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**A THESIS FOR THE DEGREE OF
MASTER OF SCIENCE**

**AN ANNOTATED CATALOGUE OF THE BIVALVIA,
POLYPLACOPHORA, SCAPHOPODA, AND CEPHALOPODA
OF JEJU ISLAND, SOUTH KOREA**

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JEJU NATIONAL UNIVERSITY**

August, 2015

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POLYPLACOPHORA, SCAPHOPODA, AND CEPHALOPODA
OF JEJU ISLAND, SOUTH KOREA**

Ronald. G. Noseworthy

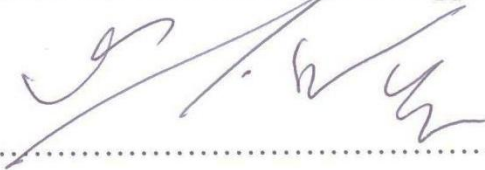
(Advised by Professor Kwang-Sik Choi)

A thesis submitted in partial fulfillment of the requirement for the degree of

MASTER OF SCIENCE

July, 2015

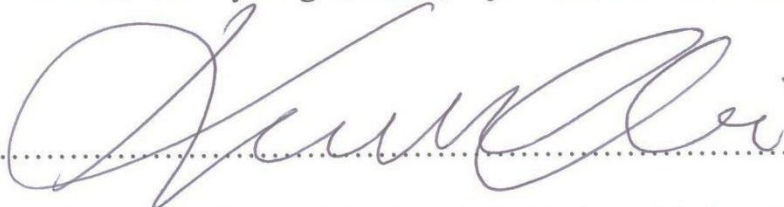
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ABSTRACT

This study of the Polyplacophora, Bivalvia, Scaphopoda, and Cephalopoda occurring on Jeju Island is the result of fifteen years of research into the biodiversity, biogeography, and ecology of Jeju Island mollusks. It examines the distribution, both general and local, of all species reported to date in those four classes, and also presents data on their habitat and biogeographical affinities. Specimens were collected from 56 survey stations (90 specific localities) around the island, from the intertidal and shallow subtidal zones as well as by SCUBA diving in several localities. A wide selection of relevant literature was consulted for identification purposes, as well as for taxonomic, biogeographical, and ecological information. Original descriptions, illustrations, and type localities are presented as well as relevant remarks on taxonomy, location of types, and distinguishing characteristics. Distribution maps are also provided to more clearly show the occurrence of each species around the island. A total of 272 species are treated, 19 polyplacophorans (chitons), 225 bivalves, 8 scaphopods, and 20 cephalopods. Eleven species have been added to the island's mollusk fauna: seven bivalves, three chitons, and one cephalopod, with most of those species ranging south to Southeast Asia and the Indo-Pacific. Most species of three of the four classes studied prefer warm water, with only the Polyplacophora favoring cooler water. It appears that in the above classes a slight shift toward a warmer water mollusk fauna has occurred and may be attributable to climate change.

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SPECIES CATALOGUE

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INTRODUCTION

Jeju Island, 33.10 to 33.50 N. Lat., 126.10 to 127.0 E. Long, is Korea's largest and southernmost island with an area of about 1800 km². It is situated about 80 km. south of the Korean peninsula. The coastline is mainly rocky with several sandy beaches and a few sand tidal flats. Mud flats are virtually nonexistent. (Choi *et al.*, 2000). Although cooler water currents, particularly from the eastern area of the Yellow Sea, exert some influence, the warm Tsushima Current, a branch of the Kuroshio flowing from the southwest, gives the island a warm maritime climate with mild winters and hot, humid summers, and an average yearly temperature of 16°C (61°F) (World Climates, 2015) (Fig. 1). The prevailing winds from the Pacific Ocean are southeasterly in summer, and also help to raise the temperature of the water. The water temperature is highest in August (26.1°C-78.9F) and the lowest in February or March (13.5°C-56.2F) (World Sea Temperature, 2015).

The blending of warm and cool currents around the island has resulted in an abundance of marine life. Jeju Island has a rich mollusk fauna, with over 1000 species presently recorded, This fauna is a combination of warm temperate (Central Japan to the Yellow Sea) and tropical and subtropical species (Southern Japan to Indo-West Pacific) (Noseworthy *et al.*, 2007). The great majority of Jeju mollusks are gastropods, followed by bivalves, and the three smaller classes, Cephalopoda, Polyplacophora, and Scaphopoda respectively.

This catalogue is the result of fifteen years of research and fieldwork on the mollusks of Jeju Island. A previous catalogue (Noseworthy *et al.*, 2007) listed the island's mollusk fauna, giving general and island distribution and also commenting on the nature of the fauna and its affinities with other regions. 225 bivalve species out of 1,015 marine mollusks listed in this catalogue were recorded from subtidal and intertidal habitats (Noseworthy *et al.*, 2007).

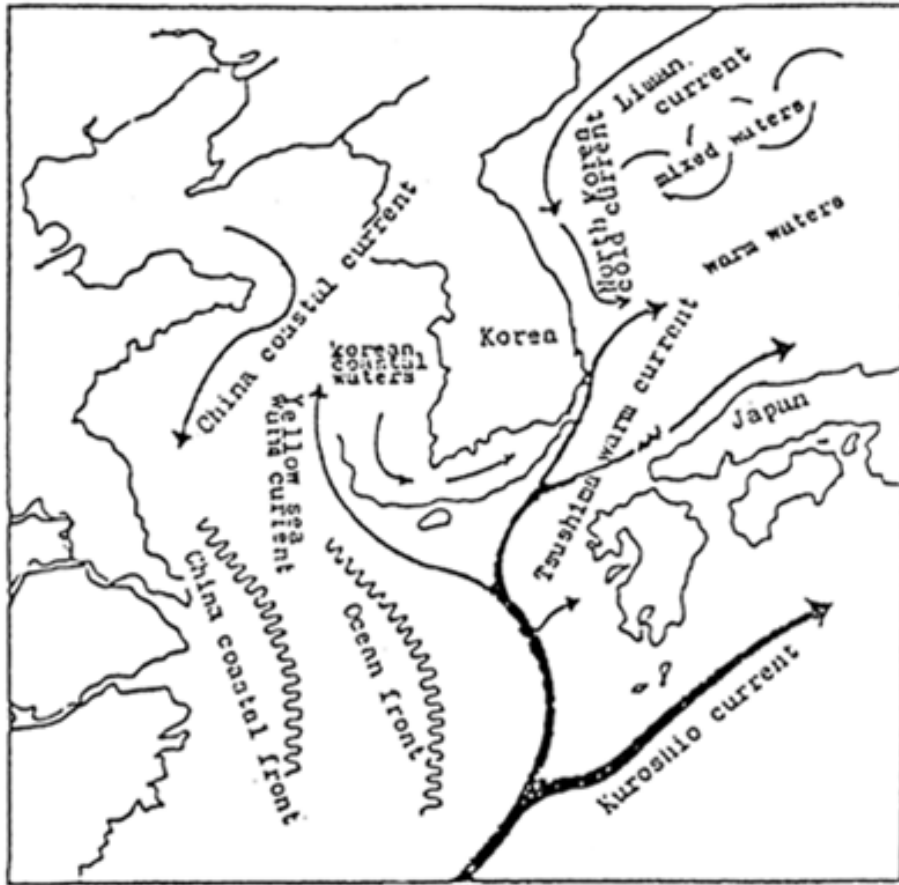


Fig. 1: Ocean currents which affect the climate and marine fauna of Jeju Island. (After Tae, J. J. 1988)

Historical Background

The Korean fauna received little attention from malacologists in the nineteenth and the first half of the twentieth century. In the middle of the nineteenth century some mollusk collections from Korean waters were made during the visit of the British Navy ship “H. M. S. Samarang”. Arthur Adams, a malacologist and assistant surgeon on the “Samarang” supervised these collections. They were described in the “Zoology of the Voyage of H.M.S. *Samarang*” (Adams and Reeve, 1850). Five bivalve species described here also occur in Jeju Island, and several others described elsewhere are also listed. Adams, in his introduction to the mollusk section of the above publication, stated: “In Quelpart (Jeju Island), for instance, where the perpendicularity of the sides of this deep-seated submarine mountain will not allow of the formation of coral, few shells are found.”

Reeve (1847) described a Polyplacophora (chiton) species, “*Chiton coreanicus*” (= *Lepidozona coreanica*) from the “Korean Archipelago” based on the “Samarang” collections, and Adams and Reeve described two others, “*Chiton scutiger*” (= *Acantochitona scutigera*) and “*Chiton circellatus*” (= *A. circellata*) from the “Island of Quelpart” (Adams and Reeve in Reeve, 1847)

Jeffreys (1879) described a collection of bivalves, gastropods, and brachiopods, without illustrations, from Korea Strait, between Jeju Island and the southern Korean mainland. However, his list was based on the erroneous idea that a number of species from Japan or Korea were the same as those in Europe: “certain species ... are identical or varieties of European species” (p. 418). Although it would be most interesting to ascertain the Korean species to which Jeffreys was referring, it would be extremely difficult, if not impossible, to do so without access to the actual specimens.

Lee (1956) and Yoo (1976) reviewed other European works of the nineteenth century that dealt mainly with freshwater or brackish water fauna, mostly from the mainland. However, A. Adams, who described the “Samarang” species, also described a lucinid species (*Myrtea delicatula* A. Adams, 1862) from Korea Strait. In the first half of the twentieth century Japanese authors began to catalog the Korean fauna, and some comprehensive lists were produced. Nomura and Hatai (1928) discussed the distribution of 59 species of bivalves along the eastern, southern, and western coasts of Korea. Shiba (1934) published the “Catalogue of the Mollusca of Chosen (Corea)” enumerating 93 marine bivalves (excluding freshwater Unionidae and freshwater and brackish water Corbiculidae). Some attention was paid to the Cephalopoda with the publication of a species list of Korean cephalopods (Yamamoto, 1942).

In the 1950s Korean national malacological studies began (Lee, 1956; 1958; etc.). Many of the pioneer studies on the experimental culture of cephalopods were performed by Korean and Japanese workers on species of the Sepiidae family. Ohshima and Choe (1961) described rearing success in four cephalopod species, three of which have been reported from Jeju Island. In 1990 a two-part survey of Korean chitons was published (Dell’Angelo *et al.*, 1990; Hong *et al.*, 1990) which included 23 species. The sampling program which produced this study did not include Jeju Island, but the majority of species covered also occur on the island. Also, in the introduction to Part One, a summary is given of the history of Polyplacophora research in Korea. Several identification guide-books with color photographs (Yoo, 1976; Kwon *et al.*, 1993; 2001; Kwon, and Lee, 1999; Min *et al.*, 2004) have been published. Lists of Korean mollusks (Je, 1989, Lee and Min 2002; Noseworthy *et al.*, 2002, 2007, 2010) have also been produced, with Noseworthy *et al.* (2007) being the first

comprehensive listing of the Jeju Island mollusk fauna. These works have contributed much to the understanding of the species composition of the molluscan fauna of Jeju Island specifically and also the Korean Peninsula.

There have been many studies of Jeju bivalves, with emphasis on those which may have some commercial value. Those studies examine the parasitology, physiology, and reproduction of species such as *Saccostrea kegaki*, *Striostrea circumpecta*, and *Hytissa hyotis* (Hong *et al.*, 2013), *Heteromacoma irus* (Limpanont *et al.*, 2011), *Ylistrum japonicum* (Son and Chung, 2005), and *Acrosterigma burchardi* (Limpanont *et al.*, 2010); Choi *et al.* (2000) provide an overview of 26 bivalve species with possible commercial potential. However, no commercial bivalve mollusk aquaculture is possible because of the relatively small populations of edible species and the exposed, mainly rocky shoreline.

The Scaphopoda has received little, if any attention from either Korean or Japanese researchers. Most of the scaphopod species were described first from Japan or other regions and later found in Korea, including Jeju Island.

MATERIALS AND METHODS

Four classes, Bivalvia, Polyplacophora, Scaphopoda, and Cephalopoda, were surveyed in order to ascertain their distribution and habitat, and update their taxonomy. All bivalves, including a freshwater species, were included. Detailed locality lists were prepared which included the number of specimens, living or dead, maturity of specimens, and other relevant comments. Special attention was paid to the possible effects of climate change on the composition of the fauna. The island's gastropod fauna is quite extensive, about 800 species, so it was decided to include this class in a future study.

Mollusks belonging to the four classes studied were collected from a total of 56

general survey stations encompassing the coast of the island (Fig. 2). An attempt was made to sample as many localities as possible with a wide variety of habitats. All records from the previous catalogue are included as well as new survey stations and species records, both from fieldwork and literature. Some stations were visited on several occasions, and many of them contained several specific collecting localities. Therefore the surveys included 87 marine and 3 freshwater localities, for a total of 90 localities. The map (Fig. 2) shows the location of those stations. The numbers correspond with those in the list of stations. Specimens collected are kept either at the Shellfish Aquaculture and Research Laboratory at Cheju National University (CNU) or in the author's collection (RGN). Additional locality records were obtained from a number of sources: *Mollusks in Korea* (Min *et al.*, 2004), *Commercially Exploitable Bivalves in Jeju Island*. (Choi *et al.*, 2000), *The Chiton Fauna (Mollusca: Polyplacophora) of Korea. Parts I and II* (Dell'Angelo *et al.*, 1990; Hong *et al.*, 1990), and *Cephalopods of the World* (Jereb and Roper, 2005, 2010; Jereb *et al.*, 2014). These records are listed in the catalog if they are the only ones available for any species.

Collecting of marine species was done mainly from the intertidal and upper subtidal zones, and beach driftlines. Specimens of Polyplacophora were tied in flattened position before being immersed in 70% ethanol or dried. Details of the valves and girdles, important for identification, were studied under a dissecting microscope. Live-taken bivalves, after identification, were stored in 70% ethanol. Several octopods were encountered during fieldwork, and those were carefully photographed for identification; sepiids were identified mainly from cuttlebone. Scaphopods were obtained from beach drift. Samples of beach drift, rock brushings, and detritus obtained from depths of ½ to two meters were also sorted, and the micromolluscs extracted and identified with the help of a Zeiss dissecting microscope and a handheld 50x magnifier. Freshwater surveys were conducted with the aid of a long-handled

