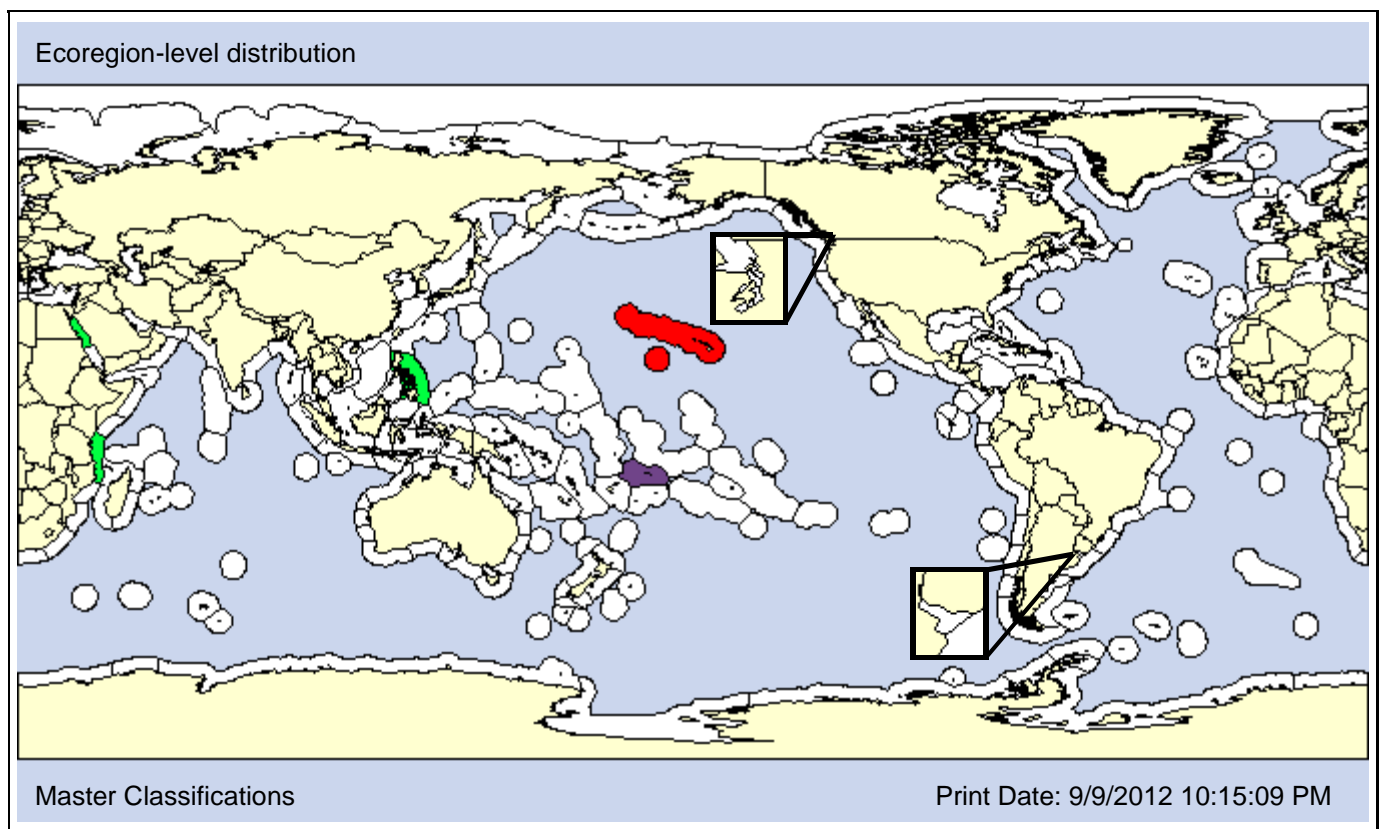
**Family:** Phoxichilidiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Red Sea



**Date 1st record:**

1998

**Loc 1st record:**

Barber's Point Harbor, Hawaii

**Established:**

Yes

### VECTORS

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X	X	X				AO	PO								

Comments: In addition to Hawaii, Anoplodactylus arescus has been introduced into Brazil.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
	X	X											

**DEPTH [Obs: 0 - 5m] [Pref: 0 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	P					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												O		

**SALINITY [Obs: - 34psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					X	X							

**Taxon:** Pycnogonid

**Taxonomic Author:** Hall, 1912

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Phoxichilidiidae

**Subfamily:**

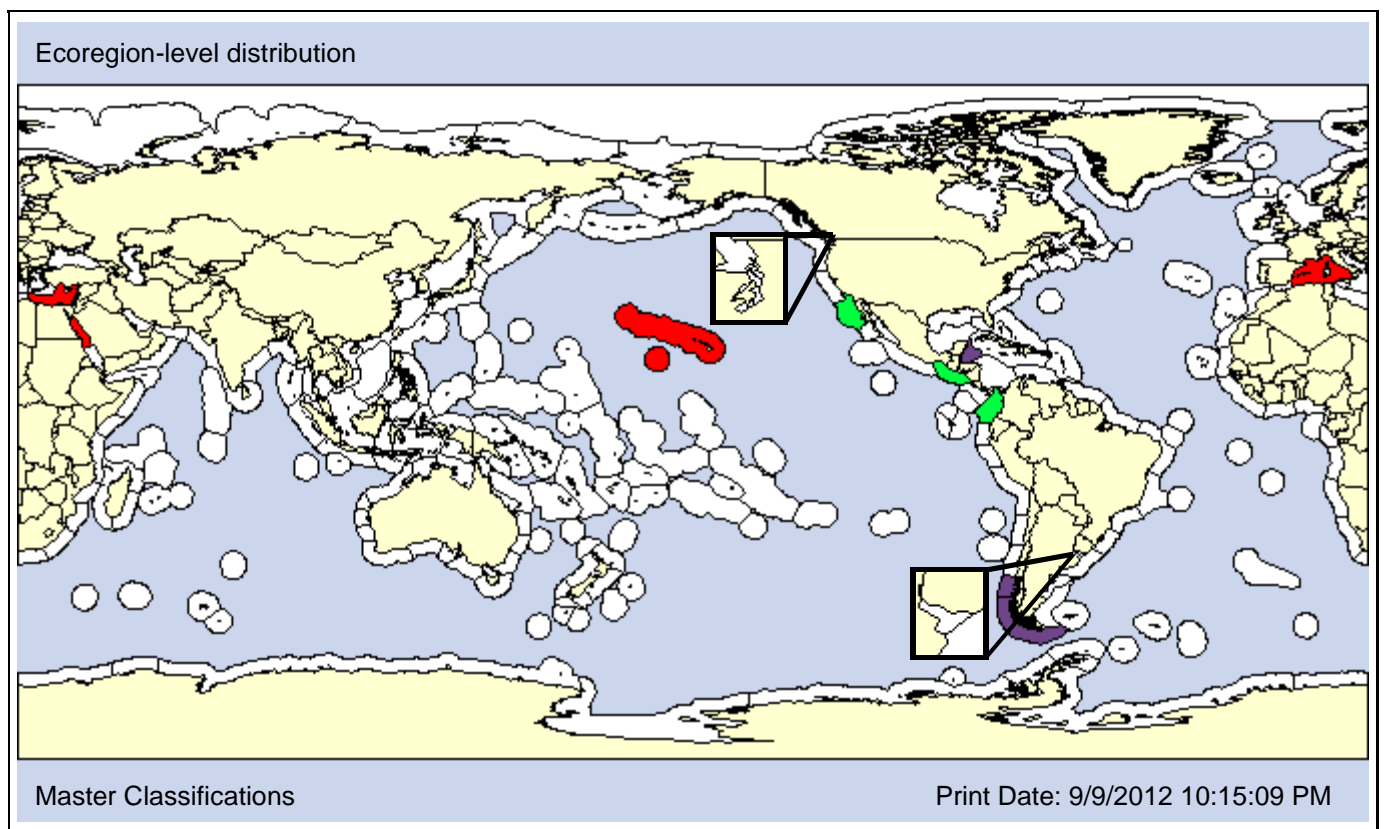
**Also Known As (Name - Type):**

Anoplodactylus portus	Synonym
Anoplodactylus projectus	Synonym
Anoplodactylus robustus Hilton, 1939; not Dohrn, 1881	Misidentified

**Common Names:**

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**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 1937 Native  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii Native  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: *Anoplodactylus californicus* may consist of more than one species worldwide (Carlton and Eldredge, 2009). Nonetheless, it appears that the form in Hawaii and the Mediterranean are introduced. Additionally, we suggest that the form in California and the Eastern Tropical Pacific is native, though perhaps not the same species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	
	X	X						X					

**DEPTH [Obs: 0 - 100m] [Pref: 0 - 29m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 17 - 17%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O					

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								P					P	P

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	
					X	X							

# Anoplodactylus digitatus

Species ID: 15908

**Taxon:** Pycnogonid

**Taxonomic Author:** (Böhm, 1879)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Phoxichilidiidae

**Subfamily:**

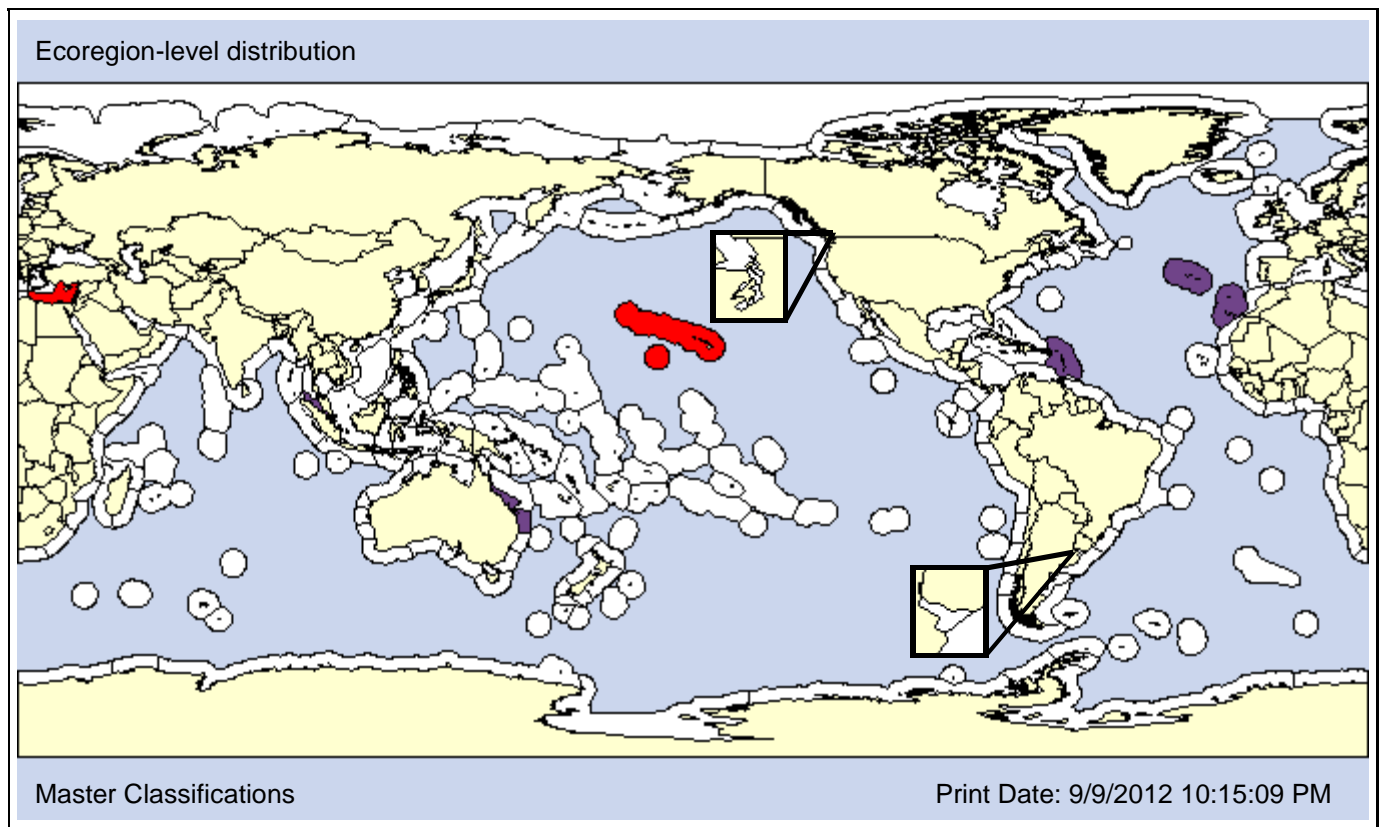
**Also Known As (Name - Type):**

Anoplodactylus digitatus of Arnaud, 1974; not (Bohm, 1879)	Misidentified
Anoplodactylus investigatoris	Synonym
Anoplodactylus saxatilis	Synonym
Phoxichilidium (Anoplodactylus) digitatum	Synonym

**Common Names:**

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**Type Locality:** Singapore Strait



**Date 1st record:**

2000

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments: Anoplodactylus digitatus was described from the Singapore Straits, but the native region is unknown (Carlton and Eldredge, 2009). It is considered introduced in Hawaii and the Mediterranean.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O	O				

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: 0 - 600m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep	O		

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM X		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	
						X							

**Taxon:** Pycnogonid

**Taxonomic Author:** Cole, 1904

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:**

**Infraorder:**

**Superfamily:**

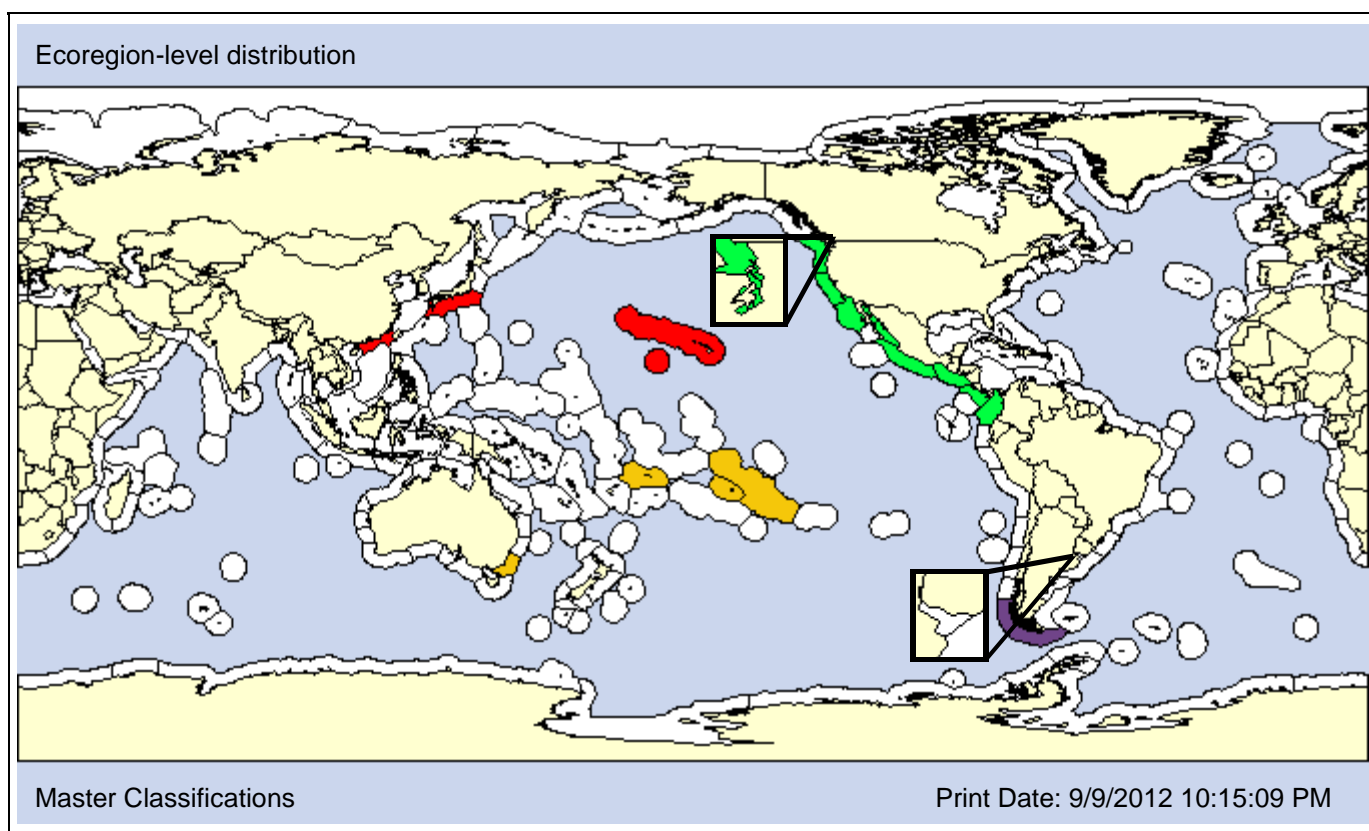
**Family:** Phoxichilidiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** California, USA



<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-style:dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:brown; border:1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; background-color:white; border:1px solid black;"></span> Unidentified
<b>NWP</b>			<b>Hawaii</b>		<b>NEP</b>		

<b>Date 1st record:</b> Unknown	<1942	Native
<b>Loc 1st record:</b> Unknown	Honolulu, Hawaii	Native
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

SH <b>X</b>			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
<b>X</b>		<b>X</b>				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	
	X	X					X						

**DEPTH [Obs: 0 - 182m] [Pref: 3 - 100m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			P	P			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: - 97.8%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	<b>O</b>

**SALINITY [Obs: 25 - 35.48psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
					<b>X</b>	<b>X</b>							



# Anoplodactylus marshallensis

Species ID: 123396

**Taxon:** Pycnogonid

**Taxonomic Author:** Child, 1982

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:**

**Infraorder:**

**Superfamily:**

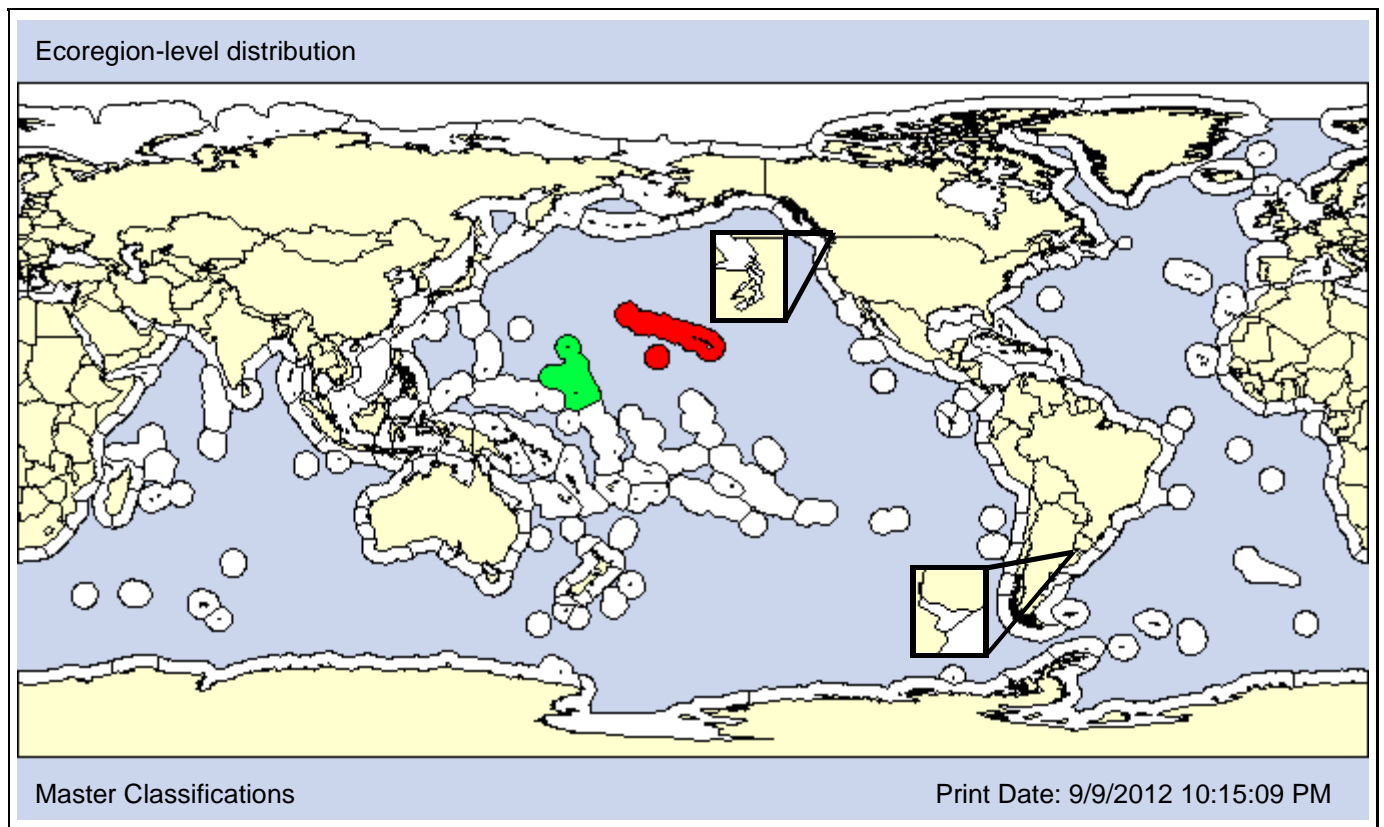
**Family:** Phoxichilidiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



**Date 1st record:**

2000

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

### VECTORS

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
X		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												P	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

# Anoplodactylus pycnosoma

Species ID: 170027

**Taxon:** Pycnogonid

**Taxonomic Author:** (Helfer, 1938)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Phoxichilidiidae

**Subfamily:**

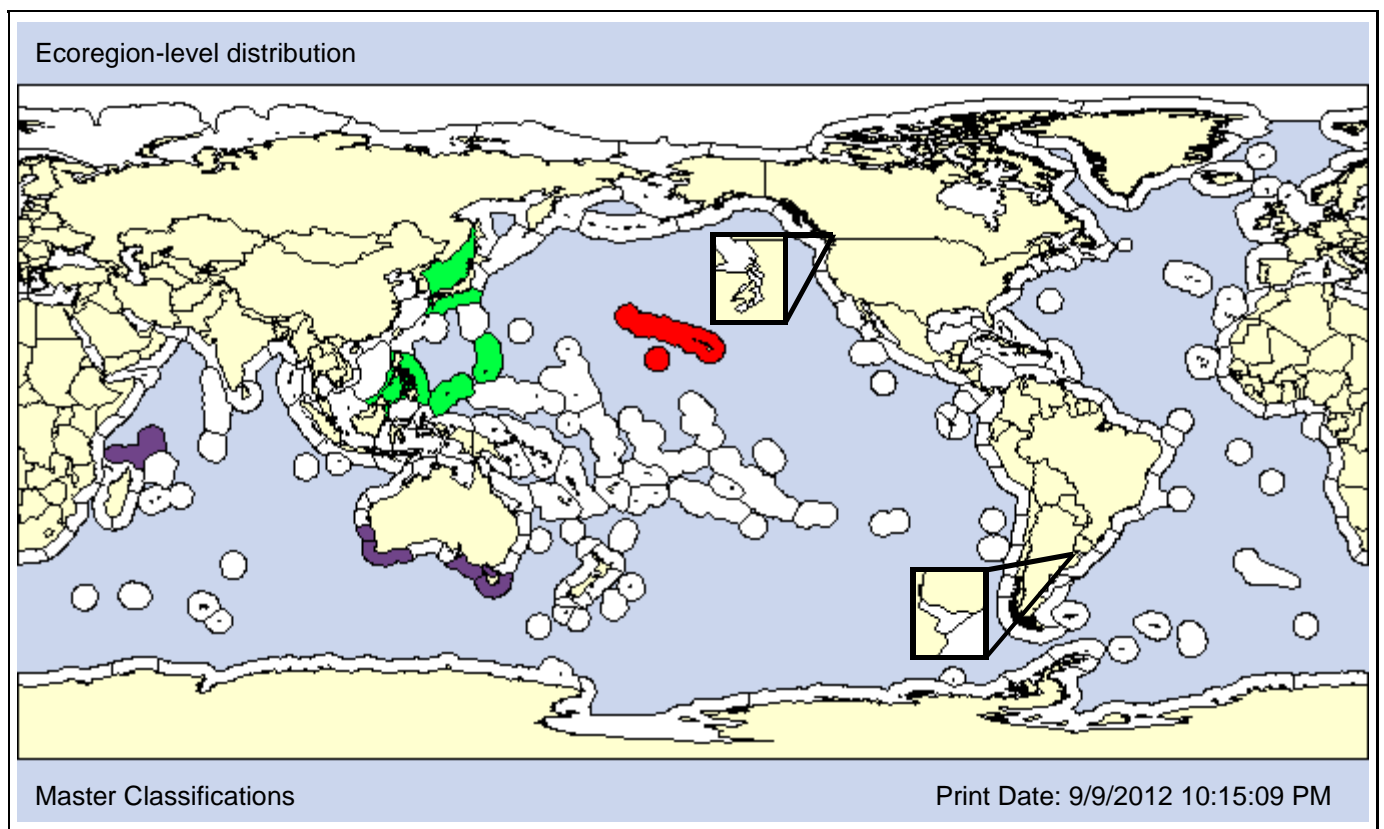
**Also Known As (Name - Type):**

Bathypallenopsis truncatum  
Peritrochia pycnosoma  
Phoxichilidium truncatum

Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:** Kobe, Japan



**Date 1st record:** Unknown

2000

**Loc 1st record:** Unknown

Pearl Harbor, Oahu, Hawaii

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: We consider *Anoplodactylus pycnosoma* native to the Central Indo-Pacific and Japan but unclassified in the Western Indo-Pacific and southern Australia.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	
		X											

**DEPTH [Obs: 0 - 17m] [Pref: 0.5 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O					

**CONSOLIDATED SUBSTRATE X**

R O	HP	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O				O					O		O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	X
					X	X							

**Taxon:** Pycnogonid

**Taxonomic Author:** Stock, 1968

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:** Eupantopodida

**Infraorder:**

**Superfamily:** Phoxichilidoidea

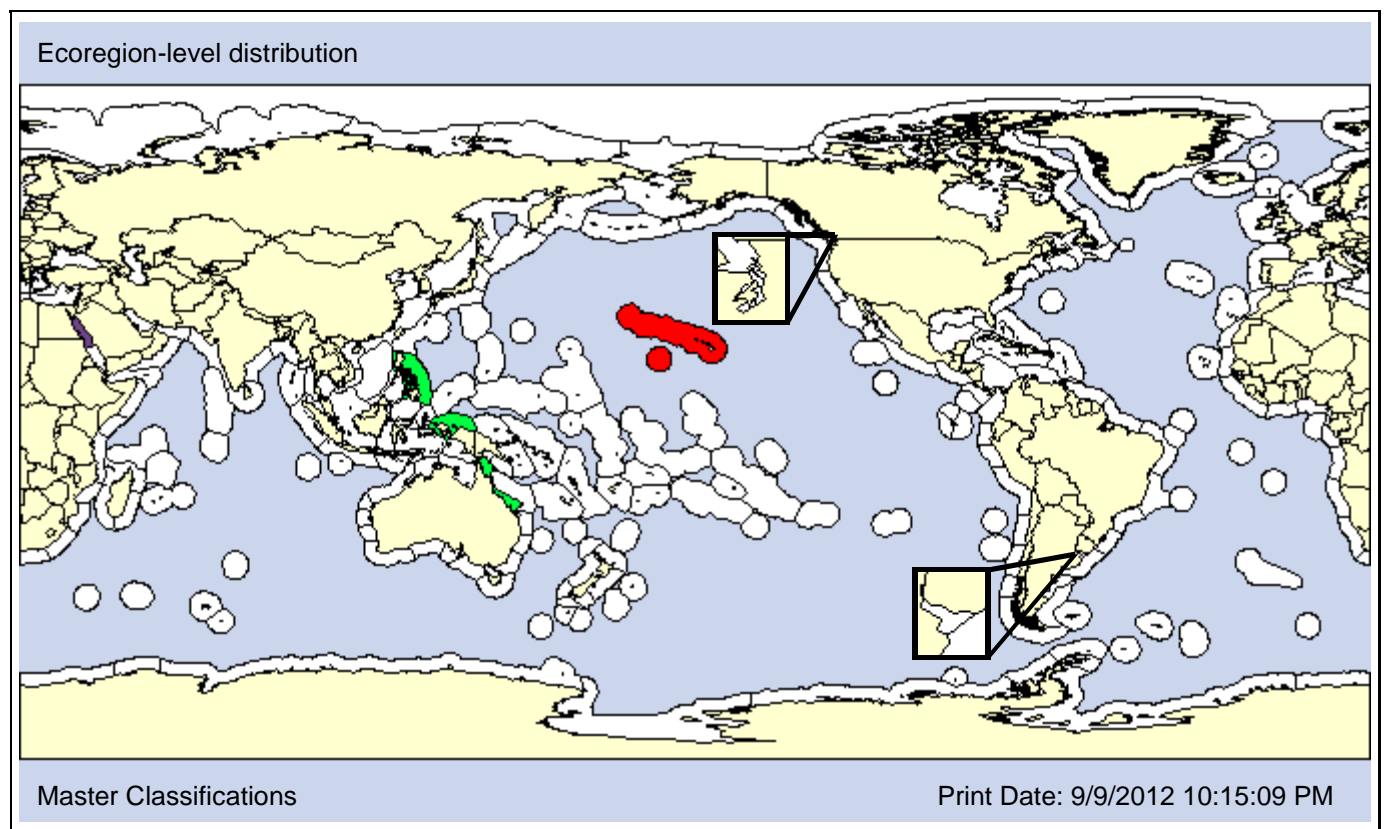
**Family:** Endeidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Seget, W. New Guinea



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1960

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments: Based on Carlton and Eldredge (2009), we list *Endeis biseriata* as native to the Central Indo-Pacific Region. It has also been reported from the Red Sea, Indian Ocean, and Brazil.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X		X	
	X	X											

**DEPTH [Obs: 0 - 37m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O										O	O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
					X	X							

**Taxon:** Pycnogonid

**Taxonomic Author:** Hilton, 1942

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:** Eupantopodida

**Infraorder:**

**Superfamily:** Phoxichilidoidea

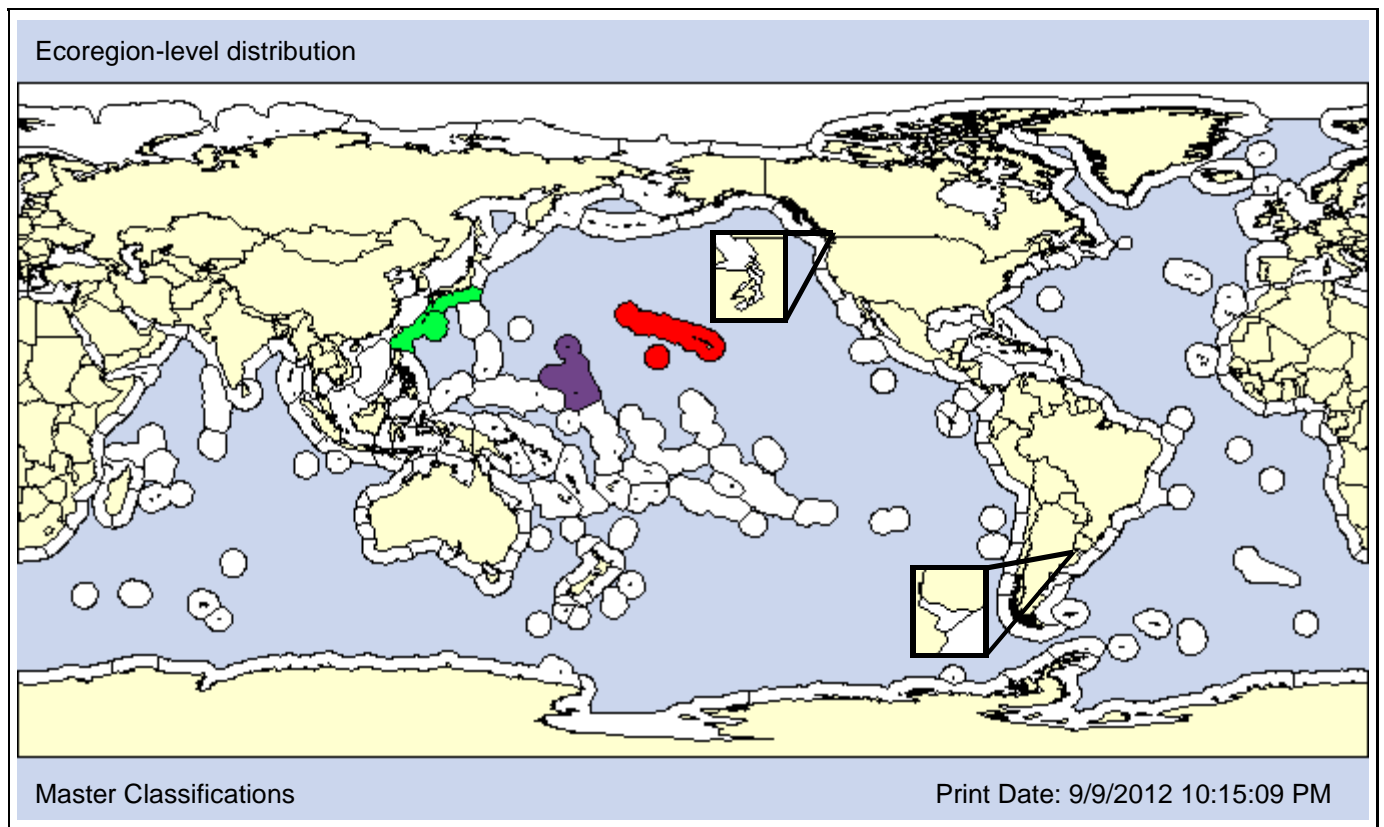
**Family:** Endeidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Unknown 1924  
**Loc 1st record:** Unknown Kaneohe Bay, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
<b>X</b>		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI X	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X		X

**DEPTH [Obs: 0 - 45m] [Pref: 1 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

R O	HP	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O										O	O	O

**SALINITY [Obs: - 36psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	O	
						O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
						X							



**Taxon:** Pycnogonid

**Taxonomic Author:** (Loman, 1908)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:** Eupantopodida

**Infraorder:**

**Superfamily:** Phoxichilidoidea

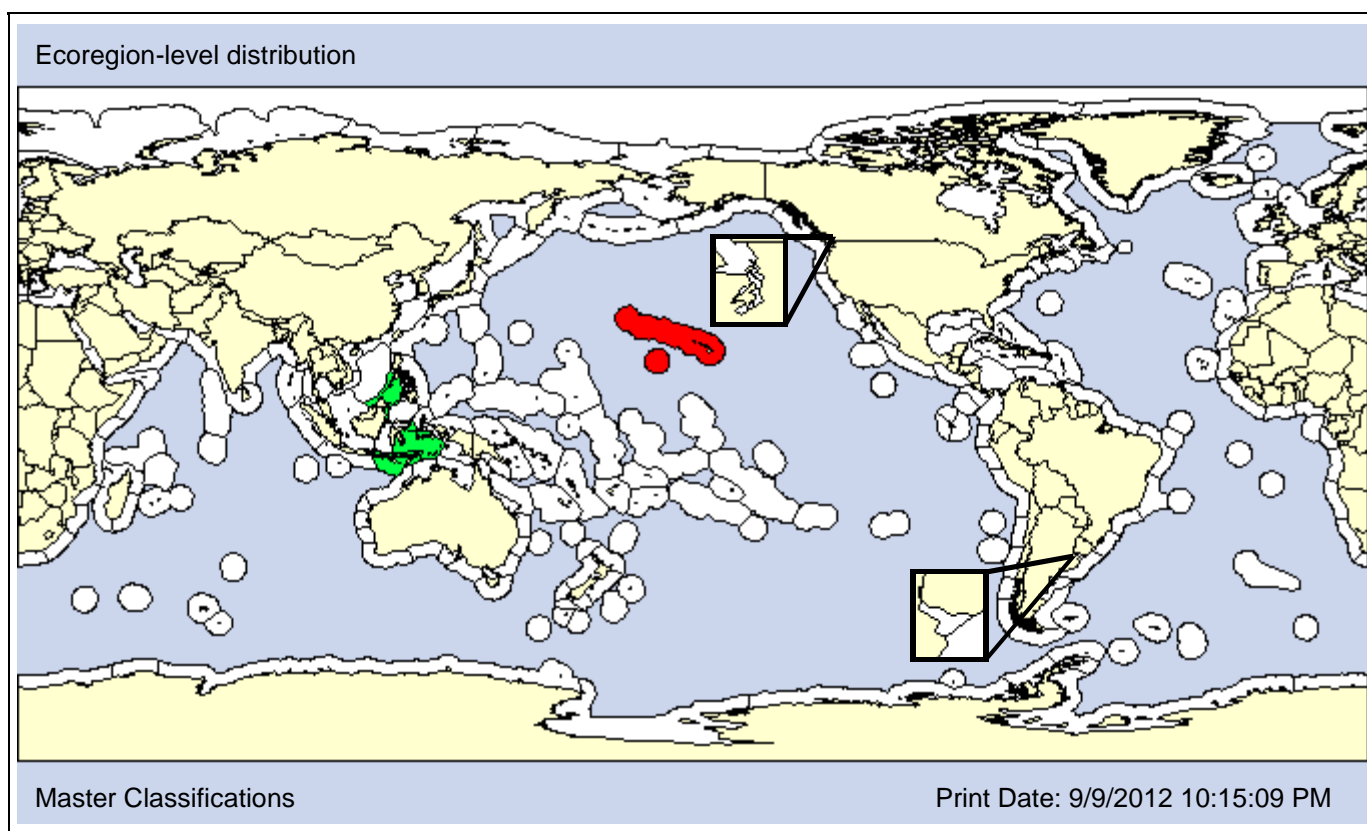
**Family:** Endeidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



<span style="display:inline-block; width:15px; height:15px; background-color: #4CAF50; border: 1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color: #F44336; border: 1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color: #FFEB3B; border: 1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color: #4DD0E1; border: 1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color: #9575CD; border: 1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color: #795548; border: 1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; background-color: #FFFFFF; border: 1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:**

1996

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	
		X											

**DEPTH [Obs: 3.25 - 50m] [Pref: - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O	P			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O				O	

**CONSOLIDATED SUBSTRATE X**

R	HP	Biogenic						Artificial Substrate O						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY [Obs: - 33psu]**

Fresh	Brackish O					Marine P		Hyper
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	
						O		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X		FR	SD	SP
				LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					X	X							

**Taxon:** Pycnogonid

**Taxonomic Author:** Calman, 1927

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:** Eupantopodida

**Infraorder:**

**Superfamily:** Ascorhynchoidea

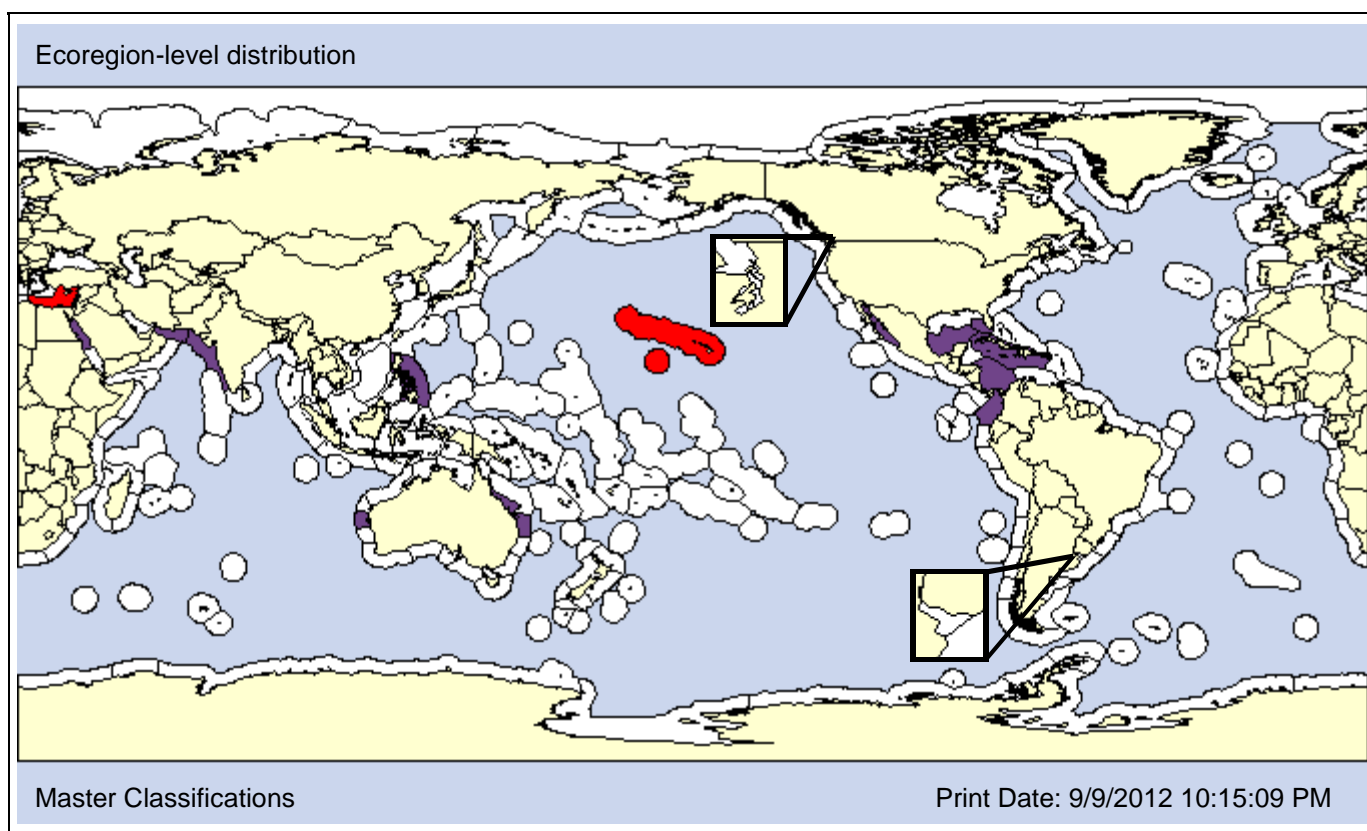
**Family:** Ascorhynchoidea family in ce **Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Clotenopsa prima	Synonym	
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**Type Locality:** Lake Timsah, Suez Canal, Egypt



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b>	1930	1971
<b>Loc 1st record:</b>	Oahu, Hawaii	Bahia Ballenas, Mexico
<b>Established:</b>	Yes	Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	X				
X		X			AO	PO									

Comments: The native region of *Pigrogromitus timsanus* is unknown. It is considered introduced in Hawaii (Carlton and Eldredge, 2009) and the Mediterranean though the Mediterranean report is questionable (Zenetos et al., 2010). Larvae were found in the Gulf of California in 1971, though we are unaware of any other records from the NEP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X				TP	RI-PH	X			X	
		X											

**DEPTH [Obs: 0 - 200m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O	O		O		

**CONSOLIDATED SUBSTRATE X**

R O	HP	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												O	O	O

**SALINITY [Obs: - 33psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	
					X	X							

**Taxon:** Pycnogonid

**Taxonomic Author:** Child, 1970

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Chelicerata

**Superclass:**

**Class:** Pycnogonida

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pantopoda

**Suborder:**

**Infraorder:**

**Superfamily:**

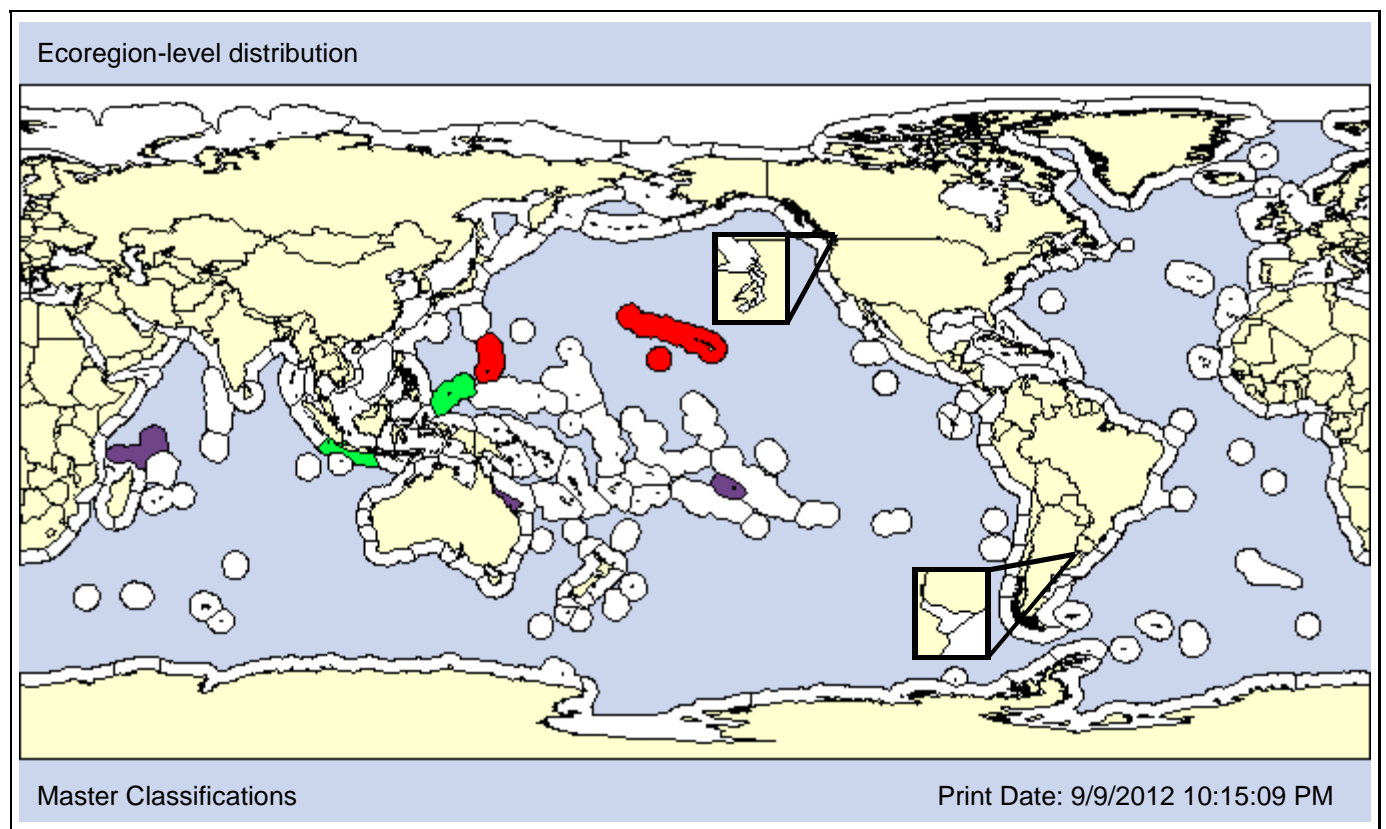
**Family:** Ammotheidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Moorea, French Polynesia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 2000  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: Carlton and Eldredge (2009) state that *Tanystylum rehderi* is native to the Indo-Pacific but likely introduced to Guam.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X	X		X	
	X	X											

**DEPTH [Obs: 0 - 18m] [Pref: 0 - 11m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		P	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				P		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		P											O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X						X
					X	X							

**Kingdom: Animalia**

**Phylum: Arthropoda**

**Subphylum: Hexapoda**

**Class: Insecta**

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**Taxon:** Insects

**Taxonomic Author:** (Bonelli, 1832)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Dermaptera

**Suborder:** Catadermaptera

**Infraorder:**

**Superfamily:**

**Family:** Carcinophoridae

**Subfamily:**

**Also Known As (Name - Type):**

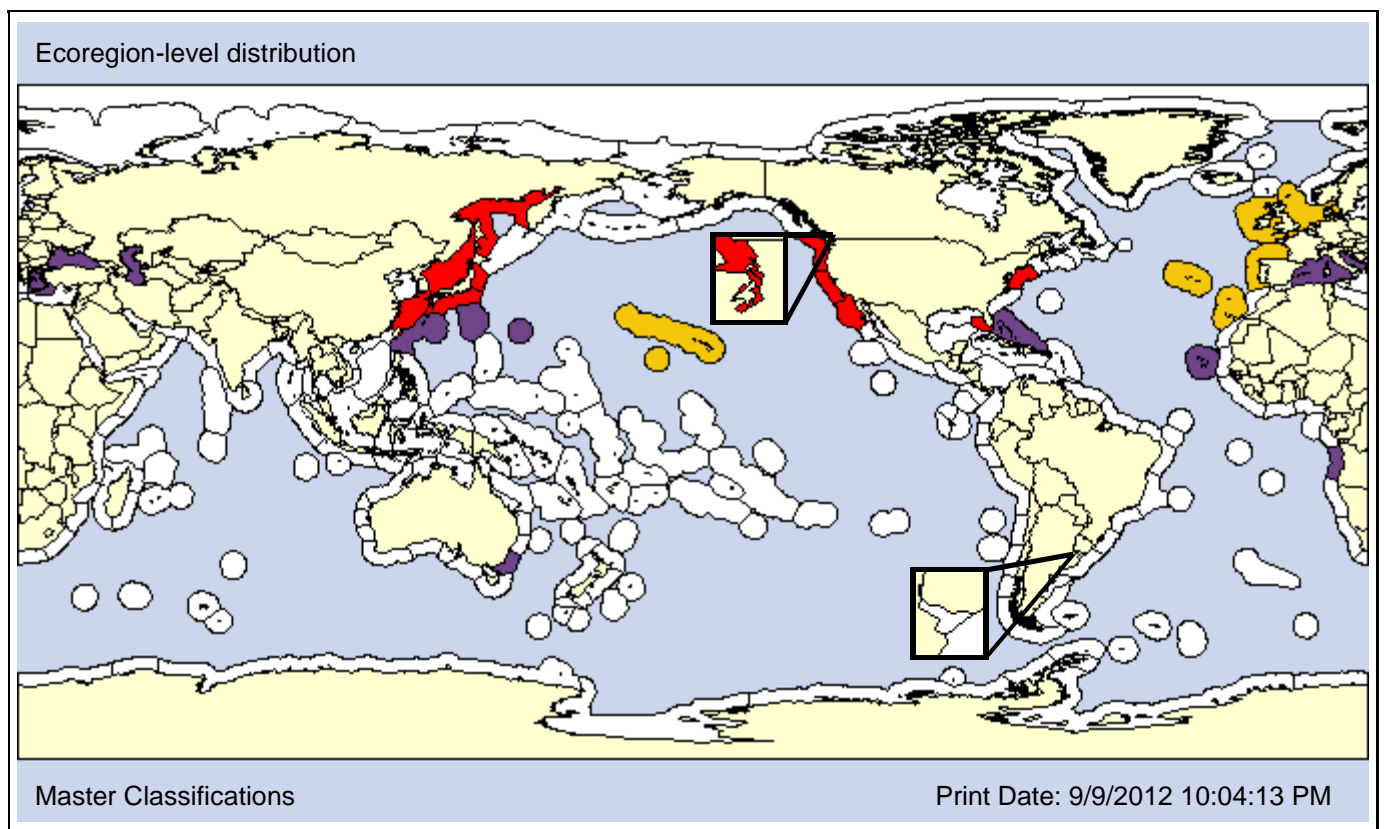
Forficula maritima

Synonym

**Common Names:**

maritime earwig  
seaside earwig

**Type Locality:** Mediterranean Sea



NWP

Hawaii

NEP

**Date 1st record:** Unknown

1912

1921

**Loc 1st record:** Unknown

Laysan Island, Hawaii

Laguna Beach, California

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
	X					AO	PO								

Comments: The native range of the earwig, *Anisolabis maritima*, is unknown. We used regional classifications when available, otherwise we listed it as unclassified. It has likely been transported via solid ballast and cargo.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
X	X												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	P	O	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O	O		O		

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										O				

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
					O	O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X						
					X								

**Taxon:** Insects

**Taxonomic Author:** (de Meijere, 1907)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Nematocera

**Infraorder:** Culicomorpha

**Superfamily:**

**Family:** Ceratopogonidae

**Subfamily:**

**Also Known As (Name - Type):**

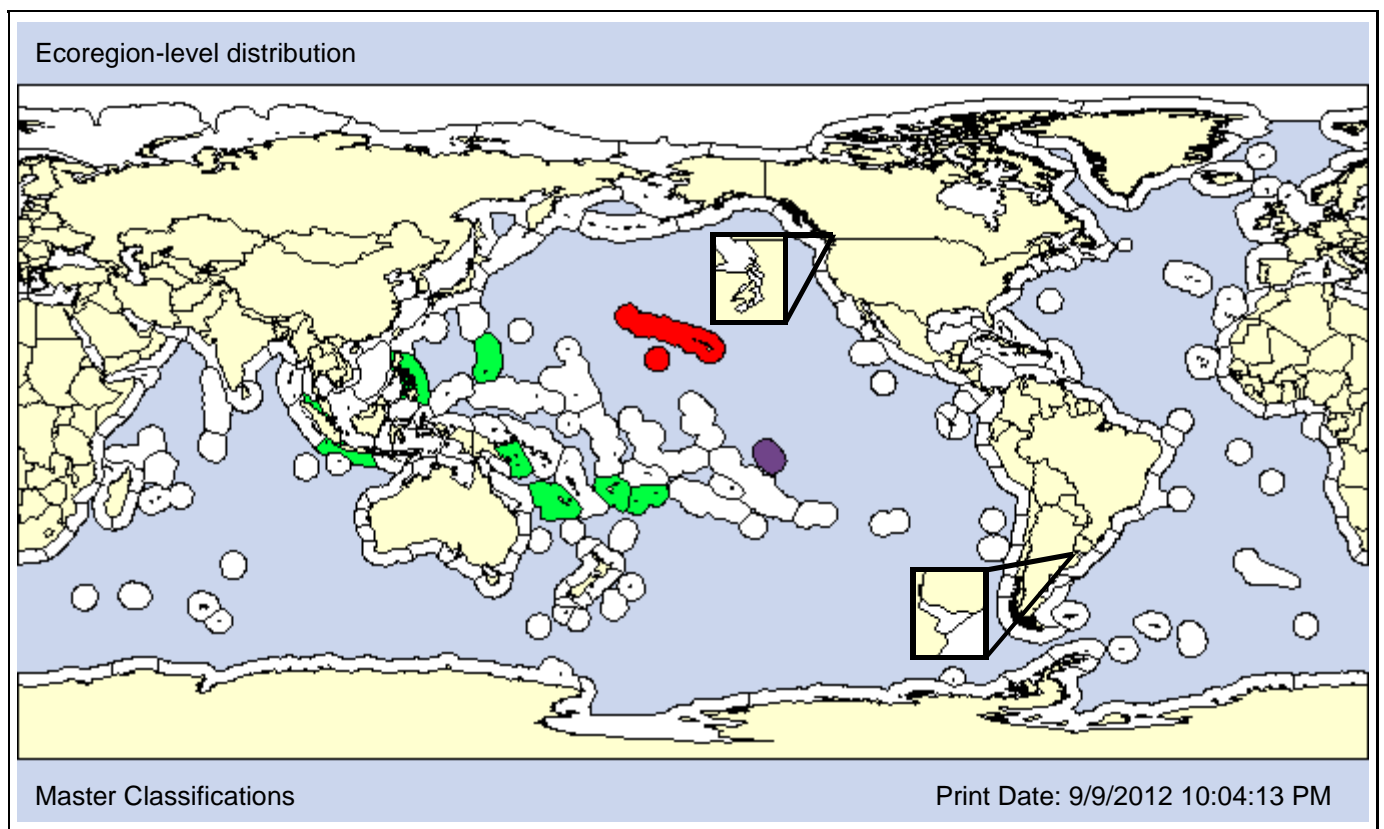
Atrichopogon cavernarum  
Ceratopogon jacobsoni

Synonym  
Synonym

**Common Names:**

biting midge (*Atrichopogon jacobsoni*)

**Type Locality:** Java, Indonesia



**Date 1st record:** Native 1958  
**Loc 1st record:** Native Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				X
						AO	PO			X				

Comments: *Atrichopogon jacobsoni* was first recorded from Hawaii in 1958. It is reported as having originated from "Oriental and Pacific regions", including India and China. It was found in estuarine waters in Hawaii (Carlton and Eldredge, 2009), though it generally appears to be a terrestrial species, including being found in caves (Wirth, 1980).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>O</b>		<b>P</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Nematocera

**Infraorder:** Culicomorpha

**Superfamily:**

**Family:** Ceratopogonidae

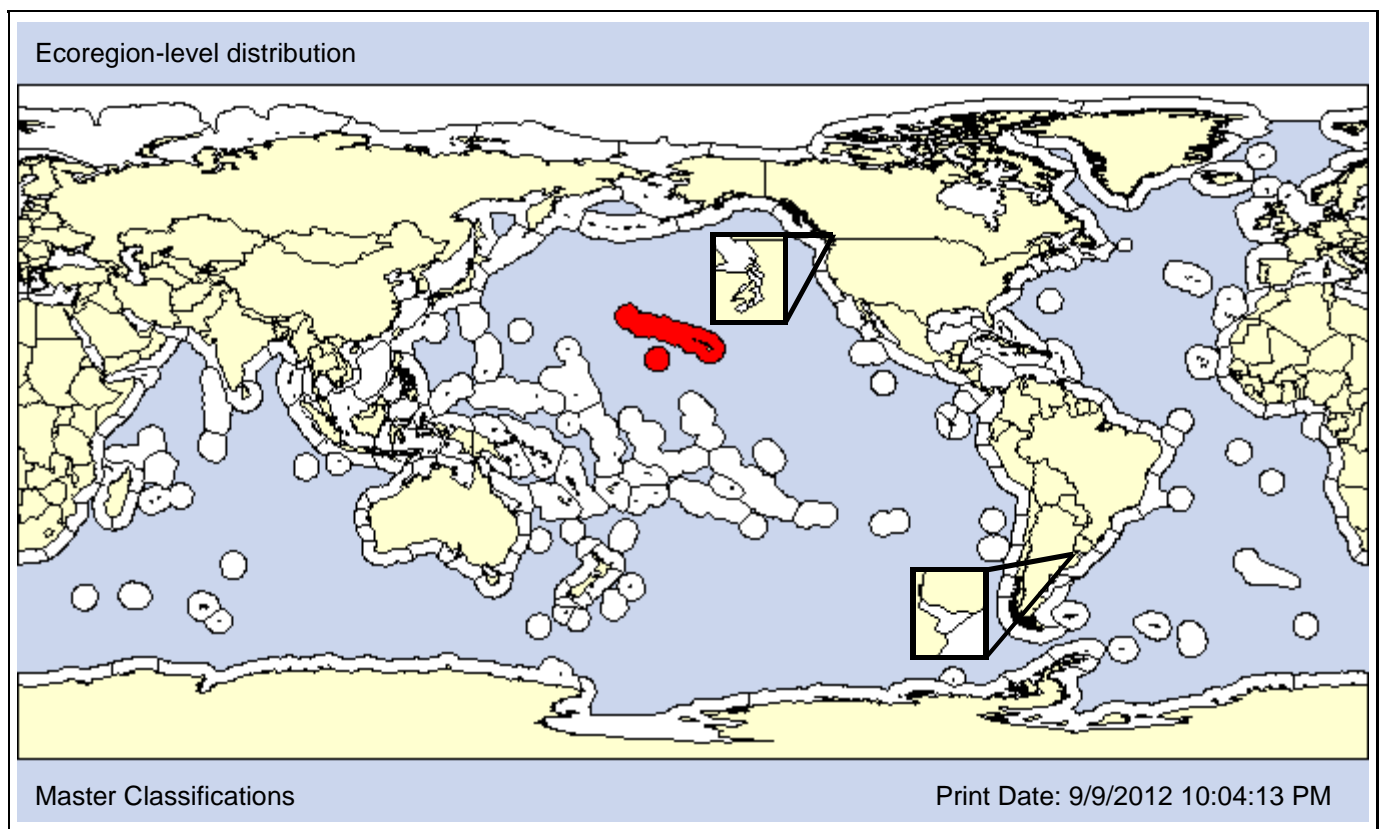
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

biting midge (*Atrichopogon* sp. (Carlton & Eldredge,

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1998

**Loc 1st record:** Hawaii

**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO				X				

Comments: *Atrichopogon* sp. (Carlton & Eldredge, 2009) was first reported from Hawaii in 1998. It occurs in Hawaiian streams at salinities ranging from 15 to 43 psu. As is true for biting midges in general, the adult is presumably terrestrial.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>P</b>		<b>P</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 15 - 43psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:** Ninomya, 1930

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

**Subfamily:** Parydrinae

**Also Known As (Name - Type):**

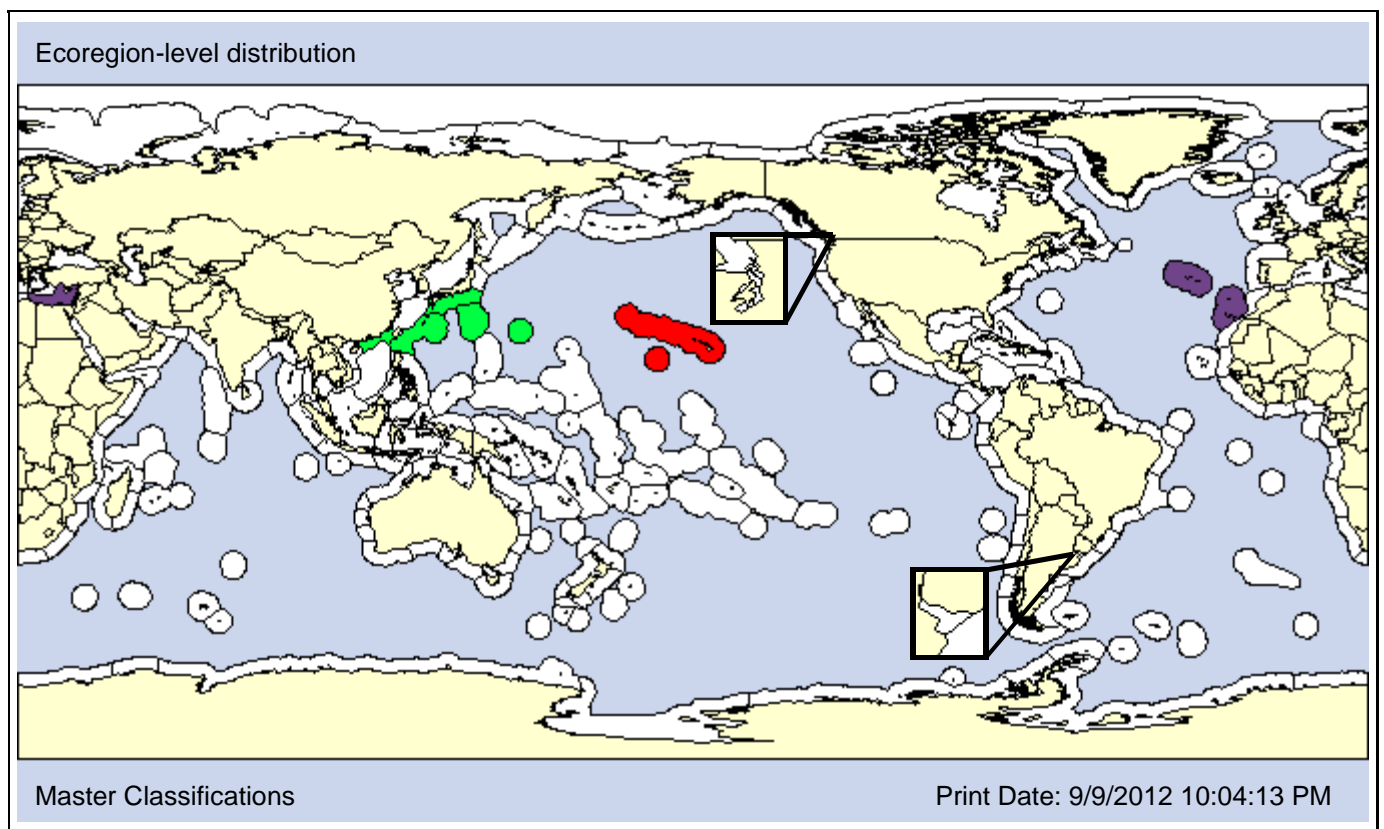
Brachydeutera argentata of authors; not Walker, 1853

Misidentified

**Common Names:**

shore fly (*Brachydeutera ibari*)

**Type Locality:** Honshu, Japan



**Date 1st record:** Native 1980

**Loc 1st record:** Native Kahoolawe, Hawaii

**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Brachydeutera ibari* is native to Asia and was first reported from Hawaii in 1980. Carlton and Eldredge (2009) reported it from estuarine water in a Hawaiian stream while Englund et al. (2000a) only found it in freshwater reaches of Hawaiian streams. We assume the adult primarily occurs in coastal fringes.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O					P	P		O

**ECOSYSTEM**

Unconsolidated X						Consolidated						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		X											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
O			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

R	HP	Biogenic						Artificial Substrate						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

Fresh P	Brackish O					Marine		Hyper
	Oligohaline O		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	O							

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
					X				DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					X								



**Taxon:** Insects

**Taxonomic Author:** Wirth, 1969

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Canaceidae

**Subfamily:**

**Also Known As (Name - Type):**

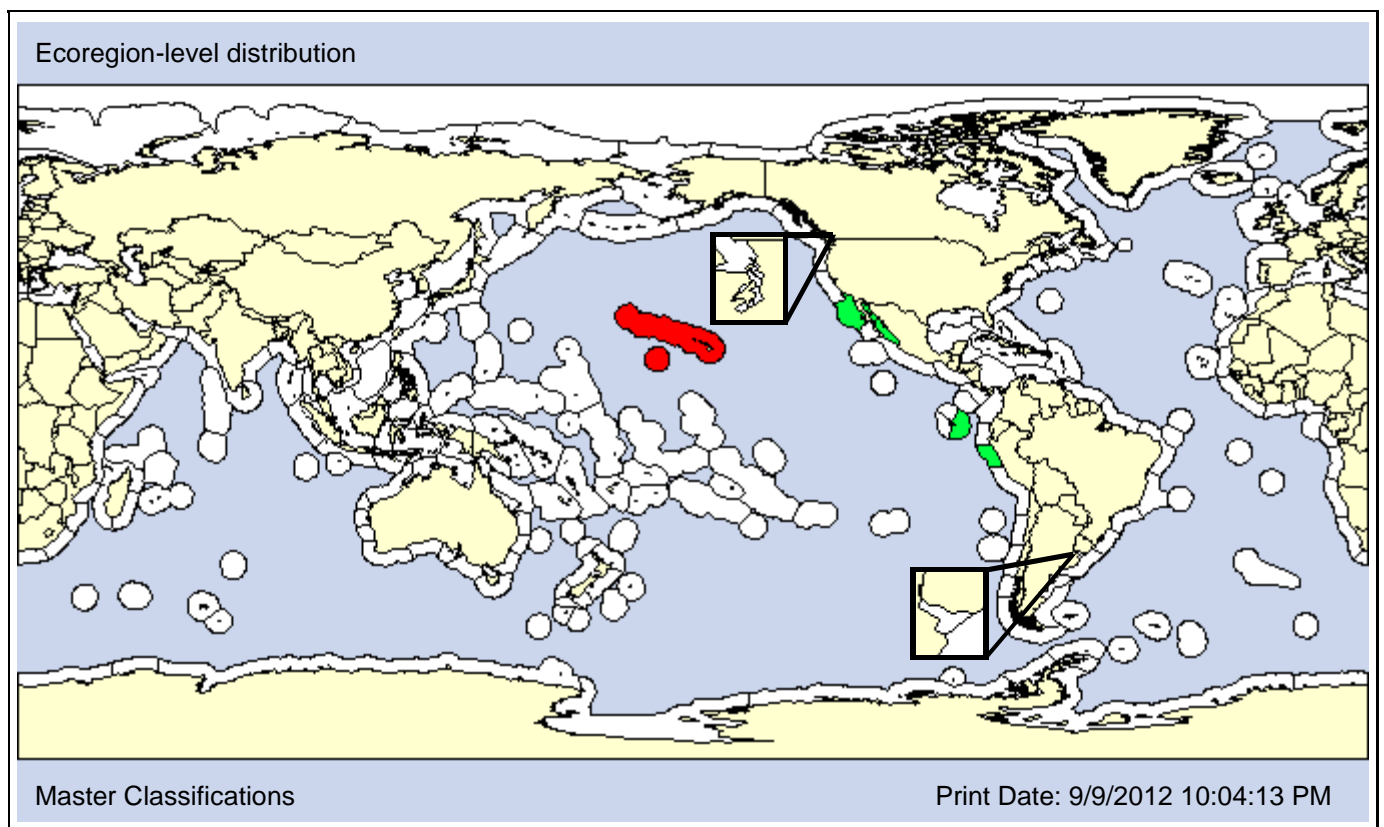
Canaceoides nudatas of authors, in part

Misidentified

**Common Names:**

beach fly (*Canaceoides angulatus*)  
surf fly (*Canaceoides angulatus*)  
surge fly (*Canaceoides angulatus*)

**Type Locality:** Oahu, Hawaii, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

<b>Date 1st record:</b>	1922	Native
<b>Loc 1st record:</b>	Oahu, Hawaii	Native
<b>Established:</b>	Yes	Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Canaceoides angulatus* was first described from Hawaii in 1922. Nonetheless, it is considered introduced to Hawaii and native to tropical and subtropical Eastern Pacific, North and South America (Englund et al., 2000a; Carlton and Eldredge, 2009). It has been found in freshwater, estuarine, and marine habitats.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>				<b>O</b>	<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					
<b>X</b>	<b>X</b>												

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>	<b>O</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 35psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>	<b>X</b>							

**Taxon:** Insects

**Taxonomic Author:** Mannerheim, 1852

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Coleoptera

**Suborder:** Polyphaga

**Infraorder:** Staphyliniformia

**Superfamily:** Hydrophiloidea

**Family:** Hydrophilidae

**Subfamily:** Sphaeridiinae

**Also Known As (Name - Type):**

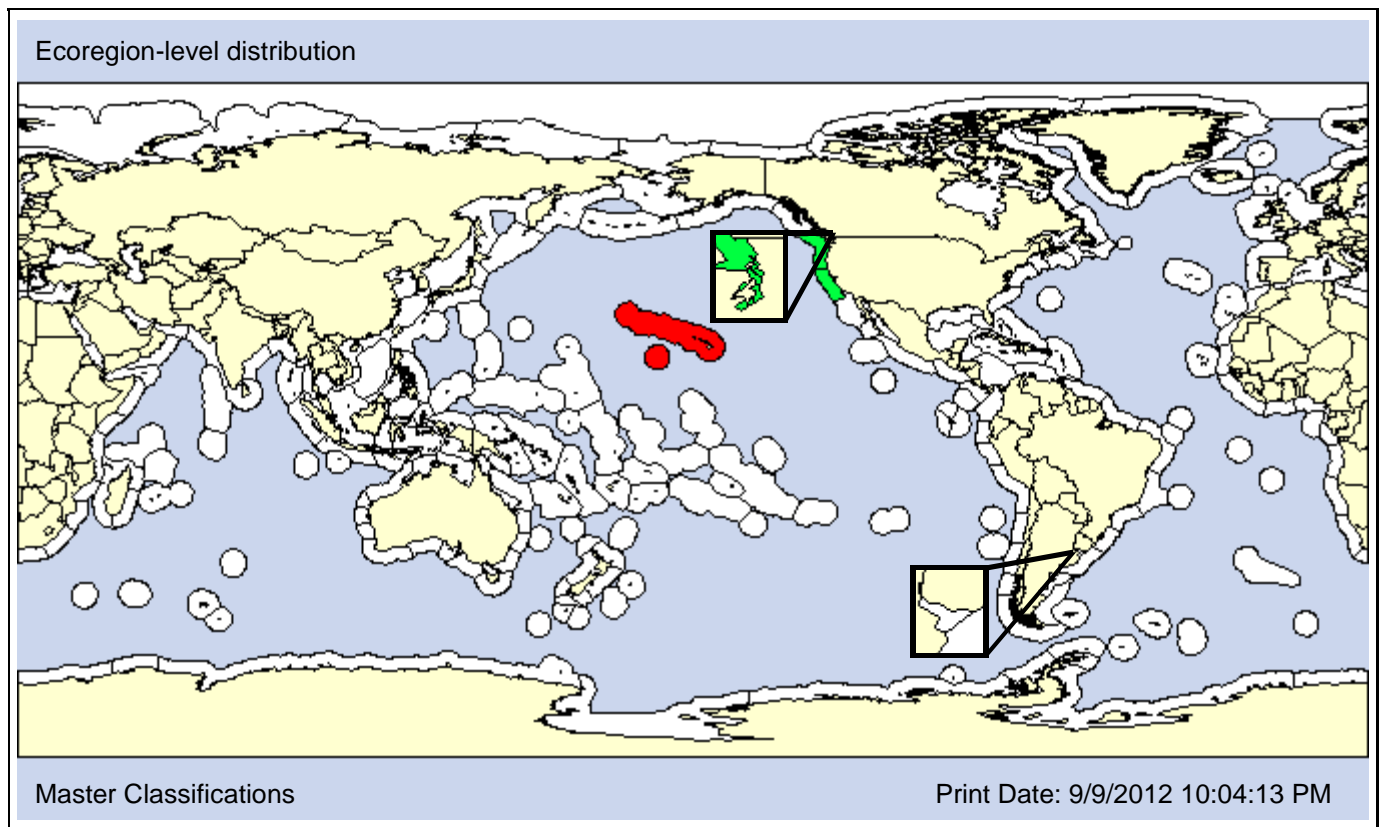
Cercyon (Cercyon) fimbriatum  
Cercyon fimbriatus

Convention  
Convention

**Common Names:**

beach beetle (Cercyon fimbriatum)  
water scavenger beetle (Cercyon fimbriatum)

**Type Locality:**



**Date 1st record:** 2001 Native  
**Loc 1st record:** Maui, Hawaii Native  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Cercyon fimbriatum* is a beetle found in high intertidal zones and rocky shores. It is native to Pacific North America. The first record of this taxon in Hawaii is from 2001.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - 0m] [Pref: 0 - 0m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	P	P	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Insects

**Taxonomic Author:** Cresson, 1922

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

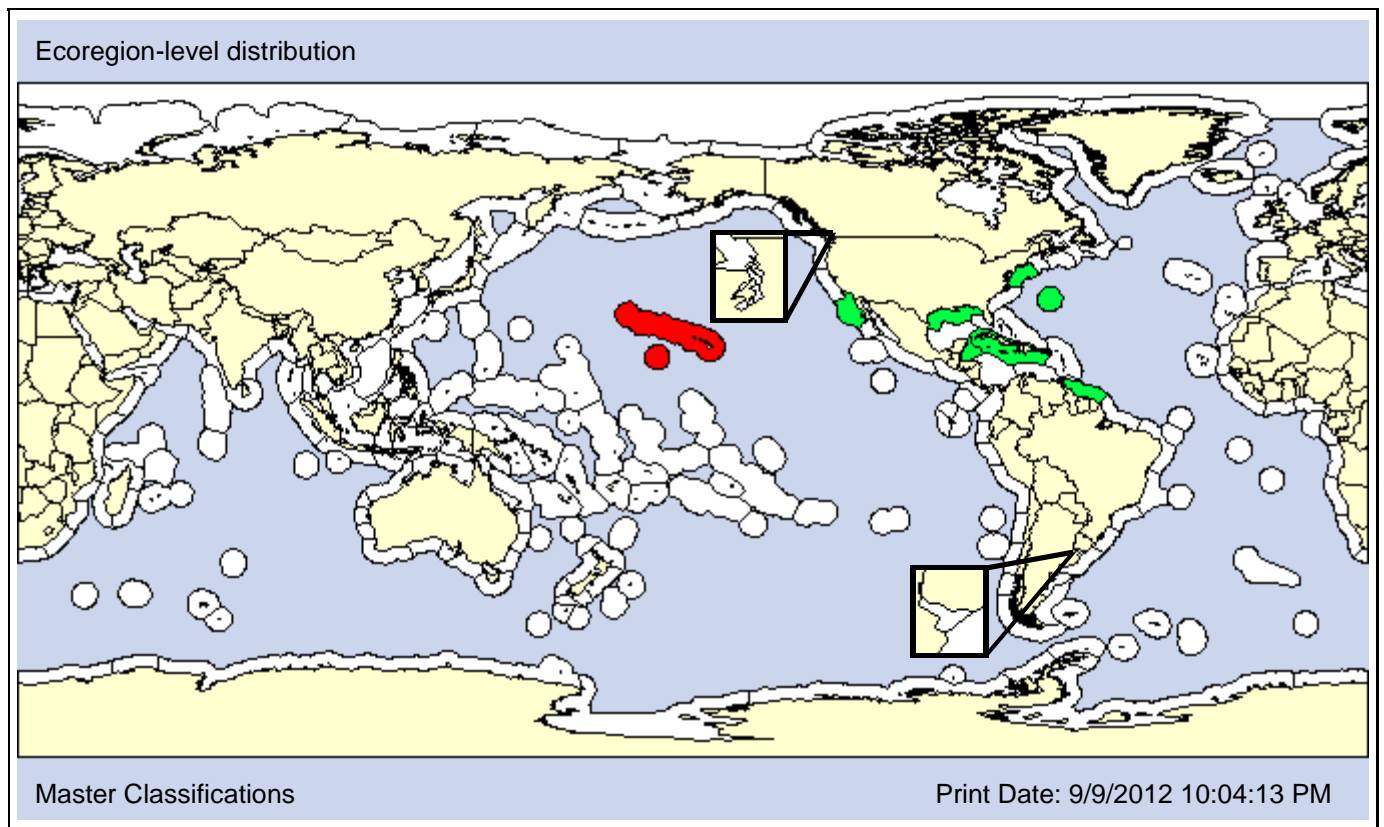
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

shore fly (*Ceropsilopa coquilletti*)

**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1946 Native  
**Loc 1st record:** Oahu, Hawaii Native  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: The fly, *Ceropsilopa coquilletti*, was described from California and considered to be a Nearctic species. It was first reported from Hawaii in 1946 where it occurs in a variety of freshwater, estuarine, and marine habitats, including saline streams with salinities up to 43 psu, mangroves, wetlands, and mud banks (Englund et al., 2000a).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>	<b>X</b>		TP	RI-PH					
	<b>X</b>												

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>	<b>O</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>	<b>O</b>					

**SALINITY [Obs: 0 - 43psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:** Hendel, 1914

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

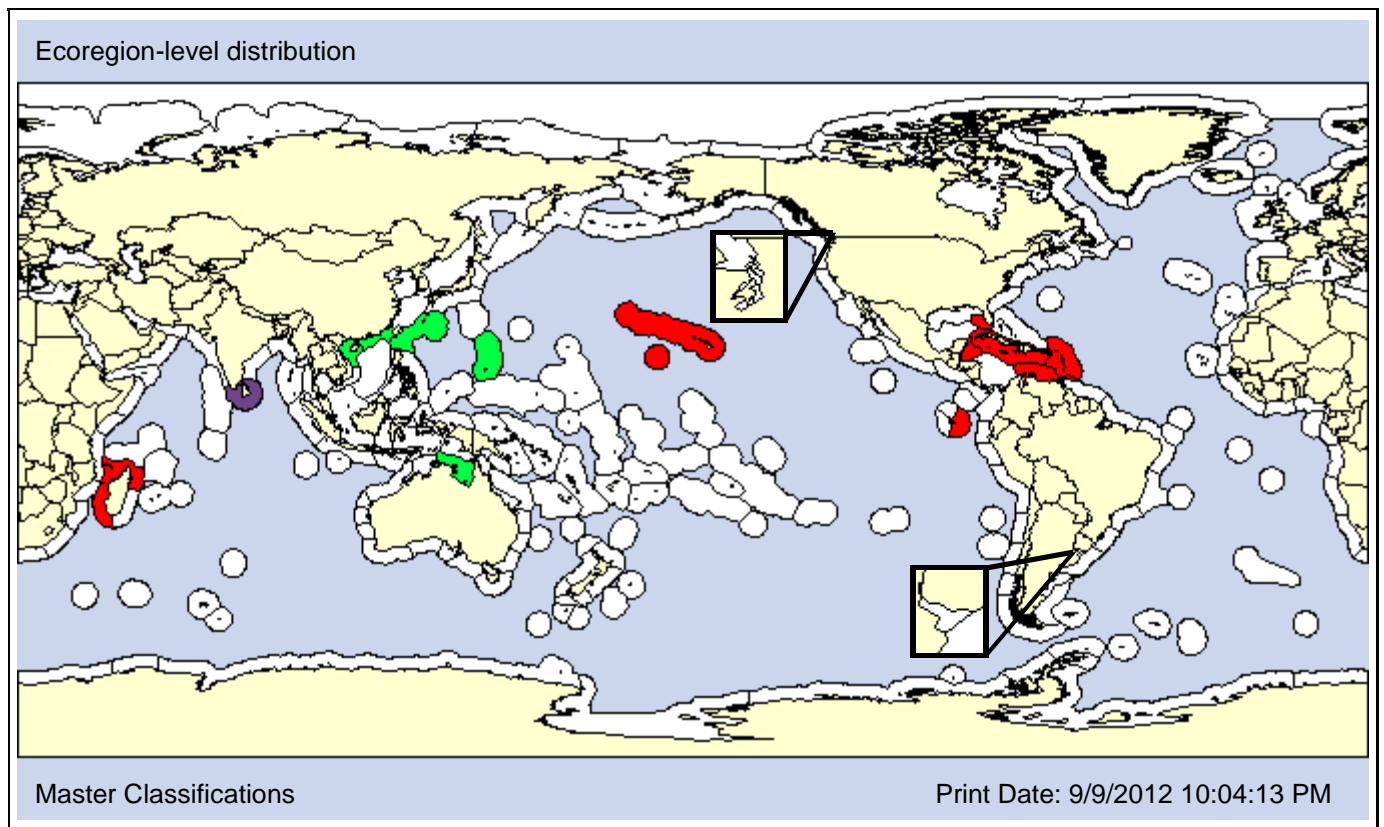
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Psilopa giordanii	Synonym	
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**Type Locality:** Formosa (Taiwan)



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1946  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Clasiopella uncinata* is native to Taiwan and Australasia. Early records from Midway Island, Caribbean, and Kenya were interceptions on airplanes, a likely vector for this species. These flies are found among both red and black mangroves and in saline streams.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>	<b>O</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>P</b>					

**SALINITY [Obs: 0 - 39psu]**

<b>Fresh O</b>	<b>Brackish O</b>					<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>	<b>X</b>							



*Cricotopus bicinctus*

Species ID: 6069

**Taxon:** Insects

**Taxonomic Author:** (Meigen, 1818)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Nematocera

**Infraorder:** Culicomorpha

**Superfamily:**

**Family:** Chironomidae

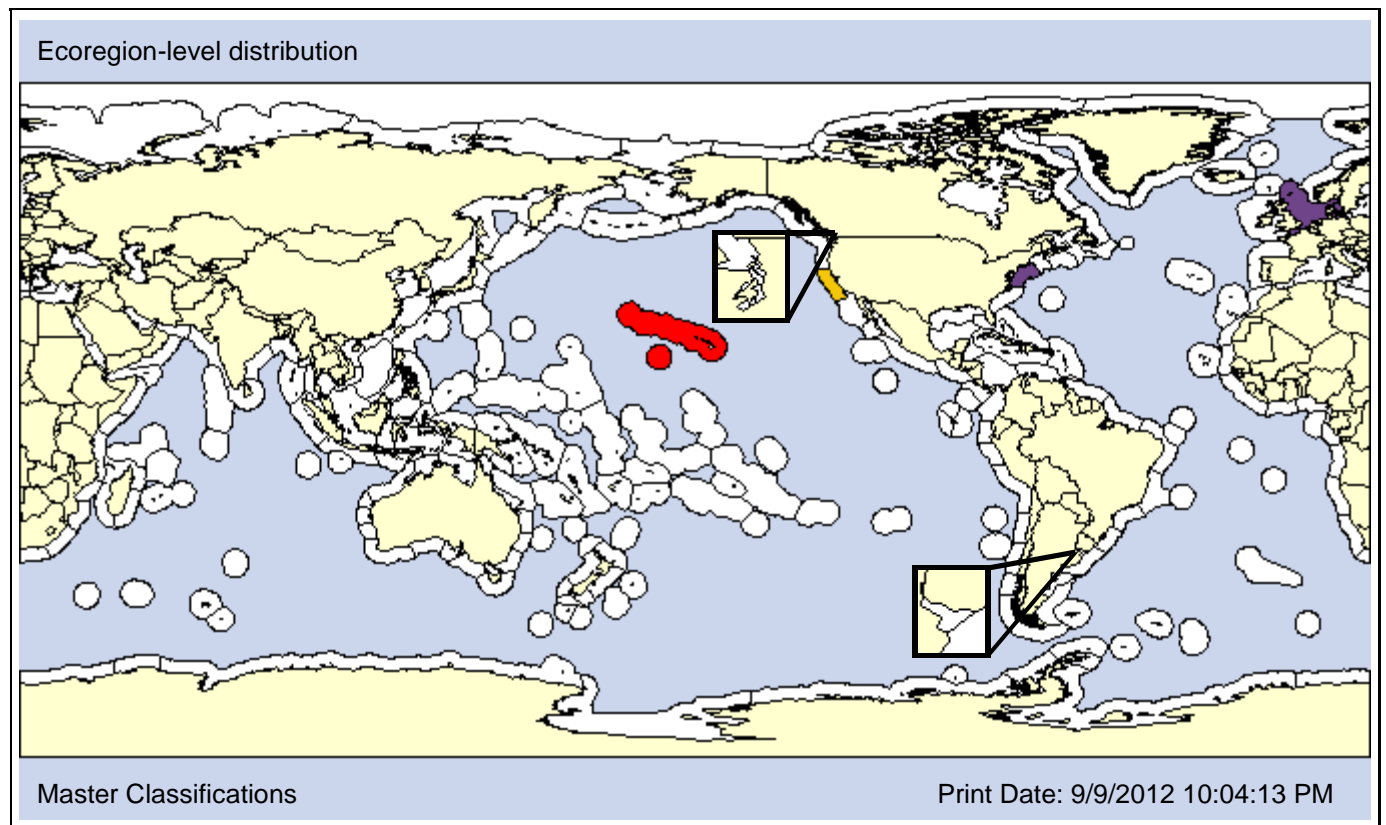
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Chironomus bicinctus	Synonym	midge (Cricotopus bicinctus)

**Type Locality:**



NWP

Hawaii

NEP

**Date 1st record:**

1955

Unknown

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

Unknown

**Established:**

Yes

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO			X	X				

Comments: *Cricotopus bicinctus* is a widespread Afrotropical and Holarctic midge, it was first reported from Hawaii in 1955. In Hawaii, it occurs in brackish streams with salinities up to 9 psu, as well as in high elevations (>1220 m).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>P</b>		<b>P</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0 - 1m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 9psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>					

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC					<b>X</b>		
					<b>X</b>								

**Taxon:** Insects

**Taxonomic Author:** (Drury, 1770)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Palaeoptera

**Superorder:**

**Order:** Odonata

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Libellulidae

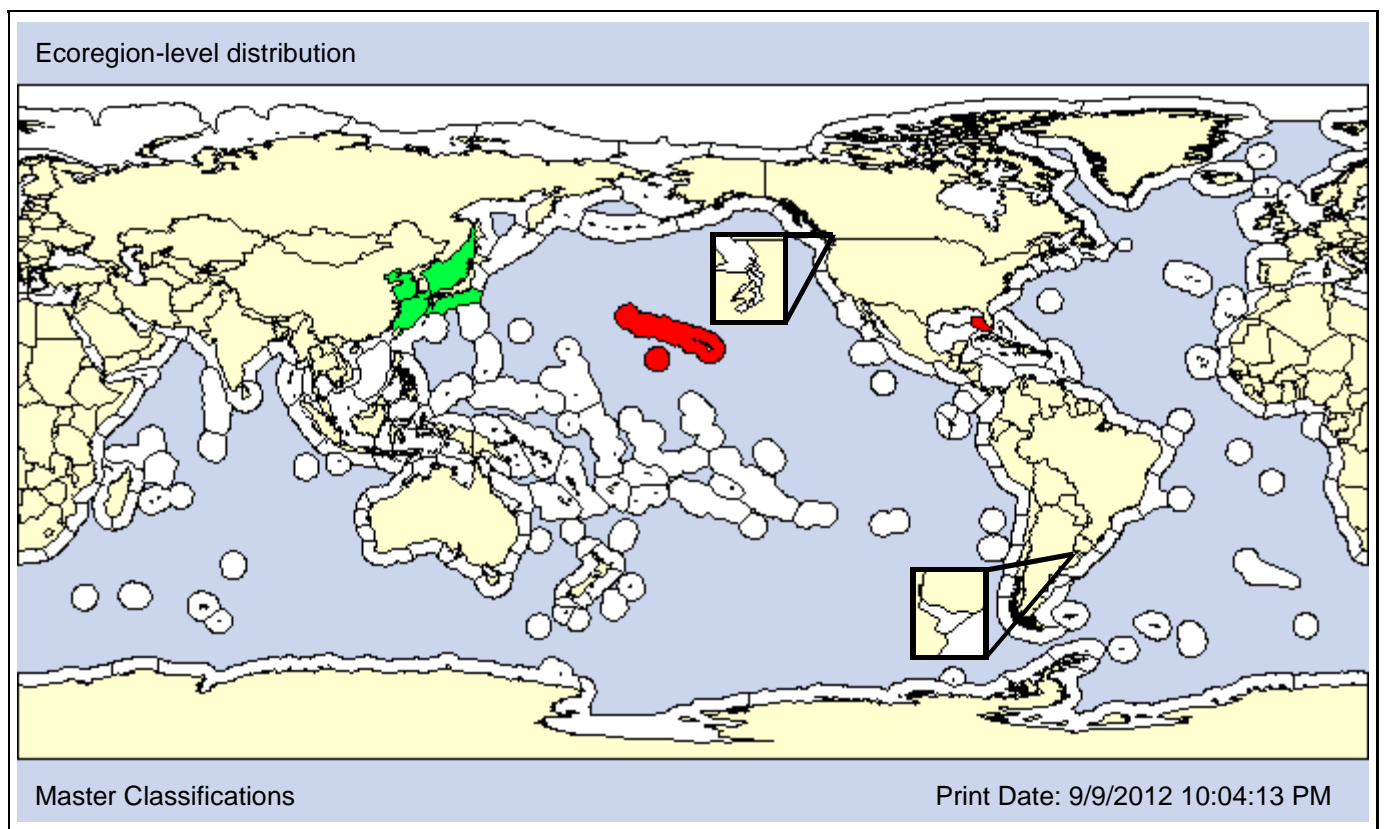
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

scarlet skimmer dragonfly

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1994  
**Loc 1st record:** Native Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA	IR			A	P			
						AO	PO			X	X			

Comments: The scarlet skimmer dragonfly, *Crocothemis servilia*, is native to the Middle East, Asia, and Australia, and introduced in Hawaii (Englund, 2002a) and southern Florida (Rodgers, 2010). It is one of the most common and widespread odonate species in the world, occurring in artificial and highly disturbed habitats (IUCN Redlist).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>P</b>		<b>P</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>								

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Insects

**Taxonomic Author:** (Sharp, 1885)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Coleoptera

**Suborder:** Polyphaga

**Infraorder:** Cucujiformia

**Superfamily:** Tenebrionoidea

**Family:** Anthicidae

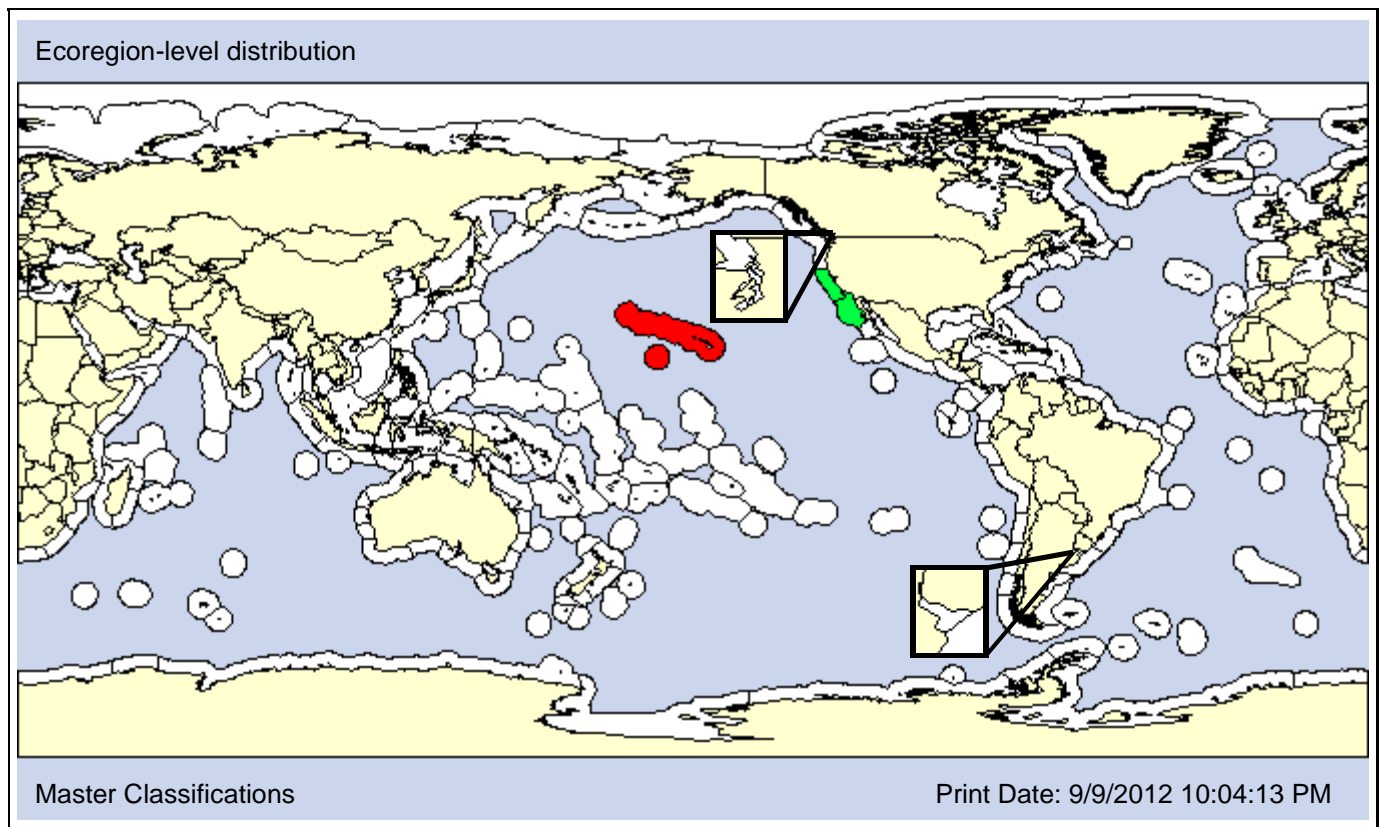
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Anthicus mundulus	Synonym	ant-like beetle
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**Type Locality:** Hawaii, USA



■ Native
 ■ Nonindigenous
   NIS Not Established
   Cryptogenic
   Transient
   Unclassified
   Conflicting Classification
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1895 Native

**Loc 1st record:** Oahu and Kauai, Hawaii Native

**Established:** Unknown Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
	<b>X</b>				AO	PO									

Comments: The maritime beetle *Cyclodinus mundulus* was introduced into Hawaii, however, it has not been observed for more than 50 years and may be extinct (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O			O			

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		X			TP	RI-PH					
X	X												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
O	P	O	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O					O

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			X	X		X			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:** Aldrich, 1922

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Dolichopodidae

**Subfamily:**

**Also Known As (Name - Type):**

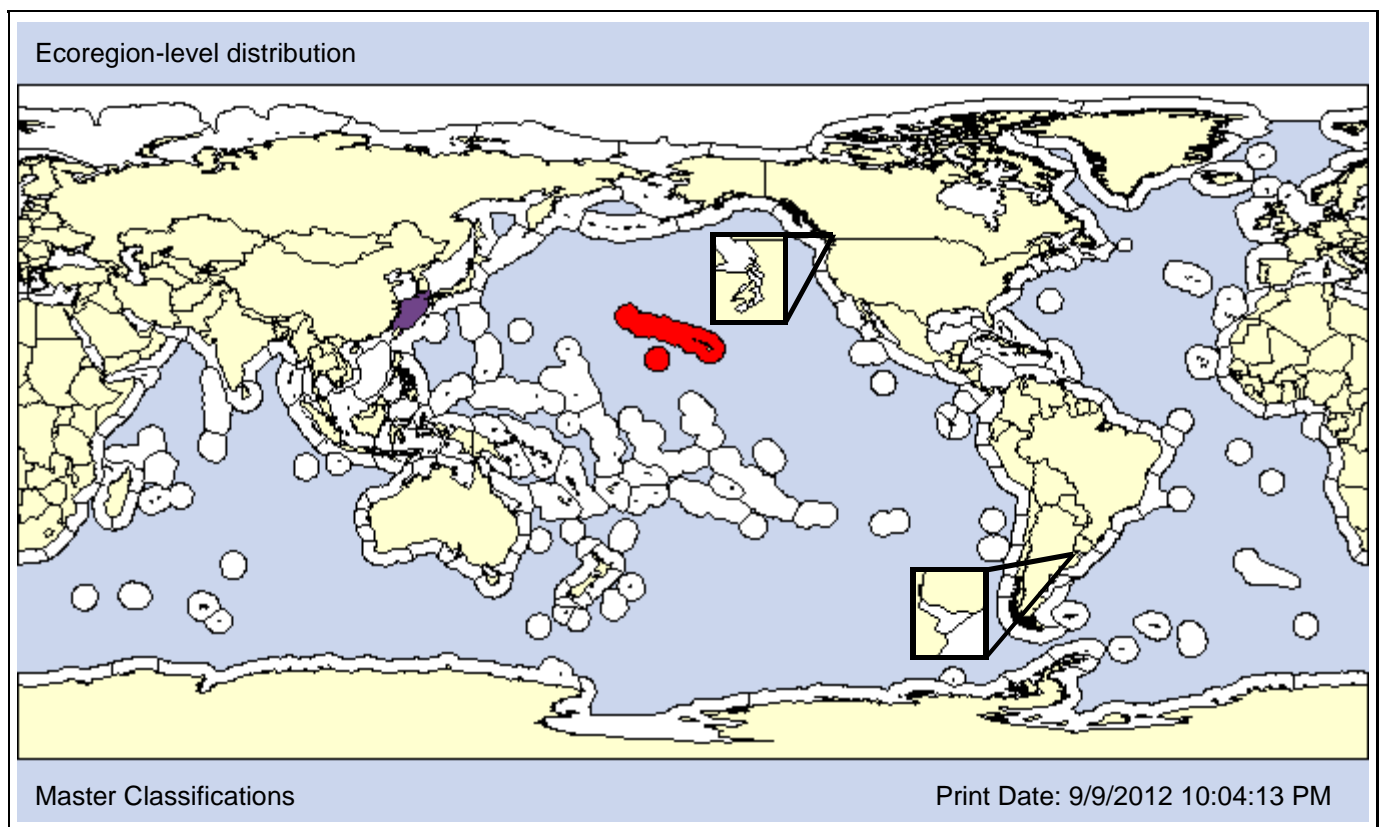
Dolichopus angustinervis  
Dolichopus sigmatifer