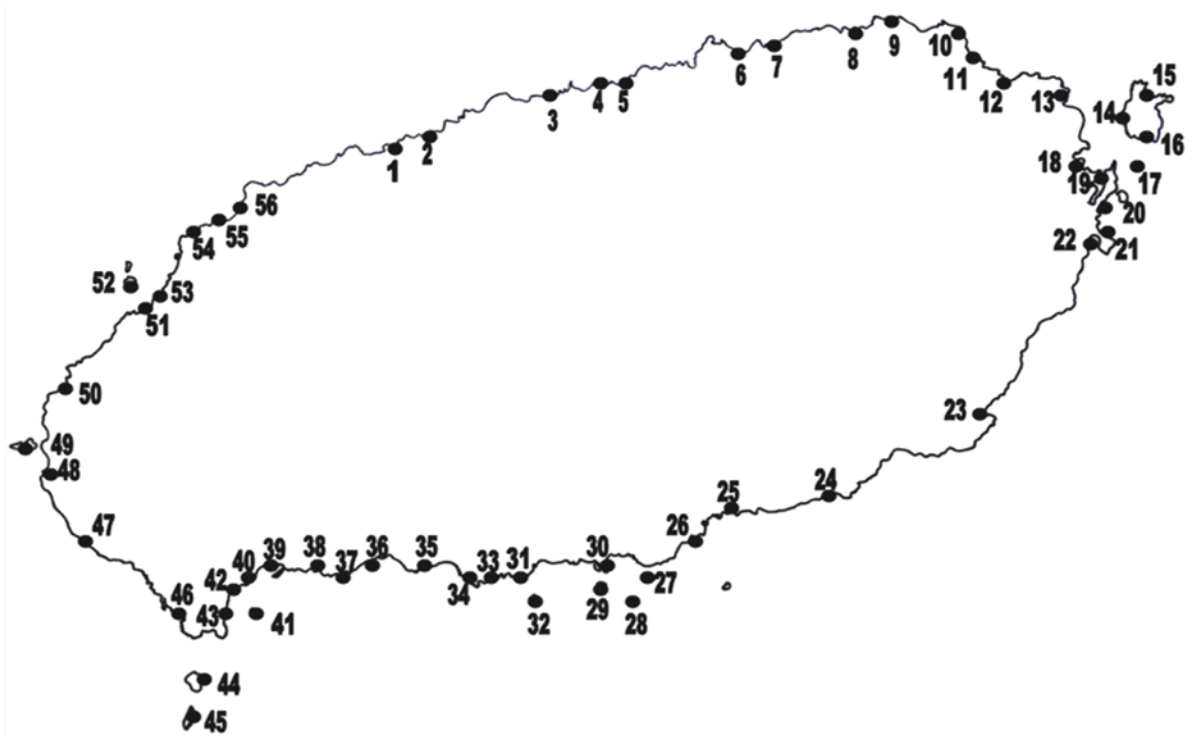


Fig. 2: Survey stations. 1. Dong-gwi, 2. Iho, 3. Jeju-shi, 4. Hwabuk, 5. Samyang, 6. Hamdeok, 7. Bukchon-ri,, 8. Gimnyeong, 9. Wolpyeong, 10. Haengwong, 11. Handong, 12. Sehwa, 13. Hado, 14. Udo (Sanhosa), 15. Udo (Hagosudong), 16. Udo (Geomeollae), 17. 5 km East of Songsan, 18. Jongdal-ri, 19. Ojo-ri, 20. Songsan, 21. Seopjikoji, 22. Shinyang, 23. Pyoseon, 24. Namwon, 25. Wimi, 26. Bomok, 27. Supseom, 28. 2 km south of Seogwipo, 29. Munseom, 30. Seogwipo, 31. Seogundo, 32. Bumseom, 33. Bophwan, 34. Gangjeong, 35. Daepo, 36. Jungmun, 37. Yerae, 38. Daepyeong, 39. Hwasoon, 40. Yeongmeori, 41. Hyungjaeseom, 42. Sagye, 43. Songaksan, 44. Gapado, 45. Marado, 46. Hamo, 47. Yongnak, 48. Gosan, 49. Chagwi-do, 50. Sinchang, 51. Keumneung, 52. Biyangdo, 53. Hyeopchae, 54. Suwon, 55. Gwideok, 56. Gwakji

sieve in order to obtain samples of mud and aquatic plants which might contain samples of Sphaeriidae

In 2012 the author identified a large number of mostly live-taken mollusk specimens obtained by SCUBA on behalf of ECO21, an environmental survey company; all species identified from each location were listed with relevant comments regarding numbers, sizes, and association with other mollusks. Also, a survey was conducted by the Shellfish Aquaculture and Research Laboratory, from 2012 to 2014, on the distribution of the encrusting coral *Alveopora japonica* Eguchi, 1968, which was rapidly extending its range around the island. Coral specimens were obtained by SCUBA diving from several localities around the island. Mollusks, mainly bivalves, were sorted and identified, then preserved for further study. Identification of specimens was facilitated by several books, mainly *Mollusks in Korea* (Min *et al.*, 2004), *Compendium of Bivalves* (Huber, 2010), *Catalogue of the Living Bivalvia of the Continental Coast of the Sea of Japan (East Sea)* (Lutaenko and Noseworthy, 2012), and *Marine Mollusks in Japan* (Okutani, 2000), as well as local field guides and a selection of journal publications.

Apart from the regular numbering of figure and tables in the other sections of the text, species in the taxonomic section are figured separately for each class; this is done for easier reference. Ten plates are also included showing species representative of the Jeju bivalve fauna. The entries in this catalogue follow a specific format. For each species, the citation for the original description is given with the illustration, if any, as well as the original name. The type locality, if known, is also given, followed by the habitat and general distribution range. Specific Jeju survey stations are listed and also mapped to show the distribution of each species more clearly; the listing is in a clockwise order, and the mapping follows this order. As in the list of stations in Fig. 2, Dong-gwi, or the next nearest locality, has been selected as

the first station; the first map mark is hollow, to indicate the beginning of the clockwise mapping of localities, and the rest are solid. The names of all localities and the map marks coincide (Fig. 3).

Any species having only one or two localities is combined with one or two others on one map to make the listing more compact. Different locality marks are used for each species on the combined maps (Fig. 4). This arrangement eliminates the necessity of a cumbersome numbering system.

Zonal-geographical groupings are included to more clearly show the biogeographical affinities of each species, followed by remarks, if necessary, regarding taxonomy, distinguishing characters, location of types, and other relevant information. Although every effort was made to include specific references to page and figure numbers in the original descriptions, as well as type localities, some literature, apart from online references, was unobtainable. In those few cases, the general reference is given and the type locality is referred to as “unobtainable”. In the References section references are grouped by each class for easier access. Abbreviations of institutions referred to in the species catalogue are listed below.

LIST OF INSTITUTION ABBREVIATIONS

AMNH—American Museum of Natural History (New York, U. S. A.)

ANSP—Academy of Natural Sciences, Philadelphia (U.S.A)

BMNH—The Natural History Museum (London, U.K.)

MCZ—Museum of Comparative Zoology (Cambridge, U.S.A.)

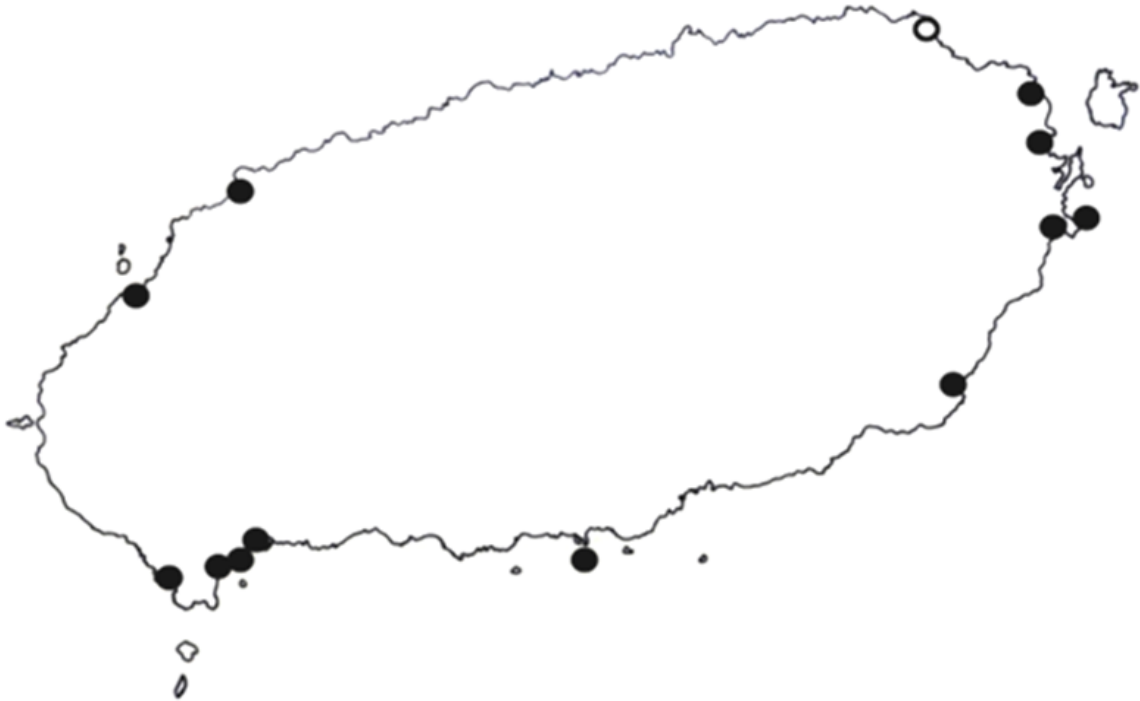
NHM—Naturhistorisches Museum (Vienna, Austria)

NSMT—National Science Museum, Tokyo (Japan)

SHM—Saito Ho-on Kai Museum (Japan)

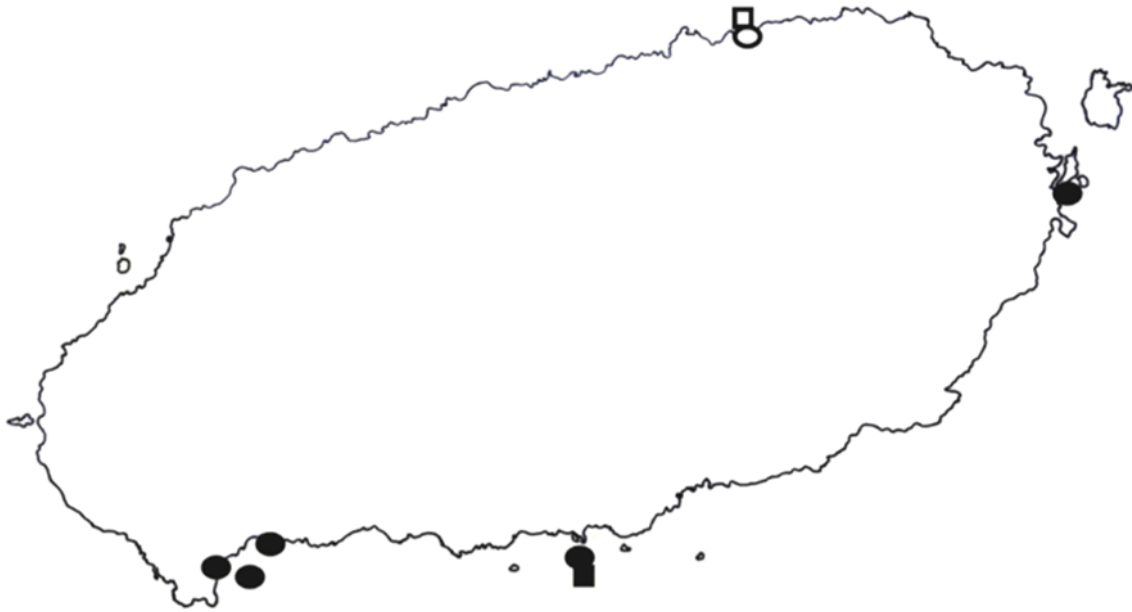
USNM—National Museum of Natural History (Washington, U.S.A.)

ZMA—Zoologisch Museum, Amsterdam (Netherlands)



JEJU: Handong, Hado, Jongdal-ri, Seopjikoji, Shinyang, Pyoseon, Munseom, Hwasoon, Yongmeori, Sagye, Hamo, Keunmeung, Gwakji

Fig. 3: Sample map showing distribution of *Acar plicata* ("Chemnitz" Dillwyn, 1817)



JEJU: Bukchon-ri, Songsan, Munseom, Hwasoon, Songaksan, Hyungjaeseom (*Cryptoplax japonica*)

JEJU: Bukchon-ri, Munsom (*C. propior*)

Fig. 4. Sample map showing distribution of *Cryptoplax japonica* Pilsbry, 1901 (●) and *C. propior* Is. and Iw. Taki, 1930 (■)

SPECIES CATALOGUE

Class: POLYPLACOPHORA de Blainville, 1816

Subclass: Neoloricata Bergenhayn, 1955

Order: LEPIDOPLEURIDA Thiele, 1910

Suborder: *Lepidopleurina* Thiele, 1910

Family: LEPTOCHITONIDAE Dall, 1889

Genus: *Leptochiton* Gray, 1847

1 *Leptochiton japonicus* (Thiele, 1909)

(Fig. 1)

ORIGINAL DESCRIPTION: Thiele, J. 1909. *Revision des Systems der Chitonen*.

Zoologica Stuttgart, 22, 11, pl. 1; figs. 21-29 (As *Lepidopleurus japonicus* Thiele, 1909)

TYPE LOCALITY: Kajima, Shizouka Prefecture; Enoshima, Sagami Bay, Japan? “1 type specimen from Kajima (in alcohol) and 1 set of plates from Enoshima (also marked as a type” (Ferreira, 1979)

HABITAT: Shell and gravel substrate at depth of 20-500 m.

GENERAL DISTRIBUTION: Korea; Japan; East Sea; Sea of Okhotsk; **JEJU:** Dodu-dong, Jeju-shi (Jeju City) (“Jejudo” Hong *et al.* (2006)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: Ferreira (1979) regarded *L. japonicus* as a synonym of *Leptochiton alveolus* Loven, 1846), described from the North Atlantic. However, Skoglund (1989) restricts *L.*

alveolus to the North Atlantic and regards *L. japonicus* as a synonym of *L. belknapi* Dall, 1878. Sigwart *et al.* (2011) and Schwabe (2014) accept *L. japonicus* as a valid species. Types in Zoologisches Museum, Humboldt University, Berlin (Ferreira, 1979).

Order: CHITONIDA Thiele, 1910

Suborder: Chitonina Thiele, 1910

Superfamily: Chitonoidea Rafinisque, 1815

Family: ISCHNOCHITONIDAE Dall, 1889

Genus: *Lepidozona* Pilsbry, 1892

2 *Lepidozona coreanica* (Reeve, 1847)

(Fig. 1)

ORIGINAL DESCRIPTION: Reeve, L. 1847. Descriptions of new species of shells collected in the Eastern Archipelago by Capt. Sir Edward Belcher and Mr. Adams during the voyage of H.M.S. Samarang. *Proceedings of the Zoological Society of London* 15 (169): 24-26. (As *Chiton coreanicus* Reeve, 1847) (Without illustration) (First figured in *Conchologia Iconica*, (1847) Vol. 4, Plate XXVIL, No. 128) (see Petit, 2007, p. 30)

TYPE LOCALITY: Korean Archipelago

HABITAT: Underside of stones in intertidal and subtidal zones

GENERAL DISTRIBUTION: Korea and Japan to Hong Kong; **JEJU:** Jeju-shi, Supseom, Seogwipo, Munseom, Gangjeong, Yerae, Daepyeong, Hwasoon, Sagyei, Songaksan, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: Figured without description or comment in Adams and Reeve (1850) (Pl. 15, fig. 9). Type: BMNH 2986.136/1; lectotype (designated by Kaas and Van Belle, 1987).

Ischnochiton coreanicus Adams & Reeve, 1847 is a synonym.

Genus: *Ischnochiton* Gray, 1847

3 *Ischnochiton (Ischnochiton) boninensis* Bergenhayn, 1933

(Fig. 2)

ORIGINAL DESCRIPTION: Bergenhayn, J. R. M. 1933. Die Loricaten von Prof. Dr. Sixten Bocks Expedition nach Japan und den Bonin-Inseln 1914. *Kungliga Svenska Vetenskapsakademiens Handlingar* 12(4): 1–58, pls. 1–3. (As *Ischnochiton boninensis* Bergenhayn, 1933)

TYPE LOCALITY: Sagami, Japan

HABITAT: Underside of rocks in intertidal and subtidal zones

GENERAL DISTRIBUTION: Sea of Okhotsk to East China Sea; **JEJU:** Bukchon-ri, Seongsan, Munseom, Gangjeong, Yerae, Daepyeong, Hyungjaeseom, Songaksan, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: *Ischnochiton (Ischnochiton) boninensis* can be distinguished from *I. (Haploplax) comptus* by the presence of vertical striations on girdle scales, while those of the latter are smooth. Lee *et al.*, (2008) stated that differences in scale morphology are not sufficient to separate *Ischnochiton* genera, as is presently done. Syntypes are in UUZM, Sweden (Wallin, 1996). The dominant algae ingested by *Ischnochiton* are corallines (Kaas and van Belle, 1987). *Ischnochiton (Simplischnochiton) boninensis* Bergenhayn, 1933 and *Ischnochiton boninensis zebrinus* Is. Taki, 1962 are synonyms.