Synonym  
Synonym

**Common Names:**

long-legged fly (*Dolichopus exsul*)

**Type Locality:**



**Date 1st record:** Unknown 1930  
**Loc 1st record:** Unknown Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				X
						AO	PO			X				

Comments: *Dolichopus exsul* was first recorded from Hawaii in 1930. In Hawaii it is found in hypersaline environments at salinities up to 38 psu. Carlton and Eldredge (2009) suggest that it is native to the Caribbean region, however Evenhuis (1989) lists it as occurring in China, Taiwan, and India.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>O</b>		<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
														<b>O</b>

**SALINITY [Obs: 0 - 38psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							



**Taxon:** Insects

**Taxonomic Author:** Cresson, 1943

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

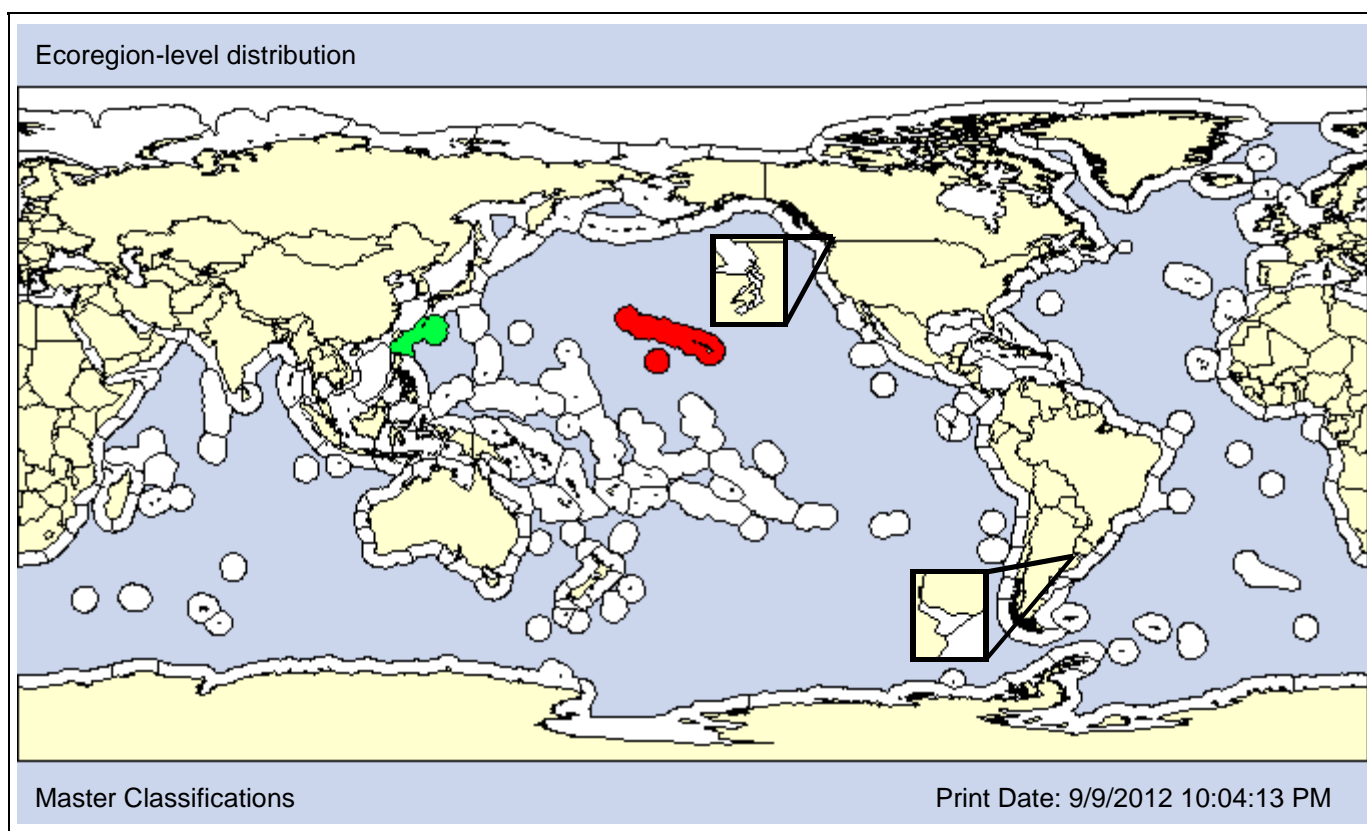
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

shore fly (*Donaceus nigronotatus*)

**Type Locality:** Taiwan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1958  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Donaceus nigronotatus* is an Asian species described from Taiwan and recorded in Hawaii in 1958. Transport on airplanes is a likely vector for the spread of this generalist species (Englund et al., 2000a).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>O</b>		<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
<b>X</b>													

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>						

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 39psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:** Hagen, 1862

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Palaeoptera

**Superorder:**

**Order:** Odonata

**Suborder:** Zygoptera

**Infraorder:**

**Superfamily:**

**Family:** Coenagrionidae

**Subfamily:**

**Also Known As (Name - Type):**

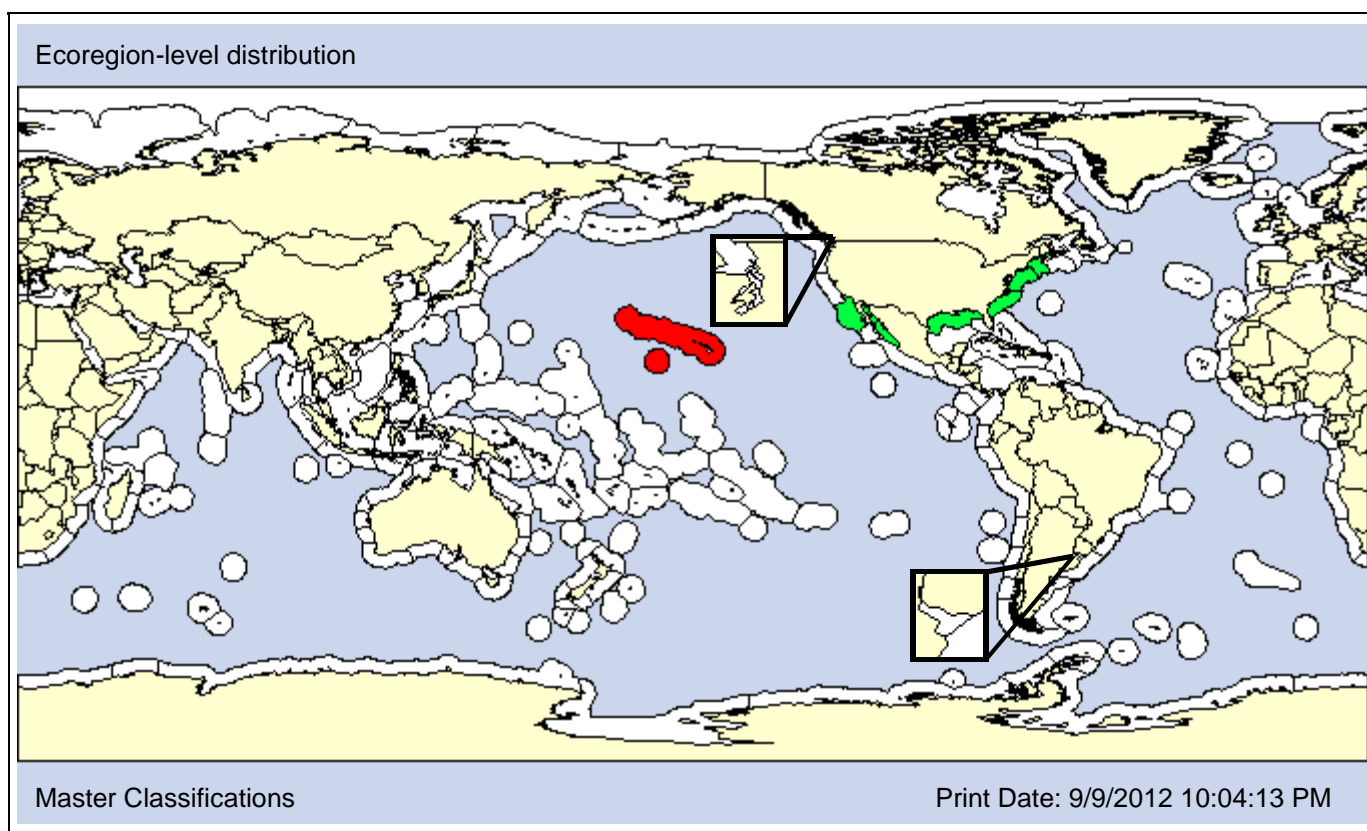
Agrion plebeium  
Agrion simile

Synonym  
Synonym

**Common Names:**

familiar bluet damselfly

**Type Locality:**



<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span> Native	<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> Nonindigenous	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-style:dashed;"></span> NIS Not Established	<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Cryptogenic	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Transient	<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Unclassified	<span style="display:inline-block; width:15px; height:15px; background-color:lightgrey; border:1px solid black;"></span> Conflicting Classification	<span style="display:inline-block; width:15px; height:15px; background-color:white; border:1px solid black;"></span> Unidentified
<b>NWP</b>			<b>Hawaii</b>			<b>NEP</b>	

**Date 1st record:** 1936 Native  
**Loc 1st record:** Oahu, Hawaii Native  
**Established:** Yes Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				
						AO	PO		X	X				

Comments: *Enallagma civile* is native to Western North America, but numerous eastern American records exist.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - 24psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Insects

**Taxonomic Author:** Gundersen, 1977

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Coleoptera

**Suborder:** Polyphaga

**Infraorder:** Staphyliniformia

**Superfamily:** Hydrophiloidea

**Family:** Hydrophilidae

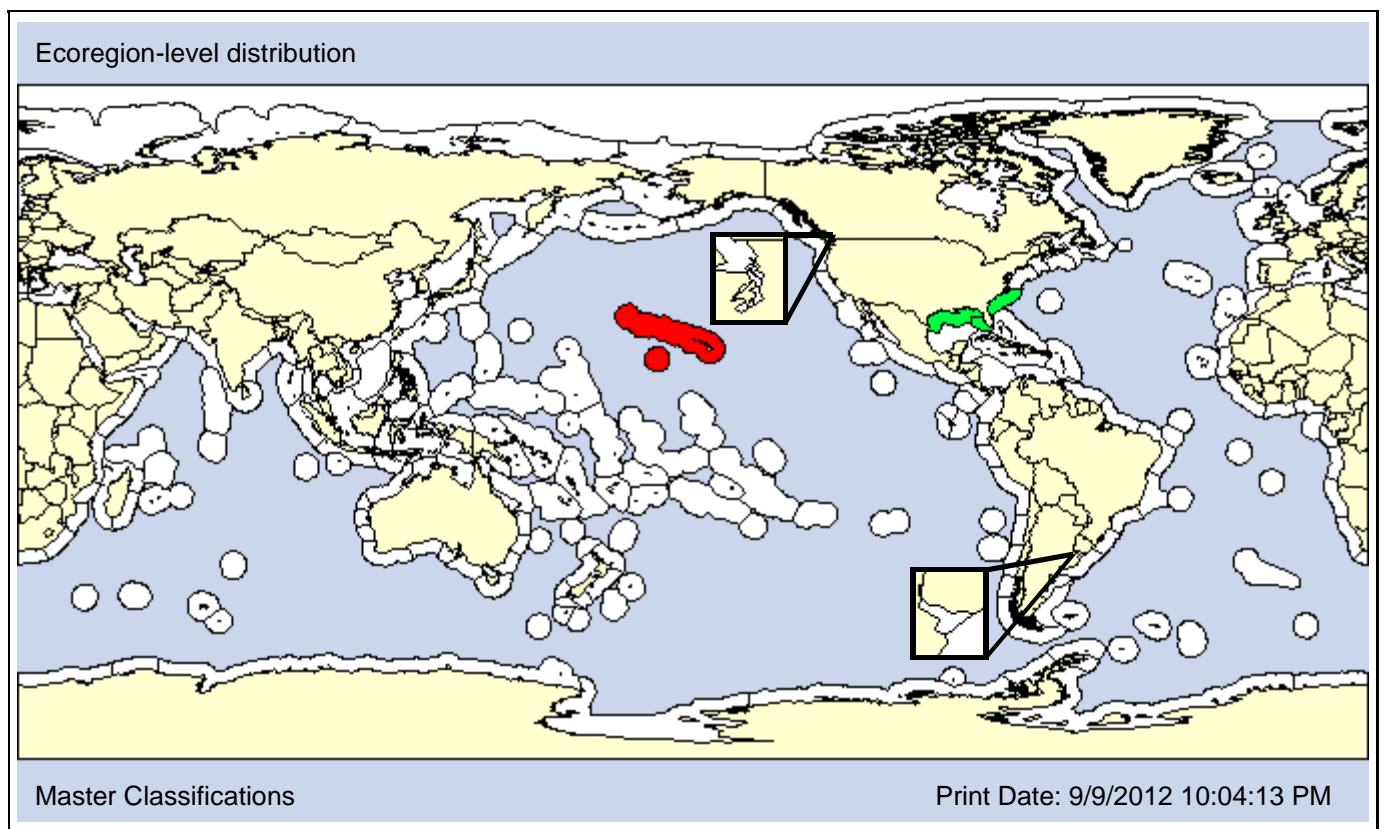
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

scavenger beetle (*Enochrus sayi*)  
water scavenger beetle (*Enochrus sayi*)

**Type Locality:** Okeechobee, Florida, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1937  
**Loc 1st record:** Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Enochrus sayi* was first recorded from Hawaii in 1937. These beetles are attracted to light and may be transported between islands by ships or planes.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>						

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 16psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
					<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
	<b>X</b>		BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:** Packard, 1871

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

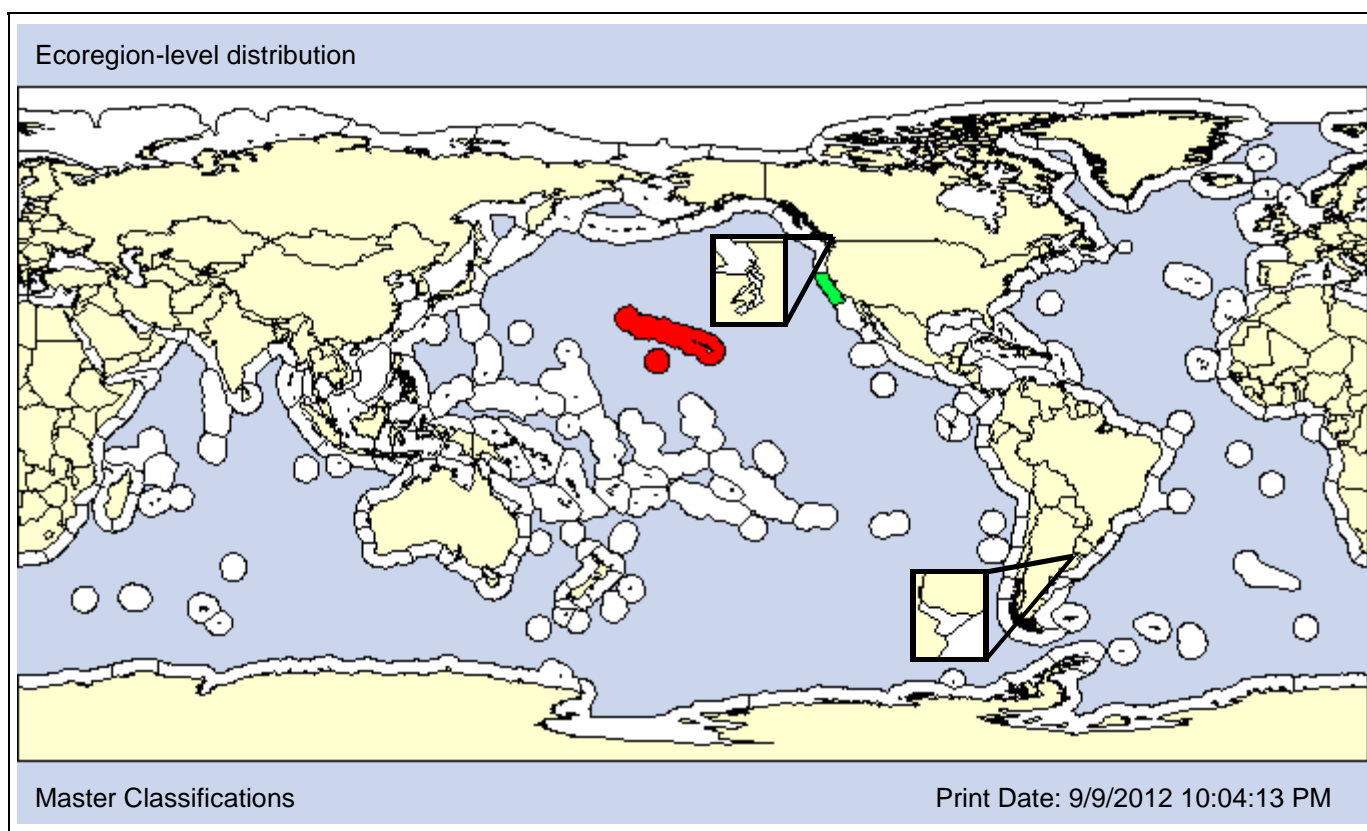
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Ephydra cinerea	Synonym	brine fly ( <i>Ephydra gracilis</i> )
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**Type Locality:**



■ Native
 ■ Nonindigenous
   NIS Not Established
   Cryptogenic
   Transient
   Unclassified
   Conflicting Classification
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1946 Native

**Loc 1st record:** Hawaii Native

**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Ephydra gracilis* is native to California. A population explosion occurred in Hawaii shortly after its arrival in 1946 but then crashed and was not observed again until 1998 (Carlton and Eldredge, 2009). Its introduction is blamed on seaplanes flying from California to Oahu.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O					O	O	O	O

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		X			TP	RI-PH					

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
O		O	Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								O						

**SALINITY [Obs: - 38psu]**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		O

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			X						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	



**Taxon:** Insects

**Taxonomic Author:** Jones, 1906

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

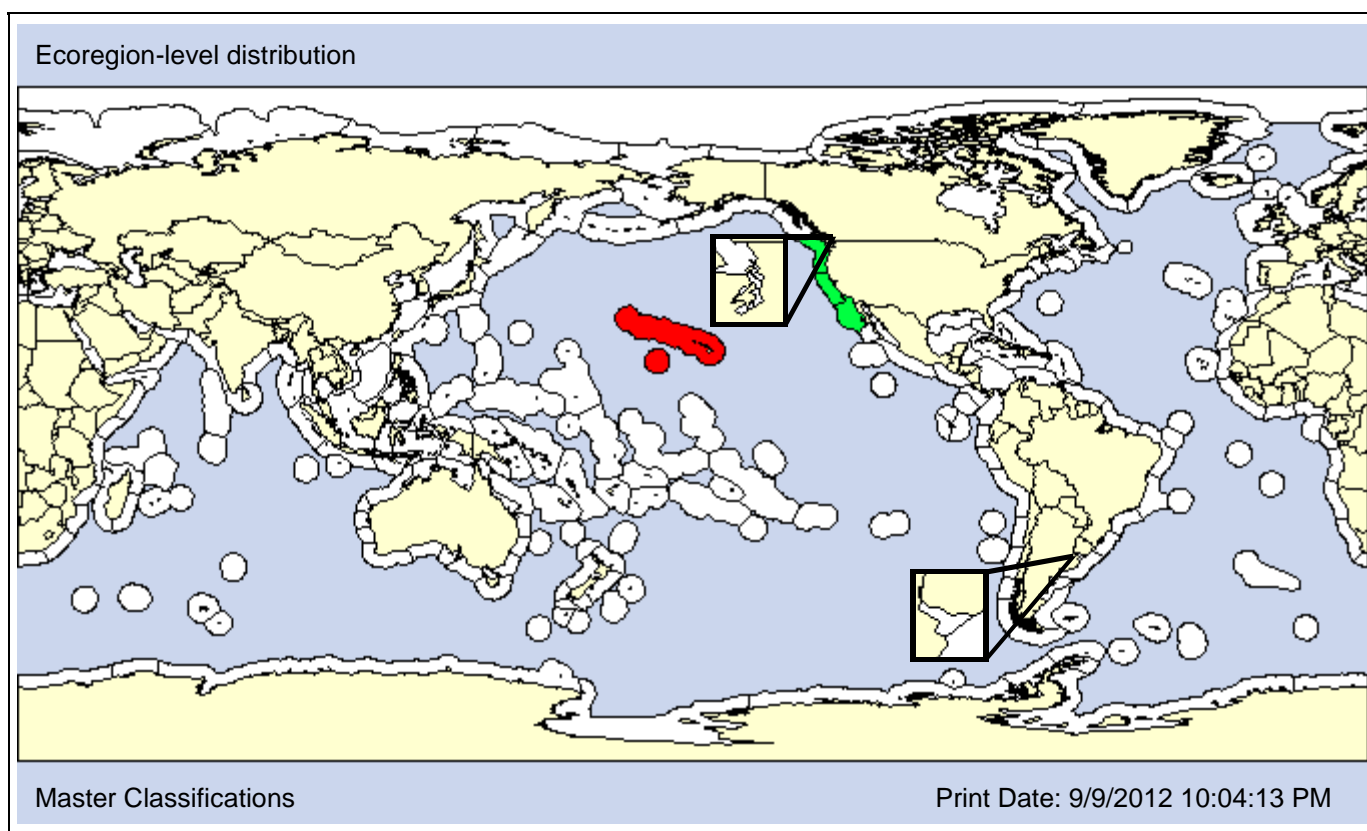
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

brine fly (*Ephydra millbrae*)

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1950 Native  
**Loc 1st record:** Hawaii Native  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Ephydra millbrae* is reported as native to California, with the first record from Hawaii reported in 1950.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>O</b>		<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
						<b>O</b>

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 15 - 44psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	

# Goeldichironomus holoprasinus

Species ID: 220016

**Taxon:** Insects

**Taxonomic Author:** (Goeldi, 1905)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Nematocera

**Infraorder:** Culicomorpha

**Superfamily:**

**Family:** Chironomidae

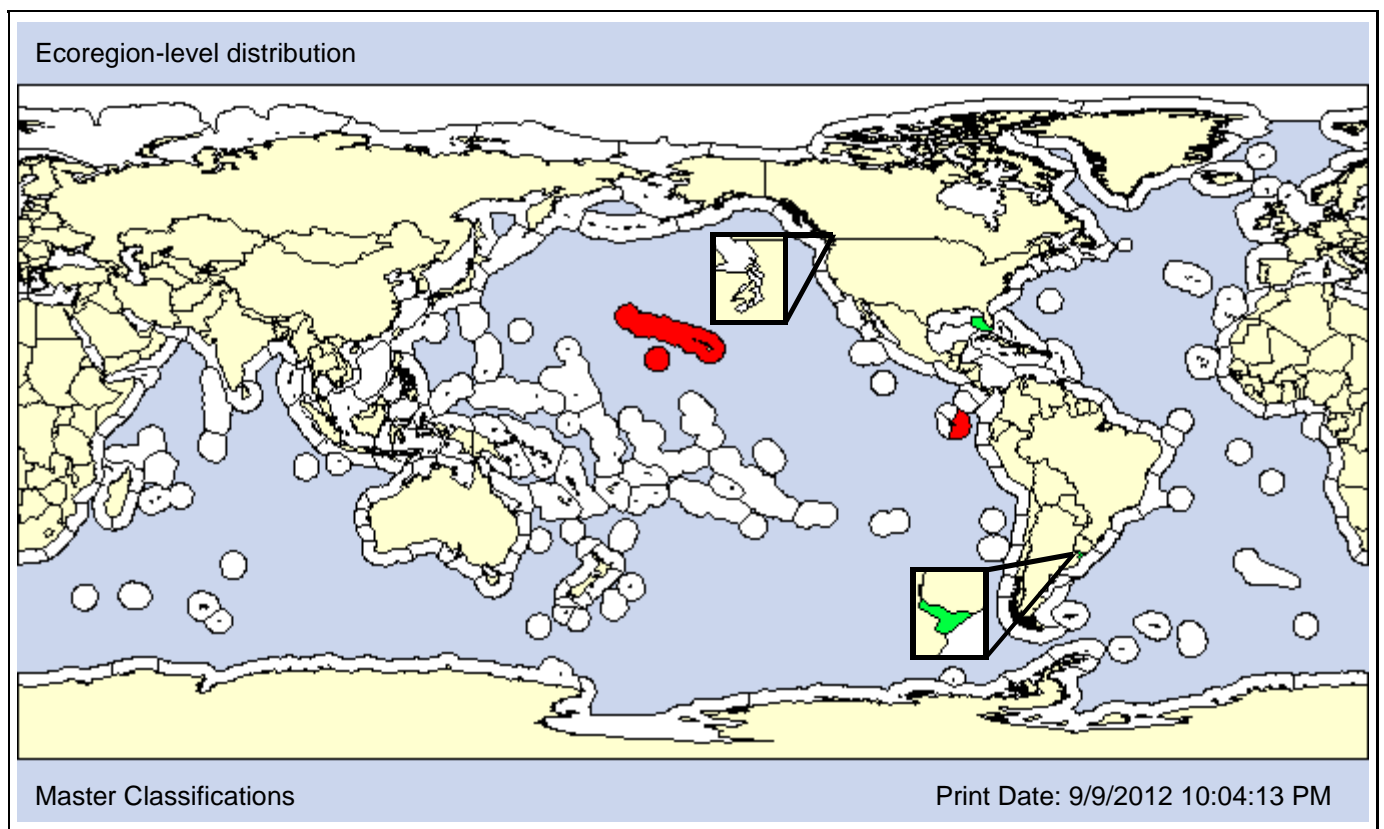
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

non-biting midge

**Type Locality:** Brazil



**Date 1st record:**

1969

**Loc 1st record:**

Honolulu, Hawaii

**Established:**

Yes

### VECTORS

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: Goeldichironomus holoprasinus is native to north and south America.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O							P	O

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		X											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:** Thomson, 1869

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

**Subfamily:**

**Also Known As (Name - Type):**

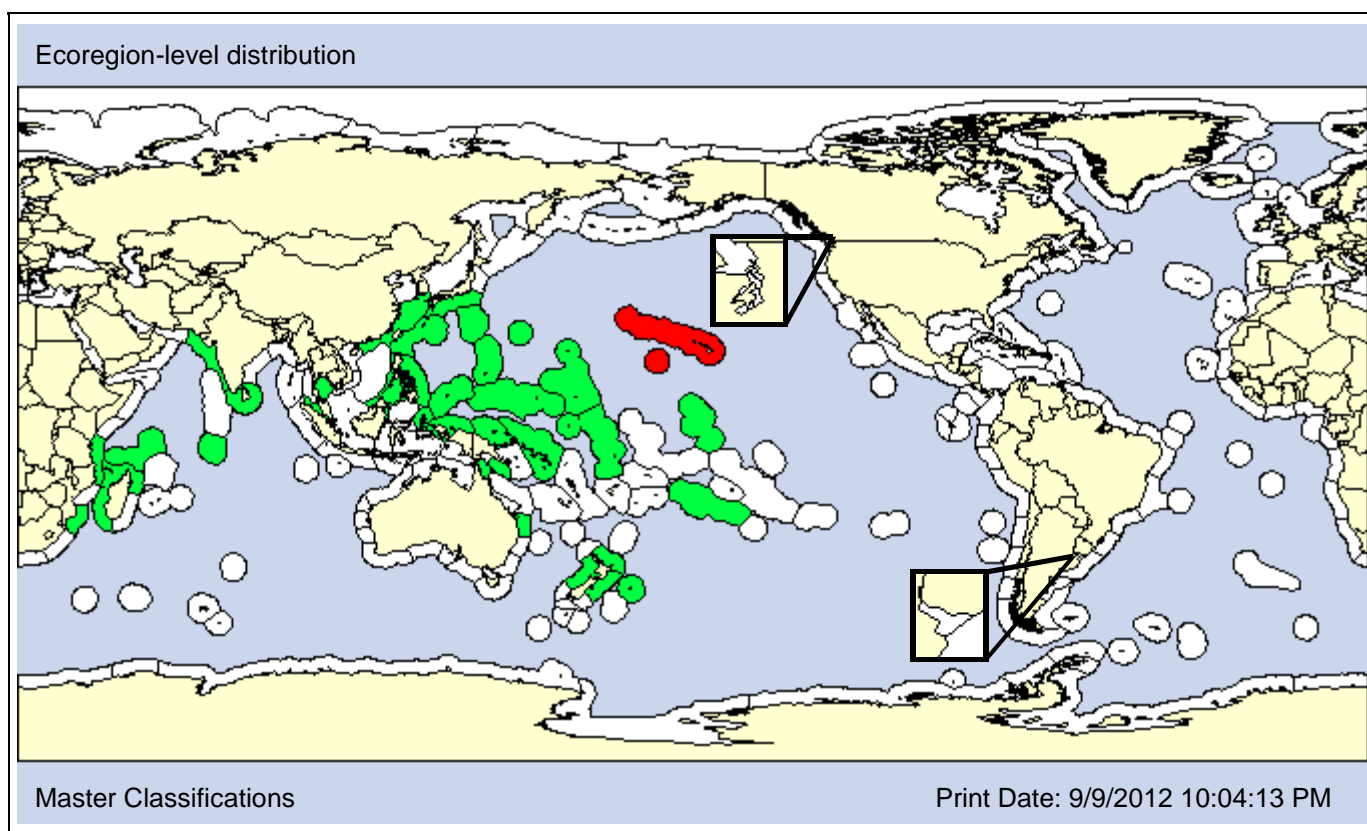
Hecamede (Hecamede) granifera  
 Hecamede femoralis  
 Hecamede lacteipennis  
 Hecamede nivea

Convention  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

shore fly (Hecamede granifera)

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Unknown 1923  
**Loc 1st record:** Unknown Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Hecamede granifera* is native to the Western/South Pacific with records from both Guam and Sri Lanka. It was first reported from Hawaii in 1923 and occurs in sea shore habitats and saline streams.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>				<b>P</b>	<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					
<b>X</b>	<b>X</b>												

**DEPTH [Obs: 0 - 22m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
<b>P</b>	<b>O</b>	<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>					<b>O</b>

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 15 - 43psu] [Pref: - 37psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>		<b>X</b>	<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
					<b>X</b>								

**Taxon:** Insects

**Taxonomic Author:** Cresson, 1945

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

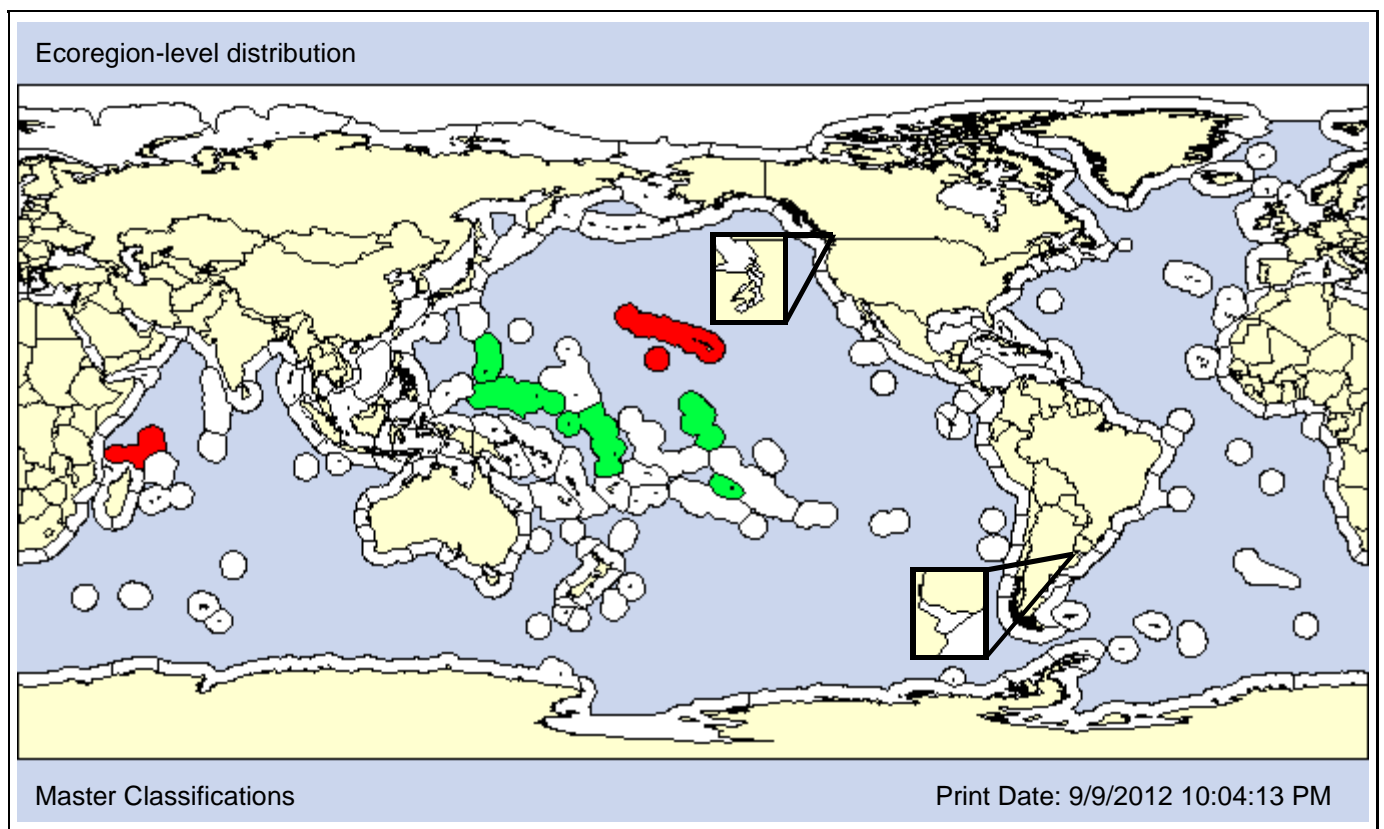
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Discocerina rattii	Synonym	
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**Type Locality:** Guam



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1946  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Hostis guamensis* is an Australasian species first recorded from Hawaii in 1946. It is reported as having invaded Madagascar as well and is noted to have an "Afrotropical" distribution. The type specimen is from an airplane that landed on Guam, and airplanes are a likely vector for this species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	O	O	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	P					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
					X	X			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	



**Taxon:** Insects

**Taxonomic Author:** (Selys-Longchamps, 1850)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Palaeoptera

**Superorder:**

**Order:** Odonata

**Suborder:** Zygoptera

**Infraorder:**

**Superfamily:**

**Family:** Coenagrionidae

**Subfamily:**

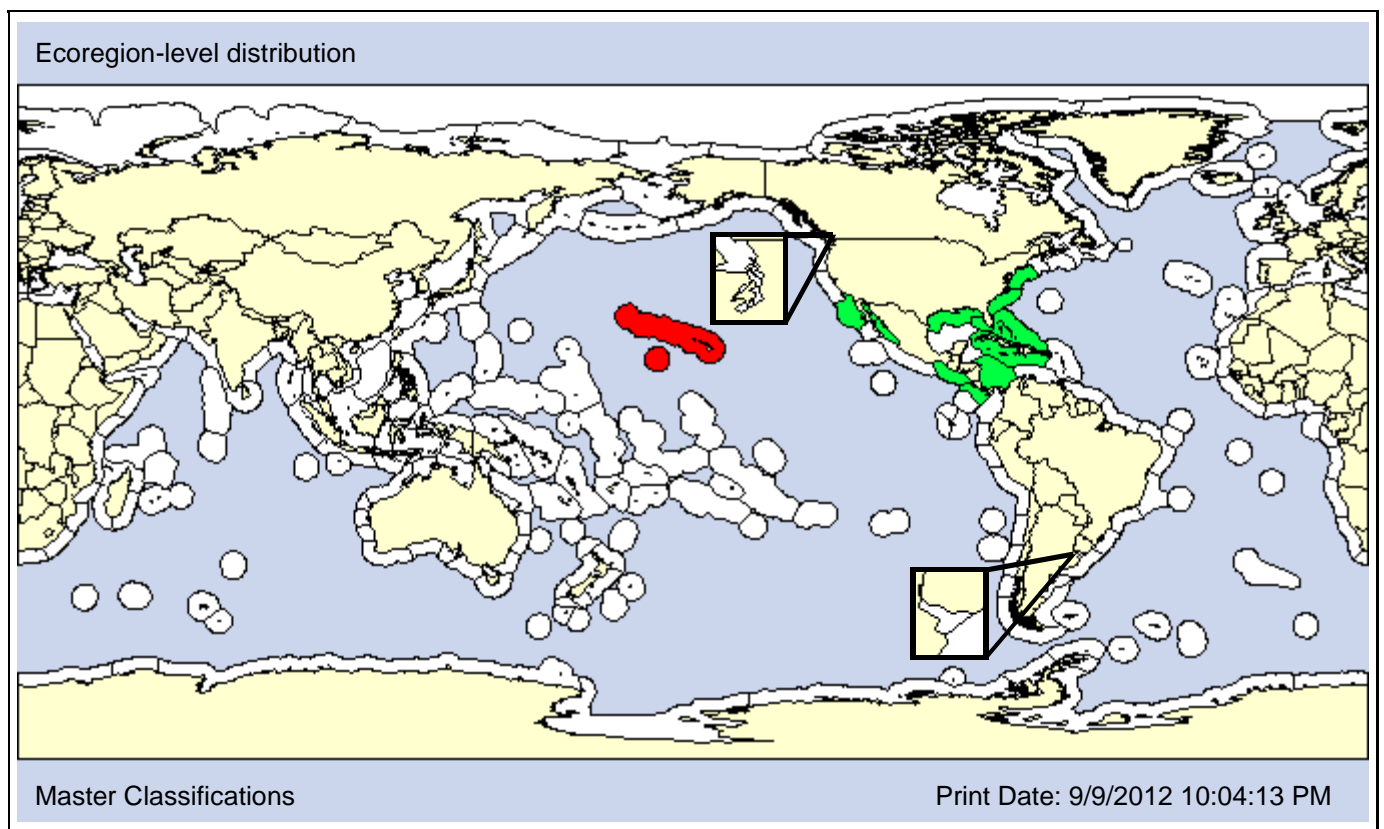
**Also Known As (Name - Type):**

Agrion aurantiaca	Synonym
Agrion credula	Synonym
Agrion defixa	Synonym
Agrion expertum	Synonym

**Common Names:**

Rambur's forktail damselfly
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1973  
**Loc 1st record:** Hilea, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF			ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
						AO	PO			X	X			

Comments: *Ischnura ramburii* is native to North and South America and, based on numerous records, appears to be primarily eastern American. Reproduction occurs in freshwater, but all other life stages occur around salt water environments.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>P</b>		<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - 10psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>								

**Taxon:** Insects

**Taxonomic Author:** Yoshimoto, 1962

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Hymenoptera

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Eucoilidae

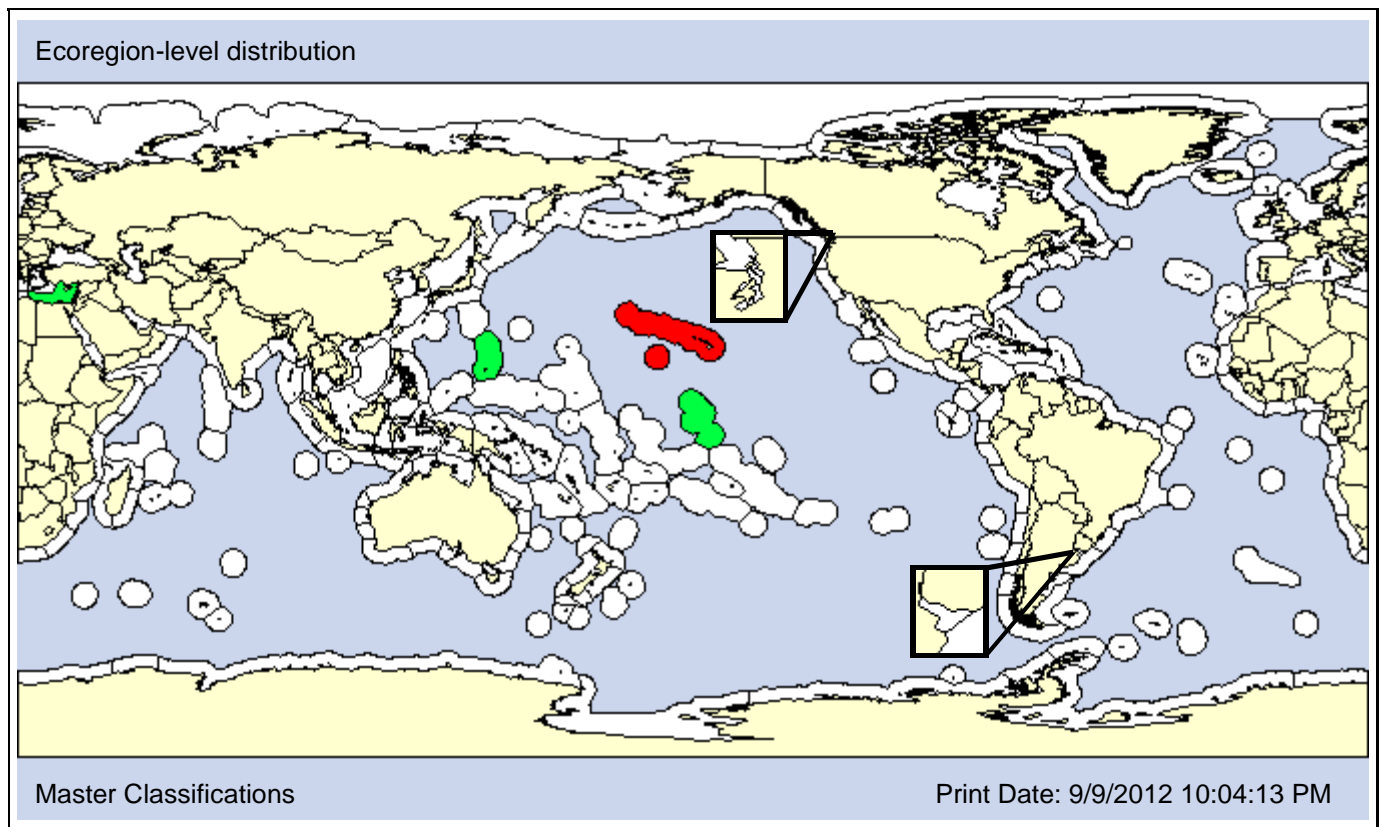
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Kleidotoma (Kleidotoma) bryani	Convention	
--------------------------------	------------	--

**Type Locality:** Oahu, Hawaii, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1923  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: Although originally described from Hawaii, Carlton and Eldredge (2009) list *Kleidotoma bryani* as introduced to Hawaii and native to Guam and Palmyra Islands. This wasp appears to be a parasite of an unknown littoral fly.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>O</b>			<b>O</b>			<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
<b>X</b>									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>

**Taxon:** Insects

**Taxonomic Author:** Meijere, 1916

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Dolichopodidae

**Subfamily:**

**Also Known As (Name - Type):**

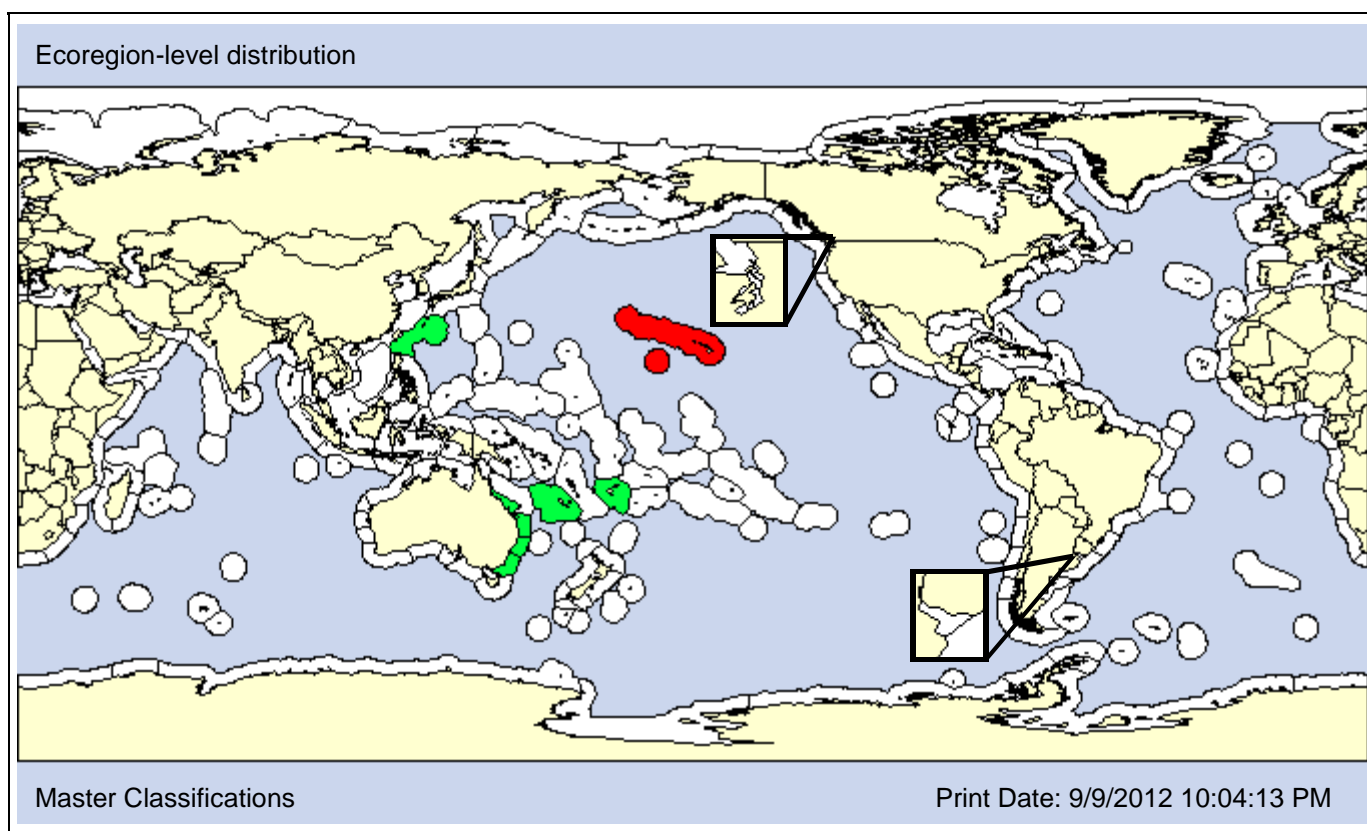
Medetera atrata  
 Medetera cilifemorata  
 Medetera hawaiiensis of VanDuzee, 1933  
 Medetera palmae

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

long-legged fly (*Medetera grisescens*)

**Type Locality:**



**Date 1st record:**

1914

**Loc 1st record:**

Honolulu, Hawaii

**Established:**

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Medetera grisescens* is a wide-spread tramp species, thought to be native to the Australasia region. It was first recorded from Hawaii in 1914.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O					O	P		O

**ECOSYSTEM**

Unconsolidated X						Consolidated						Pelagic	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
O			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

R	HP	Biogenic						Artificial Substrate						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 38psu]**

Fresh O	Brackish O						Marine O		Hyper
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	O	
	O	O	O	O	O	O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
									DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					X								

**Taxon:** Insects

**Taxonomic Author:** Uhler, 1894

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Hemiptera

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Mesoveliidae

**Subfamily:**

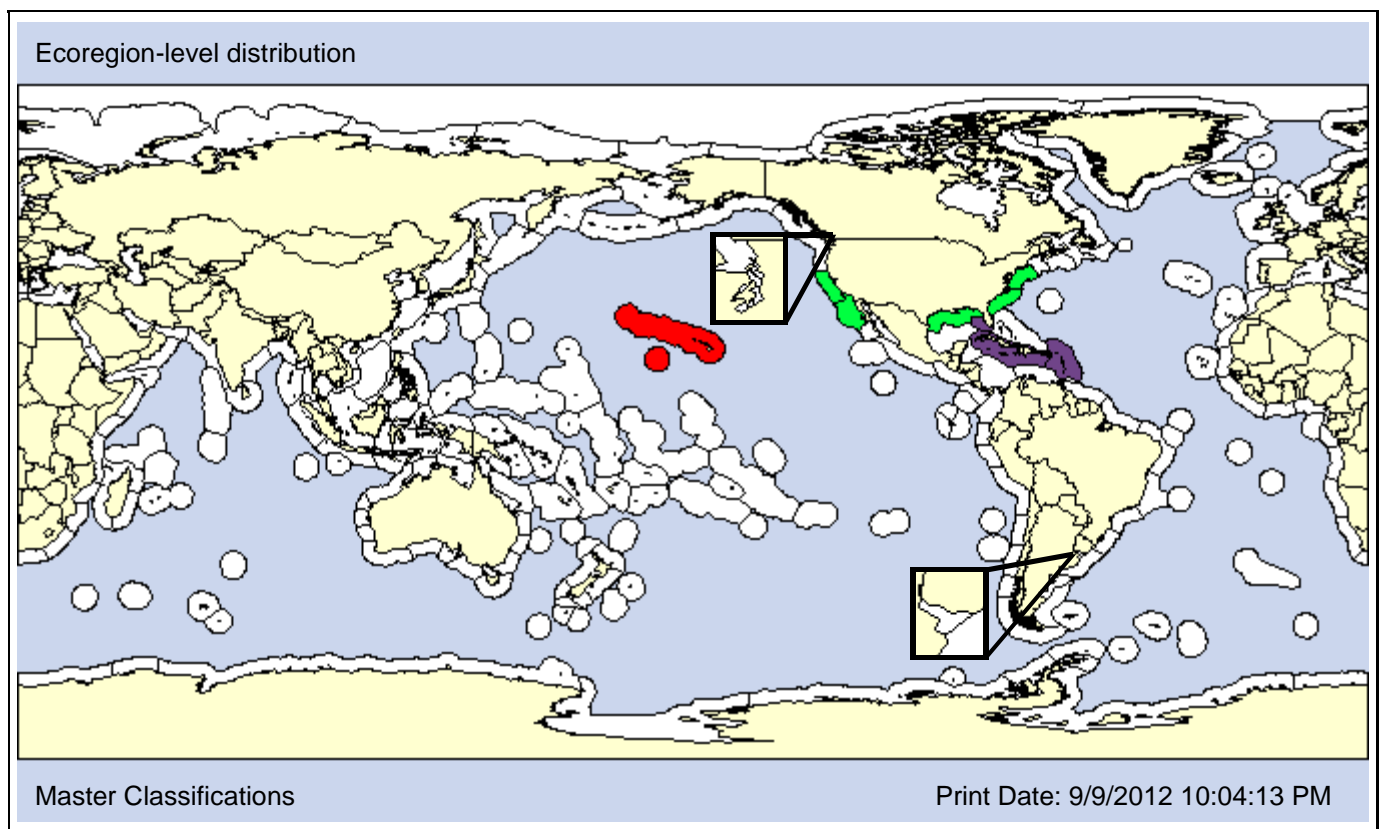
**Also Known As (Name - Type):**

Mesovelia douglasensis	Synonym

**Common Names:**

water treader (Mesovelia amoena)

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1971 Native  
**Loc 1st record:** Oahu, Hawaii Native  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: Mesovelia amoena is native to North and South America. This species is apparently parthenogenetic in Hawaii as males are unknown (Englund et al., 2000a).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>P</b>		<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>						

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>						

**SALINITY [Obs: 0 - 9psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>						

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
<b>X</b>			BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Insects

**Taxonomic Author:** White, 1879

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Hemiptera

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Mesoveliidae

**Subfamily:**

**Also Known As (Name - Type):**

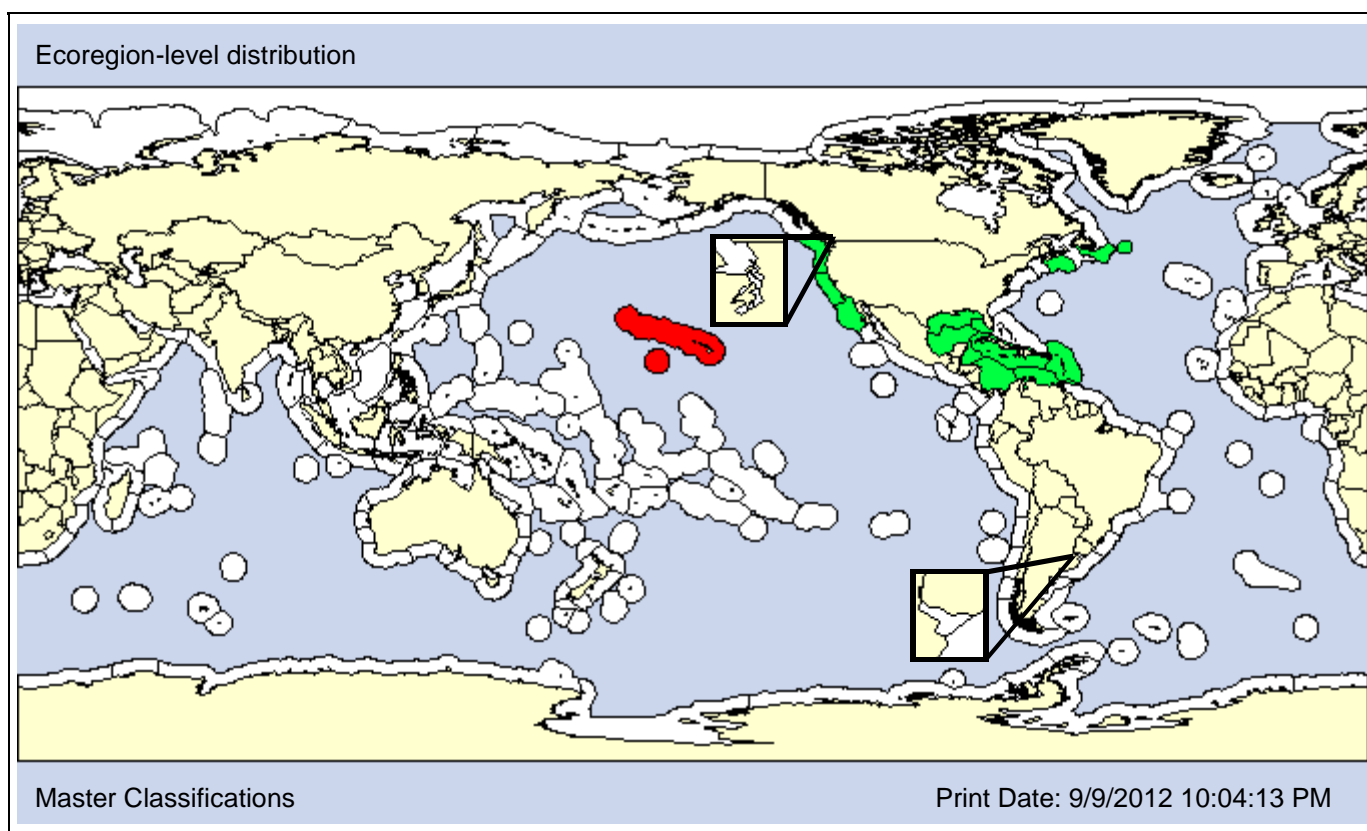
Mesovelia bisignata  
Mesovelia mulsanti bisignata

Synonym  
Convention

**Common Names:**

shore bug (*Mesovelia mulsanti*)  
water treader (*Mesovelia mulsanti*)

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1933 Native  
**Loc 1st record:** Oahu, Hawaii Native  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
						AO	PO			X	X				

Comments: *Mesovelia mulsanti* is native to North and South America and there are many records of this taxon in coastal Argentina. "Winged and apterous forms were observed moving across the water surface, lily pads, algal masses and other aquatic vegetation. Eggs are laid in aquatic plant tissue." (Englund et al., 2000a).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O					O	P		O

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X				TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
O	O	O	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		O	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
O						

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								O						

**SALINITY [Obs: 0 - 4.5psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	O	O						

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
X			BP	EPS	EPU	EPC						X	

**Taxon:** Insects

**Taxonomic Author:** (Say, 1832)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Hemiptera

**Suborder:** Heteroptera

**Infraorder:** Leptopodomorpha

**Superfamily:** Leptopodoidea

**Family:** Saldidae

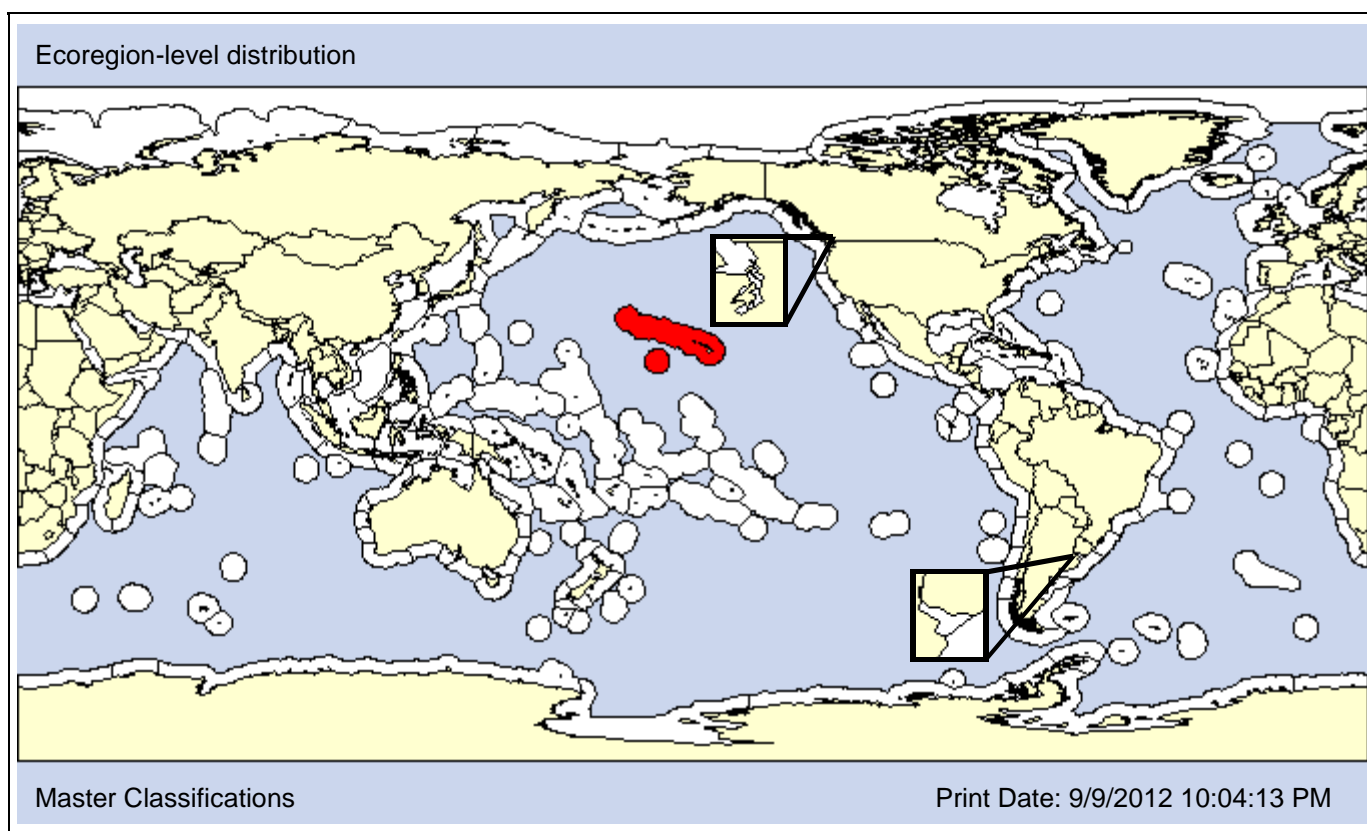
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

shore bug (*Micracanthia humilis*)

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1988  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O					O	P		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
O	O		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O						

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 28psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	O	O	O	O	O	O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:** Cresson, 1916

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

**Subfamily:**

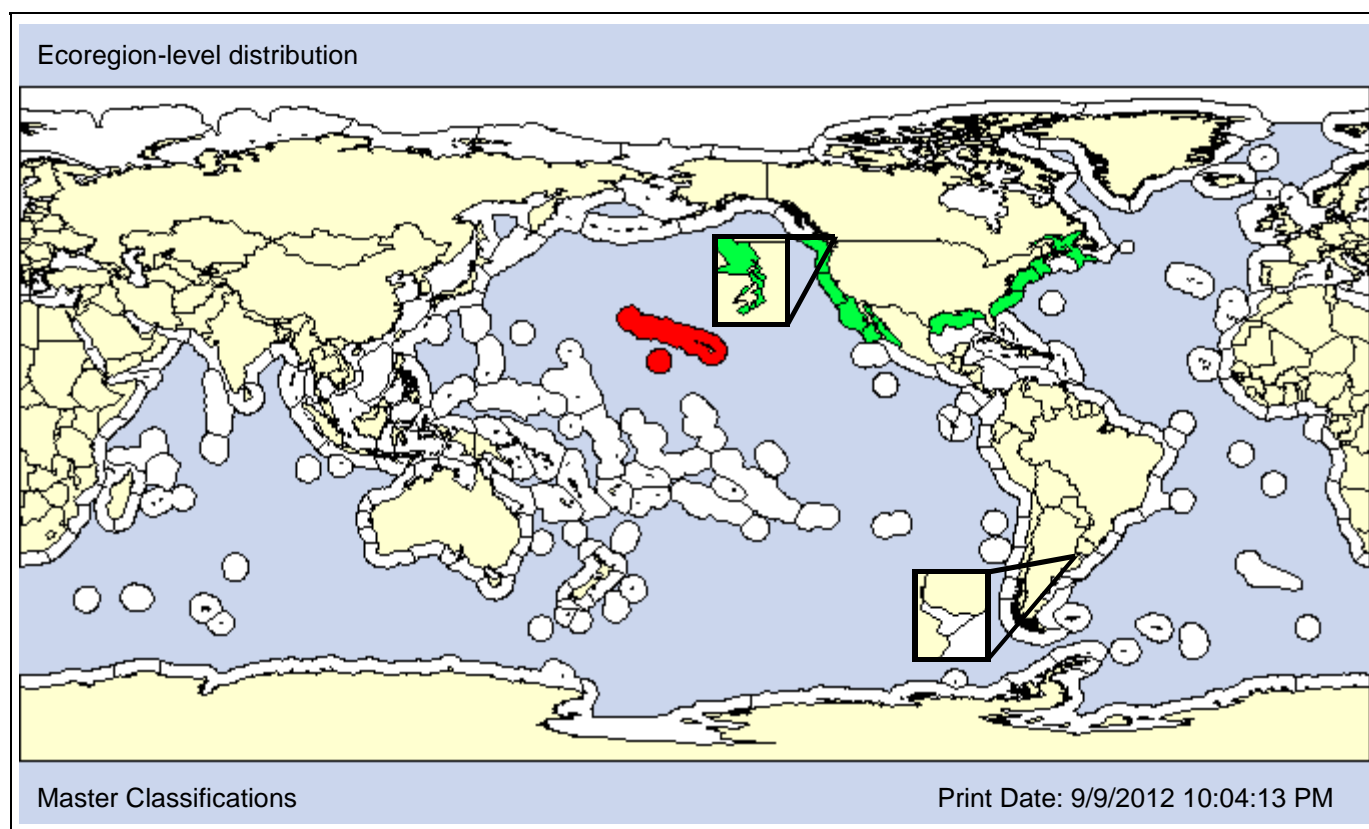
**Also Known As (Name - Type):**

Gymnopa tibialis	Synonym

**Common Names:**

shore fly ( <i>Mosillus tibialis</i> )

**Type Locality:** Wildwood, New Jersey, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1944 Native  
**Loc 1st record:** Molokai, Hawaii Native  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Mosillus tibialis* is a widespread species in temperate North America. It was first reported from Hawaii in 1944 and was likely introduced from the Western U.S. by commerce.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>P</b>	<b>O</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
<b>X</b>	<b>X</b>												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>P</b>	<b>O</b>	<b>O</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>						<b>O</b>

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 38 - 43psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Insects

**Taxonomic Author:** (Cresson, 1939)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

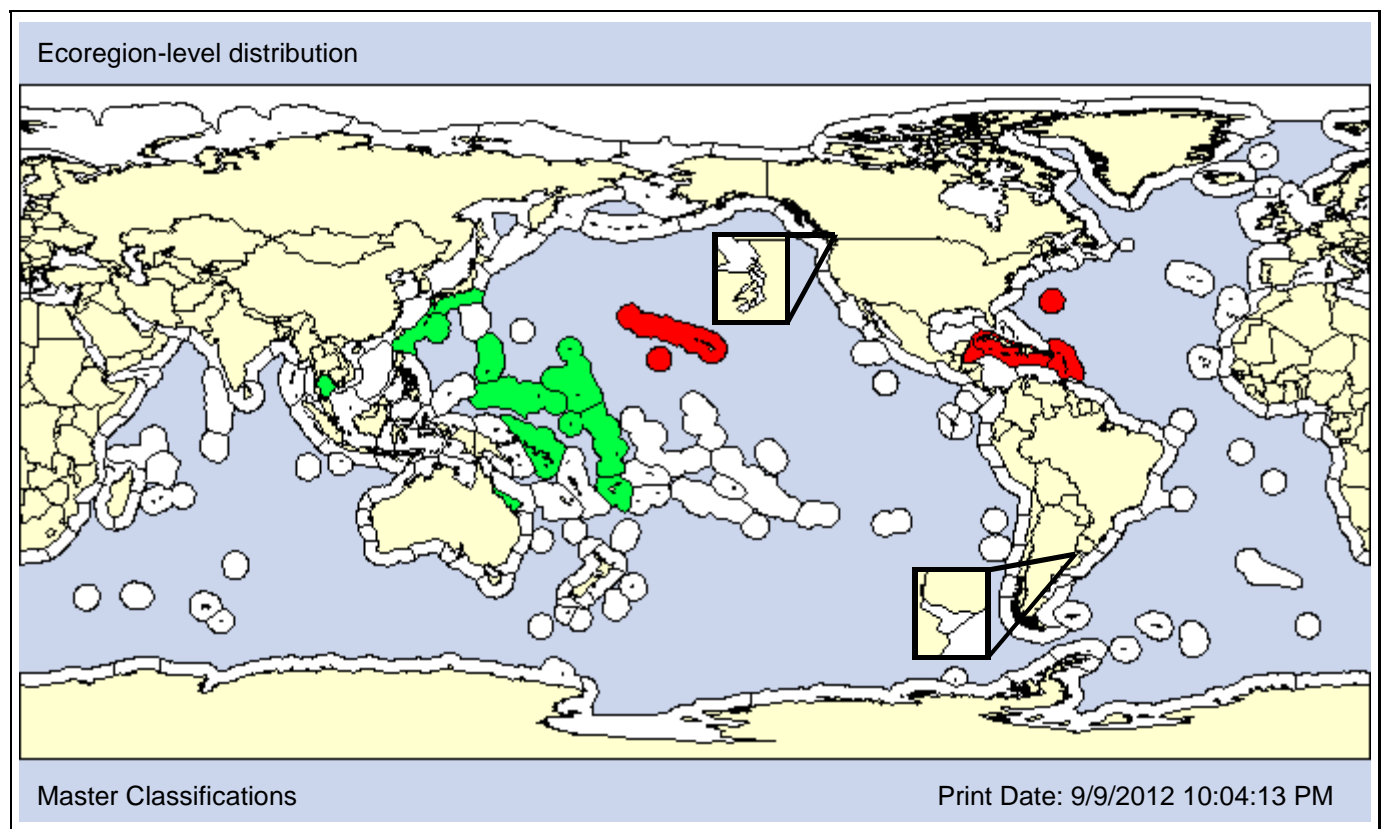
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Discocerina mera	Synonym	shore fly ( <i>Orasiopa mera</i> )
------------------	---------	------------------------------------

**Type Locality:** Taiwan



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1948  
**Loc 1st record:** Native Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Orasiopa mera* (= *Discocerina mera*) is native to the western/southern Pacific Ocean and was first reported from Hawaii in 1948.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O					O	O		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			X		TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
O	O	O	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O					

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									O					

**SALINITY [Obs: 10 - 39psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	O	
				O	O	O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	
					X	X							



**Taxon:** Insects

**Taxonomic Author:** Woolridge, 1990

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Coleoptera

**Suborder:** Polyphaga

**Infraorder:** Elateriformia

**Superfamily:** Byrrhoidea

**Family:** Limnichidae

**Subfamily:**

**Also Known As (Name - Type):**

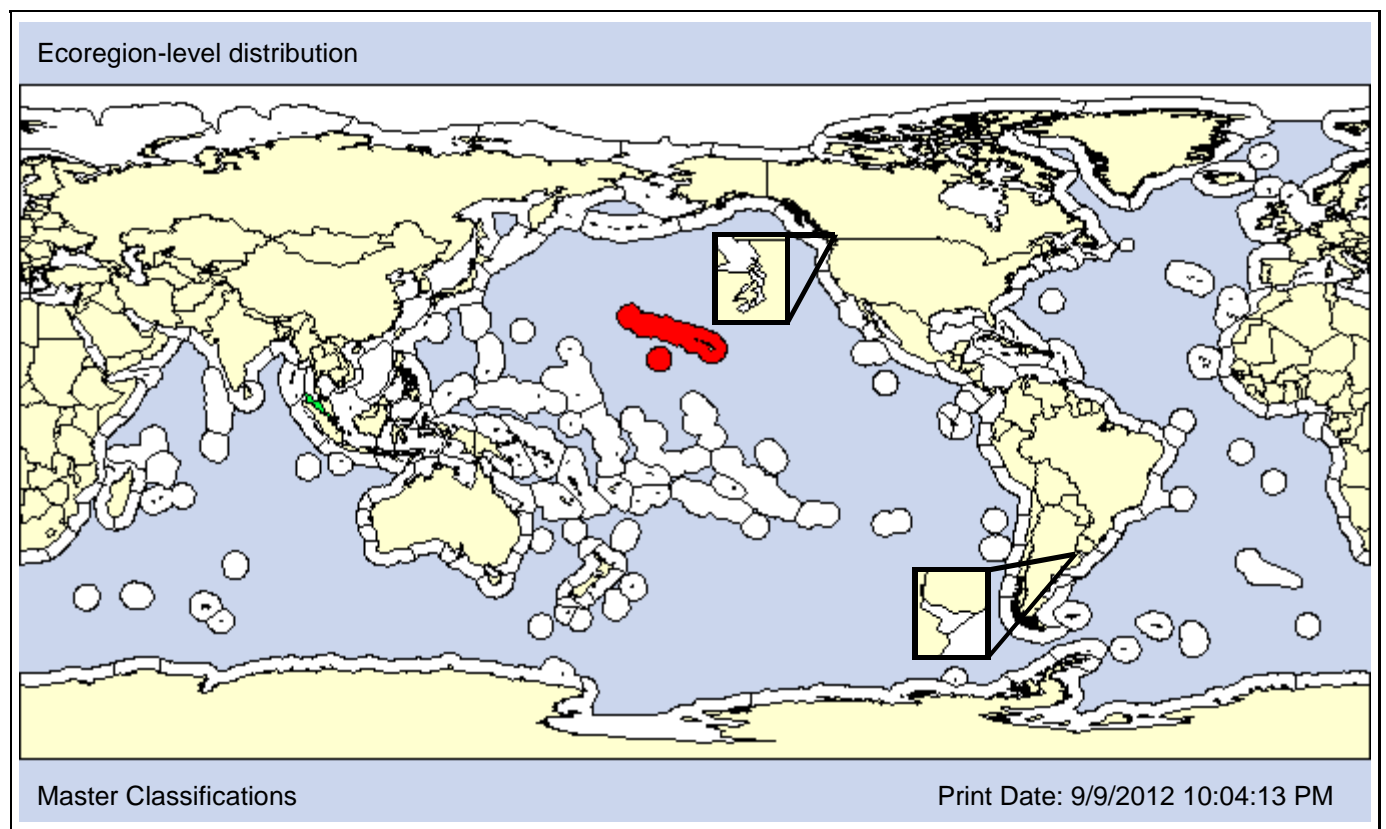
Parathroscinus cf. murphyi of Englund et al., 2000

Ambiguous syn.

**Common Names:**

minute marsh-loving beetle (*Parathroscinus murphyi*)  
small mangrove mudflat beetle

**Type Locality:** Singapore



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1996  
**Loc 1st record:** Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
<b>X</b>						AO	PO								

Comments: *Parathroscinus murphyi* is native to Southeast Asia (holotype described from Singapore). This beetle was first recorded from Hawaii in 1996 and has become abundant in mangrove habitats. Carlton and Eldredge (2009) suggest that it was introduced via ballast water.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>					<b>O</b>	<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>	<b>X</b>		TP	RI-PH					
	<b>X</b>												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>	<b>P</b>					

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>								

**Taxon:** Insects

**Taxonomic Author:** (Williston, 1896)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

**Subfamily:**

**Also Known As (Name - Type):**

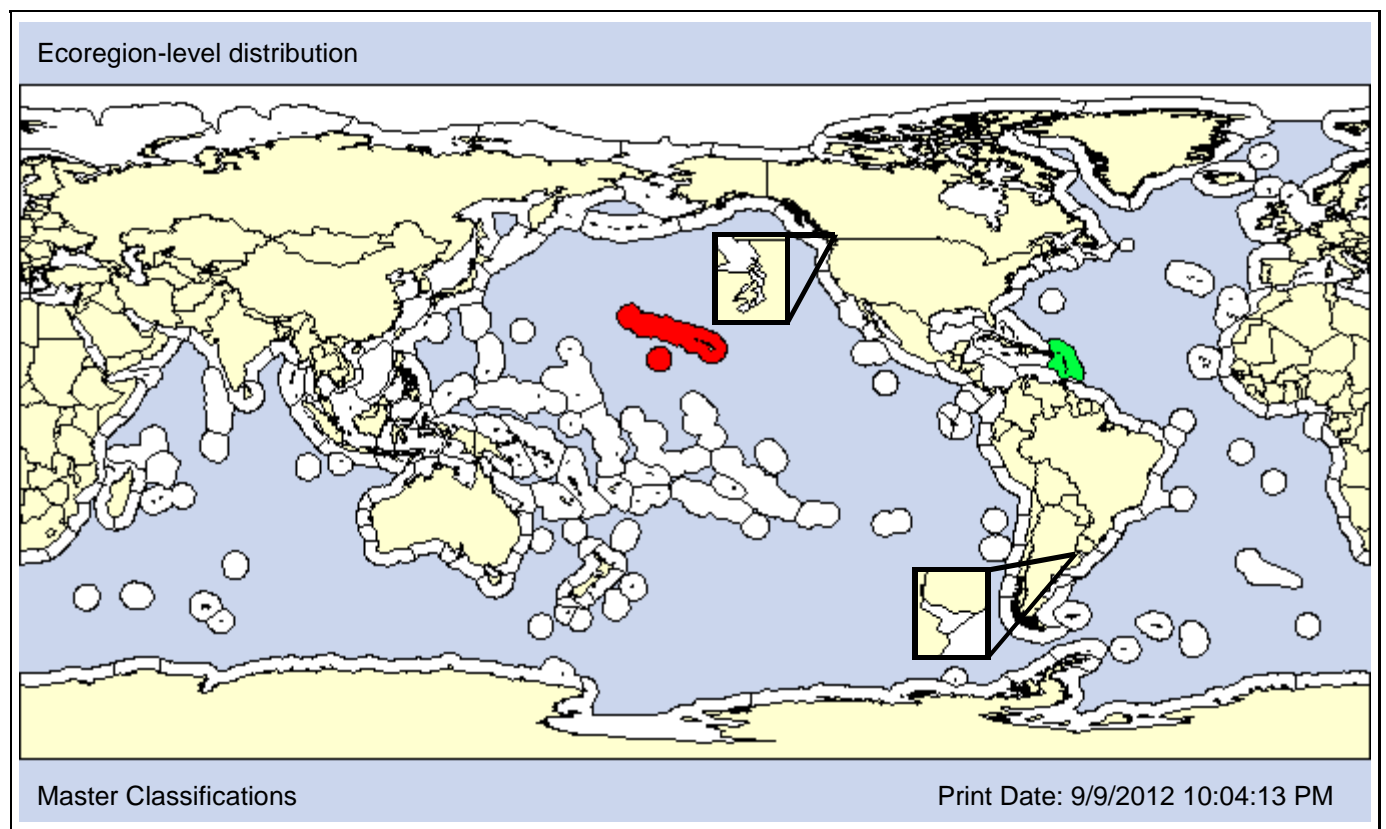
Drosophila pollinosa  
Paratissa semilutea of authors in part

Synonym  
Misidentified

**Common Names:**

shore fly (*Paratissa pollinosa*)

**Type Locality:** St. Vincent, West Indies



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1945  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Paratissa pollinosa* is native to the Caribbean and South America and was first recorded from Hawaii in 1945.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>O</b>			<b>P</b>			

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
<b>X</b>													

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>P</b>	<b>P</b>	<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>		<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>	<b>X</b>							

**Taxon:** Insects

**Taxonomic Author:** (Malloch, 1933)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

**Subfamily:** Psilopininae

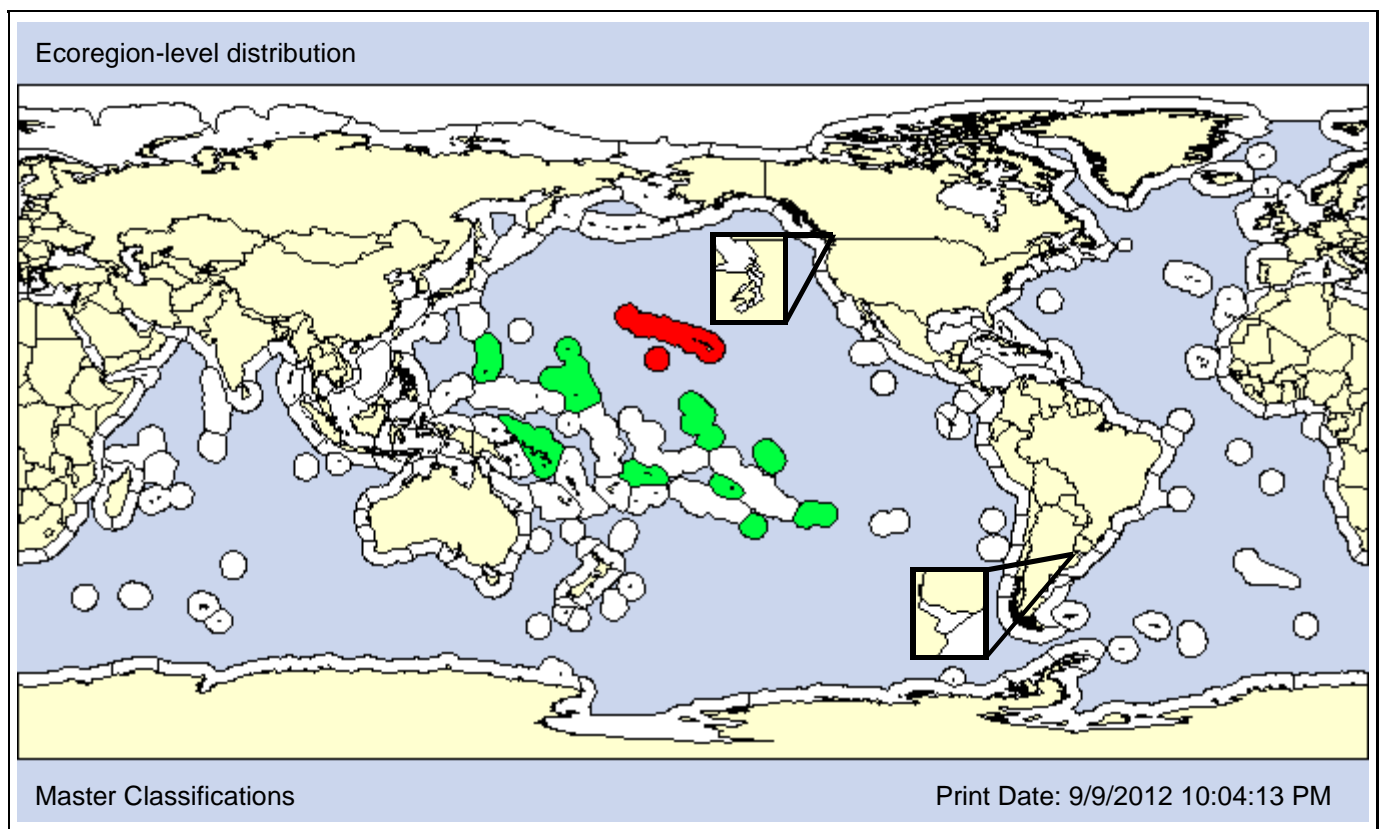
**Also Known As (Name - Type):**

Placopsidella cynocephala of Hawaiian authors; not Kertész, Misidentified

**Common Names:**

shore fly (*Placopsidella marquesana*)

**Type Locality:** New Guinea



**Date 1st record:** 1951  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Placopsidella marquesana* is described from New Guinea and has a broad Indo-Pacific distribution. The first record from Hawaii is 1951. Recent collections from Oahu include areas with relatively little or no freshwater input, with salinities as high as 42 psu (Englund et al., 2000a).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O			O	O		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
X													

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
O	O		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O					O

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>								<b>Artificial Substrate</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
							O		O					

**SALINITY [Obs: 30 - 42psu]**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	O	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	
					X	X							

**Taxon:** Insects

**Taxonomic Author:** Wirth, 1951

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Canaceidae

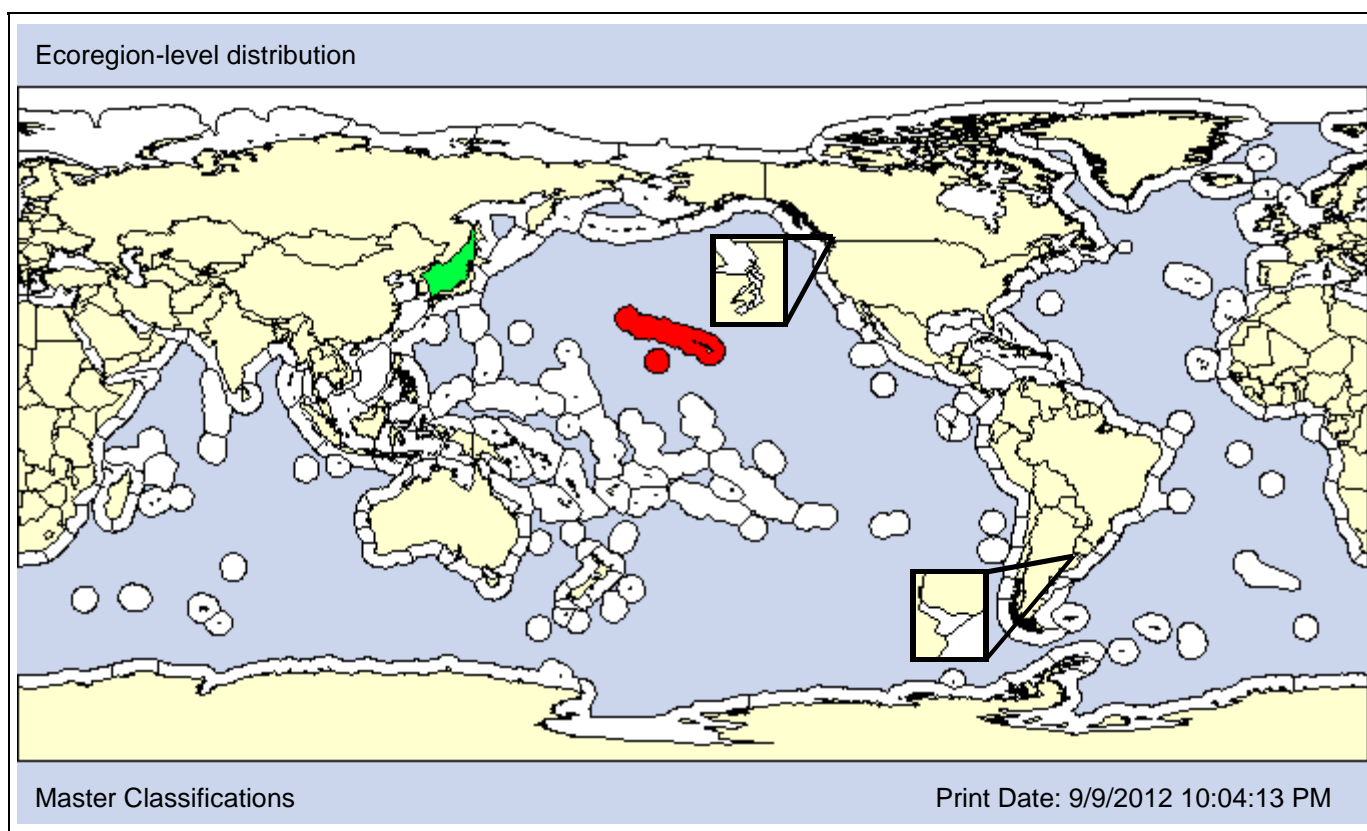
**Subfamily:** Nocticanacinae

**Also Known As (Name - Type):**

**Common Names:**

beach fly (*Procanace williamsi*)

**Type Locality:** Kalihi, Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1944  
**Loc 1st record:** Native Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Procanace williamsi* is reported as native to Japan and was first recognized in Hawaii in 1944. It is now one of the most common beach flies found on Oahu, Hawaii (Englund et al., 2000a). It may have been introduced by airplanes.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O					O	O		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
X	X												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
O	O		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
O	O					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 30psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
						O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					X								



**Taxon:** Insects

**Taxonomic Author:** (Van Duzee, 1897)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Hemiptera

**Suborder:** Auchenorrhyncha

**Infraorder:** Fulguromorpha

**Superfamily:** Fulgoroidea

**Family:** Delphacidae

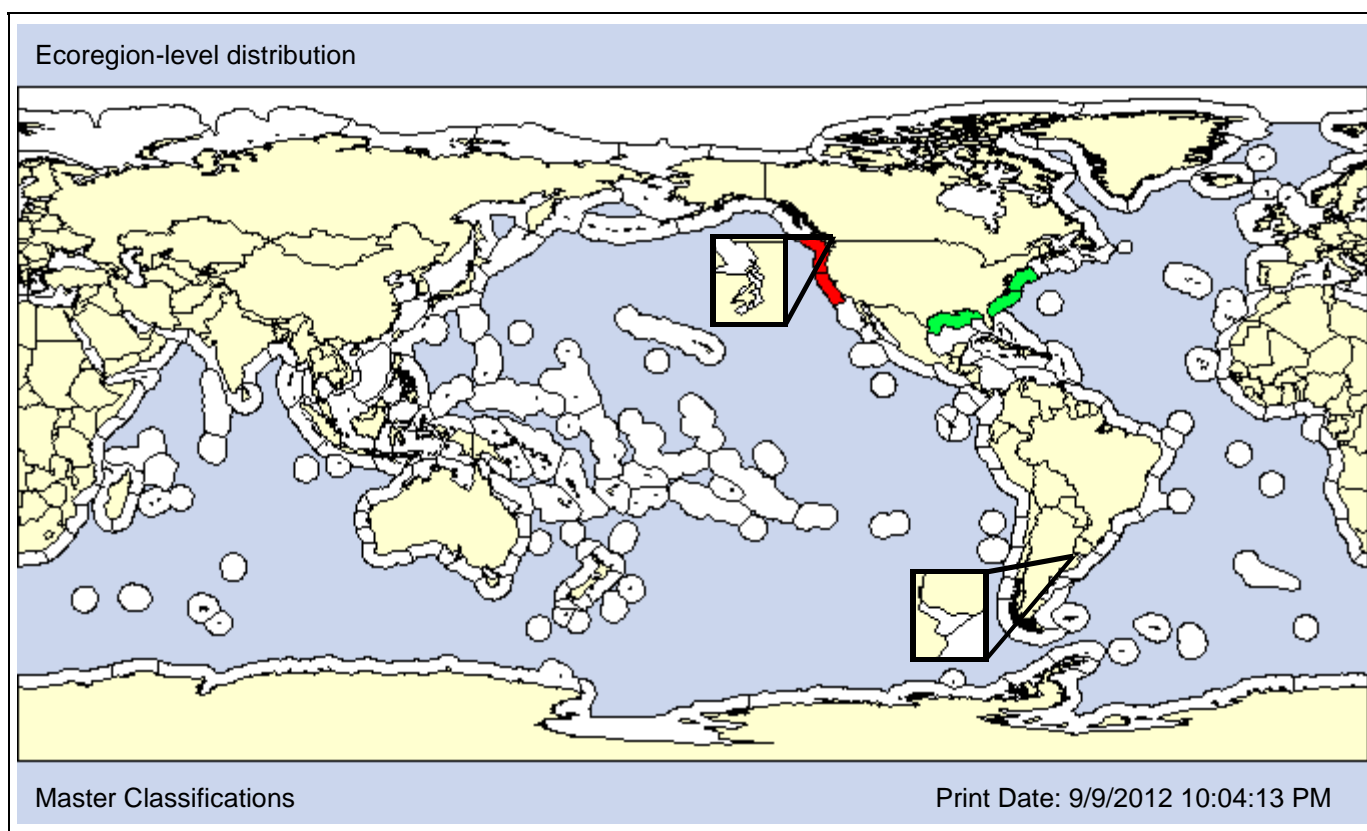
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

delphaeid planthopper

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1993

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P			X	
						AO	PO								

Comments: *Prokelisia marginata* is an herbivore on *Spartina* on the east coast of the U.S. and was introduced into Willapa Bay, Washington as a biocontrol.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE** **X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b> <b>P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY**

<b>Fresh</b>	<b>Brackish</b> <b>P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
			<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b> <b>X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	

**Taxon:** Insects

**Taxonomic Author:** (Herbst, 1795)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Coleoptera

**Suborder:** Polyphaga

**Infraorder:** Cucujiformia

**Superfamily:** Curculionoidea

**Family:** Curculionidae

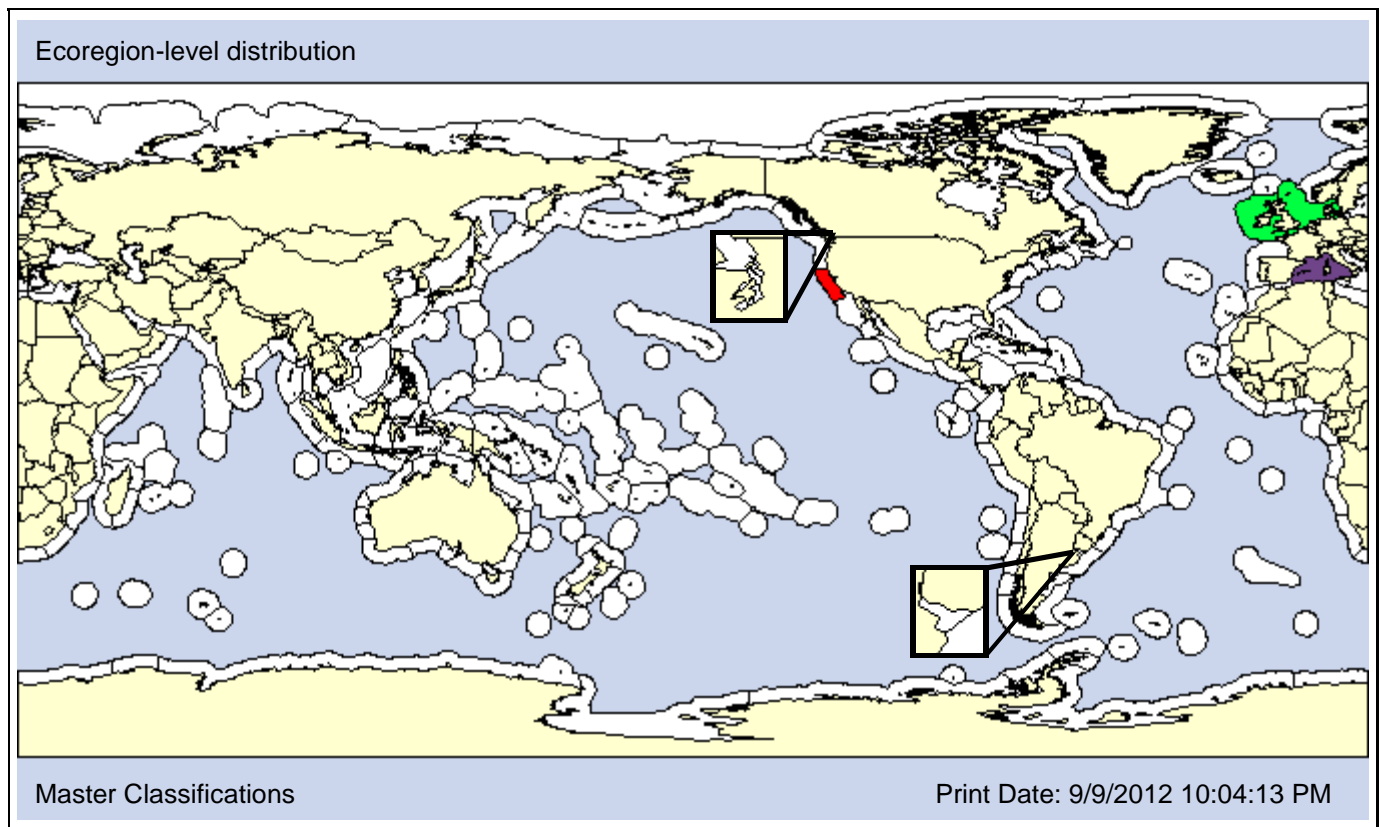
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Curculio spadix	Synonym	marine wood boring weevil
-----------------	---------	---------------------------

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1966  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF</b>				ID	RE	<b>AP</b>		REC	SF	HR	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: *Pselactus spadix* is a wood boring weevil that occurs from the mid-tide through the splash zone.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated <b>X</b></b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE **X****

<b>R</b>	<b>HP</b>	<b>Biogenic <b>P</b></b>						<b>Artificial Substrate <b>P</b></b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>P</b>		<b>P</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish <b>O</b></b>						<b>Marine <b>O</b></b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
							<b>X</b>		DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual <b>X</b></b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
			<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic <b>X</b></b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC		<b>X</b>					

**Taxon:** Insects

**Taxonomic Author:** Roder, 1889

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

**Subfamily:**

**Also Known As (Name - Type):**

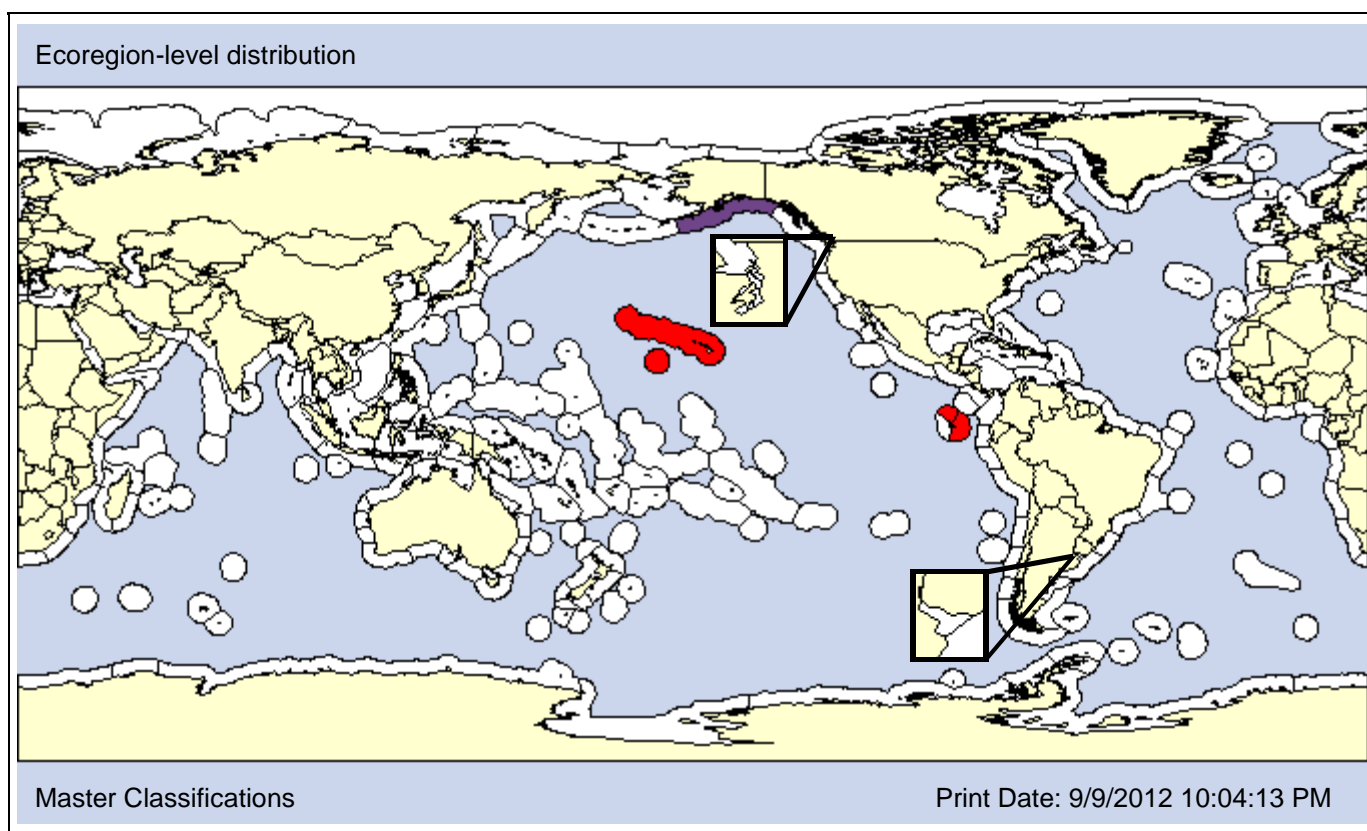
Psilopa dimidiata  
Psilopa olga

Synonym  
Synonym

**Common Names:**

shore fly (*Psilopa girschneri*)

**Type Locality:**



**Date 1st record:** 1952  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Psilopa girschneri* is a broadly distributed Northern hemisphere taxon. It was first reported from Hawaii in 1952, where it can occur in salinities as high as 43 psu (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>O</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>												

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 15 - 43psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
			<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Insects

**Taxonomic Author:** Quate, 1954

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Nematocera

**Infraorder:** Psychodomorpha

**Superfamily:**

**Family:** Psychodidae

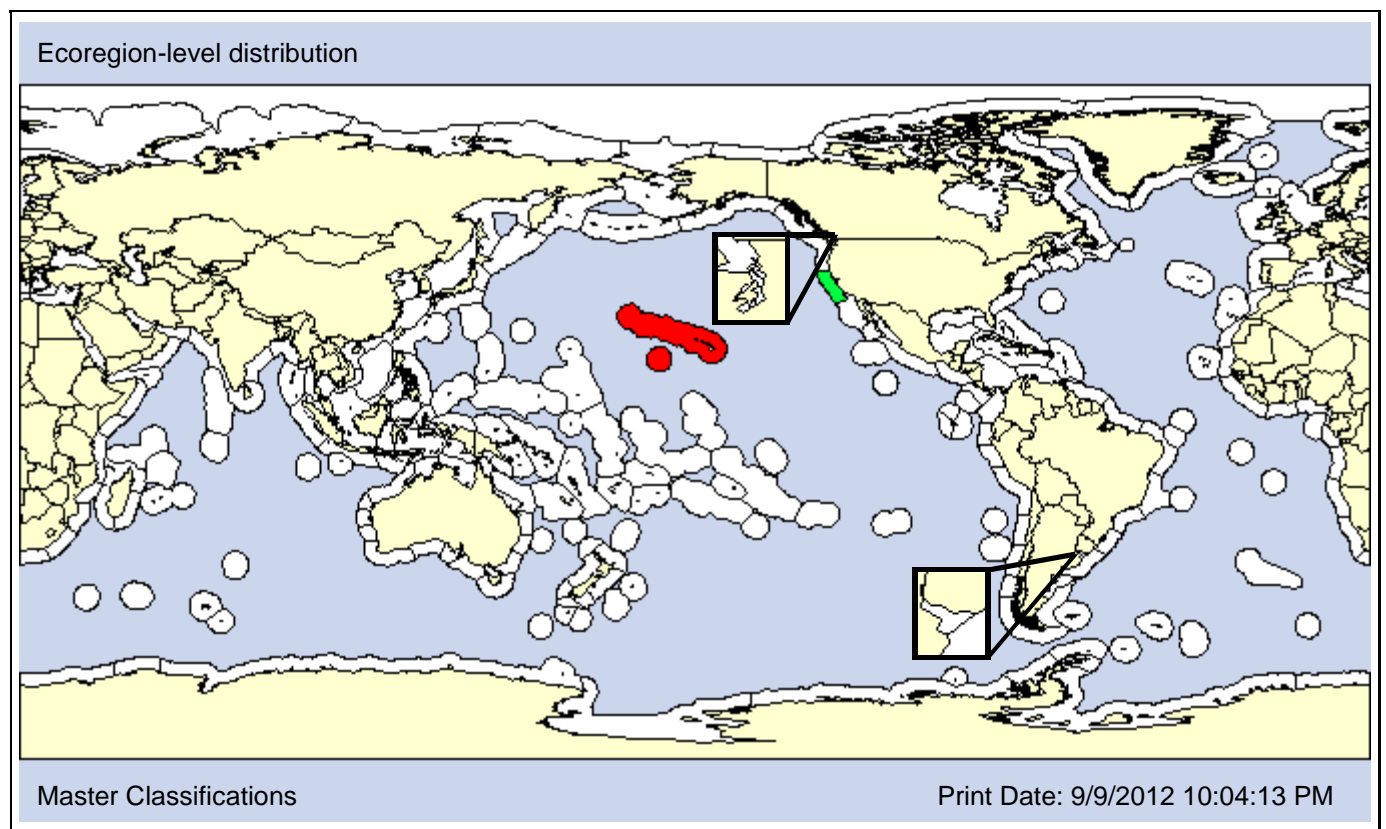
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

moth fly

**Type Locality:** San Francisco and Tomales Bays, California, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1945 Native  
**Loc 1st record:** Hawaii Native  
**Established:** Unknown Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Psychoda salicornia* appears to be native to California and was first reported from Hawaii in 1945. This fly is found on pickleweed, *Salicornia* (*Sarcocornia*) in its native California. It has not been definitively reported from Hawaii since 1946; thus we consider its establishment as unknown.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - 0m] [Pref: 0 - 0m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	<b>O</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline O		Polyhaline O		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
			<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	



**Taxon:** Insects

**Taxonomic Author:** (Fallén, 1813)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Ephydriidae

**Subfamily:**

**Also Known As (Name - Type):**

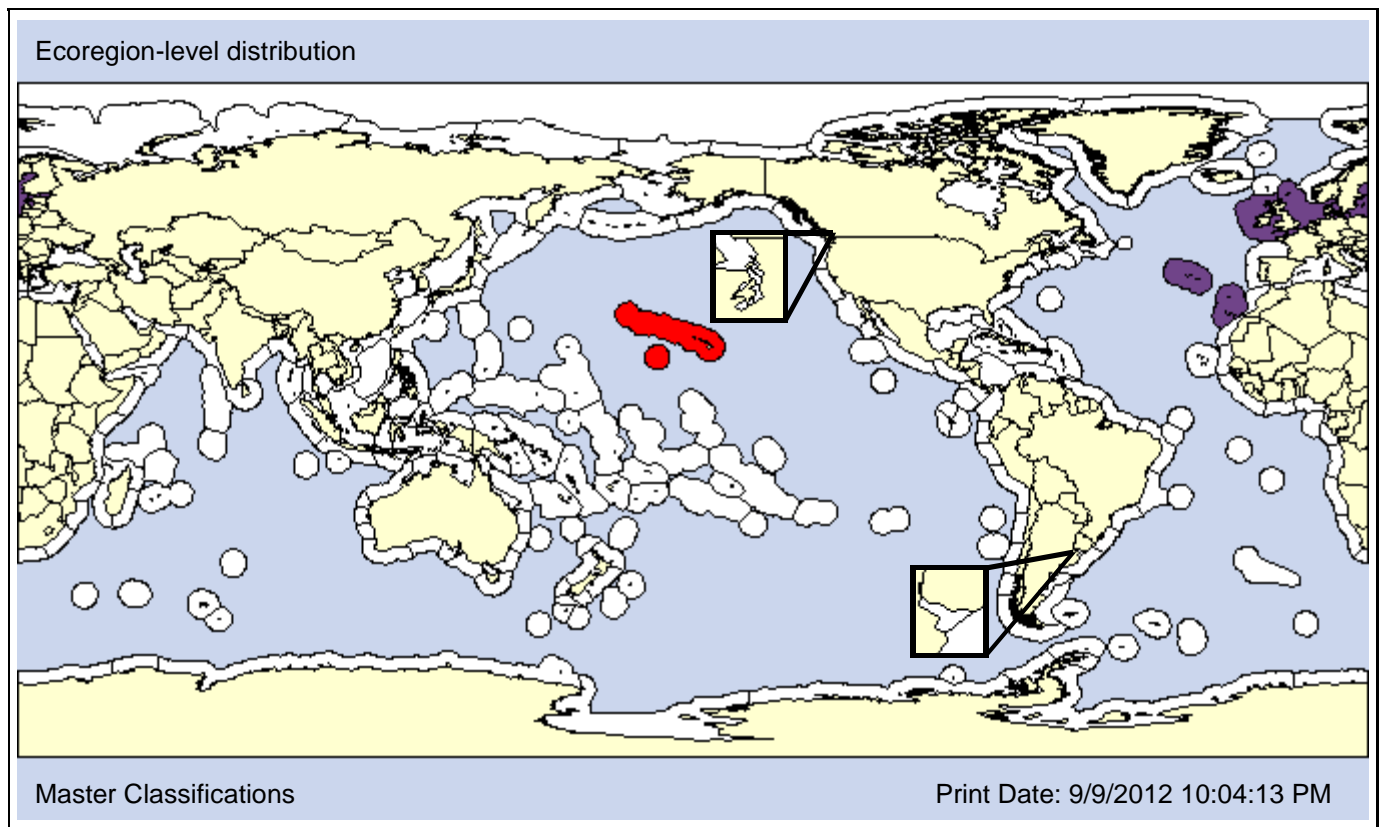
Scatella (Scatella) stagnalis

Convention

**Common Names:**

shore fly (Scatella stagnalis)

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1967  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Scatella stagnalis* is broadly distributed in the Northern hemisphere. It was first recorded from Hawaii in 1967.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>O</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - 0m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 43psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:** Becker, 1922

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Dolichopodidae

**Subfamily:**

**Also Known As (Name - Type):**

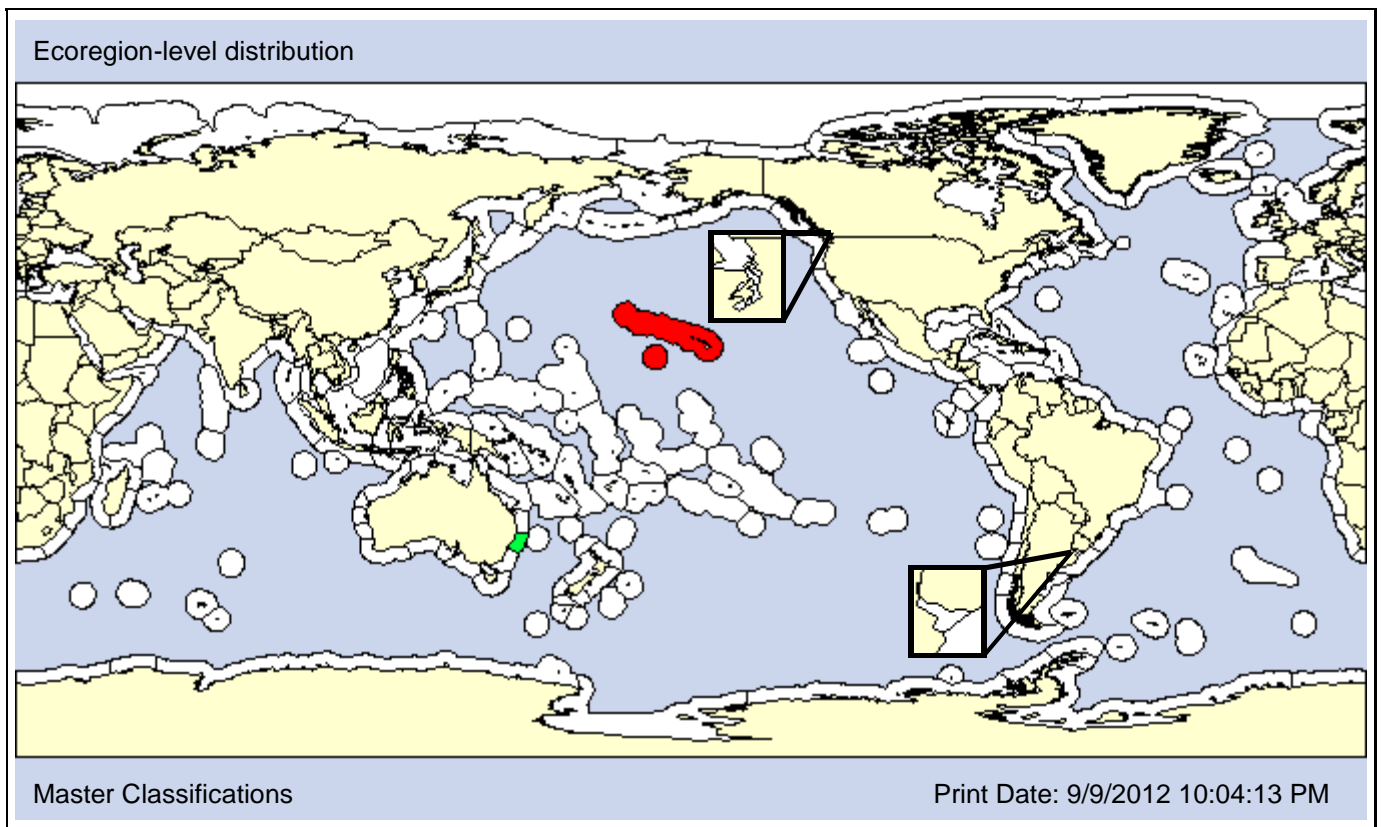
Syntormon distortitarsis  
Syntormon flexibile

Synonym  
Convention

**Common Names:**

long-legged fly (Syntormon flexible)

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1917  
**Loc 1st record:** Kauai, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: Syntormon flexible is considered native to the Indo-West Pacific, and was first reported from Hawaii in 1917.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>		

**ECOSYSTEM**

Unconsolidated						Consolidated						Pelagic	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

R	HP	Biogenic						Artificial Substrate						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 37psu]**

Fresh <b>O</b>	Brackish <b>O</b>						Marine <b>O</b>		Hyper
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
									DF-SUR	DF-SUB

**REPRODUCTION**

Sexual <b>X</b>						Asexual				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic <b>X</b>							Epibiotic			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:** Tokunaga, 1933

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Nematocera

**Infraorder:** Culicomorpha

**Superfamily:**

**Family:** Chironomidae

**Subfamily:** Orthocladiinae

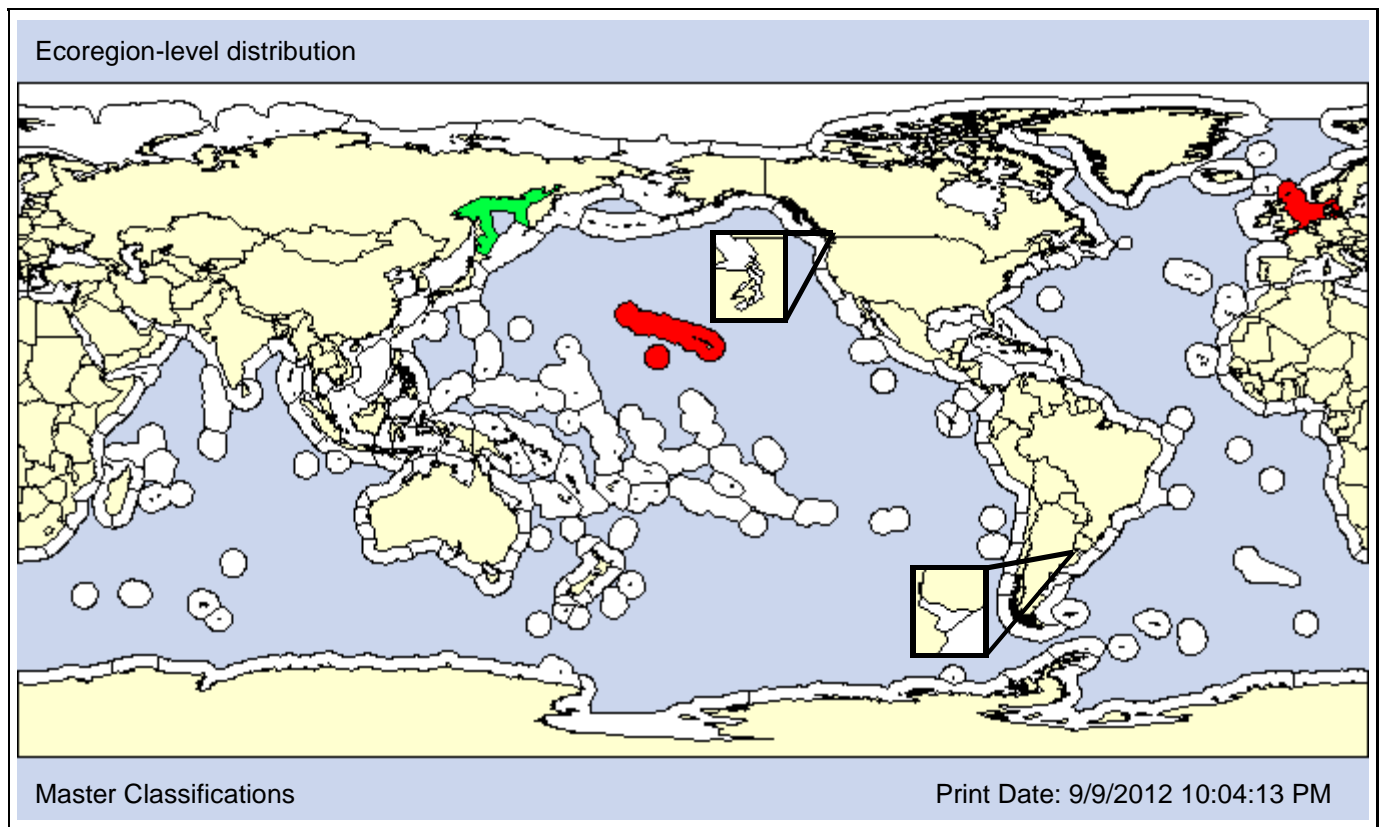
**Also Known As (Name - Type):**

Telmatogeton remanei	Synonym

**Common Names:**

giant midge
marine splash midge
maritime non-biting midge

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1946

**Loc 1st record:** Native Hilo, Hawaii

**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: *Telmatogeton japonicus* is native to Japan and first reported from Hawaii in 1946. Flies are associated with algae, including *Ulva* sp. and *Enteromorpha* sp. According to ICES (2005), hull fouling (above the water line) is a likely vector.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>				<b>O</b>			

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>P</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	<b>O</b>

**SALINITY [Obs: 0 - 35psu]**

<b>Fresh O</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Insects

**Taxonomic Author:** (Melander, 1913)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Canaceidae

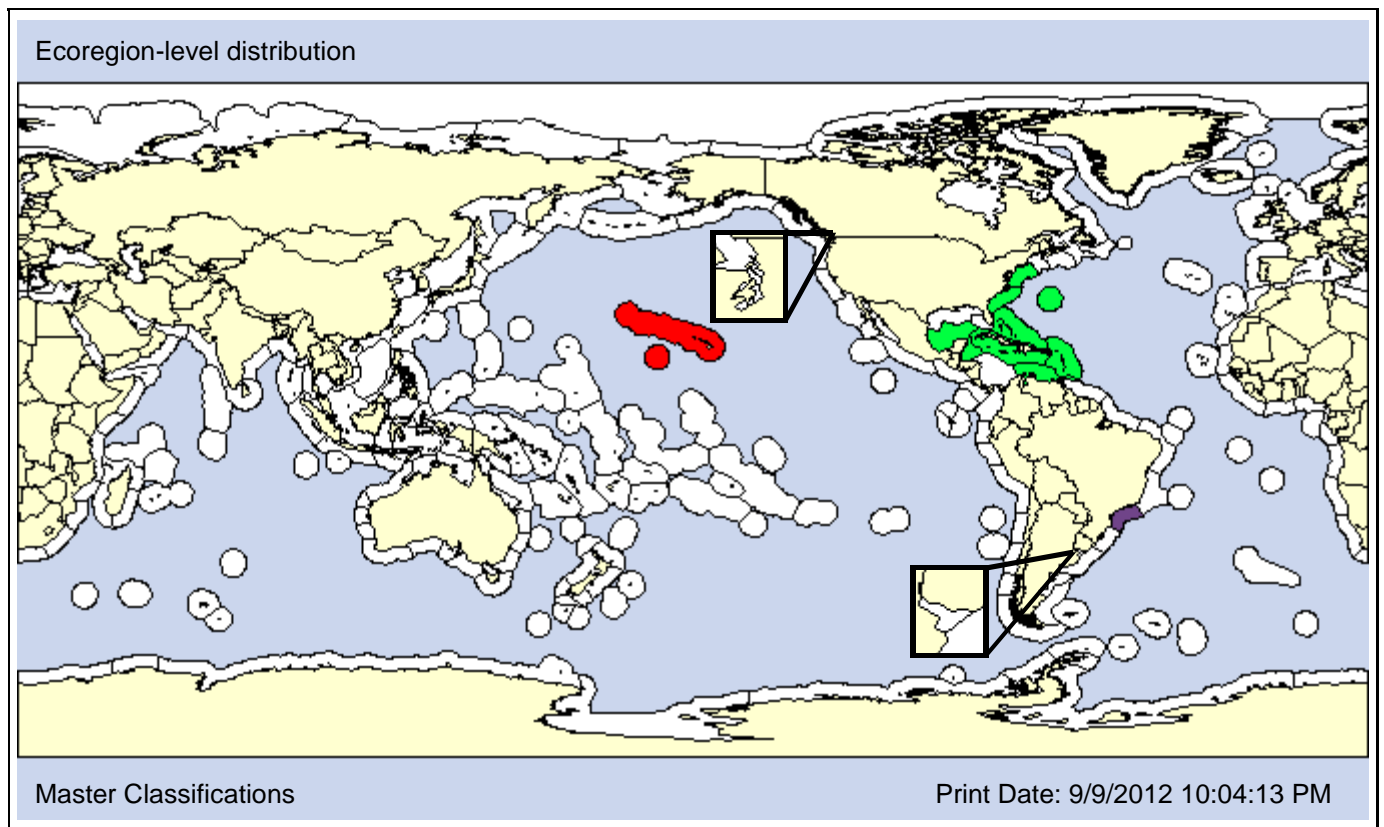
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Tethina variseta	Synonym	beach fly ( <i>Tethina willistoni</i> )
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**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1919  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Tethina willistoni* is classified as a Western Atlantic species (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O					O	O		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			X		TP	RI-PH					
X													

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
O	O		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				O		O

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									O					

**SALINITY [Obs: - 42psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O	O	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
									DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			X							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	X		X	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	



**Taxon:** Insects

**Taxonomic Author:** (Takagi, 1965)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Diptera

**Suborder:** Brachycera

**Infraorder:** Muscomorpha

**Superfamily:**

**Family:** Dolichopodidae

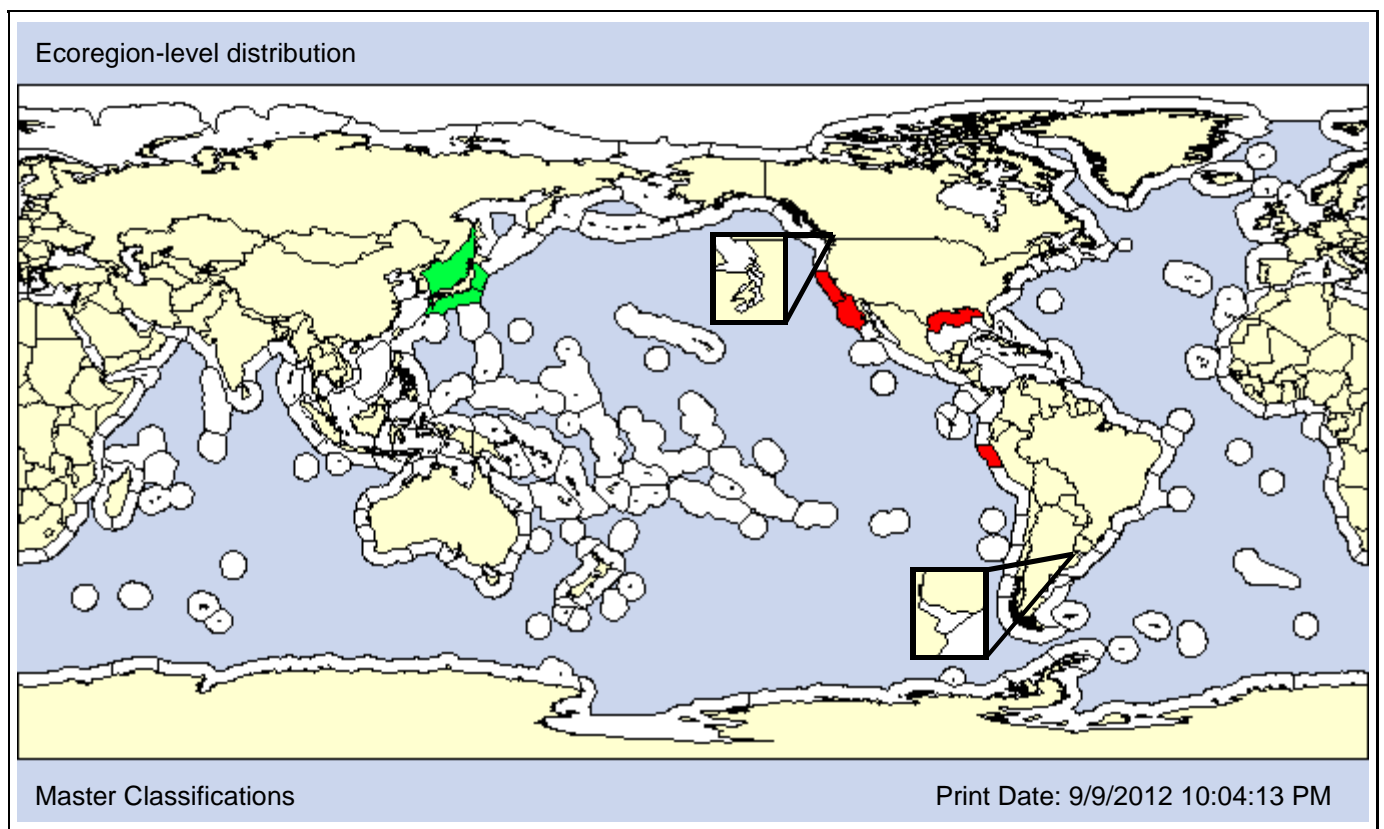
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Conchopus borealis	Synonym	long-legged fly ( <i>Thambemyia borealis</i> )

**Type Locality:**



**Date 1st record:** Native

<1999

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
		<b>X</b>				AO	PO								

Comments: *Thambemyia borealis* lays its eggs in the interspaces between barnacles. The larvae are thought to prey mainly on other larval Diptera living among the barnacles. According to Schlinger (2007), it is an Asian species introduced to California, Alabama, and Peru.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Insects

**Taxonomic Author:** Hagen, 1862

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Palaeoptera

**Superorder:**

**Order:** Odonata

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Libellulidae

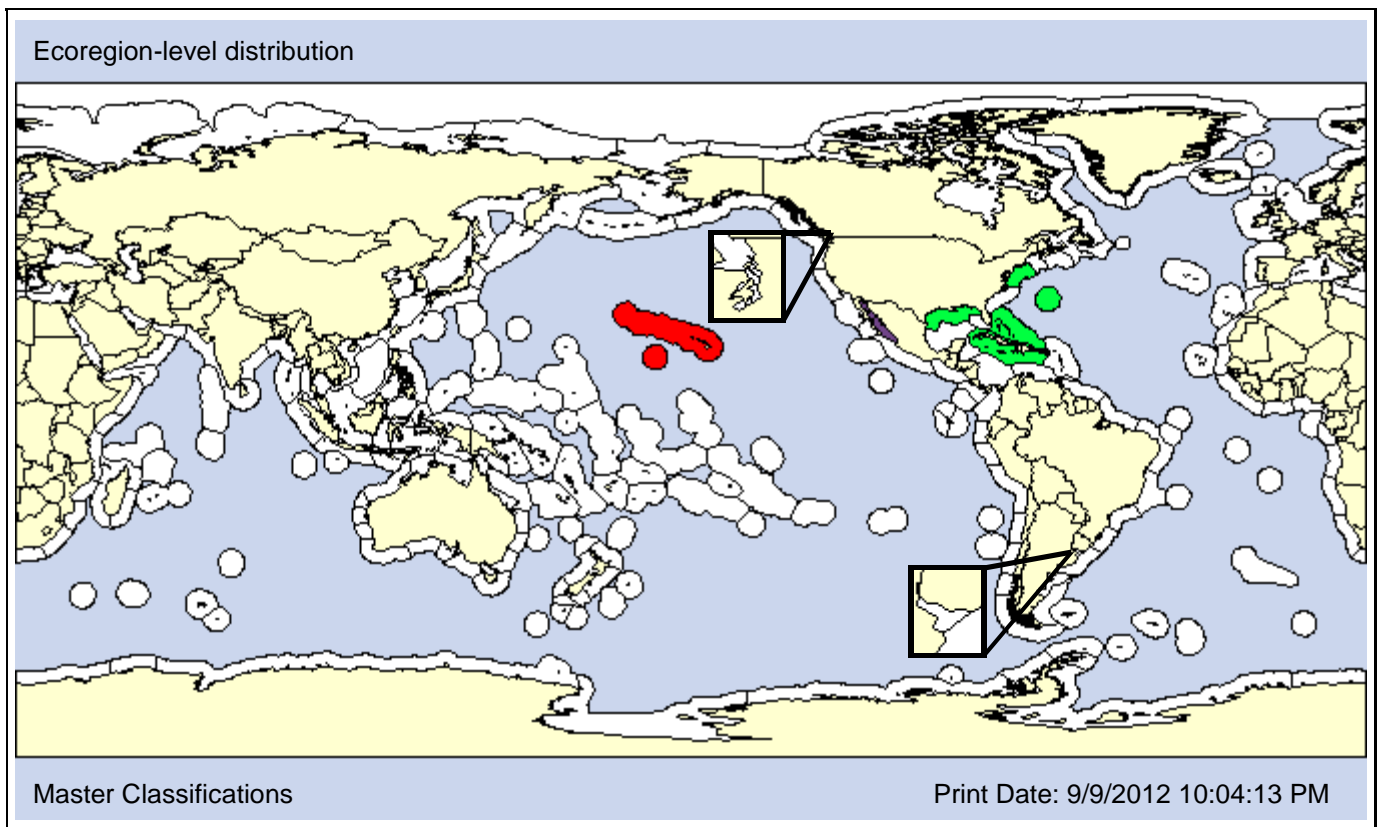
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

black saddlebags  
black-mantled glider dragonfly

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1873  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Tramea lacerata* is native to eastern North America. It was first recorded on Hawaii in 1873.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
<b>O</b>			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 24psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Insects

**Taxonomic Author:** (Guerin-Meneville, 1857)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Hemiptera

**Suborder:** Heteroptera

**Infraorder:**

**Superfamily:**

**Family:** Corixidae

**Subfamily:**

**Also Known As (Name - Type):**

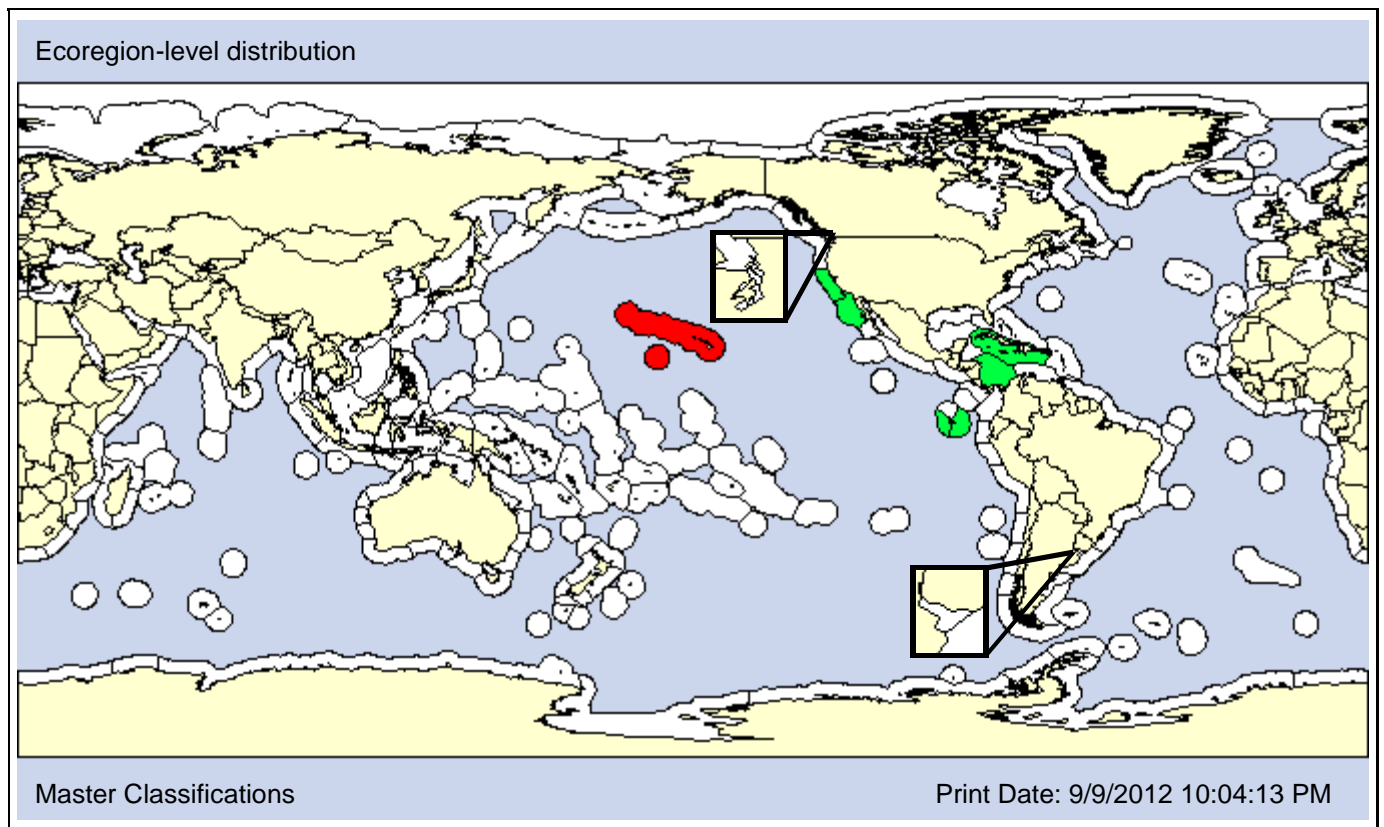
Arctocorixa blackburni  
Corixa blackburni

Synonym  
Synonym

**Common Names:**

reticulate water boatman  
water boatman (*Trichocorixa reticulata*)

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b>	1877	Native
<b>Loc 1st record:</b>	Oahu, Molokai, Maui, Hawaii	Native
<b>Established:</b>	Yes	Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
						AO	PO								X

Comments: The water boatman, *Trichocorixa reticulata* is a well-known North American taxon that inhabits brackish to high saline pools.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>					<b>O</b>		<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>	<b>X</b>		TP	RI-PH					

**DEPTH [Obs: 0 - 1.65m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic <b>P</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep			
<b>P</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 43psu]**

<b>Fresh</b>	<b>Brackish O</b>				<b>Marine O</b>		<b>Hyper O</b>	
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>
			<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
<b>X</b>		<b>X</b>	BP	EPS	EPU	EPC							
					<b>X</b>								

**Taxon:** Insects

**Taxonomic Author:** (Reuter, 1876)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Hemiptera

**Suborder:** Heteroptera

**Infraorder:** Cimicomorpha

**Superfamily:** Miroidea

**Family:** Miridae

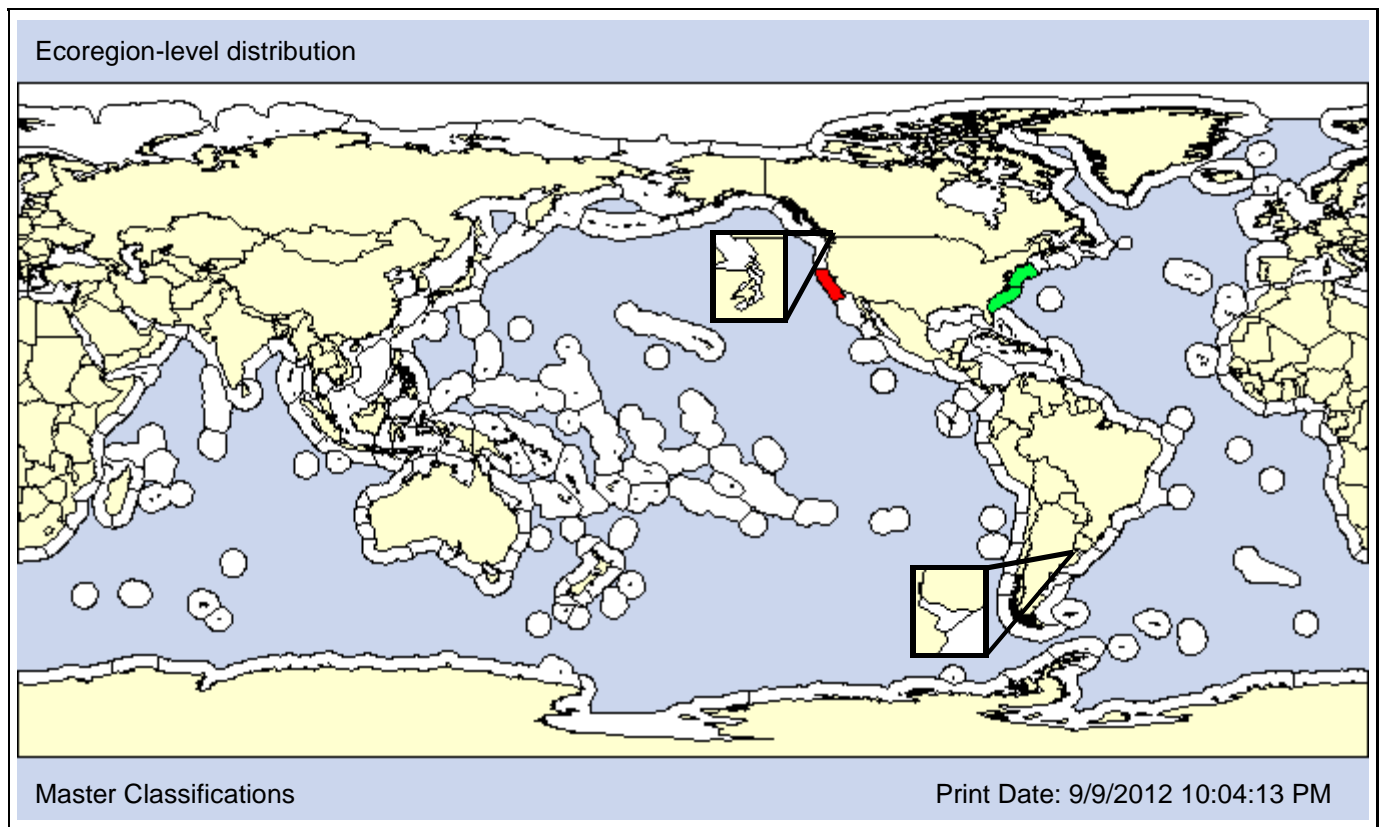
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

cordgrass bug

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1993  
**Loc 1st record:** San Francisco Estuary, CA  
**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P			X	
						AO	PO								

Comments: The NWA *Trigonotylus uhleri* was first found in the San Francisco Estuary in 1993. It is an herbivore on *Spartina* and may have been accidentally transported with *Spartina* imported for erosion control (Cohen and Carlton, 1995). However, it has little effect on the invasive populations of *Spartina* in San Francisco (Daehler and Strong, 1995).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b> <b>X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
	<b>O</b>	<b>P</b>	Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE** **X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b> <b>P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 2 - 13psu]**

<b>Fresh</b>	<b>Brackish</b> <b>P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual</b> <b>X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic</b>							<b>Epibiotic</b> <b>X</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	



**Taxon:** Insects

**Taxonomic Author:** Fall, 1901

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Arthropoda

**Subphylum:** Hexapoda

**Superclass:**

**Class:** Insecta

**Subclass:** Pterygota

**Infraclass:** Neoptera

**Superorder:**

**Order:** Coleoptera

**Suborder:** Polyphaga

**Infraorder:** Staphyliniformia

**Superfamily:** Hydrophiloidea

**Family:** Hydrophilidae

**Subfamily:**

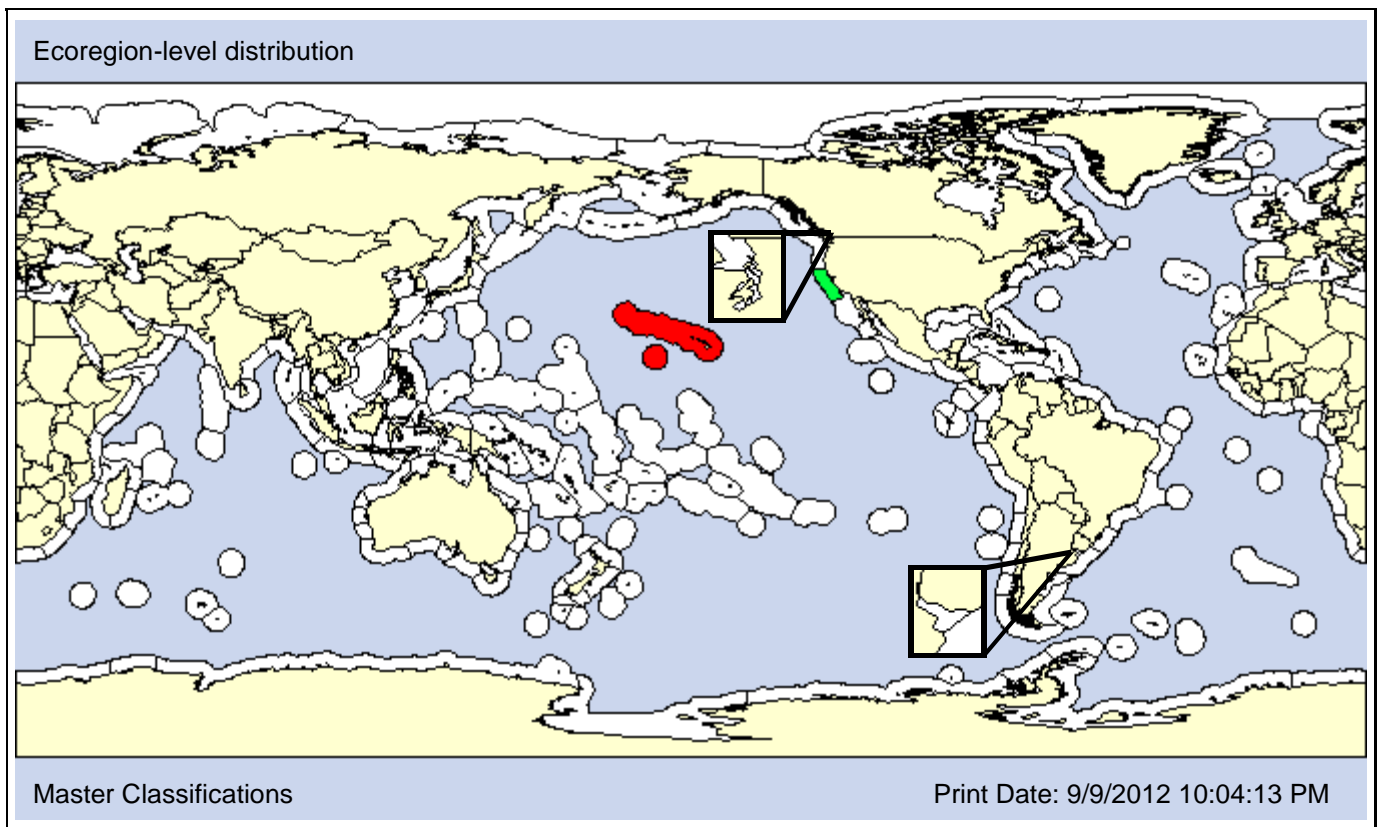
**Also Known As (Name - Type):**

Tropisternis salsamentus	Convention

**Common Names:**

water scavenger beetle ( <i>Tropisternus salsamentus</i> )

**Type Locality:** California, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1968      Native

**Loc 1st record:** Maui, Hawaii      Native

**Established:** Yes      Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>					AO	PO									<b>X</b>

Comments: *Tropisternus salsamentus* was first reported from Hawaii in 1968. Englund (2002) suggested that ballast water was a likely vector; however since it is attracted to light we suggest that other possible vectors include airplanes or ship cargo.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>					<b>O</b>	<b>O</b>		<b>O</b>

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m] [Pref: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
<b>O</b>	<b>O</b>		Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic P			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>						

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - 24psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
					<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>		<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC						<b>X</b>	
					<b>X</b>								

Kingdom: Animalia

Phylum: Echinodermata

Subphylum: Asterozoa

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**Taxon:** Ophiuroid

**Taxonomic Author:** (Müller & Troschel, 1842)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Echinodermata

**Subphylum:** Asterozoa

**Superclass:** Cryptosyringida

**Class:** Ophiuroidea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Ophiurida

**Suborder:** Ophiurina

**Infraorder:** Gnathophiurina

**Superfamily:**

**Family:** Ophiactidae

**Subfamily:**

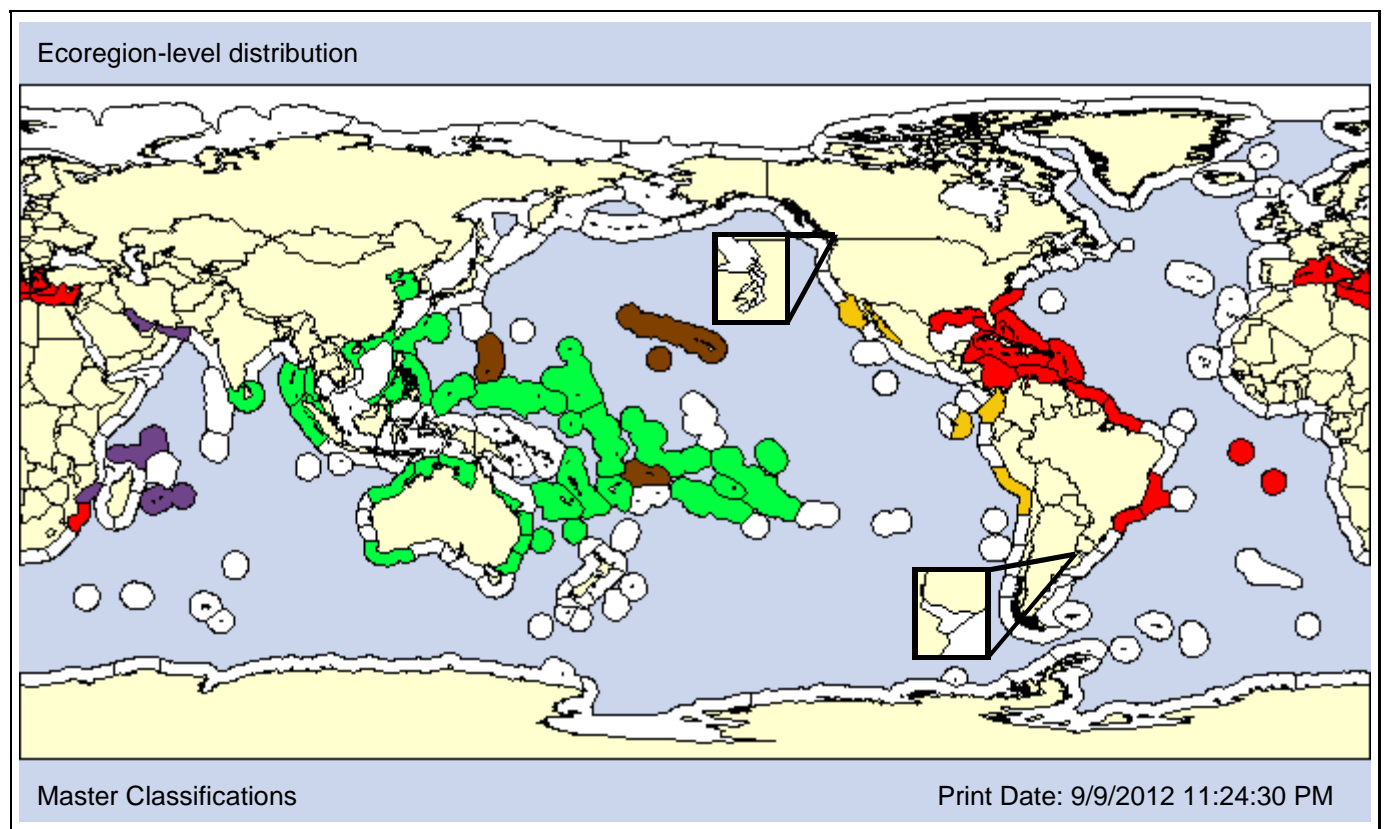
**Also Known As (Name - Type):**

Ophiactis brocki	Synonym
Ophiactis incisa	Synonym
Ophiactis krebsii	Synonym
Ophiolepis savignyi	Synonym

**Common Names:**

savigny's brittle star
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**Type Locality:** Egypt



NWP

Hawaii

NEP

**Date 1st record:** Native

1847-1849

Unknown

**Loc 1st record:** Native

Honolulu, Hawaii

Unknown

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
		X				AO	PO							

Comments: *Ophiactis savignyi* is considered native to the Indo-Pacific, though based on nested clade analyses and its fouling habitat, Carlton and Eldredge (2009) classify it as NIS in Hawaii. Paulay et al. (2002) classify it as cryptogenic in Guam and note that it is a species complex. We list it as a conflict in Hawaii, Guam, and Samoa.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
							<b>X</b>						

**DEPTH [Obs: 0 - 550m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>						<b>P</b>				<b>P</b>	<b>P</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF X</b>	
						<b>X</b>			DF-SUR <b>X</b>	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>					<b>X</b>	<b>X</b>
						<b>X</b>							

# *Strongylocentrotus intermedius*

Species ID: 100674

**Taxon:** Echinoid

**Taxonomic Author:** (Agassiz, 1863)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Echinodermata

**Subphylum:** Asterozoa

**Superclass:**

**Class:** Echinoidea

**Subclass:** Euechinoidea

**Infraclass:** Carinacea

**Superorder:** Echinacea

**Order:** Camarodonta

**Suborder:**

**Infraorder:** Echinidea

**Superfamily:** Odontophora

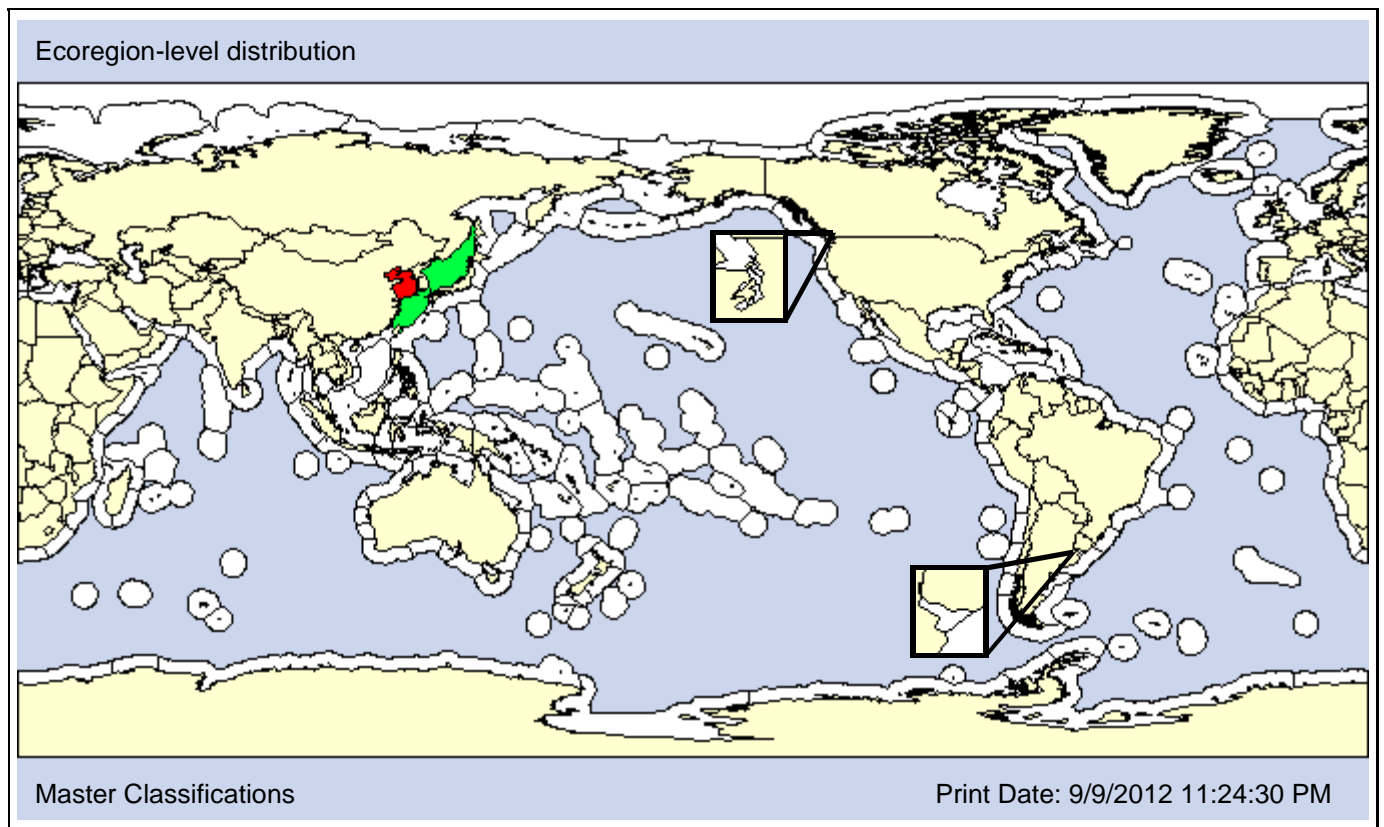
**Family:** Strongylocentrotidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



**Date 1st record:** 1989

**Loc 1st record:** Dalian, China

**Established:** Yes

### VECTORS

SH			MS	AF <span style="color: red;">X</span>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: *Strongylocentrotus intermedius* was introduced from Japan to the Yellow Sea for aquaculture and has established a wild population at Dalian.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X				
		X											

**DEPTH [Obs: 1 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	O		O	O		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			X						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
					X	X							



Kingdom: Animalia

Phylum: Chordata

Subphylum: Tunicata

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**Taxon:** Tunicate

**Taxonomic Author:** Sluiter, 1890

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ascidiidae

**Subfamily:**

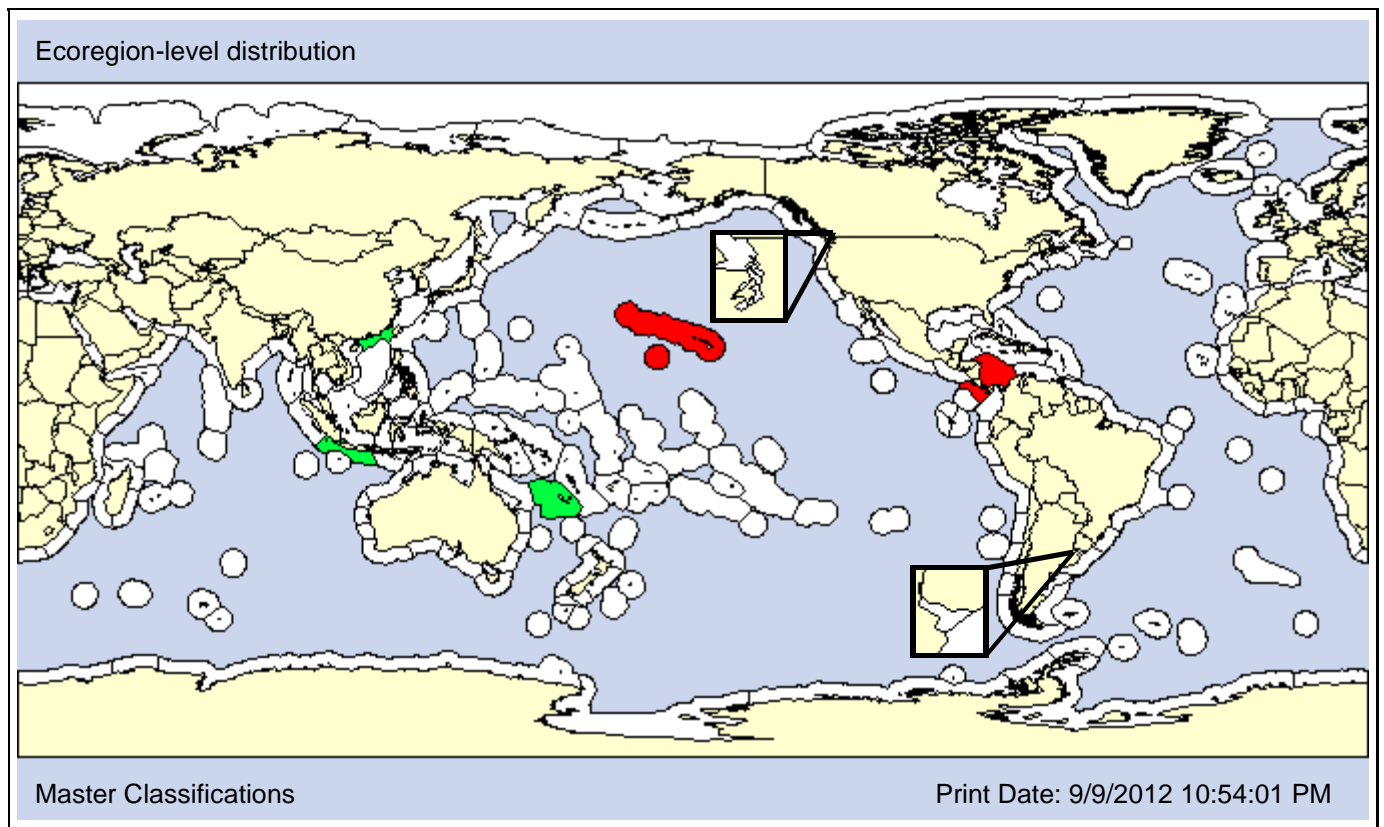
**Also Known As (Name - Type):**

Ascidia aperta	Synonym
Ascidia corelloides	Synonym
Ascidia rhabdophora	Synonym
Phallusia corelloides	Synonym

**Common Names:**

--

**Type Locality:** Bay of Jakarta (as Djakarta), Indonesia



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1940  
**Loc 1st record:** Honolulu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: *Ascidia archaia* is a western Pacific and Indo-Pacific tunicate that has been introduced into Hawaii (Carlton and Eldredge, 2009), Caribbean (Rocha, 2010), and Eastern Pacific (Bullard et al., 2011). It occurs in southern China, though apparently not the NWP region.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Lambert & Lambert, 1998

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ascidiidae

**Subfamily:**

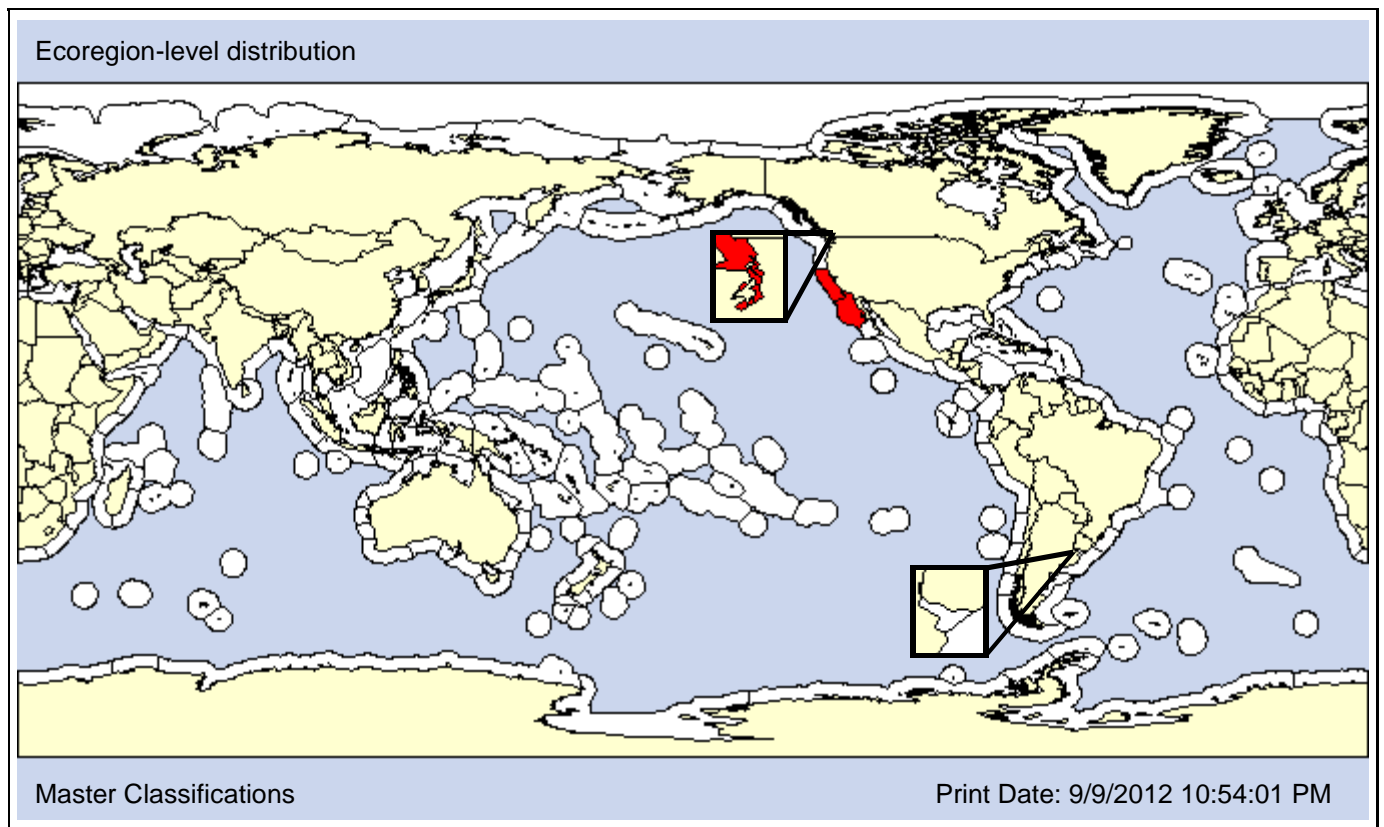
**Also Known As (Name - Type):**

Ascidia sp. (Cohen and Carlton 1995)  
Ascidia sp. A Lambert

Synonym  
Synonym

**Common Names:**

**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1983  
**Loc 1st record:** Marina del Rey and San Diego  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

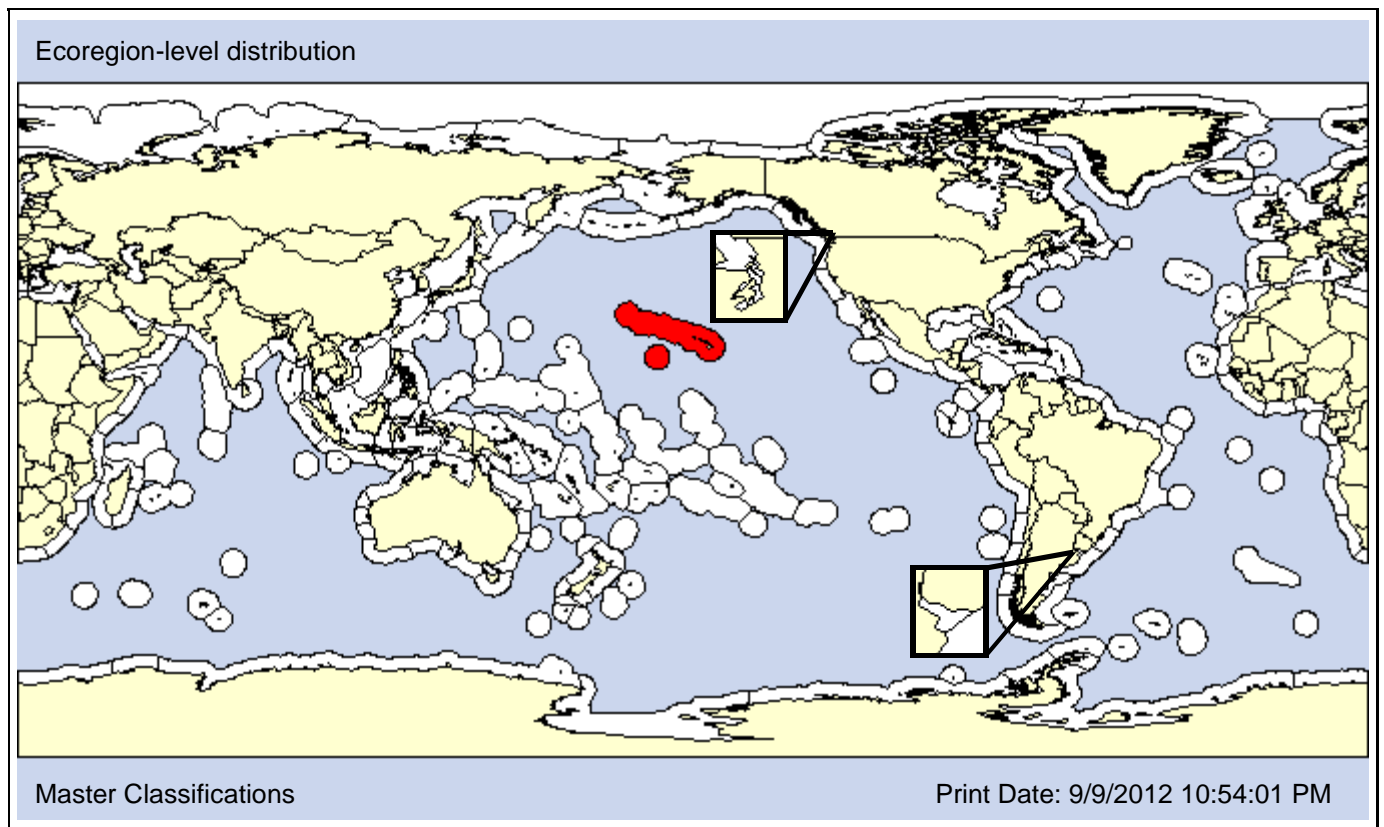
**Family:** Ascidiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1997  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		<b>X</b>		<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							



# *Ascidia species B (Carlton and Eldredge, 2009)*

Species ID: 170010

**Taxon:** Tunicate

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

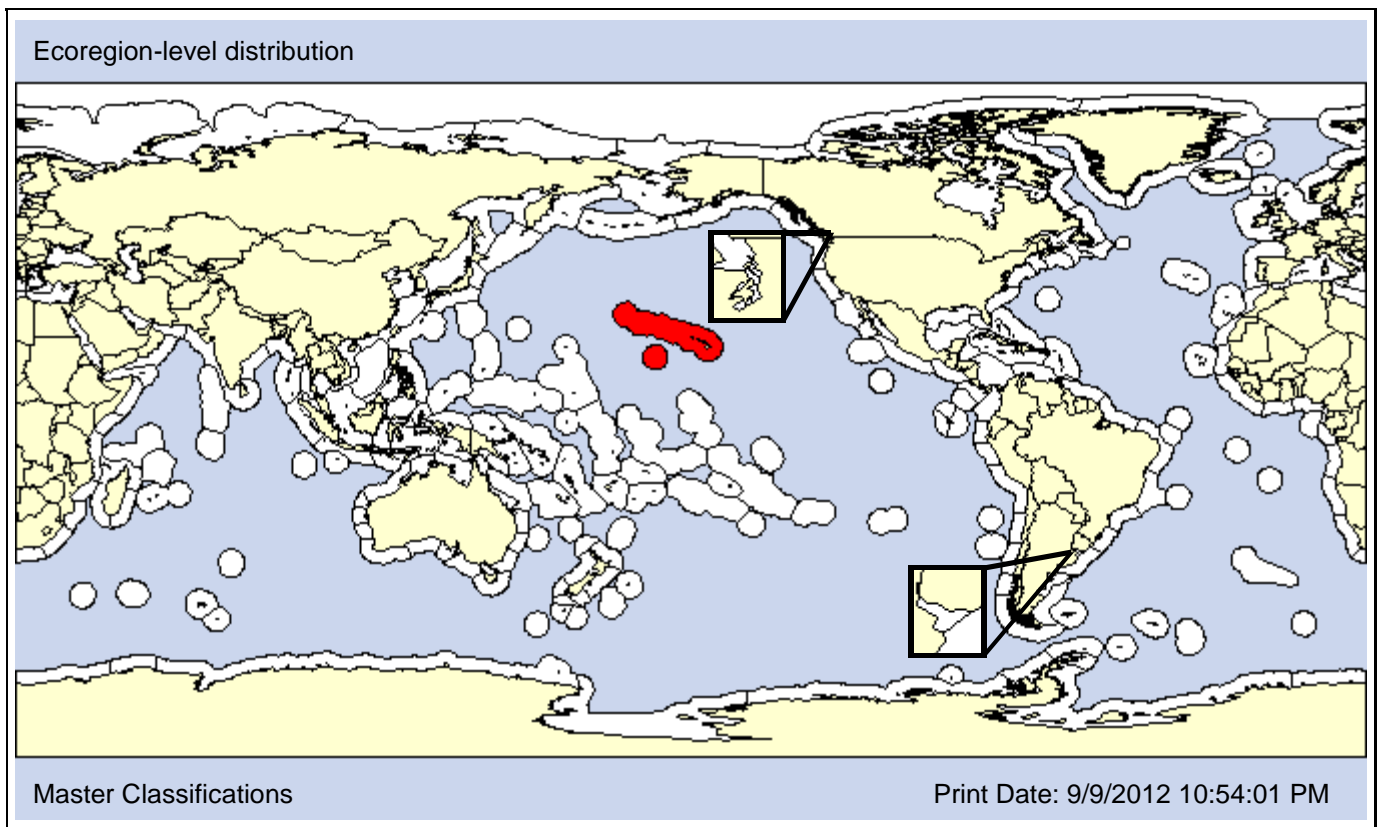
**Family:** Ascidiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** <1997  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Stimpson, 1855

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ascidiidae

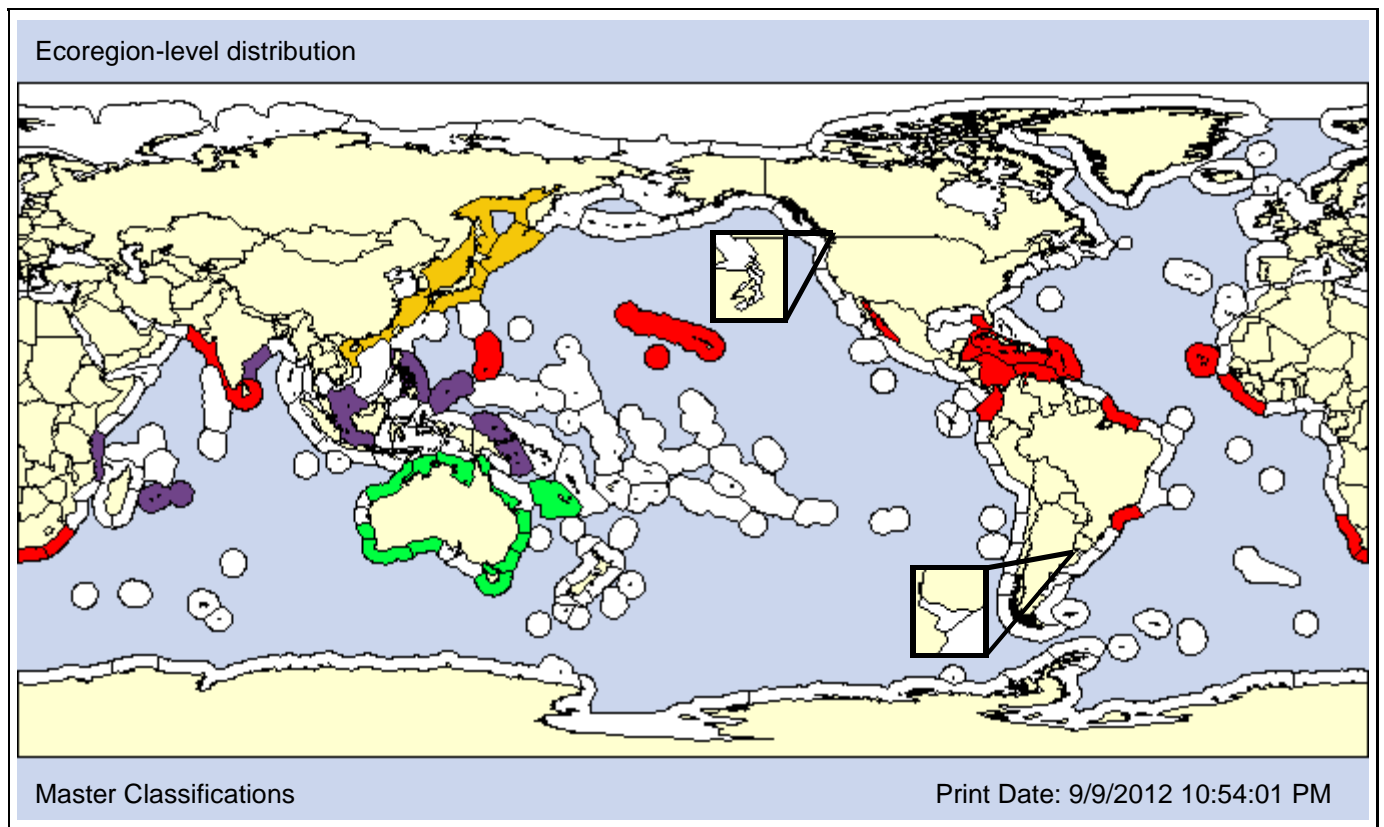
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

yellow-green sea squirt

**Type Locality:** Port Jackson, Australia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b> Unknown	1930s	<1945
<b>Loc 1st record:</b> Unknown	Pearl Harbor, Oahu, Hawaii	Gulf of California, Mexico
<b>Established:</b> Yes	Yes	Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		<b>X</b>				AO	PO								

Comments: *Ascidia sydneiensis* is a southern hemisphere species (Carlton and Eldredge, 2009) introduced in Pacific and Caribbean Panama (Carman et al., 2011), Guam (Lambert, 2002), India (Ali et al., 2009), and South Africa (Mead et al., 2011). We classify it as introduced in the Gulf of California and Atlantic and cryptogenic in the NWP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>			<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 60m] [Pref: 10 - 25m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>			<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC				<b>X</b>		<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Oka, 1935

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

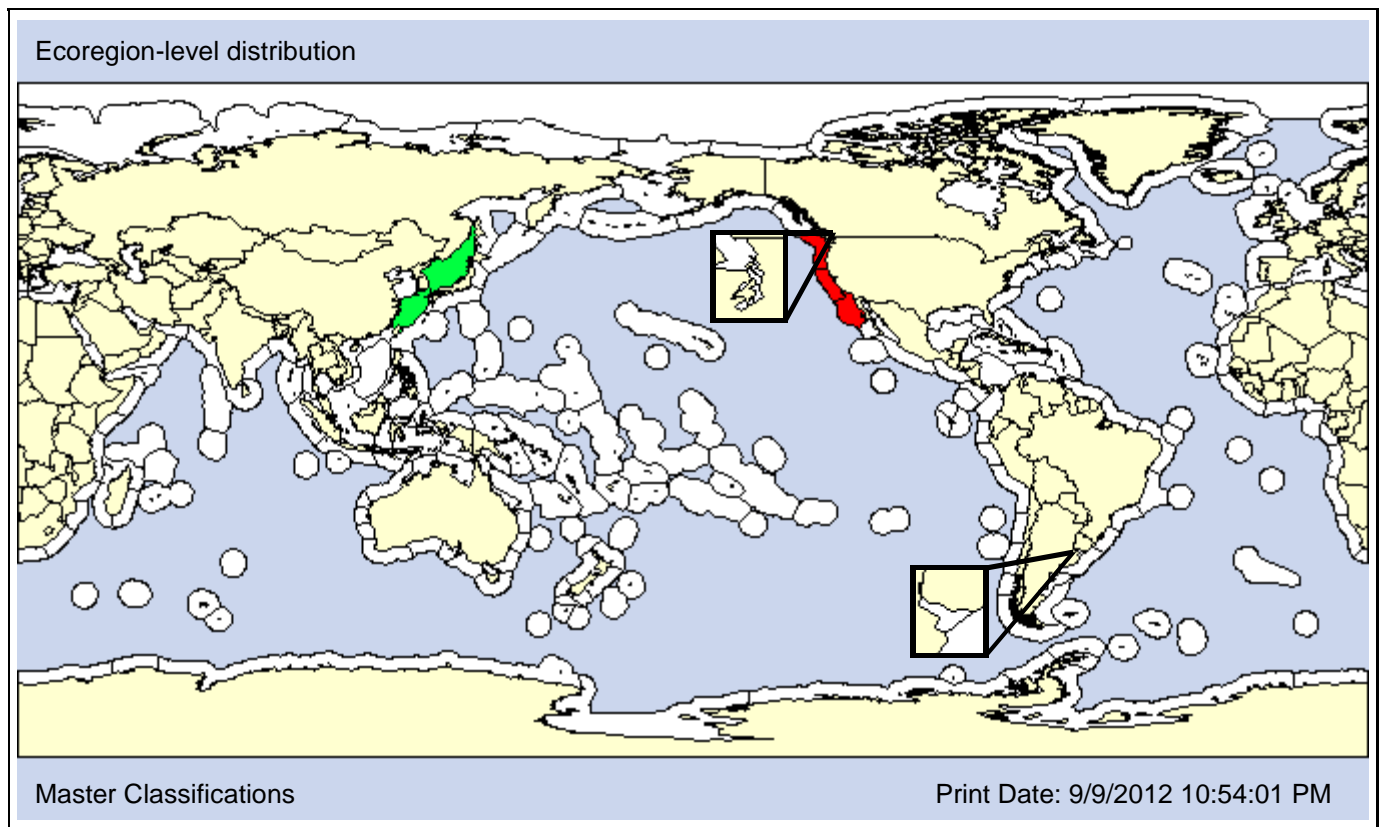
**Family:** Ascidiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1984

**Loc 1st record:** Native

Long Beach Harbor, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		<b>X</b>				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 8 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>	<b>P</b>									<b>O</b>	<b>P</b>

**SALINITY [Obs: 34 - 35.5psu] [Pref: - 35psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC				<b>X</b>			<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** (Müller, 1776)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ascidiidae

**Subfamily:**

**Also Known As (Name - Type):**

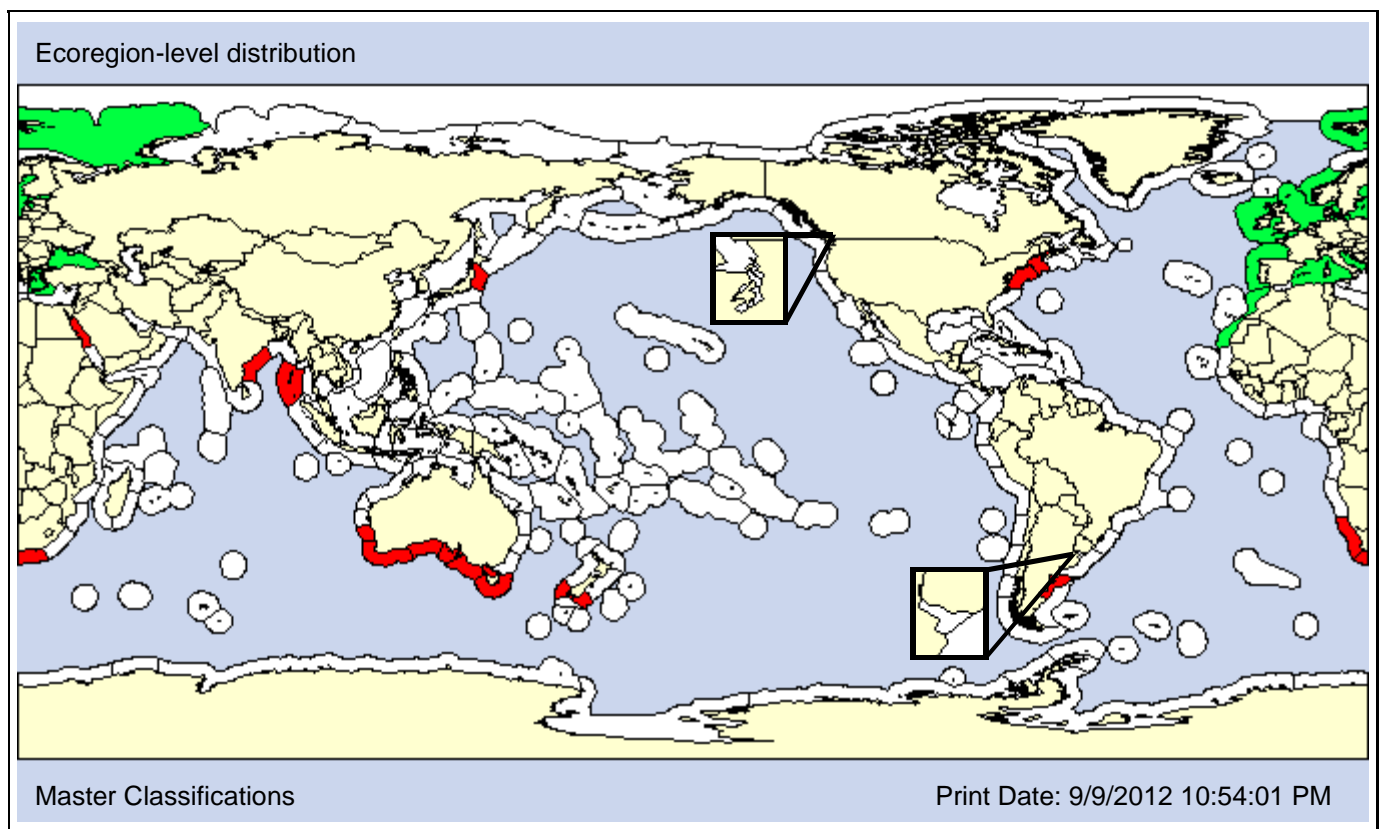
Ascidia aculeata  
Ascidia affinis  
Ascidia albida  
Ascidia aspersa

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

dirty sea squirt  
European sea squirt

**Type Locality:**



**Date 1st record:** 2009

**Loc 1st record:** Funka Bay, Japan

**Established:** Unknown

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
<b>X</b>		<b>X</b>				<b>AO X</b>	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 90m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>					<b>P</b>				<b>P</b>	<b>O</b>	

**SALINITY [Obs: 18 - 40psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Tunicate

**Taxonomic Author:** (Verrill, 1871)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Molgulidae

**Subfamily:**

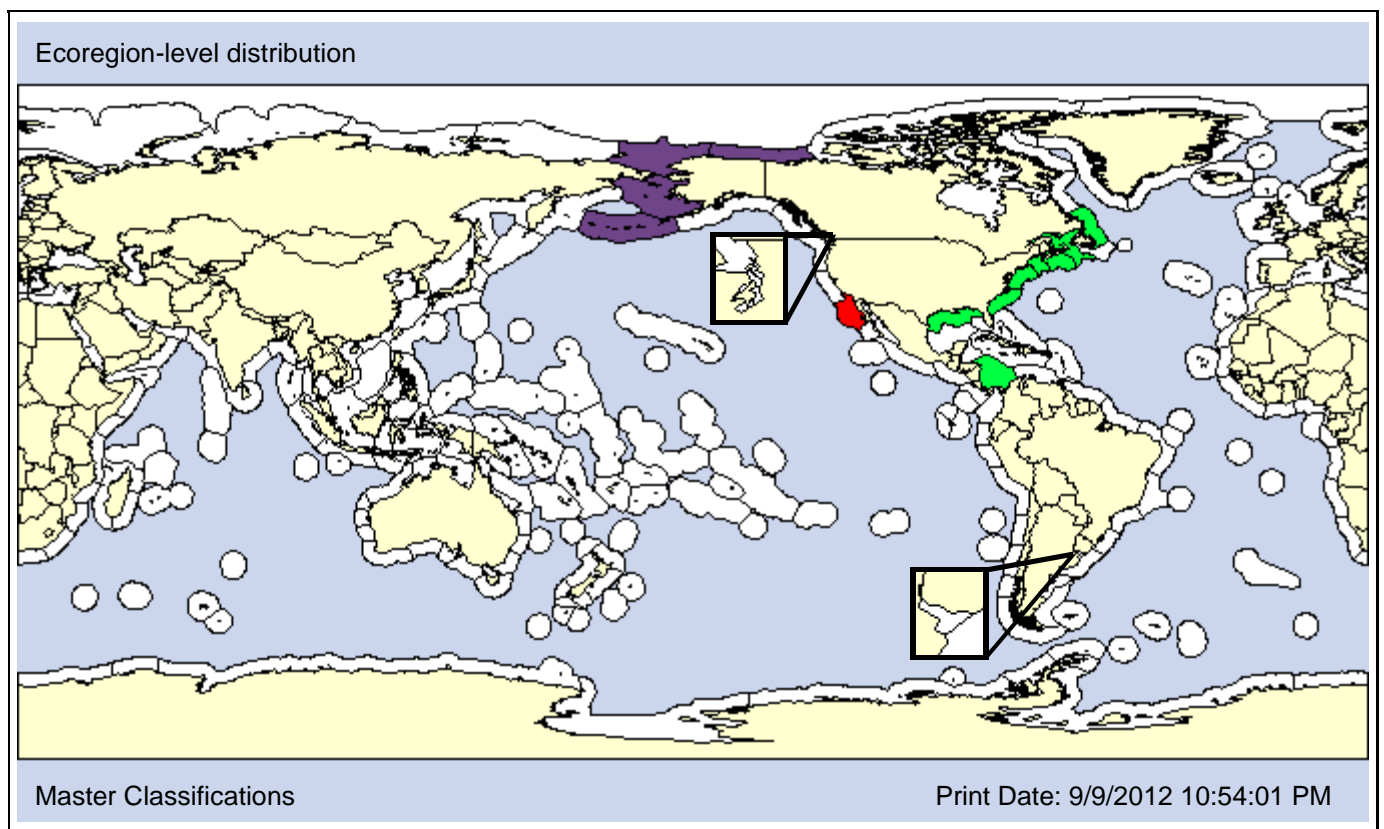
**Also Known As (Name - Type):**

Bostrichobranchnus manhattensis	Synonym
Eugyra pilularis	Synonym
Eugyriopsis manhattensis	Synonym
Herdmania bostrichobranchnus	Synonym

**Common Names:**

--

**Type Locality:**



**Date 1st record:**

1992

**Loc 1st record:**

San Dieguito Lagoon, CA

**Established:**

Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: *Bostrichobranchnus pilularis* is a Northwest Atlantic species that was common in San Dieguito Lagoon in Southern California in 1992. However, it has not been reported since (Lambert and Lambert, 1998; CANOD, 2009), and may be extinct in California. Reports from the Aleutians and Arctic were in 1986-1988 (GBIF and OBIS).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>		<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 1 - 219m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	<b>P</b>	<b>O</b>	
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC				<b>X</b>			

**Taxon:** Tunicate

**Taxonomic Author:** Ritter & Forsyth, 1917

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

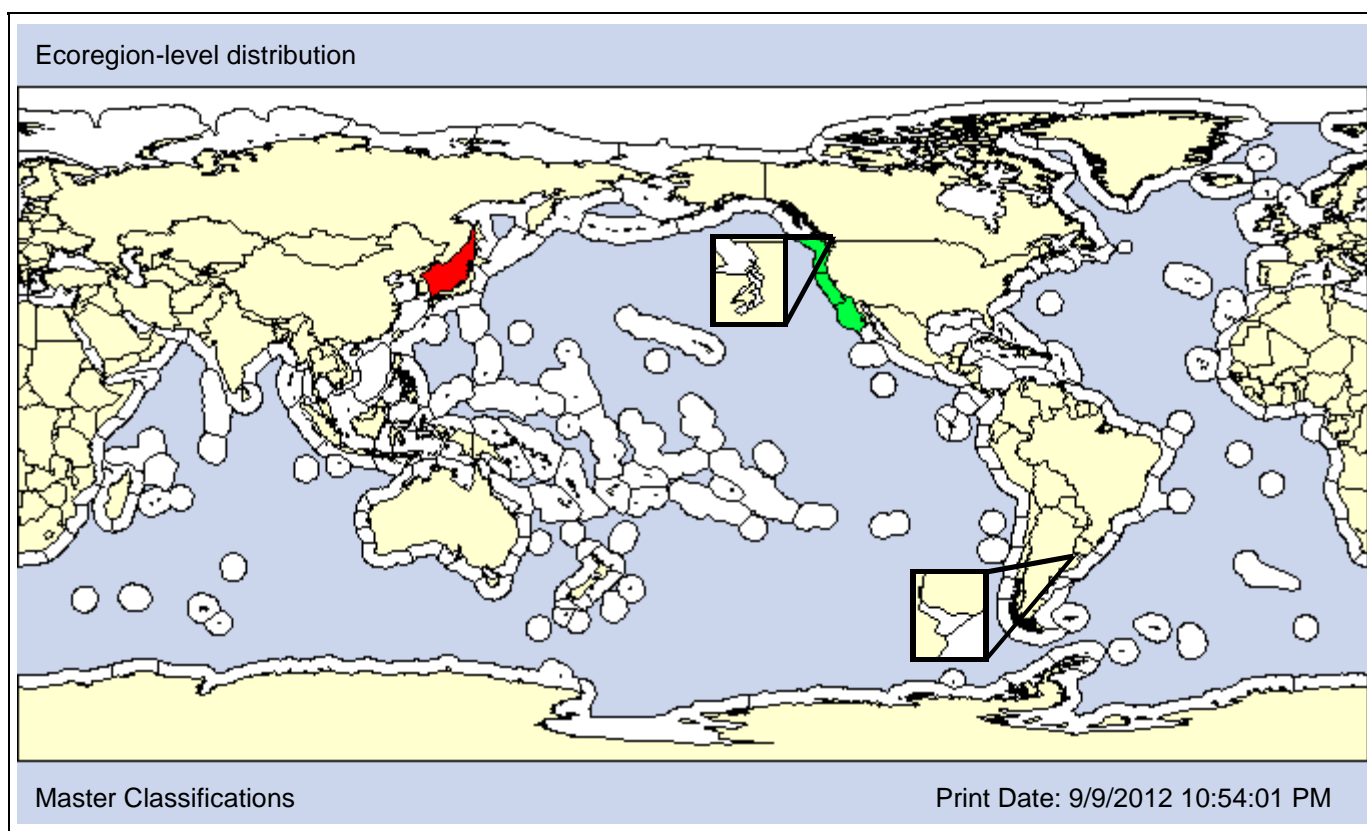
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Botryllus diegensis	Synonym	chain sea squirt

**Type Locality:** San Diego, California, USA



■ Native  
 ■ Nonindigenous  
   NIS Not Established  
   Cryptogenic  
   Transient  
   Unclassified  
   Conflicting Classification  
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1969

Native

**Loc 1st record:** Peter the Great Bay, Russia

Native

**Established:** Unknown

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
		<b>X</b>				AO	<b>PO X</b>								

Comments: *Botrylloides diegensis* is classified as native in the NEP by CANOD (2009) and Lambert and Lambert (2003), who state that it and the nonindigenous *B. violaceus* were not recognized as separate species in California until 1997. However, Carlton (2009) regards it "as introduced from the Western or South Pacific."