POLYPLACOPHORA

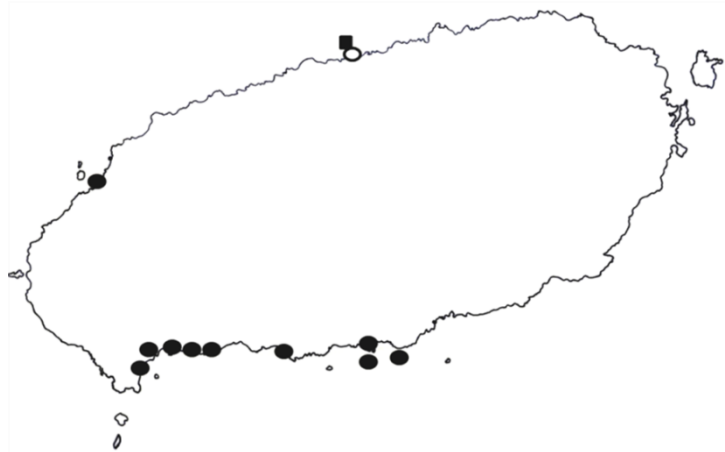


Fig. 1: Distribution of *Lepidozonia coreanica* (●) and *Leptochiton japonicus* (■)

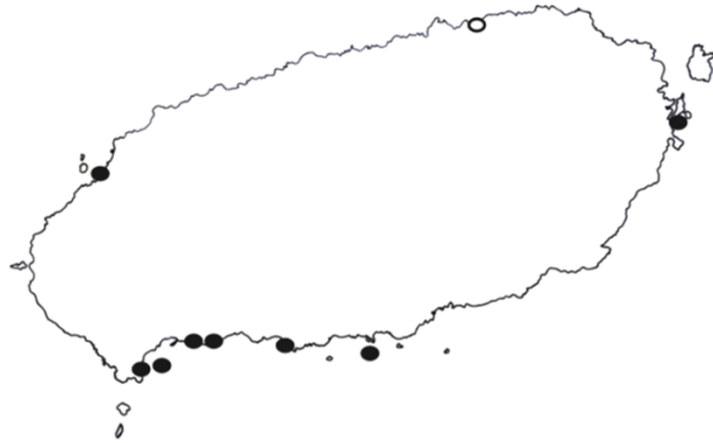


Fig. 2: Distribution of *Ischnochiton (Ischnochiton) boninensi*

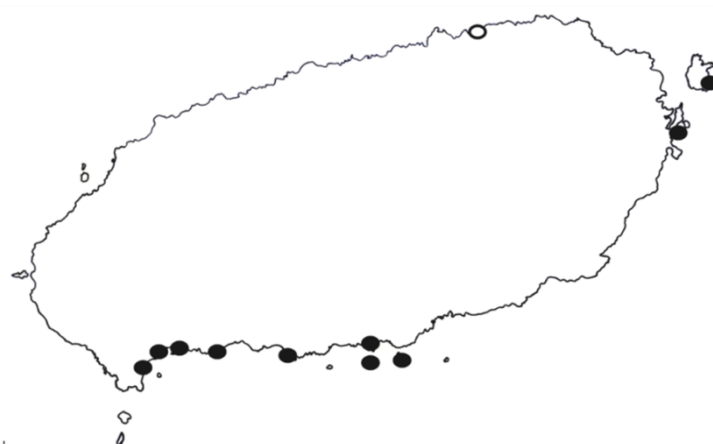


Fig. 3: Distribution of *Ischnochiton (Haploplax) comptus*

4 *Ischnochiton (Haploplax) comptus* (Gould, 1859)

(Fig. 3)

ORIGINAL DESCRIPTION: Gould, A. A. 1859. *Proceedings of the Boston Society of Natural History*. Vii. 163-164. (As *Chiton (Leptochiton) comptus* Gould, 1859) (Without illustration)

TYPE LOCALITY: Oosima (O'shima, South of Sagami Bay)

HABITAT: On underside of stones in intertidal and subtidal zones

GENERAL DISTRIBUTION: Japan to Hong Kong; **JEJU:** Bukchon-ri, Udo (Geomullae), Seongsan, Supseom, Seogwipo, Munseom, Gangjeong, Yerae, Hwasoon, Sagyei, Songaksan,

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: Pilsbry (1892) lists color variations in this species, and questions Gould in assigning it to *Leptochiton*.

Family: CHITONIDAE Rafinesque, 1815

Subfamily: Chitoninae Rafinesque, 1815

Genus: *Chiton* Linnaeus, 1758

5 *Chiton (Rhyssoplax) kurodai* Is. & Iw. Taki, 1929

(Fig. 4)

ORIGINAL DESCRIPTION: Taki, Is. & Iw. 1929. Studies on Japanese Chitons (1). *The Venus*, Vol. 1, No. 2, pp. 49, 52-53, Pl. 2, fig. 3; text figures 8-11. (As *Chiton kurodai* Is. & Iw. Taki, 1929)

TYPE LOCALITY: Seto, Kii Province, Japan

HABITAT: Underside of stones in intertidal and subtidal zones

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Jeju-shi, Bukchon-ri, Udo

(Geomullae), Songsan, Munseom, Yerae, Daepyeong, Hyupjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: May superficially resemble *Ischnochiton comptus* (Gould, 1859); however, *I. comptus* possesses fine granules arranged in zigzag patterns on the valves while *C. kurodai* is sculptured with fine longitudinal grooves. *Rhyssoplax kurodai* (Is. and Iw. Taki, 1929) is a synonym.

Subfamily: Tonicinae Pilsbry, 1893

Genus: *Onithochiton* Gray, 1847

6 *Onithochiton hirasei* Pilsbry, 1901

(Fig. 5)

ORIGINAL DESCRIPTION: Pilsbry, H. A. 1901. New Mollusca from Japan, the Loo Choo Islands, Formosa and the Philippines. *Proceedings of the Academy of Natural Sciences of Philadelphia*, Vol. 53, No. 1, 203-204. (As *Onithochiton hirasei* Pilsbry, 1901) (Without illustration)

TYPE LOCALITY: Hirado, Hizen (Hirado Island, western Kyushu)

HABITAT: On rocks or undersides of stones in intertidal and subtidal zones

GENERAL DISTRIBUTION: Korea; Japan, Taiwan; **JEJU:** Bukchon-ri, Udo (Hagosudong), Seongsan, Seogwipo, Munseom, Gangjeong, Yerae, Daepyeong, Sagyei, Songaksan

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: As in *Ischnochiton*, the dominant algae ingested by *Onithochiton* are corallines (Kaas and van Belle, 1987).

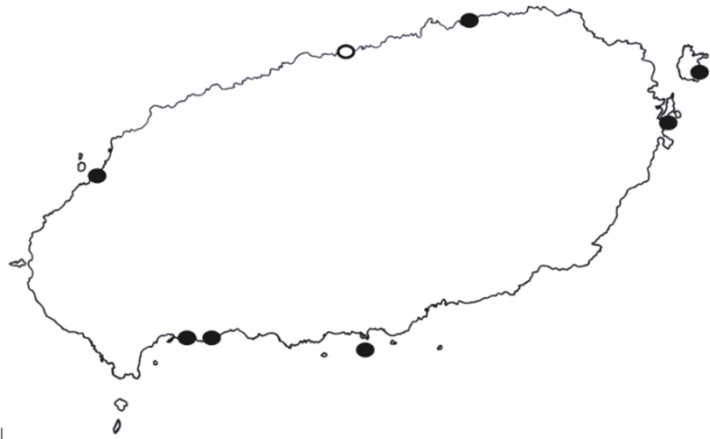


Fig. 4: Distribution of *Chiton (Rhyssoplax) kurodai*

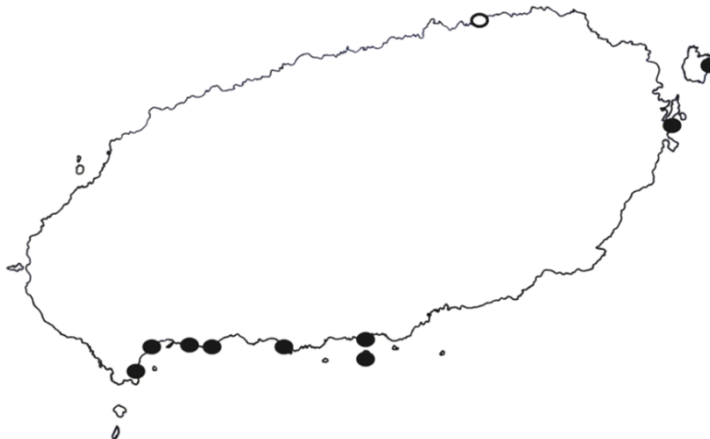


Fig. 5: Distribution of *Onithochiton hirasei*

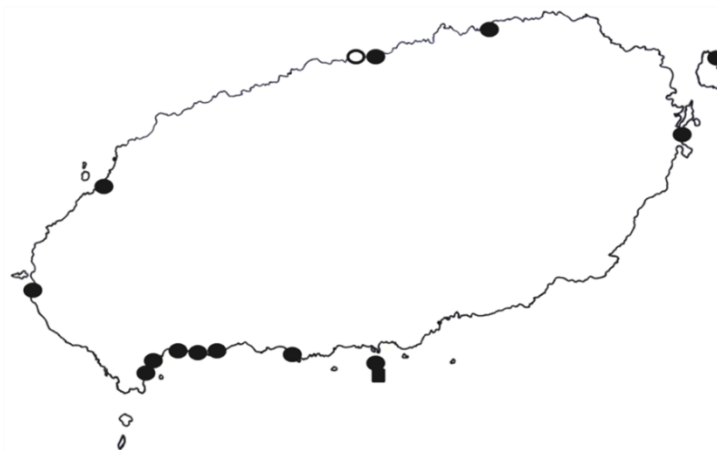


Fig. 6: Distribution of *Liolophura japonica* (●) and *Liolophura cf. tenuispinosa* (■)

Subfamily: Acanthopleurinae Dall, 1889

Genus : *Liolophura* Pilsbry, 1893

7 *Liolophura japonica* (Lischke, 1873)

(Fig. 6)

ORIGINAL DESCRIPTION: Lischke, C. E. 1873. Diagnoses neuer Meeres-Conchylien aus Japan. *Malakozoologische Blätter*, xxi, p. 22 (As *Chiton japonicus* Lischke, 1873 (Without illustration)

TYPE LOCALITY: Nagasaki, Kyushu, Japan

HABITAT: On rocks, exposed or in crevices, in intertidal zone

GENERAL DISTRIBUTION: Southern Korea and Central Japan to eastern China; Gulf of Thailand; **JEJU:** Jeju-shi Hwabuk Bukchon-ri, Udo (Hagosudong), Seongsan, Munseom, Gangjeong, Yerae, Daepyeong, Hwasoon, Sagyei, Songaksan, Gosan, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Ferreira (1986) gives a detailed review of this species and discusses synonyms. *Acanthopleura japonica* (Lischke, 1873 is a synonym.

8 *Liolophura cf. tenuispinosa* Leloup, 1939

(Fig. 6)

ORIGINAL NAME: ORIGINAL DESCRIPTION: Leloup, E. 1939. A propos des Amphineures *Liolophura japonica* (Lischke, 1873) et *L. giamardi* (Blainville, 1825): deux nouvelles formes. *Bulletin du Musée Royal d'Histoire Naturelle de Belgique*, **15**(1): 1-3, figs. 1, 3, 4. (As *Liolophura japonica f. tenuispinosa* Leloup, 1939)

TYPE LOCALITY: Shikok Kamigari, Japan

GENERAL DISTRIBUTION: Southern Japan to Southeast Asia; **JEJU:** Munseom

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Described as a form of *L. japonica* and later synonymized as *Acanthopleura japonica*, but subsequently regarded as a valid species (Saito & Yoshioka, 1993), and now accepted as such. Also known as *Acanthopleura tenuispinosa*. Resembles *L. japonica* but possessing subcentrally raised mucro and girdle with more slender spicules. Single specimen from Munseom exhibits thick girdle covering of slender spicules but valves somewhat worn making the mucro difficult to examine.

Suborder: Acanthochitonina Bergenhayn, 1930

Superfamily: Mopalioidae Dall, 1889

Family: MOPALIIDAE Dall, 1889

Subfamily: Mopaliinae Dall, 1889

Genus: *Mopalia* Gray, 1847

9 *Mopalia retifera* Thiele, 1909

(Fig. 7)

ORIGINAL DESCRIPTION: Thiele J. 1909. Revision des Systems der Chitonen. I. Teil. *Zoologica. Original-Abhandlungen aus dem Gesamtgebiete der Zoologie, Stuttgart*, 22 (56/1): 1–70, pls 1–6. Figs 40-60, 76, 79. (As *Mopalia retifera* Thiele, 1909). 31

TYPE LOCALITY: Not designated, but the following localities are given: Kagoshima, Hojo, Province Awa (Chiba Prefecture) and Enoshima (Kanagawa Prefecture), Japan; Tsingtao (Qingdao), China; Amur Bay, east of Jankowsky Peninsula (Eastern Russia).

HABITAT: On rocks or undersides of stones in subtidal zone

GENERAL DISTRIBUTION: Southern East Sea and Sea of Okhotsk, Japan to Yellow Sea and Eastern China; **JEJU:** Pyoseon; Munseom (“Jejudo” Hong *et al.* (2006)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: Redescribed by Saito and Okutani (1991).

10 *Mopalia cf. schrencki*, Thiele, 1909

(Fig. 7)

ORIGINAL DESCRIPTION: Thiele, J. 1909. *Revision des Systems der Chitonen*. Zoologica Stuttgart, 30, pl. 4, figs. 1-10. (As *Mopalia schrencki*, Thiele, 1909)

TYPE LOCALITY: 4-5 miles (6-8 km) west of Schamow Inlet, Terpeniya Bay, southeast Sakhalin, eastern Russia

HABITAT: In coralline algae in shallow water

GENERAL DISTRIBUTION: Korea, northern Japan, and eastern Russia to Kurile Islands and Sakhalin; **JEJU:** Hamo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: lowboreal

REMARKS: A single specimen in coralline algae at Hamo Beach at extreme low tide. May represent a new species record for Korea. Redescribed by Saito and Okutani (1991).

Genus: *Plaxiphora* Gray, 1847

11 *Plaxiphora (Plaxiphora) integra* (Is. Taki, 1953)

(Fig. 8)

ORIGINAL DESCRIPTION: Taki, Is. 1953. A peculiar chiton from Hachijo-jima with special reference to its distribution in the Pacific. *Records of Oceanographic Works in Japan* 1(2) (n.s.):60-65, figs. 1-13. (As *Mopalia (Hachijomopalia) integra* Is. Taki, 1953)

TYPE LOCALITY: Okataura, Okago-mura, Hachijo Island, southeastern Japan.

HABITAT: On rocks covered with coralline algae from intertidal zone to depth of 10 m.

GENERAL DISTRIBUTION: Korea; Izu and Ogasarawa Islands (southeastern Japan);

JEJU: Munseom, (“Jejudo” Hong *et al.* (2006)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical



Fig. 7: Distribution of *Mopalia retifera* (●) and *Mopalia schrencki* (■)⁴



Fig. 8: Distribution of *Plaxiphora (Plaxiphora) integra* (●) and *Placiphorella stimpsoni* (■)⁴

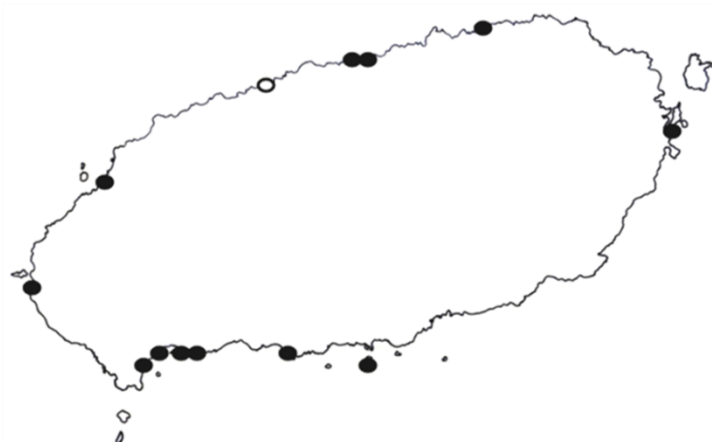


Fig. 9: Distribution of *Acanthochitona defilippii*

Genus: *Placiphorella* Dall, 1879

12 *Placiphorella stimpsoni* (Gould, 1859)

(Fig. 8)

ORIGINAL DESCRIPTION: Gould, A. A. 1859. *Proceedings of the Boston Society of Natural History*, vii, p. 165. (As *Chiton (Molpalia)* [sic] *stimpsoni* Gould, 1859. (Without illustration)

TYPE LOCALITY: Hakodadi Bay (Hakodate, Hokkaido, Japan)

HABITAT: On rocks and stones in intertidal and subtidal zones

GENERAL DISTRIBUTION: Korea; N. Japan, East China Sea; **JEJU:** Munseom (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: Syntypes are in the U. S. National Museum (Saito and Okutani, 1989)
Redescription by the same authors.