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 12m] [Pref: 1 - 6m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>	<b>P</b>								<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 24.5 - 34psu] [Pref: 26 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B <b>X</b>	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Herdman, 1886

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

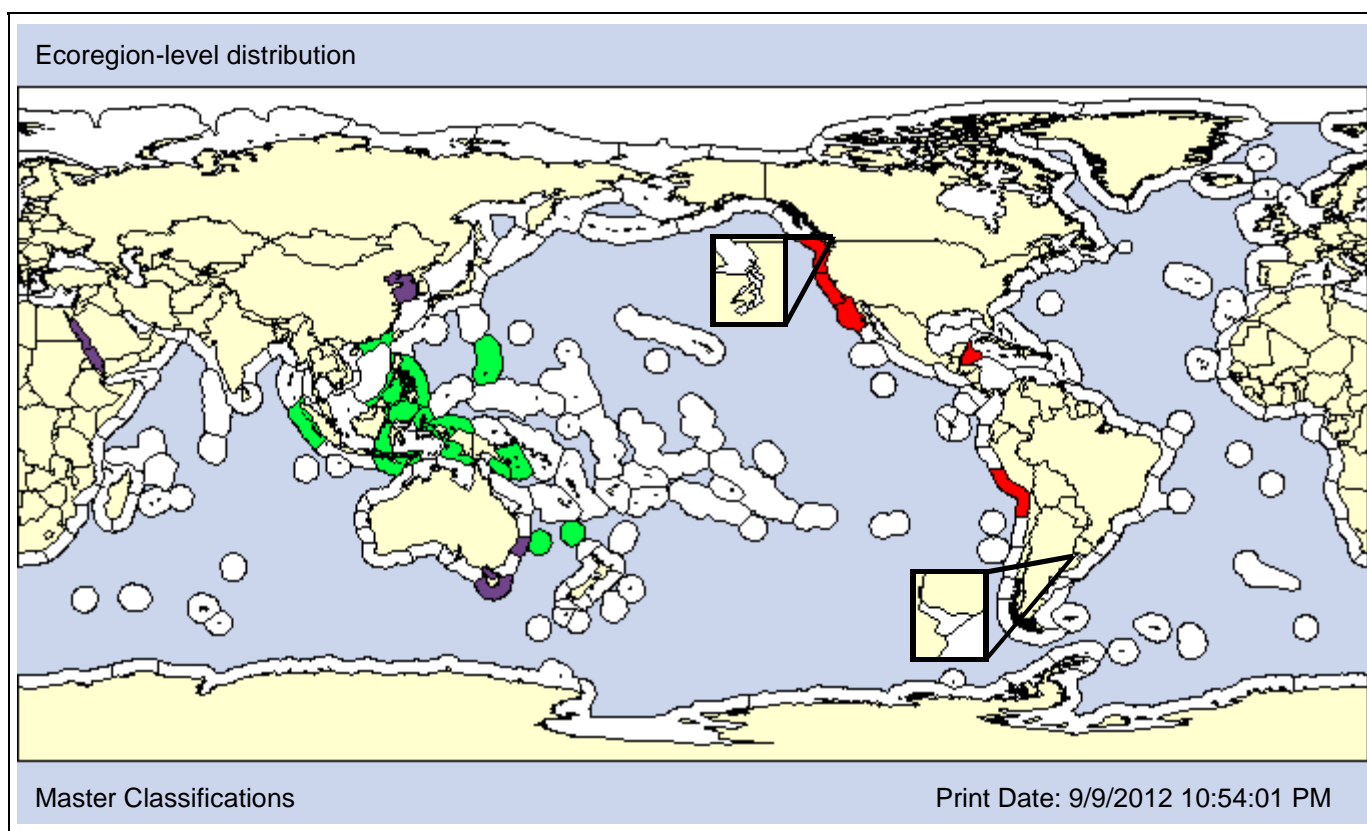
**Also Known As (Name - Type):**

Botrylloides firmus  
 Botrylloides perspicuum  
 Botryllus firmus  
 Botryllus perspicuus

Synonym  
 Convention  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** Philippines



**Date 1st record:** Unknown

1997

**Loc 1st record:** Unknown

San Diego Bay, CA

**Established:** Unknown

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR		A	P				
X		X				AO	PO							

Comments: *Botrylloides perspicuus* is an Indo-Pacific ascidian that has been introduced into the NEP, Chile, and the Caribbean. It has been reported from the Yellow Sea (Liu, 2008) but it is not clear whether this is a native or introduced distribution. Monniot and Monniot (2001) synonymized *Botryllus firmus* with *B. perspicuus*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 7 - 170m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
				<b>P</b>								<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Saito & Watanabe, 1981

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

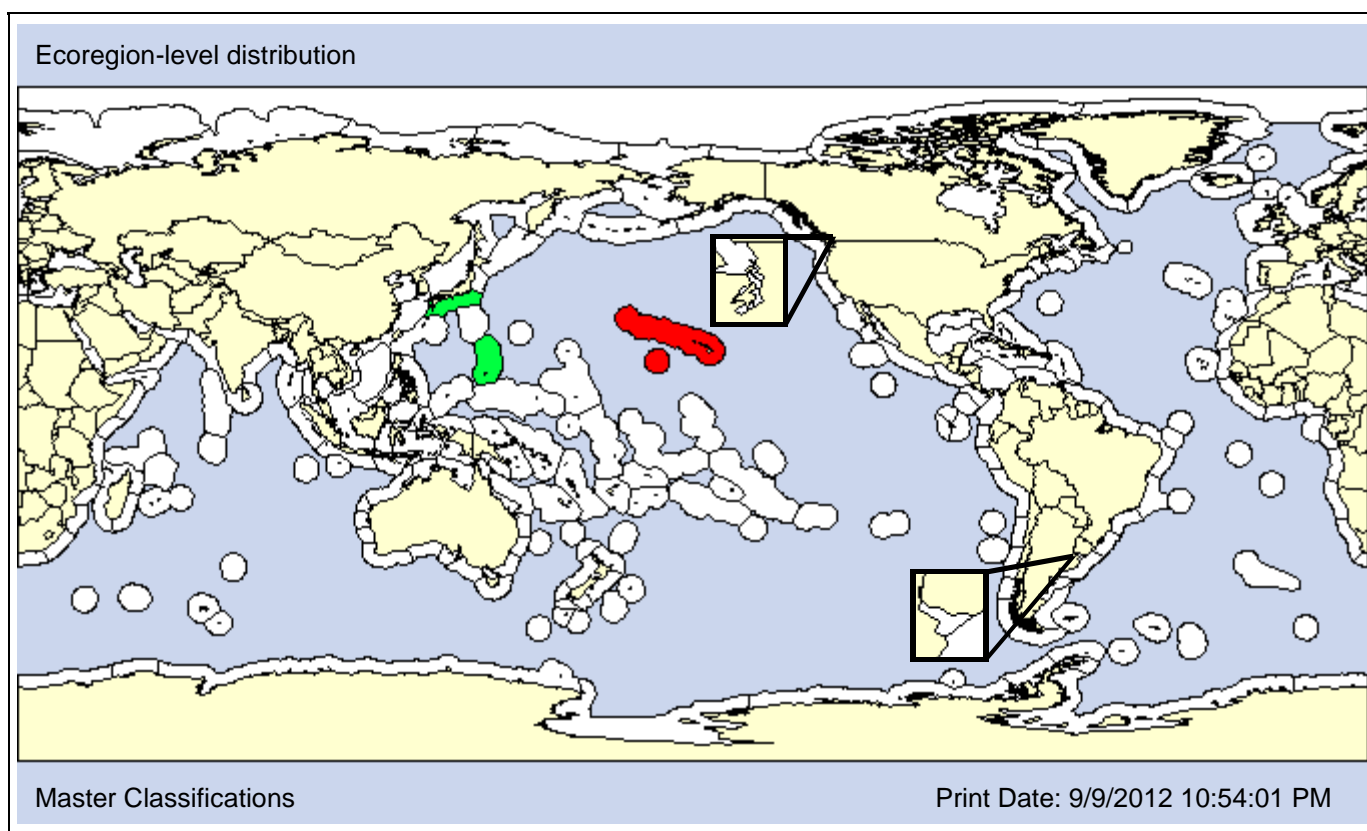
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

orange sheath tunicate

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1998  
**Loc 1st record:** Native Pearl Harbor, Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H X		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							



**Taxon:** Tunicate

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

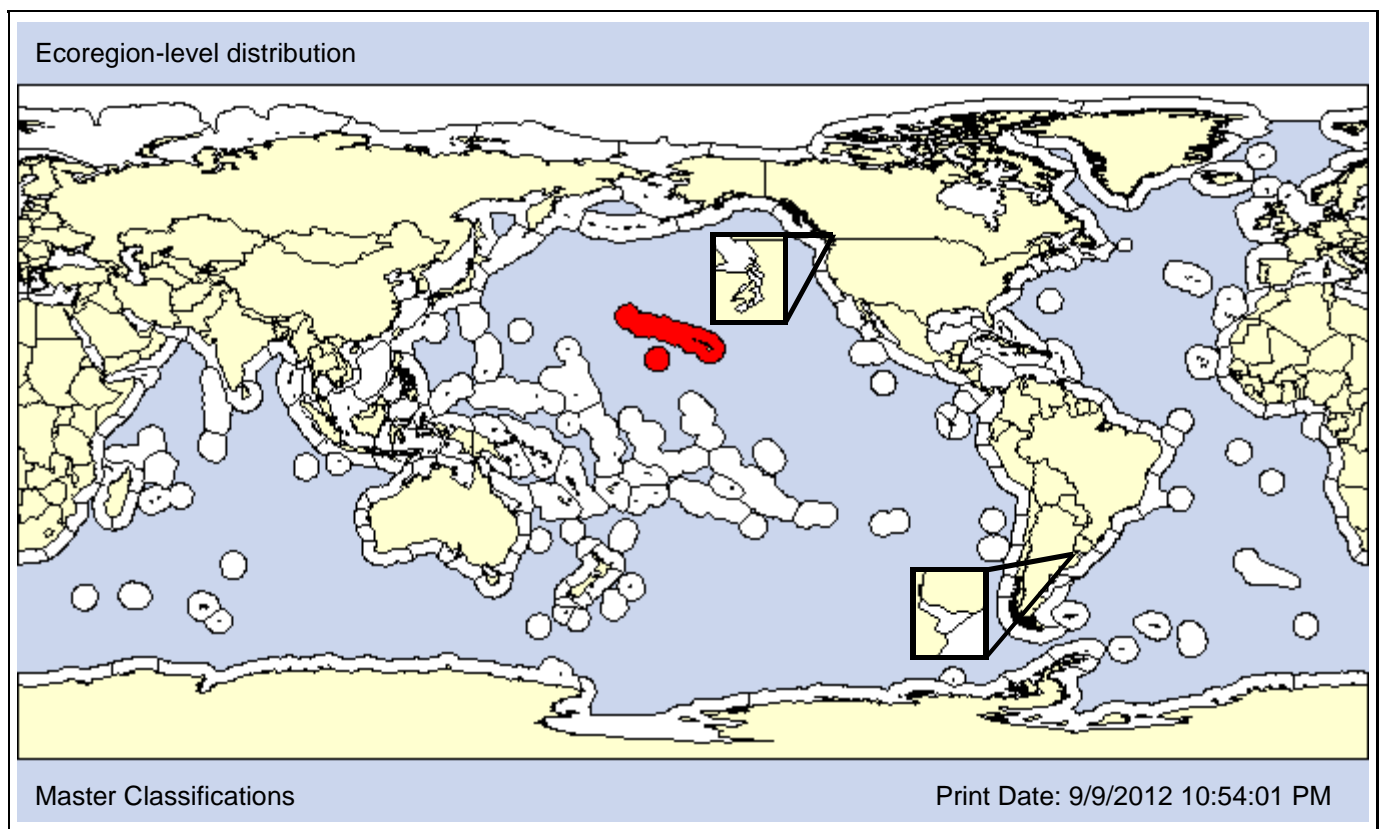
**Family:** Styelidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1973  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Tunicate

**Taxonomic Author:** Lambert

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

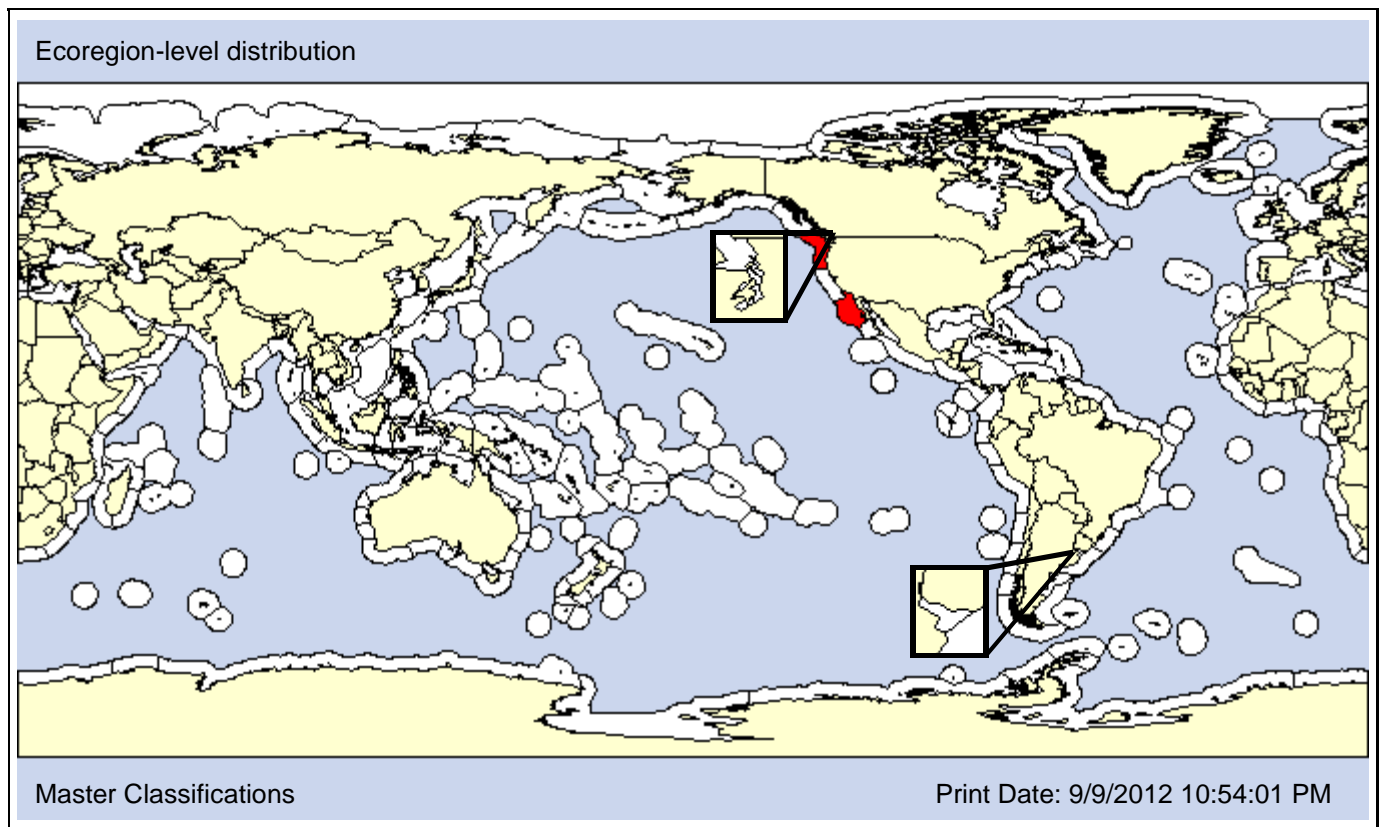
**Family:** Styelidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** California, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

2006

**Loc 1st record:**

Santa Barbara Harbor, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									<b>X</b>

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	O

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Tunicate

**Taxonomic Author:** Oka, 1927

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:** Stolidobranchia

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

**Also Known As (Name - Type):**

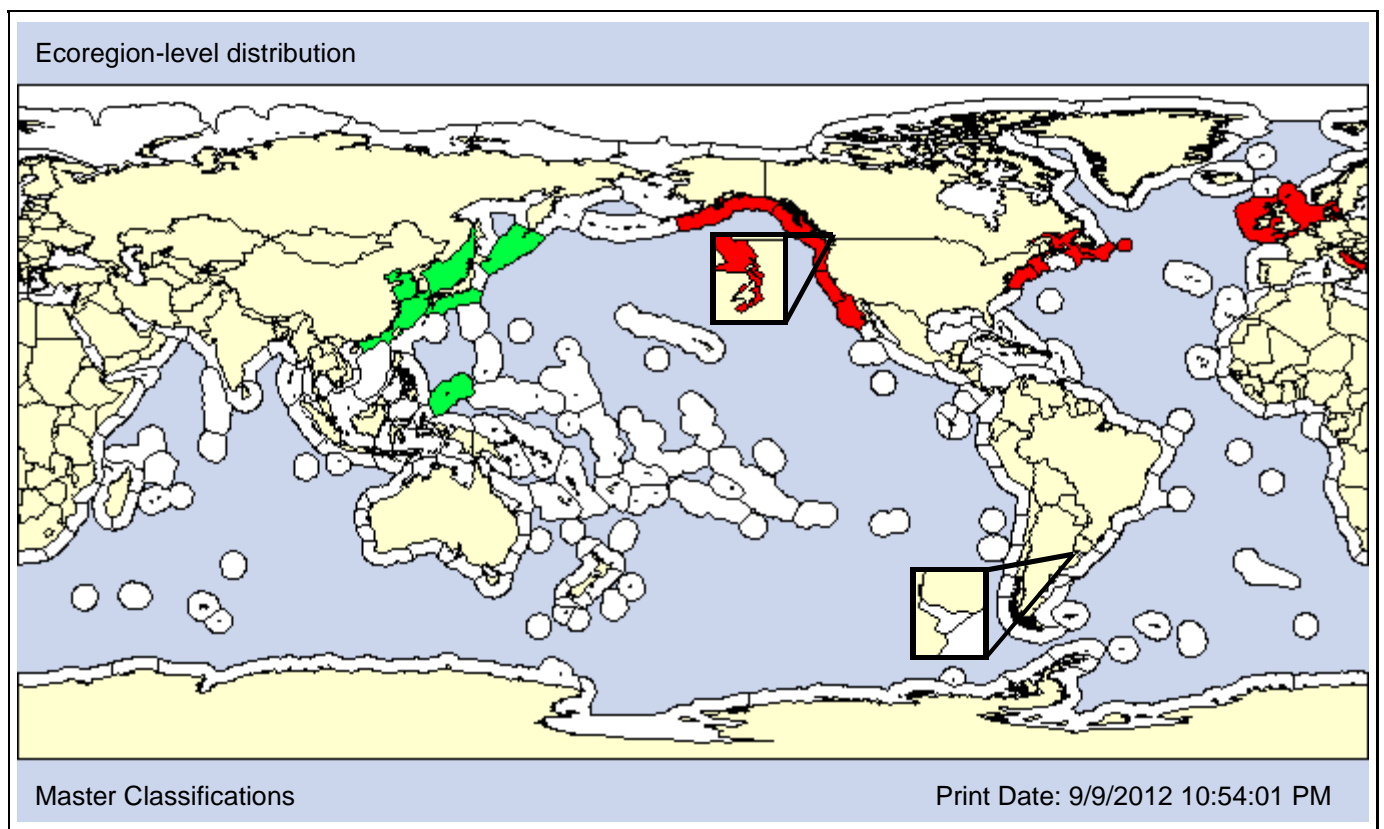
Botrylloides aurantium  
 Botrylloides aurantius  
 Botrylloides carnosum  
 Botrylloides lateritium

Synonym  
 Misspelling  
 Synonym  
 Synonym

**Common Names:**

chain tunicate  
 violet tunicate

**Type Locality:** Japan



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1945?

**Loc 1st record:** Native

Southern California

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
		<b>X</b>			AO	<b>PO X</b>									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>	<b>O</b>								<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY [Obs: 20 - 38psu] [Pref: 26 - 38psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** (Pallas, 1766)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:** Stolidobranchia

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

**Also Known As (Name - Type):**

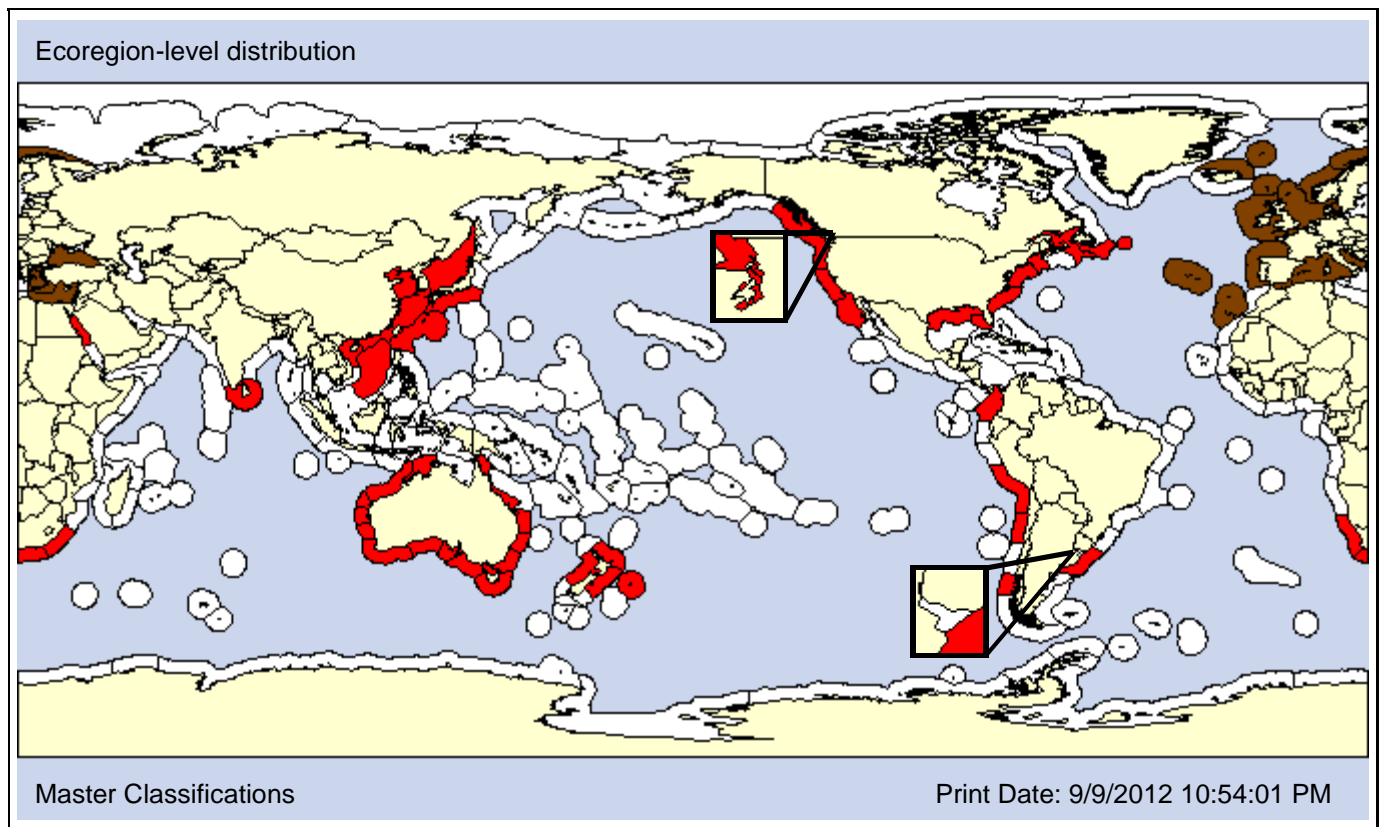
Alcyonium schlosseri  
Botryllus gouldii  
Botryllus polycyclus  
Botryllus rubens

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

golden star tunicate  
harbor stars  
star tunicate

**Type Locality:** Falmouth, English Channel



**Date 1st record:** Unknown  
**Loc 1st record:** Unknown  
**Established:** Yes

1947  
San Francisco Estuary, CA  
Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
		<b>X</b>				<b>AO X</b>	PO							

Comments: CANOD (2009) consider Botryllus schlosseri native to Europe, and Zenetos et al. (2010) does not list it as introduced in the Mediterranean. Olenin and Didžiulis (2009) list it as an alien in Europe and Mead et al. (2011) consider the native region to be unknown. We list the NEA as a conflict and tentatively introduced in other regions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X				TP	RI-PH	X		X	X	

**DEPTH [Obs: 0 - 200m] [Pref: 1 - 18m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O	O					O				P	P	

**SALINITY [Obs: 14 - 44psu] [Pref: 25 - 38psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline O		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	P	
			O	O	P				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H X		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		
X					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	X					X	X
						X							



**Taxon:** Tunicate

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

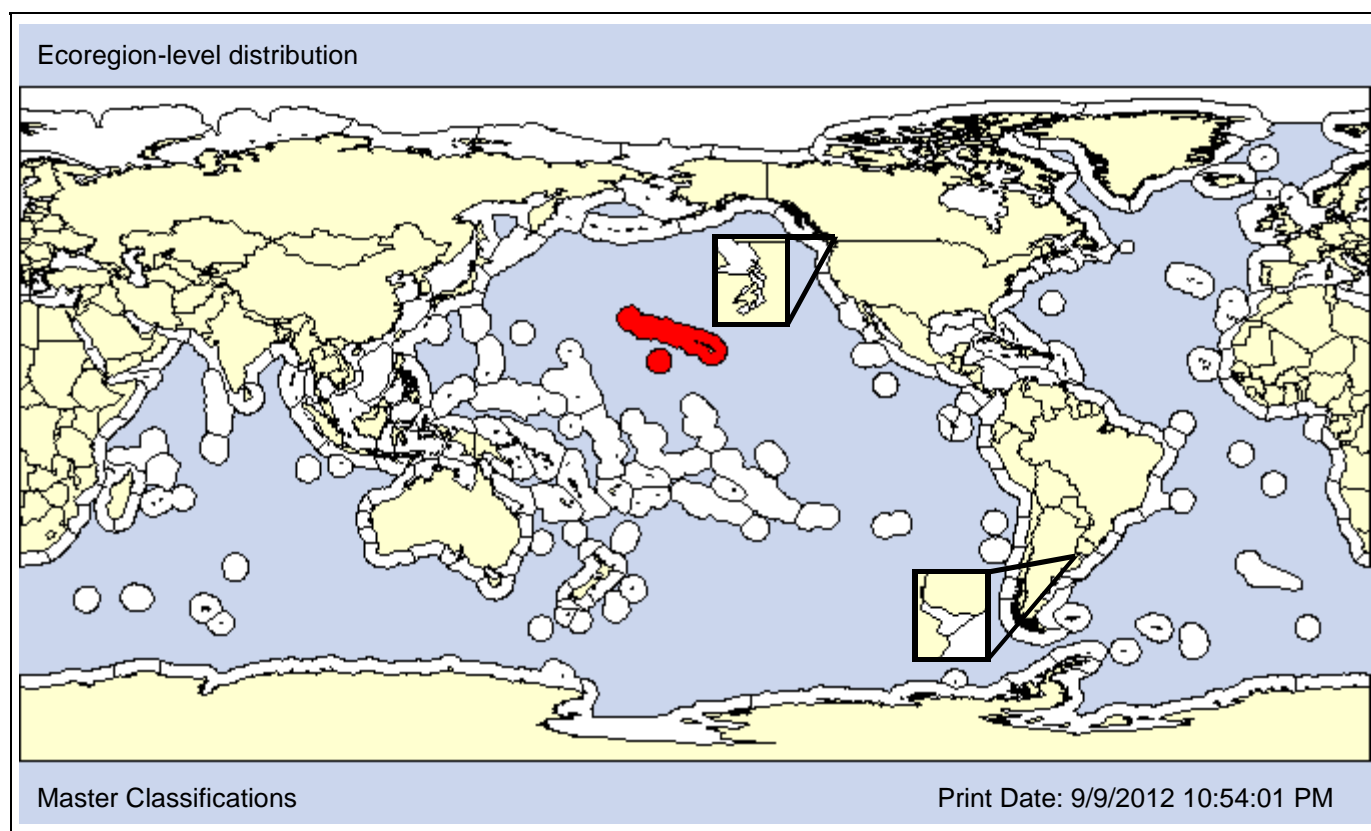
**Family:** Styelidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



**Date 1st record:** 1973  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Tunicate

**Taxonomic Author:** Lambert

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

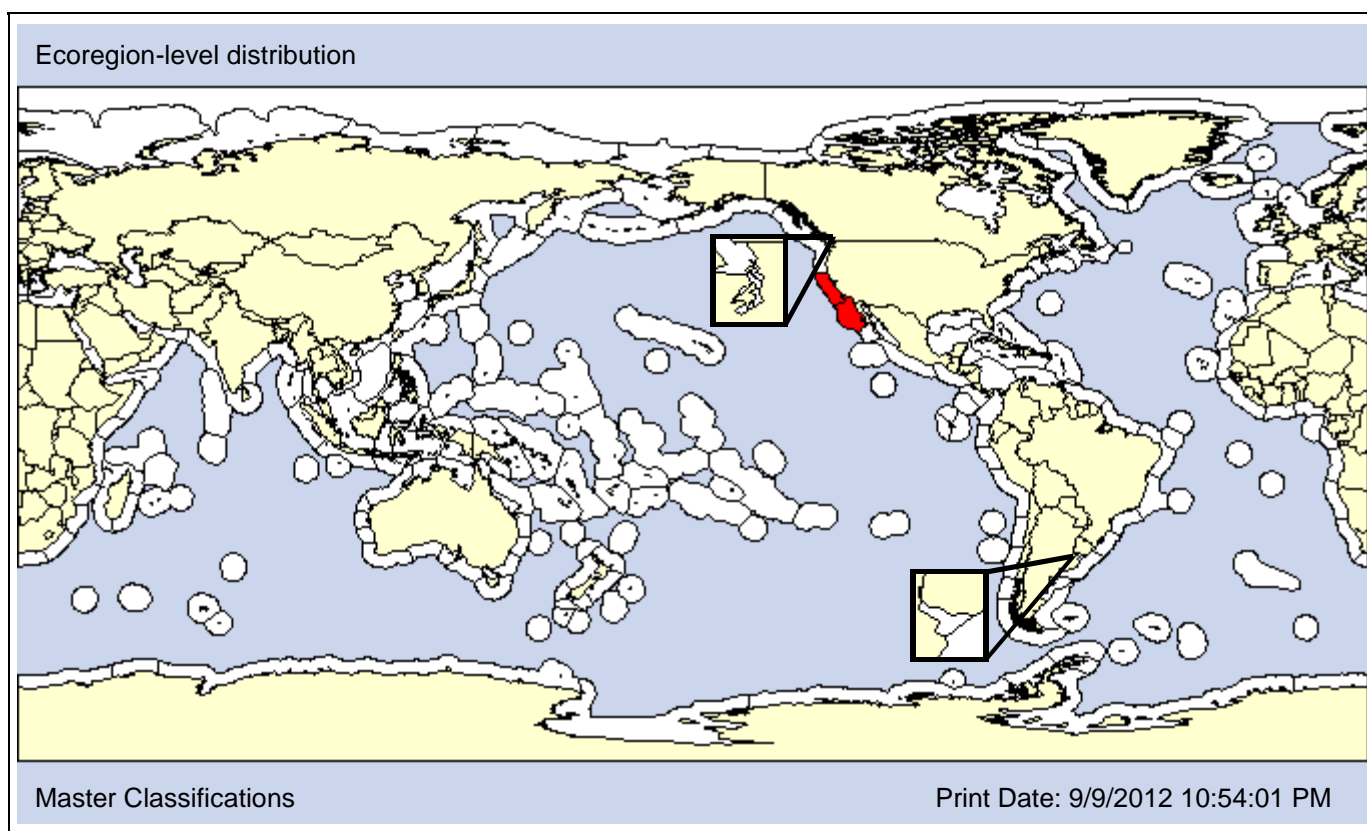
**Also Known As (Name - Type):**

Botryllus sp. (Cohen and Carlton 1995)  
 Botryllus sp. A (Cohen et al. 2002)  
 Botryllus sp. A (Lambert)

Convention  
 Convention  
 Convention

**Common Names:**

**Type Locality:** California, USA



**Date 1st record:**

1980

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
		X				AO	PO X							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>O</b>	<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** (Linnaeus, 1767)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Cionidae

**Subfamily:**

**Also Known As (Name - Type):**

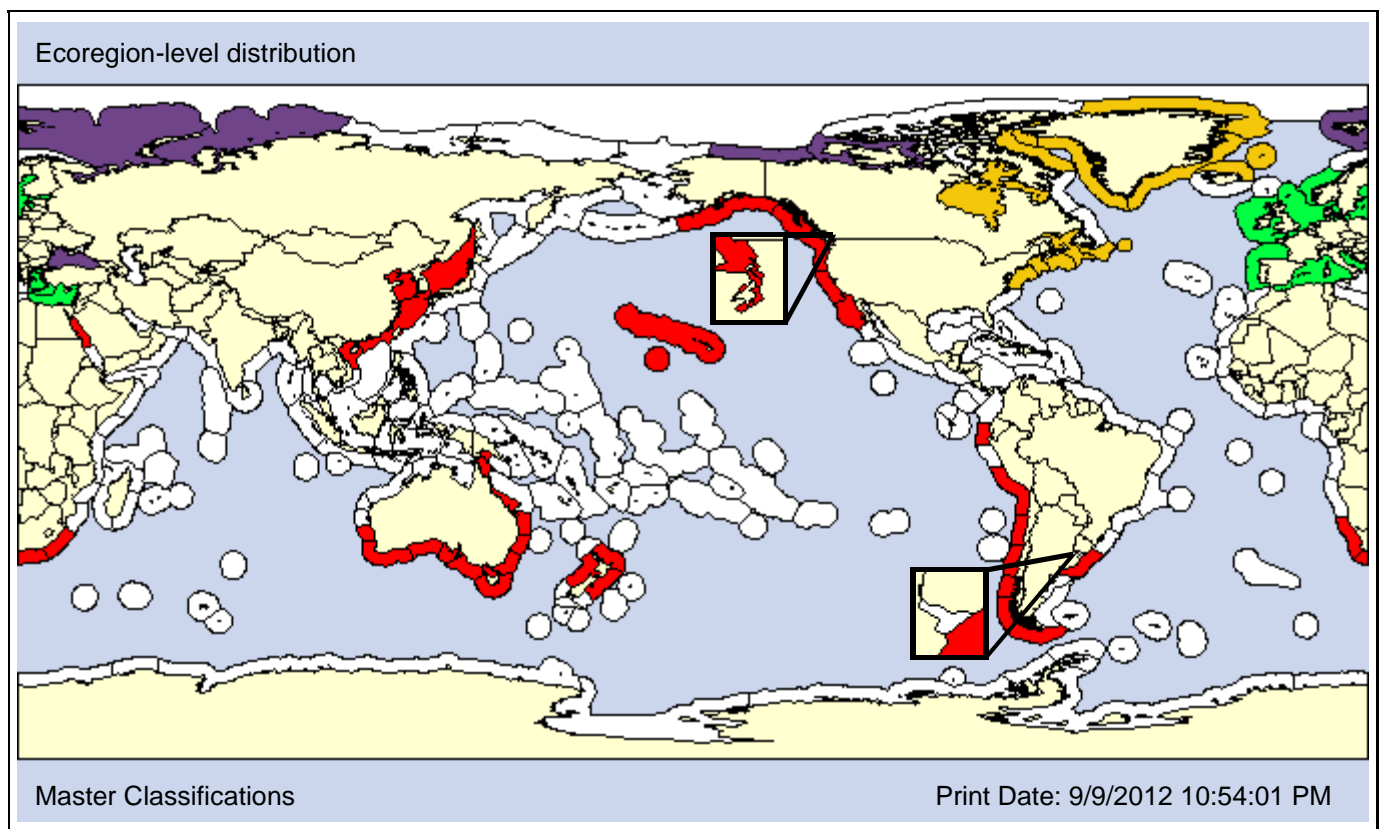
Ascidia canina  
Ascidia intestinalis  
Ciona canina  
Ciona sociabilis

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

sea vase  
smooth sea bottle  
vase tunicate  
yellow sea-squirt

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP

Hawaii

NEP

**Date 1st record:** 1965s

1933

1897

**Loc 1st record:** Busan, Korea

Honolulu Harbor, Hawaii

San Diego Bay, CA

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				<b>AO X</b>	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
		<b>X</b>											

**DEPTH [Obs: 0 - 500m] [Pref: 4.5 - 8.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 33.63 - 89.8%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>	<b>O</b>			<b>O</b>	<b>O</b>				<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 12 - 40psu] [Pref: - 30psu]**

<b>Fresh</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>
			<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Herdman, 1882

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Cionidae

**Subfamily:**

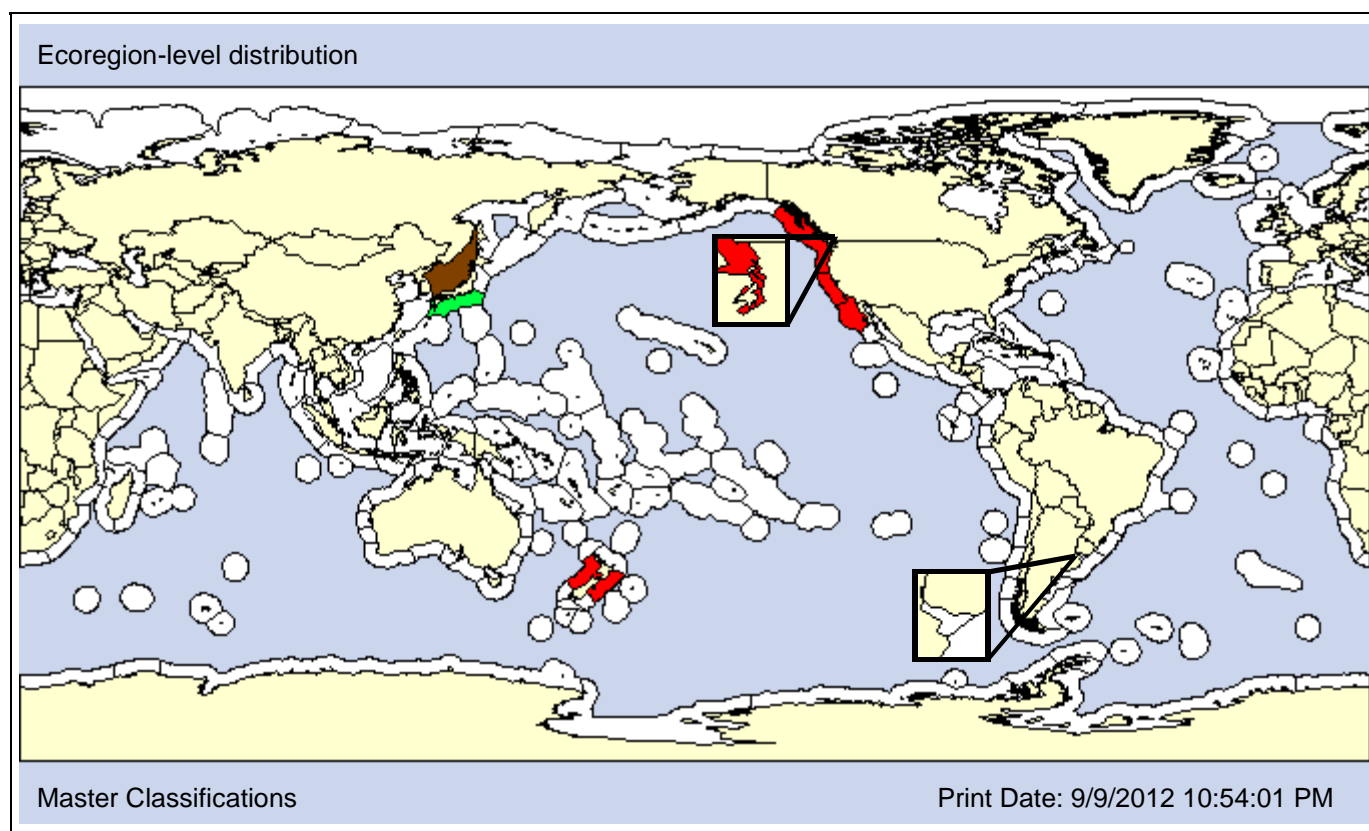
**Also Known As (Name - Type):**

Ciona intestinalis of NEP authors in part; not (Linnaeus, 176)	Partial synonym
--	-----------------

**Common Names:**

transparent tunicate
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**Type Locality:** Japan



**Date 1st record:** 2004

1903

**Loc 1st record:** Peter the Great Bay, Russia

Loring, Alaska

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X		X				AO	PO								

Comments: *Ciona savignyi* was introduced into the NEP from its native Japan (Abbott et al., 2007). However, Zvyagintsev et al. (2007a) report it as introduced into Peter the Great Bay. This introduction into Peter the Great Bay may be a range expansion within the Sea of Japan rather than a new introduction at the ecoregion scale.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 6m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>									<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 26 - 35psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Tunicate

**Taxonomic Author:** (Hartmeyer, 1906)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:** Stolidobranchia

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

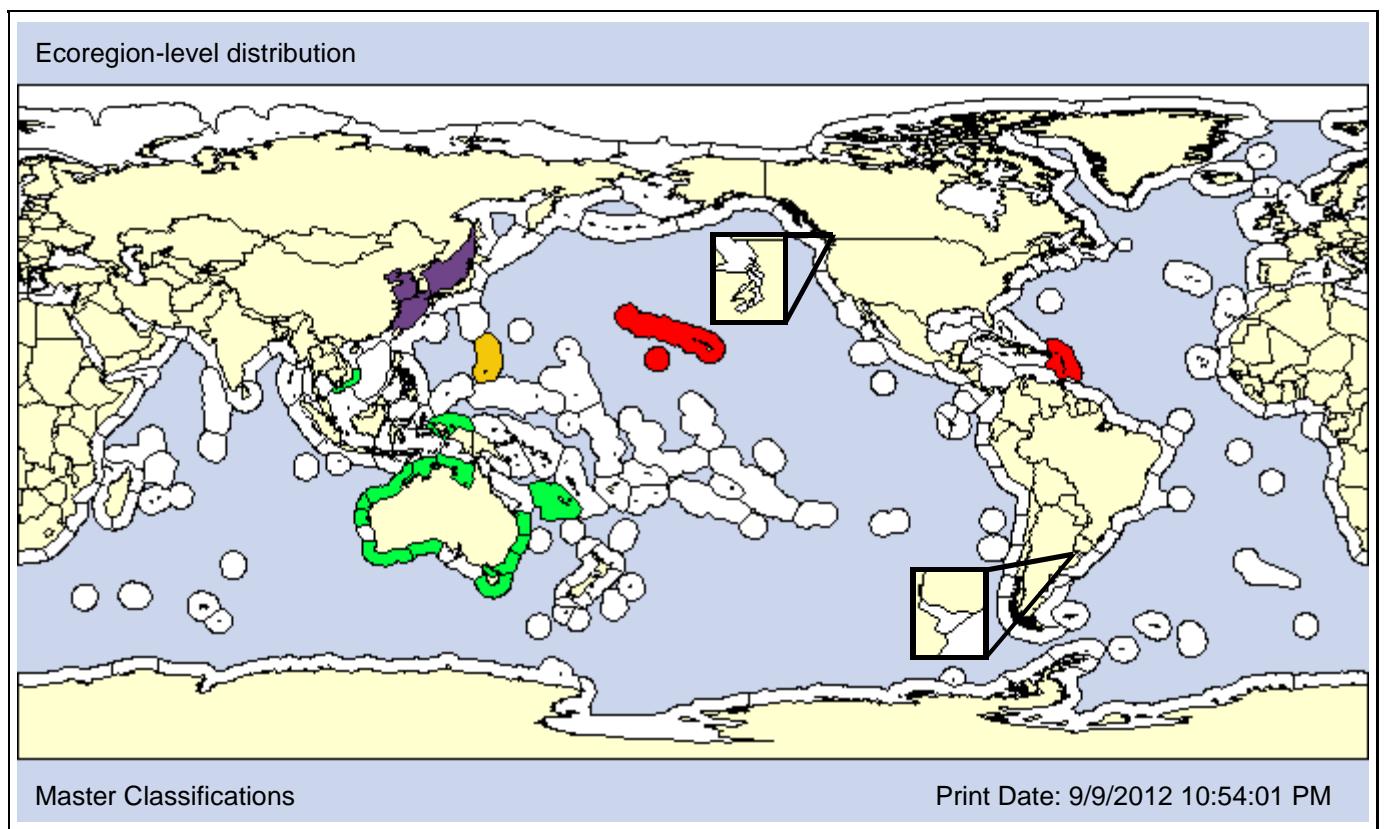
**Also Known As (Name - Type):**

Cnemidocarpa areolata of NWP authors  
 Cnemidocarpa hartogi  
 Cnemidocarpa irma  
 Cnemidocarpa legalli

Misidentified  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** Unknown 1940  
**Loc 1st record:** Unknown Honolulu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
		X				AO	PO							

Comments: The native region of *Cnemidocarpa irene* is the Indo-West Pacific (Carlton and Eldredge, 2009), though, it was classified as cryptogenic in Guam by Lambert (2002). We classify it as native in Southern Australia based on its proximity to the native Indo-West Pacific populations.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 6 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Traustedt, 1882

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Corellidae

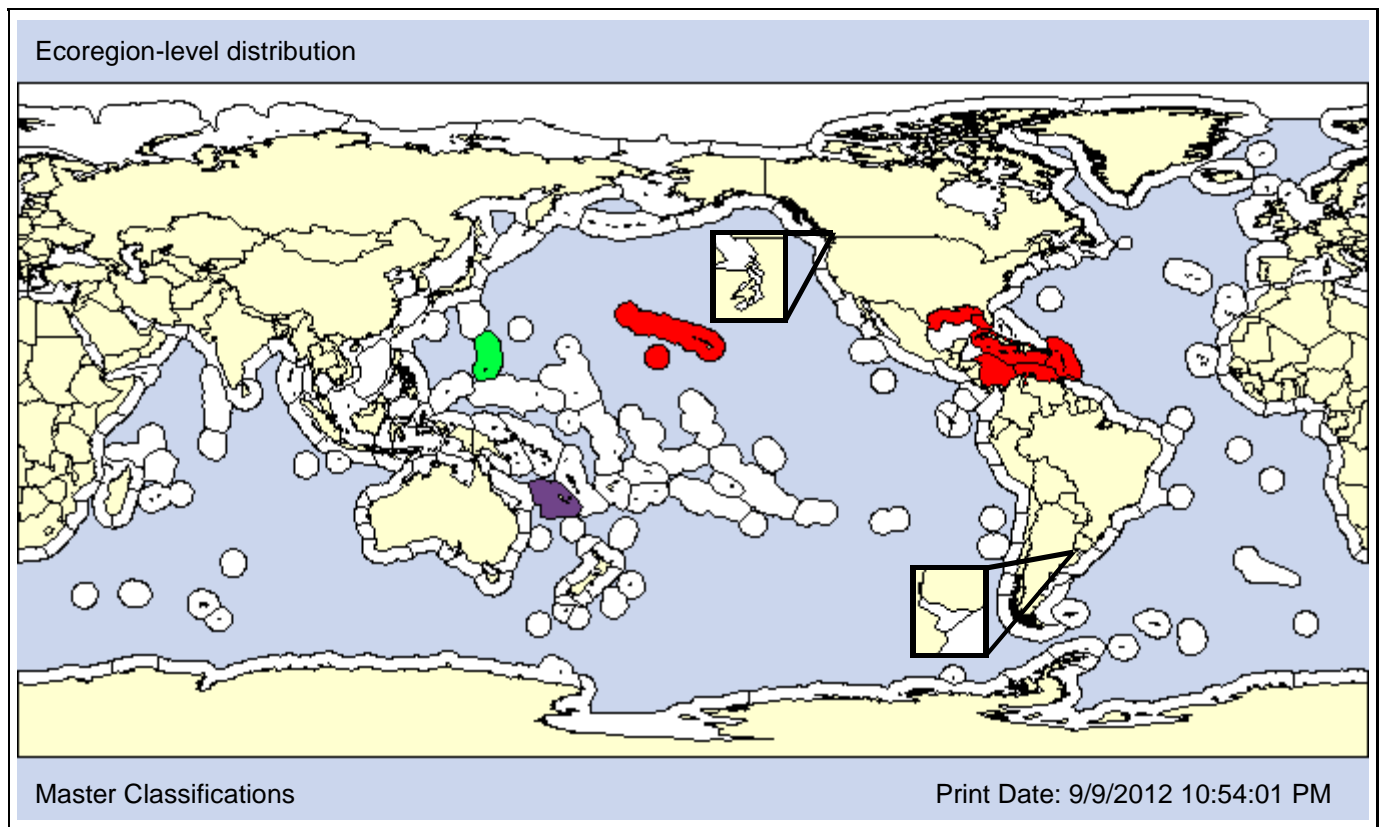
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Corella japonica of authors	Misidentified	
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**Type Locality:** Saint Thomas, U.S. Virgin Islands



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** <1997  
**Loc 1st record:** Kaneohe Bay, Hawaii  
**Established:** Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: Carlton and Eldredge (2009) note that the native range of *Corella minuta* is unknown, but classify it as introduced in Hawaii while Lambert (2003b) lists it as native in Guam. Carlton and Eldredge also suggest that it was introduced into the Caribbean even though the type location is the Virgin Islands.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH				<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 48m] [Pref: - 14m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>				<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Savignyi, 1816

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Aplousobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Didemnidae

**Subfamily:**

**Also Known As (Name - Type):**

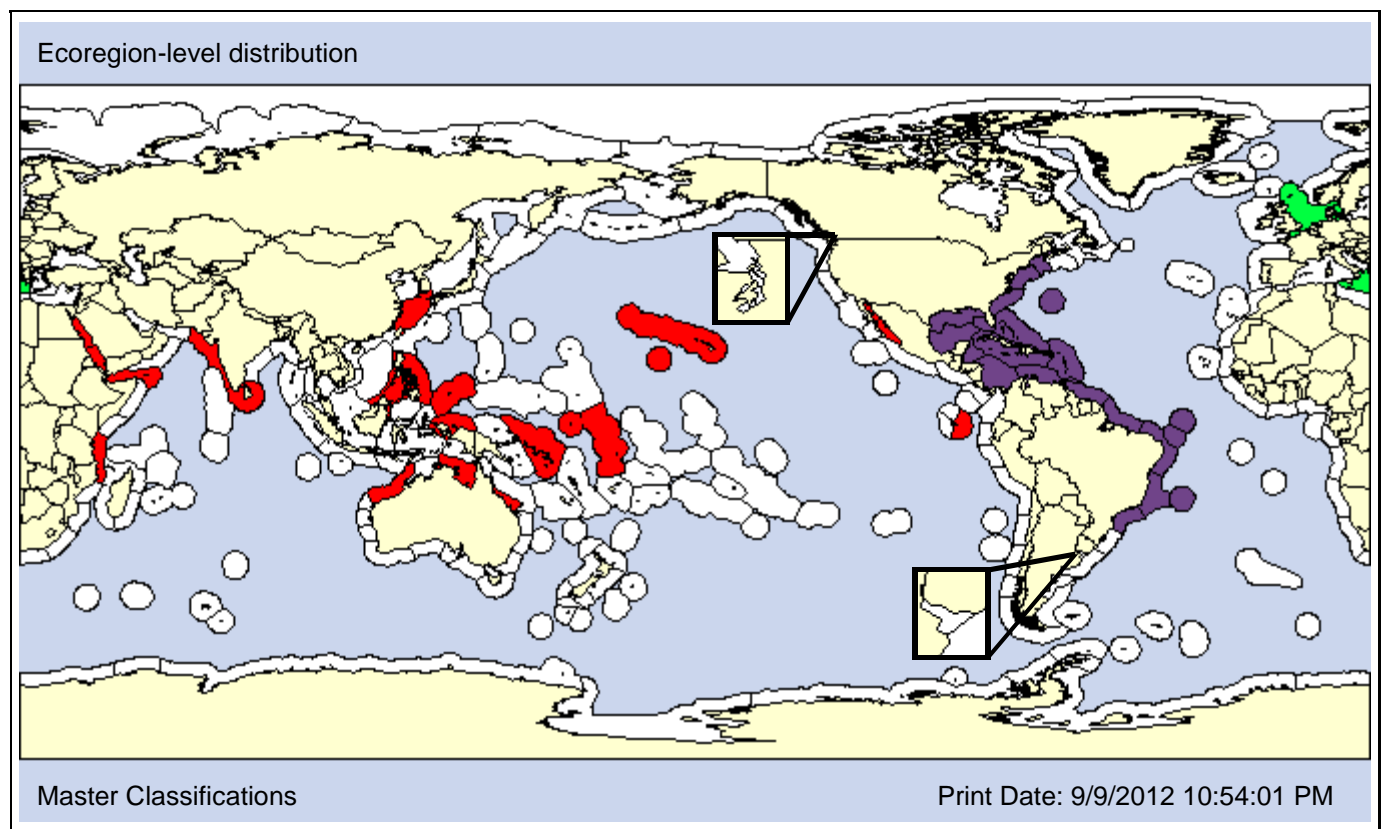
Didemnum candidum of authors  
 Leptoclinum annectens  
 Leptoclinum cretaceum  
 Leptoclinum speciosum

Ambiguous syn.  
 Ambiguous syn.  
 Ambiguous syn.  
 Ambiguous syn.

**Common Names:**

white didemnid

**Type Locality:** Red Sea



**Date 1st record:** 1996

1930

2002

**Loc 1st record:** Geojedo Island, Korea

Pearl and Hermes Reefs, HI

Isla Lobos, Mexico

**Established:** Yes

Yes

Unknown

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Though the distribution of *Didemnum candidum* is confounded by the likely presence of several species, Carlton and Eldredge (2009) state that it is "possibly of Eastern North Atlantic origin" and it is not in the list of European invaders (Olenin and Didžiulis, 2009). We classify it as NIS in the Pacific based on an Atlantic origin.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 368m] [Pref: 0 - 64m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>				<b>O</b>			<b>O</b>			<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 26 - 46psu] [Pref: 30 - 36psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

# *Didemnum perlucidum*

Species ID: 123402

**Taxon:** Tunicate

**Taxonomic Author:** Monniot, 1983

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Aplousobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

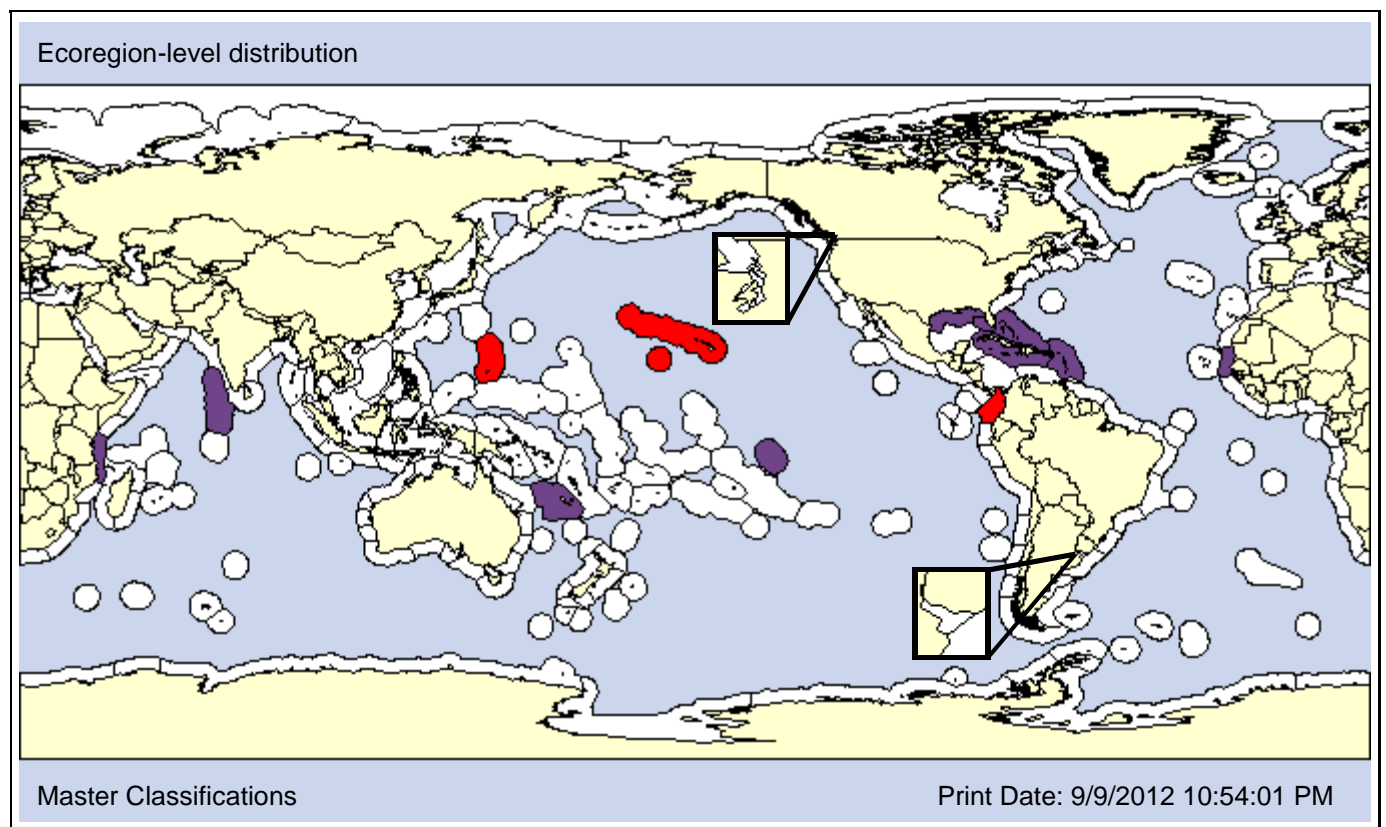
**Family:** Didemnidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Guadeloupe



**Date 1st record:**

1999

**Loc 1st record:**

Keehi Lagoon, Hawaii

**Established:**

Yes

### VECTORS

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: The native region of *Didemnum perlucidum* is unknown, though it is considered introduced in Hawaii (Carlton and Eldredge, 2009), Guam (Lambert, 2002), and Pacific Panama (Carman et al., 2011).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>		<b>O</b>									<b>P</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Tunicate

**Taxonomic Author:** (Sluiter, 1895)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Aplousobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Didemnidae

**Subfamily:**

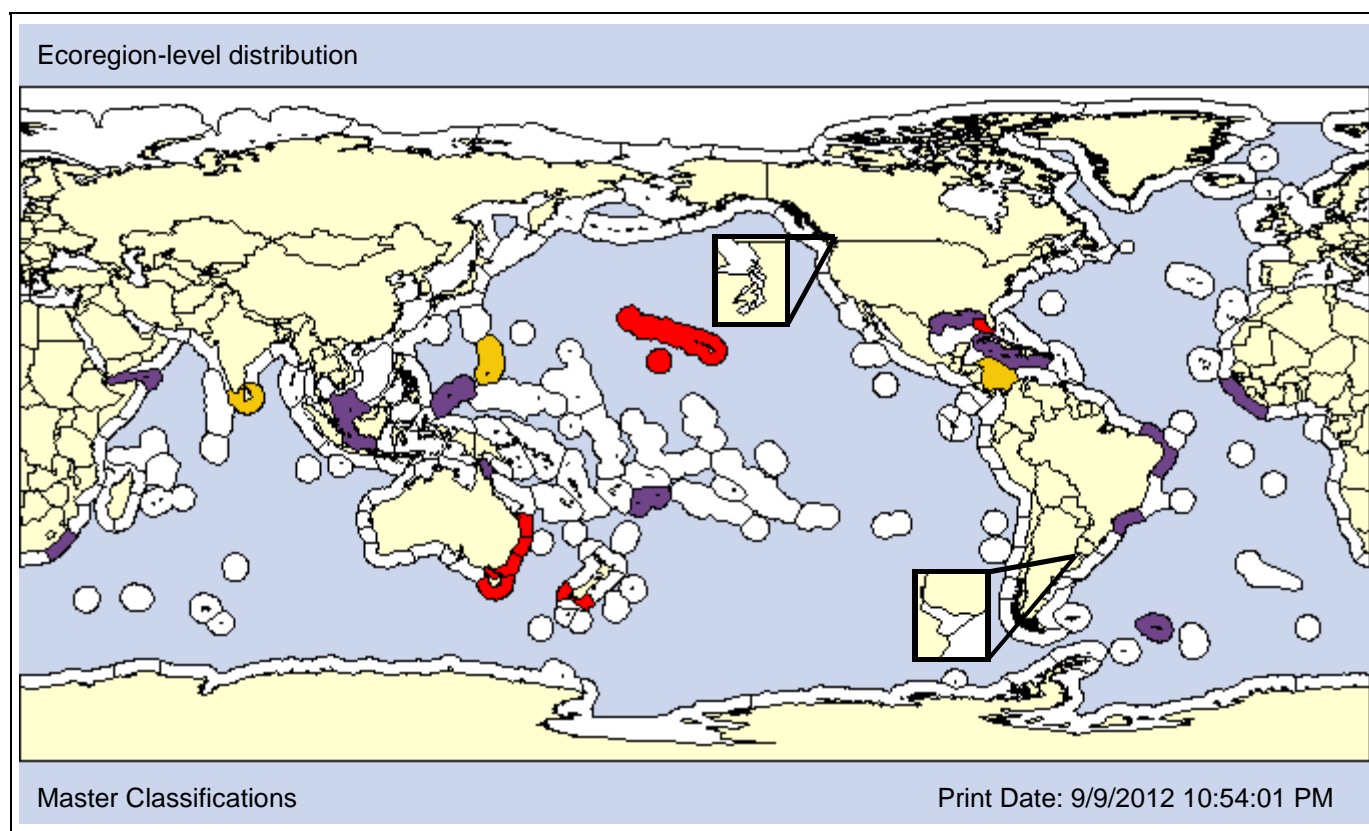
**Also Known As (Name - Type):**

Didemnum dorotubu	Synonym
Didemnum siphoniatum	Synonym
Didemnum skeati	Synonym
Didemnum venosum	Synonym

**Common Names:**

chocolate tunicate
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**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1998  
**Loc 1st record:** Keehi Lagoon, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments: Carlton and Eldredge (2009) list the Indo-Pacific as the native region for *Didemnum psammatoide* and suggest that it is introduced in the Atlantic. We consider the native region to be unknown and use regional classifications when available; otherwise we list it as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 1m] [Pref: 0 - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>							<b>P</b>				<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Kott, 2002

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Aplousobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Didemnidae

**Subfamily:**

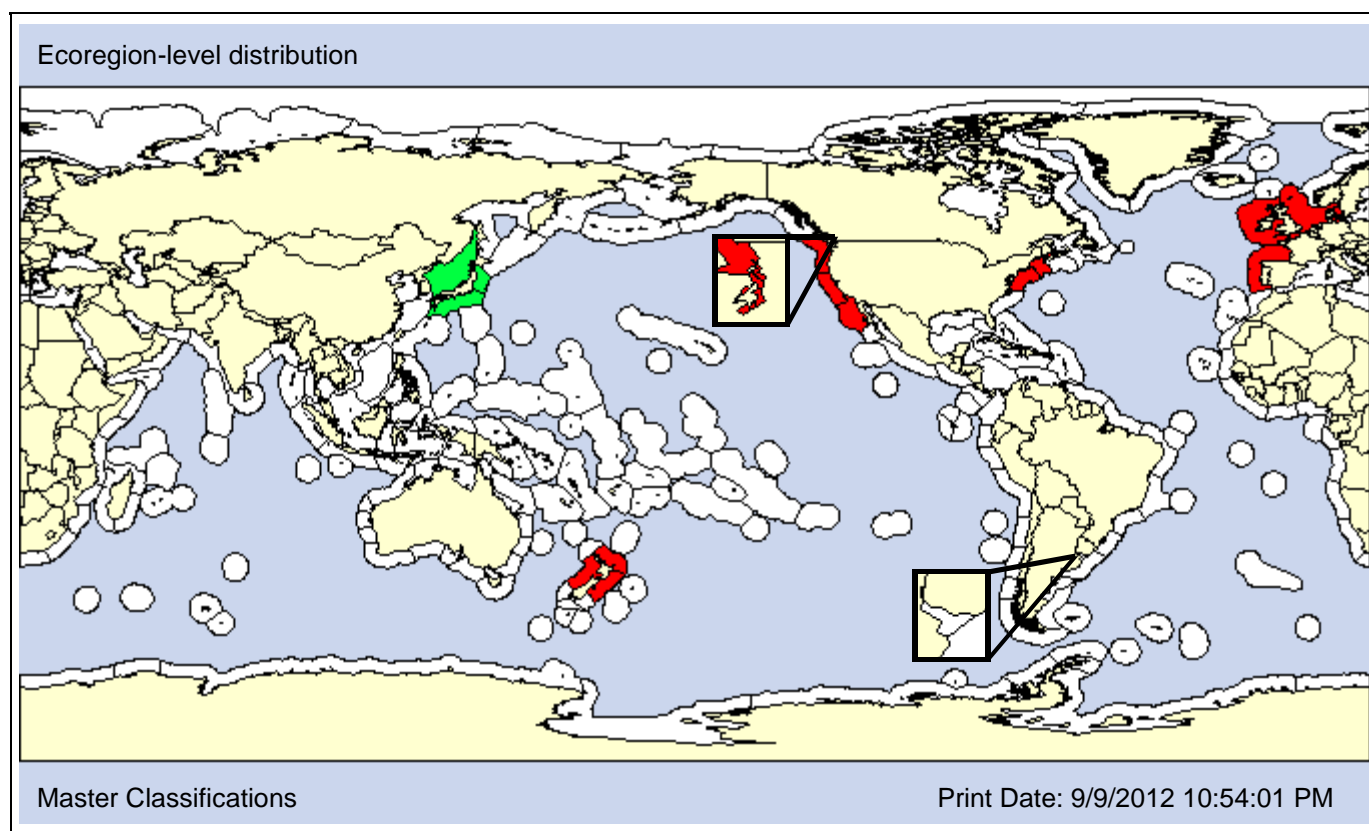
**Also Known As (Name - Type):**

Didemnum helgolandicum of NEA authors, in part  
 Didemnum carnulentum of NEP authors in part  
 Didemnum cf. lahillei  
 Didemnum lahillei of NEA authors, in part

Misidentified  
 Misidentified  
 Ambiguous syn.  
 Misidentified

**Common Names:**

**Type Locality:** Whangamata, New Zealand



**Date 1st record:** Native

1997

**Loc 1st record:** Native

Half-Moon Bay, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	<b>PO X</b>								

Comments: The taxonomy of this non-native *Didemnum* has been confused, but we follow Lambert (2009) and assume that Japan is the likely origin for *Didemnum vexillum*, though Kott (2004) considers it indigenous to New Zealand. Hull or sea chest fouling seems like the most likely vectors.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
		X											

**DEPTH [Obs: 0 - 65m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			O	O	O	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O	P								P	P	P	

**SALINITY [Obs: 26 - 36psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline P		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P	O	
					O	P			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		X		LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							X
					X	X							

**Taxon:** Tunicate

**Taxonomic Author:** (Milne-Edwards, 1841)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Aplousobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Didemnidae

**Subfamily:**

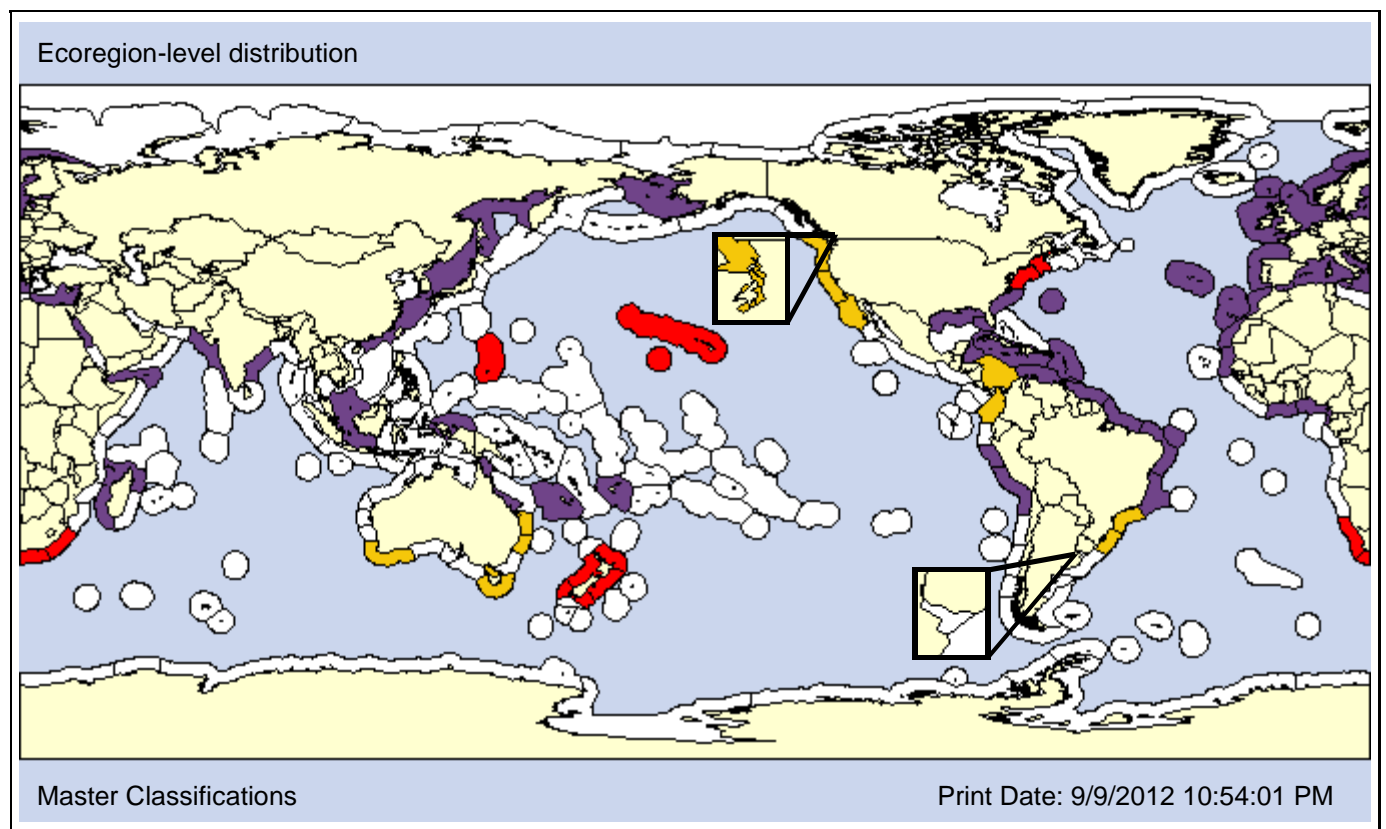
**Also Known As (Name - Type):**

Astellium spongiforme	Synonym
Didemnum gelatinosum	Synonym
Diplosoma atropunctatum	Synonym
Diplosoma crystallinum	Synonym

**Common Names:**

compound sea squirt  
diplosoma tunicate

**Type Locality:** English Channel



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** Unknown

1900

1917

**Loc 1st record:** Unknown

Honolulu, Hawaii

San Diego Bay, CA

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O	
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P				
		<b>X</b>				AO	PO									

Comments: The native range of *Diplosoma listerianum* is not known. We classify it as NIS or cryptogenic based on regional classifications and unclassified elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 80m] [Pref: 1 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>O</b>					<b>P</b>	<b>O</b>		<b>P</b>	<b>O</b>	<b>P</b>	

**SALINITY [Obs: 24 - 34psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

# *Ecteinascidia imperfecta*

Species ID: 170003

**Taxon:** Tunicate

**Taxonomic Author:** Tokioka, 1950

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Perophoridae

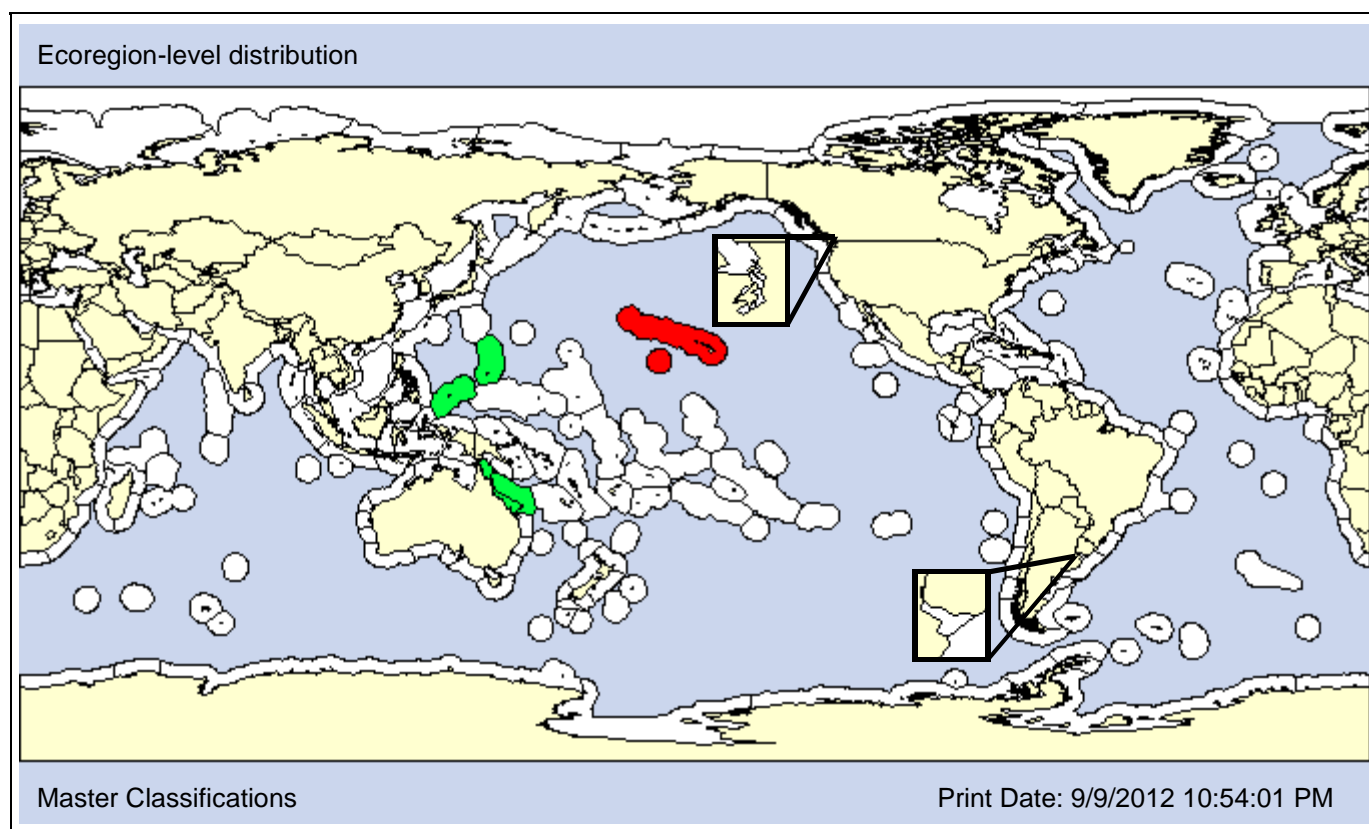
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Ecteinascidia remanea	Synonym	
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**Type Locality:** Palau Island



**Date 1st record:**

1979

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

### VECTORS

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		<b>X</b>		<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>			<b>P</b>	<b>O</b>							<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Tunicate

**Taxonomic Author:** Michaelsen, 1904

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

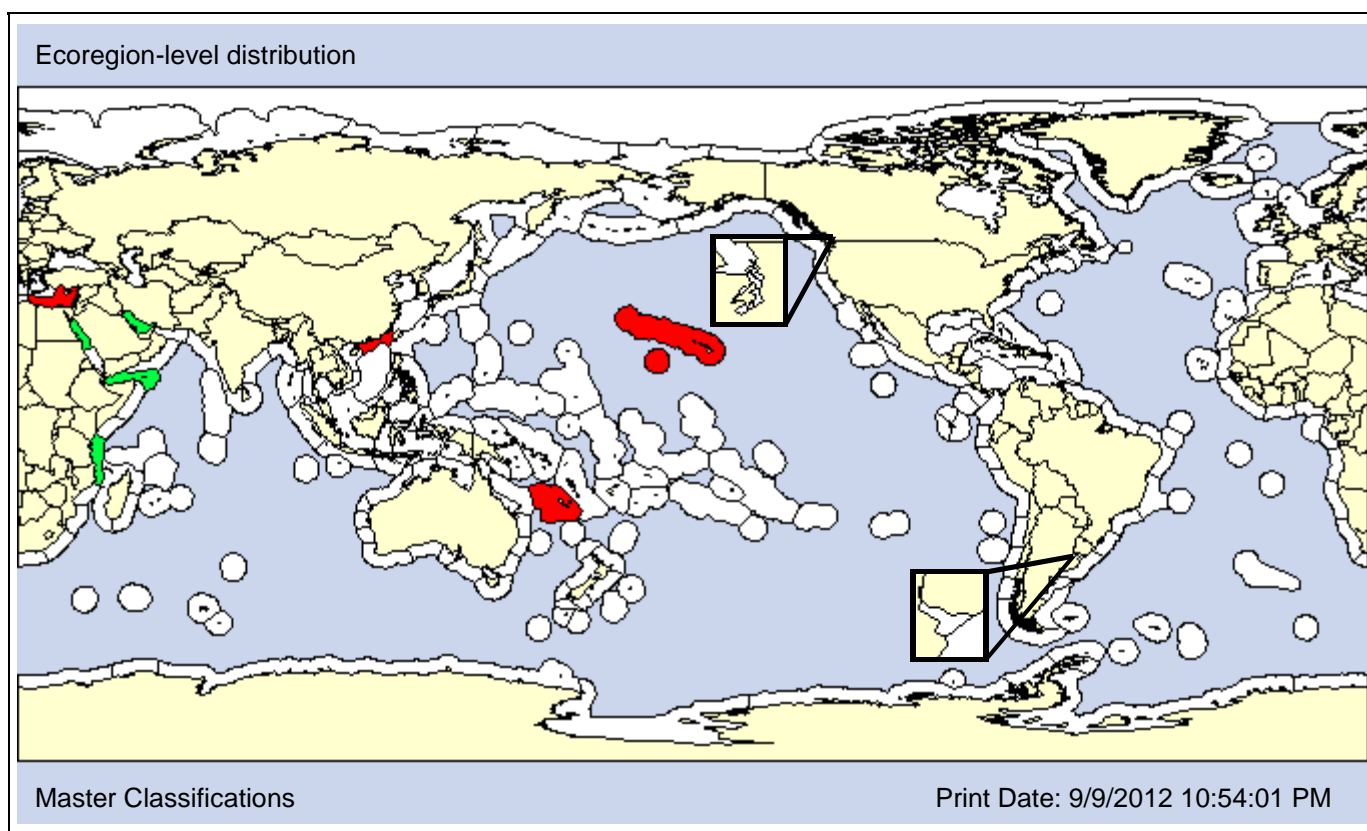
**Also Known As (Name - Type):**

Cnemidocarpa hartmeyeri  
Eusynstyela aliena  
Michaelsenia tinctoria  
Polyandrocarpa violacea

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:** Indian Ocean and New Caladonia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1998  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P			<b>X</b>	
		<b>X</b>				AO	<b>PO X</b>								

Comments: *Eusynstyela hartmeyeri* is native to the Indian Ocean, and has been introduced to Hawaii (Carlton and Eldredge, 2009), Mediterranean (Shenkar and Loya, 2009), New Caledonia and Hong Kong (Monniot and Monniot, 2001).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH		<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 5 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>	<b>O</b>						<b>O</b>			<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		<b>X</b>		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** (Drasche, 1884)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Pyuridae

**Subfamily:**

**Also Known As (Name - Type):**

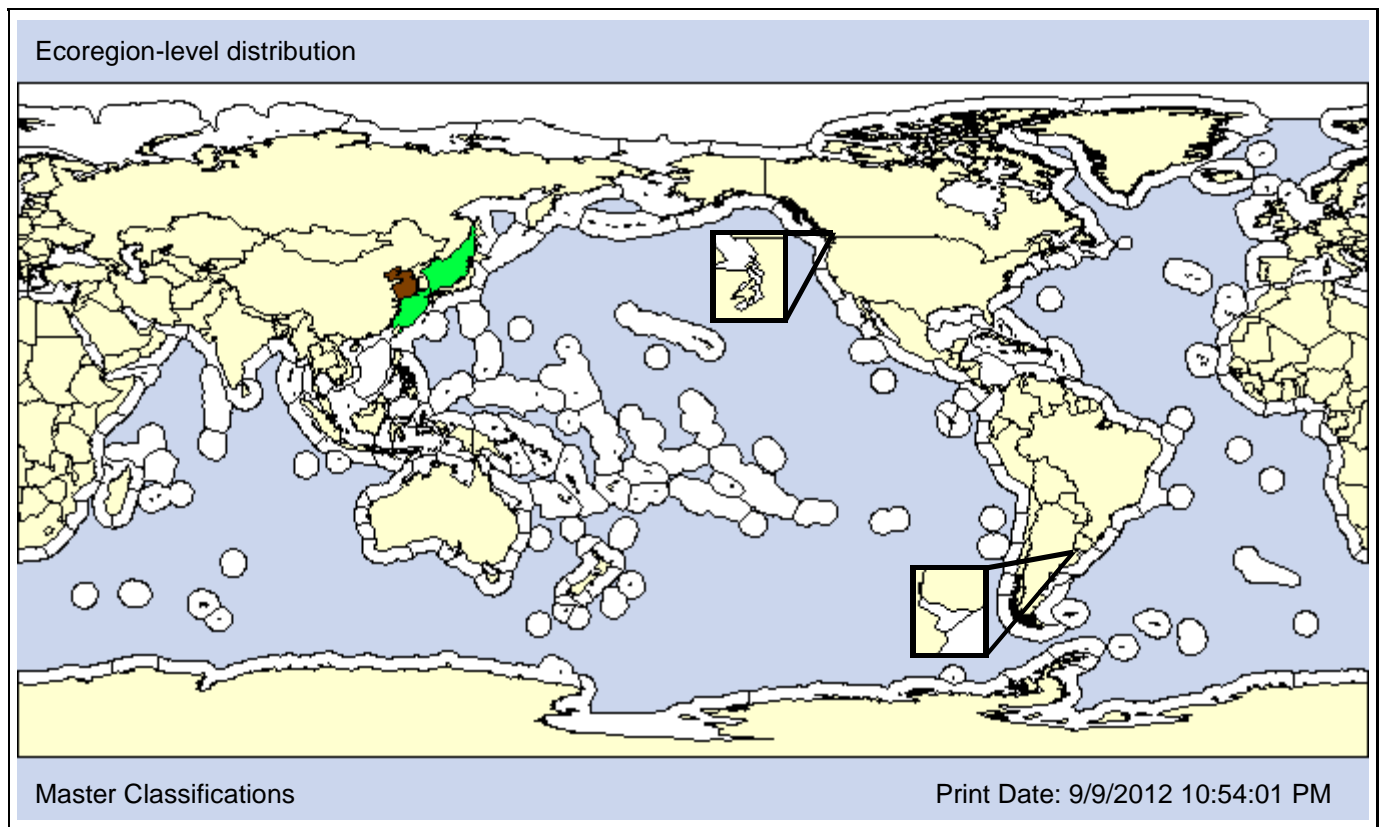
Cynthia roretzi  
Tethyum roretzi

Synonym  
Synonym

**Common Names:**

sea pineapple

**Type Locality:**



**Date 1st record:** Unknown

**Loc 1st record:** Liaoning and Shandong, China

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: The edible ascidian *Halocynthia roretzi* is native to Japan. It is cultured in Korea and Chavanich et al. (2010) and Seo and Lee (2008) listed it as introduced into the Yellow Sea and Korea, respectively. However, it is not clear whether it occurs naturally in the Yellow Sea, so we list this as a conflict.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	O	O	O					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X			X	

**DEPTH [Obs: 6 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
														O

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					X					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	X			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Tunicate

**Taxonomic Author:** (Drasche, 1884)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Pyuridae

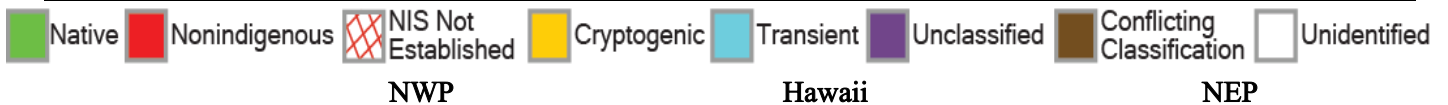
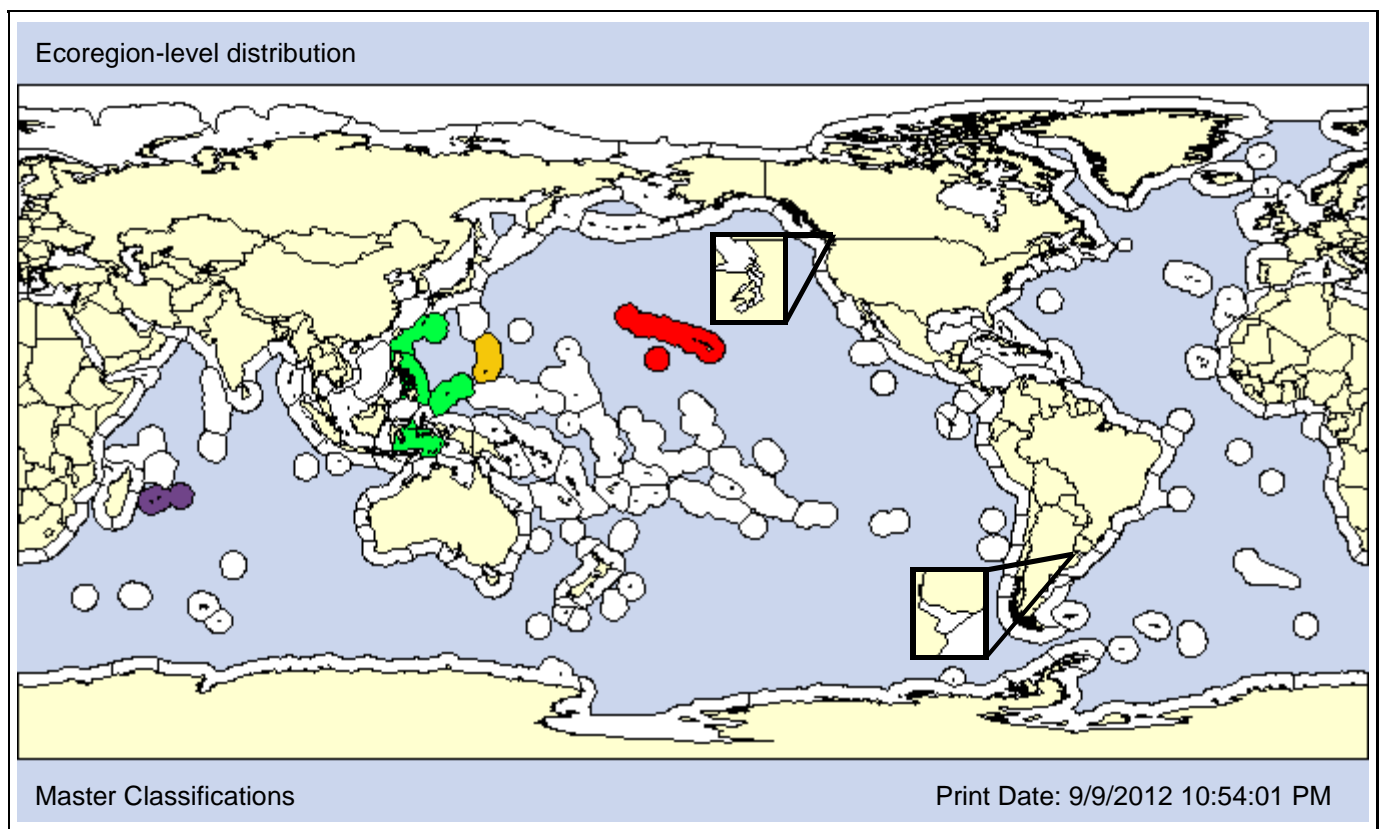
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Cynthia mauritiana Herdmania insolita	Synonym Ambiguous syn.	
--	---------------------------	--

**Type Locality:** Mauritius



**Date 1st record:**

1985

**Loc 1st record:**

Keehi Lagoon, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: Nishikawa (2002c) synonymized *Herdmania insolita* with *H. mauritiana*, though WoRMS and Lambert (2003b) list it as a valid species. Lambert classified *H. insolita* as cryptogenic in Guam while Carlton and Eldredge (2009) classified *H. mauritiana* as introduced in Hawaii and native in the Indo-Pacific.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH [Obs: 0 - 7m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													O	P

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H X		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Tunicate

**Taxonomic Author:** (Savigny, 1816)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:** Stolidobranchia

**Infraorder:**

**Superfamily:**

**Family:** Pyuridae

**Subfamily:**

**Also Known As (Name - Type):**

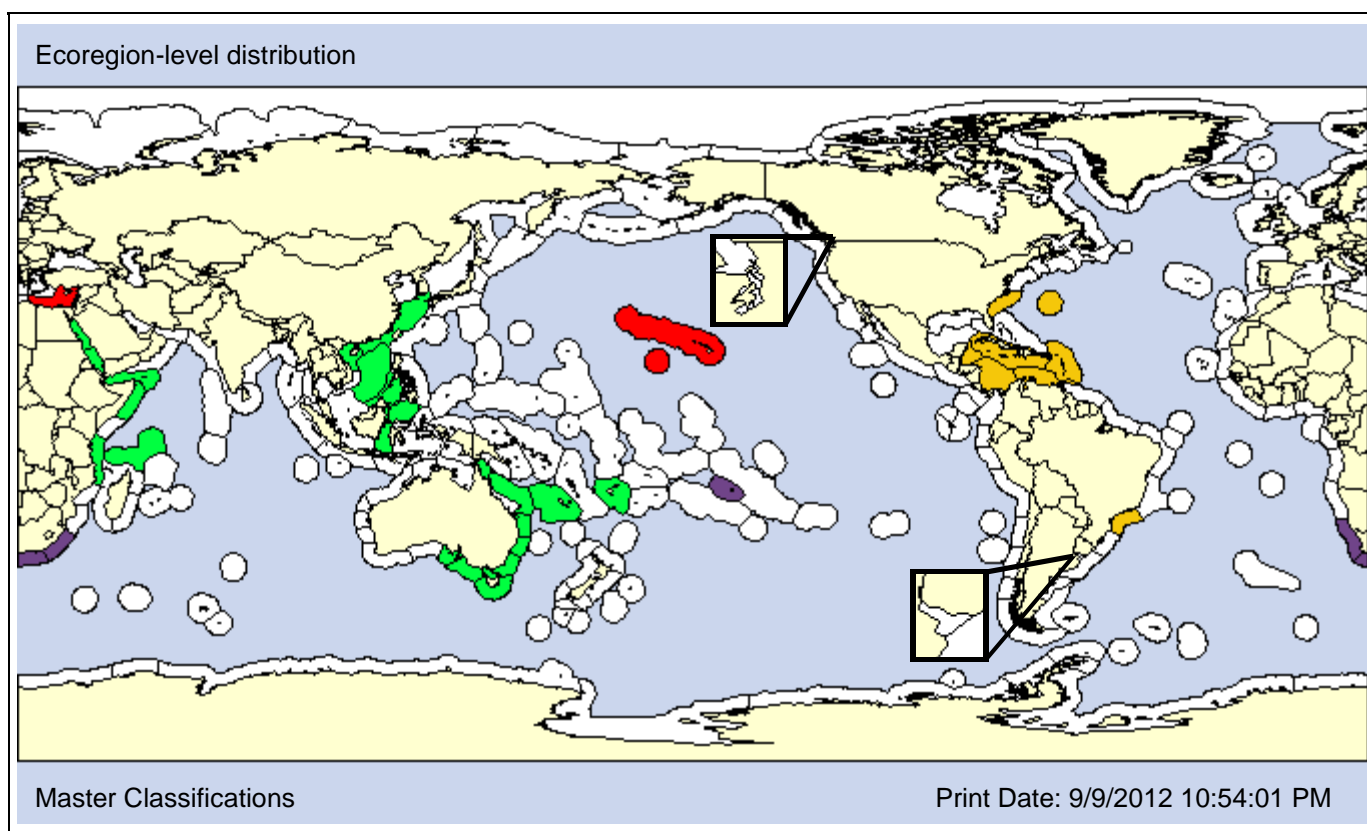
Cynthia momus  
Cynthia papietensis  
Herdmania contorta  
Herdmania momus curvata

Synonym  
Synonym  
Synonym  
Convention

**Common Names:**

Herdman's sea  
red throated ascidian

**Type Locality:** Red Sea



**Date 1st record:** Native 1930s  
**Loc 1st record:** Native Pearl Harbor, Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR	X		A	P			
		X				AO	PO								

Comments: The *Herdmania momus* reported in the Atlantic may be *H. pallida*. Thus, we classify it as cryptogenic in the Atlantic at this time.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 1 - 50m] [Pref: 10 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
													<b>O</b>	<b>P</b>

**SALINITY [Obs: - 40.5psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							



**Taxon:** Tunicate

**Taxonomic Author:** (Heller, 1878)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Pyuridae

**Subfamily:**

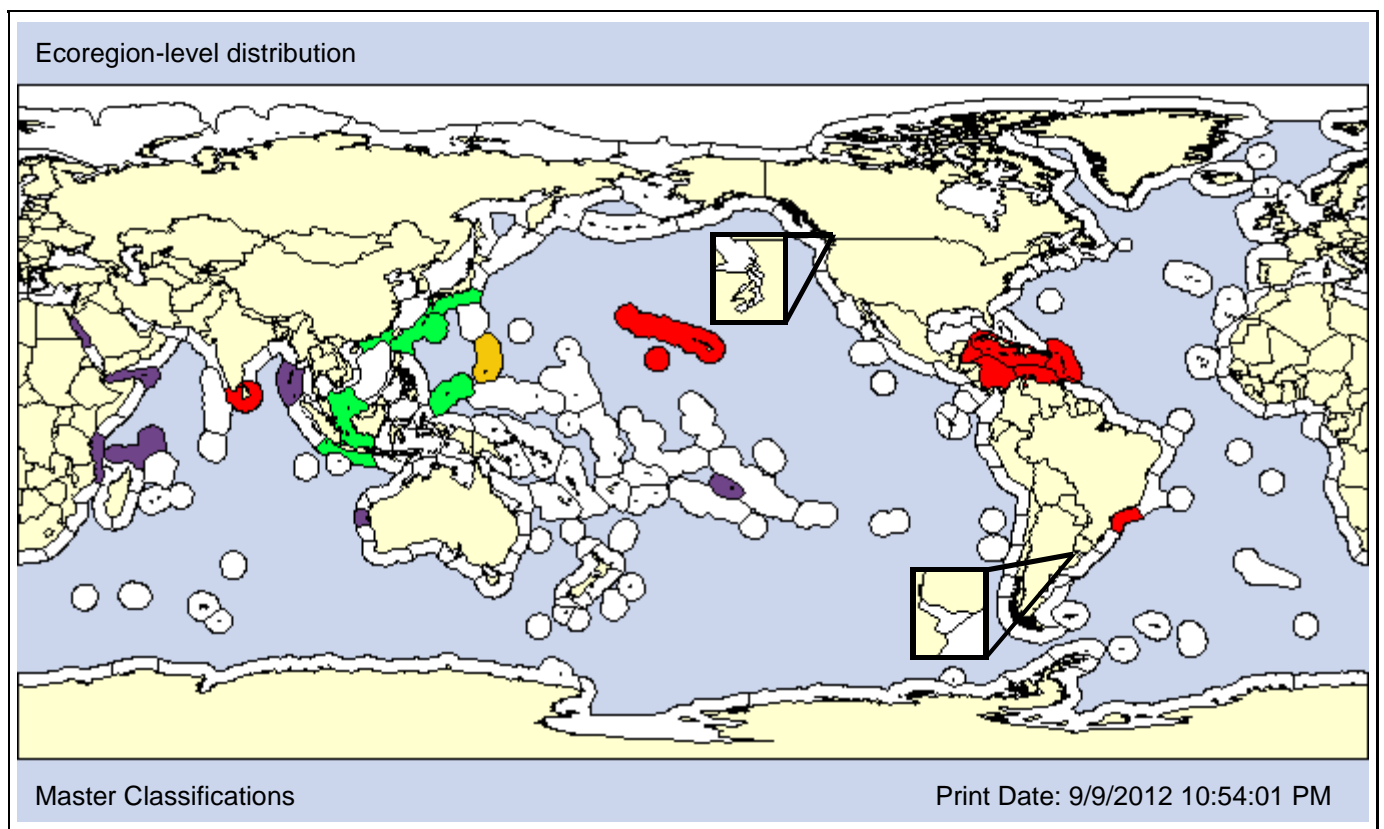
**Also Known As (Name - Type):**

Cynthia pallida in part  
Herdmania sp. of Coles et al., 2002

Partial synonym  
Synonym

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Native 1972  
**Loc 1st record:** Native Pearl Harbor, Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
		X				AO	PO								

Comments: According to Carlton and Eldredge (2009), *Herdmania pallida* is an Indo-Pacific species, though it has been classified as NIS in southern India (Ali et al., 2009) and cryptogenic in Guam (Lambert, 2002). Assuming a general Indo-Pacific origin, we classify *H. pallida* as NIS in the Atlantic.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O	O					

**ECOSYSTEM**

Unconsolidated X						Consolidated X						Pelagic	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	X		X		TP	RI-PH	X	X		X	

**DEPTH [Obs: 0 - 100m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			O	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE X**

R	HP	Biogenic P						Artificial Substrate P						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		P						O	O				O	P

**SALINITY**

Fresh	Brackish O						Marine P		Hyper
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual				
H X		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP X			FR	SD	SP
				LP-B	LP-P				

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic X			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	X
					X	X							

**Taxon:** Tunicate

**Taxonomic Author:** (Van Name, 1902)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Aplousobranchia

**Suborder:** Aplousobranchia

**Infraorder:**

**Superfamily:**

**Family:** Didemnidae

**Subfamily:**

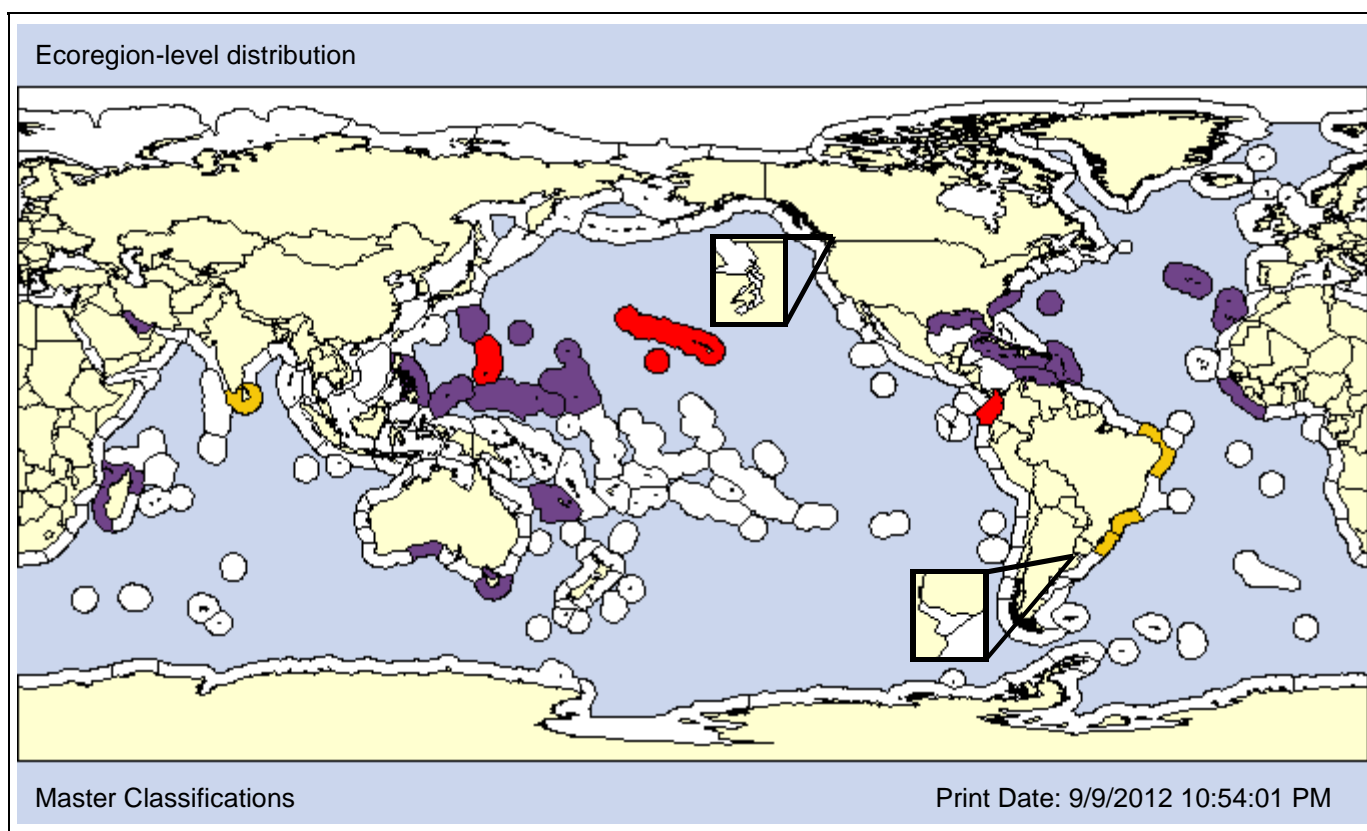
**Also Known As (Name - Type):**

Diplosoma fragile  
 Diplosomoides fragile  
 Diplpsoma (Lissoclinum) fragile

Synonym  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:** Bermuda



**Date 1st record:**

1962

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	PO								

Comments: The native region of *Lissoclinum fragile* is unknown. We classify it according to regional classifications; elsewhere we list it as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 35m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>									<b>O</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Heller, 1878

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Pyuridae

**Subfamily:**

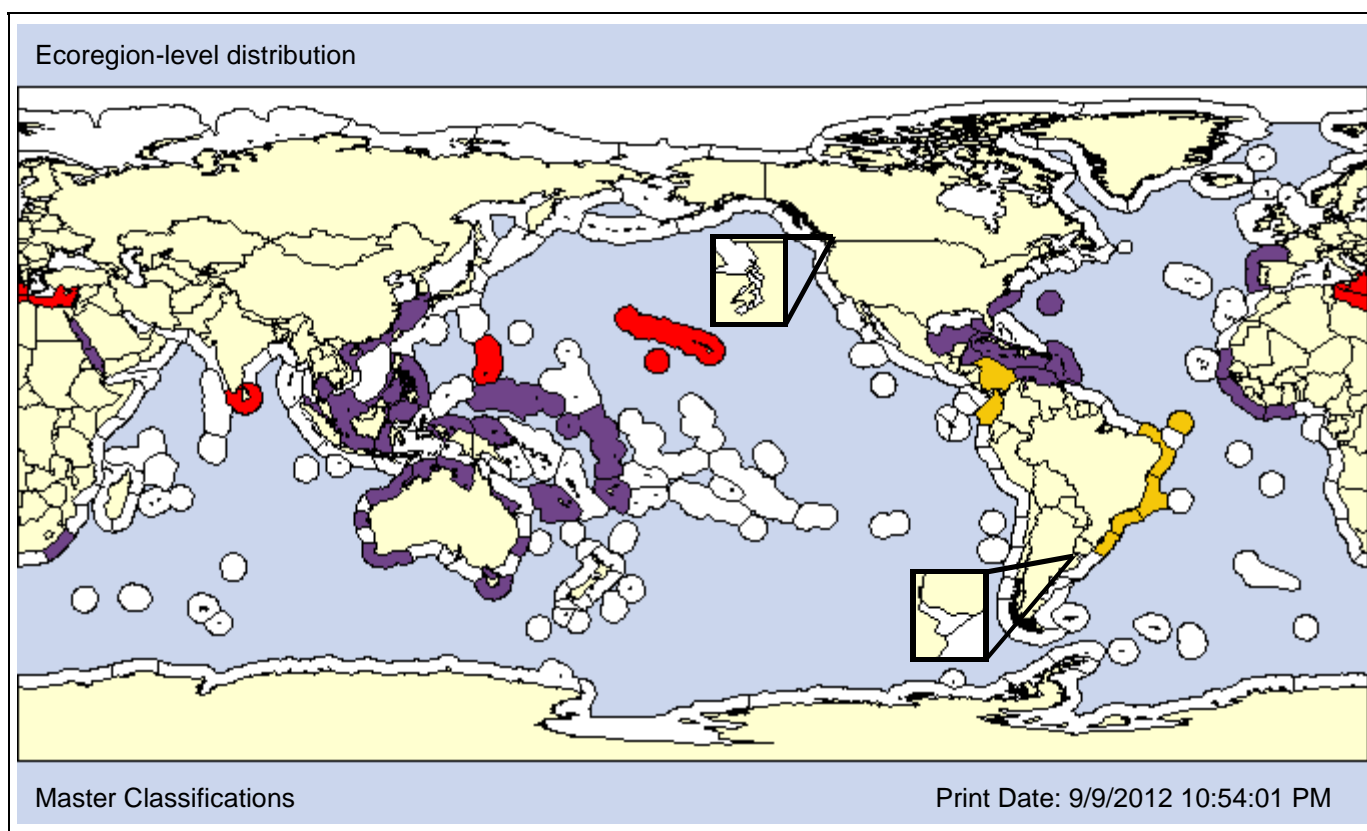
**Also Known As (Name - Type):**

Microcosmus claudicans exasperatus

Synonym

**Common Names:**

**Type Locality:**



**Date 1st record:** Unknown

1940

**Loc 1st record:** Unknown

Honolulu, Hawaii

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: The native region of *Microcosmus exasperatus* is not known. We classify it according to regional classifications; otherwise as unclassified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			X		TP	RI-PH	X	X	X	X	

**DEPTH [Obs: 0 - 41.8m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
		O	Sub-Shallow	Sub-Deep			
			P	O			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		O	O	O					O				O	P

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H X		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						X	X
						X							