Superfamily: Cryptoplacoidea H. and A. Adams, 1858

Family: ACANTHOCHITONIDAE Pilsbry, 1893

Subfamily: Acanthochitoninae Pilsbry, 1893

Genus: *Acanthochitona* Gray, 1921

13 *Acanthochitona defilippii* (Tapparone-Canefri, 1874)

(Fig. 9)

ORIGINAL DESCRIPTION: Tapparone-Canefri, C. M. 1873. Malacologia in *Zoologia del viaggio intorno al globo della regia fregata Magenta durante gli anni 1865–68*". *Zoologia Magenta*. p. 78, pl. 1, figs. 15a, b, c, e. (As *Amycula de filippi* Tapparone-Canefri, 1874)

TYPE LOCALITY: Yokohama, Japan

HABITAT: Underside of rocks and boulders on coarse sand bottom in intertidal zone.

GENERAL DISTRIBUTION: Korea; Japan, Taiwan; **JEJU:** Iho, Jeju-shi, Hwabuk Bukchon-ri Seongsan, Munseom, Gangjeong, Daepyeong, Hwasoon, Sagyei, Songaksan, Gosan, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Original illustration (Tapparone-Canefri, 1874) shows only 7 valves, possibly an artist's error.

14 *Acanthochitona rubrolineata* (Lischke, 1873)

(Fig. 10)

ORIGINAL DESCRIPTION: Lischke, K. E. 1873. Diagnosen neuer Meeres-Conchylien aus Japan. *Malakozoologische Blatter*, Vol. 21, p. 24. (As *Chiton rubro-lineatus* Lischke, 1873) (Without illustration)

TYPE LOCALITY: Nagasaki, Japan?

HABITAT: On rocks in intertidal and subtidal zones

GENERAL DISTRIBUTION: Korea; Japan, China; **JEJU:** Udo (Hagosudong), Seongsan, Hwasoon, Sagyei, Songaksan, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: *A. rubrolineata* is similar to *A. achates*. However, *A. achates* differs from the former species by the usually finer granules on the valves, the intermediate valves possessing sharper beaks, a smaller tail valve, and tufts of thicker and longer spines which are striated near the tips. *A. rubrolineata* may also possess a few dark reddish lines on the center of the valves.

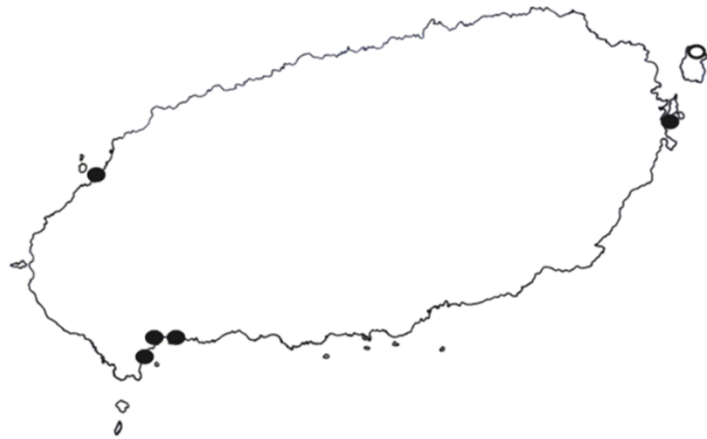


Fig. 10: Distribution of *Acanthochitona rubrolineata*

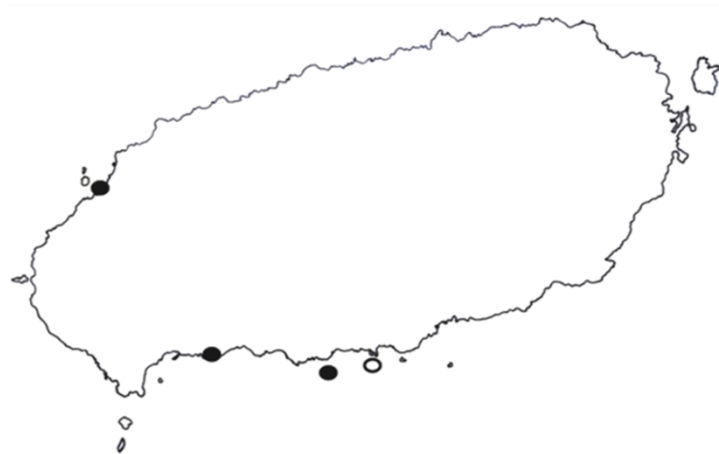


Fig. 11: Distribution of *Acanthochitona achates*

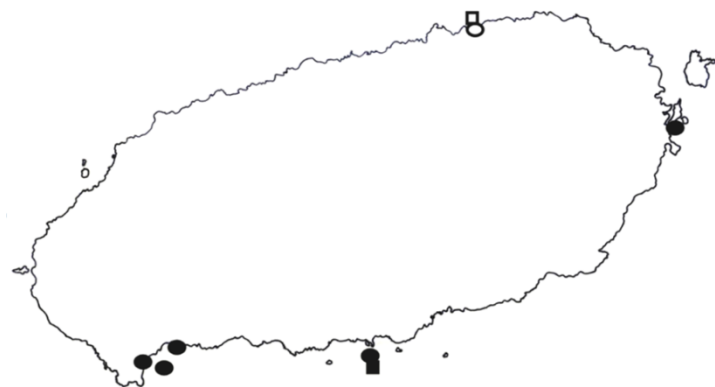


Fig. 12: Distribution of *Cryptoplax japonica* (●) and *Cryptoplax propior* (■)

15 *Acanthochitona achates* (Gould, 1859)

(Fig. 11)

ORIGINAL DESCRIPTION: Gould, A. A. 1859. Shells collected by the North Pacific Exploring Expedition. *Proceedings of the Boston Society of Natural History*, VII (1861), p. 165. (As *Chiton (Ancathochaetes) achates* Gould, 1859) (Without illustration)

TYPE LOCALITY: Kikaia and Hakodadi Bay (Hakodate, Hokkaido, Japan)

HABITAT: On rocks in intertidal and upper subtidal zones.

GENERAL DISTRIBUTION: Korea and Japan to Taiwan; **JEJU:** Munseom, Bumseom Yerae, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: May resemble *A. defilippi*; however, *A. defilippi* is generally darker in color with a wider, fleshy girdle and less-pronounced sutural tufts.

16 *Acanthochitona circellata* (A. Adams & Reeve in Reeve, 1847)

ORIGINAL DESCRIPTION: A. Adams and Reeve in Reeve, L. A. 1847. Monograph of the genus *Chiton* In: *Conchologica Iconica: or, Illustrations of the Shells of Molluscous Animals*, Vol. 4, pl. 27, fig. 180 (As *Chiton circellatus* A. Adams & Reeve MS, Reeve, 1847).

TYPE LOCALITY: “Island of Quelpart, Korean Archipelago” (Jeju Island)

HABITAT: On rocks in intertidal zone

GENERAL DISTRIBUTION: Korea (South and east coasts; Dokdo). **JEJU:** “Island of Quelpart” (Jeju) (Adams and Reeve in Reeve, 1847)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: subtropical-lowboreal

REMARKS: “This is the largest of the tufted species, and quite peculiar in its style of sculpture; the valves in all others of this group are minutely granulated, but in this they are

smooth, and characterized by a number of fine grooves radiating in concentric order from the umbones.” (Reeve, 1847). Reported from mainland Korea and Ullungdo (Hong *et al.*, 1990), Jindo (Kil *et al.*, 2005), and Dokdo (Ryu *et al.*, 2012), but the only record for Jeju Island is Adams and Reeve’s original type locality, which is repeated by Hong *et al.* (1990). The original description was based on specimens which had no written labels (Petit, 2007); thus the Jeju record may be an error.

17 *Acanthochitona scutigera* (A. Adams & Reeve in Reeve, 1847)

ORIGINAL DESCRIPTION: Adams and Reeve in Reeve, L. A. 1847. Monograph of the genus *Chiton* In: *Conchologica Iconica: or, Illustrations of the Shells of Molluscous Animals*, Vol. 4, Lovell Reeve, London, pl. 27, fig. 178. (As *Chiton scutigera* A. Adams & Reeve MS, Reeve, 1847)

TYPE LOCALITY “Island of Quelpart, Korean Archipelago” (Jeju Island)

HABITAT: On rocks in intertidal zone

GENERAL DISTRIBUTION: Korea (west, south, and east coasts), Australia (York Peninsula, fide Thiele, 1909, p 47) (Hong *et al.*, 1990); **JEJU:** “Island of Quelpart” (Jeju) (A. Adams and Reeve in Reeve, 1847)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-low boreal

REMARKS: “The figure of Reeve indicates that this is a form in which the girdle encroaches much at the sutures, and the valves are coarsely granulated” (Pilsbry, 1893, p. 21). Figured syntype (NHM 1992052/1) in Schwabe (2007; p. 156, fig. 9 e, f). The only record for Jeju Island is Adams and Reeve’s original type locality, which is repeated by Hong *et al.*

(1990). The original description was based on specimens from a private collection (Reeve, 1847, sp. 178). Accurate locality records were not often kept during the many voyages of exploration during the nineteenth century, thus the Jeju record may be an error.

Family: CRYPTOPLACIDAE H. and A. Adams, 1858

Genus: *Cryptoplax* Blainville, 1818

18 *Cryptoplax japonica* Pilsbry, 1901

(Fig. 12)

ORIGINAL DESCRIPTION: Pilsbry, H. A. (1901) New Mollusca from Japan. The Loo Choo Island, Formosa, and the Philippines. *Proceedings of the Academy of Natural Sciences of Philadelphia* 53: 204. (As *Cryptoplax japonica* Pilsbry, 1901) (Without illustration)

TYPE LOCALITY: Hirado, Hizen (Hirado Island, western Kyushu)

HABITAT: Underside of stones in intertidal and subtidal zones

GENERAL DISTRIBUTION: Eastern and southern Korea, Japan, Sea of Okhotsk, Sakhalin; **JEJU:** Bukchon-ri, Seongsan, Munseom, Hwasoon, Songaksan, Hyungjaeseom

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: Juvenile specimens may resemble *C. propior* Is. and Iw. Taki, 1930, but may be separated by differences in morphology of girdle spicules (Noseworthy *et al.*, 2014).

19 *Cryptoplax propior* Is. and Iw. Taki, 1930

(Fig. 12)

ORIGINAL DESCRIPTION: Taki, Is. and Iw. Taki, 1930. Studies on Japanese chitons (4). *Venus* Vol. 2, No. 3: 99-102, pl. 3; figs. 59-75. (As *Cryptoplax propior* Is. and Iw. Taki, 1930)

TYPE LOCALITY: “Prov. Shima” (Shima Peninsula, now part of Mie Prefecture, southeastern Japan).

HABITAT: Among rhizoids of brown laminarian algae in subtidal zone

GENERAL DISTRIBUTION: South-central Japan to Jeju Island, southwestern South Korea; **JEJU:** Bukchon-ri, Munseom

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: For a detailed discussion of this species in Jeju Island see Noseworthy *et al.* (2014).

Class: BIVALVIA Linnaeus, 1758

Subclass: PROTOBRANCHIA Pelseneer, 1889

Order: NUCULIDA Dall, 1889

Superfamily: Nuculoidea Gray, 1824

Family: NUCULIDAE Gray, 1824

Subfamily: Nuculinae Gray, 1824

Genus: *Nucula* Lamarck, 1799

1 *Nucula (Nucula) paulula* A. Adams, 1856

(Fig. 1) (Plate 1: A-D)

ORIGINAL DESCRIPTION: Adams, A. 1856. Descriptions of thirty-four new species of bivalve Mollusca (*Leda*, *Nucula*, and *Phytina*) from the Cumingian Collection. *Proceedings of the Zoological Society of London*, 24, 52. (As *Nucula paulula* A. Adams, 1856) (Without illustration)

TYPE LOCALITY: Japan

GENERAL DISTRIBUTION: Korea and Japan to Taiwan; **JEJU:** Udo (Sanhosa), Seopjikoji, Munseom, Seogundo, Hwasoon, Hamo

HABITAT: Under rocks in tidepools, on sandy mud or fine sandy substrate, from the intertidal zone to depth of 50 m

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Order: SOLEMYIDA Dall, 1889

Superfamily: Solemyoidea Gray, 1840

Family: SOLEMYIDAE Gray, 1840

Subfamily: Solemyinae Gray, 1840

BIVALVIA

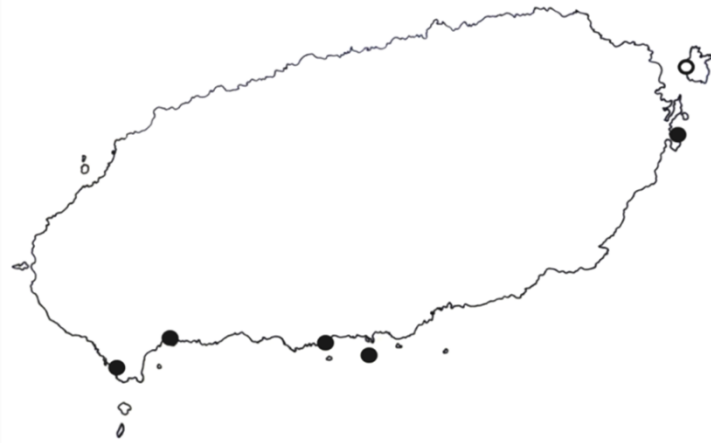


Fig. 1: Distribution of *N. paulula*



Fig. 2: Distribution of *N. (N.) scalata* (●), *N. (N.) leonina* (■), *N. (Sacella) gordonis* (▲),
and *Solemya (Pseudacharax) japonica* (★)



Fig. 3: Distribution of *M. galloprovincialis*

Genus: *Solemya* Lamarck, 1818

2 *Solemya (Pseudacharax) japonica* (Dunker 1882)

(Fig. 2)

ORIGINAL DESCRIPTION: Dunker, W. 1882. Index Molluscorum Maris Japonici. Cassel: Fischer, 220, pl. 14, fig. 3. (As *Solenomya japonica* Dunker, 1882)

TYPE LOCALITY: Japan

HABITAT: Sandy mud, from the intertidal zone to depth of 50 m

GENERAL DISTRIBUTION: Korea and Japan to northern Taiwan (Check); **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Huber (2010) states that, although Japanese authors consistently refer this species to *Acharax*, it does not belong to this genus. “It is not close in broad anterior shape, neither does it show the typical extended marginal fringes, nor is it large, nor does it live bathyally”. For this species Huber proposes a new subgenus, *Pseudacharax*. *Petrasma japonica* (Dunker, 1882) is a synonym.

Order: NUCULANIDA Carter,

Campbell, & Campbell, 2000

Superfamily: Nuculanoidea H. and A. Adams, 1858

Family: NUCULANIDAE H. and A. Adams, 1858

Subfamily: H. and A. Adams, 1858

Genus: *Nuculana* Link, 1807

3 *Nuculana (Nuculana) scalata* Prashad, 1932

(Fig. 2)

ORIGINAL DESCRIPTION: Prashad, B. 1932. The Lamellibranchia of the Siboga Expedition, Systematic part II: Pelecypoda (exclusive of the Pectinidae), Vol. 34(53c)[= livr.118]: 353 pp., 9 pls., 1 chart, in M. Weber (ed.), Siboga-Expeditie. Brill: Leiden. 22, p. 1, figs. 30, 31. (As *Nuculana (Thestyleda) scalata* B. Prashad, 1932)

TYPE LOCALITY: South China Sea (10.8°S, 123.4°E)

HABITAT: Sandy mud, at depths of 100-1640 m

GENERAL DISTRIBUTION: Korea and SE Japan to Indonesia; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: “Bernard *et al.* reported *scalata* from South China and Taiwan. Larger series of *scalata* and *subscalata* should be reanalyzed. I am not convinced that these two are distinct. At least specimens dredged off N. Borneo approximately at 100 m are in sculpture and shape intermediate between *subscalata* and *scalata* and hard to attribute.” (Huber, 2010). *Nuculana (Thestyleda) subscalata* Okutani, 1962 is a synonym.

4 *Nuculana (Nuculana) leonina* (Dall 1896)

(Fig. 2)

ORIGINAL DESCRIPTION: Dall, W. H. (1896). New species of *Leda* from the Pacific Coast. The Nautilus. 10 (1): p. 2. (As *Leda leonina* Dall, 1896) (Without illustration)

TYPE LOCALITY: British Columbia, Canada

HABITAT: Brown mud, fine sandy mud and green ooze, at depths from 200-2560 m

GENERAL DISTRIBUTION: Kamchatka to Korea and Japan; Southern Bering Sea to California; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Widely distributed boreal

REMARKS: “Furthermore, I fail to recognize Okutani’s *sagamiensis* as distinct.

Morphologically no traits were found separating Japanese from Washington [U. S. A.] specimens. Adult size and depth of *sagamiensis* fit *leonina* well. The number of commarginal ribs and the length of the rostrum in *leonina* changes markedly during its growth” (Huber, 2010). *N. (Thestyleda) sagamiensis* Okutani, 1962 (Sagami Bay) is a synonym.

5 *Nuculana (Saccella) gordonis* (Yokoyama 1920)

(Fig. 2)

ORIGINAL DESCRIPTION: Yokoyama, M. 1920. Fossils from the Miura Peninsula and its immediate north. Journal of the College of Science, Imperial University, Tokyo. Vol. 39 (6) pp. 177, 178, pl 19, figs. 4, 5. (As *Leda gordonis* Yokoyama, 1920)

TYPE LOCALITY: Naganuma, Hokkaido, Japan (fossil)

HABITAT: Fine sand and mud, from depths of 15-300 m

GENERAL DISTRIBUTION: Korea and Japan to East China Sea (Check); **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Sacella gordonis* (Yokoyama, 1920) is a synonym.

Subclass: PTERIOMORPHIA Buerlen, 1944

Order: MYTILIDA Férussac, 1822

Superfamily: Mytiloidea Rafinesque, 1815

Family: MYTILIDAE Rafinesque, 1815

Subfamily: Mytilinae Rafinesque, 1815

Genus: *Mytilus* Linnaeus, 1758

6 *Mytilus galloprovincialis* Lamarck, 1819

(Fig. 3) (Plate 5: A-D)

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. partie. Paris. 126. (As *Mytilus galloprovincialis* Lamarck, 1819) (Without illustration)

TYPE LOCALITY: French Mediterranean coast

HABITAT: Byssally attached to rocks, stones, and other objects, in the intertidal zone to depth of 24 m

GENERAL DISTRIBUTION: Native to Mediterranean Sea, Black Sea, and Adriatic Sea. Introduced to Southern Africa, eastern and western North America, Hawaii, and north-eastern Asia; **JEJU:** Gimnyeong, Wolpyeong, Haengwon, Handong, Sehwa, Seongsan, Shinyang, Yerae, Hwasoon, Gapado, Marado, Sinchang, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Circumboreal-subtropical

REMARKS: *M. edulis*, *M. galloprovincialis* and *M. trossulus* are not only morphologically, but also genetically very close. Overall, biogeography seems the easiest way to differentiate within *Mytilus*. The distinction between *edulis* and *galloprovincialis* is particularly difficult (Huber, 2010). Originally regarded as *M. edulis* Linnaeus, 1758 among Asian researchers.

7 *Mytilus coruscus* Gould, 1861

(Fig. 4) (Plate 5: E-H)

ORIGINAL DESCRIPTION: Gould, A.A. 1861. *Descriptions of shells collected by the Natural History* 8: 38. (As *Mytilus coruscus* Gould, 1861) (Without illustration)

TYPE LOCALITY: Hakodate Bay, S. Hokkaido

HABITAT: Byssally attached to rocks or stones, from the intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Korea; Japan; eastern Russia to East China Sea; **JEJU:** Seongsan, Supseom, Seogwipo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: A rather fragile shell for its size that often cracks when dried.

Genus: *Perna*: Philipsson, 1788

8 *Perna viridis* (Linnaeus, 1758)

(Fig. 4)

ORIGINAL DESCRIPTION: Linnaeus, C. 1758. Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Holmiæ. (Salvius). 706. (As *Mytilus viridis* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Unknown (“O. Meridionali” (Southern ocean) (Linnaeus))

HABITAT: Byssally attached on rocks, rocky beaches, timbers, also sheltered areas in estuaries; from the intertidal zone to depth of 10 m

GENERAL DISTRIBUTION: Southern Korea and Japan (introduced) to Indo-Pacific; U.S.A. and Caribbean (Introduced); **JEJU:** Shinyang, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Dead shells only. *P. viridis* may not be living in Jeju Island.

Subfamily: Septiferinae Scarlato and Starobogatov, 1979

Genus: *Septifer* Dunker, 1848

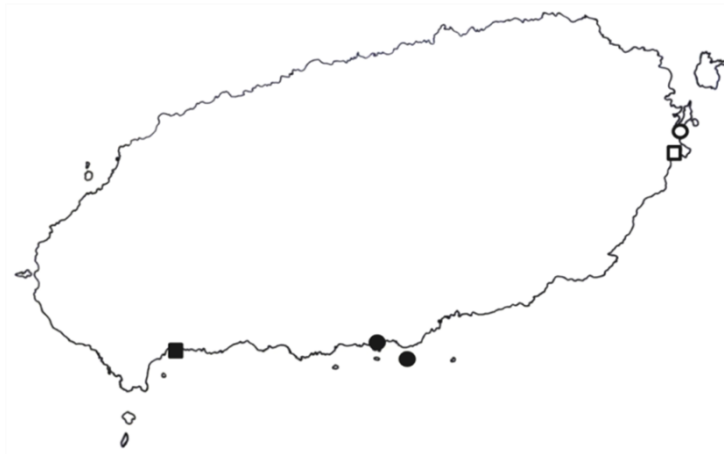


Fig. 4: Distribution of *M. coruscus* (●) and *Perna viridis* (■)

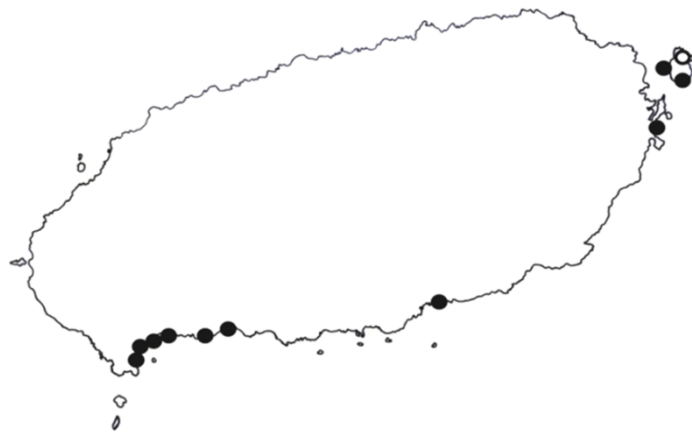


Fig. 5: Distribution of *S. bilocularis*

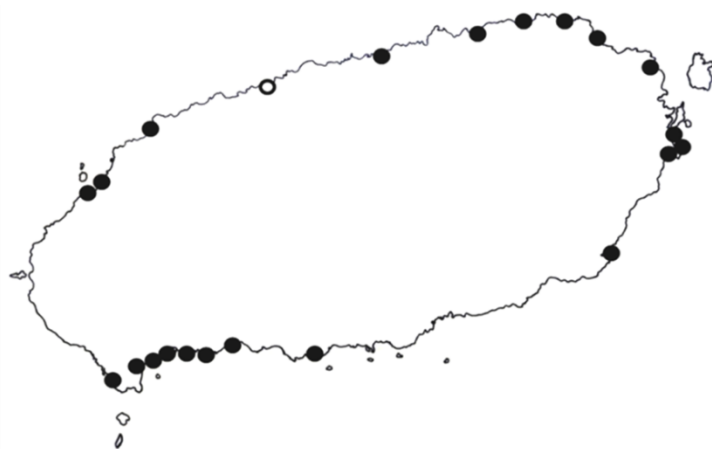


Fig. 6: Distribution of *S. excisus*

9 *Septifer bilocularis* (Linnaeus, 1758)

(Fig. 5)

ORIGINAL DESCRIPTION: Linnaeus, C. 1758. Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Holmiæ. (Salvius). 705. (As *Mytilus bilocularis* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Indian Ocean

HABITAT: Byssally attached to rocks among algae, near low tide mark, from intertidal zone to depth of 35 m

GENERAL DISTRIBUTION: Korea and Japan to Indo-West Pacific and Australia; introduced into UK and Eastern Mediterranean; **JEJU DISTRIBUTION:** Udo (Hagosudong), Udo (Sanhosa), Udo (Geomeollae), Seongsan, Wimi, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Songaksan

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Recognizable from *Septifer keenae* and *Septifer excisus* by its finer ribs and bluish interior.

10 *Septifer excisus* (Wiegmann, 1837)

(Fig. 6)

ORIGINAL DESCRIPTION: Wiegmann, A.F.A., 1837. Ueber neue Arten der Gattung Tichogonia, Rossm. (Dreissena, Van Ben.) nach den Exemplaren des Berliner Museums. Archiv für Naturgeschichte 3: 49. (*Tichogonia excisa* Wiegmann, 1837) (Without illustration)

TYPE LOCALITY: Indian Ocean

HABITAT: Byssally attached to or under rocks from intertidal zone to depth of 35 m

GENERAL DISTRIBUTION: Korea and SE Japan to Indo-W. Pacific; **JEJU:** Iho,

Samyang, Bukchon-ri, Gimnyeong, Wolpyeong, Handong, Hado, Seopjikoji, Seongsan, Shinyang, Pyoseon, Seogundo, Jungmun, Yerae, Daepyeong, Hwasoon, Yongmeori, Sagyei, Hamo, Keumneung, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *S. excisus* can be immediately distinguished from other members of the genus by the notch in its septal shelf, from which its name presumably derives. It can be further distinguished from other Indo-West Pacific members of its subgenus by the strong beading on the ribs and the frequently raised posterior adductor scar.

11 *Septifer virgatus* (Wiegmann 1837)

(Fig. 7) (Plate 5: I- L)

ORIGINAL DESCRIPTION: Wiegmann, A.F.A., 1837. Ueber neue Arten der Gattung Tichogonia, Rossm. (Dreissena, Van Ben.) nach den Exemplaren des Berliner Museums. Archiv fur Naturgeschichte 3:49. (As *Tichogonia virgata* Wiegmann, 1837) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Byssally attached to rocks, often in clumps, on exposed rocky shores in high intertidal zone;

GENERAL DISTRIBUTION: Korea and Japan to Vietnam; **JEJU:** Iho, Jeju-shi, Samyang, Hamdeok, Bukchon-ri, Hado, Udo (Sanhosa), Jongdal-ri, Ojo-ri, Shinyang, Pyoseon, Wimi, Bomok, Supseom, Seogwipo, Munseom, Bumseom, Gangjeong, Jungmun, Yerae, Daepyeong, Hwasoon, Yongmeori, Sagyei, Songaksan, Gapado, Marado, Hamo, Gosan, Chagwi-do, Keumneung, Biyangdo, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: In large specimens collected at Sado Island and Sagami Bay, Japan, dentition

in both right and left valves has been encountered; habitat, size, or morphology does not differ. In addition, this alternate position is found in *keena* as well. *S. virgatus* is a large species; specimens found in Japan are up to 50 mm, Dunker gives 55 mm and in Hong Kong specimens even attain 60 mm (Huber, 2010). A possible food species but its small size in Jeju Island inhibits commercial harvesting. *Mytilisepta virgata* (Wiegmann, 1837) is a synonym.

12 *Septifer keena* (Nomura, 1936)

(Fig. 8)

ORIGINAL DESCRIPTION: Nomura, S. 1936. A new species of the genus *Septifer* from Japan (*S. keeni*). *Venus*, 6: 205-208. (As *Septifer keeni* Nomura, 1936)

TYPE LOCALITY: Northern Honshu, Japan

HABITAT: Byssally attached to rocks; from the intertidal zone to depth of 30m

GENERAL DISTRIBUTION: Korea and Japan; East Sea to East China Sea; **JEJU:** Donggwi, Iho, Hwabuk, Hamdeok, Bukchon-ri, Gimnyeong, Wolpyeong, Haengwon, Handong, Hado, Udo (Hagosudong), Udo (Sanhosa), Udo (Geomeollae), Jongdal-ri, Ojo-ri, Seongsan, Seopjikoji, Shinyang, Pyoseon, Namwon, Wimi, Bomok, Seogwipo, Beophwan, Gangjeong, Daepo, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Songaksan, Gapado, Marado, Hamo, Chagwido, Keumneung, Biyangdo, Hyeopjae, Gwideok, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: The small, trigonal Japanese species, generally whitish inside, is *S. keena*. *Keena* remains much smaller and attains only about half size of the larger *S. virgatus* (Huber, 2010). *Mytilisepta keena* Nomura, 1936 is a synonym

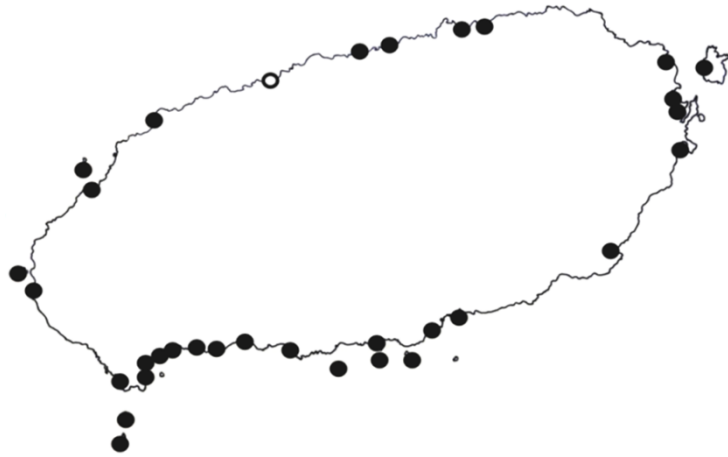


Fig. 7: Distribution of *S. virgatus*

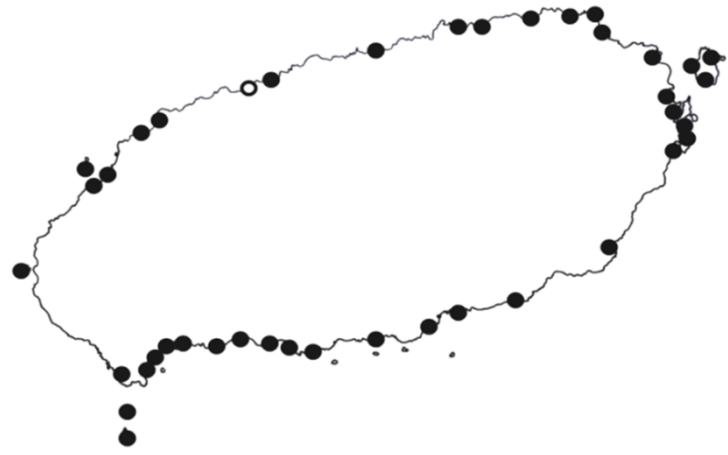


Fig. 8: Distribution of *S. keenae*

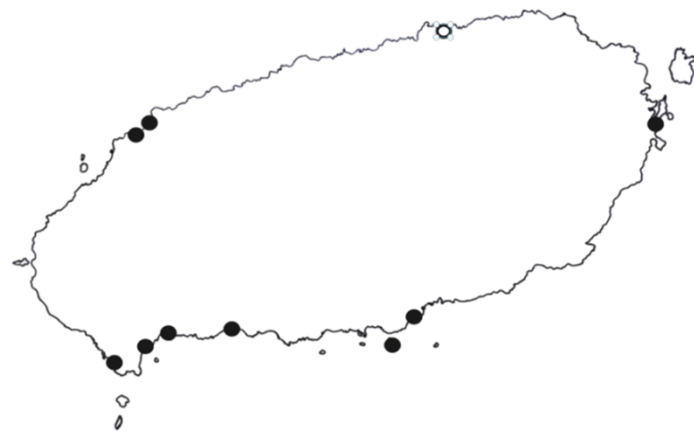


Fig. 9: Distribution of *M. modiolus*

Subfamily: Modiolinae G. Termier & H. Termier, 1950

Genus: *Modiolus* Lamarck, 1799

13 *Modiolus modiolus* (Linnaeus, 1758)

(Fig. 9)

ORIGINAL DESCRIPTION: Linnaeus, C. 1758. Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Holmiæ. (Salvius): p. 706. (As *Mytilus modiolus* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: None (“M. Mediterraneo” (Linnaeus), but *M. modiolus* has not been reported from the Mediterranean Sea)

HABITAT: Shallowly burrowed in mud or sand bottoms, or byssally attached to rocks, shells, gravel, or in the holdfasts of *Laminaria*, from the intertidal zone to a depth of 146 m

GENERAL DISTRIBUTION: Korea and N. Japan to Arctic; south to California; south to New Jersey; northern Europe; **JEJU:** Hamdeok, Seongsan, Bomok, Supseom, Jungmun, Hwasoon, Sagyei, Hamo, Gwideok, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Circumboreal

REMARKS: *M. kurilensis* has been analyzed by Coan et al. (2000) and synonymized with *modiolus*. Recently, this view has also been accepted by Russian authors (Huber, 2010). *Modiolus kurilensis* Bernard, 1983 is a synonym.