**Taxon:** Tunicate

**Taxonomic Author:** Michaelsen, 1927

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:** Stolidobranchia

**Infraorder:**

**Superfamily:**

**Family:** Pyuridae

**Subfamily:**

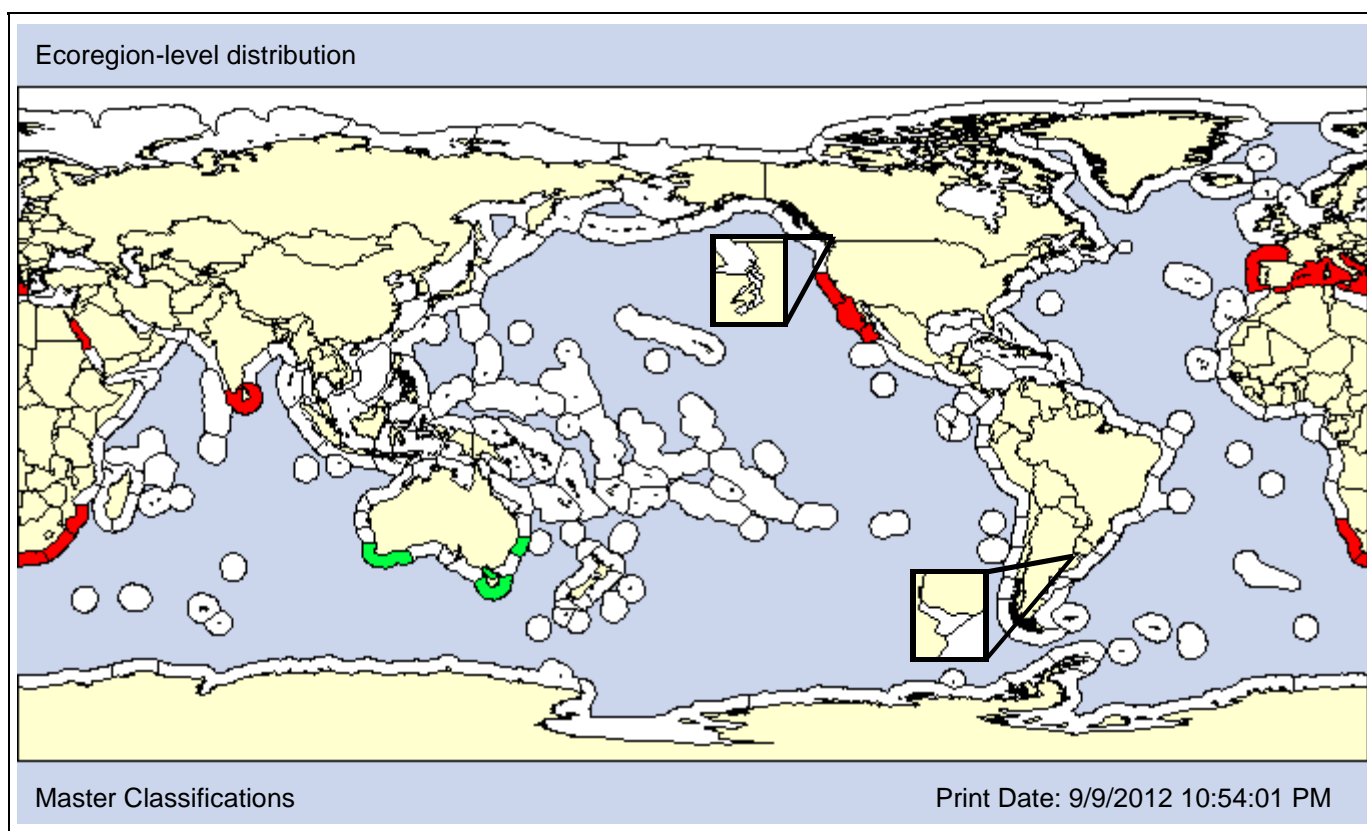
**Also Known As (Name - Type):**

Microcosmus exasperatus of NEP authors; not Heller, 1878  
Microcosmus squmiger

Misidentified  
Misspelling

**Common Names:**

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1986

**Loc 1st record:**

Alamitos Bay, California

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				IR	A				
		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 3.4 - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 21 - 26%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>	<b>P</b>								<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	
						<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							



**Taxon:** Tunicate

**Taxonomic Author:** (Macdonald, 1859)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:** Stolidobranchia

**Infraorder:**

**Superfamily:**

**Family:** Molgulidae

**Subfamily:**

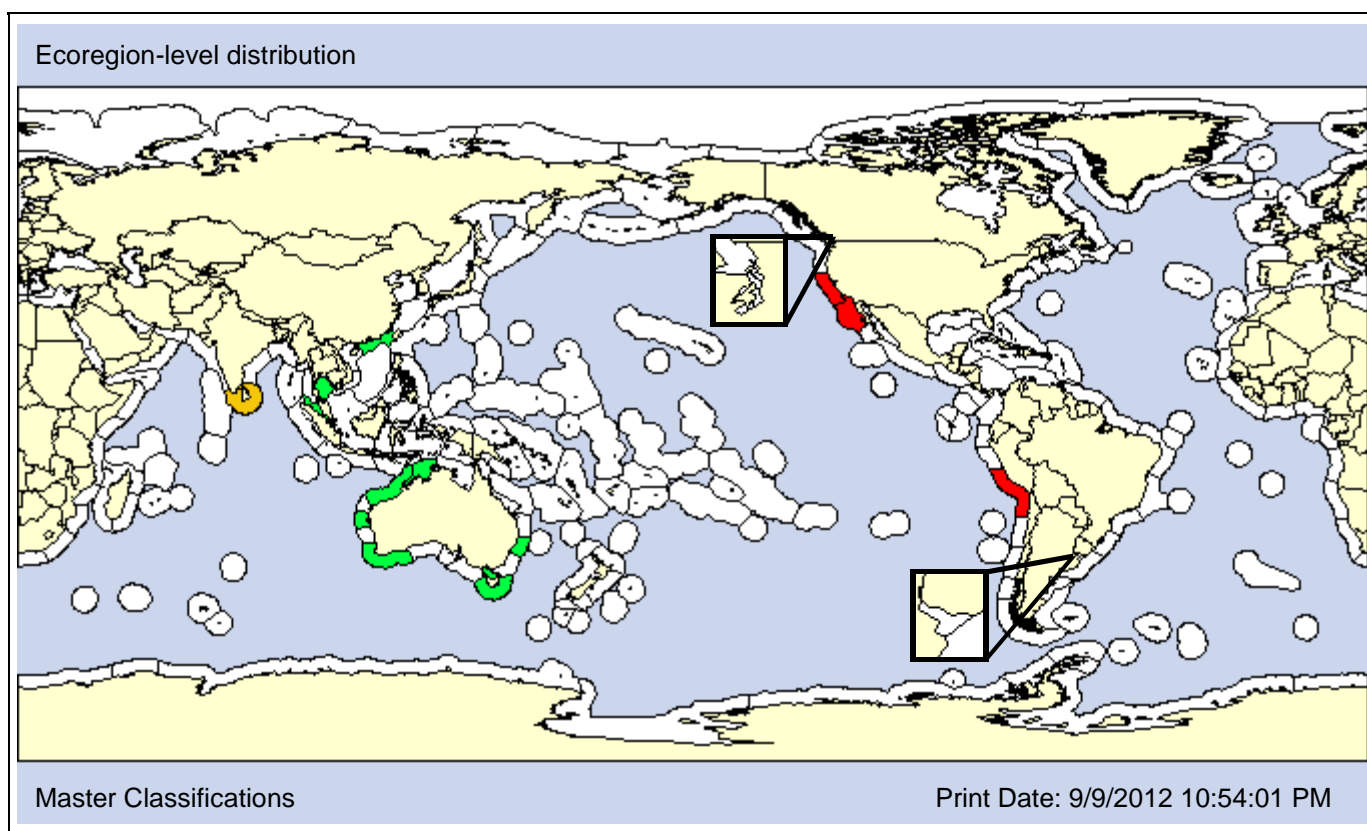
**Also Known As (Name - Type):**

Ascopera nana  
Caesira ficus  
Caesira forbesi  
Molgula forbesi

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

**Type Locality:** Shark Bay, Australia



**Date 1st record:**

1994

**Loc 1st record:**

San Diego Bay, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>	IR			A	P			
		<b>X</b>				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 20m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>O</b>								<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** (De Kay, 1843)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:** Stolidobranchia

**Infraorder:**

**Superfamily:**

**Family:** Molgulidae

**Subfamily:**

**Also Known As (Name - Type):**

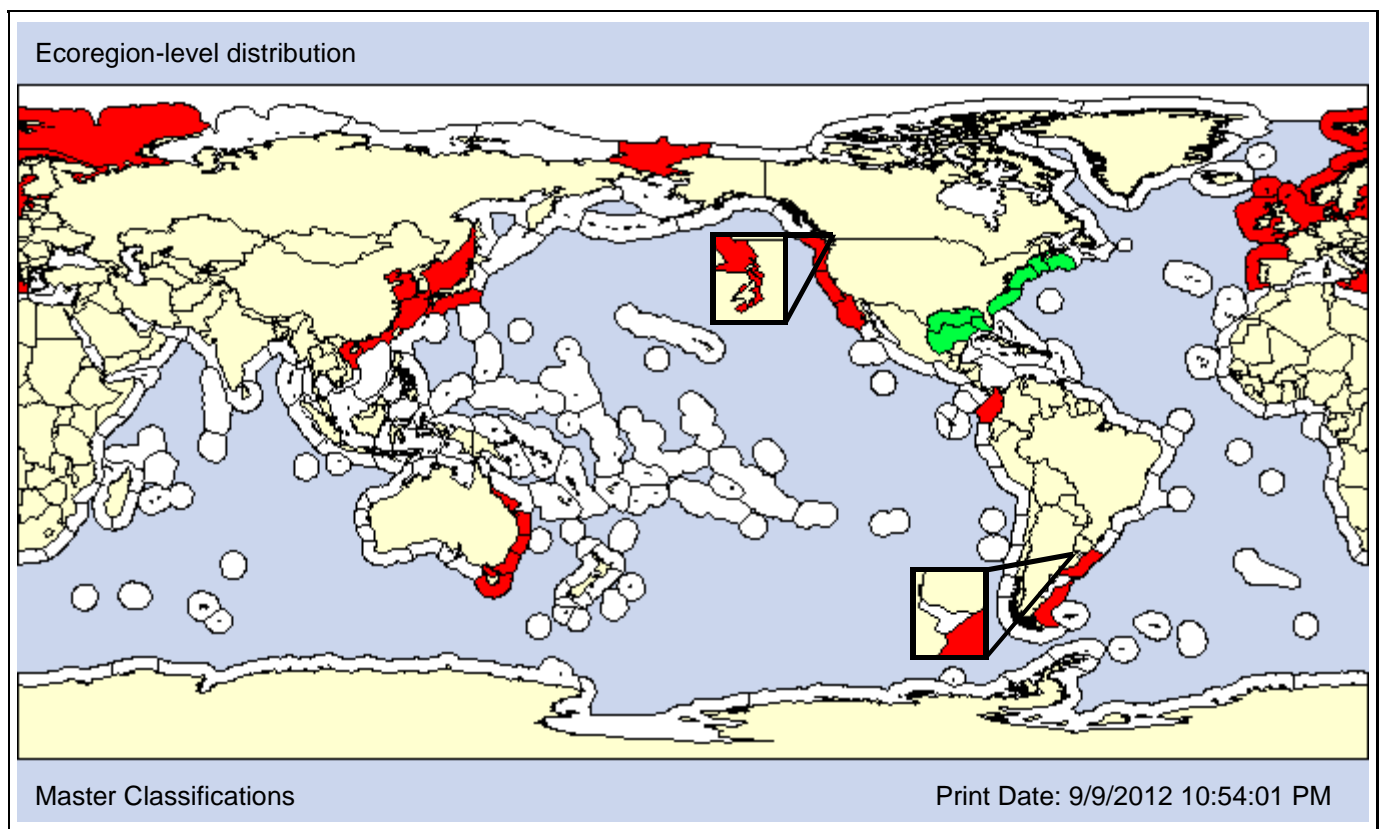
Ascidia manhattensis  
 Caesira manhattensis  
 Caesira sordida  
 Gymnocystis manhattensis

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Manhattan-boya  
 sea grape tunicate

**Type Locality:** Northeast United States



**Date 1st record:** 1972

1949

**Loc 1st record:** Takehara, Japan

Tomales Bay, California

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA X	IR			A	P			
		X				AO X	PO							

Comments:

## REGIME

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>					

## ECOSYSTEM

Unconsolidated <b>X</b>						Consolidated <b>X</b>						Pelagic	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

## DEPTH [Obs: 0 - 90m] [Pref: 0 - m]

## Benthic Depth

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

## Pelagic Depth

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

UNCONSOLIDATED SUBSTRATE [Obs % Fines: 16.33 - 69.67%] **X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

CONSOLIDATED SUBSTRATE **X**

<b>R P</b>	<b>HP</b>	Biogenic <b>O</b>						Artificial Substrate <b>P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>O</b>		<b>O</b>		<b>P</b>	<b>P</b>	

## SALINITY [Obs: 10 - 35psu] [Pref: 27 - 30psu]

Fresh	Brackish <b>P</b>				Marine <b>P</b>		Hyper	
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>P</b>			

## TROPHIC LEVEL AND FEEDING

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
								<b>X</b>	DF-SUR	DF-SUB

## REPRODUCTION

Sexual <b>X</b>						Asexual				
H <b>X</b>		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

## EARLY DEVELOPMENT

## JUVENILE DEVELOPMENT/DISPERSAL

V	OVI	OVO	DD	LP <b>X</b>			FR	SD	SP
				LP-B	LP-P	<b>X</b>			

## HABITAT ASSOCIATION

Pelagic			Benthic <b>X</b>							Epibiotic <b>X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC				<b>X</b>		<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Oka, 1927

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

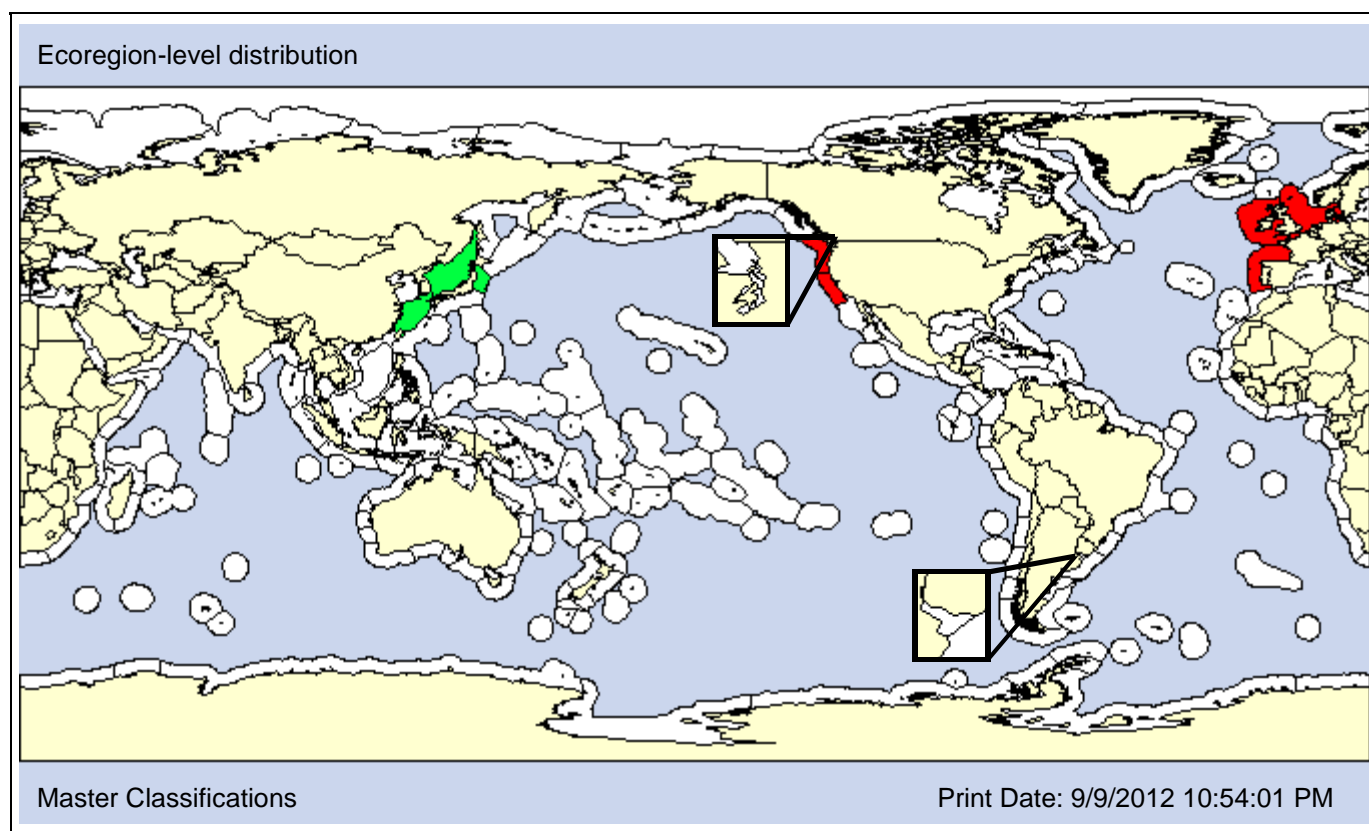
**Family:** Perophoridae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

2003

**Loc 1st record:** Native

Humboldt Bay, CA

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>				A	P				
		<b>X</b>				AO	<b>PO X</b>								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>	<b>O</b>								<b>O</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** Savigny, 1816

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Phlebobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ascidiidae

**Subfamily:**

**Also Known As (Name - Type):**

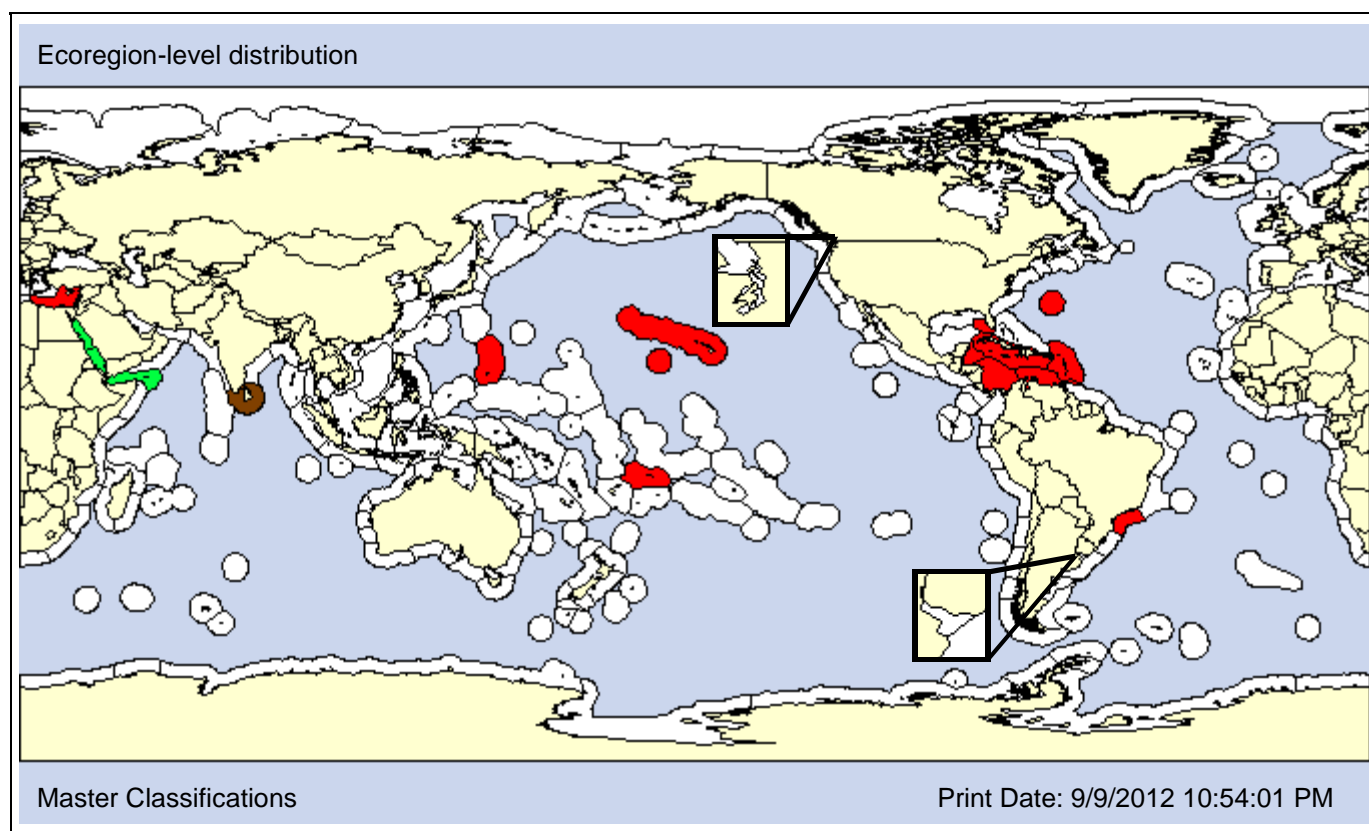
Ascidia nigra  
Phallusia (Ascidia) nigra

Synonym  
Convention

**Common Names:**

black sea squirt

**Type Locality:** Red Sea



**Date 1st record:**

1930s

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR	X	A	P				
		X				AO	PO								
		X				AO	PO								

Comments: We follow Carlton and Eldredge (2009) and consider *Phallusia nigra* a Red Sea-Indian Ocean species. Ali et al. (2009) classify it as introduced in southern India, which we list as a conflict.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 30m] [Pref: 0 - 7m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>							<b>P</b>			<b>P</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Tunicate

**Taxonomic Author:** Tokioka, 1953

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

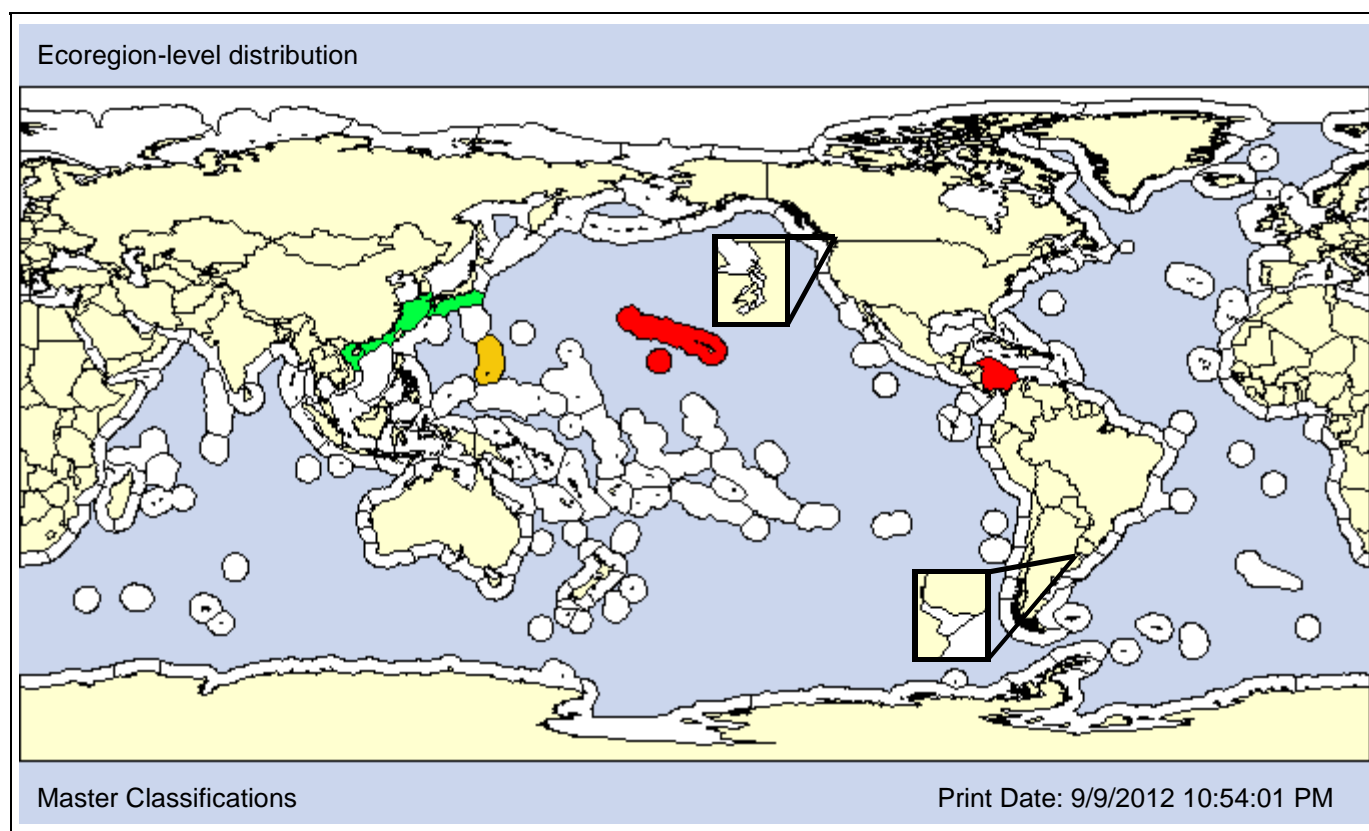
**Family:** Styelidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Japan



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Native <1997  
**Loc 1st record:** Native Kaneohe Bay, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Carlton and Eldredge (2009) classify the colonial tunicate *Polyandrocarpa sagamiensis* as introduced in Hawaii while Lambert (2002) classifies it as cryptogenic in Guam. Carman et al. (2011) recently reported it from the Atlantic side of Panama.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				X	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal O		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			O				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H+B	Oth
													O	P

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	P		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H X		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	X			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						X							

**Taxon:** Tunicate

**Taxonomic Author:** (Van Name, 1931)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

**Also Known As (Name - Type):**

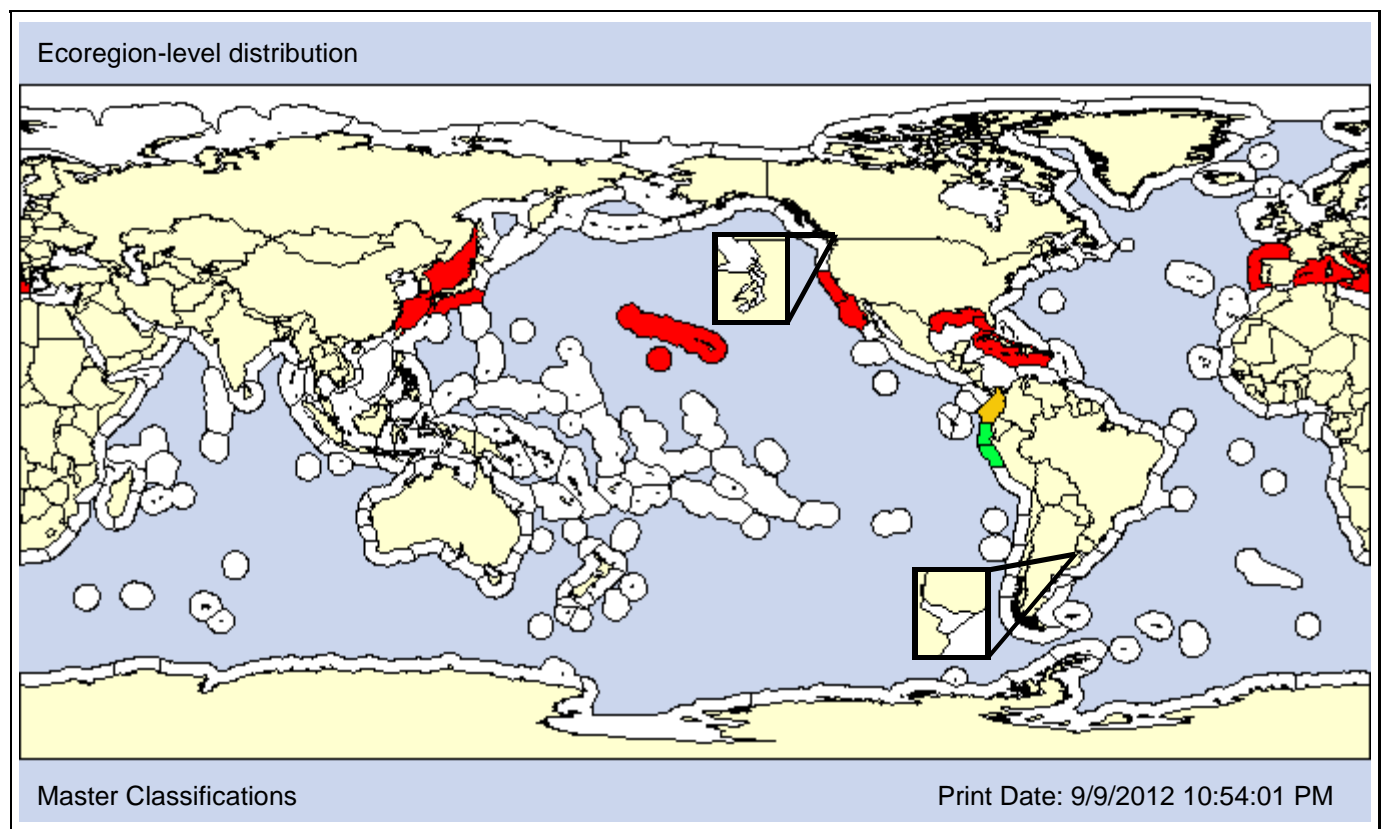
Polyandrocarpa zorritensis  
Stolonica zorritensis

Misspelling  
Synonym

**Common Names:**

Kuro-mameitaboya

**Type Locality:** Peru



NWP

Hawaii

NEP

**Date 1st record:** 1991

<1997

1994

**Loc 1st record:** Usa, Tosa Bay, Japan

Kaneohe Bay, Hawaii

San Diego and Oceanside, CA

**Established:** Yes

Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: Abbott et al. (2007) and Carlton and Eldredge (2009) consider the native range of *Polyandrocarpa zorritensis* to be unknown, while Cohen (2006) lists it as the Southeastern Pacific. Regional experts have classified it as introduced in the NWP, NEP, Hawaii, Caribbean, NEA, and Mediterranean, and cryptogenic in Pacific Panama.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	X		X	X	
		X											

**DEPTH [Obs: 1 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					O	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			O	O								P	O	P

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								X	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P		X		

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC				X			X
						X							

**Taxon:** Tunicate

**Taxonomic Author:** Savigny, 1816

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Aplousobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Polyclinidae

**Subfamily:**

**Also Known As (Name - Type):**

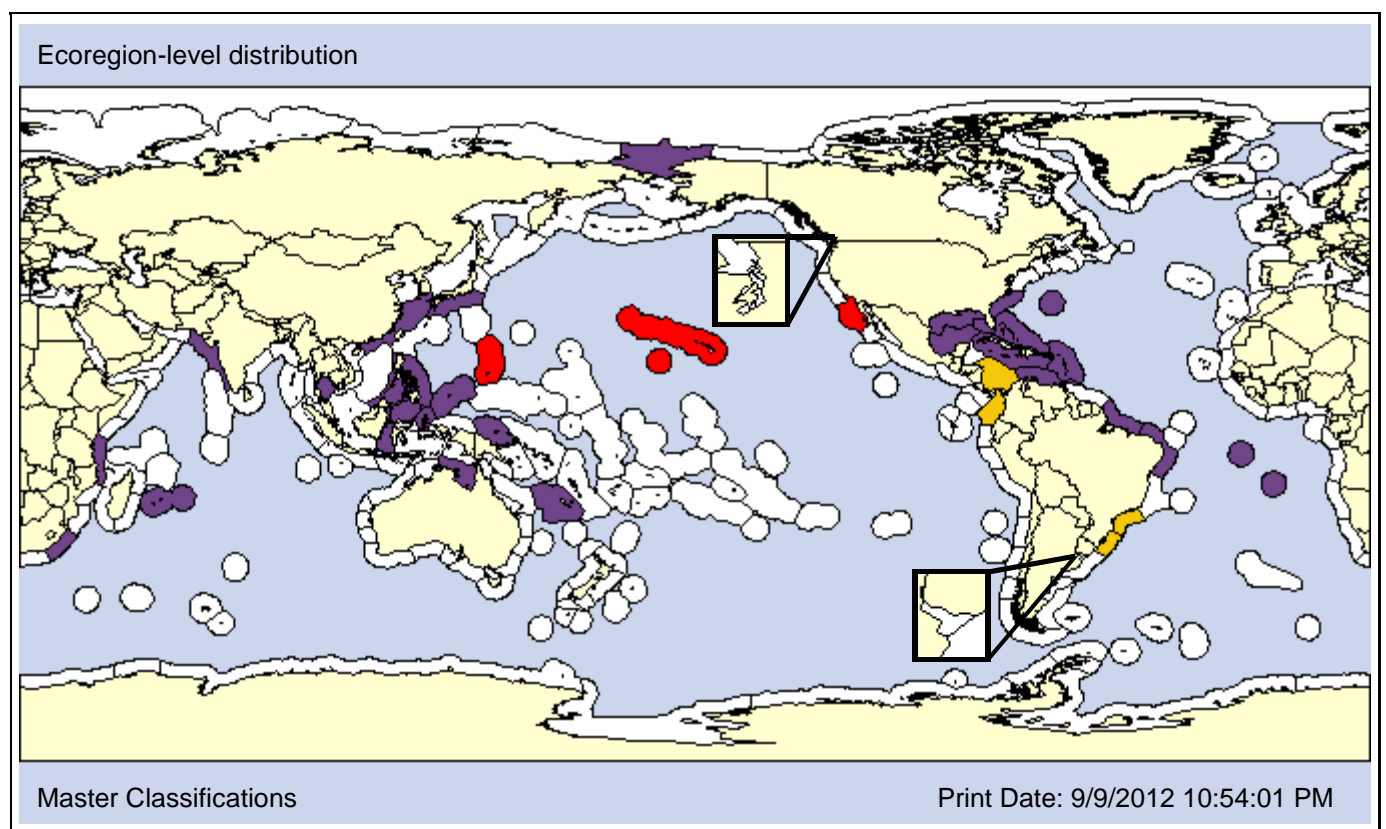
Glossophorum sundaicum  
 Polyclinum brasiliense

Synonym  
 Synonym

**Common Names:**

starred gelatinous tunicate

**Type Locality:** Mauritius



**Date 1st record:** Unknown 1873 2000  
**Loc 1st record:** Unknown Oahu, Hawaii Southern California  
**Established:** Yes Yes Unknown

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments: The native range of *Polyclinum constellatum* is not known. We classify it using regional classifications and as unclassified elsewhere. The record in the Chukchi Sea was from 1884 (see GBIF, OBIS), and is suspect.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 0 - 68m] [Pref: 0 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>							<b>O</b>			<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 24 - 32psu] [Pref: - 32psu]**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** (Savigny, 1816)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:** Stolidobranchia

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

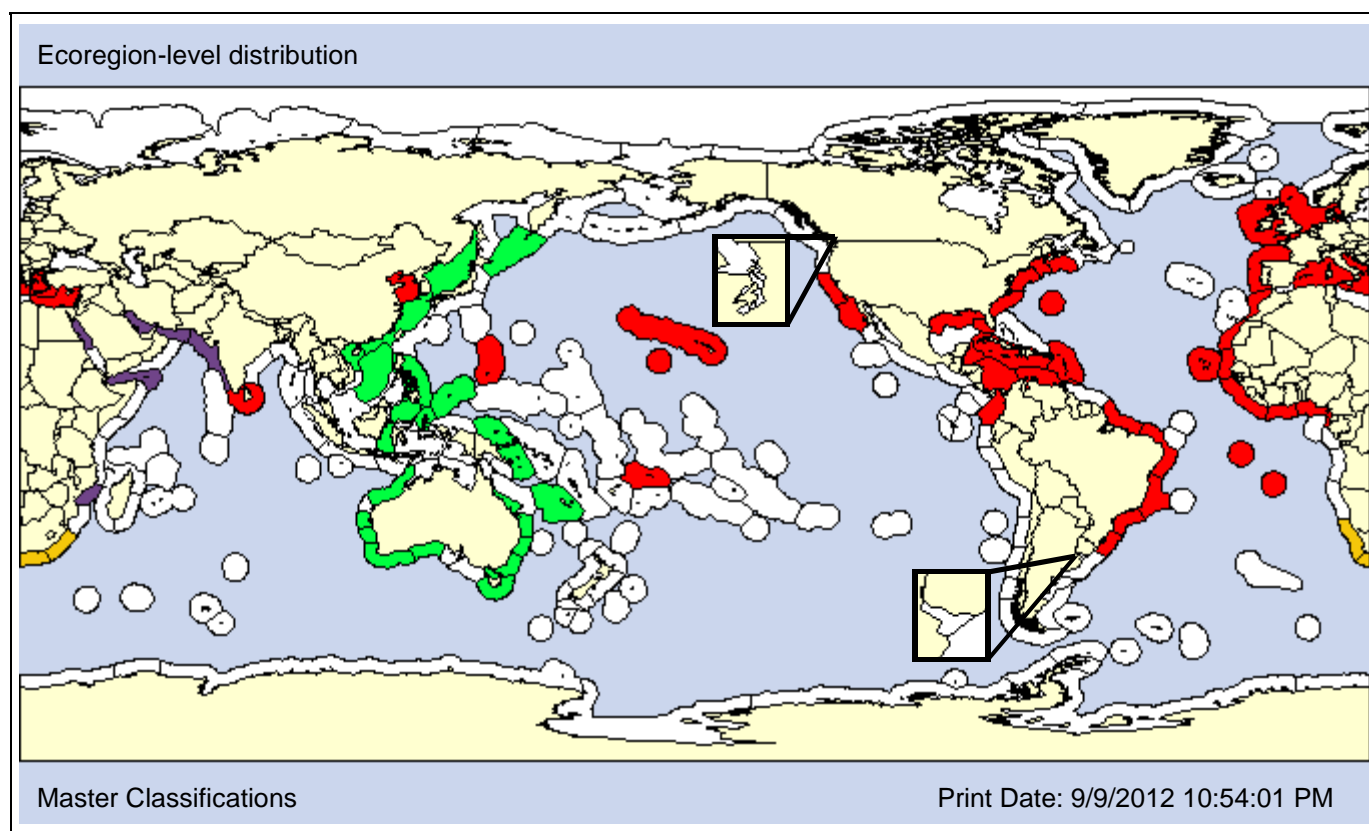
**Also Known As (Name - Type):**

Ascidia rugosa	Synonym
Cynthia canopoides	Synonym
Cynthia canopus	Synonym
Styela bicolor	Synonym

**Common Names:**

rough sea tunicate

**Type Locality:** Red Sea



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP

Hawaii

NEP

**Date 1st record:** Unknown

1940

1972

**Loc 1st record:** Yellow Sea

Pearl Harbor, Oahu, Hawaii

San Diego Bay, CA

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
		<b>X</b>				AO	<b>PO X</b>								

Comments: Based on Abbott et al. (2007), Carlton and Eldredge (2009) and Pollard and Pethebridge (2002a) we classify *Styela canopus* as native in Asia, Australia, and Central Indo-Pacific except for the Yellow Sea and Guam where it is considered introduced by UNDP/GEF (2007) and Lambert (2002), respectively.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 80m] [Pref: 0 - 27m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>								<b>Artificial Substrate P</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>	<b>P</b>						<b>O</b>		<b>P</b>	<b>P</b>	<b>P</b>	

**SALINITY [Obs: 20 - 43psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Tunicate

**Taxonomic Author:** Herdman, 1881

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

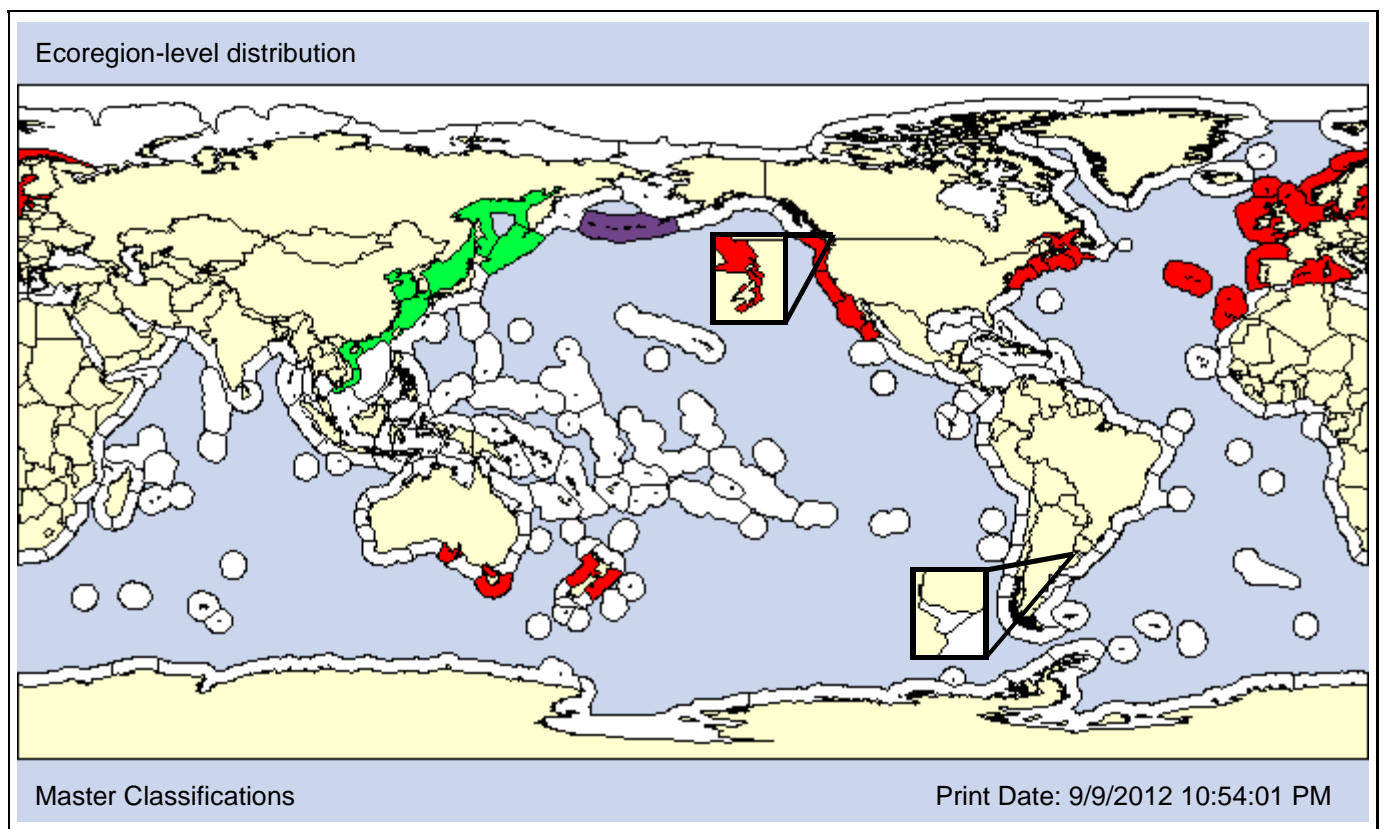
**Also Known As (Name - Type):**

Bostryorchis clava	Synonym
Styela barnharti of Van Name, 1945; not of Ritter and Forsyth	Ambiguous syn.
Styela clava clava	Convention
Styela mammiculata	Synonym

**Common Names:**

Asian sea-squirt  
club tunicate  
leathery sea-squirt  
rough sea squirt

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1932

**Loc 1st record:** Native

Newport Bay, California

**Established:** Yes

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	<b>AP</b>		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>				IR	A				
		<b>X</b>			AO	<b>PO X</b>									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	

**DEPTH [Obs: 0 - 25m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>P</b>		<b>P</b>		<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 18 - 37psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
<b>X</b>					<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** (Lesueur, 1823)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

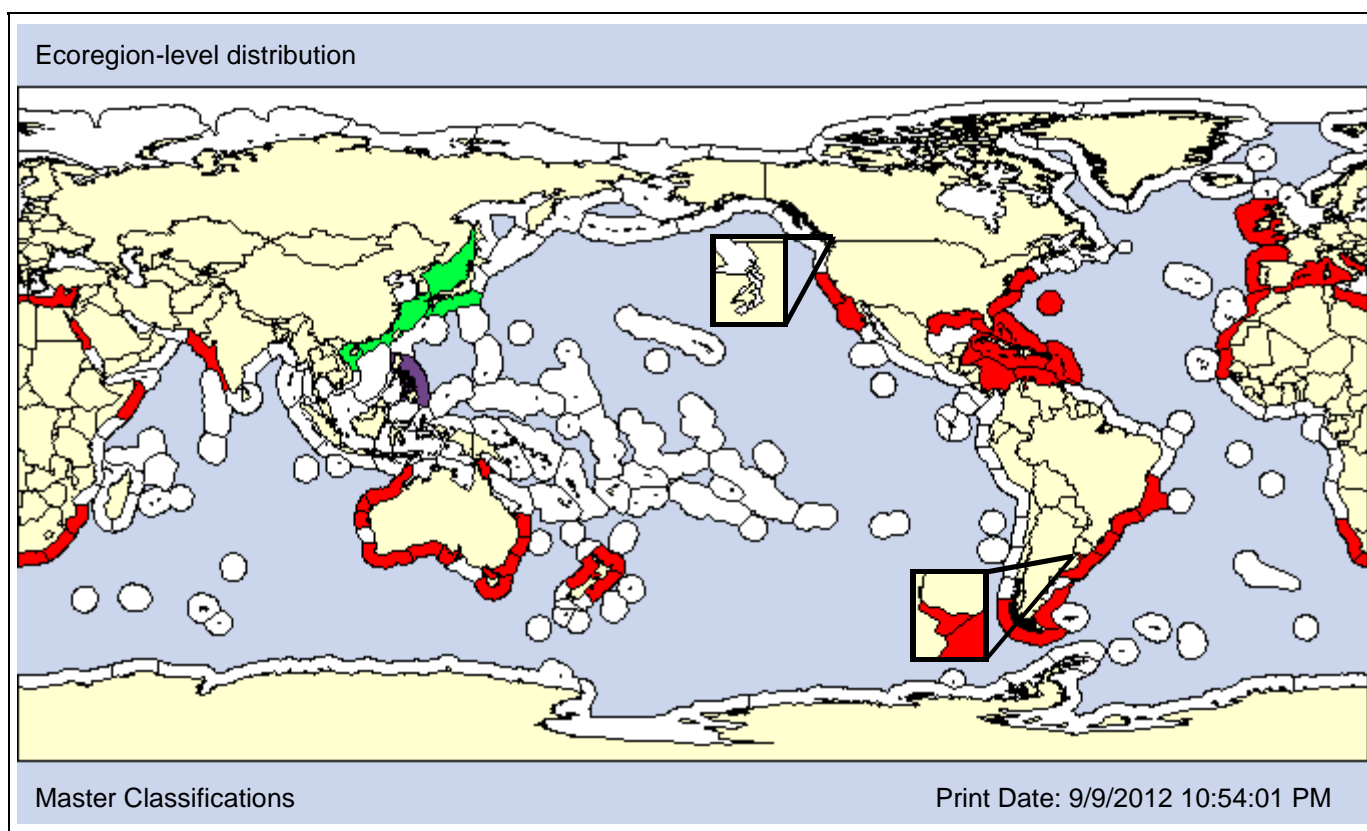
**Also Known As (Name - Type):**

Ascidia plicata Lesueur, 1823  
 Styela barnharti  
 Styela gyrosa  
 Tethyum plicata

Synonym  
 Ambiguous syn.  
 Synonym  
 Synonym

**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Native 1915  
**Loc 1st record:** Native San Diego Bay, CA  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P		<b>X</b>		
		<b>X</b>				AO	<b>PO X</b>								

Comments: Based on the genetic analysis by Barros et al. (2009), we classify the northwestern Pacific as the native region for *Styela plicata*. We note, however, that Chavanich et al. (2010) list it as introduced into the East China Sea and South China Ecoregions and USGS-NAS lists it as native in the Gulf of Mexico.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 30m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE [Obs % Fines: 7 - 7%] X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
					<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>	<b>P</b>						<b>P</b>		<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY [Obs: 22 - 34psu] [Pref: 30 - psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		<b>SUR X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							<b>X</b>
						<b>X</b>							

**Taxon:** Tunicate

**Taxonomic Author:** (Michaelsen, 1904)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

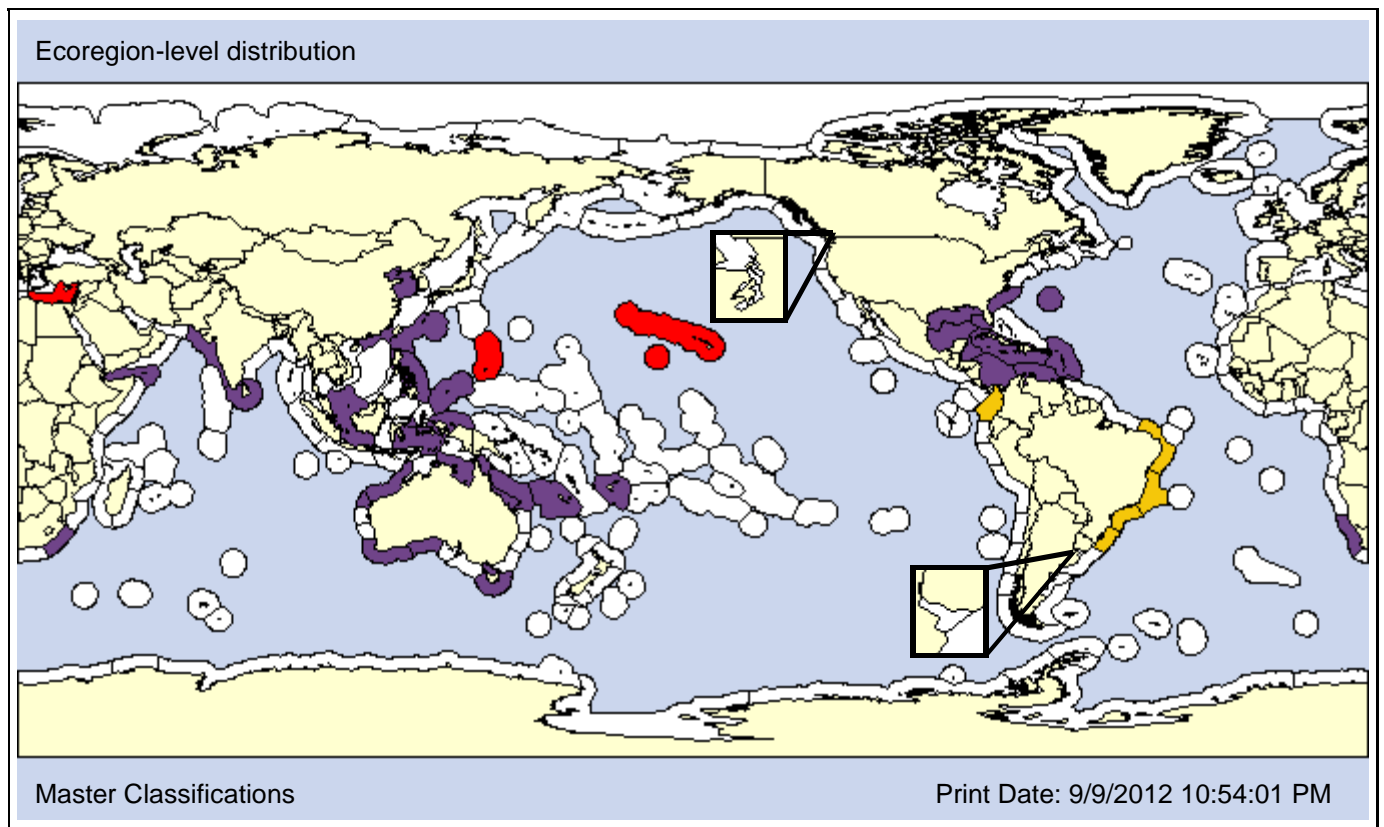
**Also Known As (Name - Type):**

Diandrocarpa brakenhielmi	Synonym
Gynandrocarpa quadricornulis	Synonym
Gynandrocarpa similis	Synonym

**Common Names:**

--

**Type Locality:** Veracruz, Gulf of Mexico.



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** Unknown 1967  
**Loc 1st record:** Unknown Kaneohe Bay, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR		A	P				
		X				AO	PO							

Comments: The type locality for *Symplegma brakenhielmi* is the Gulf of Mexico, though Carlton and Eldredge (2009) list it as an Indo-Pacific species. Additionally *S. brakenhielmi* has been confused with *S. viride* and *S. reptans*. Because of this uncertainty, we use regional classification where available and list it as unclassified elsewhere.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>							

**ECOSYSTEM**

Unconsolidated						Consolidated <b>X</b>						Pelagic	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>	SR	CR	O/M	F	K	
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

**DEPTH [Obs: 0 - 33m] [Pref: 0 - 3m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>P</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE **X****

<b>R <b>P</b></b>	<b>HP</b>	<b>Biogenic <b>P</b></b>						<b>Artificial Substrate <b>P</b></b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>		<b>P</b>			<b>O</b>	<b>O</b>		<b>P</b>		<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish <b>O</b></b>						<b>Marine <b>P</b></b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual <b>X</b></b>						<b>Asexual <b>X</b></b>				
<b>H <b>X</b></b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP <b>X</b></b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic <b>X</b></b>							<b>Epibiotic <b>X</b></b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							

*Symplegma reptans*

Species ID: 2402

**Taxon:** Tunicate

**Taxonomic Author:** (Oka, 1927)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Styelidae

**Subfamily:**

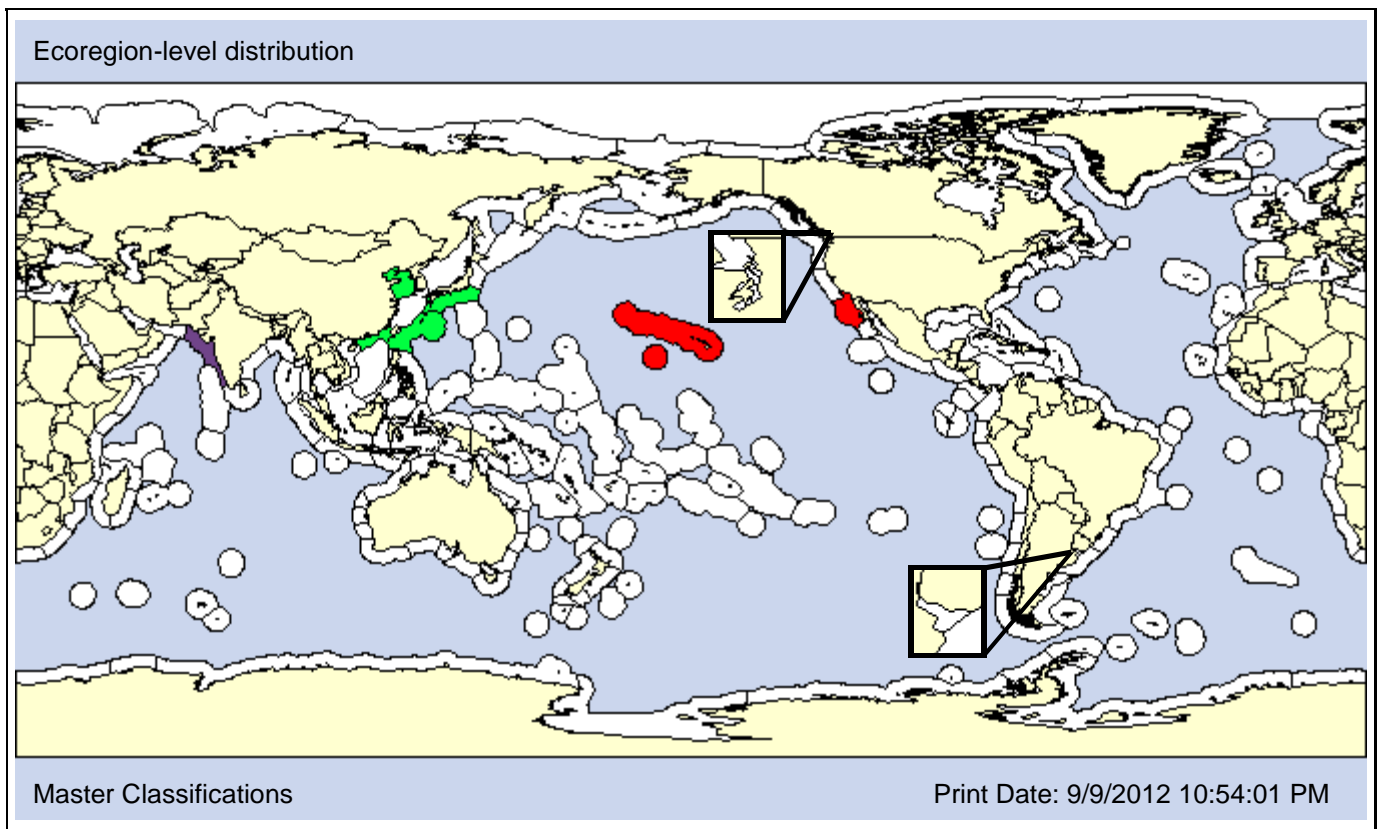
**Also Known As (Name - Type):**

Symplegma brakenhielmi of Lambert and Lambert, 1998  
Synstyela reptans

Misidentified  
Synonym

**Common Names:**

**Type Locality:**



■ Native
 ■ Nonindigenous
   NIS Not Established
   Cryptogenic
   Transient
   Unclassified
   Conflicting Classification
   Unidentified

NWP
Hawaii
NEP

<b>Date 1st record:</b> Native	1996	1991
<b>Loc 1st record:</b> Native	Pearl Harbor, Oahu, Hawaii	Long Beach Harbor, CA
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

SH <span style="color: red;">X</span>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P				
		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>

**DEPTH [Obs: - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>				<b>P</b>			<b>P</b>		<b>P</b>	<b>P</b>	<b>P</b>

**SALINITY [Obs: 22.1 - 36.2psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
					<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic X</b>			
PL	NE	SUB	DEM		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC						<b>X</b>	<b>X</b>
						<b>X</b>							



**Taxon:** Tunicate

**Taxonomic Author:**

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Tunicata

**Superclass:**

**Class:** Ascidiacea

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Stolidobranchia

**Suborder:**

**Infraorder:**

**Superfamily:**

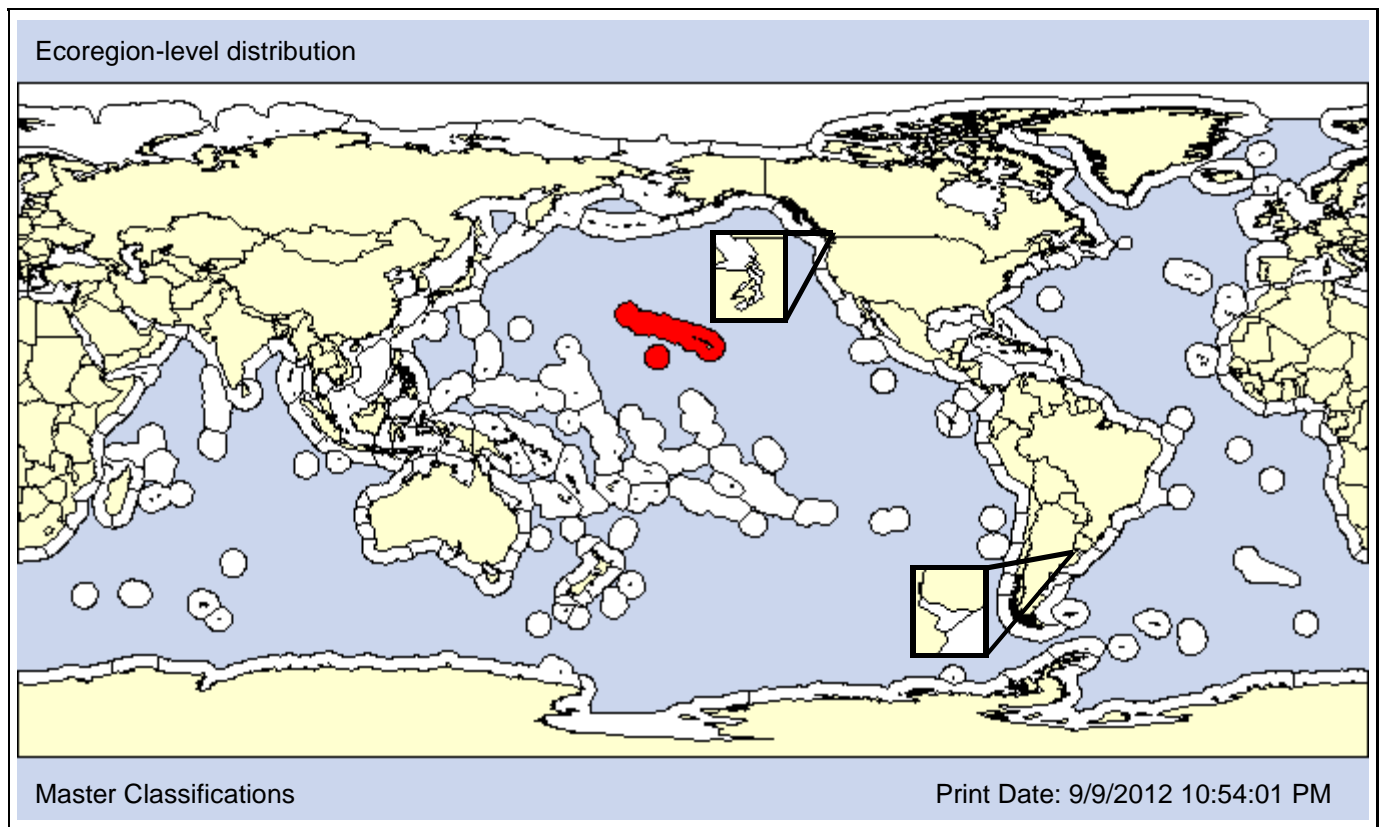
**Family:** Styelidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1998  
**Loc 1st record:** Pearl Harbor, Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
		X				AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>								

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH				<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>O</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
								<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual X</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P	<b>X</b>			

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR X		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
						<b>X</b>							

**Kingdom: Animalia**

**Phylum: Chordata**

**Subphylum: Vertebrata**

**Class: Actinopterygii**

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**Taxon:** Ray-finned fish

**Taxonomic Author:** (Quoy & Gaimard, 1825)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Labroidei

**Infraorder:**

**Superfamily:**

**Family:** Pomacentridae

**Subfamily:**

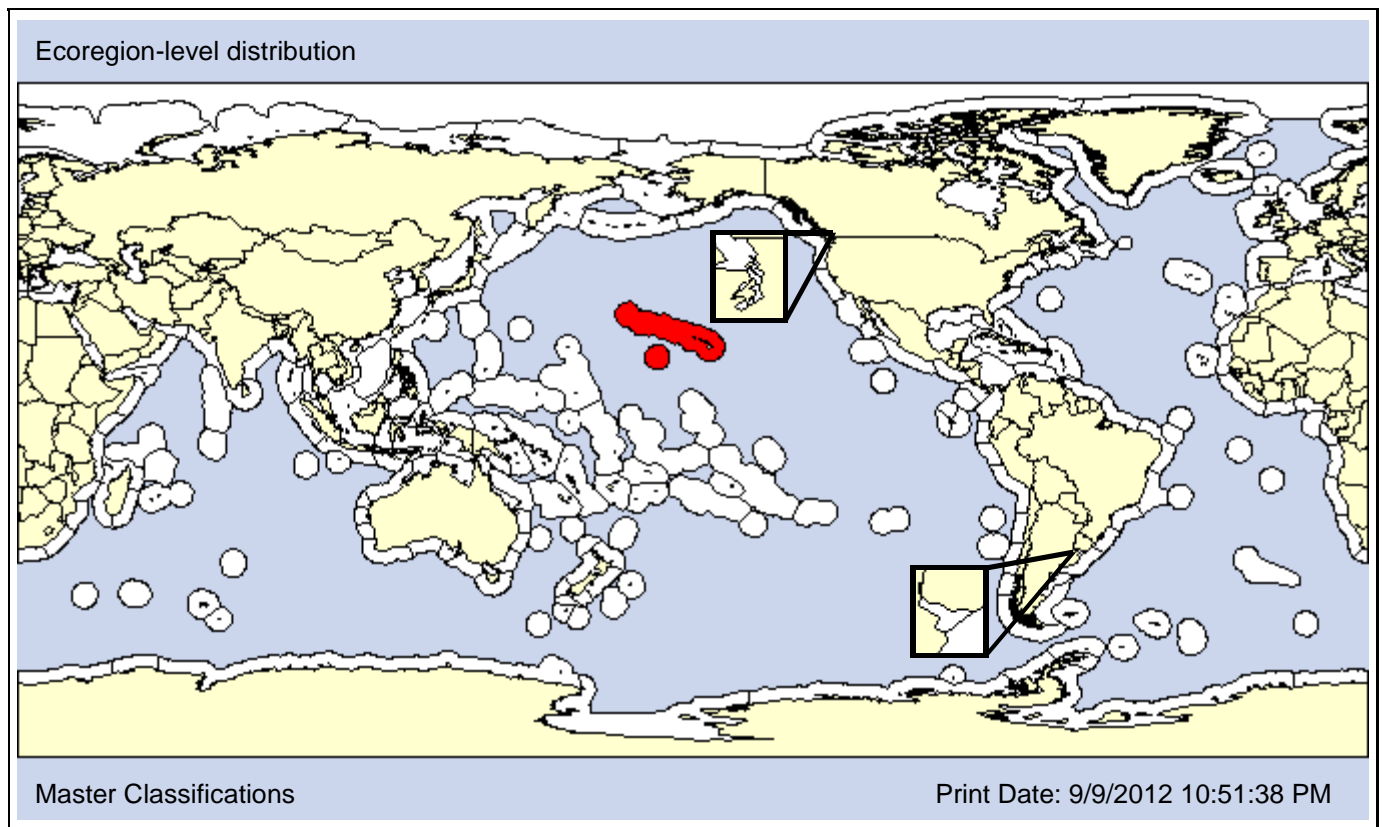
**Also Known As (Name - Type):**

Abudefduf caudobimaculatus	Synonym
Abudefduf quinquilineatus	Synonym
Chaetodon tyrwhitti	Synonym
Glyphisodon quadrifasciatus	Synonym

**Common Names:**

Indo-Pacific sergeant  
yellowback sergeant

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1991  
**Loc 1st record:** Maui, Hawaii  
**Established:** Unknown

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	AA	IR			A	P				X
						AO	PO			X					

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
		<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>			

**DEPTH [Obs: 1 - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

# Acanthogobius flavimanus

Species ID: 1563

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Temminck & Schlegel, 1845)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Gobioidi

**Infraorder:**

**Superfamily:**

**Family:** Gobiidae

**Subfamily:**

**Also Known As (Name - Type):**

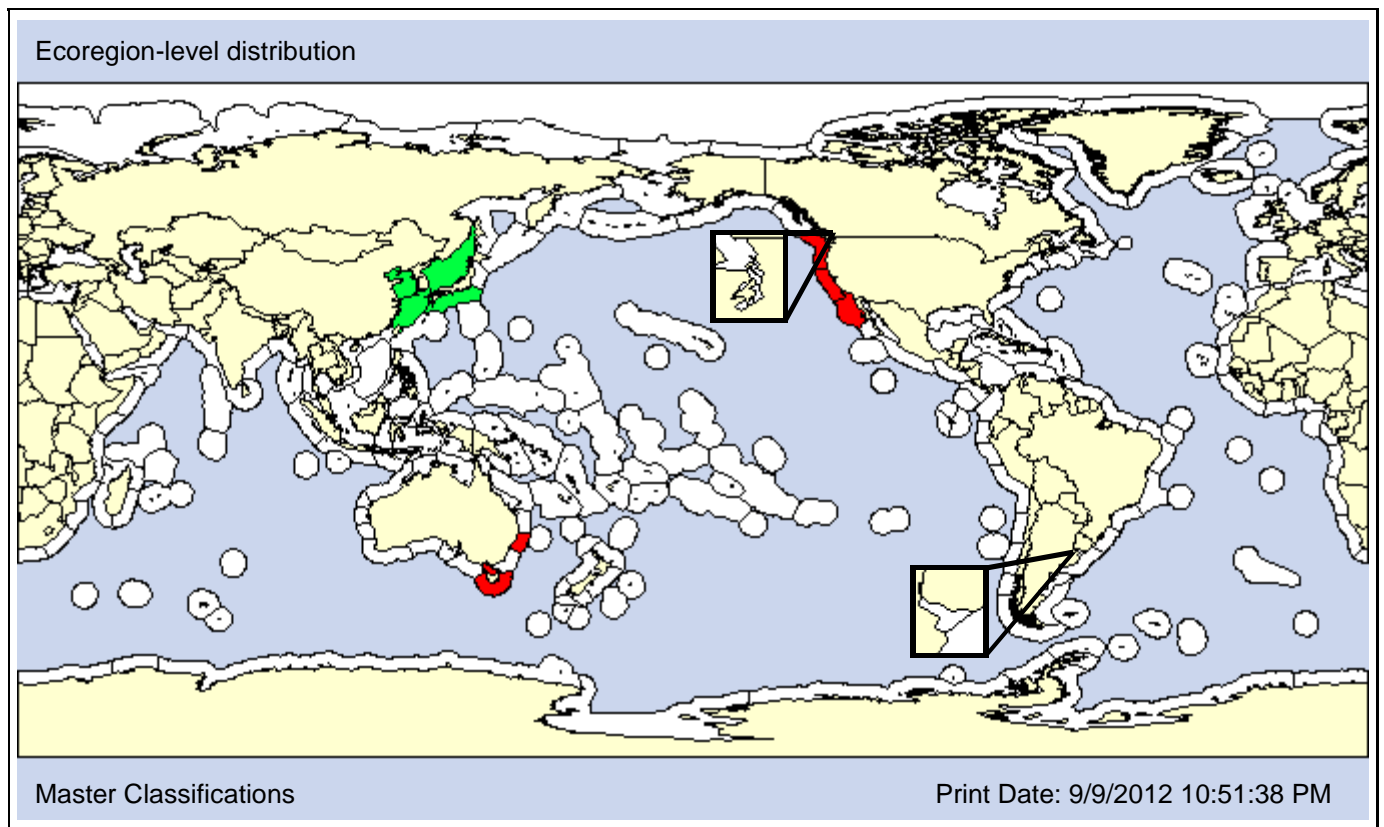
Aboma snyderi  
Gobius flavimanus  
Gobius stigmatonius

Synonym  
Synonym  
Synonym

**Common Names:**

Japanese river goby  
mahaze  
yellowfin goby

**Type Locality:**



**Date 1st record:** Native

1963

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
X		X				AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>					<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH			<b>X</b>	<b>X</b>	
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 14m] [Pref: 1 - 14m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>		<b>O</b>			

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>										<b>O</b>	

**SALINITY [Obs: 0 - 40psu] [Pref: 5 - psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR <b>X</b>		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>		<b>X</b>							



# Acanthorhodeus macropterus

Species ID: 220128

**Taxon:** Ray-finned fish

**Taxonomic Author:** Bleeker, 1871

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Ostariophysi

**Order:** Cypriniformes

**Suborder:** Cypriniformes

**Infraorder:**

**Superfamily:** Cyprinoidea

**Family:** Cyprinidae

**Subfamily:**

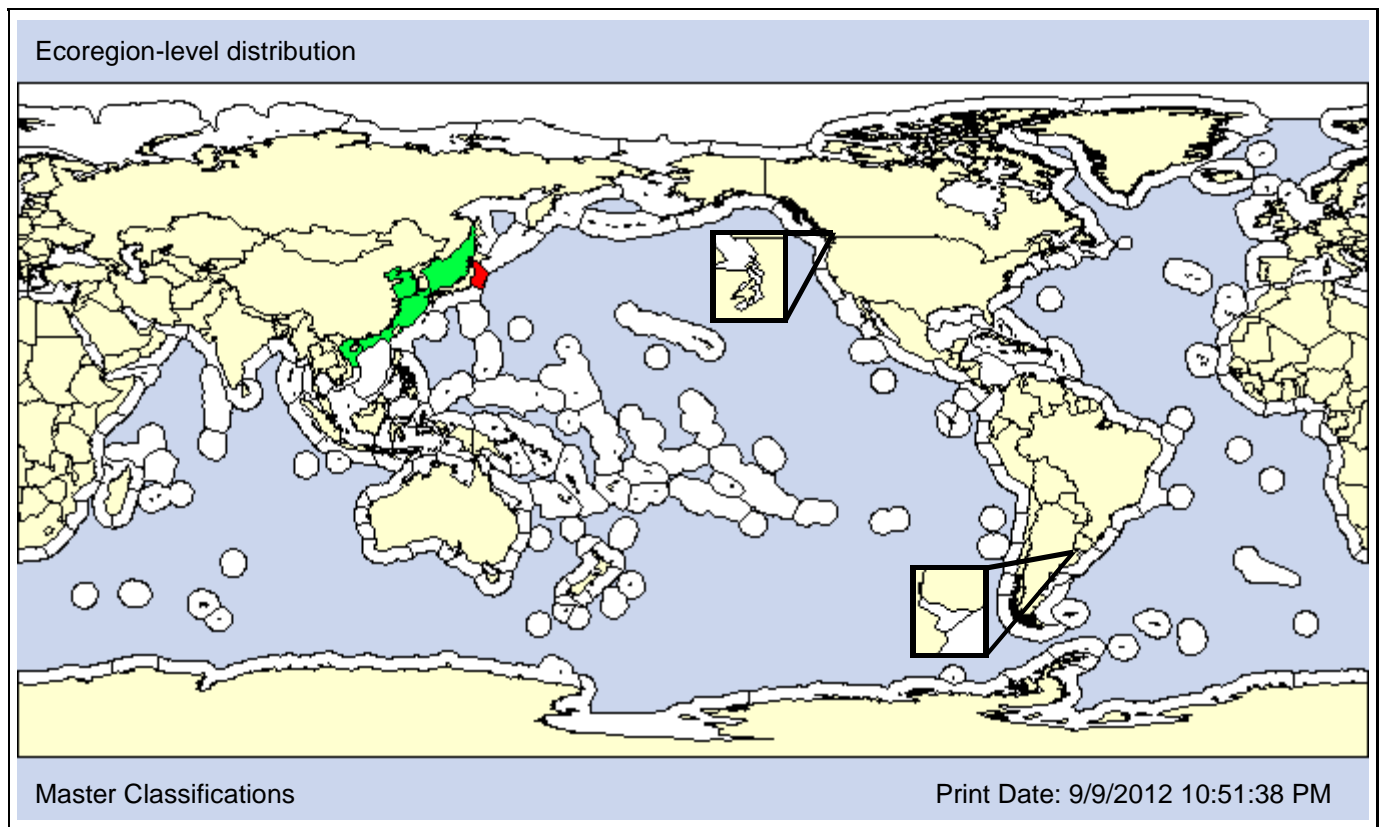
**Also Known As (Name - Type):**

Acanthorhodeus jeholicus	Synonym
Acanthorhodeus ngowyangi	Synonym
Acheilognathus dicaeus	Synonym
Acheliognathus macropterus	Synonym

**Common Names:**

Chinese bitterling  
deep body bitterling

**Type Locality:**



**Date 1st record:** 2001

**Loc 1st record:** Lake Kasumigaura, Japan

**Established:** Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA X	IR			A	P			
						AO	PO	X		X				

Comments: *Acanthorhodeus macropterus* (= *Acheilognathus macropterus*) is a freshwater fish that has some tolerance to low salinities. It reproduces by the female depositing eggs inside freshwater mussels. Mito and Uesugi (2004) list it as introduced into Japan.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					

**DEPTH [Obs: - 4m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline		Polyhaline		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>O</b>								

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM X		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** Brandt & Ratzeburg, 1833

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Chondrostei

**Infraclass:**

**Superorder:**

**Order:** Acipenseriformes

**Suborder:** Acipenseroidei

**Infraorder:**

**Superfamily:**

**Family:** Acipenseridae

**Subfamily:**

**Also Known As (Name - Type):**

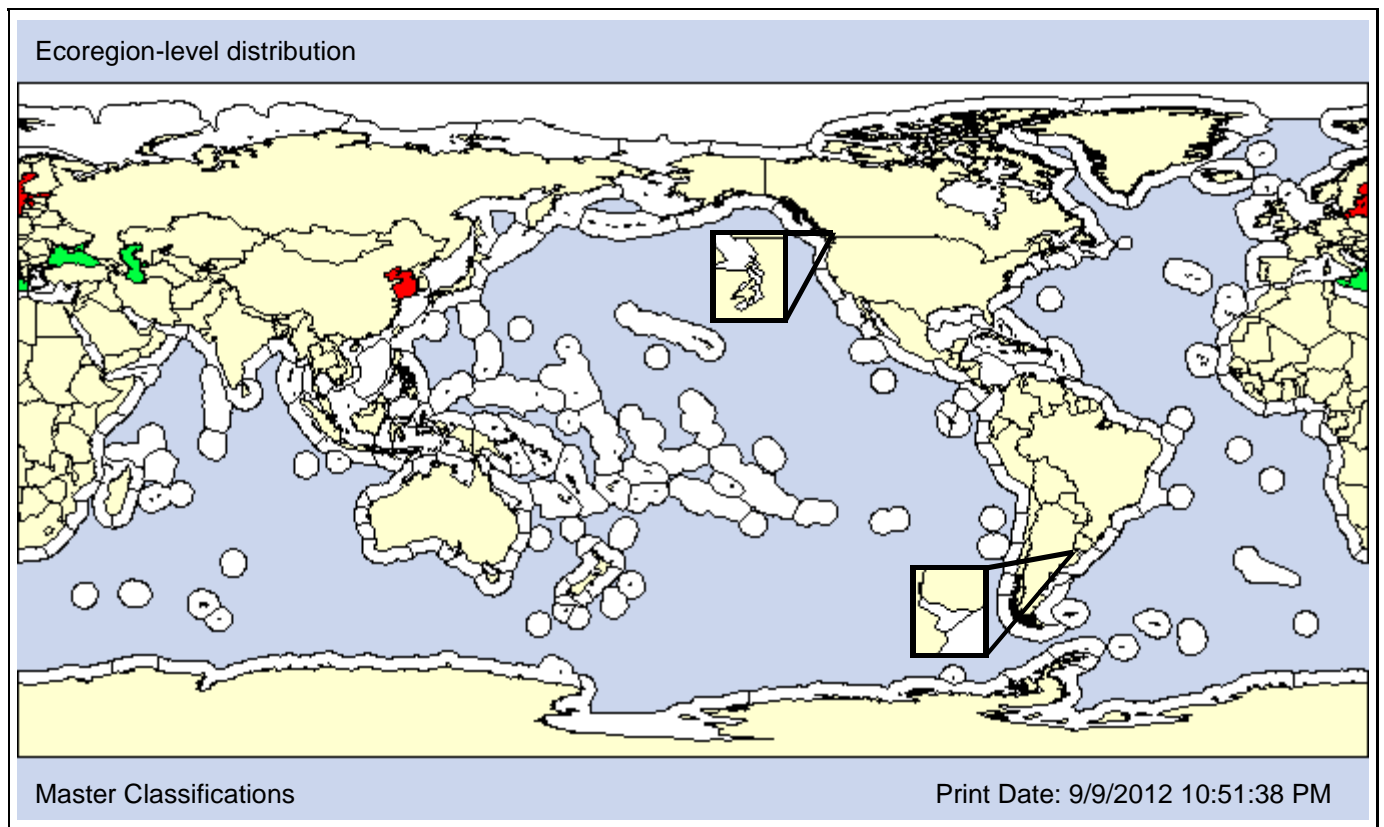
Acipenser gueldenstaedtii colchica  
Acipenser gueldenstaedtii gueldenstaedtii

Synonym  
Synonym

**Common Names:**

Russian sturgeon

**Type Locality:**



**Date 1st record:** 1975

**Loc 1st record:** China

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X	X	AO	PO								

Comments: The anadromous Russian sturgeon, *Acipenser gueldenstaedtii*, is considered endangered by the IUCN. It has been introduced into Japan and China, and is considered "probably established" in China according to FishBase. *A. gueldenstaedtii* has been observed to hybridize with *A. naccarii*, *A. baerii*, and *A. ruthenus*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>			<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				
		<b>X</b>											

**DEPTH [Obs: 2 - 130m] [Pref: 2 - 40m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>		<b>P</b>	<b>P</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							

**Taxon:** Ray-finned fish

**Taxonomic Author:** Lovetsky, 1828

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Chondrostei

**Infraclass:**

**Superorder:**

**Order:** Acipenseriformes

**Suborder:** Acipenseroidei

**Infraorder:**

**Superfamily:**

**Family:** Acipenseridae

**Subfamily:**

**Also Known As (Name - Type):**

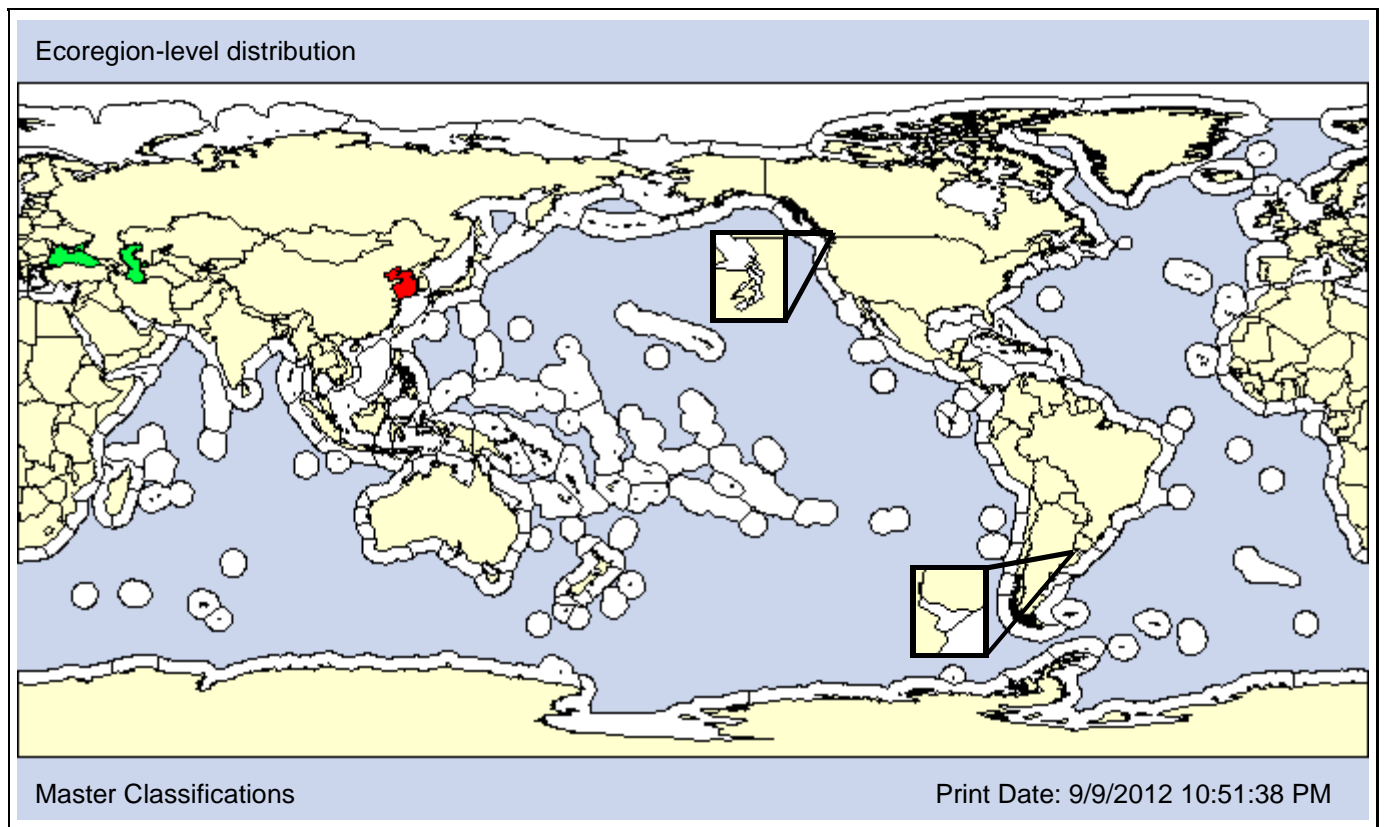
Acipenser glaber

Synonym

**Common Names:**

fringebarbel sturgeon  
ship sturgeon  
spiny sturgeon  
thorn sturgeon

**Type Locality:**



**Date 1st record:** 1933

**Loc 1st record:** Ili River, China

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: The anadromous sturgeon *Acipenser nudiventris* is native to the Ponto-Caspian region. It has been introduced into the Ili River in China (Chavanich et al., 2010), which flows into Lake Balkhash. Additionally, Seo and Lee (2008) list it as introduced into Korea, which we interpret as the Yellow Sea.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>				<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 11 - 60m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** Gray, 1835

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Chondrostei

**Infraclass:**

**Superorder:**

**Order:** Acipenseriformes

**Suborder:** Acipenseroidei

**Infraorder:**

**Superfamily:**

**Family:** Acipenseridae

**Subfamily:**

**Also Known As (Name - Type):**

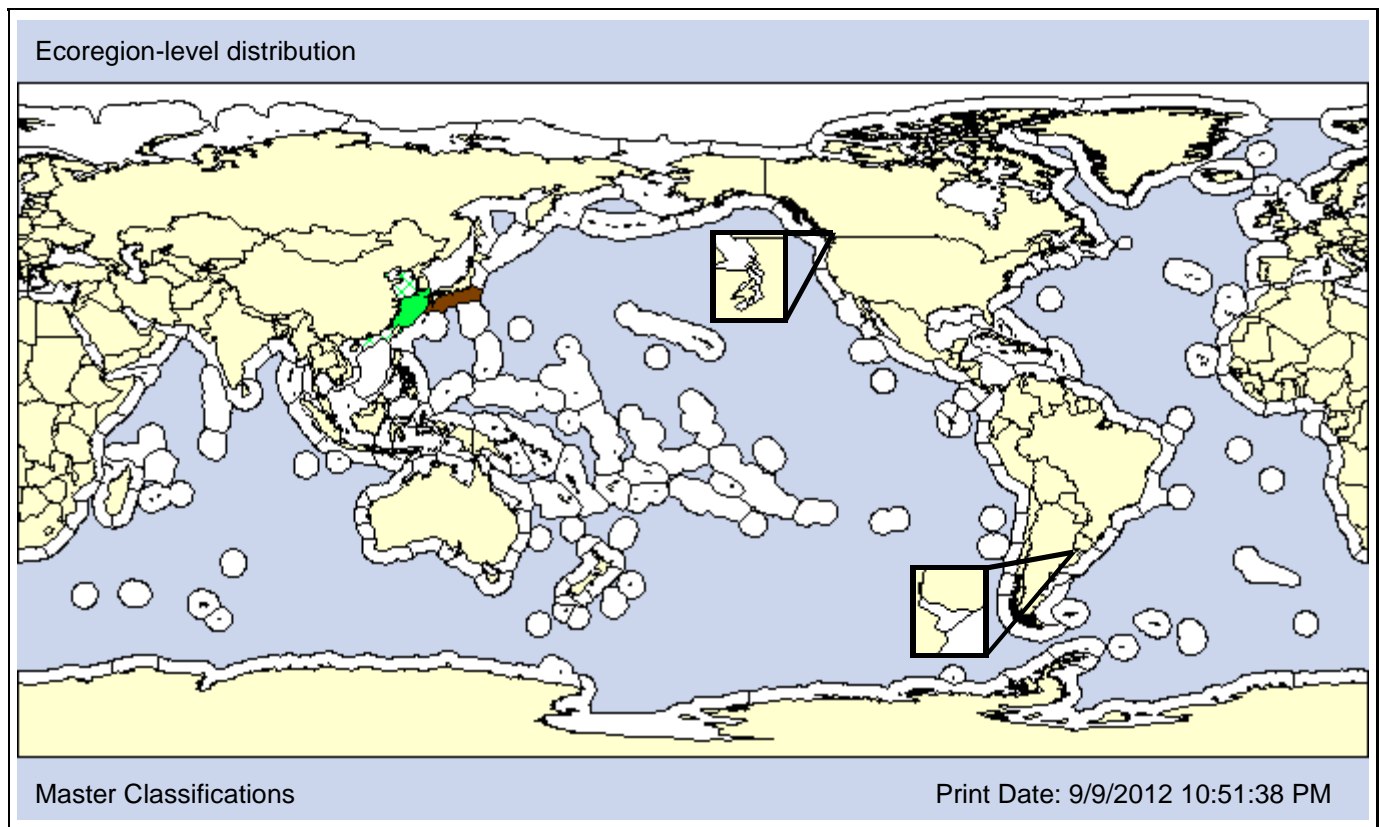
Acipenser kikuchii

Synonym

**Common Names:**

Chinese sturgeon  
Sagami sturgeon

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1965

**Loc 1st record:** Japan

**Established:** Yes

**VECTORS**

SH			MS	AF <span style="color: red;">X</span>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: Historically, the anadromous *Acipenser sinensis* was native to China, SW Korea, and western Kyushu, Japan. According to the IUCN, it is currently restricted to "the mid-lower section of the Yangtze River". Iwasaki (2006) lists it as introduced into Japan, resulting in a conflict of native and introduced populations in western Japan.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>			<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				
		<b>X</b>											

**DEPTH [Obs: 3 - 140m] [Pref: 3 - 40m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>		<b>P</b>			

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - 35psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									



**Taxon:** Ray-finned fish

**Taxonomic Author:** Linnaeus, 1758

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Chondrostei

**Infraclass:**

**Superorder:**

**Order:** Acipenseriformes

**Suborder:** Acipenseroidei

**Infraorder:**

**Superfamily:**

**Family:** Acipenseridae

**Subfamily:**

**Also Known As (Name - Type):**

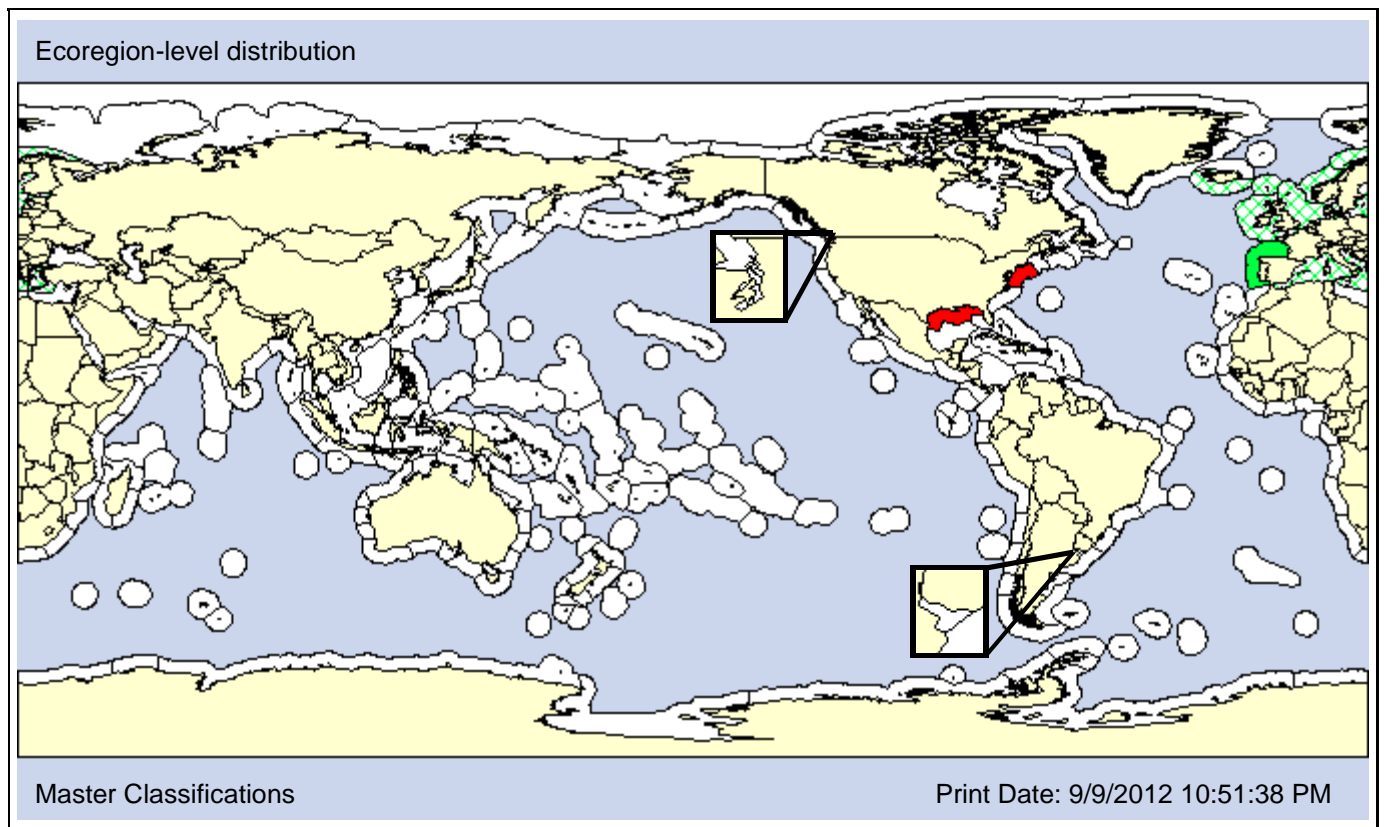
Accipenser attilus  
 Accipenser sturio  
 Acipenser attilus  
 Acipenser ducissae

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Atlantic sturgeon  
 Baltic sturgeon  
 common sturgeon  
 European sturgeon

**Type Locality:**



**Date 1st record:** 1975

**Loc 1st record:** Japan

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X	X	AO	PO								

Comments: *Acipenser sturio* is native to Europe. The records from the East coast of the U.S. are from 1822 and 1955 and need to be validated. Iwasaki (2006) listed *A. sturio* as introduced into Japan in 1975 with an unknown population status, and we are unaware of specific locations where it was introduced.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 4 - 93m] [Pref: 5 - 60m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>		<b>P</b>			

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - 35psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Wilson, 1811)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Clupeomorpha

**Order:** Clupeiformes

**Suborder:** Clupeoidei

**Infraorder:**

**Superfamily:**

**Family:** Clupeidae

**Subfamily:**

**Also Known As (Name - Type):**

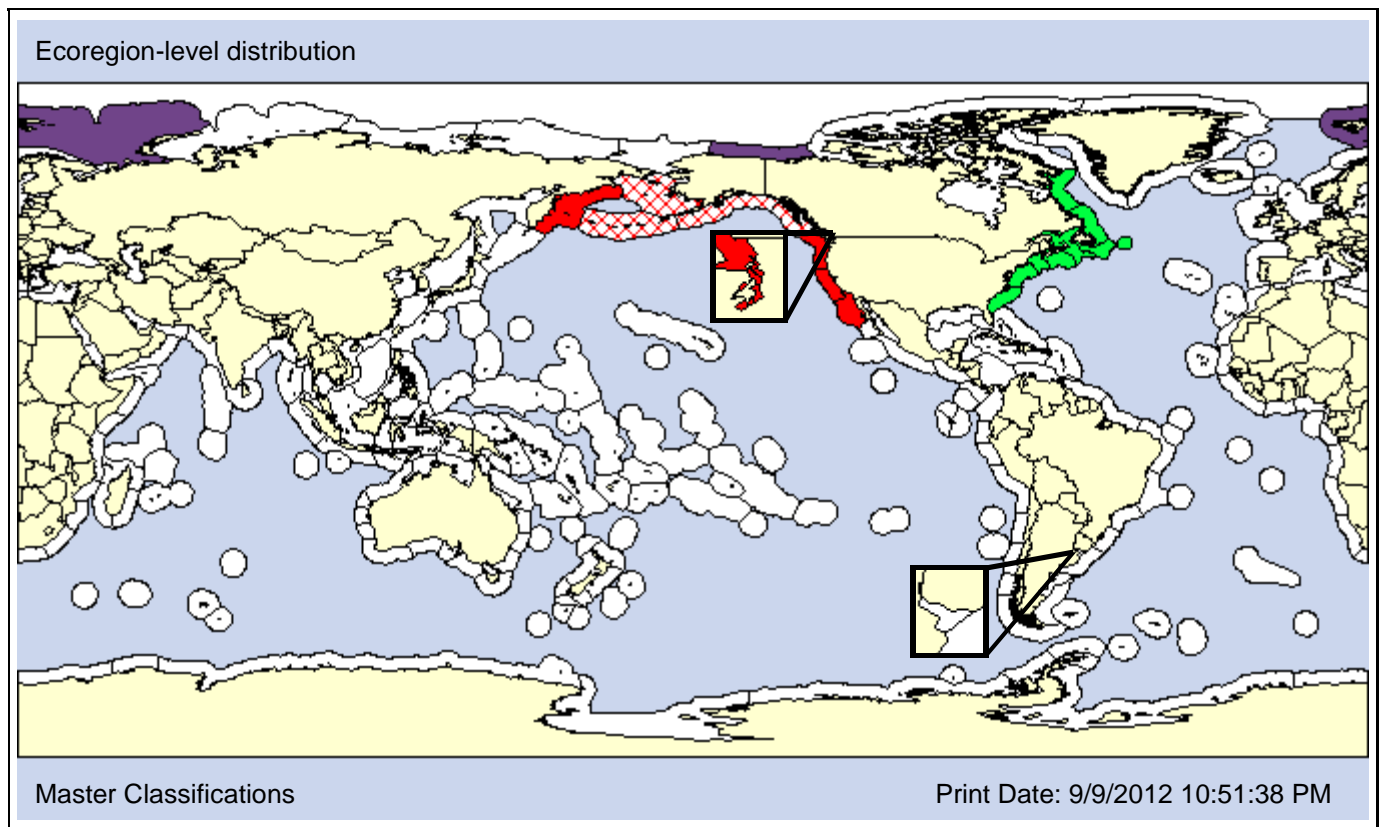
Alosa praestabilis  
Clupea indigena  
Clupea sapidissima

Synonym  
Synonym  
Synonym

**Common Names:**

American shad  
common shad  
herring jack  
white shad

**Type Locality:**



**Date 1st record:** Unknown

1871

**Loc 1st record:** Kamchatka, Russia

Sacramento River, California

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				X
				X		AO	PO							

Comments: According to Mecklenburg et al. (2002), *Alosa sapidissima* was "Introduced to Pacific coasts via Sacramento River, California in 1871-1881, and spread north to Kamchatka and Bering Sea and south to Baja, California." In Alaska, *A. sapidissima* is a "Summer migrant from spawning areas to the south" (Ruiz et al., 2006).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>		<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0 - 375m] [Pref: - 100m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep	<b>O</b>		
<b>O</b>	<b>P</b>	<b>P</b>			

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>		<b>P</b>			

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 32psu] [Pref: 0 - 32psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P <b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Rafinesque, 1820)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Siluriformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ictaluridae