14 *Modiolus auriculatus* (Krauss, 1848)

(Fig. 10)

ORIGINAL DESCRIPTION: Krauss, F. 1848. Die Südafrikanischen Mollusken. Eine Beitrag zur Kenntnis der Mollusken Des Kap- und Natallandes und zur Geographischen

Verbreitung Derselben, mit Beschreibung und Abbildung der Neuen Arten. Stuttgart, Verlag von Ebner & Seubert: p. 20, pl. 2; fig. 4. (As *Modiola auriculatus* Krauss, 1848)

TYPE LOCALITY: Natal, South Africa

HABITAT: Byssally attached to rocks, in tidepools and in crevices, also on dead coral blocks and among rubble, from the intertidal zone to depth of 35 m

GENERAL DISTRIBUTION: Korea and S. Japan to Indo- Pacific; Mediterranean: **JEJU:** Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Hamo, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *M. auriculatus* is very common and also highly variable in color. It is typically brownish, with umbos lighter ventrally, The interior is usually purple dorsally and whitish ventrally; but dark-purplish and lighter yellowish, orange, and red colors occur.

15 *Modiolus nipponicus* (Oyama 1950)

(Fig. 11) (Plate 4: O-R)

ORIGINAL DESCRIPTION: Oyama, K. 1950. Studies of fossil molluscan biocoenosis, No. 1. Biocoenological studies on the mangrove swamps, with description of new species from Yatuo Group. Report of Geological Survey of Japan, 132pp. 1–15. pls. 1–3. (As *Volsella nipponicus* Oyama 1950)

TYPE LOCALITY: Japan

HABITAT: Byssally attached to rocks and other hard substrates, from the intertidal zone to depth of 40 m

GENERAL DISTRIBUTION: Korea and Japan to West Pacific; **JEJU:** Iho, Handong, Udo (Sanhosa), Jongdal-ri, Seongsan, Seopjikoji, Shinyang, Supseom, Bumseom, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Hamo, Biyangdo, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

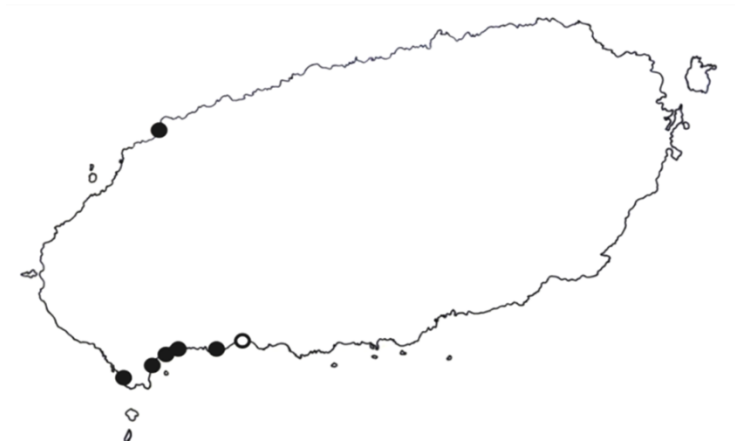


Fig. 10: Distribution of *M. auriculatus*

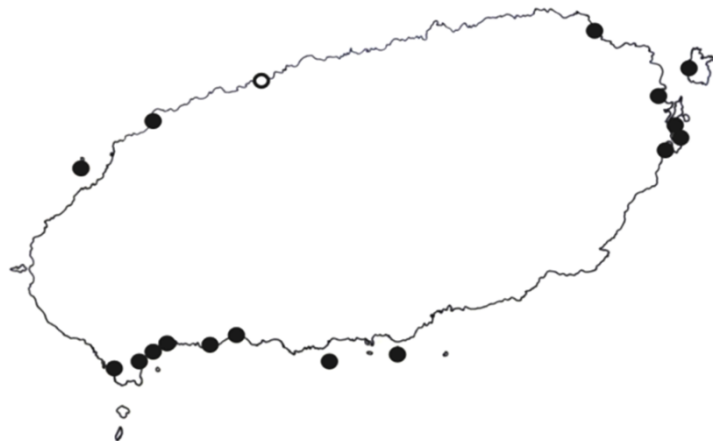


Fig. 11: Distribution of *M. nipponicus*

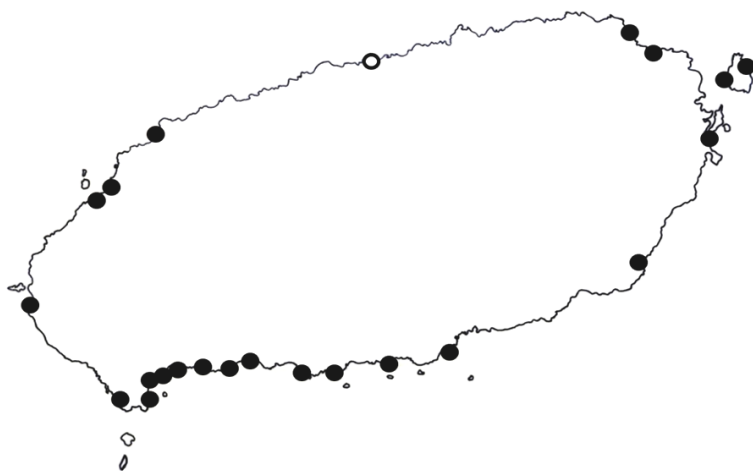


Fig. 12: Distribution of *B. mutabilis*

REMARKS: *M. nipponicus* seems much more widely distributed than *auriculatus*, which occurs occasionally in reddish colors. These two species appear to occur partly within the same areas. Okutani (2000) depicted both from Japan and mentioned differences in color and shape (Huber, 2010). *Modiolus agripetus* (Iredale, 1939) is a synonym.

Subfamily: Brachidontinae "Thiele" Nordsieck, 1969

Genus: *Brachidontes* Swainson, 1840

16 *Brachidontes mutabilis* (Gould, 1861)

(Fig. 12)

ORIGINAL DESCRIPTION: Gould, A.A. 1861. *Descriptions of shells collected by the North Pacific Exploring Expedition (continued)*. Proceedings of the Boston Society of Natural History 8: 38. (As *Mytilus mutabilis* Gould, 1861) (Without illustration)

TYPE LOCALITY: Kagoshima Bay, Kyushu, Japan

HABITAT: Byssally attached to rock, shells and stones in intertidal zone

GENERAL DISTRIBUTION: Southern Korea and Japan to W. Pacific; **JEJU:** Jeju-shi, Handong, Sehwa, Udo (Hagosudong), Udo (Sanhosa), Seongsan, Pyoseon, Bomok, Seogwipo, Seogundo, Gangjeong, Jungmun, Yerae, Daepyeong, Hwasoon, Yongmeori, Sagyei, Songaksan, Hamo, Gosan, Keumneung, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: This species has been observed using its byssal threads to trap muricid predators (Ishida and Iwasaki, 1999). *Hormomya (Brachidontes) mutabilis* (Gould, 1861) and *Hormomya mutabilis* (Gould, 1861) are synonyms.

Subfamily: Crenellinae Gray, 1840

Genus: *Exosiperna* Iredale, 1929

17 *Exosiperna kuroharai* Habe, 1961

(Fig. 13)

ORIGINAL DESCRIPTION: Habe, T., 1961. Four new bivalves from Japan. *Venus* 21 (2):152-156. (As *Exosiperna kuroharai* Habe, 1961)

TYPE LOCALITY: Southwestern Shikoku, Japan

HABITAT: Sand and gravel, from depths of 100-300 m

GENERAL DISTRIBUTION: Korea; S. Japan; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Genus: *Limnoperna* Rochebrune, 1882

18 *Limnoperna atrata* (C. E. Lischke 1871)

(Fig. 14)

ORIGINAL DESCRIPTION: Lischke, C. E. 1871. Diagnosen neuer Meeres-Conchylien von Japan. *Malakozoologische Blätter*, xviii 1871: p. 44. (As *Mytilus atratus* Lischke, 1871) (Without illustration)

TYPE LOCALITY: Nagasaki, Kyushu, Japan

HABITAT: Marine-estuarine, sheltered situations; byssally attached to rocks or shells, from the high intertidal zone to depth of 1 m

GENERAL DISTRIBUTION: Korea and Japan to W. Pacific; **JEJU:** Hamdeok, Handong, Yongmeori, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Xenostrobus atrata* (Lischke, 1871) is a synonym.

Subfamily: Musculinae Iredale, 1939

Genus: *Gregariella* Monterosato, 1884



Fig. 13: Distribution of *E. kuroharai* (●), *Gregariella barbata* (■), and *G. coralliophaga* (▲)



Fig. 14: Distribution of *Limnoperna atrata*

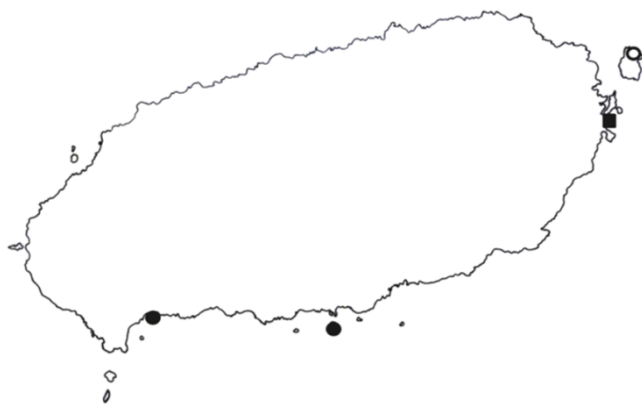


Fig. 15: Distribution of *M. (M.) pusio* (●) and *M. (Modiolarca) cumingianus* (■)

19 *Gregariella barbata* (Reeve, 1858)

(Fig. 13)

ORIGINAL DESCRIPTION: Reeve, L. A., 1857–58. Monograph of the genus *Lithodomus*.

In: *Conchologia Iconica*, 10: 5 Pls. (+ descriptions). London, Reeve Brothers, pl. 5; fig. 27.

[January, 1858] (As *Lithodomus barbata* Reeve, 1858)

TYPE LOCALITY: Sydney, Australia

HABITAT: Under stones, on rocks, nestling in cavities of larger shells, also embedded in sandy clay and mud; from the intertidal zone to depth of 90 m

GENERAL DISTRIBUTION: Korea and Japan to Thailand, southern Australia; New Zealand; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Replaces *Trichomusculus semigranatus* (Reeve, 1858). This species is referable to Reeve's *Lithodomus barbata*. Reeve, 1858 stated that *semigranatus* is "grain-striated only on the posterior area"; however Okutani (2000 p. 869 sp. 36), states that the Japanese species has "radial ribs present in anterior and posterior regions" as also noted by Reeve for his *Lithodomus barbatus*. *G. barbata* is a small species, rarely more than 10 mm in length with strongly-branched periostracal hairs (Huber, 2010). *Trichomusculus semigranatus* jap. auctt. non Reeve 1858; *Trichomusculus barbatus* (Reeve, 1858) are synonyms.

20 *Gregariella coralliophaga* (Gmelin, 1791)

(Fig. 13)

ORIGINAL DESCRIPTION: Gmelin, J. F. 1791. Caroli a Linné, systema naturae. Lipsiae (Leipzig), (Beer). 13. Tom. I. Pars VI. (Vol. 1, part 6) pp. 3351, 3352. (As *Mytilus coralliophaga* Gmelin, 1791) (Without illustration)

TYPE LOCALITY: Caribbean; Indo-Pacific

HABITAT: Chemically boring in corals (*Porites sp*), limestone, and shells; from the intertidal zone to depths of 20 m

GENERAL DISTRIBUTION: Korea and Japan to Indo-West Pacific; Caribbean; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: This species also occurs in Florida and Brazil. Originally, *G. coralliophaga* was described from both the Western Atlantic and the Indo-Pacific. This rare cosmopolitan distribution is accepted by virtually all modern authors. However, a genetic confirmation is at present lacking (Huber, 2010).

Genus: *Musculus* Röding, 1798

21 *Musculus (Musculus) pusio* (A. Adams 1862)

(Fig. 15)

ORIGINAL DESCRIPTION: Adams A. 1862a. On some new species of acephalous Mollusca from the Sea of Japan. *Annals and Magazine of Natural History, Series 3* (9): 229. (As *Modiolaria pusio* A. Adams, 1862) (Without illustration)

TYPE LOCALITY: Mishima, East Sea, Japan

HABITAT: Byssally attached to rock, gravel and seaweed in soft mud, from the intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Western part of East Sea to East China Sea; **JEJU:** Udo (Hagosudong), Munseom, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

22 *Musculus (Musculus) viridulus* (H. Adams 1871)

(Fig. 16) (Plate 4: K-N (as *nanus*); S-T)

ORIGINAL DESCRIPTION: Adams, H., 1871. Descriptions of twenty-six new species of shells collected by Robert McAndrew, Esq., in the Red Sea. *Proceedings of the Zoological Society of London* 1870: 792. (As *Crenella (Modiolaria) viridulus* H. Adams, 1871) (Without illustration)

TYPE LOCALITY: Red Sea

HABITAT: Rocky and sandy areas, byssally attached to sand grains, also nestling on rocks and on large shells, from the intertidal zone to depth of 70 m

GENERAL DISTRIBUTION: (Southern Korea and southern. Japan to Indo-W. Pacific;

JEJU: Wolpyeong, Udo (Sanhosa), Bomok, Munseom, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Musculus nanus* has been described by Dunker, 1857 from Port Lincoln, Southern Australia. From all data available, this species is restricted to S. Australia. The species referred to as *M. nanus*, from the Philippines to Japan, is actually *M. viridulus*. Adams' "*viridulus*" from the Red Sea has been described as a small greenish species, and is widely distributed, being also reported from Japan. This is a minute, ovate, compressed, fragile species. It is often found in reddish and brownish colors, but whitish, reddish or greenish specimens may occur in the same locality; it is smaller than 10 mm (Huber, 2010). "*M. nanus*" in Okutani (2000) is *M. viridulus* (Huber, 2010), exhibiting some variability in shape. According to Moolenbeek (2009), *Musculus viridulus* (H. Adams, 1871), has a rounded shape, and the one shell figured by Oliver (1992) looks very similar to *M. nanus*.