**Subfamily:**

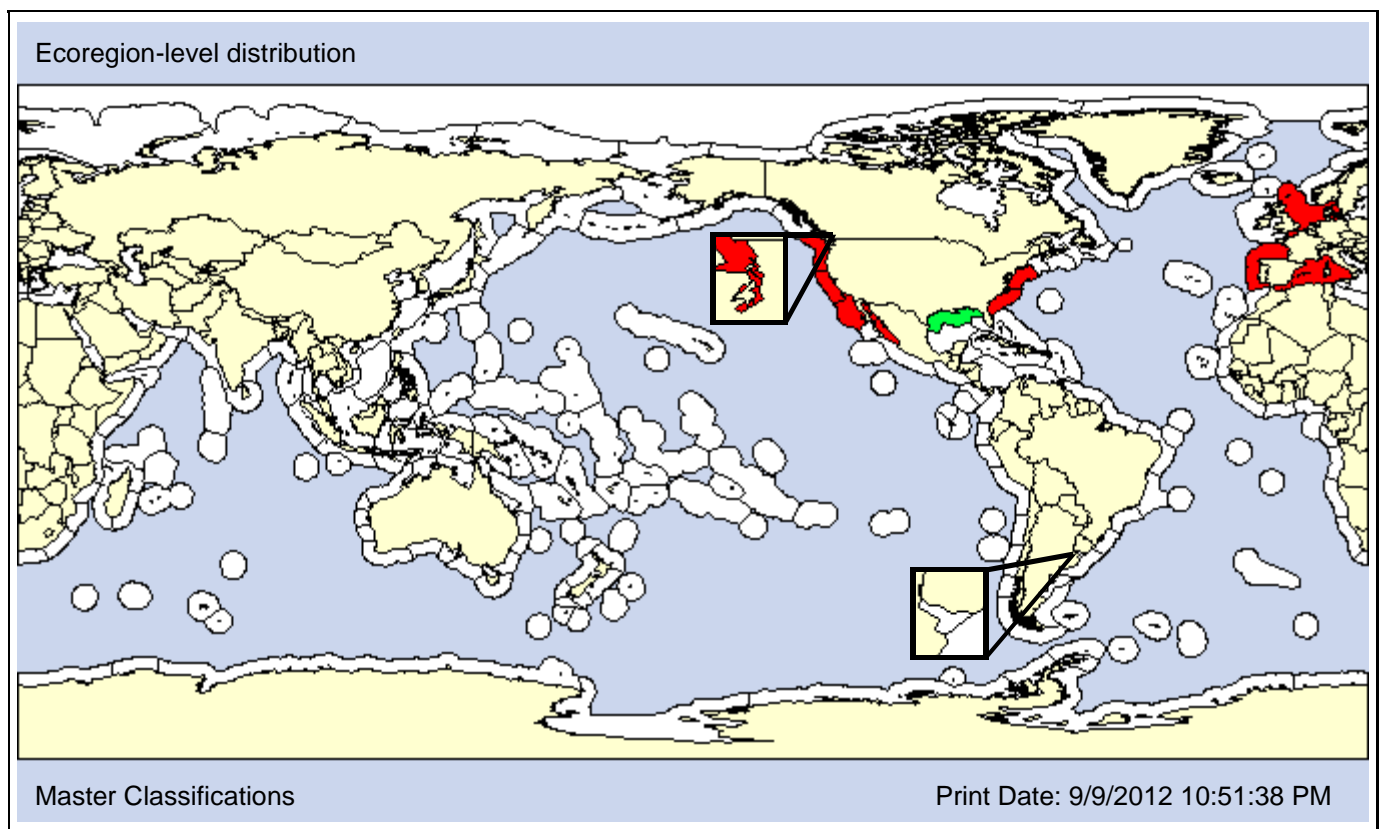
**Also Known As (Name - Type):**

Ictalurus melas	Synonym
Silurus melas	Synonym

**Common Names:**

black bullhead

**Type Locality:** Ohio River, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1874

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X		AO	PO	X							

Comments: *Ameiurus melas* is freshwater species but can survive salinities up to about 13 psu. Its original range was the streams and rivers of the eastern and southern United States and Mexico. It has invaded the NEP, Mediterranean, NWA, and NEA including the Guadalquivir Estuary in Spain (Garcia-de-Lomas et al., 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 10 - m] [Pref: 10 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 13.8psu] [Pref: 0 - 0psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Elopomorpha

**Order:** Anguilliformes

**Suborder:** Anguilloidei

**Infraorder:**

**Superfamily:**

**Family:** Anguillidae

**Subfamily:**

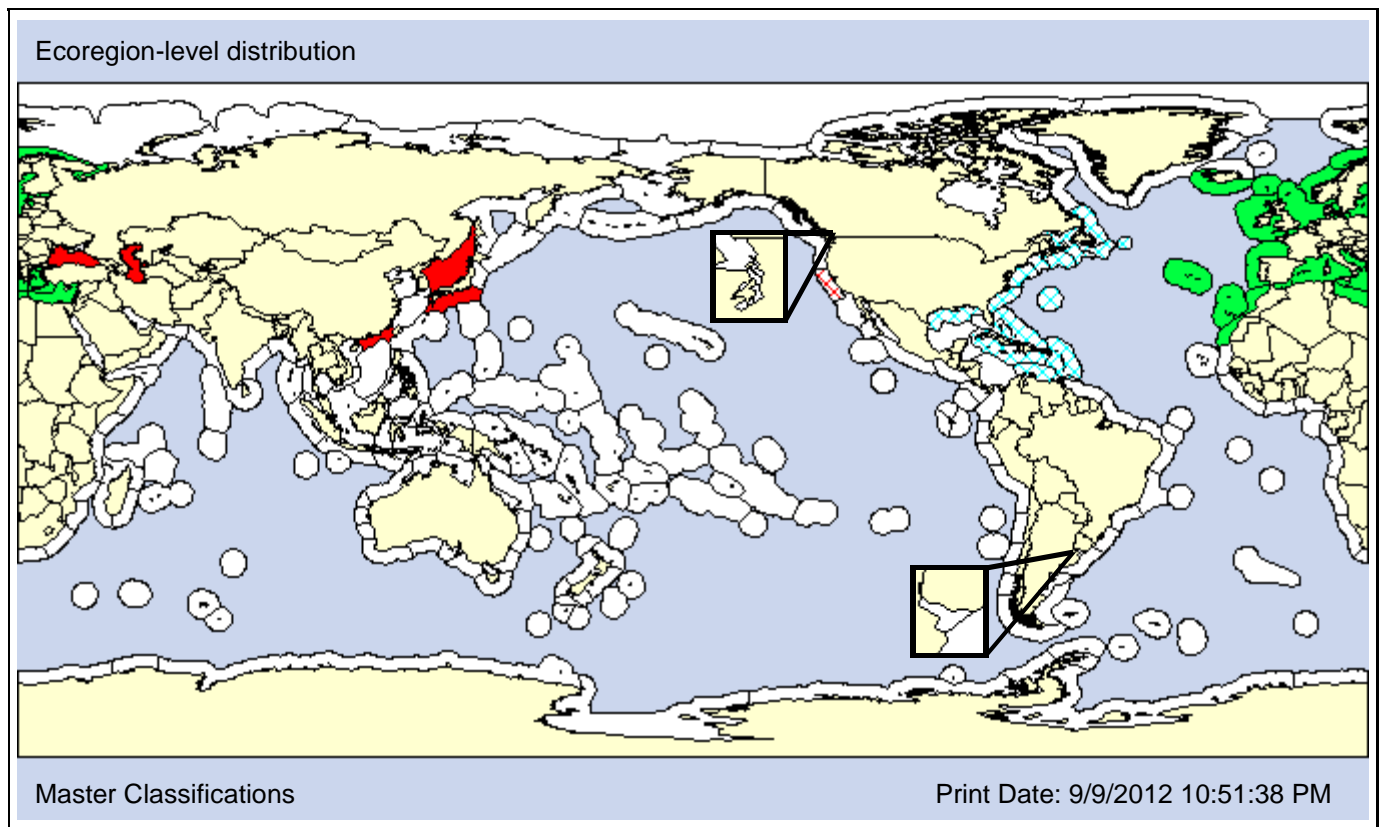
**Also Known As (Name - Type):**

Angill angill	Synonym
Anguilla acutirostris	Synonym
Anguilla aegyptiaca	Synonym
Anguilla altirostris	Synonym

**Common Names:**

common eel
European eel
freshwater eel
river eel

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown 1969  
**Loc 1st record:** Unknown San Francisco Estuary, CA  
**Established:** Yes No

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P		X		
X					X	AO	PO	X							

Comments: *Anguilla anguilla* is native to Europe, but migrates to the Sargasso Sea to spawn. As such, records from the NWA do not represent breeding populations and are classified as transient. It has been stocked in China and Japan and is established at least in Japan. It has been found but did not become established in the NEP.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				

**DEPTH [Obs: 0 - 700m] [Pref: 1 - 600m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	<b>P</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 36psu] [Pref: 0 - 36psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>	<b>X</b>				DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC	<b>X</b>						
				<b>X</b>									



**Taxon:** Ray-finned fish

**Taxonomic Author:** Richardson, 1841

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Elopomorpha

**Order:** Anguilliformes

**Suborder:** Anguilloidei

**Infraorder:**

**Superfamily:**

**Family:** Anguillidae

**Subfamily:**

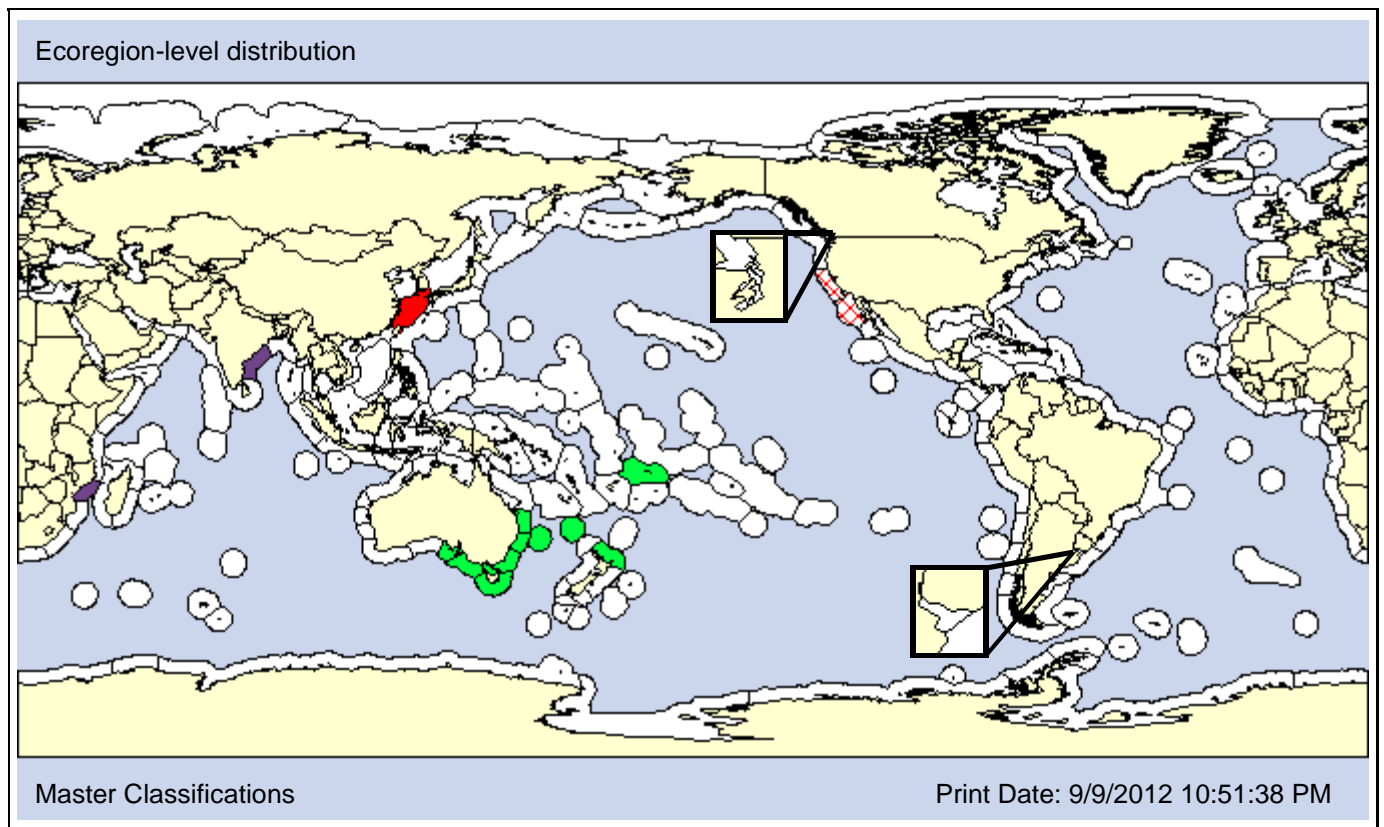
**Also Known As (Name - Type):**

Anguilla australis australis	Convention
------------------------------	------------

**Common Names:**

shortfin eel
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**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1975

1978

**Loc 1st record:** Japan

Los Angeles River, CA

**Established:** Unknown

No

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P		X	
					X	AO	PO	X						

Comments: *Anguilla australis* is a catadromous, benthopelagic eel native to Australia and New Zealand. It was introduced into the NEP but did not become established. The FAO states that it is "probably established" in Japan. However, FishBase states that the *A. australis* introduced into Japan and China are not established and unknown, respectively.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>		<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic <b>P</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep			
	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 36psu] [Pref: 0 - 36psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P <b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** Quoy & Gaimard, 1824

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Elopomorpha

**Order:** Anguilliformes

**Suborder:** Anguilloidei

**Infraorder:**

**Superfamily:**

**Family:** Anguillidae

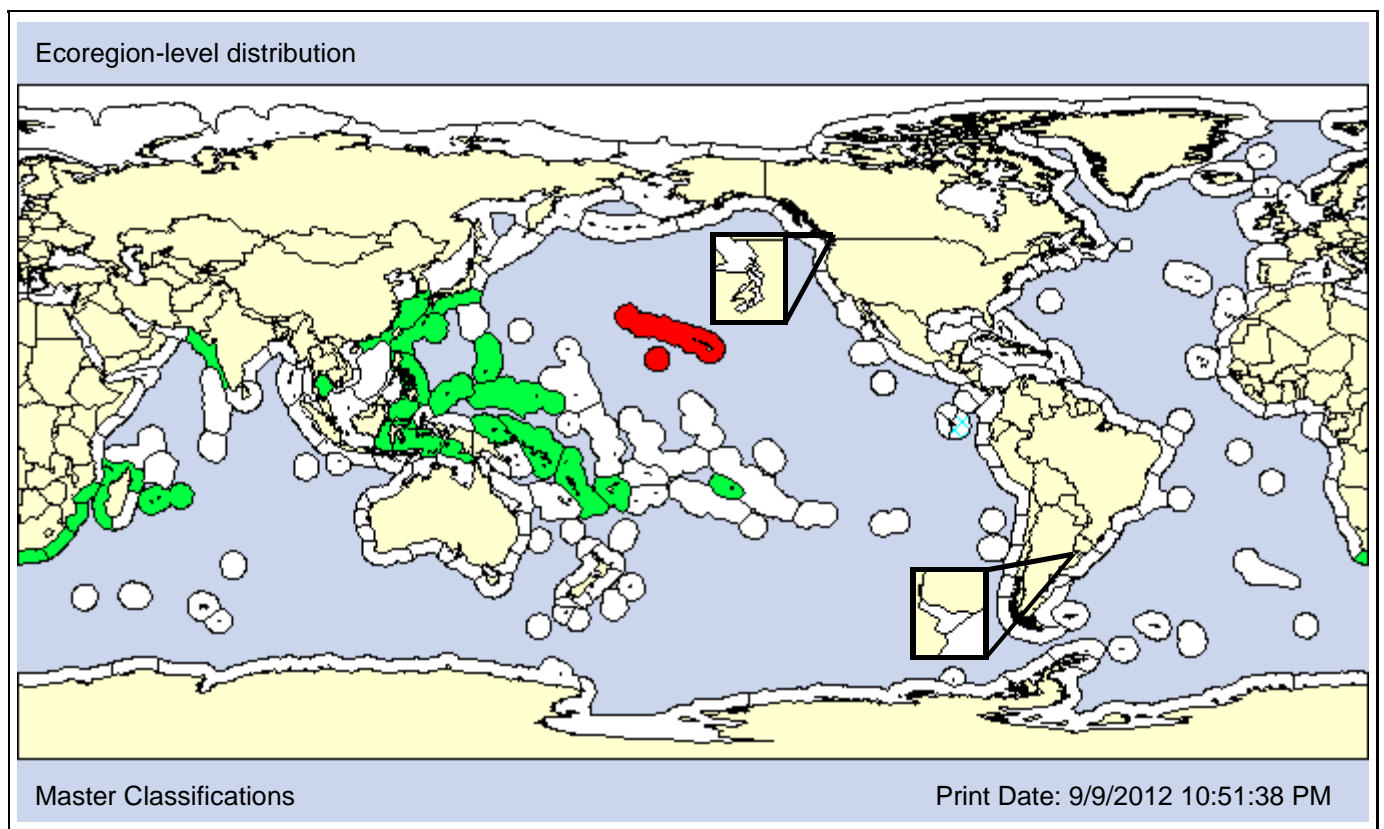
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

giant mottled eel  
marbled eel

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 2002  
**Loc 1st record:** Native Maui, Hawaii  
**Established:** Yes Unknown

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P		X		
					X	AO	PO	X						

Comments: A specimen of the catadromous eel *Anguilla marmorata* was found in a stream in Maui, Hawaii in 2002. According to James and Suzumoto (2006), "it is unlikely that this individual found on Maui arrived without human intervention."

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>		<b>P</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 1 - 400m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>		<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - 36psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Lesueur, 1817)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Elopomorpha

**Order:** Anguilliformes

**Suborder:** Anguilloidei

**Infraorder:**

**Superfamily:**

**Family:** Anguillidae

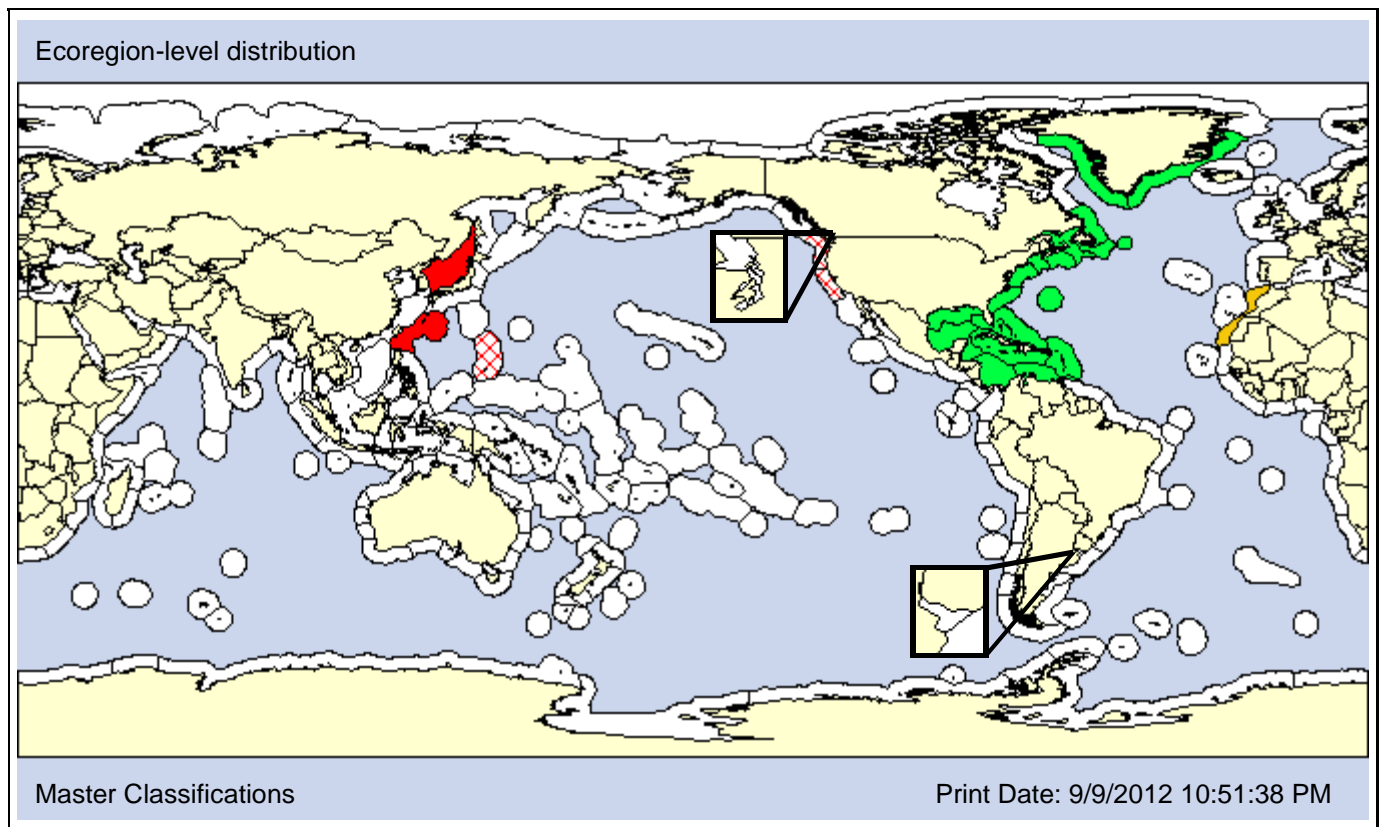
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

American eel

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1998

1873

**Loc 1st record:** Uono River, Japan

San Francisco Estuary, CA

**Established:** Yes

No

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P		X		
					X	AO	PO							

Comments: The NWA eel *Anguilla rostrata* was introduced into the NEP but did not become established. It was introduced into Japan in 1971-1972 (FishBase) and was captured in the wild in the Uono River, Japan (Miyai et al., 2004) and Taiwan (Han et al., 2002) in the 1990s.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>		<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 1 - 464m] [Pref: 1 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - 36psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Cuvier, 1831)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Percoidei

**Infraorder:**

**Superfamily:**

**Family:** Pomacanthidae

**Subfamily:**

**Also Known As (Name - Type):**

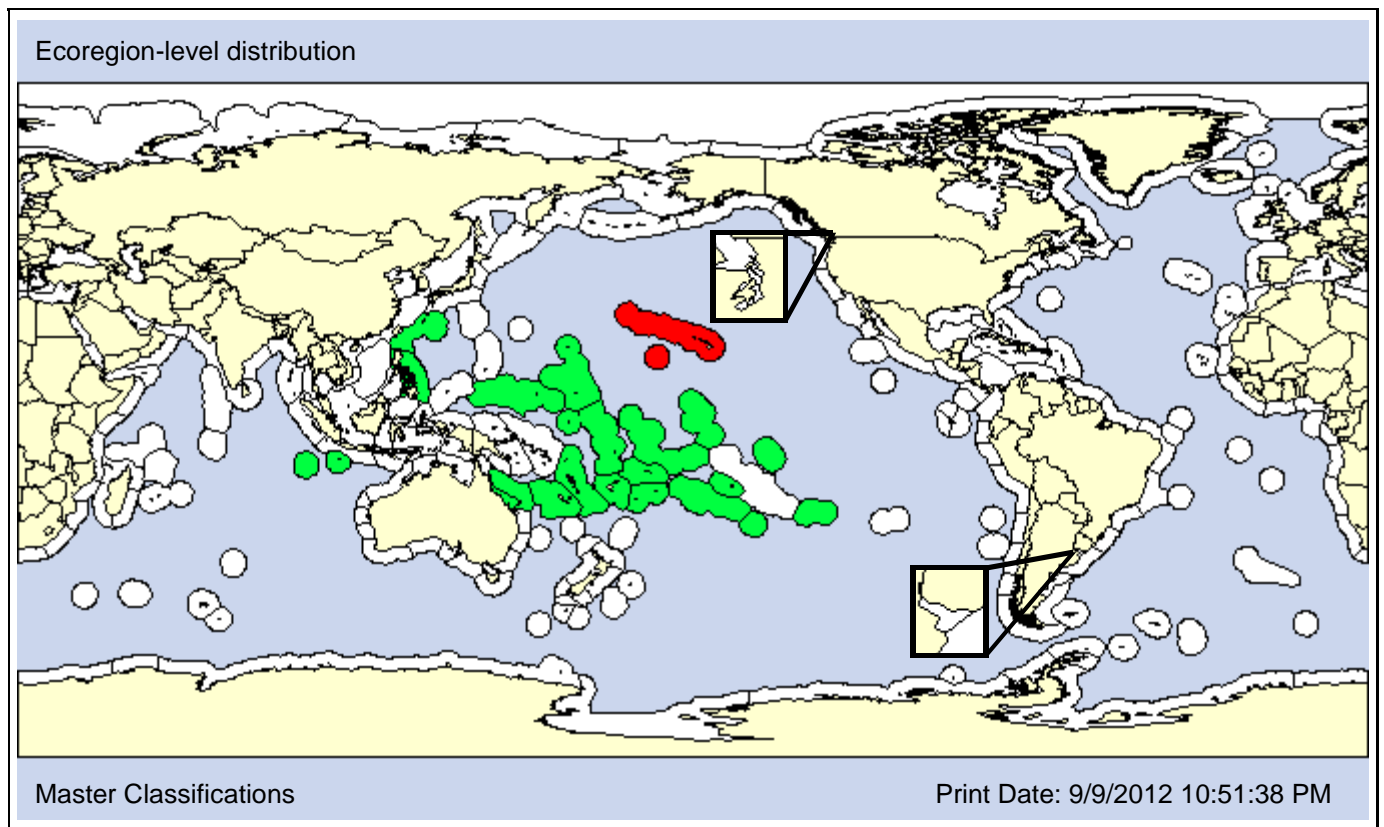
Centropyge flavissimus  
Holacanthus flavissimus

Synonym  
Synonym

**Common Names:**

Lemon peel fish  
lemonpeel angelfish

**Type Locality:**



**Date 1st record:** 1990  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Unknown

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				
						AO	PO		X					

Comments: The establishment of *Centropyge flavissima* in Hawaii is uncertain (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		<b>X</b>			
		<b>X</b>											

**DEPTH [Obs: 3 - 50m] [Pref: 3 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
				<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>												

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
						<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
			<b>X</b>										



**Taxon:** Ray-finned fish

**Taxonomic Author:** Bloch & Schneider, 1801

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Percoidei

**Infraorder:**

**Superfamily:**

**Family:** Serranidae

**Subfamily:**

**Also Known As (Name - Type):**

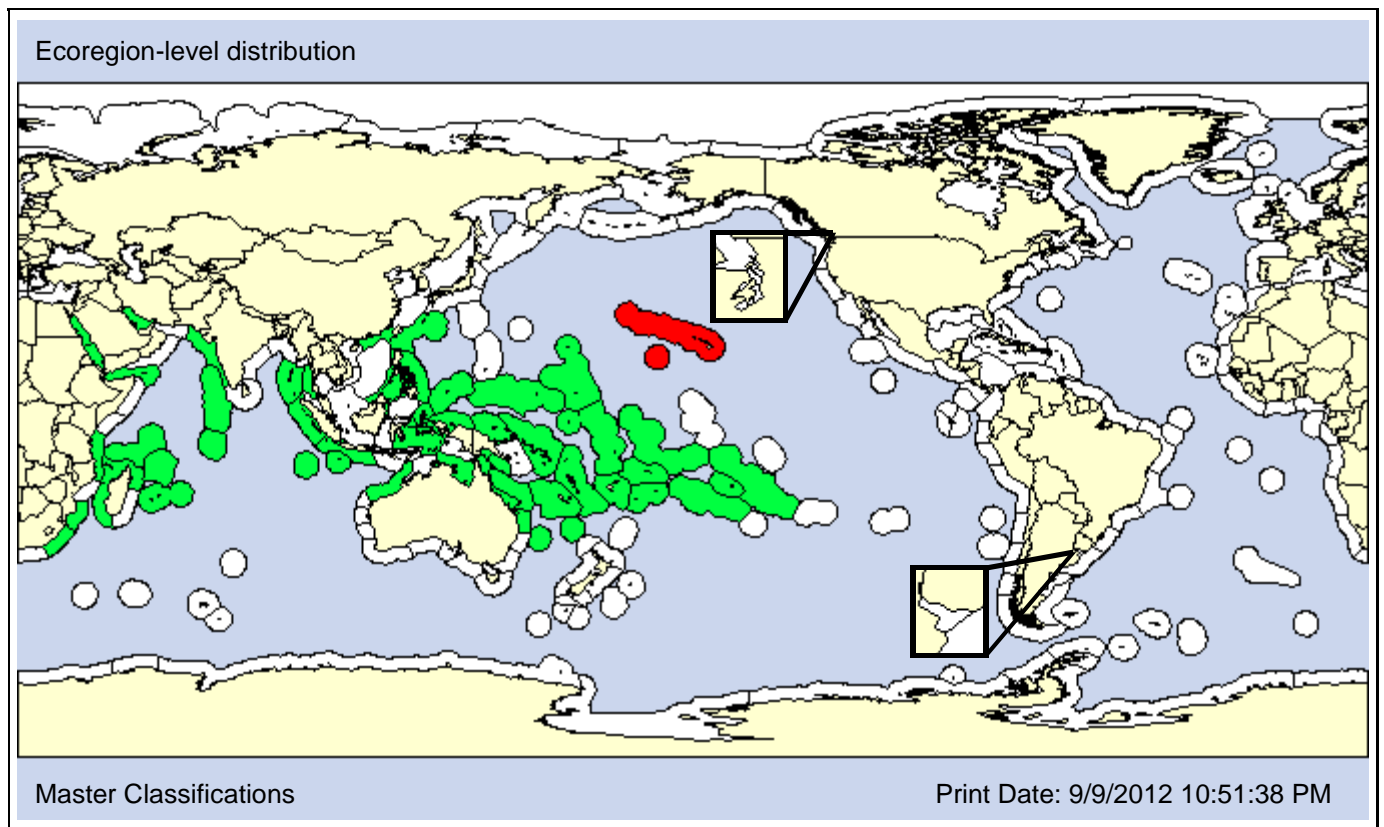
Cephalopholis guttata  
Cephalopholis guttatus  
Epinephelus argus

Synonym  
Misspelling  
Synonym

**Common Names:**

bluespotted grouper  
peacoack rockcod  
peacock groper  
peacock hind

**Type Locality:**



**Date 1st record:** 1956  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
				X		AO	PO							

Comments: "In 1956 bluespotted grouper...was intentionally released from the livewell of the vessel Hugh M. Smith that had transported the fish from Moorea in the Society Islands. ... establishment was thought to have occurred by 1958 (Randall, 1987)." (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>P</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI <b>X</b>		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>			
							<b>X</b>						

**DEPTH [Obs: 1 - 40m] [Pref: 1 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>												

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH		IF	FEE	FCS	P				
	<b>X</b>			<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	<b>DEM X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** Jordan & Seale, 1906

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Labroidei

**Infraorder:**

**Superfamily:**

**Family:** Pomacentridae

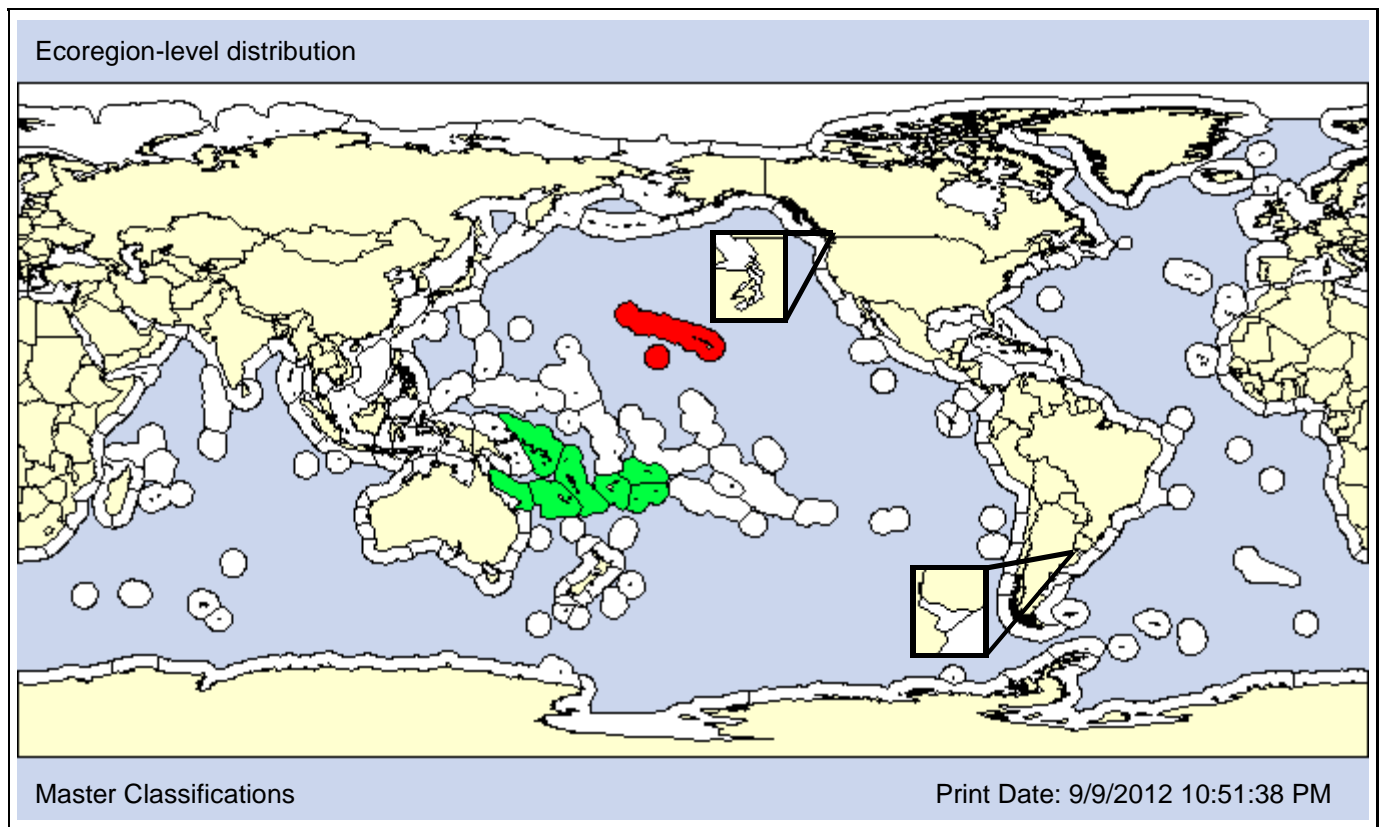
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Fiji blue devil damselfish  
southseas devil

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 2002  
**Loc 1st record:** Haunama Bay, Hawaii  
**Established:** Unknown

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF</b>			<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA			A	P				
						AO	PO		X					

Comments: The establishment of *Chrysiptera taupou* in Hawaii is uncertain (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
O	O	O						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH		X			

**DEPTH [Obs: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal P		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			P				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		P												

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	O		
						O			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	X			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM X		SUR		UR	B	N	SF	IN	EPP	EPZ
		X	BP	EPS	EPU	EPC							
			X										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Siluriformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Clariidae

**Subfamily:**

**Also Known As (Name - Type):**

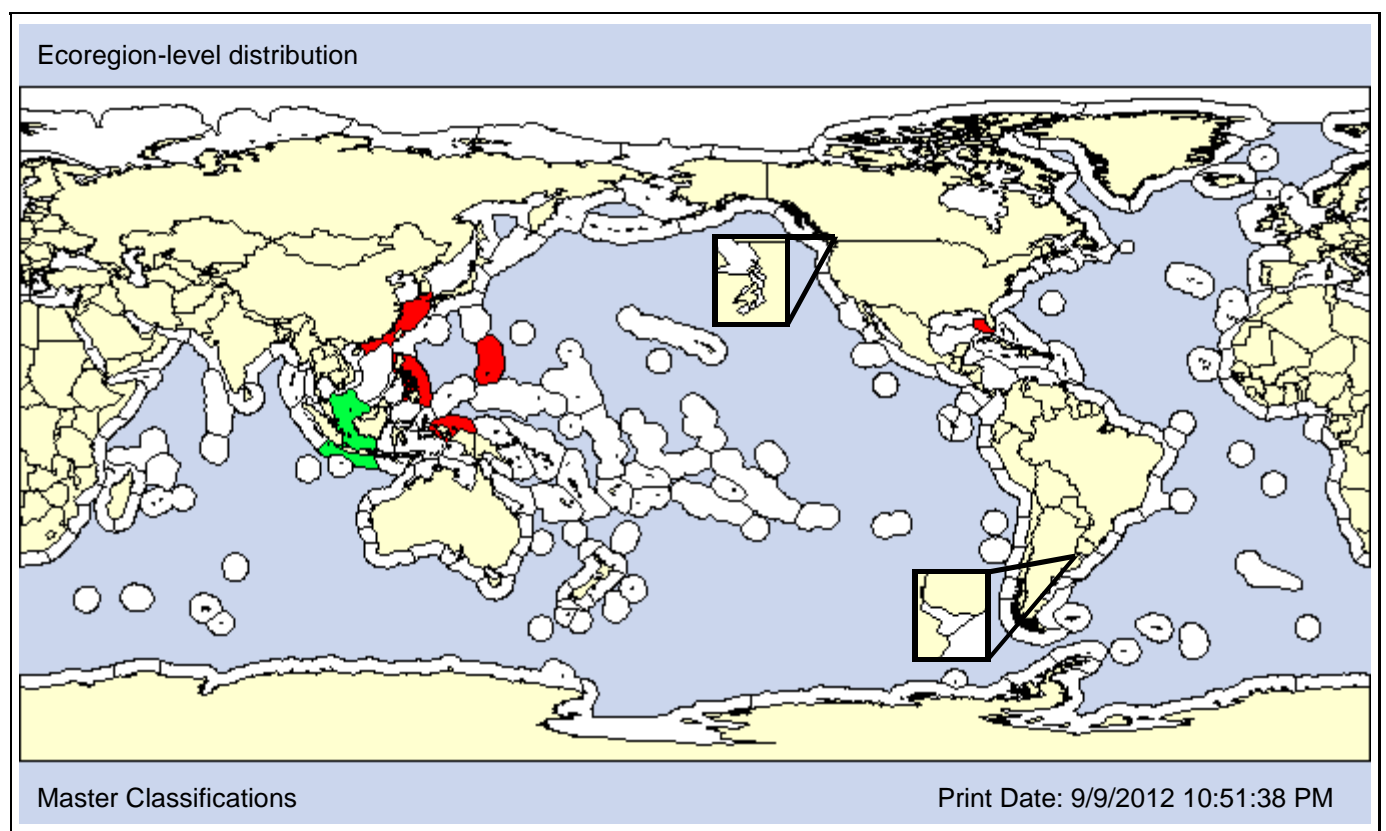
Clarias assamensis  
 Clarias betrachus  
 Clarias punctatus  
 Macropteronotus magur not Hamilton, 1822

Synonym  
 Misspelling  
 Synonym  
 Misidentified

**Common Names:**

clarias catfish  
 magur  
 Thai hito  
 walking catfish

**Type Locality:** Java, Indonesia



**Date 1st record:** Unknown

**Loc 1st record:** Japan

**Established:** Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP X</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P		X		
				X	X	AO	PO			X					

Comments: Species reported as *Clarias batrachus* represent a species complex, and *C. batrachus* is definitively known only from rivers drainages in Java (Ng and Kottelat, 2008). According to FishBase, *C. batrachus* (or one of the related species?) has invaded Japan, China, Taiwan, Guam, Papua New Guinea, and the Philippines.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0.5 - m] [Pref: 0.5 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - 18psu] [Pref: 0 - 10psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Cuvier, 1830)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Perciformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Sciaenidae

**Subfamily:**

**Also Known As (Name - Type):**

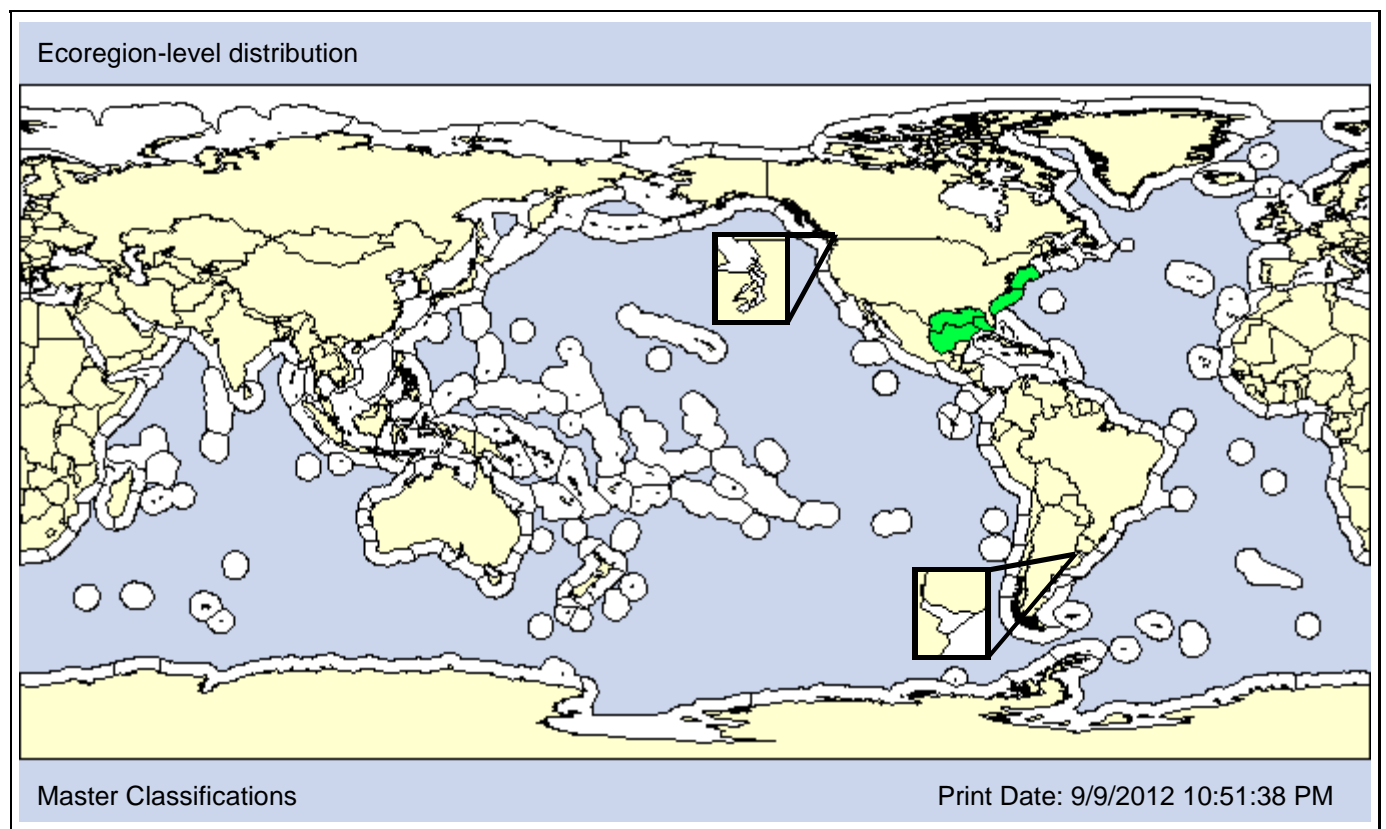
Cynosion nebulosus  
Otolithus carolinensis  
Otolithus nebulosus

Misspelling  
Synonym  
Synonym

**Common Names:**

speckled seatrout  
speckled trout (*Cynoscion nebulosus*)  
spotted seatrout  
spotted trout

**Type Locality:**



**Date 1st record:** 1991

**Loc 1st record:** China

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: The spotted weakfish, *Cynoscion nebulosus* is reported by Wang (2008) to have been introduced into China for aquaculture, though no specific sites are given.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated <b>X</b>			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>	<b>X</b>		TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 3 - 50m] [Pref: 3 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - 37psu] [Pref: 15 - 35psu]**

<b>Fresh O</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									



**Taxon:** Ray-finned fish

**Taxonomic Author:** Linnaeus, 1758

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Ostariophysii

**Order:** Cypriniformes

**Suborder:** Cypriniformes

**Infraorder:**

**Superfamily:** Cyprinoidea

**Family:** Cyprinidae

**Subfamily:**

**Also Known As (Name - Type):**

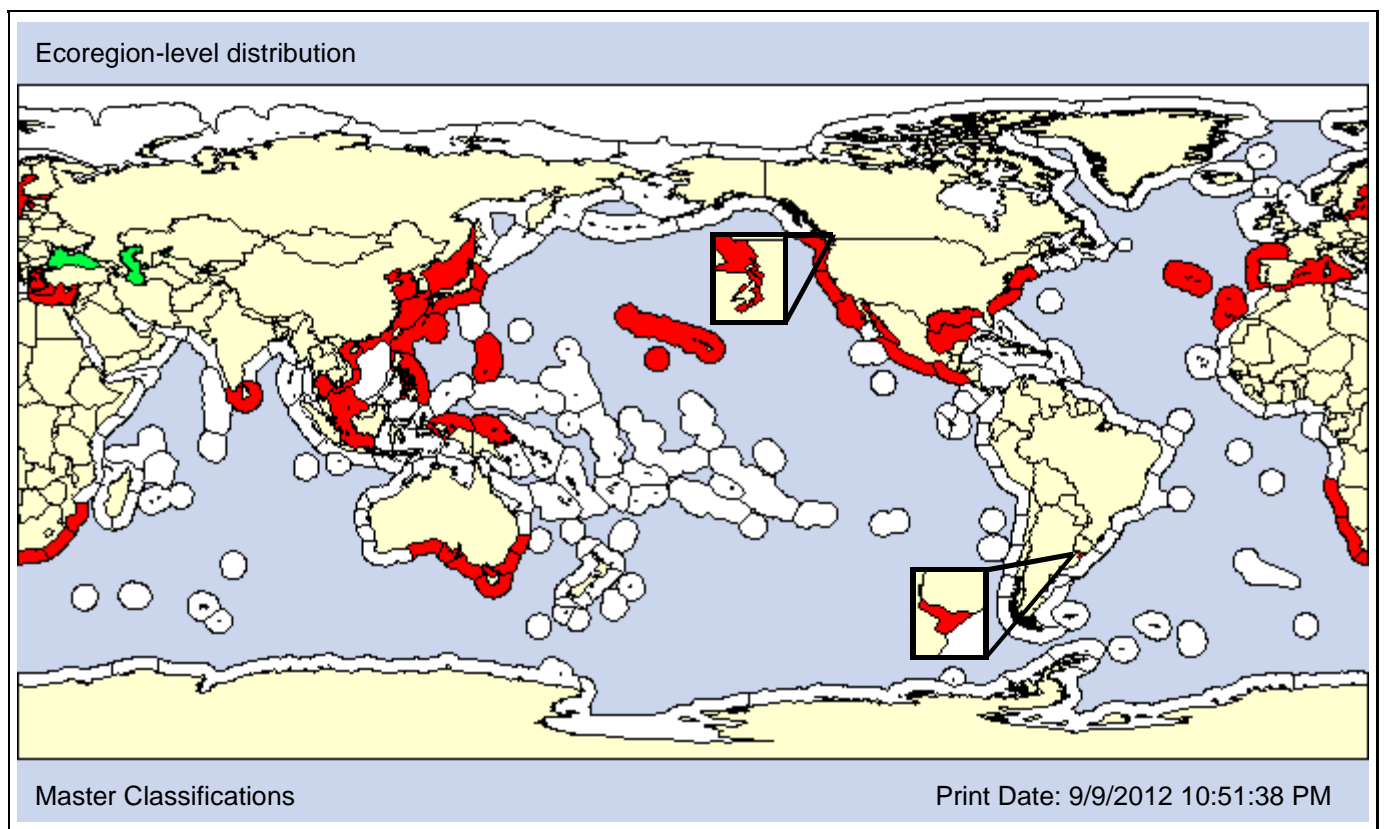
Cyprinus carpio carpio  
 Cyprinus carpio haematopterus  
 Cyprinus haematopterus

Convention  
 Convention  
 Synonym

**Common Names:**

common carp  
 European carp  
 koi  
 leather carp

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP

Hawaii

NEP

**Date 1st record:** 1905

1870

1872

**Loc 1st record:** Japan

Hawaii

Sonoma, California

**Established:** Yes

Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: *Cyprinus carpio* is one of the most widely distributed invasive species. It is native to rivers in temperate Eurasia, specifically the Black, Caspian and Aral Sea basins. While primarily freshwater, it can occur in estuaries with eggs tolerant of salinities up to 4.5 psu.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>					<b>O</b>

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 14psu] [Pref: 0 - 4.5psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Günther, 1867)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Clupeomorpha

**Order:** Clupeiformes

**Suborder:** Clupeoidei

**Infraorder:**

**Superfamily:**

**Family:** Clupeidae

**Subfamily:**

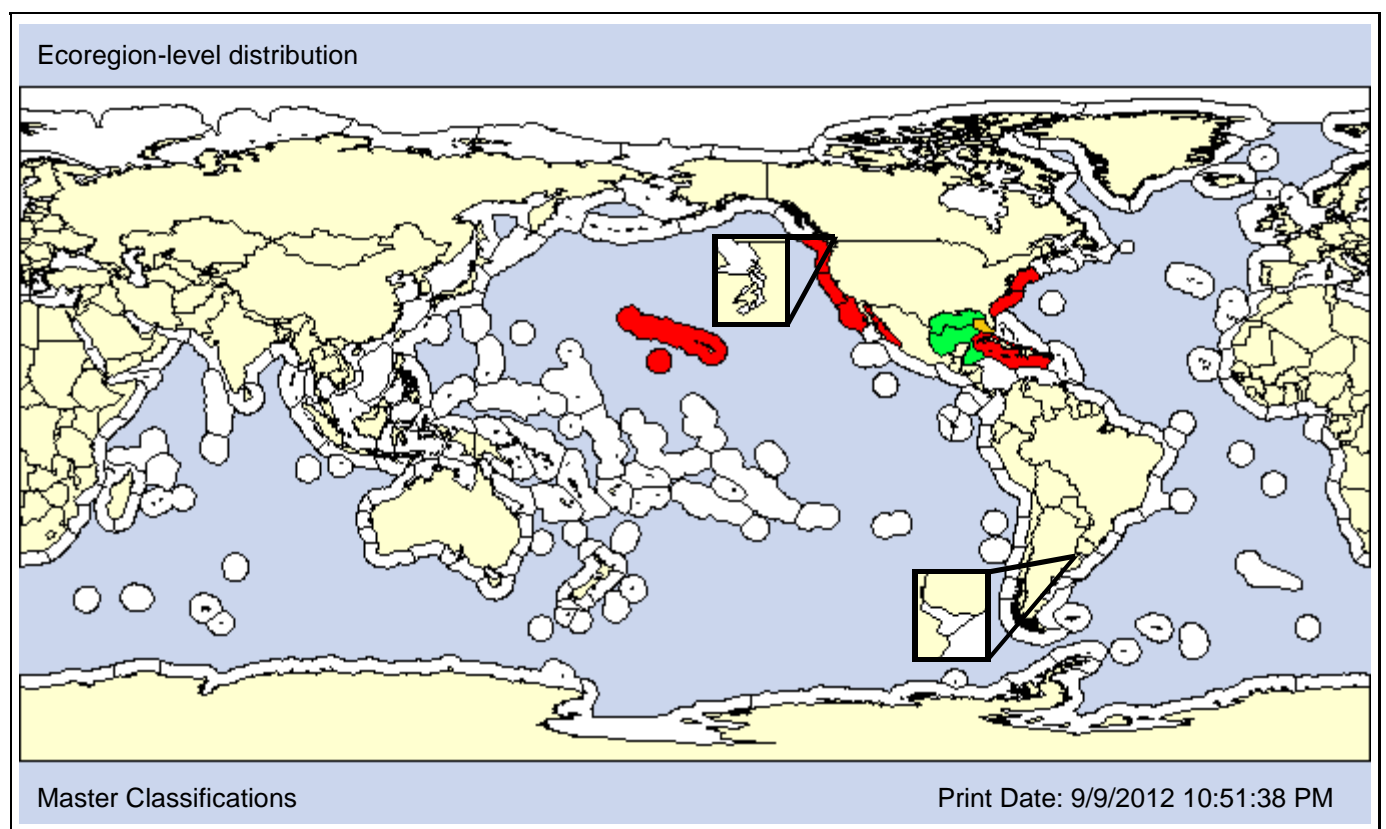
**Also Known As (Name - Type):**

Chatoessus mexicanus	Synonym
Meletta petenensis	Synonym
Signalosa atchafalayae	Synonym
Signalosa petenensis atchafaylae	Synonym

**Common Names:**

threadfin shad
----------------

**Type Locality:** Lake Petén, Guatemala



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1958

1953

**Loc 1st record:**

Oahu, Hawaii

San Diego County, CA

**Established:**

Yes

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P	X			
				X		AO	PO								

Comments: *Dorosoma petenense* occur mainly in freshwater streams and reservoirs, but adults are found in brackish/marine waters with salinities up to 32.3 psu. Adults spawn in freshwater (FishBase). Its native distribution is the Mississippi River and Gulf slope drainages from Florida to Central America.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>					<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					

**DEPTH [Obs: 0 - 15m] [Pref: - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 32.3psu] [Pref: 0 - 0psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>		<b>X</b>		<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Ray-finned fish

**Taxonomic Author:** Greenfield & Randall, 2004

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Gobioidi

**Infraorder:**

**Superfamily:**

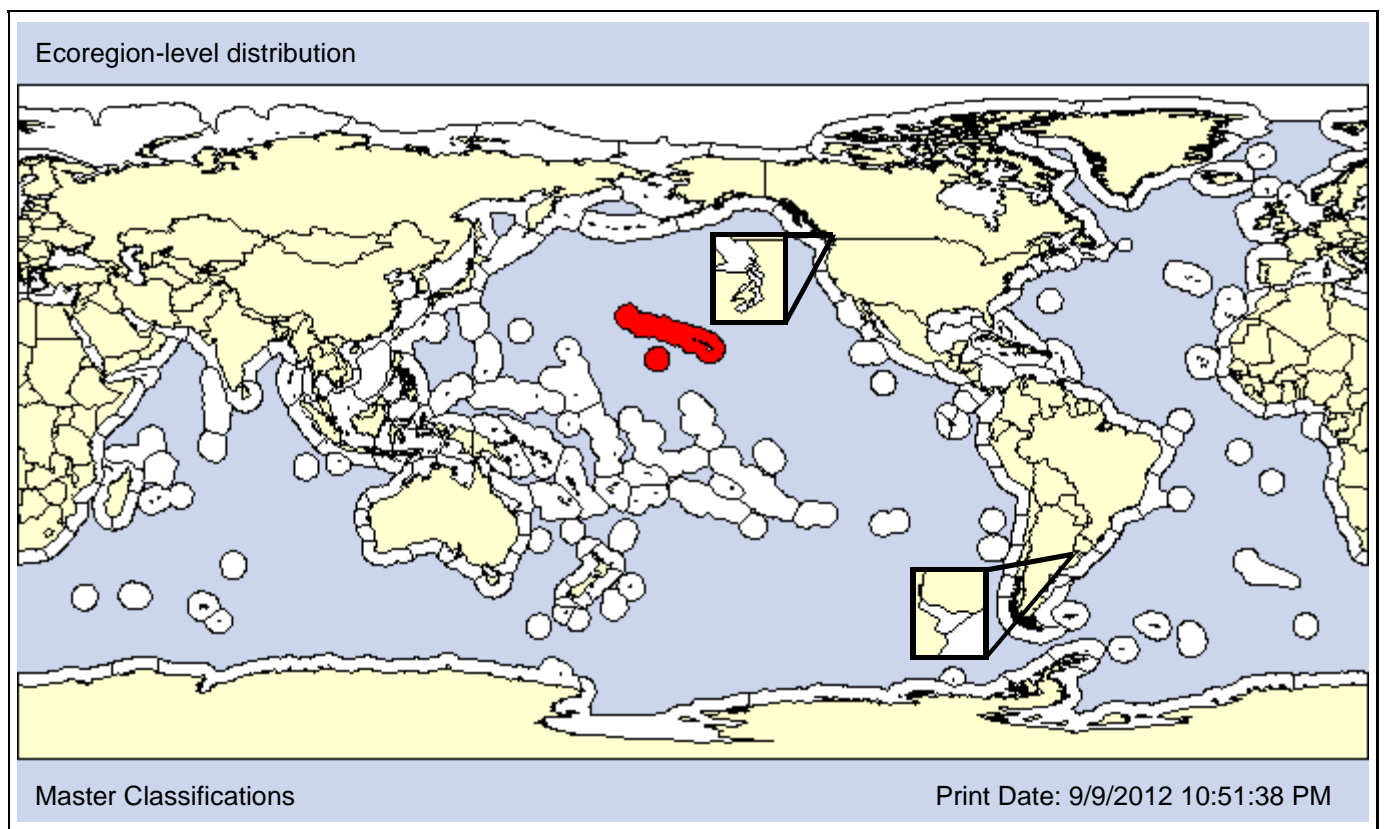
**Family:** Gobiidae

**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

**Type Locality:** Hawaii, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1990  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Unknown

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				X
						AO	PO								

Comments: This unidentified Favonigobius was found on the island of Oahu, Hawaii in 1990, but it has not been found since (Carlton and Eldredge, 2009). It may be an Australasian species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial

**ECOSYSTEM**

Unconsolidated						Consolidated						Pelagic	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

R	HP	Biogenic						Artificial Substrate						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

Fresh	Brackish				Marine		Hyper	
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		

**TROPHIC LEVEL AND FEEDING**

PAR	SA	PP	H	P	S	DET	DEC	SF	DF	
				X					DF-SUR	DF-SUB

**REPRODUCTION**

Sexual X						Asexual				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	X	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

V	OVI	OVO	DD	LP		FR	SD	SP
				LP-B	LP-P			

**HABITAT ASSOCIATION**

Pelagic			Benthic X							Epibiotic			
PL	NE	SUB	DEM X		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				X									

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Lesueur, 1817)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Cyprinodontiformes

**Suborder:** Cyprinodontoidei

**Infraorder:**

**Superfamily:**

**Family:** Fundulidae

**Subfamily:**

**Also Known As (Name - Type):**

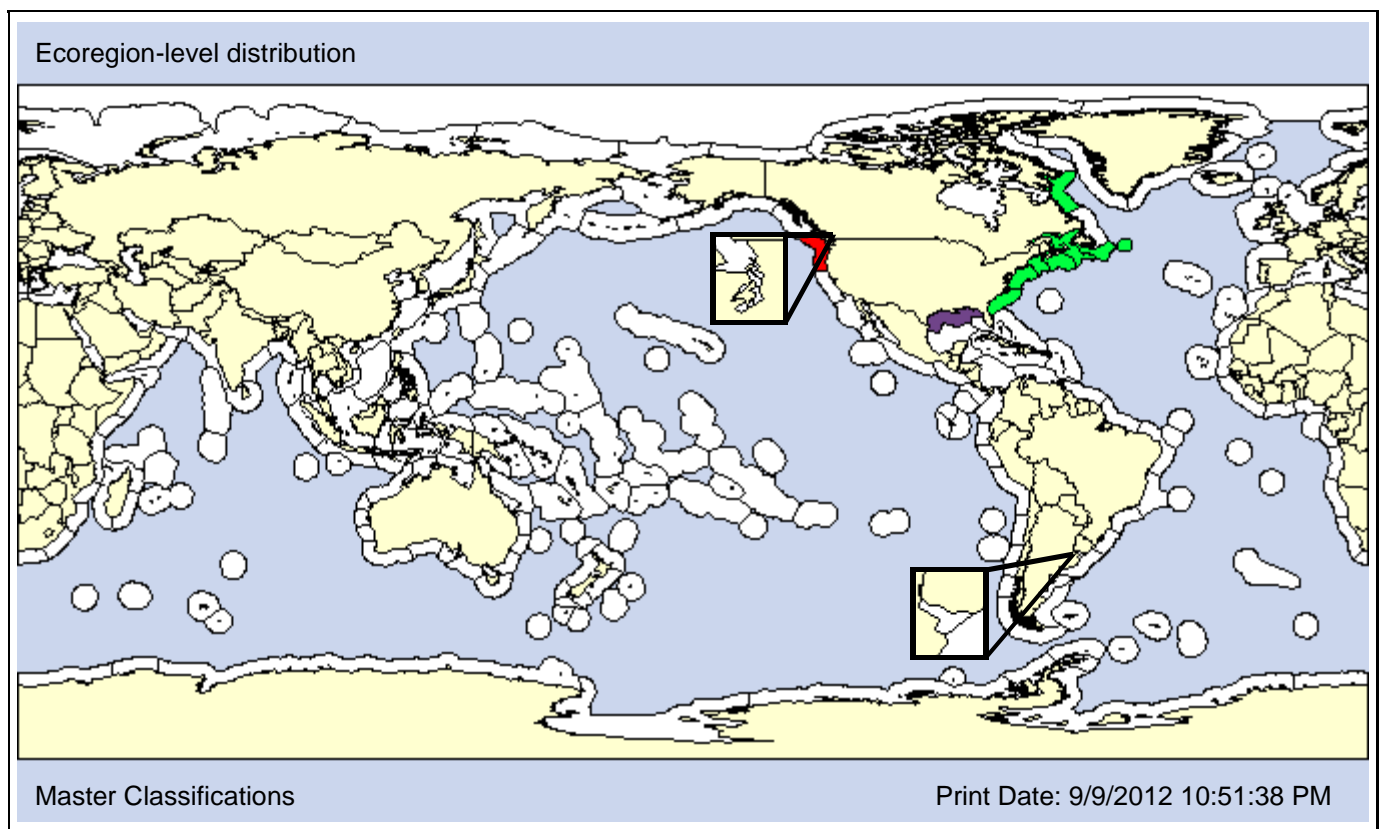
Fundulus diaphanus diaphanus  
Fundulus multifaciatius  
Hydrargira diaphana

Convention  
Synonym  
Synonym

**Common Names:**

banded killifish  
Eastern banded killifish  
Western banded killifish

**Type Locality:**



**Date 1st record:**

1971

**Loc 1st record:**

Columbia River, WA

**Established:**

Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P	X		
				X		AO	PO			X				

Comments: The benthopelagic *Fundulus diaphanus* is native to Atlantic slope drainages in North America, and has invaded the Columbia River. It prefers freshwater habitat, but it is a salinity tolerant (euryhaline) species.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0 - 1m] [Pref: 1 - 1m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 10psu] [Pref: 0 - 10psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>P</b>	<b>P</b>	<b>P</b>					

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										



**Taxon:** Ray-finned fish

**Taxonomic Author:** (Baird & Girard, 1853)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Cyprinodontiformes

**Suborder:** Cyprinodontoidei

**Infraorder:**

**Superfamily:**

**Family:** Poeciliidae

**Subfamily:**

**Also Known As (Name - Type):**

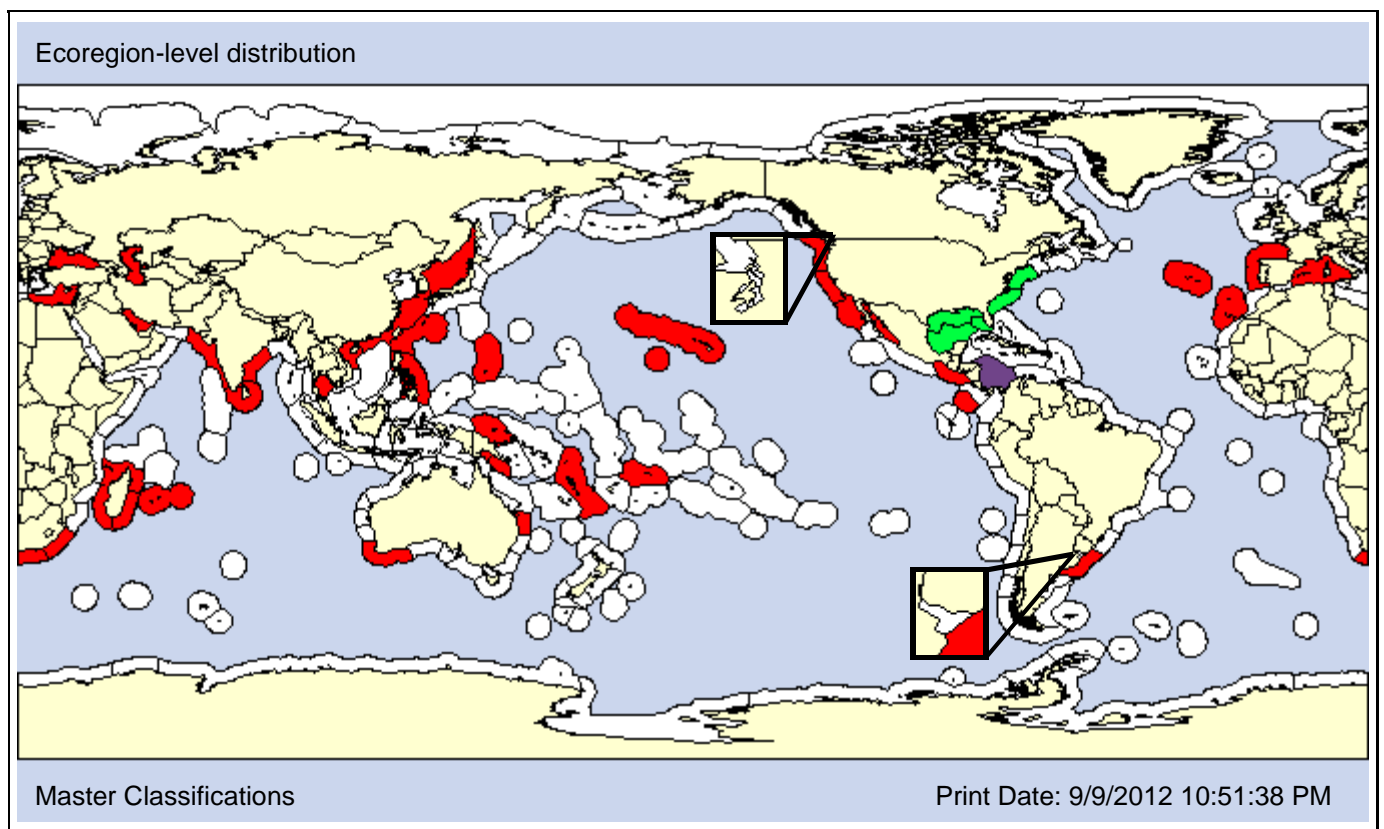
Fundulus inurus  
 Gambusia affinis affinis  
 Gambusia gracilis  
 Gambusia humilis

Synonym  
 Convention  
 Synonym  
 Synonym

**Common Names:**

Kadayashi (Japanese)  
 Kadayasi (Japanese)  
 live-bearing tooth-carp  
 mosquitofish

**Type Locality:**



Master Classifications Print Date: 9/9/2012 10:51:38 PM

■ Native  
 ■ Nonindigenous  
   NIS Not Established  
   Cryptogenic  
   Transient  
   Unclassified  
   Conflicting Classification  
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Unknown                      1905                      1922  
**Loc 1st record:** Unknown                      Oahu, Hawaii                      California  
**Established:**    Yes                      Yes                      Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P			X	
				X		AO	PO								

Comments: The benthopelagic *Gambusia affinis* is native to the Mississippi River basin and now has a nearly pan-global distribution. It generally inhabits freshwater, but is also found in brackish environments, and in Hawaii is found at salinities as high as 40 psu. It was frequently introduced for mosquito control.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0.9 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>					<b>O</b>

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - 40psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

# *Herklotsichthys quadrimaculatus*

Species ID: 122879

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Rüppell, 1837)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Clupeomorpha

**Order:** Clupeiformes

**Suborder:** Clupeoidei

**Infraorder:**

**Superfamily:**

**Family:** Clupeidae

**Subfamily:**

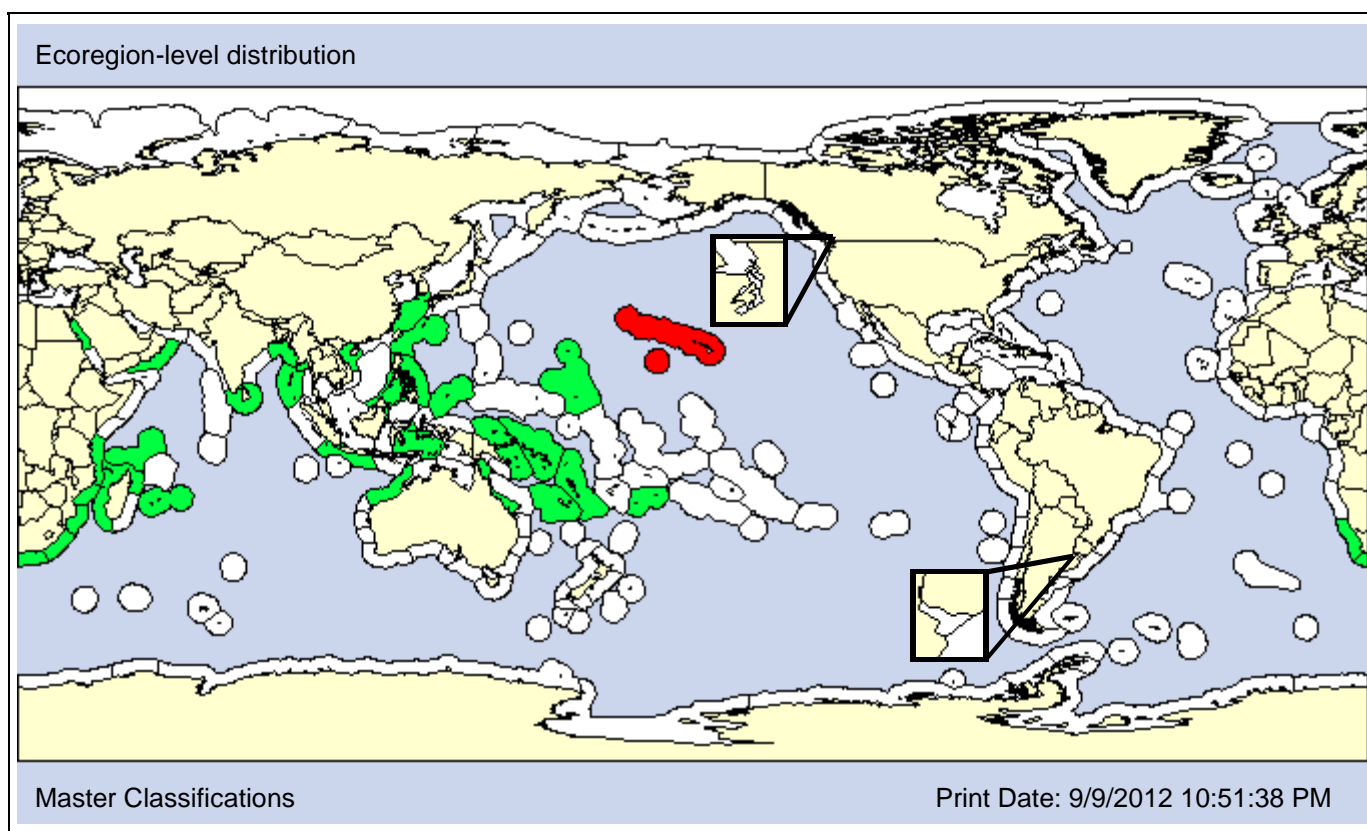
**Also Known As (Name - Type):**

Alausa schrammii	Synonym
Clupea dubia	Synonym
Clupea quadrimaculata	Synonym
Herklotsichthys punctatus of Hawaiian authors; not (Rüppell)	Misidentified

**Common Names:**

bluestripe herring  
 fourspot herring  
 gold spot herring  
 gold spot sardine

**Type Locality:**



<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;">■</span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: cyan;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;">■</span> Unidentified
NWP			Hawaii			NEP	

**Date 1st record:** Unknown 1972  
**Loc 1st record:** Unknown Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
						AO	PO					X			

Comments: *Herklotsichthys quadrimaculatus* was introduced into Hawaii when individuals from the Marshall Islands used for tuna bait were released (Carlton and Eldredge, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>O</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>		<b>X</b>		TP	RI-PH		<b>X</b>		<b>X</b>	

**DEPTH [Obs: 1 - 13m] [Pref: 1 - 13m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: - 35psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Ray-finned fish

**Taxonomic Author:** McAllister, 1963

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Protacanthopterygii

**Order:** Osmeriformes

**Suborder:** Osmeroidei

**Infraorder:**

**Superfamily:** Osmeroidea

**Family:** Osmeridae

**Subfamily:**

**Also Known As (Name - Type):**

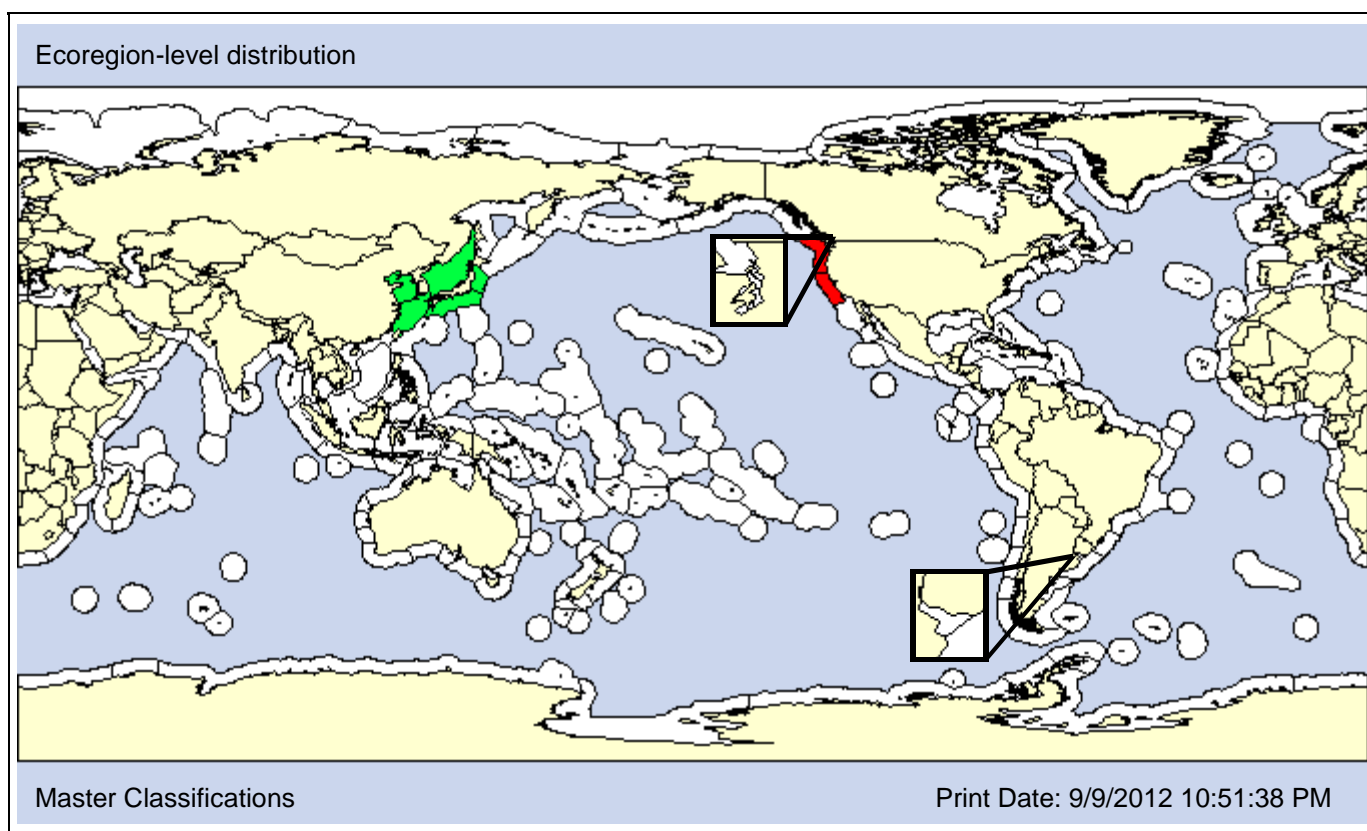
Hypomesus transpacificus nipponensis

Synonym

**Common Names:**

freshwater smelt  
Japanese pond smelt  
Japanese smelt  
wakasagi

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1959

**Loc 1st record:** Native

California

**Established:** Yes

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P	X			
				X		AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic		<b>P</b>	Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
-----	------	------------	--------	--------	-----------------	---------

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 26.8psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>						DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Valenciennes, 1840)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Ostariophysii

**Order:** Siluriformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ictaluridae

**Subfamily:**

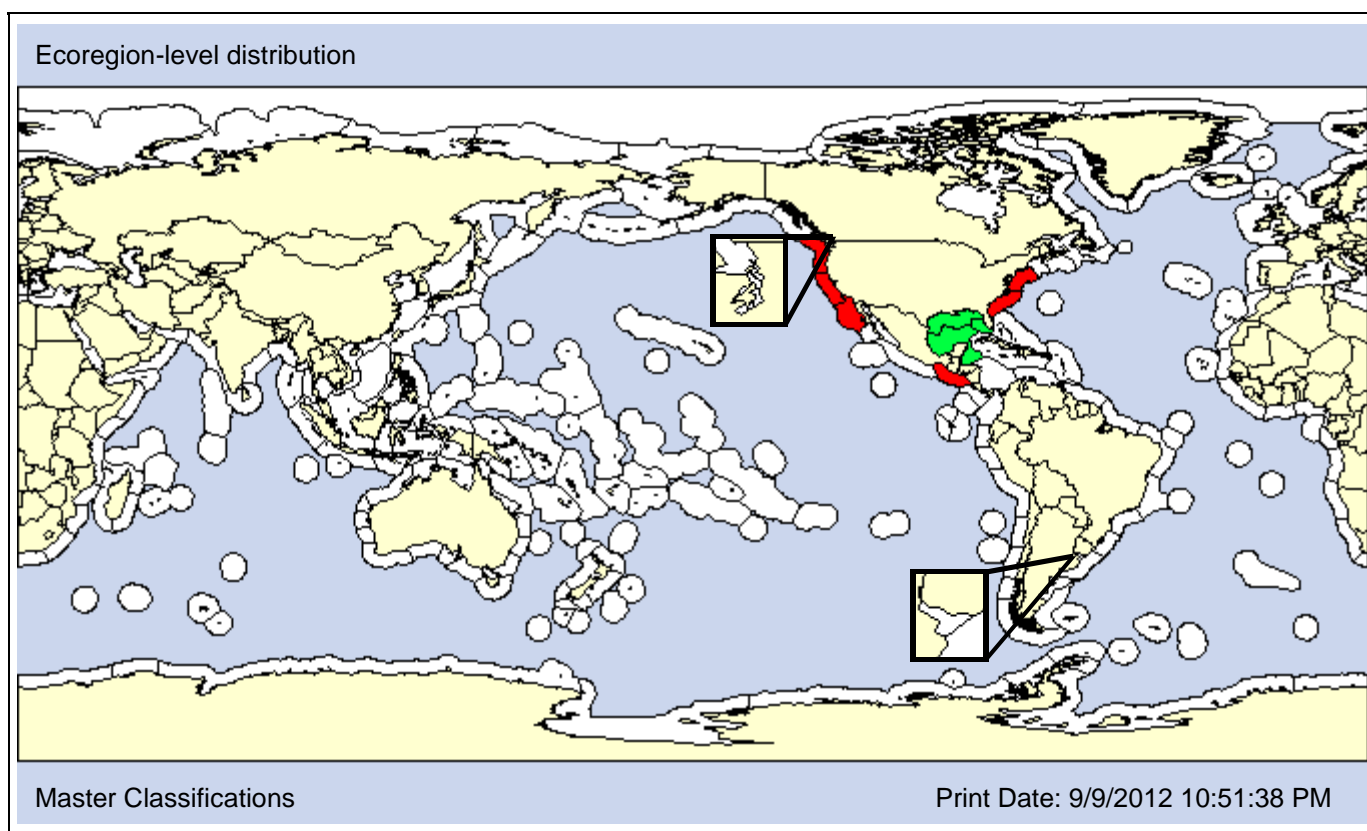
**Also Known As (Name - Type):**

Ictalurus meridionalis	Synonym
Pimelodus furcatus	Synonym

**Common Names:**

blue catfish

**Type Locality:** New Orleans, Louisiana, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1980

1969

**Loc 1st record:** China

San Diego County, CA

**Established:** Unknown

Yes

**VECTORS**

SH			MS	AF <span style="color: red;">X</span>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: *Ictalurus furcatus* primarily inhabits larger rivers and streams though it is occasionally found in brackish waters. It was intentionally introduced into China in the 1980s for aquaculture (Ma et al., 2003) though no specific locations were identified.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 3.7 - 50m] [Pref: - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>	<b>O</b>	<b>P</b>		<b>P</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 15psu] [Pref: 0 - 3.7psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									



**Taxon:** Ray-finned fish

**Taxonomic Author:** (Rafinesque, 1818)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Siluriformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ictaluridae

**Subfamily:**

**Also Known As (Name - Type):**

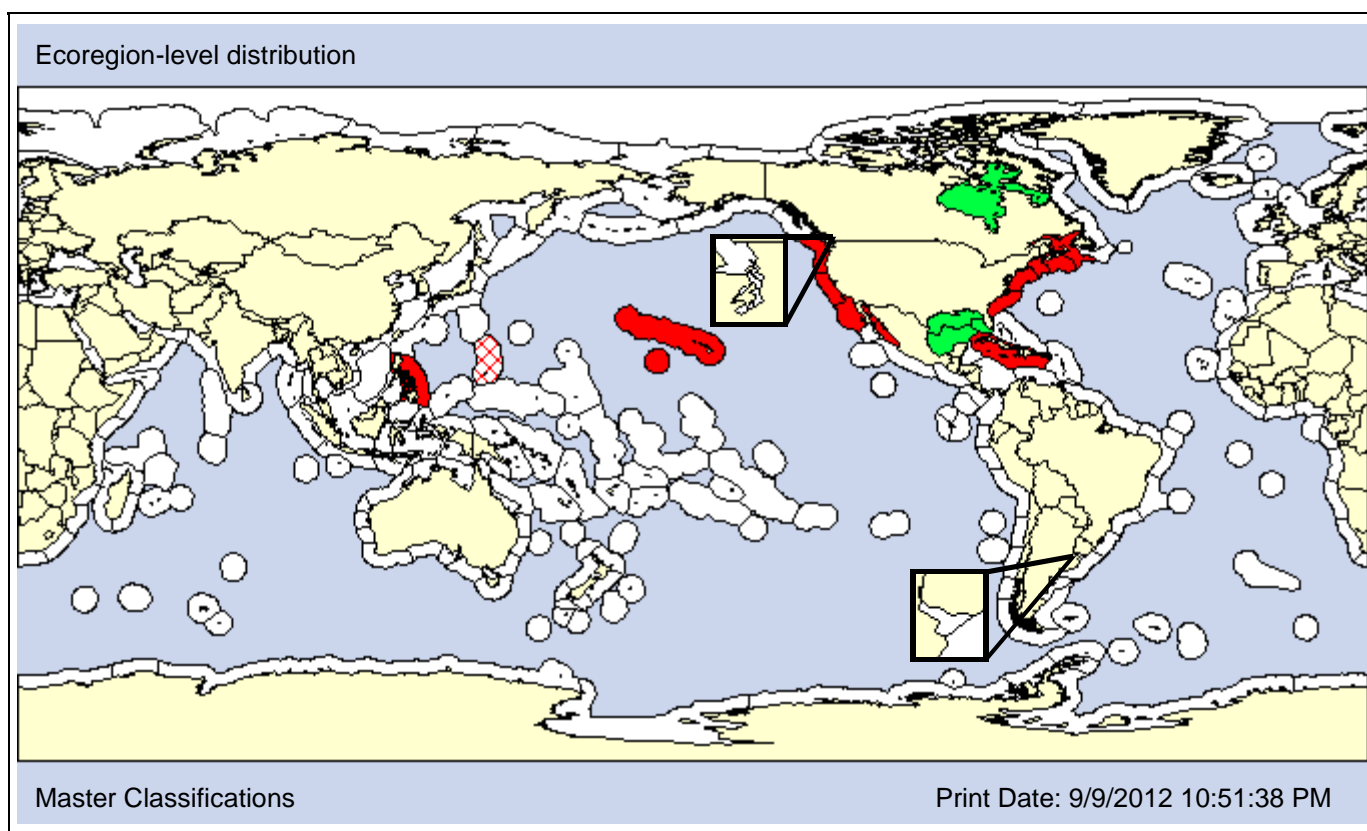
Ictalurus anguilla  
Silurus punctatus

Synonym  
Synonym

**Common Names:**

channel catfish  
spotted catfish

**Type Locality:** Ohio River, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

<b>Date 1st record:</b> 1971	1953	1891
<b>Loc 1st record:</b> Japan - inland	Hawaii	California
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

SH			MS	AF <span style="color: red;">X</span>			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
				X		AO	PO							X

Comments: *Ictalurus punctatus* is a freshwater fish though it occasionally inhabits brackish waters. It is native to the central drainages of the United States. It has been introduced for aquaculture into numerous regions including the NWA, NEP, Hawaii, China, Japan, Russia, Korea, and Taiwan, though the specific locations in Asia are not known.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: - 15m] [Pref: - 15m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>		<b>P</b>	<b>P</b>		

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 11psu] [Pref: 0 - 1.7psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** Yokogawa & Seki, 1995

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Percoidei

**Infraorder:**

**Superfamily:**

**Family:** Lateolabracidae

**Subfamily:**

**Also Known As (Name - Type):**

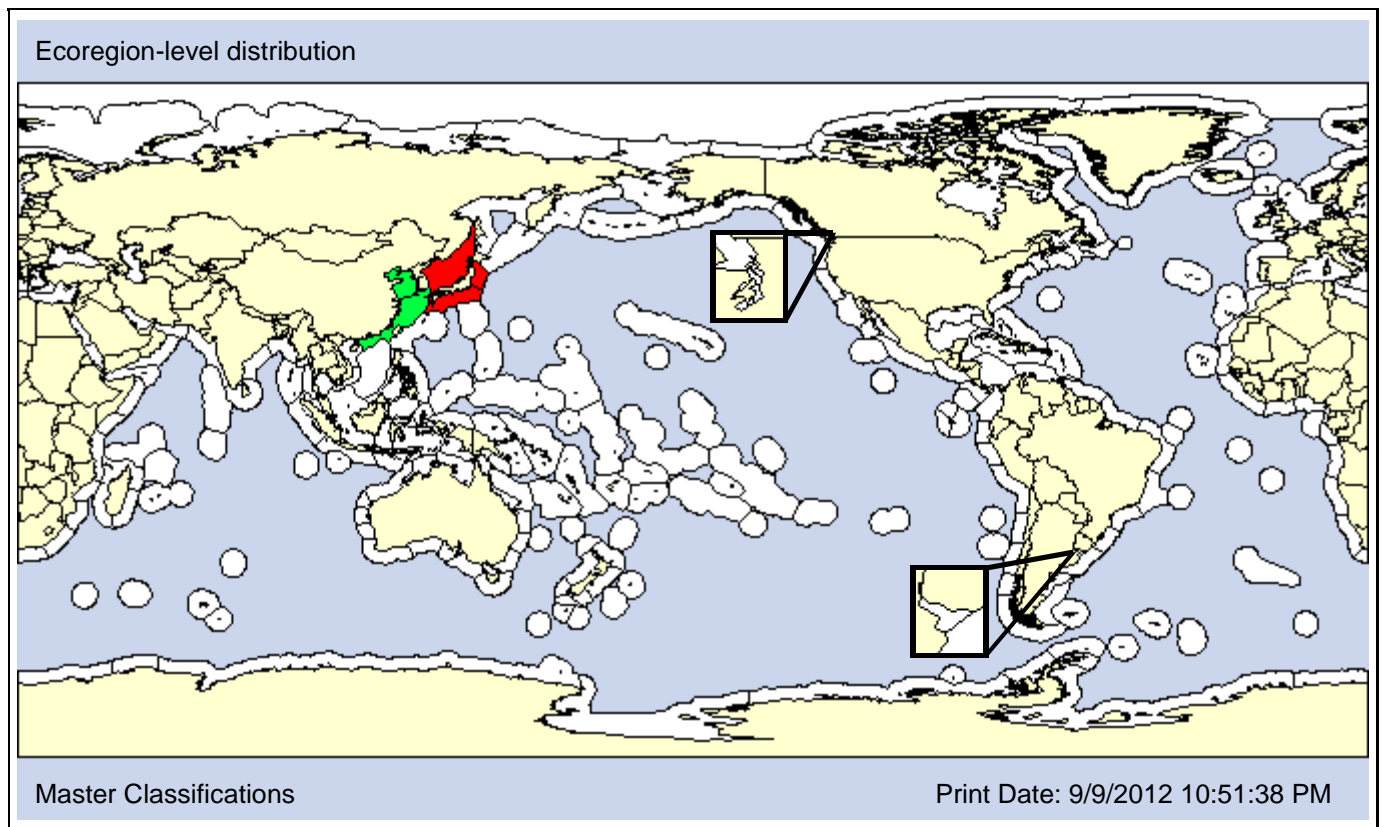
Lateolabrax sp. (NIES)  
Lateolabrax sp. of authors

Synonym  
Partial synonym

**Common Names:**

Chinese seabass  
continental seabass

**Type Locality:** Asia



**Date 1st record:** 1989

**Loc 1st record:** Western Japan

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: The Chinese seabass, *Lateolabrax sp.* (Yokogawa and Seki, 1995), was introduced into Japan in 1989. The first wild population was recorded in 1992 at Uwajima, Ehime Prefecture (NIES). We assume the life history of the undescribed *L. sp.* is similar to *L. japonicus*.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>				<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 32.3psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
	<b>X</b>									

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Bloch, 1790)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Centropomidae

**Subfamily:**

**Also Known As (Name - Type):**

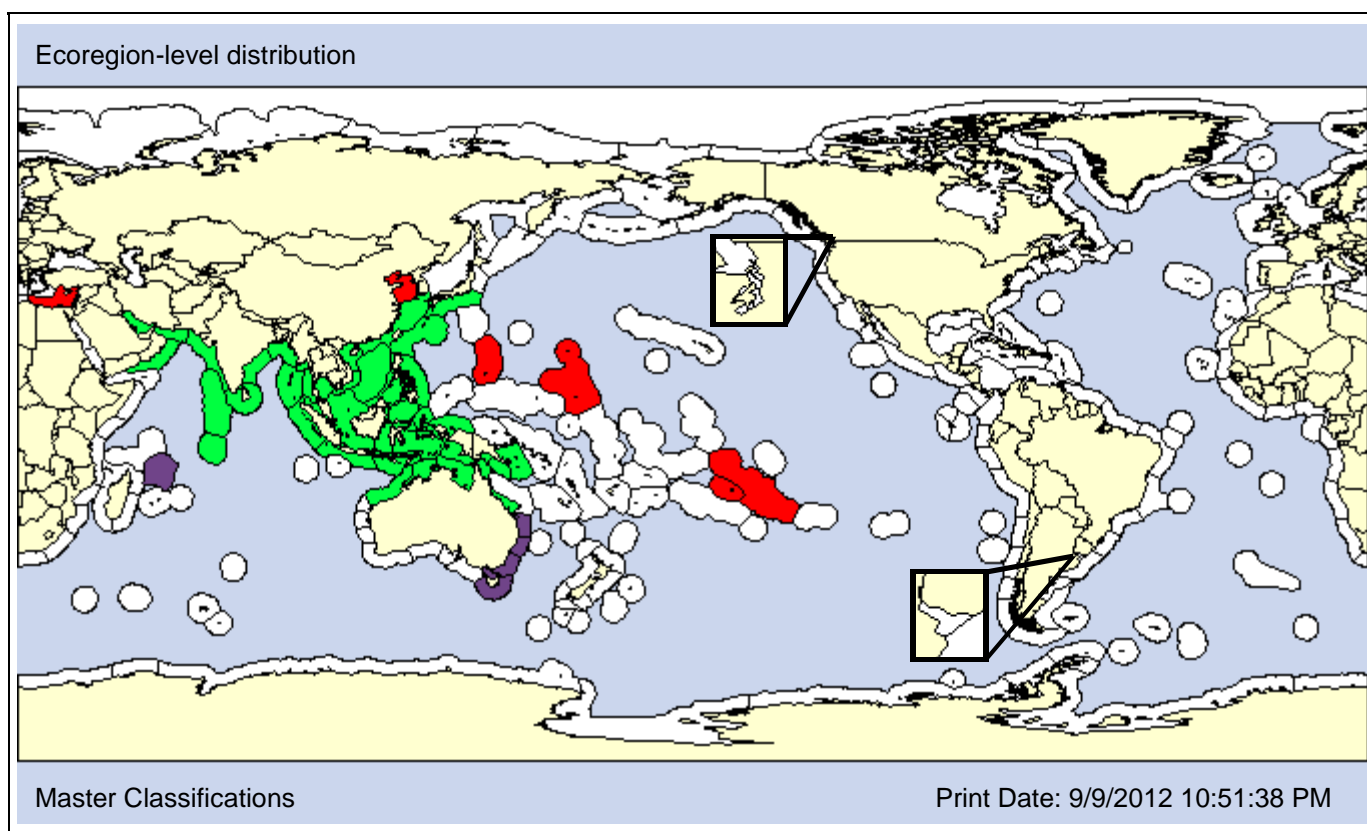
Coius vacti  
 Holocentrus calcarifer  
 Lates darwiniensis  
 Pseudolates cavifrons

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

Asian sea bass  
 Barramundi  
 giant perch

**Type Locality:**



**Date 1st record:** 1983

**Loc 1st record:** China

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: The native range of the catadromous *Lates calcarifer* is the "eastern edge of the Persian Gulf to China, Taiwan and southern Japan, southward to southern Papua New Guinea and northern Australia" (FishBase). It has been introduced into the Yellow Sea and perhaps other part of China for mariculture (UNDP/GEF, 2007).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>				<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 3 - 40m] [Pref: 10 - 40m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic <b>P</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep			
	<b>P</b>	<b>P</b>			

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
										<b>O</b>				

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - 35psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
<b>H X</b>		G/D	<b>SF X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
	<b>X</b>				<b>X</b>					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	<b>DEM X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Guichenot, 1853)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Cyprinodontiformes

**Suborder:** Cyprinodontoidei

**Infraorder:**

**Superfamily:**

**Family:** Poeciliidae

**Subfamily:**

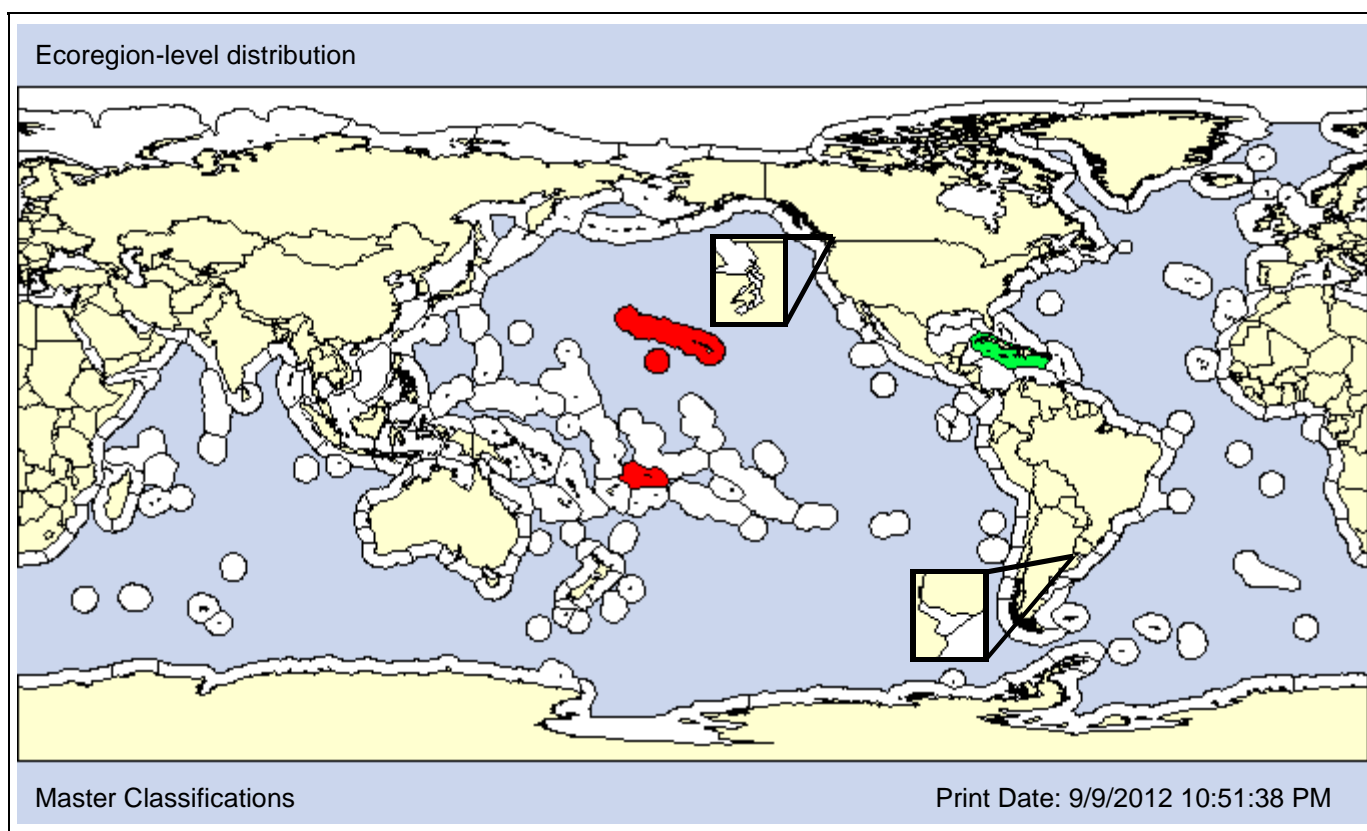
**Also Known As (Name - Type):**

Poecilia vittata	Synonym

**Common Names:**

banded limia
Cuban limia
Cuban molly
Cuban topminnow

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1950  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF			ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA	IR			A	P			
						AO	PO			X	X			

Comments: *Limia vittata* is endemic to Cuba but has been introduced into Hawaii (Carlton and Eldredge, 2009) and American Samoa (FishBase), probably through aquarium releases.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>	<b>X</b>		TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>					

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>	<b>O</b>					

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										



**Taxon:** Ray-finned fish

**Taxonomic Author:** (Baird & Girard, 1855)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Cyprinodontiformes

**Suborder:** Cyprinodontoidei

**Infraorder:**

**Superfamily:**

**Family:** Fundulidae

**Subfamily:**

**Also Known As (Name - Type):**

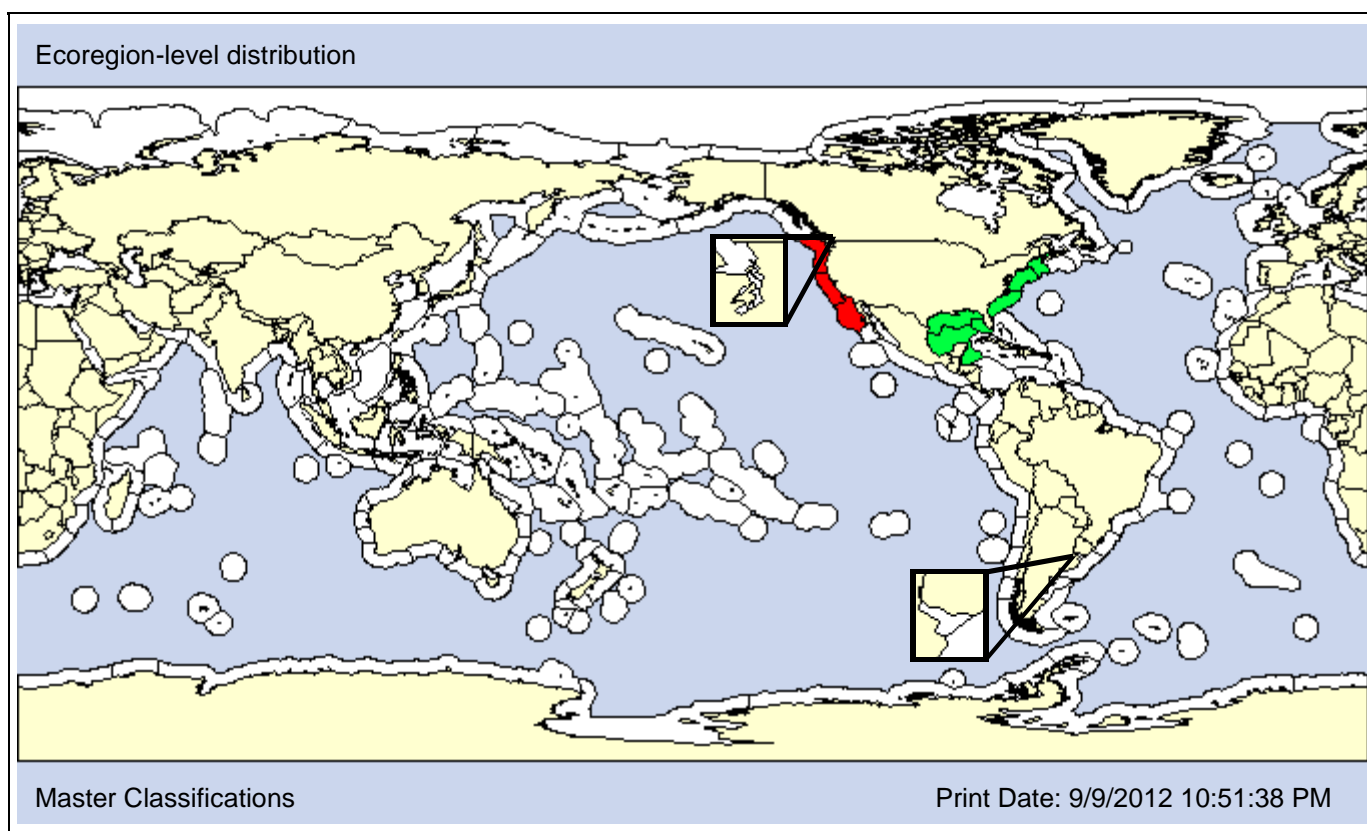
Cyprinodon parvus  
Limia venusta  
Lucania affinis

Synonym  
Synonym  
Synonym

**Common Names:**

rainwater killifish

**Type Locality:** New Jersey, USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1950s

**Loc 1st record:**

San Francisco Estuary, CA

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	<b>AF X</b>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
<b>X</b>						<b>AO X</b>	PO								

Comments: A likely vector for the rainwater killifish, *Lucania parva*, is as contaminated stock with other fishes transported for aquaculture or bait. They may also have been transported to the NEP via ballast water or as eggs on Atlantic oysters.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>O</b>				<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH			<b>X</b>		
		<b>X</b>											

**DEPTH [Obs: 0 - 1m] [Pref: 0 - 1m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>						

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 80psu] [Pref: 0.7 - 24.2psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Forster, 1801)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Percoidei

**Infraorder:**

**Superfamily:**

**Family:** Lutjanidae

**Subfamily:**

**Also Known As (Name - Type):**

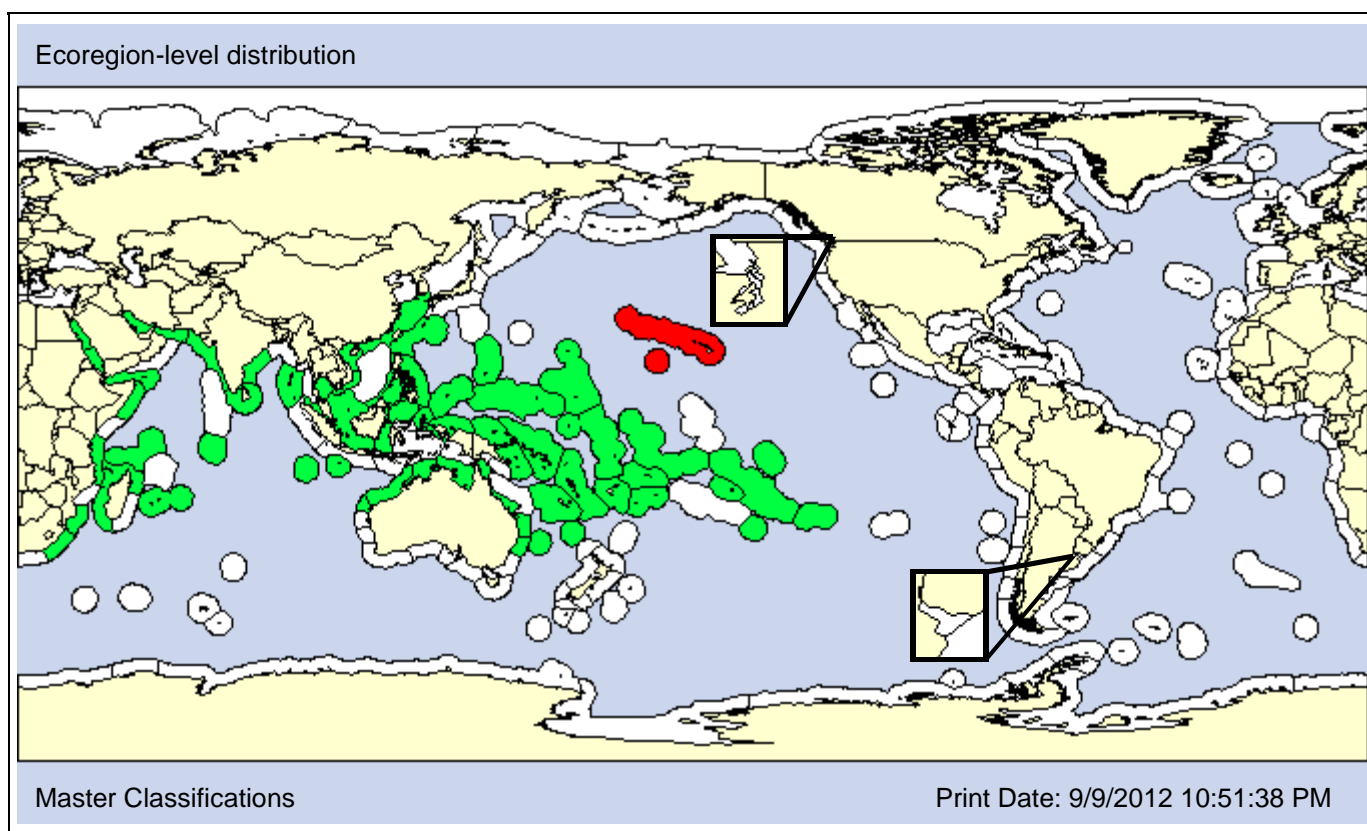
Diacope analis  
Diacope aurantiaca  
Diacope flavipes  
Diacope immaculata

Synonym  
Synonym  
Synonym  
Synonym

**Common Names:**

blacktail snapper  
flame-colored snapper  
flametail snapper  
toau

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1956  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

SH			MS	AF <span style="color: red;">X</span>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
				<span style="color: red;">X</span>		AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>			<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH [Obs: 1 - 128m] [Pref: 1 - 75m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>	<b>P</b>				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate P</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>							<b>O</b>					<b>P</b>

**SALINITY [Obs: 0 - psu]**

<b>Fresh O</b>	<b>Brackish O</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>		<b>O</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Forsskål, 1775)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Perciformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Lutjanidae

**Subfamily:**

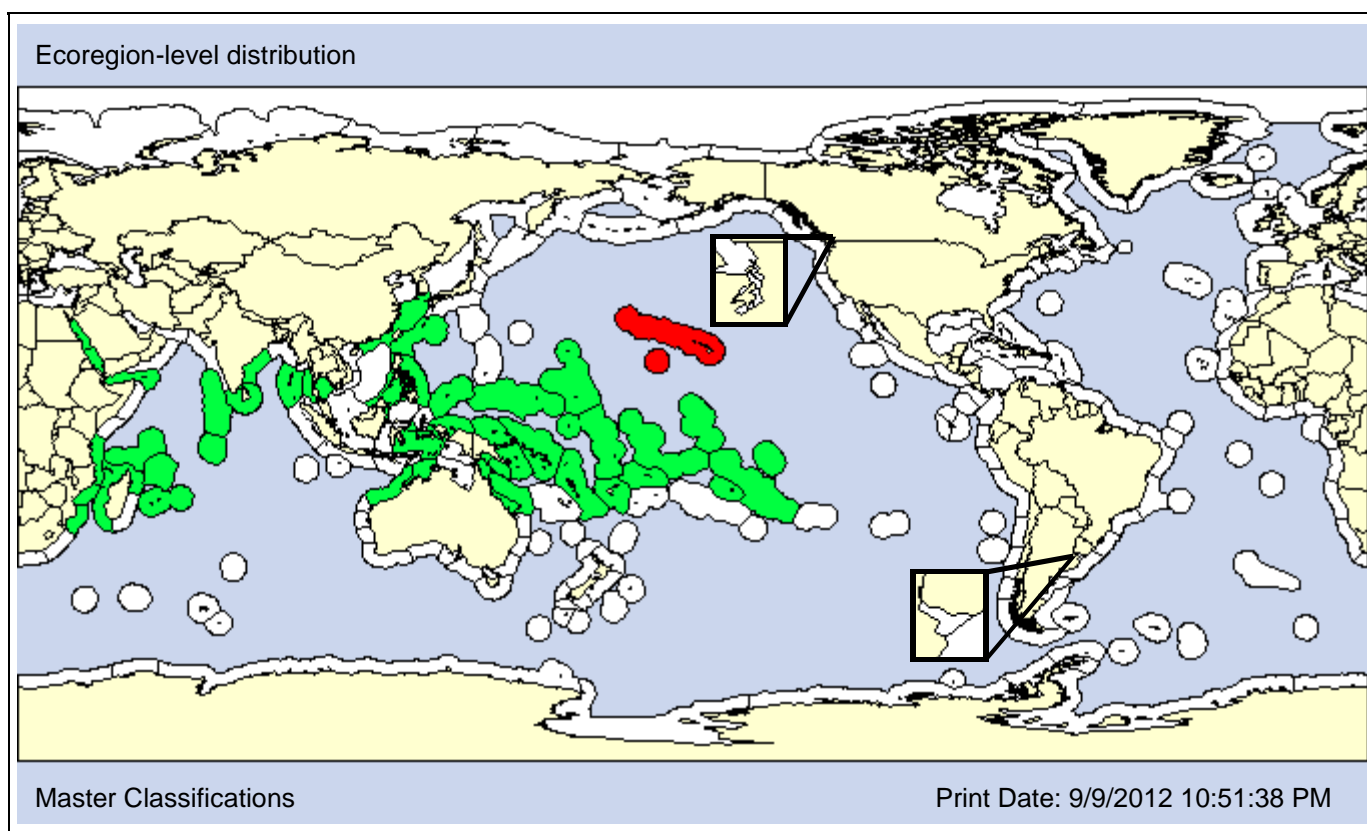
**Also Known As (Name - Type):**

Anthias heraldi	Synonym
Diacope axillaris	Synonym
Diacope borensis	Synonym
Diacope coccinea	Synonym

**Common Names:**

humpback red snapper
humpback snapper
paddletail
red snapper ( <i>Lutjanus gibbus</i> )

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1958  
**Loc 1st record:** Native Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH		<b>X</b>			

**DEPTH [Obs: 1 - 150m] [Pref: 6 - 29m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>						<b>P</b>						

**SALINITY [Obs: 31 - 34.2psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Forsskål, 1775)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Percoidei

**Infraorder:**

**Superfamily:**

**Family:** Lutjanidae

**Subfamily:**

**Also Known As (Name - Type):**

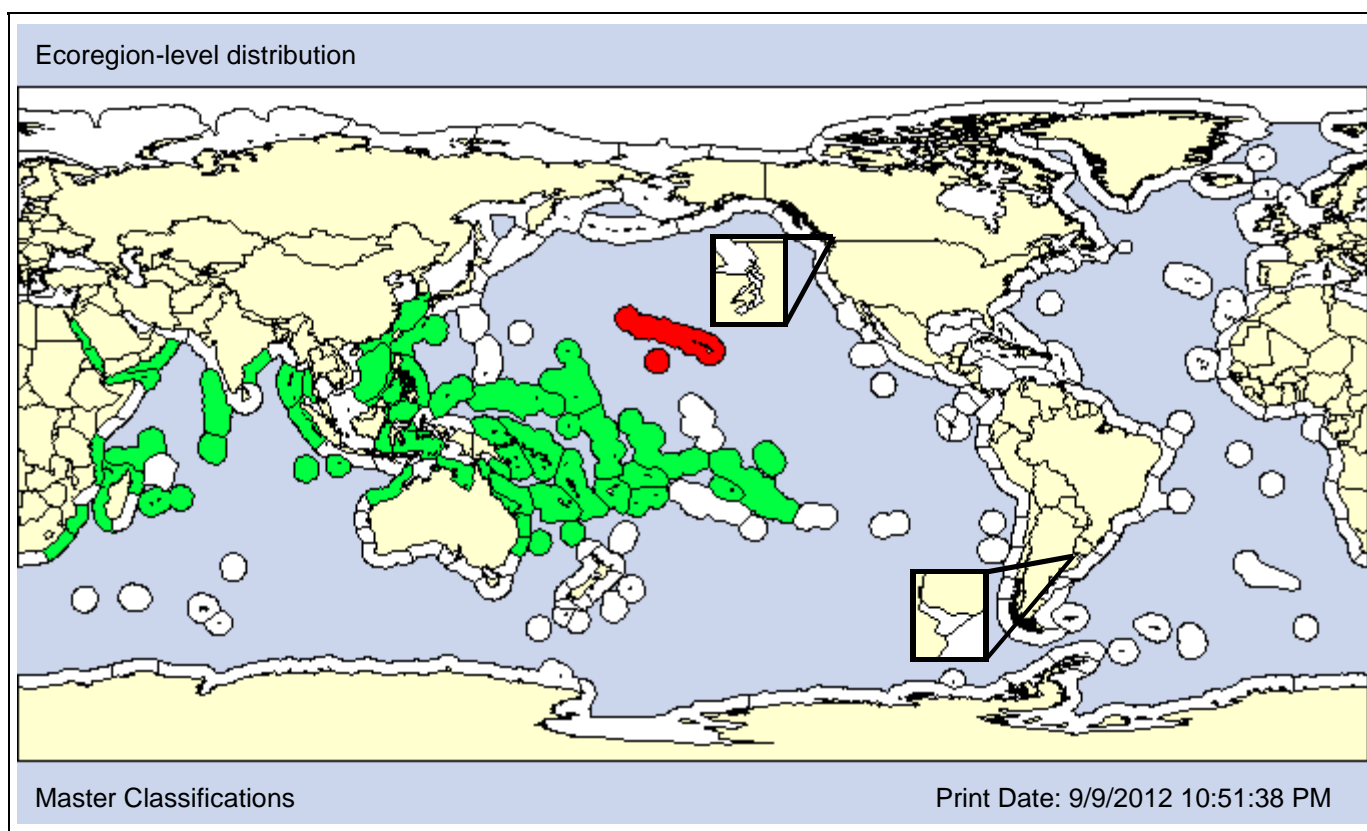
Diacope octolineata  
Lutianus kasmira  
Mesoprion etaape  
Mesoprion pomacanthus

Ambiguous syn.  
Synonym  
Synonym  
Synonym

**Common Names:**

blue stripe snapper  
blueline snapper  
blue-lined snapper  
blue-striped seaperch

**Type Locality:**



**Date 1st record:** Native 1958  
**Loc 1st record:** Native Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			IR	A				
				X		AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH		<b>X</b>			
		<b>X</b>											

**DEPTH [Obs: 3 - 275m] [Pref: 30 - 150m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep		<b>O</b>		
	<b>O</b>	<b>P</b>				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>												

**SALINITY [Obs: 34.8 - 35.1psu]**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										



**Taxon:** Ray-finned fish

**Taxonomic Author:** (Cope, 1867)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Atheriniformes

**Suborder:** Atherinoidei

**Infraorder:**

**Superfamily:**

**Family:** Atherinidae

**Subfamily:**

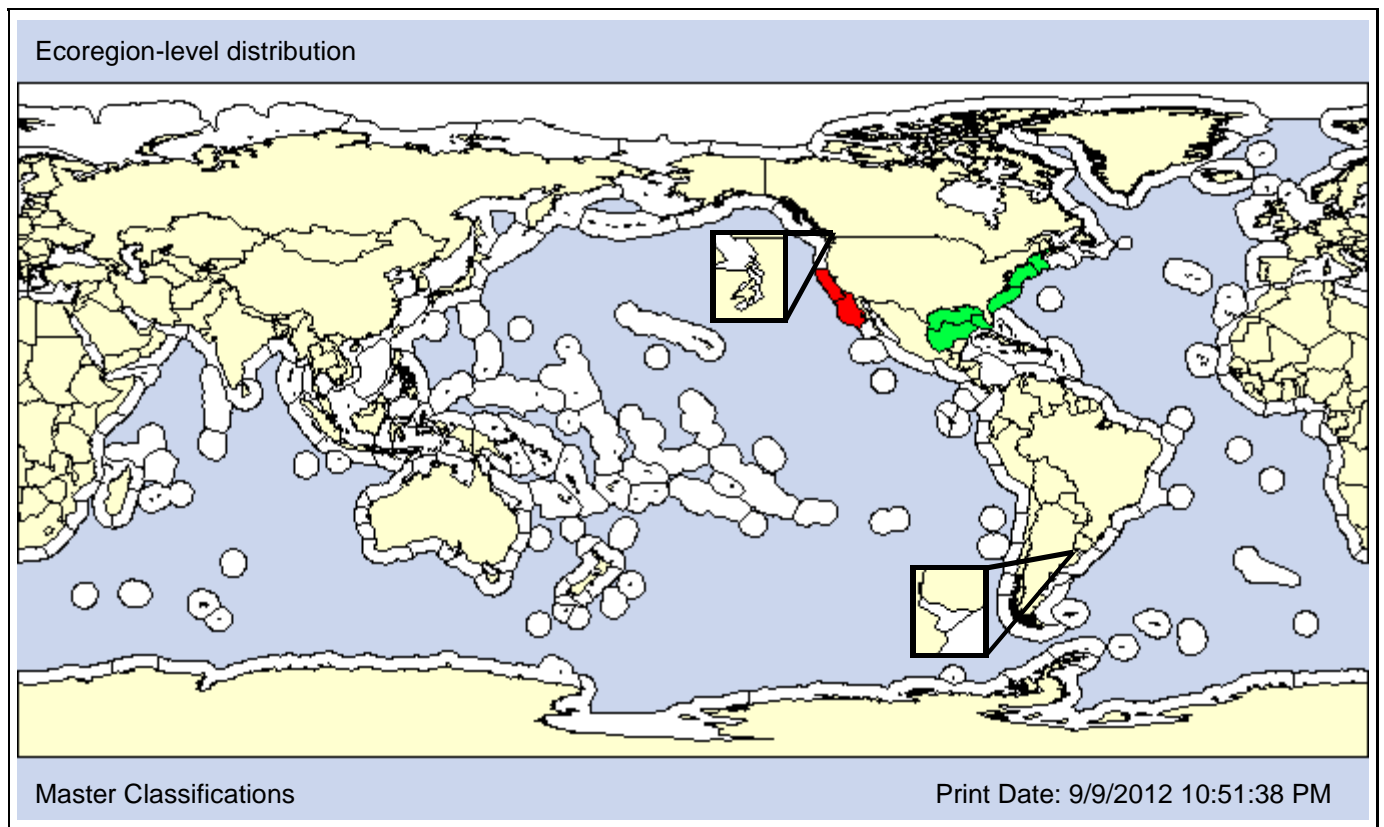
**Also Known As (Name - Type):**

Chirostoma beryllinum	Synonym
Ischnomembras gabunensis	Synonym
Menidia audens	Synonym
Menidia beryllina cerea	Convention

**Common Names:**

inland silverside  
Mississippi silverside

**Type Locality:** Potomac River, Washington D.C, USA



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
   Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1967  
**Loc 1st record:** Lake County, California  
**Established:** Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>			<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>	
BW	SB	HF		S/R	AE	AA	IR			A	P			X	
				X		AO	PO	X							

Comments: According to FishBase, *Menidia beryllina* is marine species that ascends rivers and also consists of landlocked populations that reproduce in freshwater. It was introduced into California for biocontrol, though it has also been stocked as forage for sport fish in freshwater systems.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>					<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0 - 2m] [Pref: 1 - 2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Walbaum, 1792)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Percoidei

**Infraorder:**

**Superfamily:**

**Family:** Moronidae

**Subfamily:**

**Also Known As (Name - Type):**

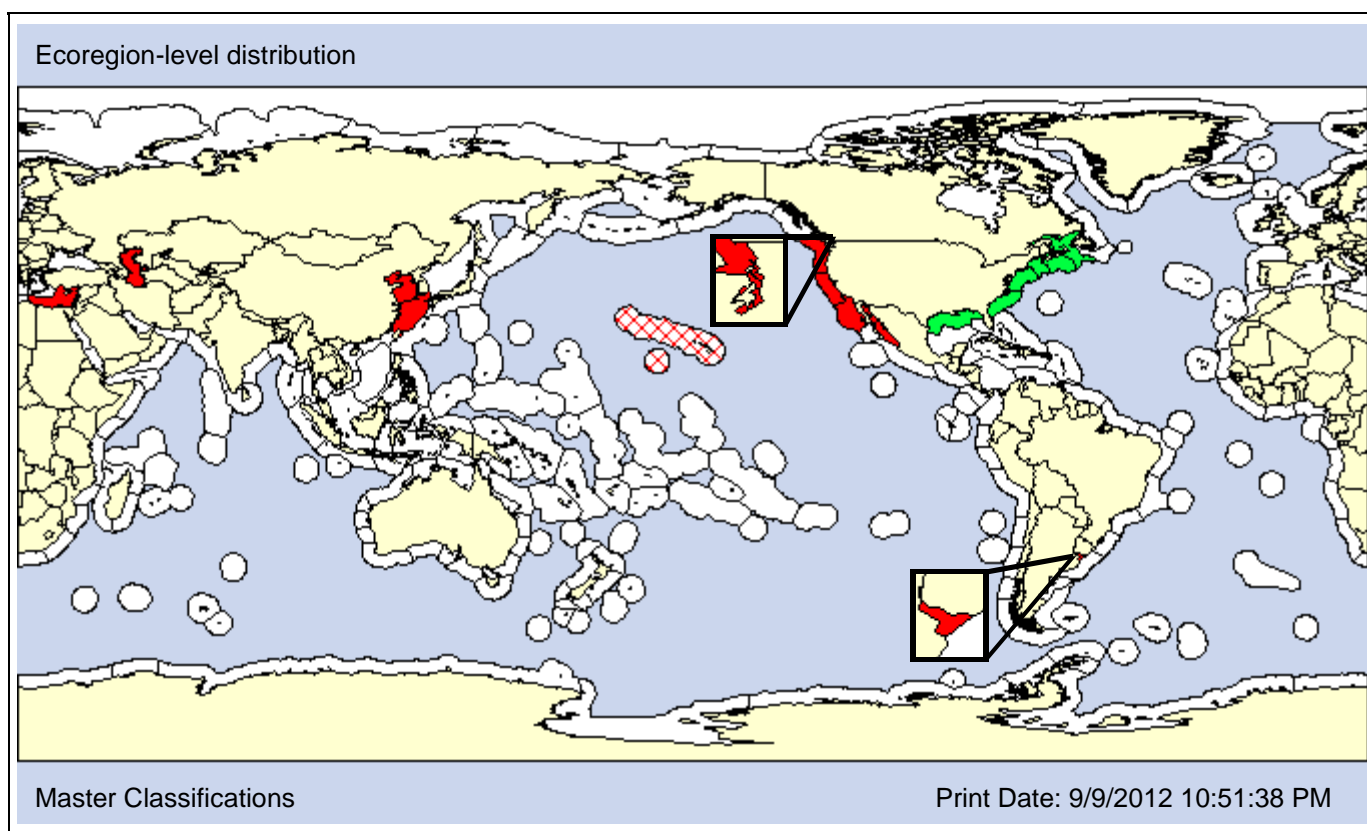
Morone lineatus  
Morone saxatilis  
Perca mitchilli alternata  
Perca saxatilis

Synonym  
Misspelling  
Synonym  
Synonym

**Common Names:**

gestreepte baars  
linesider  
rock bass (Morone saxatilis)  
rock fish (Morone saxatilis)

**Type Locality:** New York , USA



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1990 (NWP)      1922 (Hawaii)      1879 (NEP)  
**Loc 1st record:** China (NWP)      Hawaii (Hawaii)      San Francisco Estuary, CA (NEP)  
**Established:** Yes (NWP)      No (Hawaii)      Yes (NEP)

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
				X		AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			<b>P</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>		<b>X</b>		
		<b>X</b>											

**DEPTH [Obs: 1 - 97m] [Pref: 10 - 30m]****Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - 35psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT****JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Weber, 1909)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Gobioidi

**Infraorder:**

**Superfamily:**

**Family:** Gobiidae

**Subfamily:**

**Also Known As (Name - Type):**

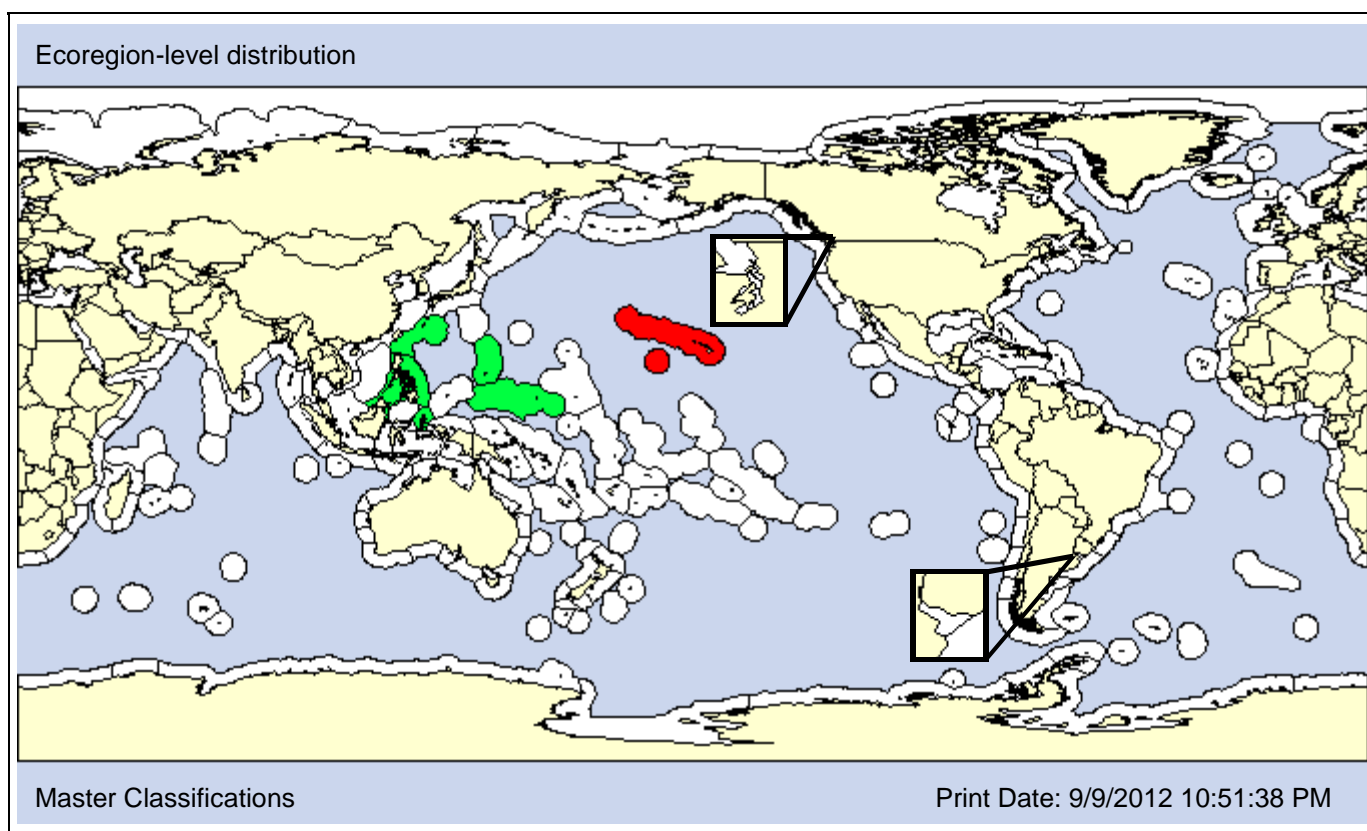
Gobius cavifrons  
 Mugilogobius parvus fide Larson, 2001  
 Tamanka philippina  
 Tamanka talavera

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

bandfin mullet goby  
 mangrove goby

**Type Locality:** Moluccas, Indonesia



**Date 1st record:**

1987

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
X						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>					<b>O</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					

**DEPTH [Obs: 0 - 1.2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>O</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>O</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>					

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 36psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Valenciennes, 1835)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Atheriniformes

**Suborder:** Atheriniformes

**Infraorder:**

**Superfamily:**

**Family:** Atherinopsidae

**Subfamily:**

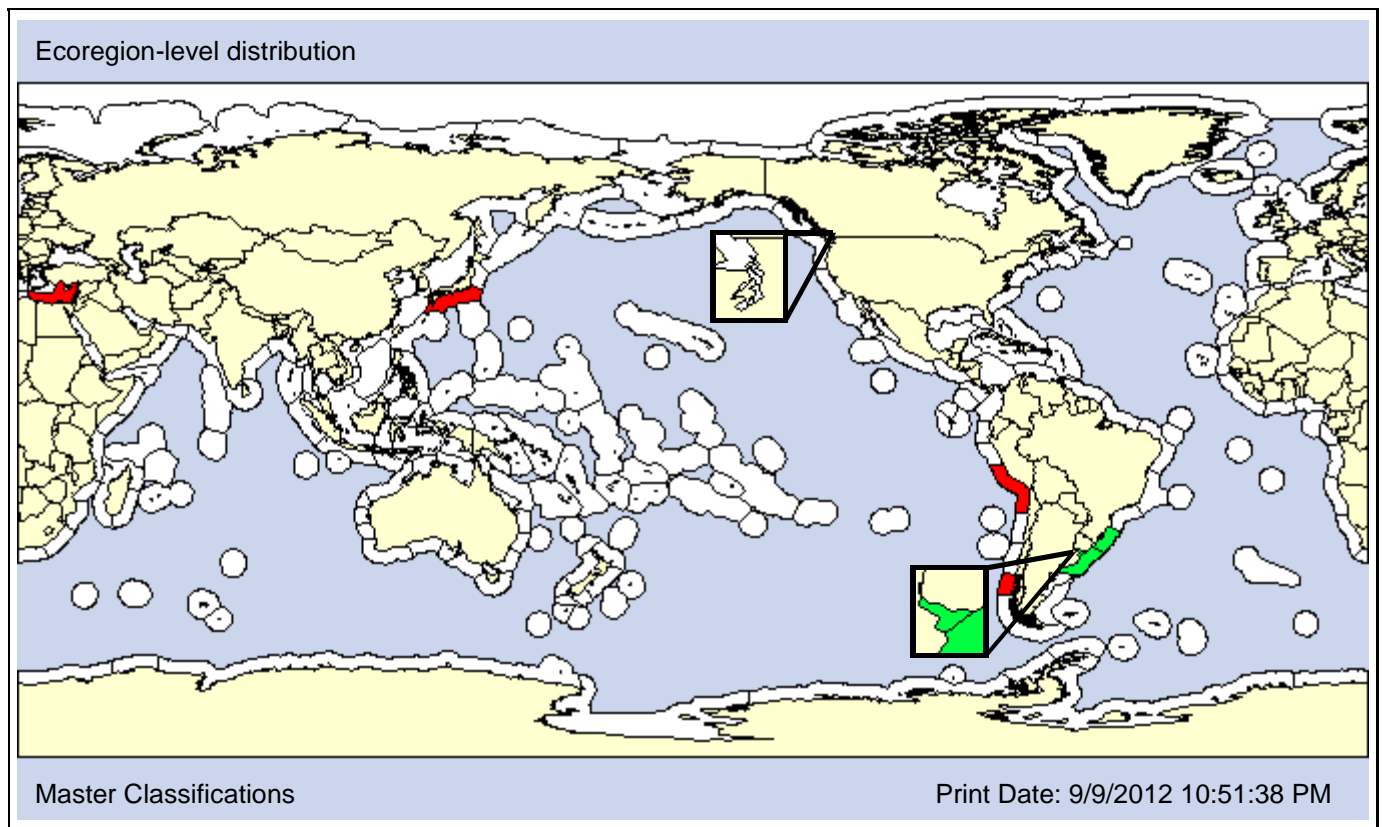
**Also Known As (Name - Type):**

Atherina bonariensis	Synonym
Atherina lichtensteini	Synonym
Basilichthys bonariensis	Synonym
Basilichthys punctanus	Synonym

**Common Names:**

Argentinian silverside
pejerrey
piexe rei
Rapurata-tougoro (Japanese)

**Type Locality:**



**Date 1st record:** 1966

**Loc 1st record:** Japan

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: *Odontesthes bonariensis* is primarily a freshwater species though it can tolerate brackish waters. It was introduced into Japan in 1966 and established wild populations.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 1 - m] [Pref: 1 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 20psu] [Pref: 0 - 15psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>				

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							



**Taxon:** Ray-finned fish

**Taxonomic Author:** (Herre, 1927)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Blennioidei

**Infraorder:**

**Superfamily:**

**Family:** Blenniidae

**Subfamily:**

**Also Known As (Name - Type):**

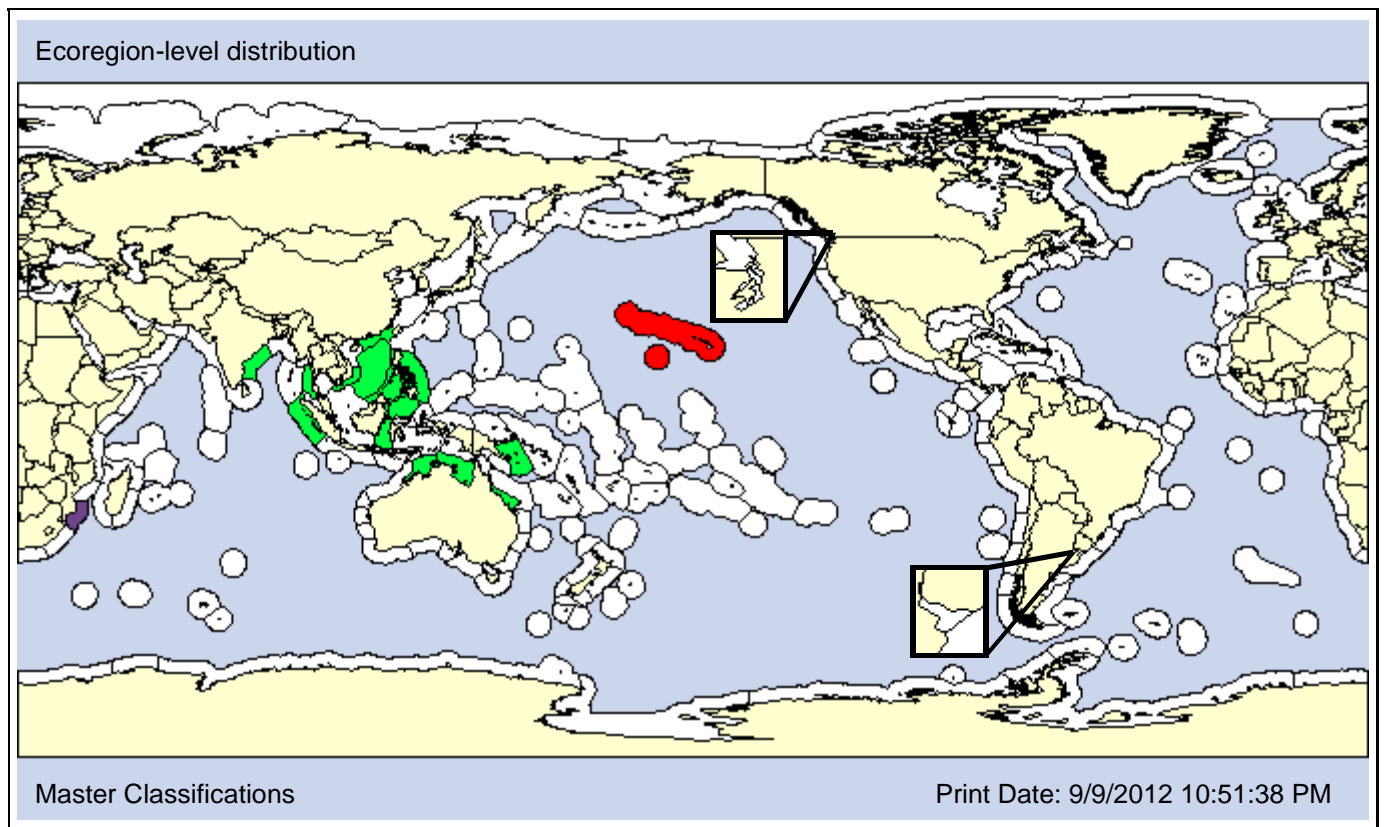
Omobranchus kranjiensis

Synonym

**Common Names:**

fang-toothed blenny  
gossamer blenny

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1998  
**Loc 1st record:** Oahu, Hawaii  
**Established:** Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF	<b>X</b>	S/R	AE	AA				A	P				
<b>X</b>						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>O</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 0 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
		<b>O</b>		<b>O</b>		

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate O</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>O</b>					<b>O</b>

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM X		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

# *Omobranchus rotundiceps*

Species ID: 122885

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Macleay, 1881)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Blennioidei

**Infraorder:**

**Superfamily:**

**Family:** Blenniidae

**Subfamily:**

**Also Known As (Name - Type):**

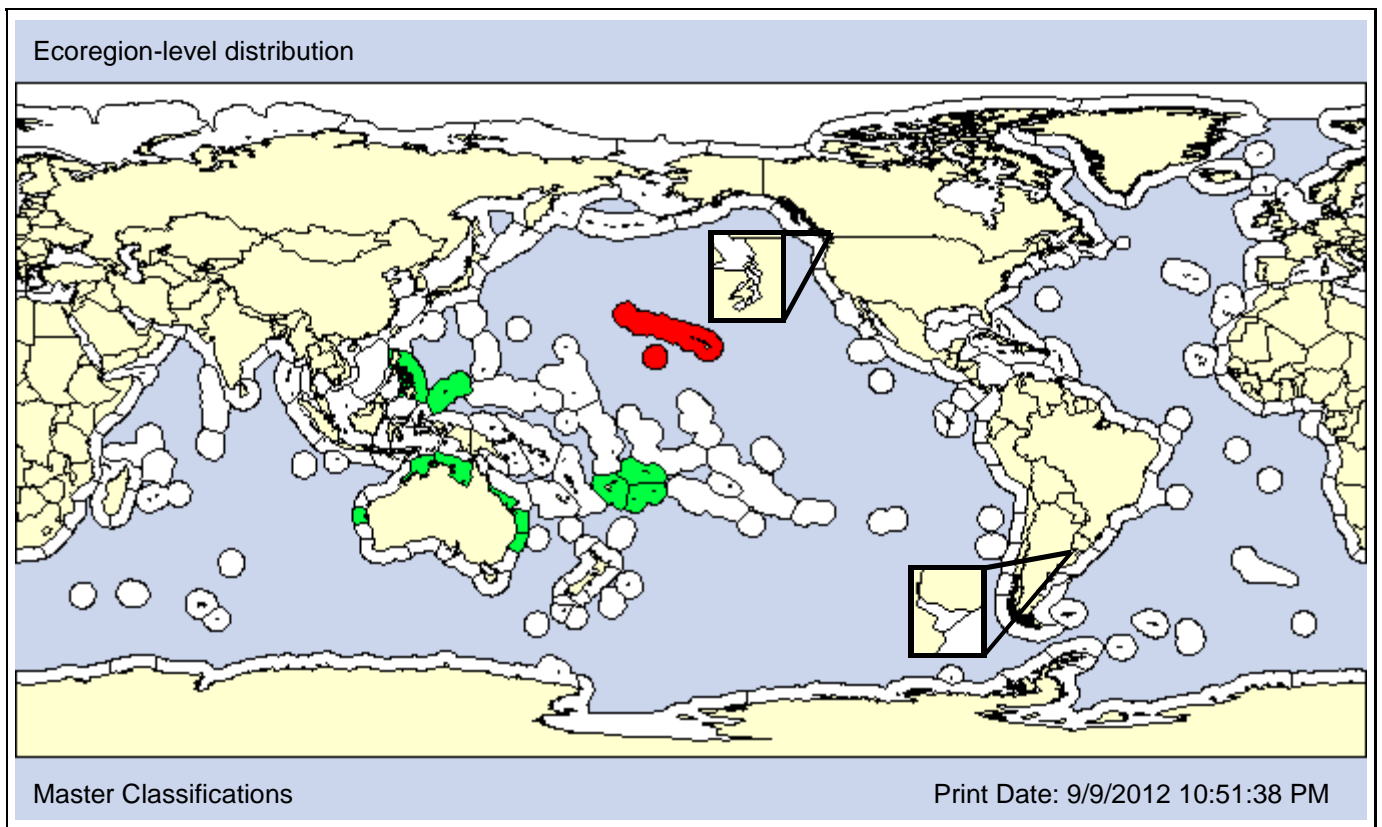
Omobranchus elongatus of Strasburg (1956, 1966)  
Omobranchus rotundiceps obliquus

Synonym  
Convention

**Common Names:**

mangrove blenny  
rocky-reef blenny  
roundhead blenny

**Type Locality:**



**Date 1st record:**

1951

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

SH			MS	AF				ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
						AO	PO			X					

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH	<b>X</b>	<b>X</b>		<b>X</b>	

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>P</b>							<b>O</b>			<b>O</b>	<b>O</b>	

**SALINITY**

<b>Fresh</b>	<b>Brackish O</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Walbaum, 1792)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Salmoniformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Salmonidae

**Subfamily:**

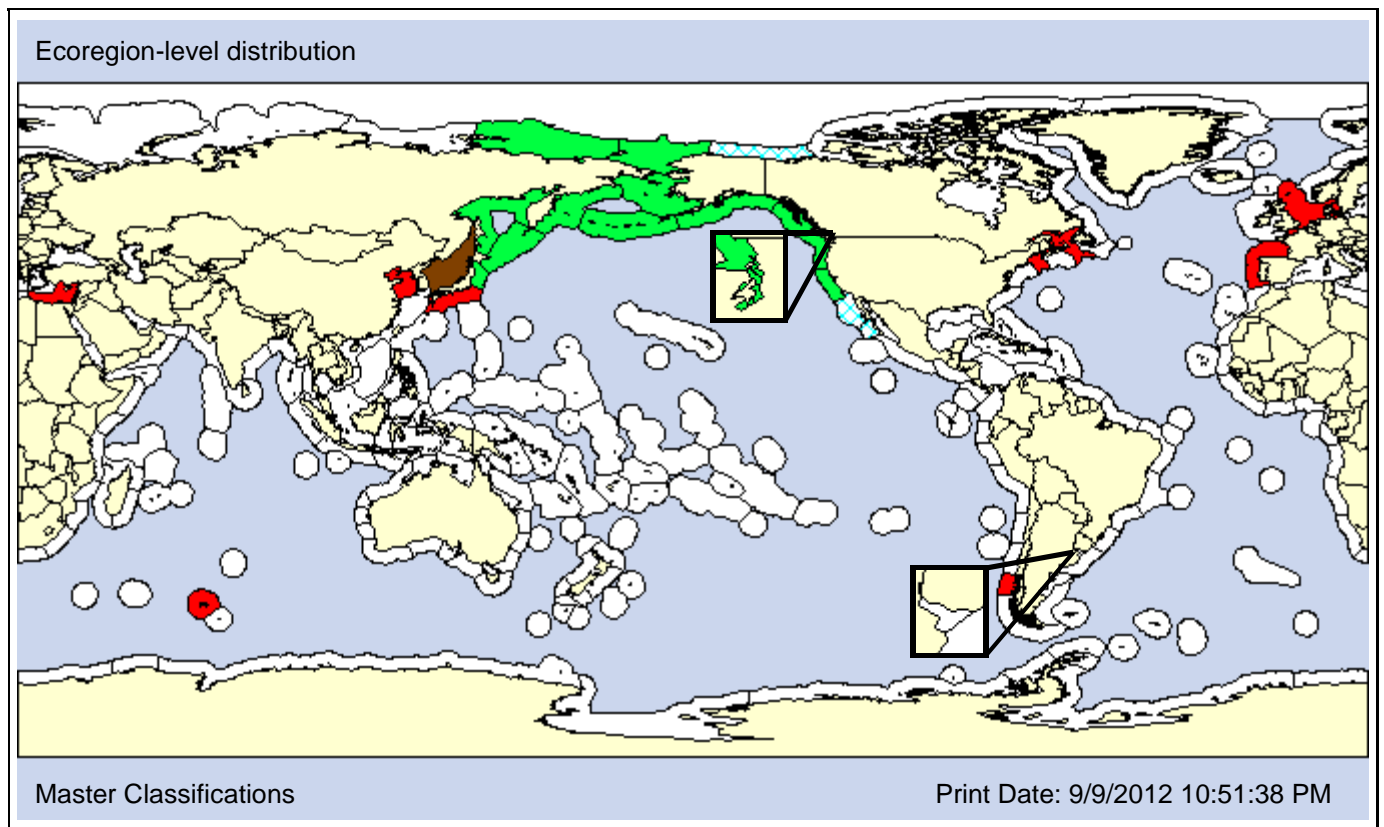
**Also Known As (Name - Type):**

Salmo kisutch	Synonym

**Common Names:**

coho salmon
hooknose salmon
salmon trout ( <i>Oncorhynchus kisutch</i> )
silver salmon ( <i>Oncorhynchus kisutch</i> )

**Type Locality:**



<span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></span> Native	<span style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></span> Nonindigenous	<span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; border-style: dashed;"></span> NIS Not Established	<span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></span> Cryptogenic	<span style="display: inline-block; width: 15px; height: 15px; background-color: lightblue; border: 1px solid black;"></span> Transient	<span style="display: inline-block; width: 15px; height: 15px; background-color: purple; border: 1px solid black;"></span> Unclassified	<span style="display: inline-block; width: 15px; height: 15px; background-color: brown; border: 1px solid black;"></span> Conflicting Classification	<span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black;"></span> Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1965

Native

**Loc 1st record:** Japan

Native

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF <span style="color: red;">X</span>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: The native range of *Oncorhynchus kisutch* includes Kamchatka, Sea of Okhotsk, and northern Sea of Japan. However, it has been introduced into parts of Japan (NIES, 2011), China (Ma et al., 2003; Chavanich et al., 2010) and Korea (Seo and Lee, 2008), presumably including the Yellow Sea, southern Sea of Japan, and Kyushu.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>		<b>P</b>	<b>P</b>	<b>P</b>		<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>O</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			<b>P</b>	<b>P</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 36psu] [Pref: 0 - 36psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Walbaum, 1792)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Salmoniformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Salmonidae

**Subfamily:**

**Also Known As (Name - Type):**

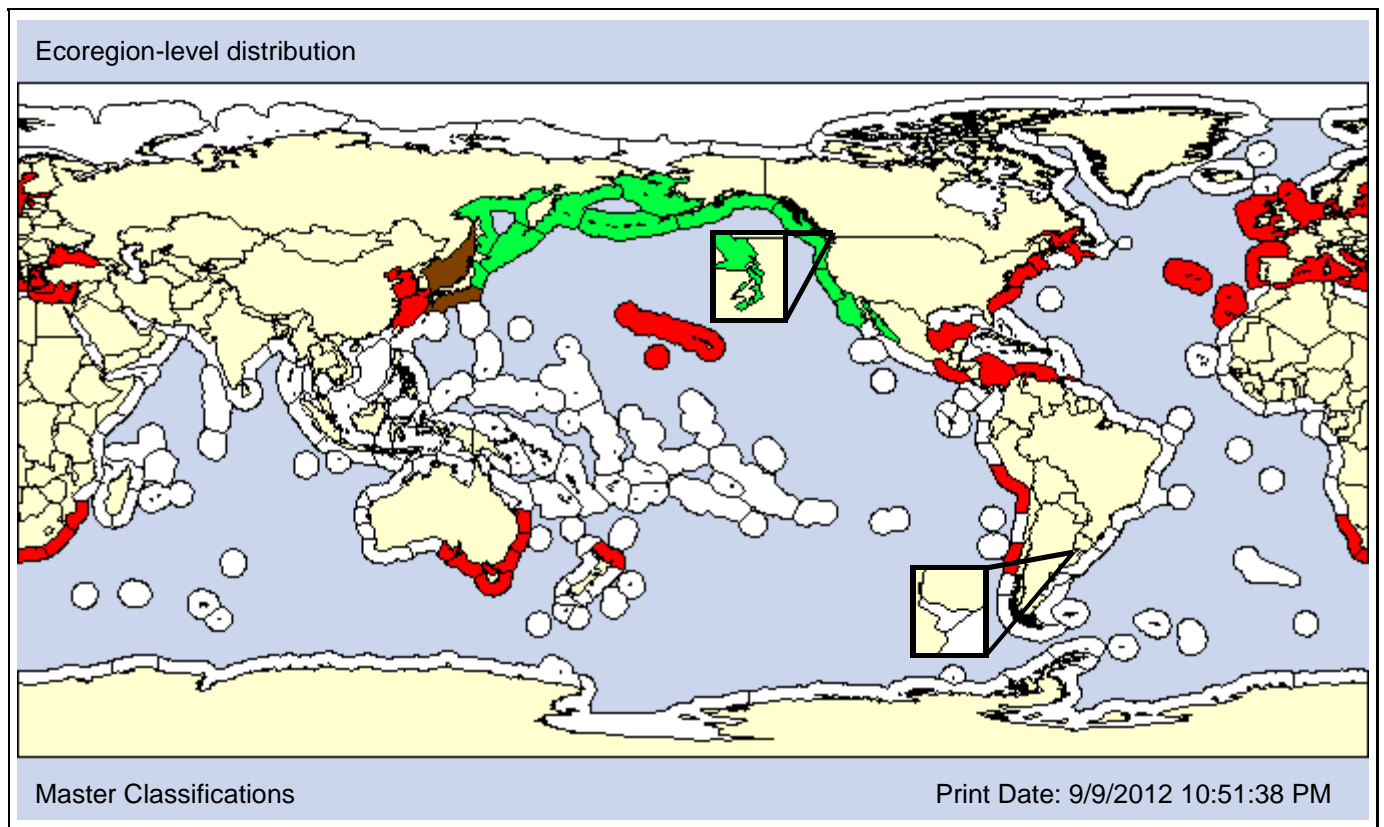
Onchorrhynchus mykiss  
 Onchorhynchus mykiss  
 Oncorhynchus mykiss gairdeneri  
 Oncorhynchus mykiss gairdnerii

Misspelling  
 Misspelling  
 Convention  
 Convention

**Common Names:**

Columbia River redband trout  
 Kamchatka  
 Niji-masu (Japanese)  
 rainbow trout

**Type Locality:**



Master Classifications Print Date: 9/9/2012 10:51:38 PM

<span style="color: green;">■</span> Native	<span style="color: red;">■</span> Nonindigenous	<span style="border: 1px dashed red; padding: 2px;"> </span> NIS Not Established	<span style="background-color: yellow;">■</span> Cryptogenic	<span style="background-color: lightblue;">■</span> Transient	<span style="background-color: purple;">■</span> Unclassified	<span style="background-color: brown;">■</span> Conflicting Classification	<span style="border: 1px solid black; padding: 2px;"> </span> Unidentified
NWP			Hawaii		NEP		

<b>Date 1st record:</b> 1877	1920	Native
<b>Loc 1st record:</b> Japan	Hawaii	Native
<b>Established:</b> Yes	Yes	Yes

**VECTORS**

SH			MS	AF <span style="color: red;">X</span>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: The native range of *Oncorhynchus mykiss* extends from the Kamchatka to the Amur River in the northern Sea of Japan. It has been introduced into the Yellow Sea and the East China Sea while there are conflicting classifications for the Sea of Japan and Central Kuroshio Current Ecoregions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>		<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 0 - 250m] [Pref: 0 - 23m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep	<b>O</b>			
<b>P</b>	<b>P</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			<b>P</b>	<b>P</b>		

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - 35psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P <b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										



**Taxon:** Ray-finned fish

**Taxonomic Author:** (Steindachner, 1864)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Labroidei

**Infraorder:**

**Superfamily:**

**Family:** Cichlidae

**Subfamily:**

**Also Known As (Name - Type):**

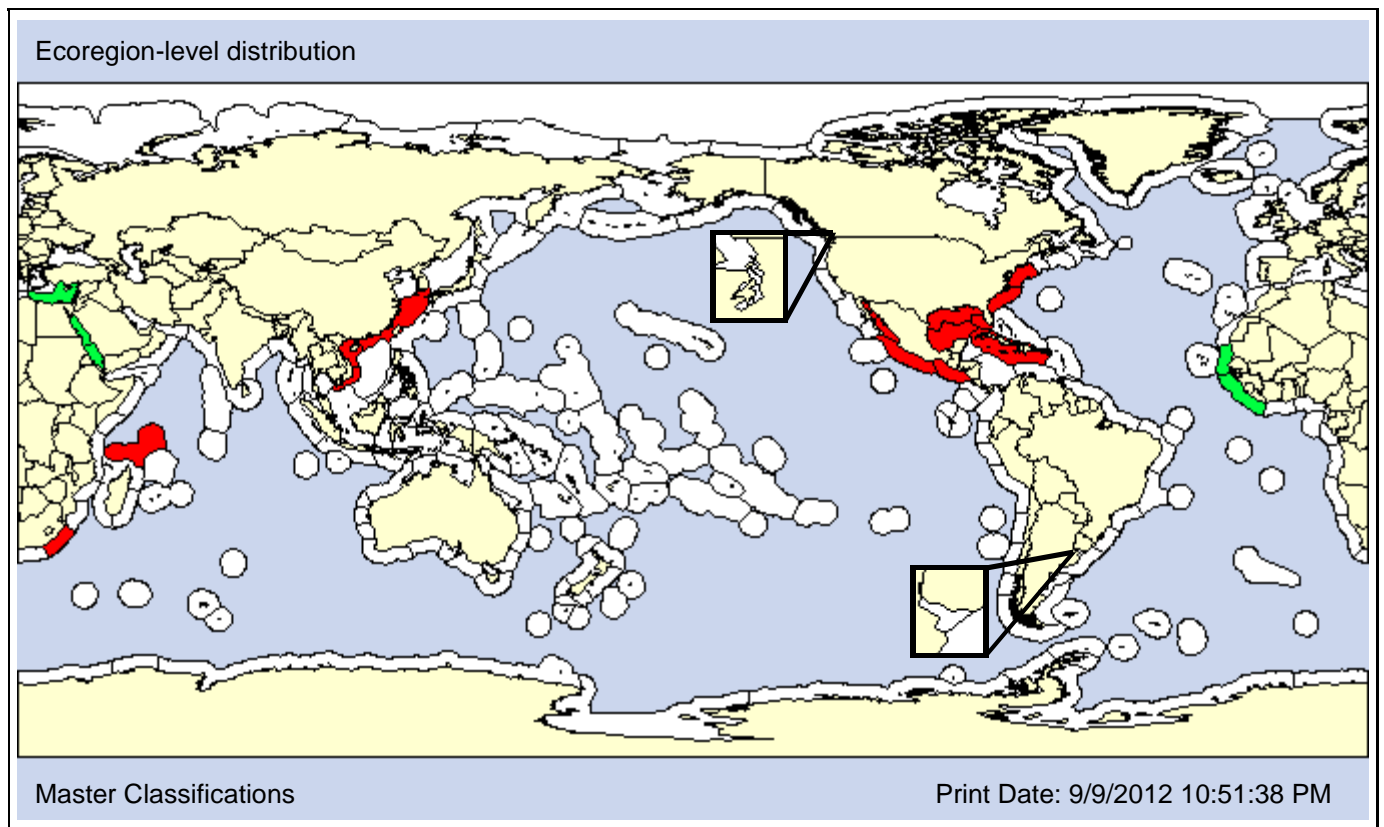
Oreochromis niloticus of authors; not (Linnaeus, 1758)  
Tilapia aurea

Misidentified  
Synonym

**Common Names:**

blue tilapia

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** 1980

1964

**Loc 1st record:** Japan

Mexico

**Established:** Yes

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: While primarily a freshwater fish, *Oreochromis aureus* is able to live and reproduce in brackish waters. It has been widely introduced for aquaculture, though most of these facilities are inland versus coastal. Thus, it is not clear to what extent the invasion pattern shown here actually represents coastal invasions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>				
		<b>X</b>											

**DEPTH [Obs: 5 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline O		Mesohaline O		Polyhaline O		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF X			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM X		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

# Oreochromis mossambicus

Species ID: 4403

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Peters, 1852)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Labroidei

**Infraorder:**

**Superfamily:**

**Family:** Cichlidae

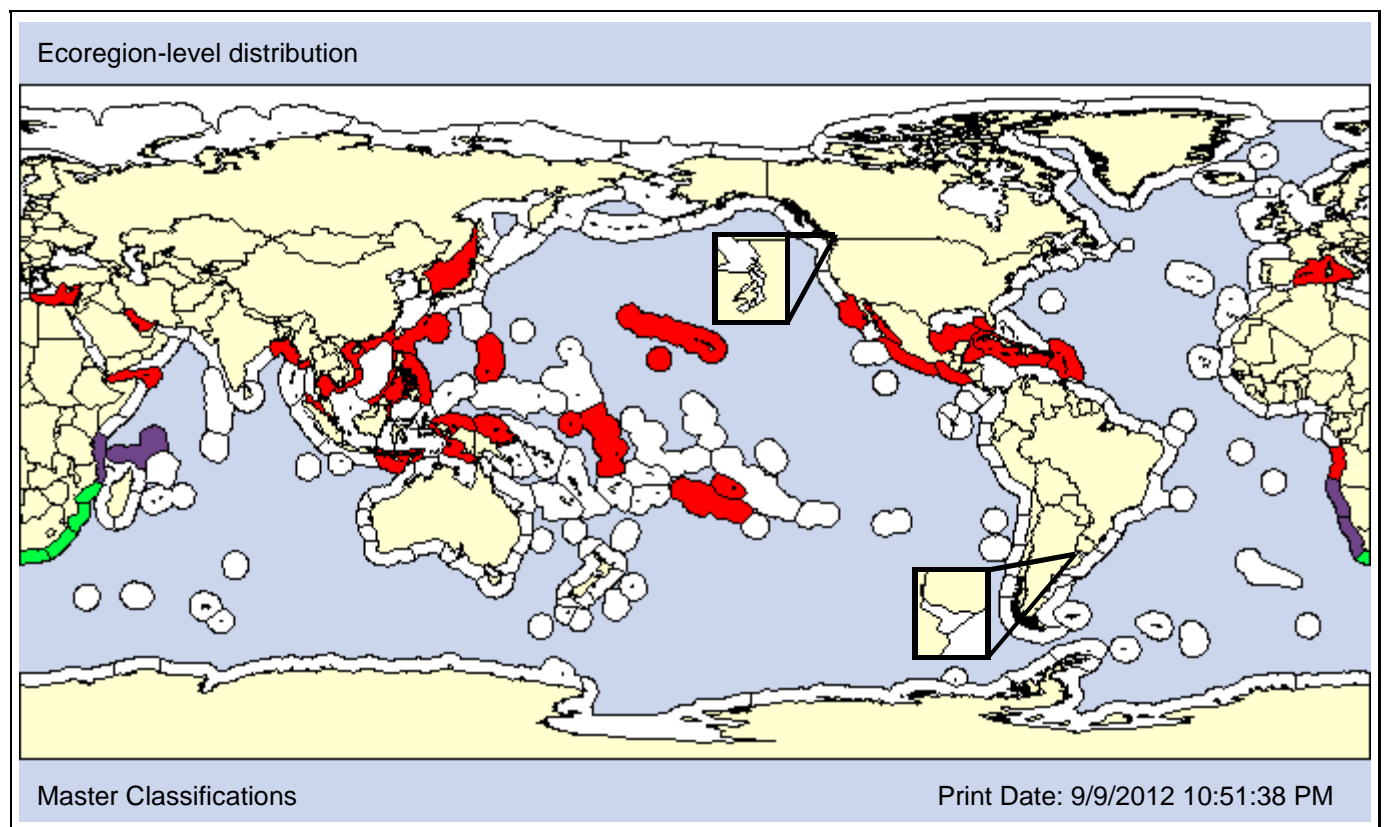
**Subfamily:**

**Also Known As (Name - Type):**

Chromis dumerilii	Synonym	African mouthbrooder
Chromis mossambicus	Synonym	African perch
Chromis natalensis	Synonym	common tilapia
Chromis vorax	Synonym	Hawaiian perch

**Common Names:**

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

**Date 1st record:** 1954

1951

Unknown

**Loc 1st record:** Japan

Oahu, Hawaii

Unknown

**Established:** Yes

Yes

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P			X	
				X	X	AO	PO								

Comments: *Oreochromis mossambicus* is a fresh and brackish water tilapia widely distributed for aquaculture. It is established in Southern California, including the Santa Ana, San Gabriel, and Los Angeles rivers (USGS-NAS), Hawaii (Coles et al., 1999a), and Japan (FishBase).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>					<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 1 - 12m] [Pref: 1 - 12m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>						

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>						

**SALINITY [Obs: 0 - 40psu] [Pref: 0 - 20psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>		<b>X</b>		<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Labroidei

**Infraorder:**

**Superfamily:**

**Family:** Cichlidae

**Subfamily:**

**Also Known As (Name - Type):**

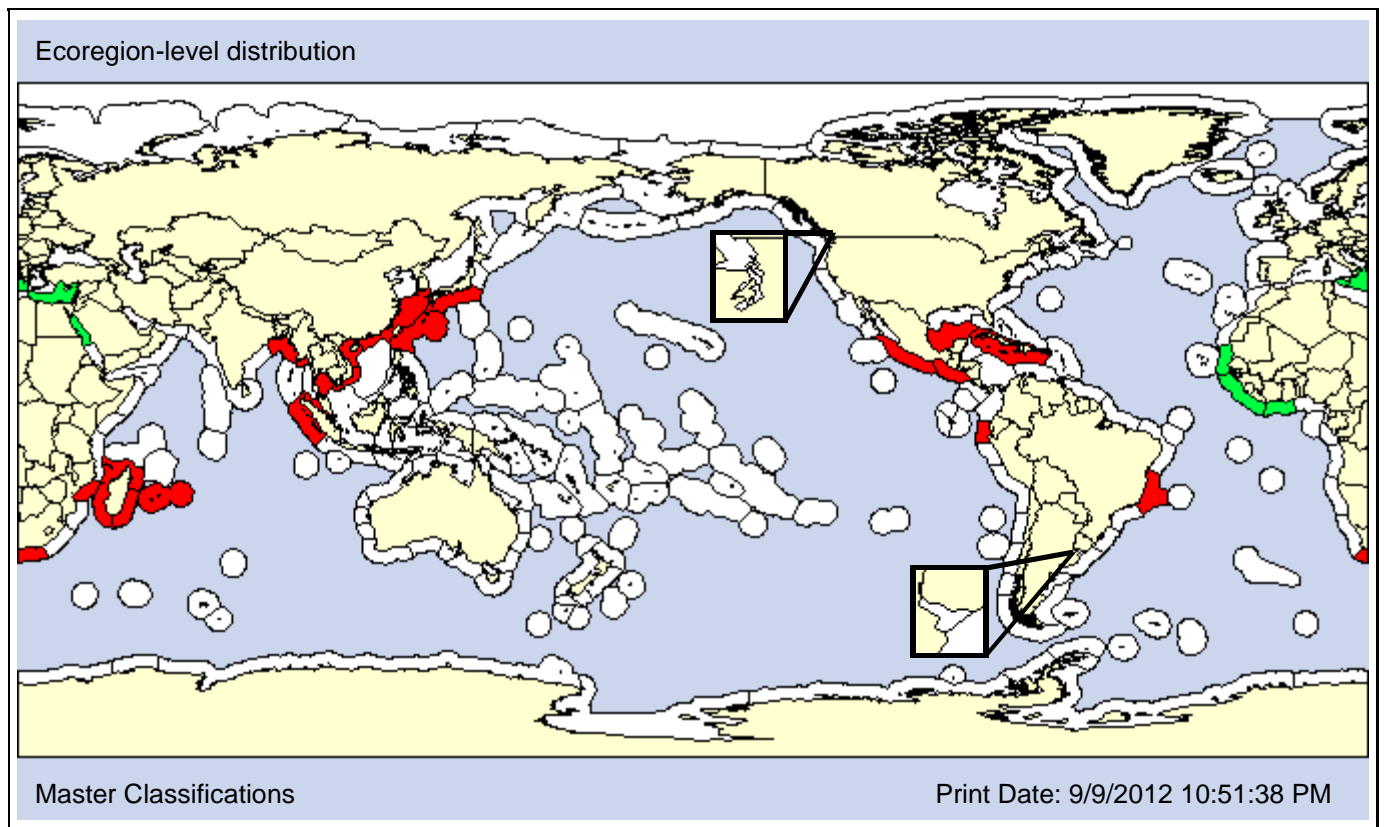
Chromis nilotica  
 Chromis niloticus  
 Oreochromis niloticus niloticus  
 Perca nilotica

Synonym  
 Synonym  
 Convention  
 Synonym

**Common Names:**

Baringo tilapia  
 Chikadai (Japanese)  
 mango fish  
 Nile mouthbreeder

**Type Locality:**



**Date 1st record:** 1962

**Loc 1st record:** Japan

**Established:** Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X	X	AO	PO								

Comments: *Oreochromis niloticus* is of Western African origin and primarily inhabits freshwater lakes and streams, though it is euryhaline. It has been widely introduced into coastal basins for aquaculture, including China, Japan, and Tropical Eastern Pacific. However, it is not clear whether estuarine populations have become established.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 5 - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 40psu] [Pref: 0 - 10psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>					<b>X</b>	DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Jordan & Seale, 1907)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Blennioidei

**Infraorder:**

**Superfamily:**

**Family:** Blenniidae

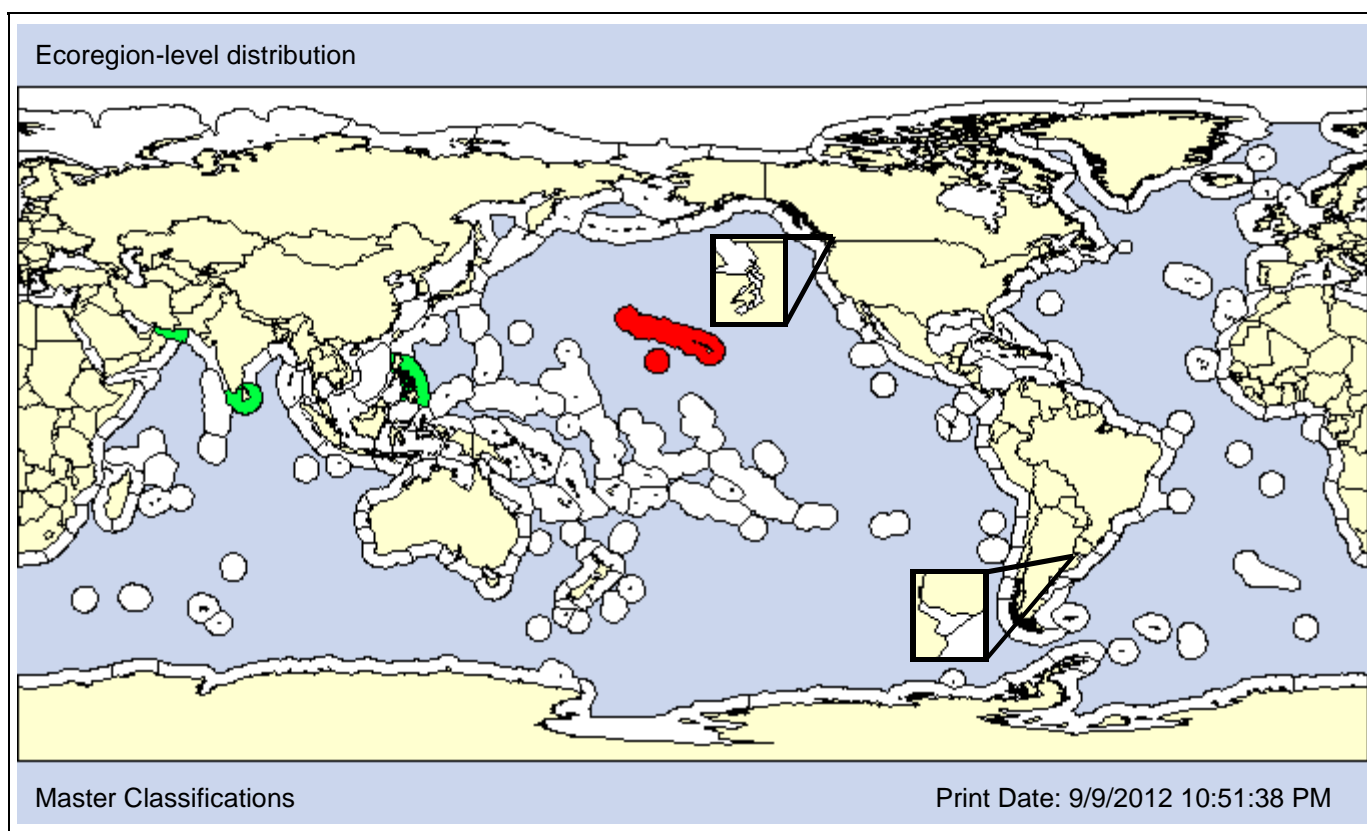
**Subfamily:**

**Also Known As (Name - Type):**

Blennius thysanius	Synonym	Indo-Pacific blenny tasseled blenny tasselled blenny
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**Common Names:**

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:**

1971

**Loc 1st record:**

Kaneohe Bay, Hawaii

**Established:**

Yes

**VECTORS**

<b>SH X</b>			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
<b>X</b>		<b>X</b>			AO	PO									

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>			<b>X</b>	

**DEPTH [Obs: 1 - 10m] [Pref: 1 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate P</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
												<b>P</b>	<b>O</b>	<b>P</b>

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									



**Taxon:** Ray-finned fish

**Taxonomic Author:** (Linnaeus, 1766)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pleuronectiformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Paralichthyidae

**Subfamily:**

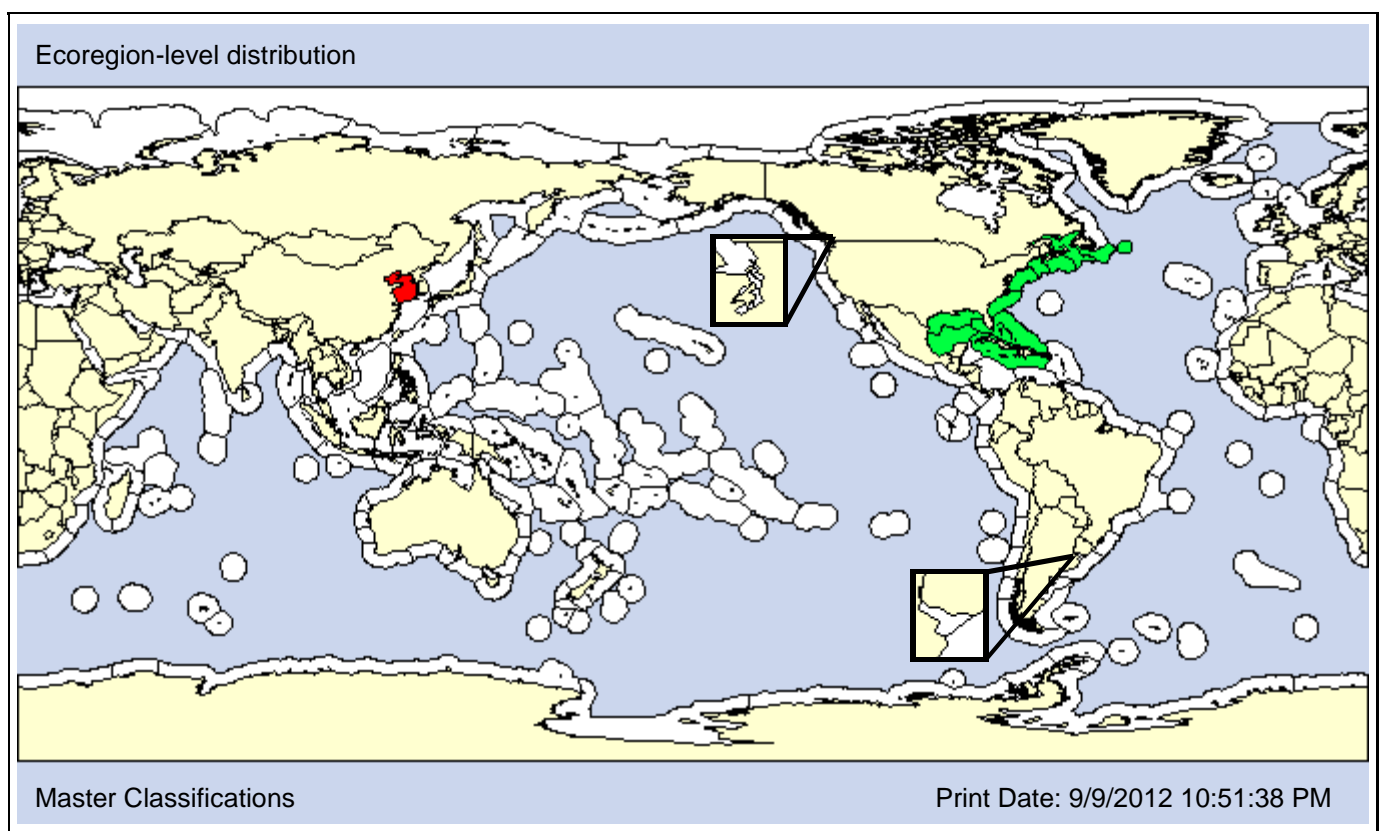
**Also Known As (Name - Type):**

Pleuronectes dentatus	Synonym

**Common Names:**

fluke
summer flounder

**Type Locality:**



**Date 1st record:** 2000

**Loc 1st record:** China

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X	X	AO	PO								

Comments: *Paralichthys dentatus* has been introduced into China for cage culture, though it is not known if any wild populations have become established.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 183m] [Pref: 0 - 37m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>O</b>			<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 10 - 35psu] [Pref: 24 - 35psu]**

<b>Fresh</b>	<b>Brackish P</b>				<b>Marine P</b>		<b>Hyper</b>	
	Oligohaline		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	
			<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** Jordan & Gilbert, 1884

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pleuronectiformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Paralichthyidae

**Subfamily:**

**Also Known As (Name - Type):**

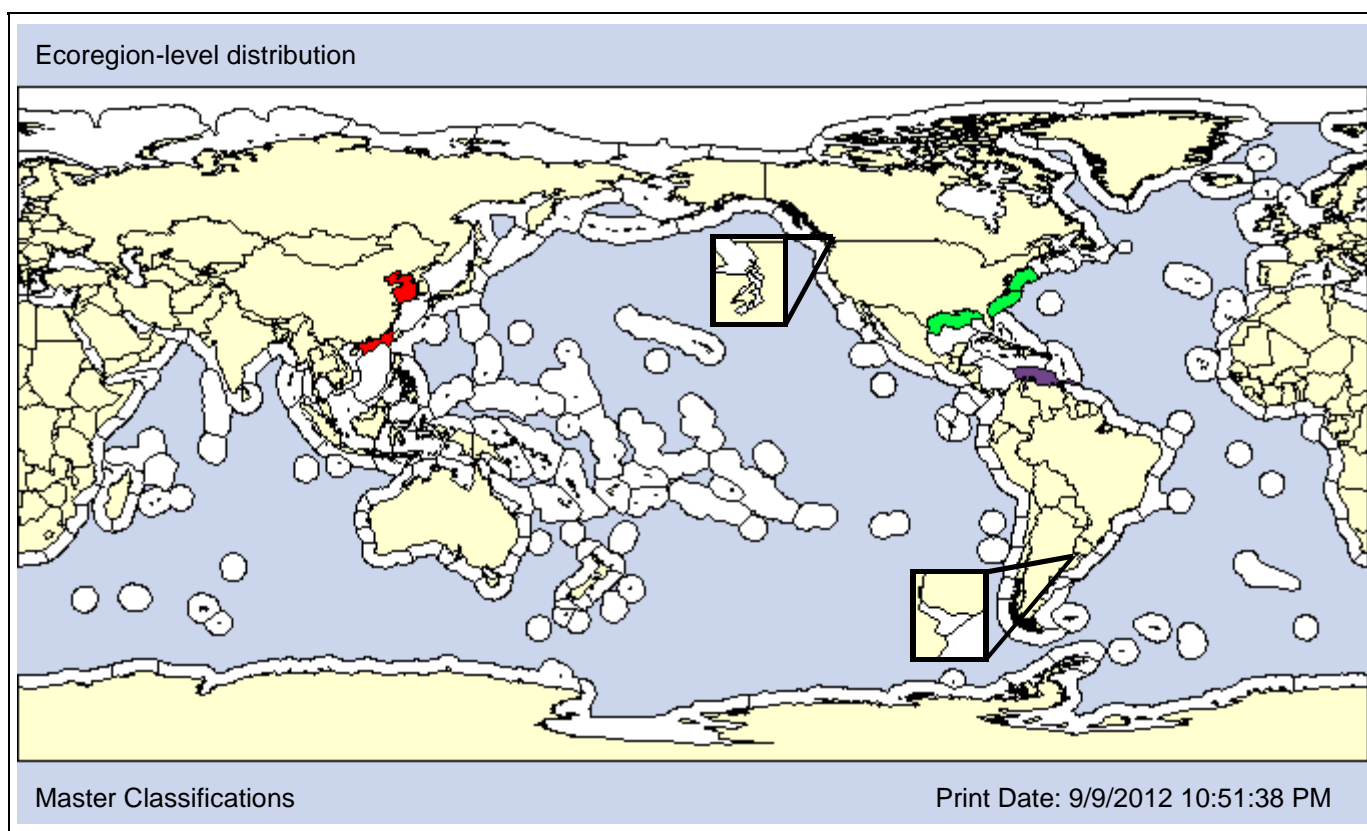
Paralichthys lethostigma

Misspelling

**Common Names:**

doormat  
mud flounder  
southern flounder

**Type Locality:**



**Date 1st record:** 2002

**Loc 1st record:** China

**Established:** Unknown

**VECTORS**

SH			MS	AF <span style="color: red;">X</span>				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
				<span style="color: red;">X</span>	<span style="color: red;">X</span>	AO	PO								

Comments: *Paralichthys lethostigma* is cage-cultured in China, however it is not known if it has become established in the wild.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>			<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
	<b>X</b>	<b>X</b>											

**DEPTH [Obs: 0 - 40m] [Pref: - 40m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>	<b>O</b>				

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 35psu] [Pref: - 35psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Hamilton, 1822)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Ambassidae

**Subfamily:**

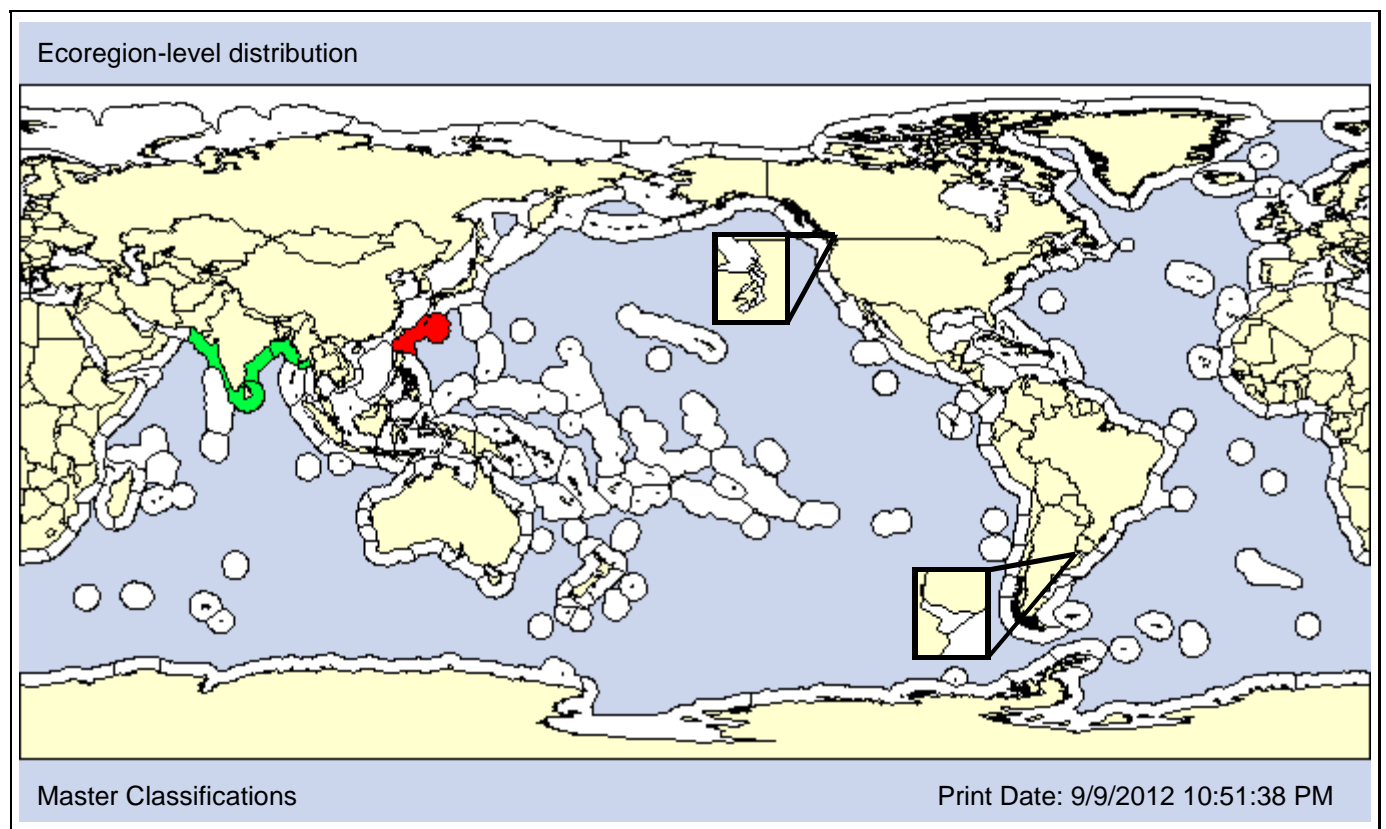
**Also Known As (Name - Type):**

Ambassis alta	Synonym
Ambassis barlovi	Synonym
Ambassis notatus	Synonym
Ambassis ranga	Synonym

**Common Names:**

chanda ranga
glass perchlet
Indian glass perch
Indian glassfish

**Type Locality:**



**Date 1st record:** Unknown

**Loc 1st record:** Japan

**Established:** Yes

**VECTORS**

SH			MS	AF				ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
						AO	PO			X					

Comments: *Parambassis ranga* (= *Psuedambassis ranga*) is a freshwater fish though according to FishBase it is also "brackish". Mito and Uesugi (2004) state that it is introduced in Japan, though no specific sites were identified. However, wild populations were found in the Ryukyu Archipelago in urban reservoirs (Ishikawa and Tachihara, 2008).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>O</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>							

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Mitchill, 1814)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Perciformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Percidae

**Subfamily:**

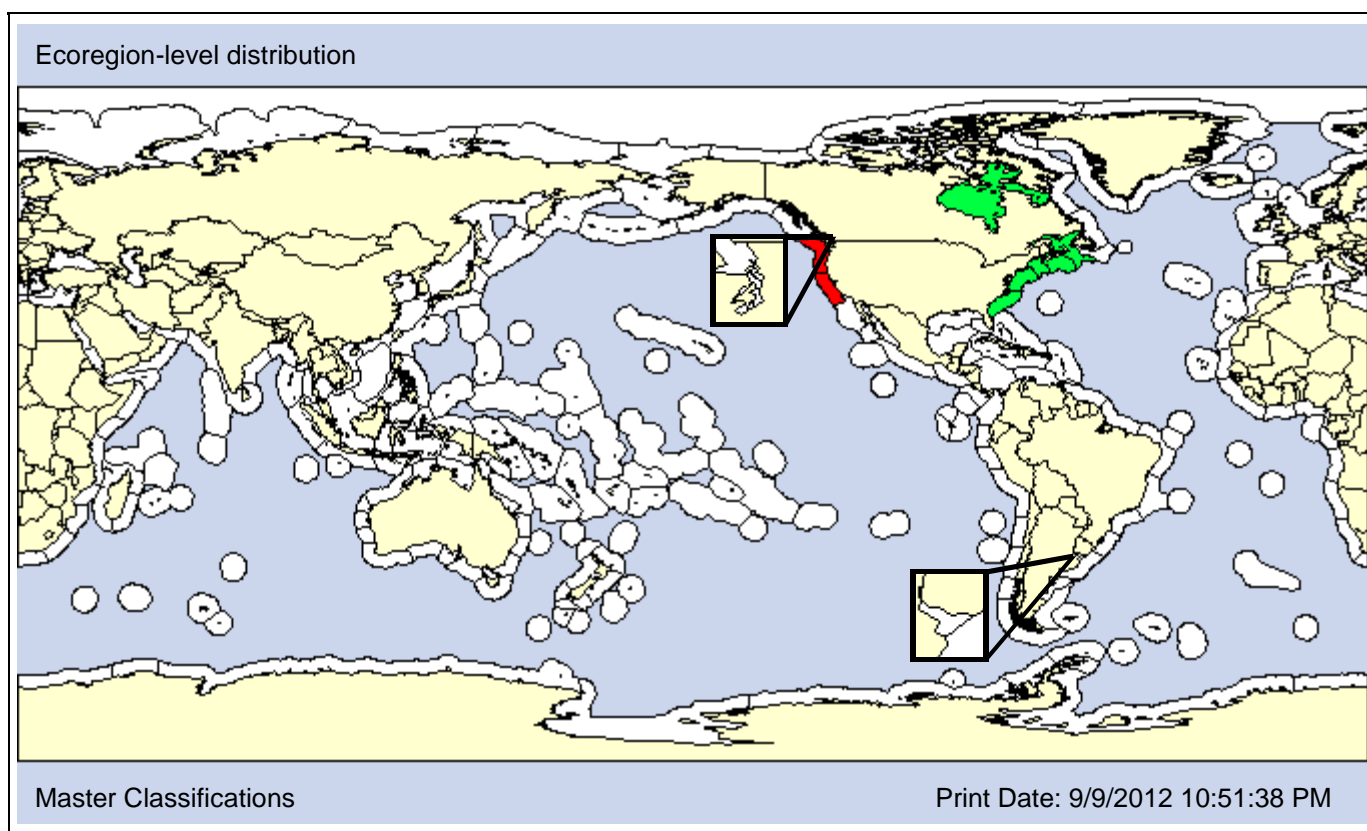
**Also Known As (Name - Type):**

Morone flavescens	Synonym
Perca acuta	Synonym
Perca fluviatilis flavescens	Synonym
Perca notata	Synonym

**Common Names:**

yellow perch
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**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii			NEP

**Date 1st record:** 1960

1891

**Loc 1st record:** Japan

San Fransico Estuary, CA

**Established:** No

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: *Perca flavescens* mostly inhabits lakes and rivers, though it is also found in brackish waters and salt lakes. It was introduced into and become established in the NEP. It was introduced into Japan in 1960 in an unknown location, but did not become established (FishBase).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: - 56m] [Pref: - 9m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep			
	<b>P</b>	<b>O</b>			

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>					<b>O</b>

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 5psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>O</b>	<b>O</b>						

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										



**Taxon:** Ray-finned fish

**Taxonomic Author:** (Lesueur, 1821)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Cyprinodontiformes

**Suborder:** Cyprinodontoidei

**Infraorder:**

**Superfamily:**

**Family:** Poeciliidae

**Subfamily:**

**Also Known As (Name - Type):**

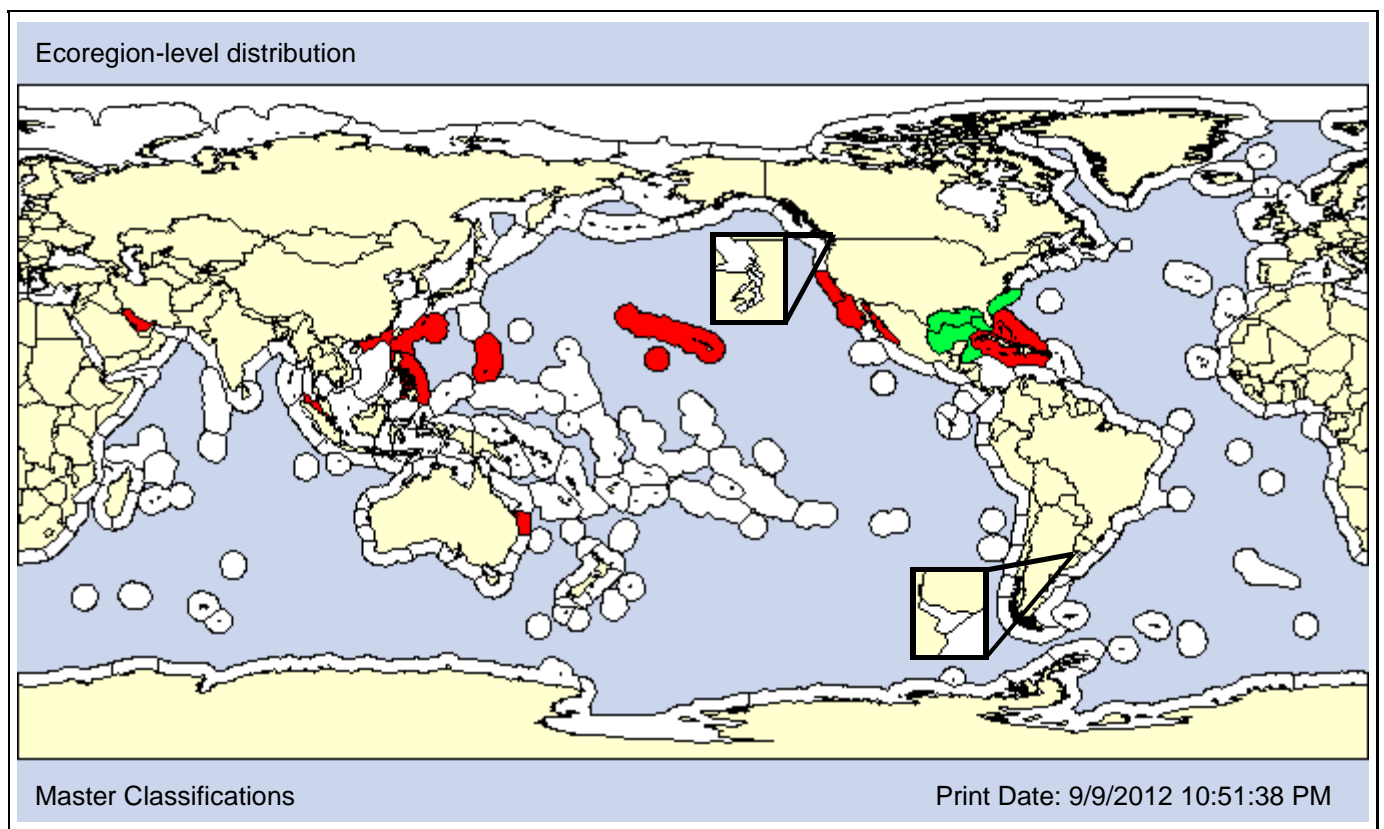
Mollienesia latipinna

Synonym

**Common Names:**

sailfin molly  
tabai (*Poecilia latipinna*)

**Type Locality:**



**Date 1st record:**

1905

ca. 1959

**Loc 1st record:**

Pearl Harbor, Oahu, Hawaii

Salton Sea, California

**Established:**

Yes

Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA		IR		A	P			X	
				X	X	AO	PO								

Comments: *Poecilia latipinna* is usually found in slow moving freshwater, such as creeks, streams, ponds, and lakes. However, it also occurs in brackish canals in Hawaii (Carlton and Eldredge, 2009) and in tidal sloughs and marshes in Southern California (CANOD, 2009).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - 32psu] [Pref: 0 - 10psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** Steindachner, 1863

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Cyprinodontiformes

**Suborder:** Cyprinodontoidei

**Infraorder:**

**Superfamily:**

**Family:** Poeciliidae

**Subfamily:**

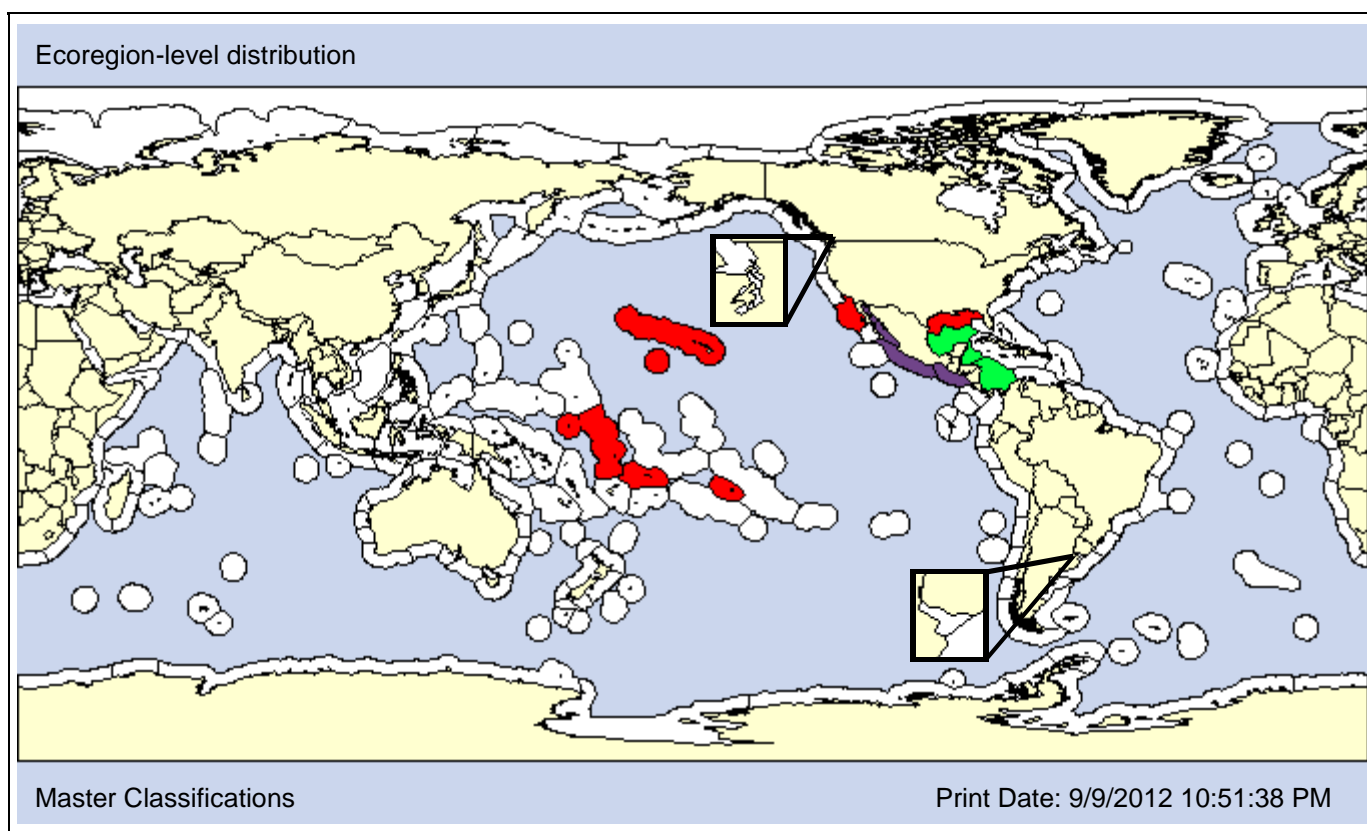
**Also Known As (Name - Type):**

Poecilia cuneata	Synonym
Poecilia limantouri	Synonym
Poecilia mexicana mexicana	Synonym
Poecilia salvatoris x mexicana of Carlton and Eldredge, 200	Convention

**Common Names:**

shortfin molly
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**Type Locality:** Orizaba, Mexico



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** after 1960 (Hawaii), 1966 (Salton Sea, California)  
**Loc 1st record:** Hawaii, Salton Sea, California  
**Established:** Yes, Yes

**VECTORS**

SH			MS	AF				ID	RE	AP X		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
						AO	PO			X	X				

Comments: *Poecilia mexicana* is primarily a freshwater fish though it can be found at salinities up to 36 psu. Its native range is the Atlantic Slope from Rio San Juan, Mexico to Guatemala. Carlton and Eldredge (2009) state that the invader in Hawaii is a hybrid, *P. salvatoris* x *mexicana*. The introduced population in Southern California is in the Salton Sea.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH					

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>O</b>						

**SALINITY [Obs: 0 - 36psu] [Pref: 0 - psu]**

<b>Fresh P</b>	<b>Brackish O</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** Peters, 1859