23 *Musculus (Modiolarca) cumingianus* ("Dunker" Reeve 1857)

(Fig. 15)

ORIGINAL DESCRIPTION: Monograph of the genus *Modiola*. In: *Conchologia Iconica*,

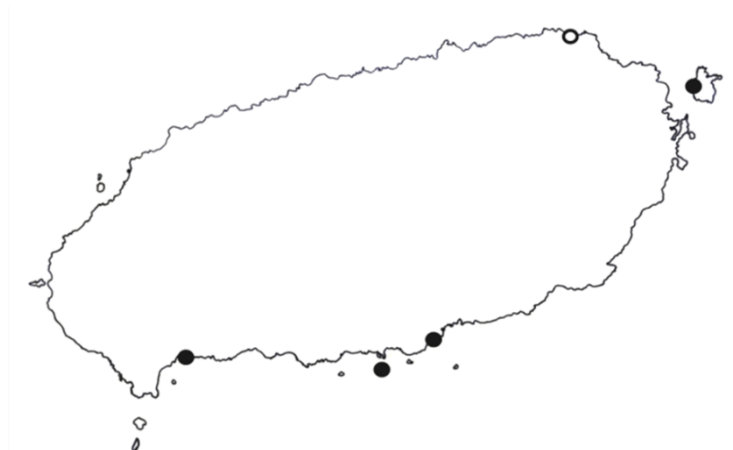


Fig. 16: Distribution of *M. (M.) viridulus*

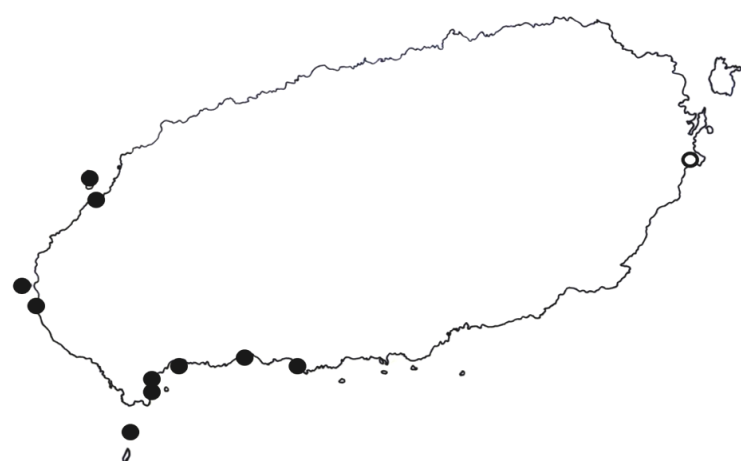


Fig. 17: Distribution of *Arcuatula senhousia*



Fig. 18: Distribution of *L. lischkei*

10: 11 Pls. (+ descriptions). London, Reeve Brothers, Pl. IX, fig. 63 (a, b). (As *Modiola cumingiana* Reeve, 1857)

TYPE LOCALITY: Moreton Bay, Queensland, Australia

HABITAT: Parasitic in tests of ascidians, on rocky bottoms, from intertidal zone to depth of 56 m

GENERAL DISTRIBUTION: Southern Korea and southern. Japan to Indo-W. Pacific;

JEJU: Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Musculus cumingiana* (Reeve, 1857) is a synonym.

Subfamily: Arcuatulinae Scarlato & Starobogatov, 1979

Genus: *Arcuatula* Jousseume in Lamy, 1919

24 *Arcuatula senhousia* (Benson in Cantor 1842)

(Fig. 17)

ORIGINAL DESCRIPTION: Benson W. H. (1842). Mollusca. In: Cantor, Th. "General features of Chusan, with remarks on the flora and fauna of that island". *Annals and Magazine of Natural History* **9**: 486-489. (Reprint (1842) pages 1-38), 34. (As *Modiola senhousia* Benson in Cantor 1842) (Without illustration)

TYPE LOCALITY: Zhousan (Chusan), Zhejiang Province, China

HABITAT: Sheltered bays, burrowing in soft mud, also among eelgrass, occasionally building nests by byssal threads, from the intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Eastern Russia to Vietnam; Kurile Is. to northwest Mexico (introduced); Mediterranean (introduced); S. Australia (introduced); New Zealand (introduced); **JEJU:** Shinyang, Gangjeong, Jungmun, Hwasoon, Sagyei, Songaksan, Gapado, Gosan, Chagwido, Keumneung, Biyangdo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: *Musculista* is here declared synonymous to the older *Arcuatula*. In Japan greenish-yellowish specimens with brown streaks have been found. Nowadays, *Arcuatula senhousia* is widely introduced in various regions and has to be regarded as virtually cosmopolitan (Huber, 2010). *Musculista senhousia* (Benson, 1842) is a synonym.

Subfamily: Lithophaginae H. & A. Adams, 1857

Genus: *Lithophaga* Carpenter, 1856

25 *Lithophaga (Leiosolenus) lischkei* (Huber, 2010)

(Fig. 18)

ORIGINAL DESCRIPTION: Huber, M. 2010. Formal description and designation of holotypes for 23 bivalve species and type species for 2 bivalve genera (Mollusca: Bivalvia). *Conchylia* 41(1): 1-32.

TYPE LOCALITY: Tokyo, Japan

HABITAT: Chemically boring into soft rocks, corals (*Montipora*), limestone, and other shells, from the intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Korea and Japan to Vietnam; **JEJU:** Dong-gwi, Jeju-shi, Hamdeok, Bukchon-ri, Ojo-ri, Seogwipo, Munseom, Bumseom, Yongmeori, Sagyei, Songaksan, Chagwido, Keumneung, Biyangdo, Gwideok

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Non *Lithodomus curta* Stoliczka, 1870, an Indian fossil. *Lischkei* is named after the original author. Both *Lithophagus* and *Lithodomus* are synonyms of *Lithophaga*, and both species are closer to *Leiosolenus*, than to *Lithophaga*. Although Lischke's type has not been located, *lischkei* is consistently recognized in Japan literature and is a quite common Japanese species (Huber, 2010). *Lithophaga (Leiosolenus) curta* (Lischke, 1874) is a

synonym.

26 *Lithophaga cf. malaccana* (Reeve 1857)

(Fig. 19)

ORIGINAL DESCRIPTION: Reeve, L. A., 1857–58. Monograph of the genus *Lithodomus*. In: *Conchologia Iconica*, 10: 5 Pls. (+ descriptions). London, Reeve Brothers, pl. 4, fig. 20. [October, 1857] (As *Lithodomus malaccana* Reeve, 1857)

TYPE LOCALITY: Malaysia

HABITAT: Chemically boring mainly in dead corals but also in calcareous rocks and shells, from the intertidal zone to depth of 40m

GENERAL DISTRIBUTION: Southern Korea and southern Japan to Indo-Pacific; **JEJU:** Munseom, Keumneung, Biyangdo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: First report from Korea. This species exhibits variability in shape from rather narrow to broader. *Malaccana* occurs occasionally with almost smooth incrustations; however, typically, these are strongly wrinkled (Huber, 2010).

Order: ARCIDA Gray, 1854

Superfamily: Arcoidea Lamarck, 1809

Family: ARCIDAE Lamarck, 1809

Subfamily: Arcinae Lamarck, 1809

Genus: *Arca* Linnaeus, 1758

27 *Arca avellana* Lamarck, 1819

(Fig. 20) (Plate 1: E-H)



Fig. 19: Distribution of *L. cf. malaccana*

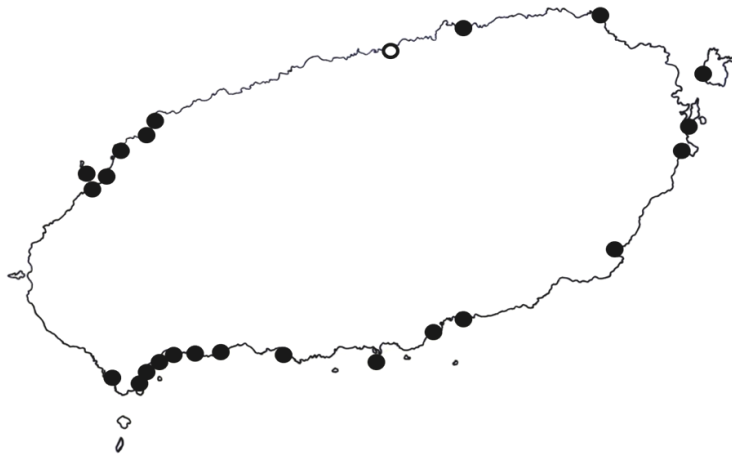


Fig. 20: Distribution of *Arca avellana*

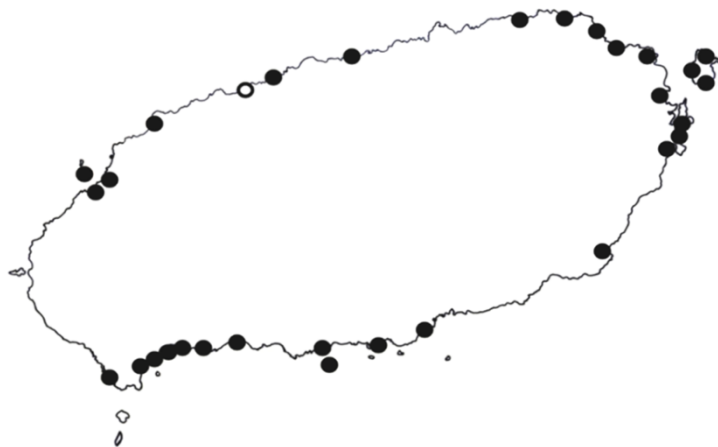


Fig. 21: Distribution of *A. boucardi*

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de. 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. partie. Paris. - pp. i-vi [= 1-6], 1-343. (As *Arca avellana* Lamarck, 1819) (Without illustration)

TYPE LOCALITY: Suez

HABITAT: Sheltered bays and coral reefs; byssally attached to rocks, shells, coral, or coarse sand, also in crevices, from the intertidal zone to depth of 100 m.,

GENERAL DISTRIBUTION: Korea and Japan to Indo-W. Pacific; South Africa; **JEJU:** Samyang, Hamdeok, Haengwon, Udo (Sanhosa), Seongsan, Shinyang, Pyoseon, Wimi, Bomok, Munseom, Gangjeong, Yerae, Daepyeong, Hwasoon, Yongmeori, Sagyei, Songaksan, Hamo, Keumneung, Biyangdo, Hyeopjae, Suwon, Gwideok, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: May be the only *Arca* species occurring on Jeju Island; specimens attributed to *A. boucardi* may instead be elongated forms of *A. avellana* (K. Lutaenko, pers. comm.).

28 *Arca boucardi* Jousseume, 1894

(Fig. 21)

ORIGINAL DESCRIPTION: Jousseume, F., 1894. - Description d'une espèce nouvelle de coquille du Japon du genre *Arca*. *The Humming Bird* **4**: 41-56, (As *Arca boucardi* Jousseume, 1894) (Without illustration)

TYPE LOCALITY: “Mers du Japon” (Japanese waters)

HABITAT: Byssally attached to rocks and stones, from intertidal zone to depth of 68m

GENERAL DISTRIBUTION: Southern Okhotsk Sea to Vietnam; **JEJU:** Dong-gwi, Iho, Jeju-shi Gimnyeong, Wolpyeong, Handong, Sehwa, Hado, Udo (Hagosudong), Udo (Sanhosa), Udo (Geomeollae), Jongdal-ri, Seongsan, Seopjikoji, Shinyang, Pyoseon, Bomok, Seogwipo, Seogundo, Bumseom, Jungmun, Yerae, Daepyeong, Hwasoon, Yongmeori, Sagyei, Hamo, Keumneung, Biyangdo, Hyeopjae, Gwakji,

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: *Arca boucardi* may not occur in Jeju Island. (See previous comment on *A. avellana*.)

Genus: *Barbatia* Gray, 1842

29 *Barbatia trapezina* (Lamarck, 1819)

(Fig. 22)

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. Partie, Paris. 41. (As *Arca trapezina* Lamarck, 1819) (Without illustration)

TYPE LOCALITY: Timor Island

HABITAT: Byssally attached to rocks and coral blocks, from the intertidal zone to depth of 30m

GENERAL DISTRIBUTION: Korea and Japan to Indo-W. Pacific; **JEJU:** Udo (Sanhosa), Songsan, Bomok, Seogwipo, Munseom, Seogundo, Jungmun, Yerae, Hwasoon, Yongmeori,

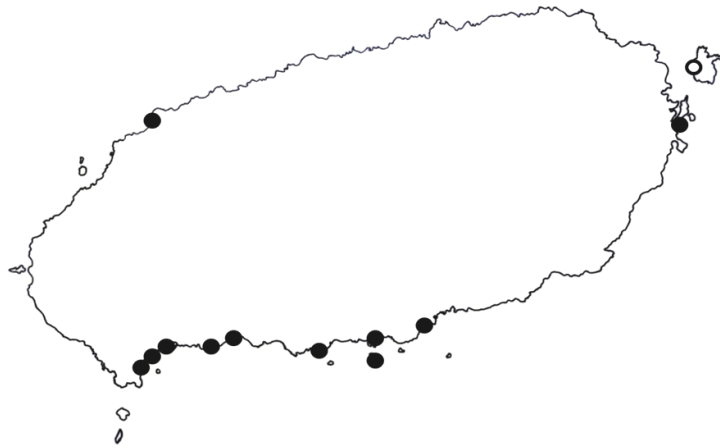


Fig. 22: Distribution of *B. trapezina*

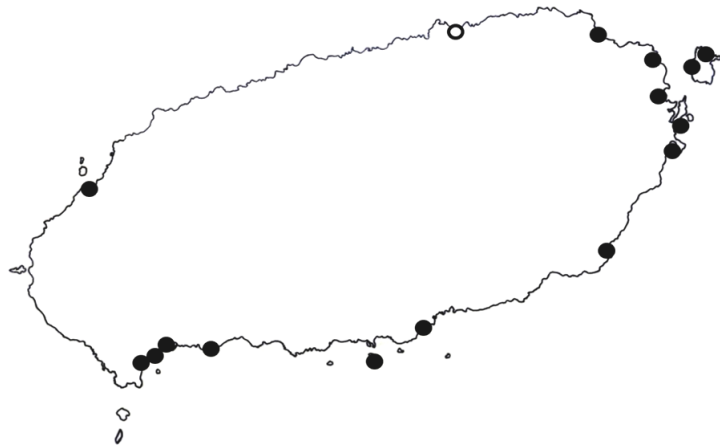


Fig. 23: Distribution of *B. (S.) virescens*

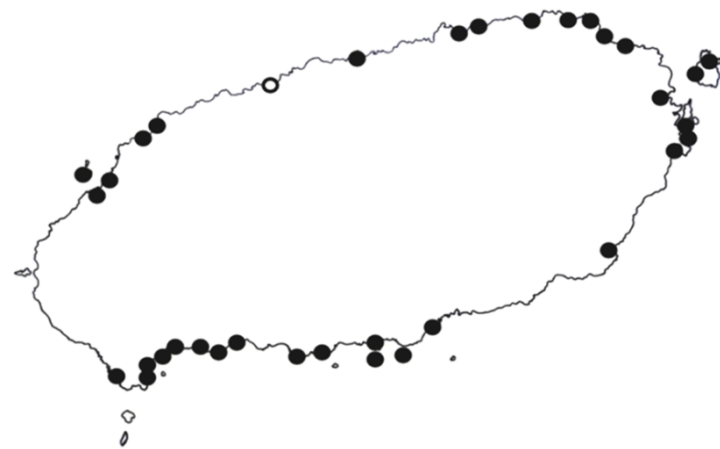


Fig. 24: Distribution of *B. (U.) stearnsi*

Sagyei, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Synonyms are: *Barbatia (Abarbatia) decussata* (Sowerby I, 1833), *Arca decussata* (Sowerby I, 1833), *Byssoarca decussata* Sowerby I, 1833.