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Cyprinodontiformes

**Suborder:** Cyprinodontoidei

**Infraorder:**

**Superfamily:**

**Family:** Poeciliidae

**Subfamily:**

**Also Known As (Name - Type):**

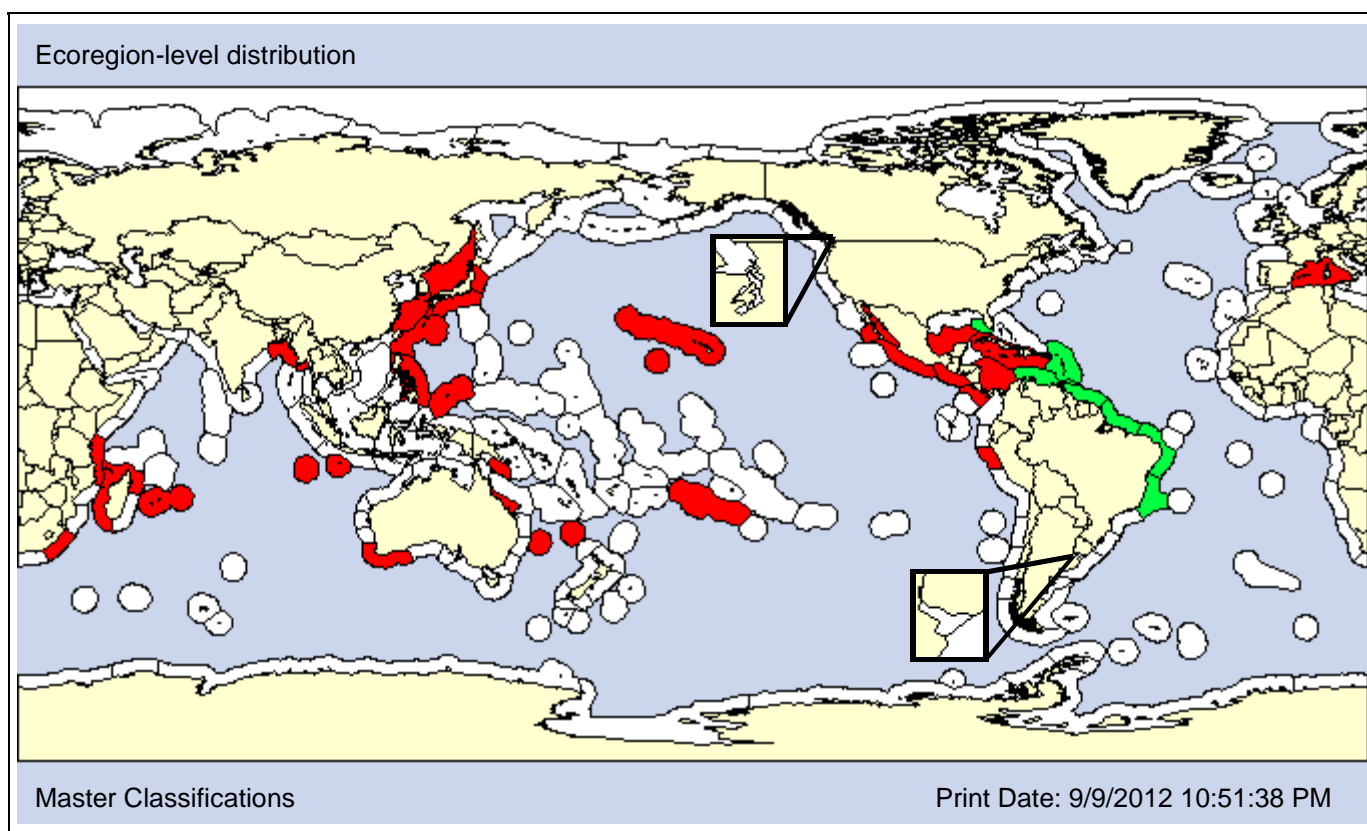
Acanthophaelus guppil  
 Acanthophaelus reticulatus  
 Girardinus guppil  
 Girardinus reticulatus

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

guppil (Japanese)  
 guppy  
 million fish  
 millions

**Type Locality:**



■ Native   
 ■ Nonindigenous   
   NIS Not Established   
   Cryptogenic   
   Transient   
   Unclassified   
   Conflicting Classification   
   Unidentified

NWP

Hawaii

NEP

**Date 1st record:** Unknown

1922

1991

**Loc 1st record:** Unknown

Hawaii

Baja California, Mexico

**Established:** Yes

Yes

Yes

**VECTORS**

SH			MS	AF			ID	RE	AP X		REC	SF	HR	O	
BW	SB	HF		S/R	AE	AA	IR			A	P			X	
						AO	PO			X					

Comments: The guppy, *Poecilia reticulata*, is primarily a freshwater fish though it can tolerate low to moderate salinities. It has been introduced throughout the Atlantic, Pacific, and Indo-Pacific. However, many of the introductions may be in inland waters so that the invasion pattern shown here may overestimate the invasion of coastal systems.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>						<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>	<b>X</b>			TP	RI-PH					
		<b>X</b>											

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>				<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
								<b>P</b>						

**SALINITY [Obs: 0 - 18psu] [Pref: 0 - 3psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
			<b>X</b>							

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>	<b>X</b>	LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Linnaeus, 1758)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Pleuronectiformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Scophthalmidae

**Subfamily:**

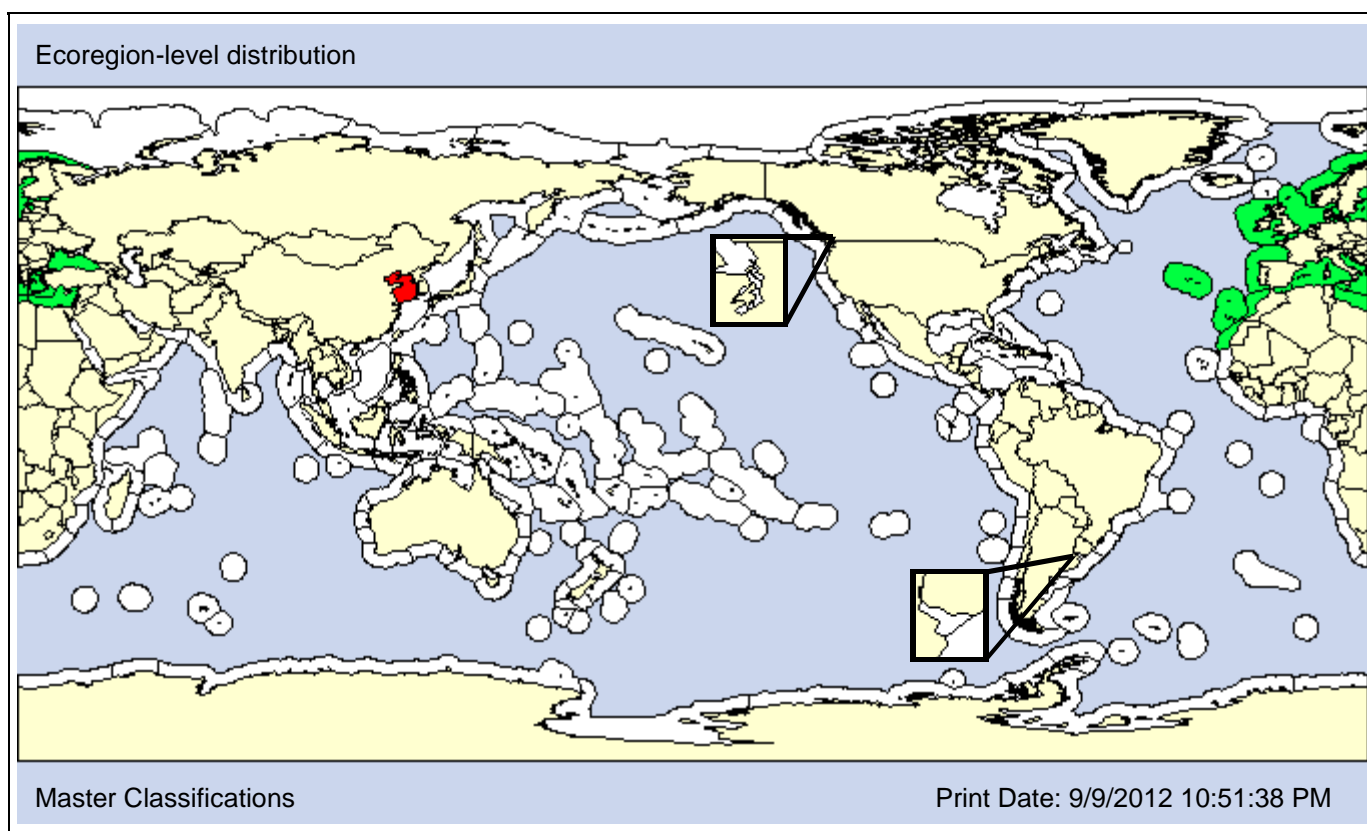
**Also Known As (Name - Type):**

Pleuronectes cyclops	Synonym
Pleuronectes maximus	Synonym
Rhombus aculeatus	Synonym
Rhombus maeoticus, not of Pallis, 1814	Misidentified

**Common Names:**

breet
britt
butt
turbot

**Type Locality:** European Ocean



**Date 1st record:** 1922

**Loc 1st record:** Dalian, China

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: *Psetta maxima* has been introduced into China (FishBase, Chavanich et al., 2010) and Korea (Seo and Lee, 2008) though it is not known if it is established in the wild. It was introduced into New Zealand in 1913 (Thomson, 1922) and apparently became established (FishBase).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>					

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				
		<b>X</b>											

**DEPTH [Obs: 20 - 100m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>P</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>	<b>P</b>			<b>P</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>		
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									



**Taxon:** Ray-finned fish

**Taxonomic Author:** Linnaeus, 1758

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Salmoniformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Salmonidae

**Subfamily:**

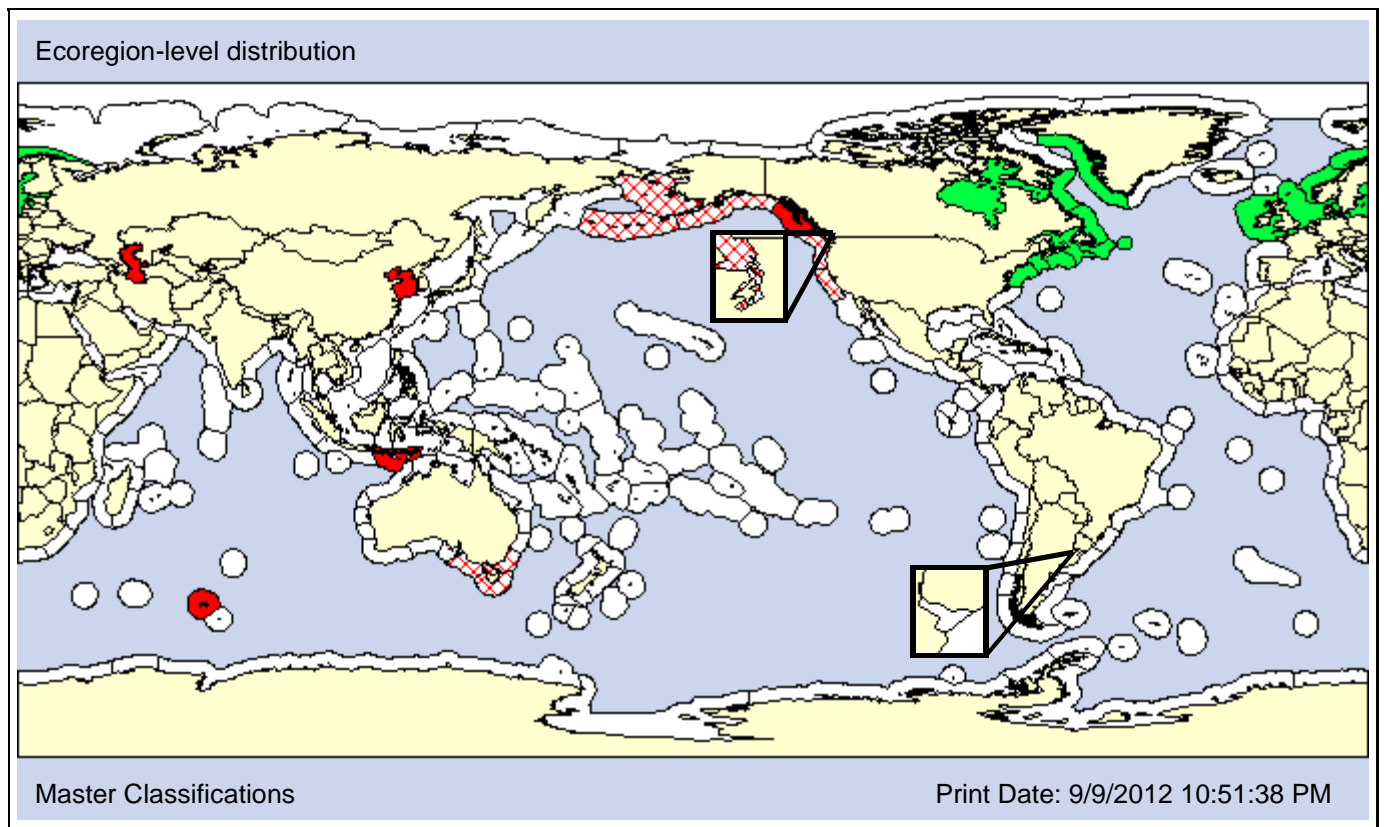
**Also Known As (Name - Type):**

Salmo brevipes	Synonym
Salmo caeruleus	Synonym
Salmo gracilis	Synonym
Trutta salar	Synonym

**Common Names:**

Atlantic salmon
black salmon
fiddler
landlocked salmon ( <i>Salmo salar</i> )

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
		NWP		Hawaii		NEP	

**Date 1st record:** 1980

1874 (anadromous form)

**Loc 1st record:** Japan

Sacramento River, California

**Established:** Unknown

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: Because of the numerous reports of escapees and the finding of natural reproduction in a British Columbia coastal river (Volpe et al., 2000), we classify *Salmo salar* as established in the N.A. Pacific Fjordland Ecoregion. It has been introduced into China, Korea and Japan, though it is not known whether it has established wild populations.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				
		<b>X</b>											

**DEPTH [Obs: 0 - 210m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep	<b>O</b>		
<b>P</b>	<b>P</b>	<b>O</b>			

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			<b>O</b>	<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 36psu] [Pref: 0 - 36psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P <b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** Linnaeus, 1758

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Protacanthopterygii

**Order:** Salmoniformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Salmonidae

**Subfamily:**

**Also Known As (Name - Type):**

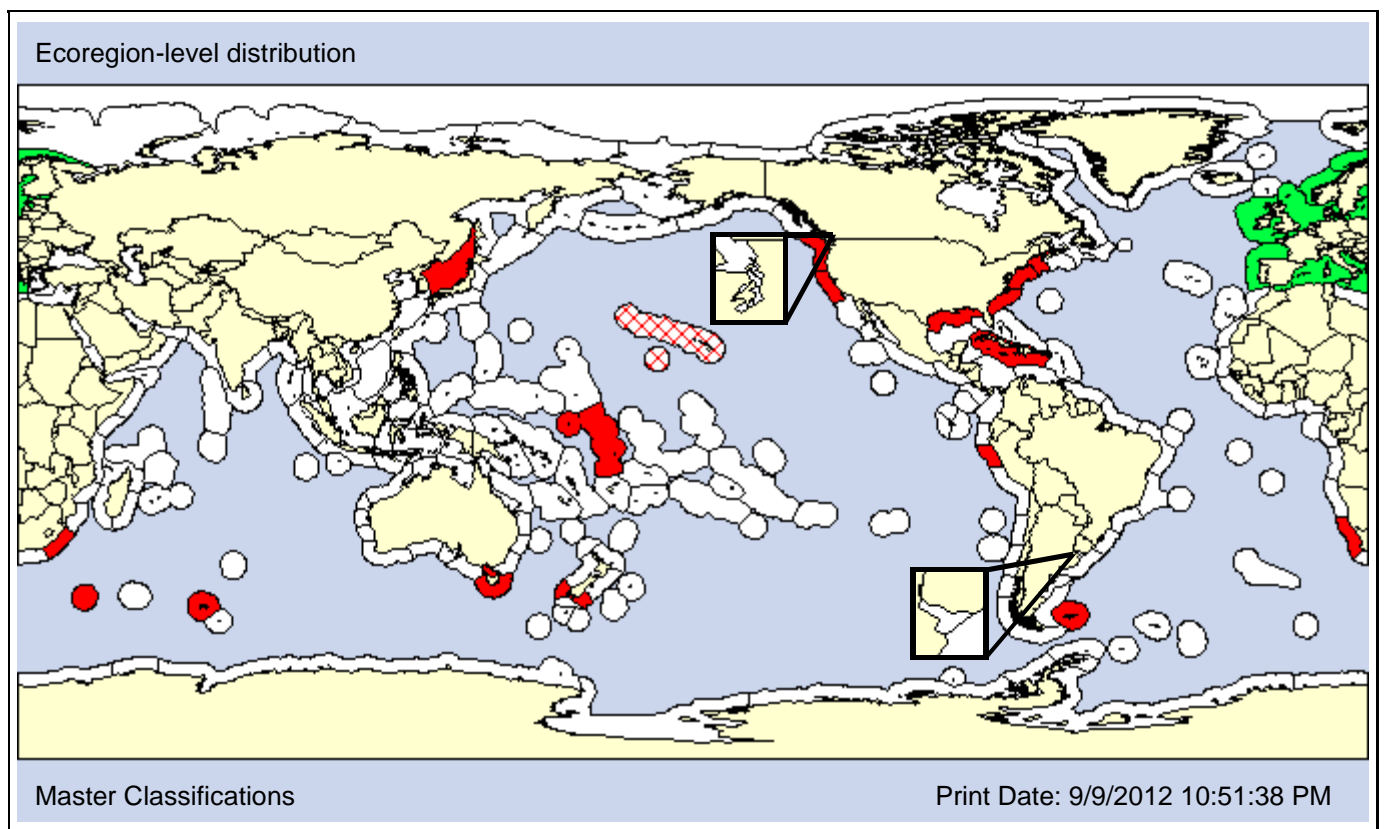
Salmo trutta fario  
Salmo trutta trutta

Synonym  
Convention

**Common Names:**

brown trout  
Loch Leven trout  
sea trout (*Salmo trutta*)  
von Behr trout

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

**Date 1st record:** 1900 (NWP)      1935 (Hawaii)      1893 (NEP)  
**Loc 1st record:** Japan (NWP)      Kauai, Hawaii (Hawaii)      Humboldt County, California (NEP)  
**Established:** Yes (NWP)      No (Hawaii)      Yes (NEP)

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	AA				A	P				X
				X	X	AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>		<b>P</b>	<b>P</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>				

**DEPTH [Obs: 0 - 50m] [Pref: 0 - 10m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>P</b>	<b>P</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			<b>O</b>	<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE X**

<b>R O</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 35psu] [Pref: 0 - 36psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Mitchill, 1814)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Salmoniformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Salmonidae

**Subfamily:**

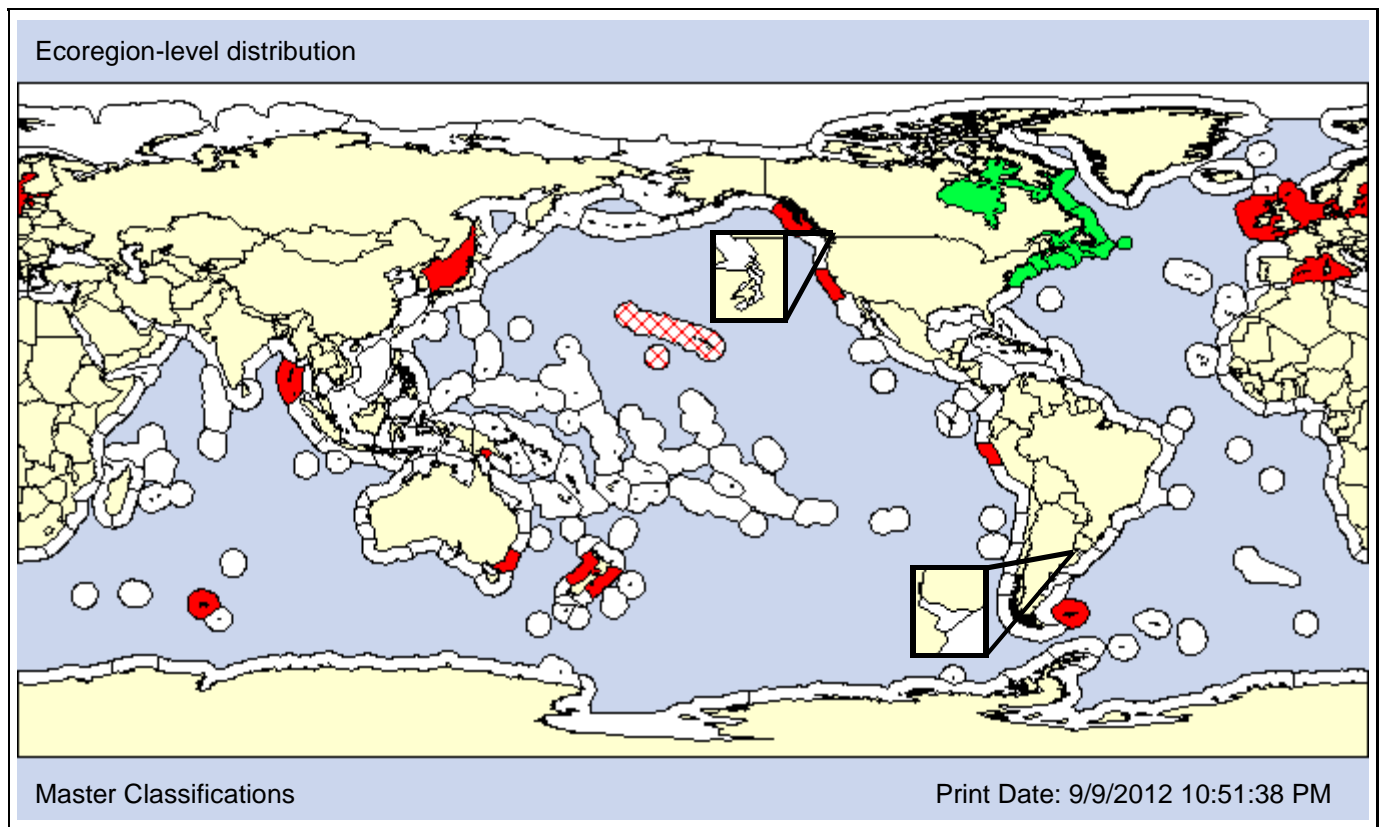
**Also Known As (Name - Type):**

Salmo fontinalis	Synonym

**Common Names:**

american brook charr
american brook trout
aurora trout
braiser

**Type Locality:**



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii		NEP		

<b>Date 1st record:</b> 1901	1876	ca. 1871
<b>Loc 1st record:</b> Japan	Hawaii	San Francisco Estuary, CA
<b>Established:</b> Yes	No	Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X	X	AO	PO								

Comments: There are both anadromous and landlocked populations of brook trout (*Salvelinus fontinalis*). This species has been widely stocked in temperate regions throughout the world, including British Columbia, Japan, China, and Hawai'i and are established in the first two regions.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>O</b>	<b>O</b>				<b>P</b>	<b>O</b>	

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 15 - 27m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
			<b>O</b>	<b>O</b>	<b>O</b>	

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - 36psu] [Pref: 0 - 36psu]**

<b>Fresh P</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** Berry & Whitehead, 1968

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Clupeomorpha

**Order:** Clupeiformes

**Suborder:** Clupeoidei

**Infraorder:**

**Superfamily:**

**Family:** Clupeidae

**Subfamily:**

**Also Known As (Name - Type):**

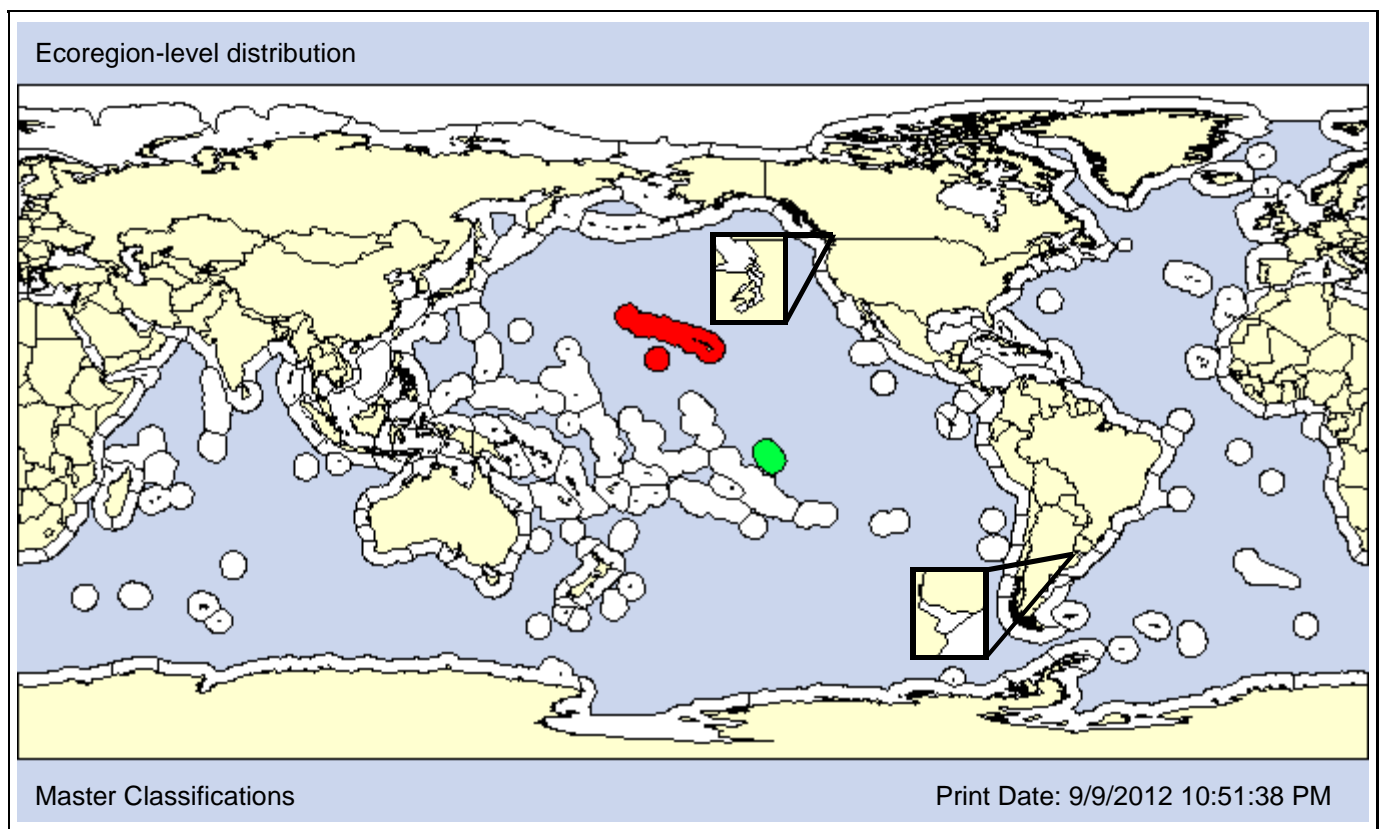
Haregula vittata

Synonym

**Common Names:**

Marquesan sardine  
Marquesan sardinella

**Type Locality:**



**Date 1st record:**

1955

**Loc 1st record:**

Oahu, Hawaii

**Established:**

Yes

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				A	P				
				X		AO	PO								

Comments: *Sardinella marquesensis*, the Marquesan sardine, was intentionally introduced into Hawaii in an attempt to establish a tuna bait fisheries.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
	<b>O</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH					

**DEPTH [Obs: 0 - 50m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			

**Pelagic Depth**

Epipelagic			<b>P</b>	Meso		Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep						
<b>O</b>	<b>P</b>	<b>O</b>						

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE**

<b>R</b>	<b>HP</b>	<b>Biogenic</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY**

<b>Fresh</b>	<b>Brackish</b>					<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P				

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							



**Taxon:** Ray-finned fish

**Taxonomic Author:** Rüppell, 1852

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Labroidei

**Infraorder:**

**Superfamily:**

**Family:** Cichlidae

**Subfamily:**

**Also Known As (Name - Type):**

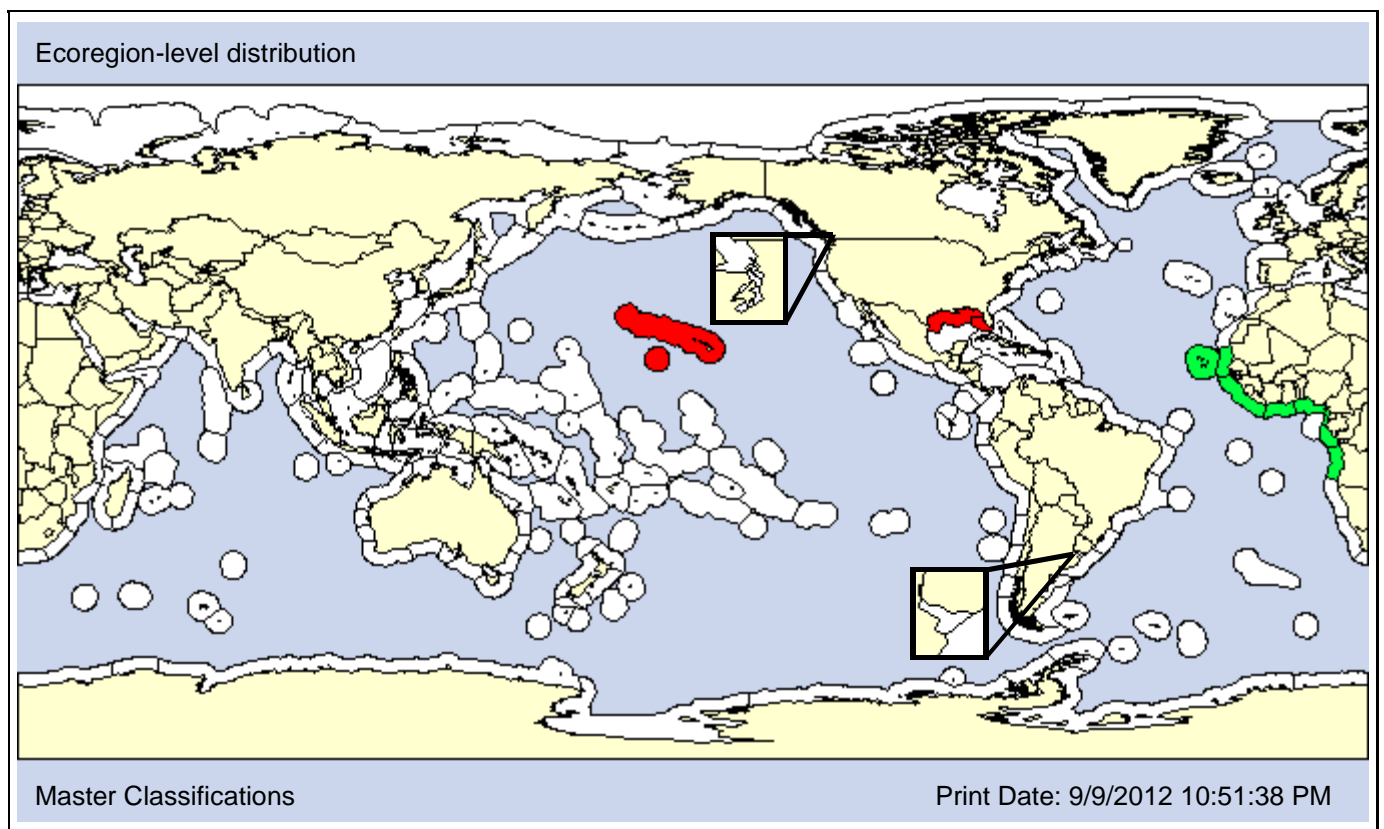
Sarotherodon melanotheron melanotheron  
Tilapia macrocephala  
Tilapia melanotheron

Convention  
Synonym  
Synonym

**Common Names:**

blackchin mouthbreeder  
blackchin tilapia  
silvery tilapia

**Type Locality:**



**Date 1st record:**

1962

**Loc 1st record:**

Oahu, Hawaii

**Established:**

Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
					X	AO	PO							

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>					<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH					
		<b>X</b>											

**DEPTH [Obs: 3 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
									<b>P</b>					

**SALINITY [Obs: 0 - 45psu] [Pref: 10 - 15psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
			<b>X</b>	<b>X</b>		<b>X</b>			DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
		<b>X</b>		LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Linnaeus, 1766)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Perciformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Sciaenidae

**Subfamily:**

**Also Known As (Name - Type):**

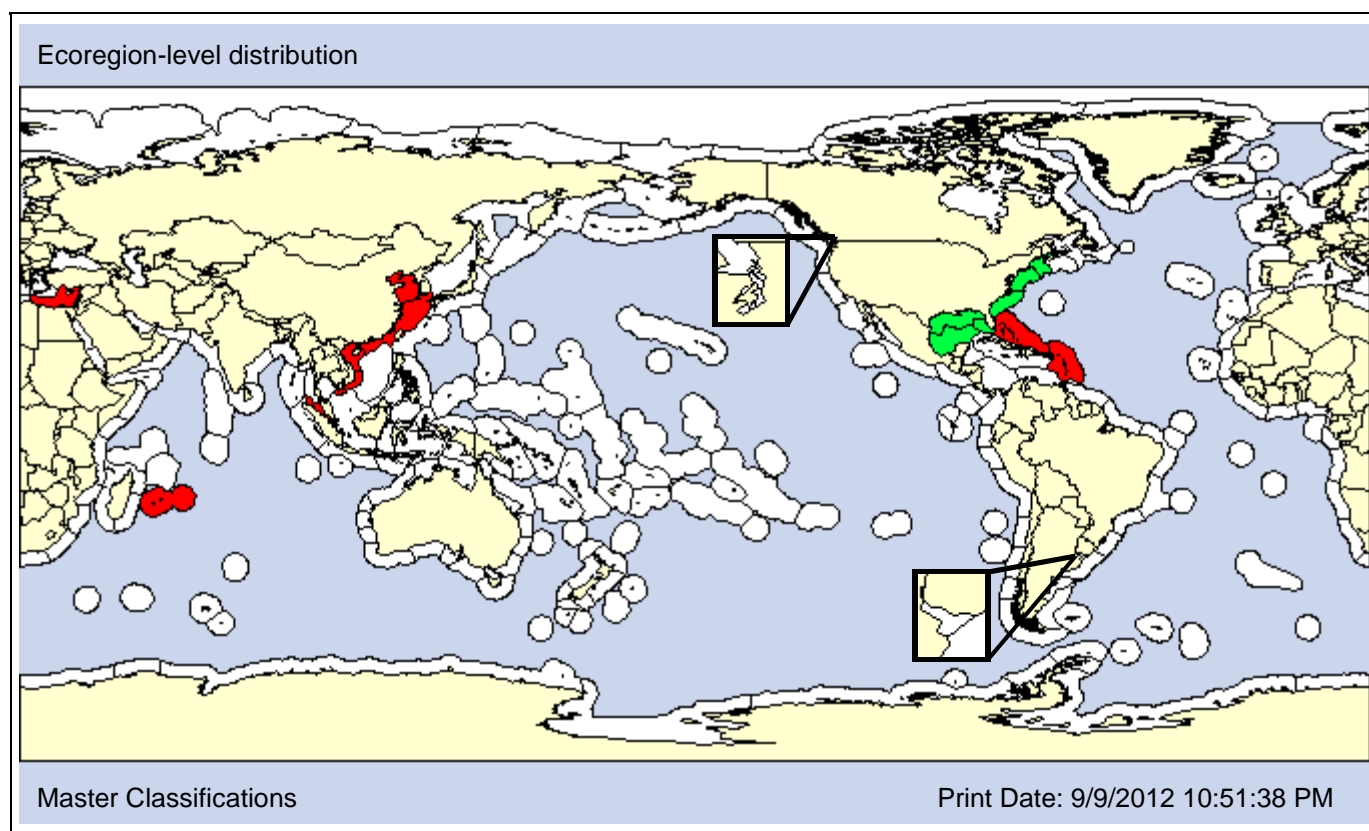
Lutjanus triangulum  
Perca ocellata

Synonym  
Synonym

**Common Names:**

channel bass  
red drum  
redfish  
spotted bass

**Type Locality:**



**Date 1st record:** 1991

**Loc 1st record:** China

**Established:** Unknown

**VECTORS**

SH			MS	AF X				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA		IR		A	P				
				X	X	AO	PO								

Comments: *Sciaenops ocellatus* was introduced for aquaculture into Korea (Seo and Lee, 2008), China (Chavanich et al., 2010), as well as Vietnam, Singapore and Taiwan (FishBase). It did not become established in Taiwan, and the population status in Korea, China, and Vietnam are not known. However, it is likely established in Singapore (FishBase).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>P</b>						

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH			<b>X</b>		
		<b>X</b>											

**DEPTH [Obs: 0 - 70m] [Pref: 10 - m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
<b>O</b>	<b>P</b>	<b>O</b>				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>P</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>					<b>P</b>						

**SALINITY [Obs: 0.14 - 50psu] [Pref: 30 - 35psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper O</b>
	Oligohaline <b>O</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>O</b>	
	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Temminck & Schlegel, 1850)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Tetraodontiformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Tetraodontidae

**Subfamily:**

**Also Known As (Name - Type):**

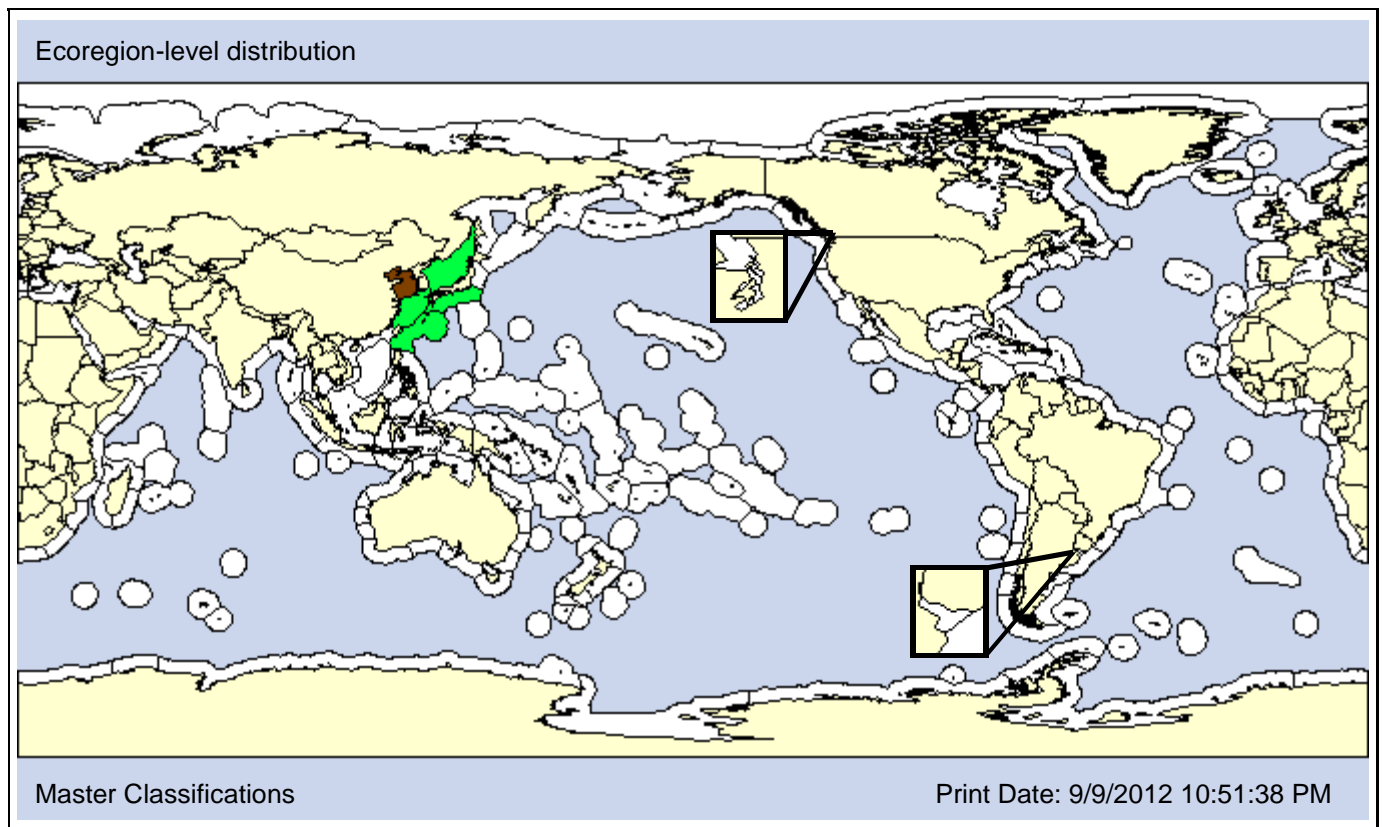
Fugu rubripes  
Sphaeroides rubripes  
Tetraodon rubripes

Synonym  
Synonym  
Synonym

**Common Names:**

Japanese pufferfish  
tiger puffer

**Type Locality:**



**Date 1st record:** 1991

**Loc 1st record:** Yellow Sea

**Established:** Yes

**VECTORS**

SH			MS	AF X			ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA			A	P				
					X	AO	PO							

Comments: According to FishBase, *Takifugu rubripes* is native to Russia, Japan, China, and Korea. However, Chen et al. (2006a) list it as introduced into the Yellow Sea and Seo and Lee (2008) list it as introduced into Korea. Thus, we list the Yellow Sea as a conflict.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>O</b>	<b>P</b>	<b>P</b>	<b>P</b>			<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>				

**DEPTH [Pref: - 20m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
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**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth

**SALINITY [Obs: 0 - psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline <b>O</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
	<b>O</b>	<b>O</b>	<b>O</b>	<b>P</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Günther, 1861)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Gobioidi

**Infraorder:**

**Superfamily:**

**Family:** Gobiidae

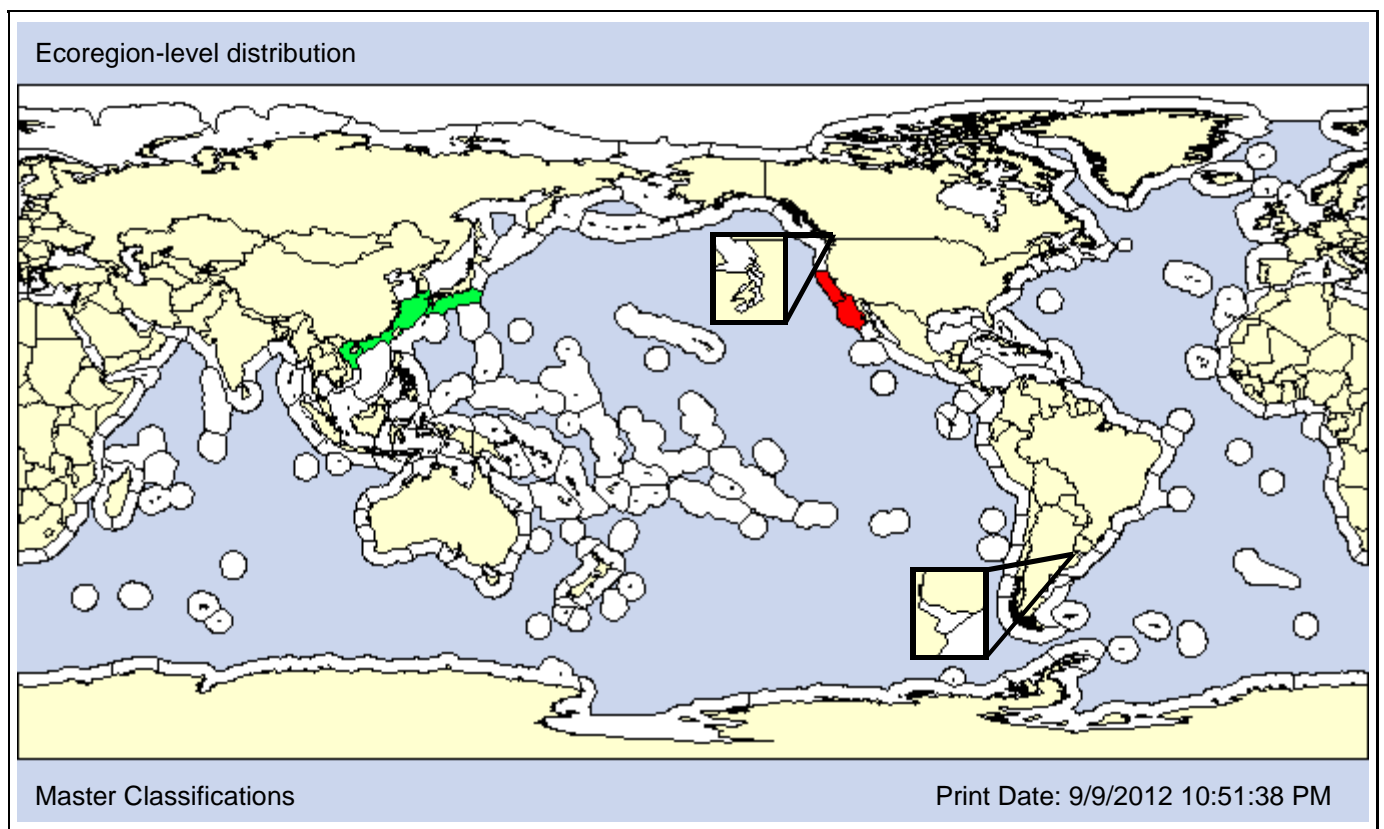
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

Shokihaze goby

**Type Locality:**



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1997

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

**VECTORS**

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
X						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>O</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH			<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 2.2 - 29.5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
		<b>O</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>								<b>Artificial Substrate O</b>				
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>						<b>O</b>			<b>O</b>		

**SALINITY [Obs: 0.09 - 28.81psu] [Pref: 2.5 - 9psu]**

<b>Fresh O</b>	<b>Brackish P</b>						<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>P</b>		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha			
	<b>P</b>	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>							<b>Asexual</b>				
H		G/D	SF				BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P					

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>								<b>Epibiotic</b>		
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									



# *Tridentiger bifasciatus*

Species ID: 1587

**Taxon:** Ray-finned fish

**Taxonomic Author:** Steindachner, 1881

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Gobioidi

**Infraorder:**

**Superfamily:**

**Family:** Gobiidae

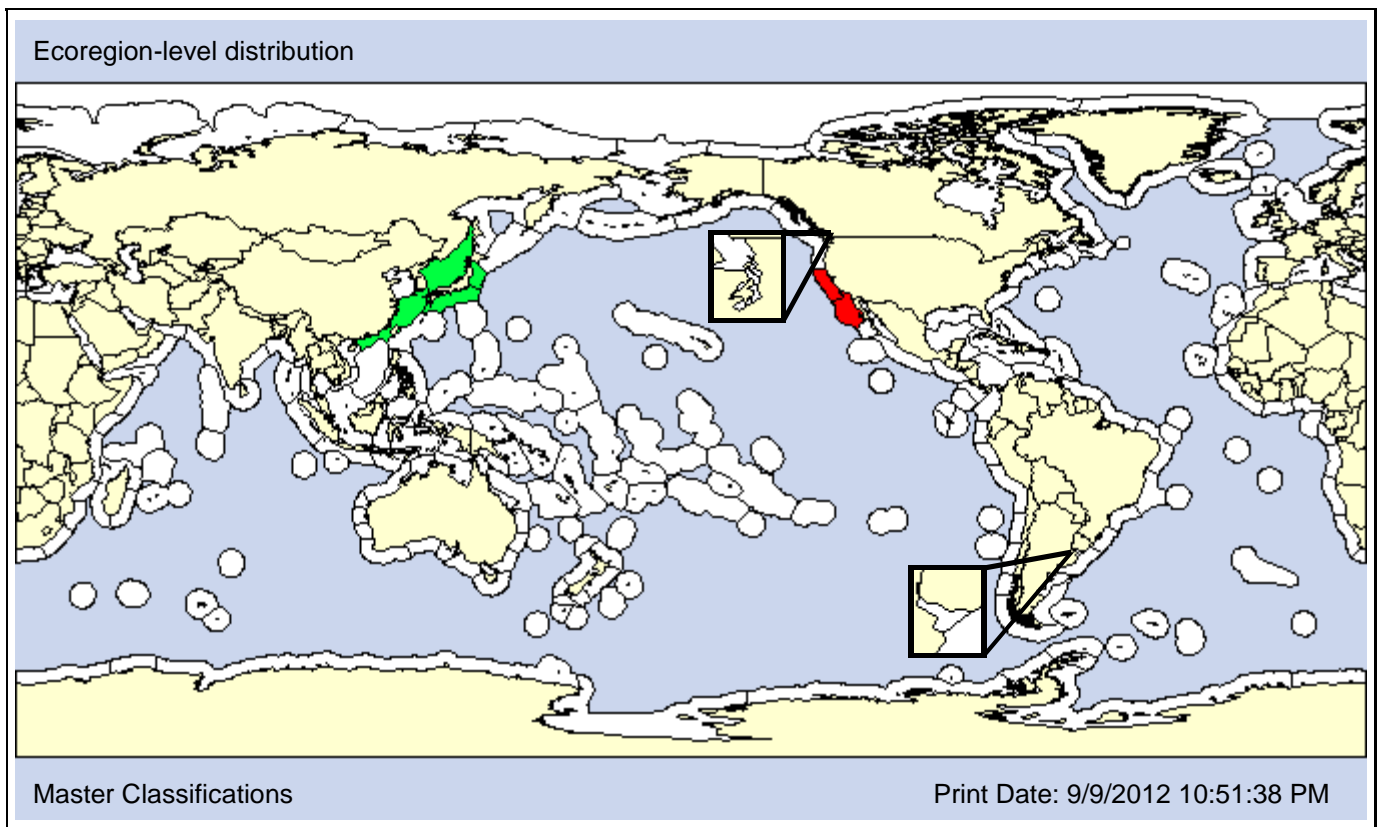
**Subfamily:**

**Also Known As (Name - Type):**

**Common Names:**

shimofuri goby  
shimofuri shimahaze

**Type Locality:** near Vladivostok, Russia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native

1985

**Loc 1st record:** Native

San Francisco Estuary, CA

**Established:** Yes

Yes

### VECTORS

SH X			MS	AF				ID	RE	AP		REC	SF	HR	O
BW	SB	HF		S/R	AE	AA				IR	A				
X						AO	PO								

Comments:

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>						<b>P</b>		

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB		<b>X</b>			TP	RI-PH			<b>X</b>		
		<b>X</b>											

**DEPTH [Obs: - 2m] [Pref: - 2m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>O</b>	<b>O</b>	<b>O</b>				<b>O</b>

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>							<b>Artificial Substrate</b>					
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>O</b>											

**SALINITY [Obs: 0 - 19psu] [Pref: 0 - 5psu]**

<b>Fresh P</b>	<b>Brackish P</b>					<b>Marine</b>		<b>Hyper</b>
	Oligohaline <b>P</b>		Mesohaline <b>O</b>		Polyhaline <b>O</b>		Beta	Alpha
	Beta	Alpha	Beta	Alpha	Beta	Alpha		
	<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

# Tridentiger trigonocephalus

Species ID: 1588

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Gill, 1859)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Perciformes

**Suborder:** Gobioidi

**Infraorder:**

**Superfamily:**

**Family:** Gobiidae

**Subfamily:**

**Also Known As (Name - Type):**

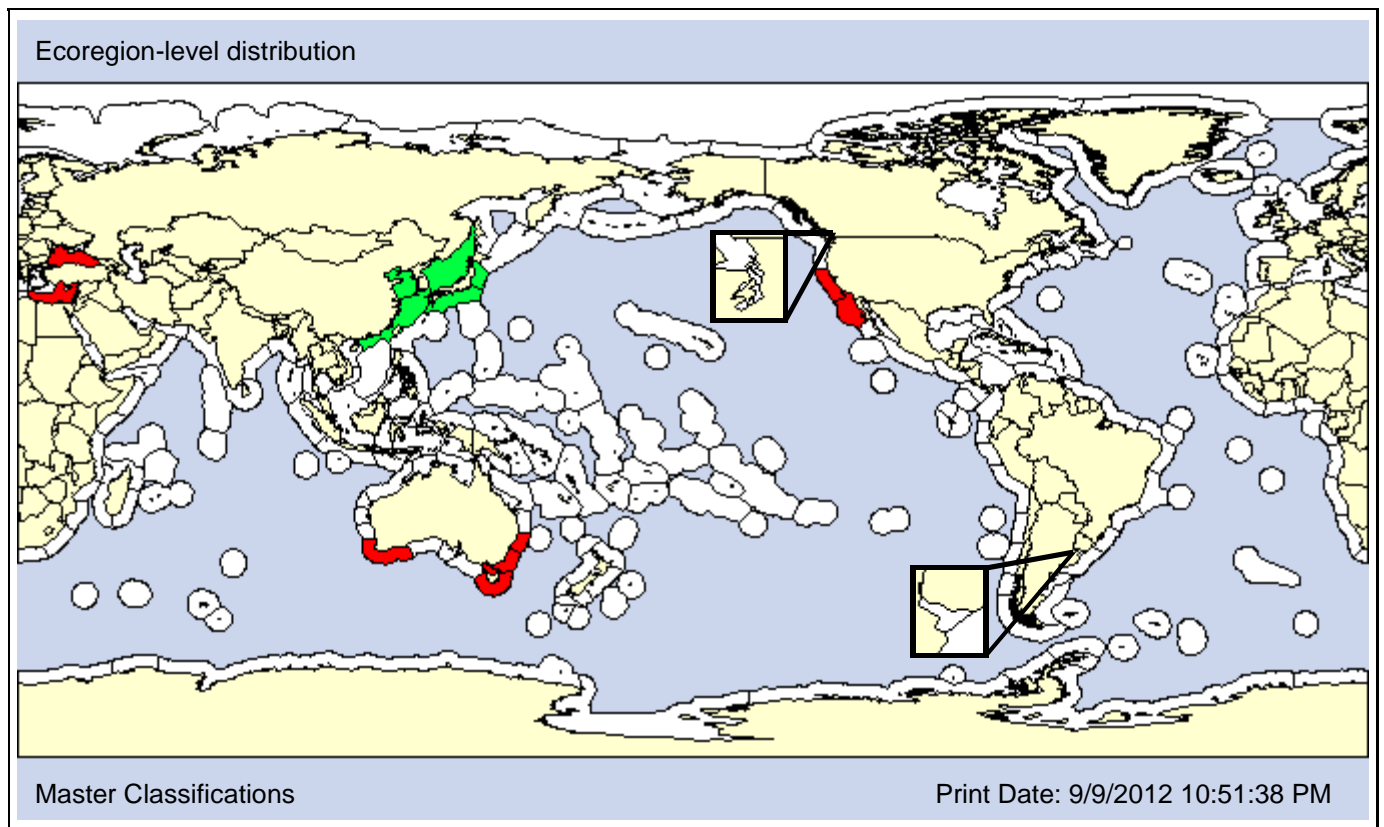
Triaenophorichthys trigonocephalus  
 Triaenophorus trigonocephalus  
 Tridentiger taeniatus  
 Trifissus ioturus

Synonym  
 Synonym  
 Synonym  
 Synonym

**Common Names:**

chameleon goby  
 Japanese goby  
 shimahaze  
 trident goby

**Type Locality:**



■ Native   
 ■ Nonindigenous   
  NIS Not Established   
 ■ Cryptogenic   
 ■ Transient   
 ■ Unclassified   
 ■ Conflicting Classification   
  Unidentified

**Date 1st record:** Native 1960  
**Loc 1st record:** Native Los Angeles Harbor, CA  
**Established:** Yes Yes

**VECTORS**

<b>SH X</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
<b>X</b>		<b>X</b>				AO	PO <b>X</b>								

Comments: The chameleon goby, *Tridentiger trigonocephalus*, can be found in “oyster shells and crevices among barnacles and other fouling organisms” (FishBase). Thus, transport of Pacific oysters and/or hull fouling are potential vectors, along with ballast water.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB	<b>X</b>				TP	RI-PH	<b>X</b>		<b>X</b>	<b>X</b>	
		<b>X</b>											

**DEPTH [Obs: 0 - 15m] [Pref: 4 - 5m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
		<b>O</b>	Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
	<b>P</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R P</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate O</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
			<b>P</b>					<b>O</b>				<b>O</b>	<b>O</b>	

**SALINITY [Obs: 14.6 - 36.8psu]**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline <b>P</b>		Polyhaline <b>P</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>	<b>O</b>	
				<b>P</b>	<b>P</b>	<b>P</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF <b>X</b>			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				
				<b>X</b>						

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP X</b>			<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P	<b>X</b>			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
			BP	EPS	EPU	EPC							
				<b>X</b>									

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Forsskål, 1775)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:**

**Infraclass:**

**Superorder:**

**Order:** Perciformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Mullidae

**Subfamily:**

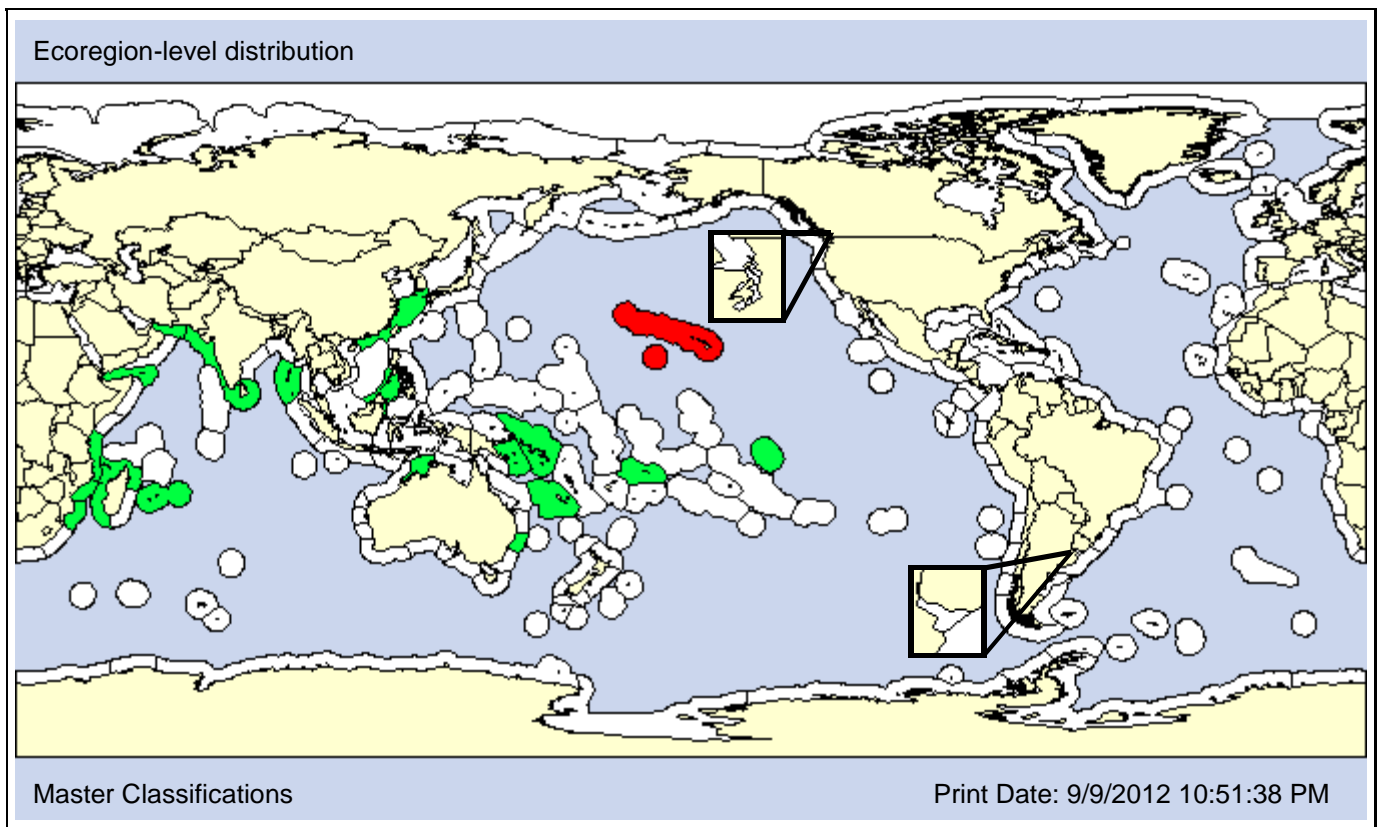
**Also Known As (Name - Type):**

Mullus vittatus	Synonym
-----------------	---------

**Common Names:**

bandedtail goatfish
bartailed goatfish
striped goatfish
yellowbanded goatfish

**Type Locality:** Jeddah, Saudi Arabia



Native
  Nonindigenous
  NIS Not Established
  Cryptogenic
  Transient
  Unclassified
  Conflicting Classification
  Unidentified

NWP
Hawaii
NEP

**Date 1st record:** Native 1955

**Loc 1st record:** Native Oahu, Hawaii

**Established:** Yes Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR			A	P			
						AO	PO								

Comments: *Upeneus vittatus* is widely distributed throughout the Eastern, Central, and Western Indo-Pacific (FishBase).

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>P</b>	<b>O</b>	<b>O</b>	<b>O</b>				

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB			<b>X</b>		TP	RI-PH		<b>X</b>			
		<b>X</b>											

**DEPTH [Obs: 5 - 320m]**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep	<b>O</b>		
			<b>P</b>	<b>O</b>			

**Pelagic Depth**

Epipelagic <b>P</b>		Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep	<b>O</b>		
	<b>P</b>	<b>O</b>			

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>O</b>	<b>P</b>				

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic P</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>							<b>P</b>					

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine P</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>P</b>	<b>P</b>	
						<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
				LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic X</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										

**Taxon:** Ray-finned fish

**Taxonomic Author:** (Bleeker, 1858-59)

**Kingdom:** Animalia

**Subkingdom:** Eumetazoa

**Phylum:** Chordata

**Subphylum:** Vertebrata

**Superclass:** Pisces

**Class:** Actinopterygii

**Subclass:** Neopterygii

**Infraclass:** Teleostei

**Superorder:** Acanthopterygii

**Order:** Mugiliformes

**Suborder:**

**Infraorder:**

**Superfamily:**

**Family:** Mugilidae

**Subfamily:**

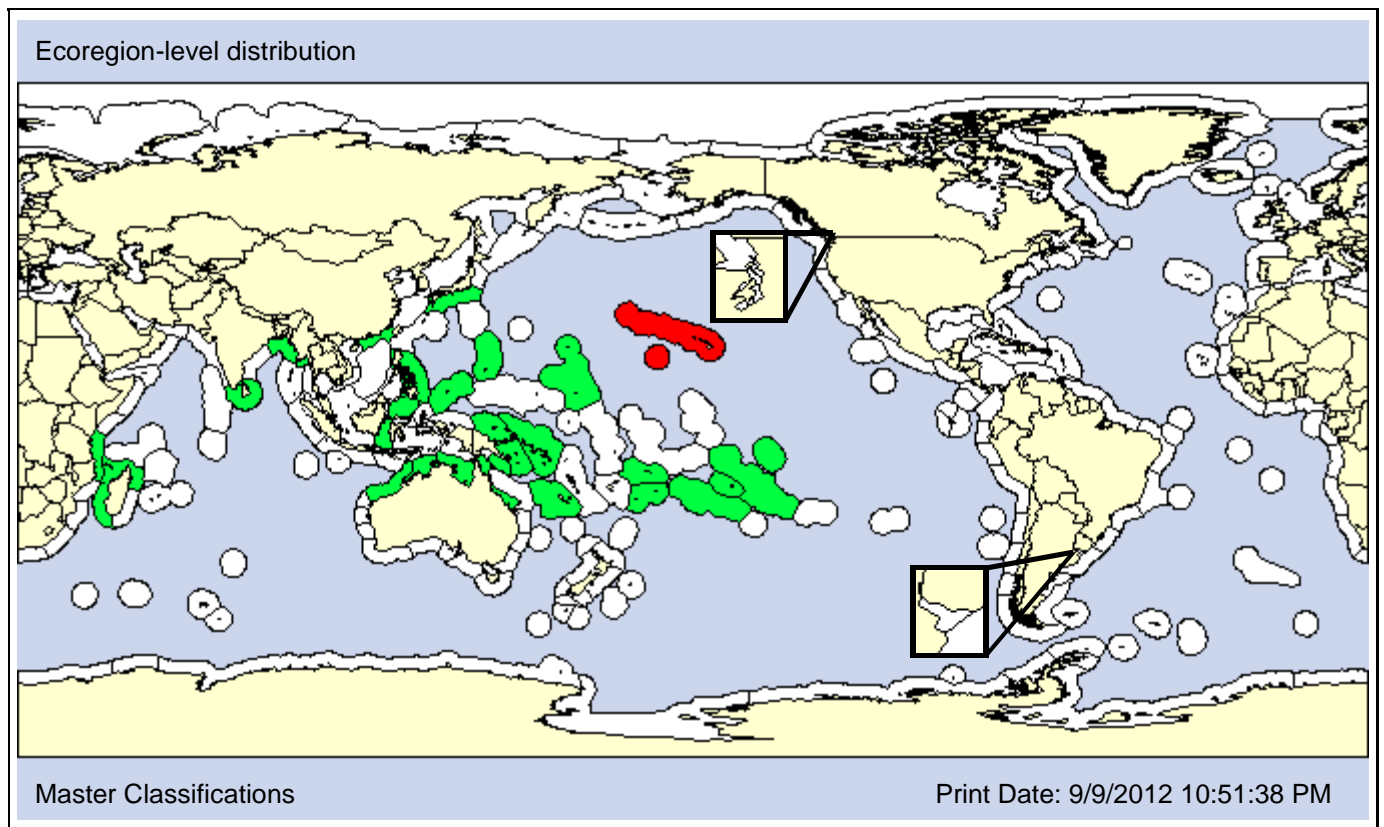
**Also Known As (Name - Type):**

Chelon engeli	Synonym
Moolgarda engeli	Synonym

**Common Names:**

Australian mullet
Engel's Mullet
Engle's mullet
Kanda

**Type Locality:** Java, Indonesia



Native	Nonindigenous	NIS Not Established	Cryptogenic	Transient	Unclassified	Conflicting Classification	Unidentified
NWP			Hawaii			NEP	

**Date 1st record:** Native 1955  
**Loc 1st record:** Native Oahu, Hawaii  
**Established:** Yes Yes

**VECTORS**

<b>SH</b>			<b>MS</b>	<b>AF X</b>				<b>ID</b>	<b>RE</b>	<b>AP</b>		<b>REC</b>	<b>SF</b>	<b>HR</b>	<b>O</b>
BW	SB	HF		S/R	AE	<b>AA X</b>		IR		A	P				
						AO	PO								

Comments: The mullet, *Valamugil engeli*, was accidentally introduced into Hawaii with the Marquesan sardine (*Sardinella marquesensis*) (Eldredge, 1994). It inhabits “shallow protected sandy to muddy areas of reef flats and shallow lagoons while juveniles have been encountered in tide pools” (FishBase), while in Hawaii it is largely estuarine.

**REGIME**

Estuary	Coastal Bay	Nearshore	Shelf	Oceanic	Coastal Fringe	Rivers	Lakes	Terrestrial
<b>P</b>	<b>O</b>							

**ECOSYSTEM**

<b>Unconsolidated X</b>						<b>Consolidated X</b>						<b>Pelagic X</b>	
Unvegetated X			SAV	MAR	MAN	D	RI X		SR	CR	O/M	F	K
UV-CS	UV-TF	UV-SUB					TP	RI-PH	<b>X</b>	<b>X</b>			
		<b>X</b>					<b>X</b>						

**DEPTH**

**Benthic Depth**

Coastal Fringe	Supralittoral	Intertidal	Subtidal <b>P</b>		Bathyal	Abyssal	Hadal
			Sub-Shallow	Sub-Deep			
			<b>P</b>				

**Pelagic Depth**

Epipelagic <b>P</b>			Meso	Bathyal	Abyssal	Hadal
Epi-Surface	Epi-Shallow	Epi-Deep				
	<b>P</b>					

**UNCONSOLIDATED SUBSTRATE X**

Mud	Sand	Mix. Fines	Gravel	Cobble	Mixed Sediments	Organic
<b>P</b>	<b>P</b>					

**CONSOLIDATED SUBSTRATE X**

<b>R</b>	<b>HP</b>	<b>Biogenic O</b>						<b>Artificial Substrate</b>						
		C	O	M	W	CA	K	RA	MAN	DW	R	P	H + B	Oth
		<b>O</b>												

**SALINITY**

<b>Fresh</b>	<b>Brackish P</b>						<b>Marine O</b>		<b>Hyper</b>
	Oligohaline		Mesohaline		Polyhaline <b>O</b>		Beta	Alpha	
	Beta	Alpha	Beta	Alpha	Beta	Alpha	<b>O</b>		
					<b>O</b>	<b>O</b>			

**TROPHIC LEVEL AND FEEDING**

<b>PAR</b>	<b>SA</b>	<b>PP</b>	<b>H</b>	<b>P</b>	<b>S</b>	<b>DET</b>	<b>DEC</b>	<b>SF</b>	<b>DF</b>	
				<b>X</b>					DF-SUR	DF-SUB

**REPRODUCTION**

<b>Sexual X</b>						<b>Asexual</b>				
H		G/D	SF			BF	BUD	PAR/AGA	VP	SP
SynH	SeqH	<b>X</b>	IF	FEE	FCS	P				

**EARLY DEVELOPMENT**

**JUVENILE DEVELOPMENT/DISPERSAL**

<b>V</b>	<b>OVI</b>	<b>OVO</b>	<b>DD</b>	<b>LP</b>		<b>FR</b>	<b>SD</b>	<b>SP</b>
	<b>X</b>			LP-B	LP-P			

**HABITAT ASSOCIATION**

<b>Pelagic</b>			<b>Benthic X</b>							<b>Epibiotic</b>			
PL	NE	SUB	DEM <b>X</b>		SUR		UR	B	N	SF	IN	EPP	EPZ
		<b>X</b>	BP	EPS	EPU	EPC							
			<b>X</b>										



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**Blackfordia virginica**  
 #Master Comment

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 Streftaris et al., 2005  
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**Boccardiella hamata**  
 #Master Comment  
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 California Department of Fish and Game, 2002  
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 GBIF  
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**Boccardiella ligerica**  
 #Master Comment  
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 California Department of Fish and Game, 2002  
 CANOD, 2009  
 Carlton, 1979  
 Cohen, 1998  
 Cohen and Carlton, 1995  
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 Markmann, 1986  
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 Streftaris et al., 2005  
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**Bonamia ostreae**  
 #Master Comment  
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**Bonnemaisonia hamifera**  
 #Master Comment  
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 DAISIE  
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**Boonea cineta**  
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**Boreosignum wilsoni**  
 #Master Comment  
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**Bostrichobranchnus pilularis**  
 #Master Comment  
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**Bostrycapulus calyptraeiformis**  
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**Bothriocephalus acheilognathi**  
 #Master Comment  
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 Lee and Reusser (PCEIS), 2012  
 Shluker, 2003  
 USGS-NAS  
**Botrylloides diegensis**  
 #Master Comment  
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 CANOD, 2009  
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 Cohen  
 Cohen et al., 2005a  
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 Fairey et al., 2002  
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 Lutaenko, 2010  
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 Ruiz et al., 2000  
 Van Name, 1945  
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**Botrylloides perspicuus**  
 #Master Comment  
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 California Department of Fish and  
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Epelbaum et al., 2009  
Fairey et al., 2002  
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Hewitt, 1993  
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- Maclellan, 2005  
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- Botryllus schlosseri**  
#Master Comment  
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 Maclellan, 2005  
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 Mead et al., 2011  
 Mills, 2001a  
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 OBIS  
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**Botryllus sp. A Lambert (CANOD, 2009)**  
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**Bougainvillia muscus**  
 #Master Comment  
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 Calder, 1993  
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 Chaplygina, 2006  
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 Çinar et al., 2008  
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 Inglis et al., 2006b  
 Kashin et al., 2000  
 Lee and Reusser (PCEIS), 2012  
 Light et al., 2005  
 Meacham, 2001  
 Meadows and Kane, 2006  
 Miglietta et al., 2008  
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 Mills et al., 2007  
 OBIS  
 Petrova and Dautova, 2008  
 Tasmanian Planning Commission, 2009  
 Vervoort, 2006  
 WoRMS  
 Zvyagintsev et al., 2004

**Boveria teredinidi**  
 #Master Comment  
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 California Department of Fish and Game, 2002  
 CANOD, 2009  
 Carlton, 1979  
 Cohen and Carlton, 1995  
 Hillman, 1979  
 Lee and Reusser (PCEIS), 2012  
 Ruiz et al., 2000

**Bowerbankia gracilis Cmplx**  
 #Master Comment  
 ArcOD  
 Barnhart et al., 1992  
 Bishop Museum, 2000  
 Bookheim and Berry, 1999  
 Boyd et al., 2002  
 California Department of Fish and Game, 2002  
 CANOD, 2009  
 Carlton, 1989

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 Carlton et al., 2003  
 Cohen et al., 2001a  
 Cohen, 2004b  
 Cohen and Carlton, 1995  
 Cohen et al., 1998  
 Cranfield et al., 1998a  
 Creary and Webber, 2009  
 DAISIE  
 EPA, 1999  
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 EPA, 2008  
 Fairey et al., 2002  
 Farrapeira et al., 2009  
 GBIF  
 Gordon, 2009  
 Hewitt, 1993  
 Kashin et al., 2003  
 Lee and Reusser (PCEIS), 2012  
 Liu, 2008  
 Maclellan, 2005  
 McCann et al., 2007  
 Meacham, 2001  
 Meadows and Kane, 2006  
 Mills, 2001a  
 Minchin and Eno, 2002  
 Novosel and Požar-Domac, 2001  
 OBIS  
 Osburn, 1947  
 Osburn, 1953  
 Pederson et al., 2005  
 Ramalho and Muricy, 2004  
 Ruiz et al., 2000  
 SCAMIT, 2008a  
 Shluker, 2003  
 Soule et al., 2007  
 T N & Associates, 2002  
 Tasmanian Planning Commission, 2009  
 Teacă et al., 2006  
 Thompson et al., 2000  
 Wasson et al., 2002  
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 WDFW, 1998  
 Winston, 1977  
 Winston and Maturo, 2009  
 Wonham and Carlton, 2005  
 Zongguo, 2001  
 Zvyagintsev, 2003  
 Zvyagintsev et al., 2009

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#Master Comment  
 Aladin et al., 2006a  
 ArcOD  
 Bishop Museum, 2000  
 CANOD, 2009  
 Carlton and Eldredge, 2009  
 Cranfield et al., 1998a  
 GBIF  
 Gordon, 2009  
 Hayward and McKinney, 2002  
 Johnston et al., 2002  
 Lee and Reusser (PCEIS), 2012  
 Maclellan, 2005  
 Meadows and Kane, 2006  
 OBIS  
 Osburn, 1953  
 Pederson et al., 2005  
 Shluker, 2003  
 Tasmanian Planning Commission, 2009  
 Winston, 1977

#### ***Brachydeutera ibari***

#Master Comment  
 Carlton and Eldredge, 2009  
 Englund et al., 2000a  
 GBIF  
 Lee and Reusser (PCEIS), 2012  
 Mathis and Ghorpade, 1985

#### ***Branchiomma bairdi***

Capa and Lopez, 2004  
 Çinar, 2009  
 GBIF  
 Katsanevakis et al., 2009  
 Tovar-Hernández et al., 2009b  
 Zenetos et al., 2010

#### ***Branchiomma japonica***

#Master Comment  
 Biodiversity Research Museum  
 Carlton and Eldredge, 2009  
 Coles et al., 2002a  
 Coles et al., 1999a  
 Lee and Reusser (PCEIS), 2012

#### ***Brevicirrosyllis weismanni***

#Master Comment  
 Abd-Elnaby, 2009b  
 Boggemann et al., 2003  
 Day and Hutchings, 1979  
 GBIF  
 Lee and Reusser (PCEIS), 2012  
 Musco and Giangrande, 2005  
 Nelson et al., 2007

OBIS  
 San Martín et al., 2009  
 Swartz et al., 2002  
 Uebelacker and Johnson, 1984  
 Wehe and Fiege, 2002  
 WoRMS

**Bruguiera sexangula**  
 #Master Comment  
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 IUCN, 2010  
 Lin and Huang, 2007  
 OBIS  
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**Bryopsis sp. (Cohen and Carlton, 1995)**  
 #Master Comment  
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 Ruiz et al., 2000  
 Silva, 1979

**Buchnerillo sp. (Carlton and Eldredge, 2009)**  
 #Master Comment  
 Bishop Museum, 2000  
 Carlton and Eldredge, 2009  
 Meadows and Kane, 2006

**Bugula californica**  
 Bishop Museum, 2000  
 Brusca and Hendrickx  
 Carlton and Eldredge, 2009  
 CDF  
 Chavanich et al., 2010  
 Cohen and Carlton, 1995  
 Dept. of Navy, 2000  
 deRivera et al., 2007  
 Fairey et al., 2002  
 GBIF  
 Hewitt, 1993  
 Houck et al., 1997  
 Lee and Reusser (PCEIS), 2012  
 Long and Rucker, 1969  
 Morris et al., 1980  
 Osburn, 1950  
 Otani, 2006  
 Seo and Lee, 2008  
 Soule et al., 2007  
 Wasson et al., 2002  
 Zvyagintsev, 2003

**Bugula dentata**  
 #Master Comment  
 Bishop Museum, 2000  
 Branch et al., 2007  
 Carlton and Eldredge, 2009

Coles et al., 2003  
 GBIF  
 Lee and Reusser (PCEIS), 2012  
 Mead et al., 2011  
 Meadows and Kane, 2006  
 OBIS  
 Pollard and Pethebridge, 2002a  
 Ramalho et al., 2005  
 Riddell, 1980  
 Seo and Min, 2009  
 Shluker, 2003  
 Winston, 1986

**Bugula flabellata**  
 #Master Comment  
 California Department of Fish and Game, 2002  
 CANOD, 2009  
 Carlton, 1979  
 Cohen et al., 2002  
 Cranfield et al., 1998a  
 Dyrinda and Ryland, 1982  
 GBIF  
 Gordon, 2009  
 Hewitt et al., 2004  
 Lee and Reusser (PCEIS), 2012  
 Liu, 2008  
 Ma et al., 2008  
 MarLIN  
 McCauley, 1972  
 Mead et al., 2011  
 Novosel and Požar-Domac, 2001  
 OBIS  
 Orensanz et al., 2002  
 Osburn, 1912  
 Osburn, 1947  
 Osburn, 1950  
 Pollard and Hutchings, 1990  
 Robertson, 1905  
 Tasmanian Planning Commission, 2009  
 Valdivia et al., 2005  
 Winston, 1977  
 WoRMS  
 Zongguo, 2001

**Bugula fulva**  
 #Master Comment  
 deRivera et al., 2007  
 Hayward and McKinney, 2002  
 Lee and Reusser (PCEIS), 2012  
 Martínez and Adarraga, 2008  
 Maturo, 1966  
 Novosel and Požar-Domac, 2001

OBIS  
 Pierri et al., 2010  
 Zenetos et al., 2010  
**Bugula minima**  
 #Master Comment  
 Carlton and Eldredge, 2009  
 Coles et al., 2002a  
 GBIF  
 OBIS  
 Shluker, 2003  
 Winston and Woollacott, 2008  
**Bugula neritina Cmplx**  
 #Master Comment  
 Bishop Museum, 2000  
 Boyd et al., 2002  
 California Department of Fish and  
 Game, 2002  
 Cangussu et al., 2010  
 Carlton, 1979  
 Carlton, 2003  
 Carlton and Eldredge, 2009  
 Carlton et al., 2003  
 Chavanich et al., 2003  
 Chavanich et al., 2010  
 Cohen and Carlton, 1995  
 Cohen et al., 2002  
 Coles et al., 2002a  
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 Cranfield et al., 1998a  
 Creary and Webber, 2009  
 Crooks, 1998a  
 DAISIE  
 Dept. of Navy, 2000  
 deRivera et al., 2007  
 Emara and Belal, 2004  
 EPA, 2008  
 Fairey et al., 2002  
 Gaonkar et al., 2010  
 GBIF  
 GISD  
 Gordon, 2009  
 Hayward, 1981  
 Hewitt, 1993  
 Hewitt et al., 2004  
 Ignacio et al., 2010  
 Kerckhof et al., 2007  
 Lee and Reusser (PCEIS), 2012  
 Lenihan et al., 1990  
 Li et al., 2010  
 Liu, 2008  
 Long and Rucker, 1969  
 Ma et al., 2008  
 Mackie et al., 2006  
 Maclellan, 2005  
 Mead et al., 2011  
 Meadows and Kane, 2006  
 NIMPIS  
 Novosel and Požar-Domac, 2001  
 OBIS  
 Orensanz et al., 2002  
 Osburn, 1950  
 PICES Working Group 21, 2009  
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 Ramadan et al., 2006  
 Ramalho and Muricy, 2004  
 Ruiz et al., 2000  
 SCAMIT, 2008a  
 SeaLifeBase  
 Seo and Lee, 2008  
 Shluker, 2003  
 Smithsonian-Fort Pierce  
 Soule et al., 2007  
 Streftaris et al., 2005  
 Wasson et al., 2002  
 Wasson et al., 2001  
 Winston, 1977  
 Winston and Mauro, 2009  
 Wonham and Carlton, 2005  
 Zongguo, 2001  
 Zongguo et al., 1999  
**Bugula sp. 1 (Cohen et al., 1998)**  
 #Master Comment  
 Cohen et al., 1998  
 deRivera et al., 2007  
 Hines and Ruiz, 2000a  
 Meacham, 2001  
 Mills, 2001a  
**Bugula sp. 2 (Cohen et al., 1998)**  
 #Master Comment  
 Cohen et al., 1998  
 Hines and Ruiz, 2000a  
 Meacham, 2001  
 Mills, 2001a  
**Bugula stolonifera**  
 #Master Comment  
 Bishop Museum, 2000  
 Bookheim and Berry, 1999  
 California Department of Fish and  
 Game, 2002  
 Cangussu et al., 2010

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 Carlton and Eldredge, 2009  
 Clarke et al., 2004  
 Cohen, 2004b  
 Cohen and Carlton, 1995  
 Cohen et al., 1998  
 Coles et al., 1999a  
 Cranfield et al., 1998a  
 DAISIE  
 deRivera et al., 2007  
 Emara and Belal, 2004  
 Gaonkar et al., 2010  
 GBIF  
 Gollasch et al., 2009  
 Gordon, 2009  
 Hao et al., 2005  
 Kerckhof et al., 2007  
 Lee and Reusser (PCEIS), 2012  
 Liu, 2008  
 Maclellan, 2005  
 Meacham, 2001  
 Meadows and Kane, 2006  
 Mills, 2001a  
 Novosel and Požar-Domac, 2001  
 OBIS  
 Orensanz et al., 2002  
 Pederson et al., 2005  
 Pollard and Pethebridge, 2002a  
 Ramalho and Muricy, 2004  
 Ruiz et al., 2000  
 Scholz et al., 2003  
 Shluker, 2003  
 Smithsonian-Fort Pierce  
 Soule et al., 2007  
 Tasmanian Planning Commission, 2009  
 USGS-NAS  
 Wasson et al., 2002  
 Wasson et al., 2001  
 WDNR, 1998  
 Winston, 1977  
 Winston and Maturo, 2009  
 Wonham and Carlton, 2005  
 Zongguo, 2001  
 Zongguo et al., 1999
- Bunodeopsis sp. A (Engle and Richards, 2001)**  
 #Master Comment  
 California Department of Fish and Game, 2002  
 CANOD, 2009  
 Cohen et al., 2002
- Crooks, 1998a  
 Dept. of Navy, 2000  
 Engle and Richards, 2001  
 EPA, 2008  
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 Ranasinghe et al., 2005  
 SCAMIT, 1998  
 Talley et al., 2000  
 Williams, 2007c
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 California Department of Fish and Game, 2002  
 CANOD, 2009  
 Carlton, 1969  
 Carlton, 1979  
 Carlton, 1992  
 Carlton, 1999a  
 Cohen and Carlton, 1995  
 EPA, 2000  
 GBIF  
 Malacolog  
 Meehan et al., 1989  
 Nichols and Pamatamat, 1988  
 OBIS  
 Ruiz et al., 2000  
 Turgeon et al., 1988
- Caberea boryi**  
 #Master Comment  
 Bishop Museum, 2000  
 Bock  
 Carlton and Eldredge, 2009  
 Dept. Env. Water Heritage and Arts Aus. 2008  
 Dhondt, 1988  
 GBIF  
 Gluhak et al., 2007  
 Hayward and McKinney, 2002  
 Kozloff, 1996  
 Lee and Reusser (PCEIS), 2012  
 Migotto and Winston, 2005  
 OBIS  
 Seo and Min, 2009
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 #Master Comment  
 Bishop Museum, 2000  
 Brusca et al., 2001  
 Carlton, 1979  
 Carlton and Eldredge, 2009  
 Espinosa-Pérez and Hendrickx, 2006  
 GBIF  
 Kensley, 2001

Lee and Reusser (PCEIS), 2012  
 Meadows and Kane, 2006  
 Menzies, 1951b  
 Ruiz et al., 2000  
 Shluker, 2003  
 WoRMS

**Caligus sclerotinosus**  
 #Master Comment  
 GBIF  
 Ho et al., 2004  
 Maran and Ohtsuka, 2008  
 Walter and Boxshall

**Callinectes sapidus**  
 Bishop Museum, 2000  
 CANOD, 2009  
 Carlton, 1979  
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 Cohen and Carlton, 1995  
 Cohen and Carlton, 1997  
 DAISIE  
 Eldredge and DeFelice, 2002  
 GBIF  
 Hasegawa, 1992  
 Iwasaki, 2006  
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 Jamieson et al., 1998  
 Kerckhof et al., 2007  
 Meadows and Kane, 2006  
 MEI, 2008  
 Muraoka and Taguchi, 1992  
 Nabeshima, 2007  
 Olenin et al.  
 Otani, 2006  
 Shimura et al., 2007  
 Shluker, 2003  
 Smithsonian-Fort Pierce  
 Streftaris et al., 2005  
 Visser et al., 2004  
 WoRMS  
 Zenetos et al., 2010

**Callithamnion corymbosum**  
 #Master Comment  
 AlgaeBase  
 GBIF  
 Hansen, 2008  
 Lee and Reusser (PCEIS), 2012  
 OBIS  
 Oh et al., 1990  
 Yamagishi and Miwa, 2008

**Caloria indica**  
 #Master Comment

Bishop Museum, 2000  
 Carlton and Eldredge, 2009  
 CIESM, 2006  
 Meadows and Kane, 2006  
 Nudi Pixel  
 OBIS  
 Rudman, 1999  
 Streftaris et al., 2005  
 Zenetos et al., 2010

**Camallanus cotti**  
 #Master Comment  
 Carlton and Eldredge, 2009  
 Moravec and Justine, 2006

**Canaceoides angulatus**  
 #Master Comment  
 Carlton and Eldredge, 2009  
 CDF  
 Englund et al., 2000a  
 GBIF  
 Munari and Mathis, 2010  
 Wirth, 1969

**Caprella danilevskii**  
 #Master Comment  
 Aquenal Pty. Ltd., 2002  
 Carlton and Eldredge, 2009  
 Díaz et al., 2005  
 Eldredge and DeFelice, 2002  
 GBIF  
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 OBIS  
 Winfield et al., 2006

**Caprella drepanochir**  
 #Master Comment  
 ArcOD  
 California Department of Fish and Game, 2002  
 CANOD, 2009  
 Chapman, 2009  
 EPA, 1999  
 EPA, 2002a  
 EPA, 2008  
 Fairey et al., 2002  
 Liu, 2008  
 OBIS  
 PICES Working Group 21, 2010  
 T N & Associates, 2002  
 Thiel and Gutow, 2003  
 Vassilenko, 2006  
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**Caprella equilibra**

#Master Comment  
Barnhart et al., 1992  
Boyd et al., 2002  
Brusca and Hendrickx  
California Department of Fish and Game, 2002  
CANOD, 2009  
Carlton, 1979  
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Chapman, 2009  
Cohen and Carlton, 1995  
Dept. of Navy, 2000  
Díaz et al., 2005  
Doi et al., 2011  
Eldredge and DeFelice, 2002  
EPA, 2008  
Fairey et al., 2002  
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**Littorina saxatilis**  
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**Lucania parva**  
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**Martesia striata**  
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 Thompson et al., 2000  
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**Melita rylovae**  
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 #Master Comment  
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**Munna sp. A (Cohen and Carlton, 1995)**  
 #Master Comment  
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**Musculista senhousia**  
 #Master Comment  
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**Mycale grandis**  
 #Master Comment  
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 Tsuchiya, 1979  
 Turgeon et al., 1988  
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 Zvyagintsev, 2003

**Myzobdella lugubris**  
 #Master Comment  
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 Bishop Museum, 2000  
 CANOD, 2009  
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 Cohen and Moyle, 2004  
 Englund et al., 2000b  
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 Shluker, 2003

**Nebalia sp. (Cohen and Carlton, 1995)**  
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 Ruiz et al., 2000

**Nemacystus decipiens**  
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**Scolecopsis victoriensis**  
 #Master Comment  
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 EPA, 2002c  
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**Scylla serrata**  
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Eldredge and DeFelice, 2002  
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Wells et al., 2009  
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**Scyphoproctus djiboutiensis**  
#Master Comment  
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Nelson et al., 2007  
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Rangarajan, 1963  
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**Serpula watsoni**  
Carlton and Eldredge, 2009  
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**Sinelobus stanfordi Cmplx**  
#Master Comment  
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T N & Associates, 2002  
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**Sinocalanus doerrii**  
Avent et al., 2000  
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- Spartina alterniflora**  
 California Department of Fish and Game, 2002  
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- Spartina anglica**  
 #Master Comment  
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- Spartina patens**  
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- Sphaeroma quoianum**  
 #Master Comment  
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**Sphaerosyllis riseri**  
 #Master Comment  
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**Sphenia coreanica**  
 #Master Comment  
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#Master Comment  
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**Spirobranchus kraussii**  
#Master Comment  
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**Stenothoe gallensis**  
#Master Comment  
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**Stenothoe valida**  
#Master Comment  
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**Stenothyra sp. (Tamaki et al., 2002)**  
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 Williams et al., 1998c  
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 Williams et al., 1998b  
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 Zedler et al., 1992  
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**Striaria attenuata**  
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 GBIF  
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 Nelson and Maggs, 1996  
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**Strongylocentrotus intermedius**  
 #Master Comment  
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**Styela canopus**  
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 Locke, 2009  
 Maclellan, 2005  
 Marins et al., 2010  
 Mead et al., 2011  
 Meadows and Kane, 2006  
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 Paulay et al., 2002  
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 Primo and Vazquez, 2008  
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 Ruiz et al., 2000  
 SCAMIT, 2008a  
 Shluker, 2003  
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 UNDP/GEF, 2007

Van Name, 1945  
 Zongguo, 2001  
**Styela clava**  
 Abbott et al., 2007  
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 Bookheim and Berry, 1999  
 Boyd et al., 2002  
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 GBIF  
 GISD  
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 Kashin et al., 2000  
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 Olenin et al.  
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 #Master Comment  
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 SCAMIT, 2008a  
 Seo and Lee, 2008  
 Smithsonian-Fort Pierce  
 Van Name, 1945  
 Zongguo, 2001

**Stylochoplana limnoriae**  
 #Master Comment  
 Carlton, 1979  
 Lee and Reusser (PCEIS), 2012  
 Ruiz et al., 2000  
 Tyler et al.

**Suberites aurantiacus**  
 #Master Comment  
 Carlton and Eldredge, 2009  
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 Eldredge and Smith, 2001  
 Farrapeira et al., 2009  
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 Meadows and Kane, 2006  
 OBIS  
 WoRMS

**Syllides bansei**  
 #Master Comment  
 Boggemann et al., 2003  
 GBIF  
 Lee and Reusser (PCEIS), 2012  
 Musco and Giangrande, 2005  
 Nelson et al., 2007  
 OBIS  
 Perkins, 1981  
 Swartz et al., 2002  
 Uebelacker and Johnson, 1984

**Symplegma brakenhielmi**  
 #Master Comment  
 Bishop Museum, 2000  
 California Department of Fish and Game, 2002  
 Carlton and Eldredge, 2009  
 Carman et al., 2011  
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Crooks, 1998a  
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 Lee and Reusser (PCEIS), 2012  
 Locke, 2009  
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 Meadows and Kane, 2006  
 Paulay et al., 2002  
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 Rocha and Kremer, 2005  
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 Rocha et al., 2009  
 Ruiz et al., 2000  
 Shenkar and Loya, 2009  
 Shluker, 2003  
 Zenetos et al., 2010

**Symplegma reptans**  
 Abbott et al., 2007  
 Bishop Museum, 2000  
 California Department of Fish and Game, 2002  
 CANOD, 2009  
 Carlton and Eldredge, 2009  
 Cohen et al., 2002  
 Coles et al., 1999a  
 Crooks, 1998a  
 Dept. of Navy, 2000  
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 Doty et al., 1986  
 Fairey et al., 2002  
 Gaonkar et al., 2010  
 GBIF  
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 Lee and Reusser (PCEIS), 2012  
 Liu, 2008  
 Meadows and Kane, 2006  
 Ruiz et al., 2000  
 Shluker, 2003  
 Streftaris et al., 2005  
 Swami and Chhapgar, 2002  
 Zongguo, 2001

**Symplegma sp. (Carlton and Eldredge, 2009)**  
 Bishop Museum, 2000  
 Carlton and Eldredge, 2009

**Synandwakia hozawai**

#Master Comment  
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 Kostina, 2000  
 Lee and Reusser (PCEIS), 2012  
 Zvyagintsev et al., 2009  
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**Synidotea laevidorsalis**  
 #Master Comment  
 Brusca et al., 2001  
 Bushek and Boyd, 2006  
 California Department of Fish and Game, 2002  
 CANOD, 2009  
 Carlton, 1979  
 Chapman and Carlton, 1991  
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 Cohen, 2004c  
 Cohen and Carlton, 1995  
 Cuesta et al., 1996  
 DAISIE  
 EPA, 2000  
 EPA, 2002a  
 EPA, 2008  
 Espinosa-Pérez and Hendrickx, 2006  
 Filice, 1958  
 Lee and Reusser (PCEIS), 2012  
 Light et al., 2005  
 Liu, 2008  
 Markmann, 1986  
 Mees and Fockedey, 1993  
 Orensanz et al., 2002  
 Poore, 1996  
 Ruiz et al., 2000  
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 Soors et al., 2010  
 Streftaris et al., 2005  
 Sytsma et al., 2004a  
 Thompson et al., 2000  
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 Wonham and Carlton, 2005  
 WoRMS  
 Zongguo, 2001

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 #Master Comment  
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 Bishop Museum, 2000  
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 Foss, 2011  
 GBIF  
 Gluhak et al., 2007  
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 Kocak et al., 2002  
 Kozloff, 1996  
 Lee and Reusser (PCEIS), 2012  
 OBIS  
 Osburn, 1950  
 SCAMIT, 2008a  
 Tilbrook et al., 2001  
 Winston, 1986

**Syntormon flexible**  
 #Master Comment  
 Carlton and Eldredge, 2009  
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 Lee and Reusser (PCEIS), 2012

**Taenioplana teredini**  
 #Master Comment  
 Bishop Museum, 2000  
 Carlton, 2009  
 Carlton and Eldredge, 2009  
 Hoagland and Turner, 1980  
 Meadows and Kane, 2006  
 Shluker, 2003

**Takifugu rubripes**  
 #Master Comment  
 Chen et al., 2006a  
 FishBase, 2009  
 OBIS  
 Seo and Lee, 2008  
 UNDP/GEF, 2007

**Tanystylum rehderi**  
 #Master Comment  
 Arango, 2003  
 Carlton and Eldredge, 2009  
 Coles et al., 2002a  
 Lee and Reusser (PCEIS), 2012  
 Müller, 1993  
 WoRMS

**Tarebia granifera**  
 #Master Comment  
 Bishop Museum, 2000  
 Carlton and Eldredge, 2009  
 Englund et al., 2000b  
 GBIF  
 Lee and Reusser (PCEIS), 2012  
 López-López et al., 2009  
 Mead et al., 2011  
 Meadows and Kane, 2006  
 Miranda, et al., 2010  
 OBIS  
 Pointier, 2001  
 Shluker, 2003

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**Telmatogeton japonicus**  
 #Master Comment  
 Carlton and Eldredge, 2009  
 GBIF  
 Gollasch et al., 2006  
 ICES, 2005  
 Lee and Reusser (PCEIS), 2012  
 Raunio et al., 2009  
 Sunose and Fujisawa, 1982

**Tenellia adpersa**  
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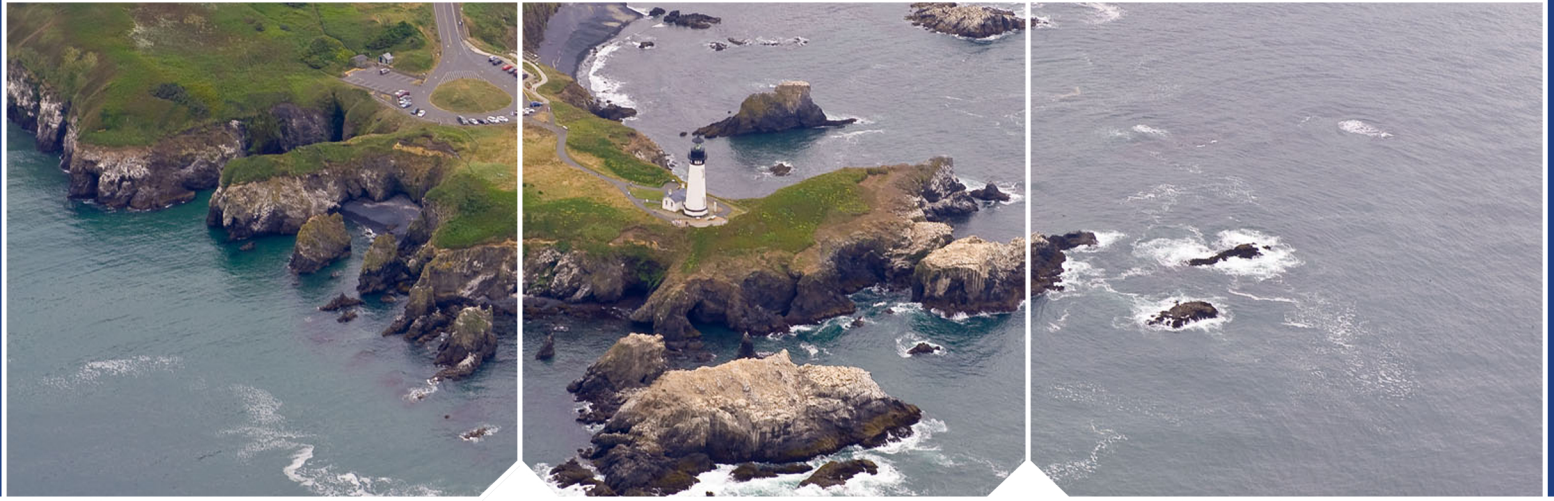
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