30 *Barbatia (Savignyarca) virescens* (Reeve, 1844)

(Fig. 23) (Plate 1: O-R)

ORIGINAL DESCRIPTION: Reeve, L. A. 1844. Descriptions of new species of *Arca*, chiefly collected by H. Cuming, Esq. in the Philippine Islands. *Proceedings of the Zoological Society of London*, 12, 124-125. (As *Arca virescens* Reeve, 1844) (Without illustration; first illustration in *Conch. Icon.* (Reeve, 1844))

TYPE LOCALITY: Catbalonga, Samar Island, Philippines

HABITAT: Byssally attached to rocks, under stones, and in crevices, from the intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Japan to Vietnam; **JEJU:** Hamdeok, Handong, Hado, Udo (Hagosudong), Udo (Sanhosa), Jongdal-ri, Seongsan, Shinyang, Pyoseon, Bomok, Munseom, Yerae, Hwasoon, Yongmeori, Sagyei, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Periostracum eroded in central shell area, with velvety, dark greenish periostracum around edge of shell. Variable in shape, usually white, occasionally greenish from algae, often deformed.

31 *Barbatia (Ustularca) stearnsi* (Pilsbry, 1895)

(Fig. 24) (Plate 1: S-V)

ORIGINAL DESCRIPTION: Pilsbry. 1895. Catalogue of the Marine Mollusks of Japan,

(Nemoto, Boshu; Yokohama, Japan). P. 148, 149, pl. 3, fig. 8-10. (As *Arca stearnsi* Pilsbry, 1895)

TYPE LOCALITY: Japan: “Nemoto, Boshu, and Yokohama” (Pilsbry)

HABITAT: Byssally attached to rocks, in coarse or muddy sand, from the intertidal zone to depth of 83 m.

GENERAL DISTRIBUTION: Japan to South China Sea; **JEJU:** Iho, Jeju-si, Hamdeok, Bukchon-ri, Gimnyeong, Wolpyeong, Haengwon, Handong, Sehwa, Udo (Hagosudong), Udo (Sanhosa), Jongdal-ri, Songsan, Seopjikoji, Shinyang, Pyoseon, Bomok, Supseom, Seogwipo, Munseom, Seogundo, Gangjeong, Jungmun, Yerae, Daepyeong, Hwasoon, Yongmeori, Sagyei, Songaksan, Hamo, Keumneung, Biyangdo, Hyeopjae, Gwideok, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: A common shell in beach drift. *Stearnsi* is typically trapezoidal with a very fine, spicate periostracum (Huber, 2010).

Genus: *Acar* Gray, 1857

32 *Acar plicata* ("Chemnitz" Dillwyn 1817)

(Fig. 25) (Plate 1: I-J)

ORIGINAL DESCRIPTION: Dillwyn, Lewis W. 1817. A Descriptive Catalogue of Recent Shells Arranged According to the Linnean Method with Particular Attention to Synonymy, Vol. 1. John and Arthur Arch, London. 227, 228. (As *Arca plicata* Dillwyn, 1817) (Without illustration)

TYPE LOCALITY: Red Sea

HABITAT: byssally attached to rocks and gravel, from intertidal zone to depth of 20 m

GENERAL DISTRIBUTION Korea and Japan to Indo-Pacific; South Africa; Hawaii, Clipperton Island, Panama; Mediterranean (Lessepsian); **JEJU:** Handong, Hado, Jongdal-ri,

Seopjikoji, Shinyang, Pyoseon, Munseom, Hwasoon, Yongmeori, Sagyei, Hamo, Keunmeung, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Acar plicatum* (Dillwyn, 1817) is a synonym.

Genus: *Hawaiarca* Dall, Bartsch & Rehder, 1938

33 *Hawaiarca uwaensis* (Yokoyama, 1928)

(Fig. 26)

ORIGINAL DESCRIPTION: Yokoyama, M., 1928b: Pliocene shells from Hyuga. Journal of the Faculty of Science, Imperial University of Tokyo, Section 2, vol. 2, pt. 7, p. 349; Pl. 67, fig. 13, 14. (As *Arca uwaensis* Yokoyama, 1928)

TYPE LOCALITY: Hyuga, Kyushu, Japan

HABITAT: Byssally attached to rocks, shells, and sunken wood, from depth of 10-500 m

GENERAL DISTRIBUTION: Korea and Japan to Vietnam; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

Genus: *Mesocibota* Iredale, 1939

34 *Mesocibota bistrigata* (Dunker 1866)

(Fig. 26)

ORIGINAL DESCRIPTION: Dunker, W.R. 1858-1878. *Novitates conchologicae. Abbildung und Beschreibung neuer Conchylien. 11. Abtheilung. Meeres-Conchylien.* Cassel (Fischer). 8, pl. 30, figs. 4, 5, 67. (As *Arca bistrigata* Dunker, 1866.)

TYPE LOCALITY: Mumbai, India, and China

HABITAT: In bays, byssally attached to rocks, in shell debris and muddy areas, at depth of

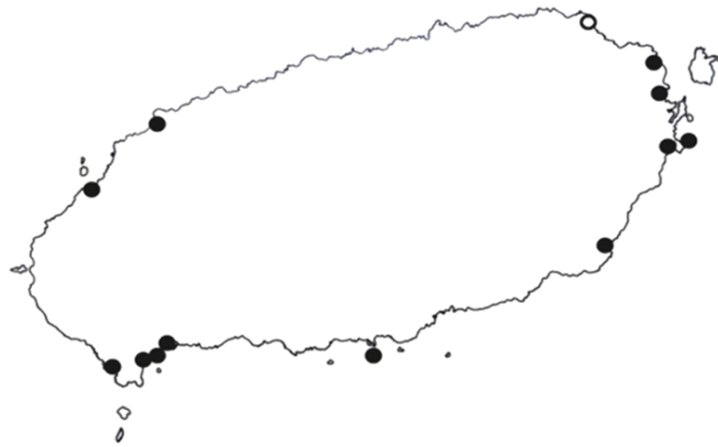


Fig. 25: Distribution of *A. plicata*

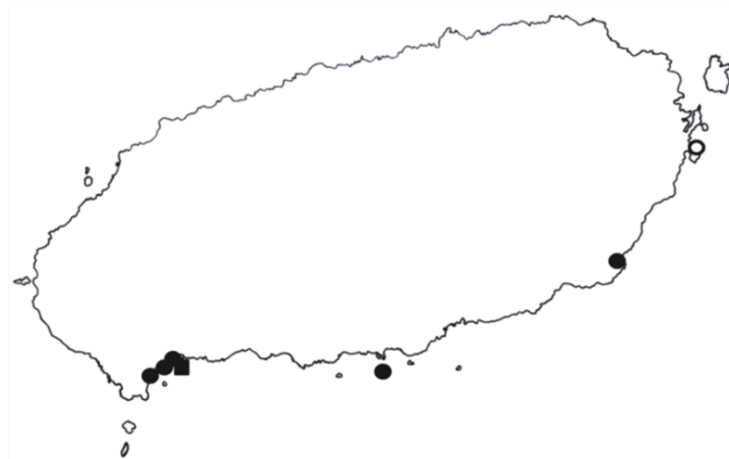


Fig. 26: Distribution of *Mesocibota bistrigata* (●) and *H. uwaensis* (■)



Fig. 27: Distribution of *B. (B.) kyurokusimana* (●) and *Samacar strabo* (■)

3-55 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-W. Pacific; **JEJU:** Seopjikoji, Pyoseon, Munseom, Hwasoon, Yongmeori, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical ??

REMARKS: *M. bistrigata* is the type of *Nipponarca*. *Nipponarca bistrigata* (Dunker, 1866) is a synonym.

Subfamily: Bathyarcinae Scarlato & Starobogatov, 1979

Genus: *Bathyarca* Kobelt, 1891

35 *Bathyarca (Bathyarca) kyurokusimana* (Nomura & Hatai 1940)

(Fig. 27)

ORIGINAL DESCRIPTION: Nomura, S. and Hatai, K. 1940. The marine fauna of Kyuroku-sima and its vicinity, Northeast Honshu, Japan. Saito Ho-on Kai Museum Research Bulletin. 19: 75, pl. 4, fig.1a, b. (As *Bathyarca. (Microcucullaea) kyurokusimana* Nomura & Hatai 1940)

TYPE LOCALITY: Kyuroku-sima, northwest Honshu, Japan

HABITAT: Fine sand and mud, from depth of 20-500 m

GENERAL DISTRIBUTION: Northern Japan, East Sea, and southern Korea to East China Sea; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: Japanese authors have synonymized *B. kyurokusimana* with *anaclima* from the Indian Ocean to Indonesia and the Philippines, although Okutani (2000) lists only *B. kyurokusimana*. However, it appears that these two species are different: *B. kyurokusimana* has a sculpture of fine radial riblets and growth striae giving a cancellate appearance (Okutani, 2000), as opposed to *B. anaclima* which has fewer radial riblets and is smaller. The figure in

Min (2004) appears to be a specimen of *B. kyurokusimana*.

Genus: *Samacar* Iredale, 1936

36 *Samacar strabo* (Hedley, 1915)

(Fig. 27)

ORIGINAL DESCRIPTION: Hedley, C. 1915. Studies on Australian Mollusca, Part XII. Proceedings of the Linnean Society of New South Wales. 39. 697, pl. 78, figs. 19, 20. (As *Arca strabo* Hedley, 1915)

TYPE LOCALITY: Port Macquarie, New South Wales, Australia

HABITAT: Byssally attached to rocks and sponges, at depths from 20-500 m (Higo *et al.*, 1999)

GENERAL DISTRIBUTION: Korea and Japan to Indo-West Pacific; South Africa (Check);

JEJU: Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: For a detailed discussion and description of this species, see Kamenev (2007).

Subfamily: Anadarinae Reinhart, 1935

Genus: *Anadara* Gray, 1847

37 “*Anadara (Scapharca) inaequalis*” (J. G. Bruguière 1789)

(Fig. 28) (Plate 2: A-F)

ORIGINAL DESCRIPTION: Bruguière, J. G., (1789) Encyclopedie Methodique. Histoire naturelle des vers. Paris, Vol. 1 (1), 1-344. (As *Arca inaequalis* Bruguière, 1789) (Without illustration)

TYPE LOCALITY: Tranquebar, India

GENERAL DISTRIBUTION: Korea; Japan (Min, 2004; Okutani, 2000) India to

Philippines (Huber, 2010); **JEJU**: Iho, Udo (Geomeollae), Jongdal-ri, Seongsan, Shinyang, Jungmun, Hwasoon, Yongmeori

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: (May not occur in Jeju) “*Sativa* is the same as the Japanese “*inaequivalvis*” (e.g. Okutani, 2000 pl. 424 fig. 39). *Sativa* has fewer ribs, is less inequivalve and has a very solid texture markedly distinct from true *inaequivalvis*” (Huber, 2010). However, Lutaenko (pers. comm.) believes that this species is not *A. sativa*. *Scapharca inaequivalvis* (Bruguiere, 1789) is a synonym.

38 *Anadara broughtonii* (Schrenck, 1867)

(Fig. 29)

ORIGINAL DESCRIPTION: Schrenck, L.I. 1867. Mollusken des Amur-Landes und des Nordjapanischen Meeres. Reisen und Forschung im Amur-Landes in den Jahren 1854–1856. Akademie der Wissenschaften zu St. Petersburg, 2. 578-580, pl. 24, figs. 1-3. (As *Arca broughtonii* Schrenck, 1867)

TYPE LOCALITY: Hakodate Bay; Nagasaki, Japan

GENERAL DISTRIBUTION: Japan and Eastern Russia to Vietnam; **JEJU**: Ojo-ri, Munseom, Bumseom, Supseom

HABITAT: In bays in sandy mud, at depths of 5-50 m

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Uncommon in Jeju Island; harvested commercially in mainland Korea.

Genus: *Tegillarca* Iredale, 1939

39 *Tegillarca granosa* (Linnaeus, 1758)

(Fig. 30)

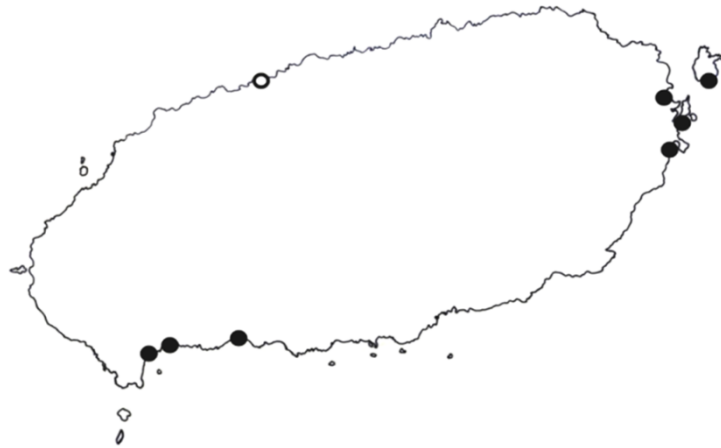


Fig. 28: Distribution of "*A. (S.) inaequalvis*"



Fig. 29: Distribution of *A. broughtonii*



Fig. 30: Distribution of *T. granosa*

ORIGINAL DESCRIPTION: Linnaeus, C. 1758, Systema Naturae per regna tria naturae, secundum Classes, Ordines, Genera, Species Editio decima, reformata (10th Edition), 1. Stockholm: 694. (As *Arca granosa* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Bays and sheltered shores, estuarine-marine environment, in mangrove areas and brackish water, close to the surface of soft mud, from the intertidal zone to depth of 10m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-Pacific; **JEJU:** Udo (Geomeollae), Seongsan, Shinyang, Bomok, Hamo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *T. granosa* is ovate with 17-21 nodulose ribs, a comparatively narrow, flat, chevroned ligament, and a break in the hinge line under the beaks; highly variable. A possible new species record for Jeju Island; most specimens appear subfossil.

Family: GLYCYMERIDIDAE Dall, 1908

Genus: *Glycymeris* da Costa, 1778

40 *Glycymeris aspersa* (Adams & Reeve 1850)

(Fig. 31)

ORIGINAL DESCRIPTION: Adams, A. and Reeve, L. 1850. Mollusca [in] Adams A. (ed.) The Zoology of the Voyage of H.M.S. Samarang, under the command of Captain Sir Edward Belcher C. B., F. R. A. S., F. G. S., during the years 1843-1846. London: Reeve, Benham & Reeve, Part III, p. 76, pl. XXII, fig. 8. (As *Pectunculus aspersa* Adams and Reeve, 1850)

TYPE LOCALITY: Honshu, Japan (Huber, 2010) (“Sulu Archipelago, Philippines – erroneous”) (Huber, 2010)

HABITAT: Shelly coarse sandy bottom from depth of 3-71 m.

GENERAL DISTRIBUTION: (Japan to East China Sea); **JEJU:** Iho, Jeju-shi, Handong,

Jongdal-ri, Seongsan, Seopjikoji, Shinyang, Wimi, Bomok, Beophwan, Gangjeong, Jungmun, Yerae, Daepyong, Hwasoon, Yongmeori, Sagyei, Hamo, Biyangdo, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical???

REMARKS: The original type locality “Philippines, Sulu Arch.” is considered erroneous and here corrected to Japan, Honshu (Huber, 2010). *Glycymeris vestita* (Dunker, 1877) is a synonym.

41 *Glycymeris albolineata* (Lischke 1872)

(Fig. 32) (Plate 3: A-D)

ORIGINAL DESCRIPTION: Lischke, C.E., 1872. Diagnosen neuer Meeres-Conchylien von Japan . *Malakozoologische Blatter*, 19: 109. (As *Pectunculus albolineata* Lischke, 1872) (Without illustration)

TYPE LOCALITY: Tokyo Bay, Japan

HABITAT: Fine sand and sandy mud subtidal, at depths from 3 - 20 m

GENERAL DISTRIBUTION: Korea and Japan to Taiwan; **JEJU:** Iho, Udo (Hagosudong), Jongdal-ri, Seongsan Seopjikoji Shinyang Wimi Bomok, Jungmun, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Smaller members of this species may resemble *G. aspersa*. However, *G. albolineata* is subquadrate, as opposed to the subcircular shape of *G. vestita*, usually with shades of yellowish-brown with narrow, incised, white radial lines, and ornamented with fine punctations. Also, *G. aspersa* usually possesses more varied color patterns.

42 *Glycymeris rotunda* (Dunker 1882)

(Fig. 33)

ORIGINAL DESCRIPTION: Dunker, W. 1882. Index Molluscorum Maris Japonici. Cassel:

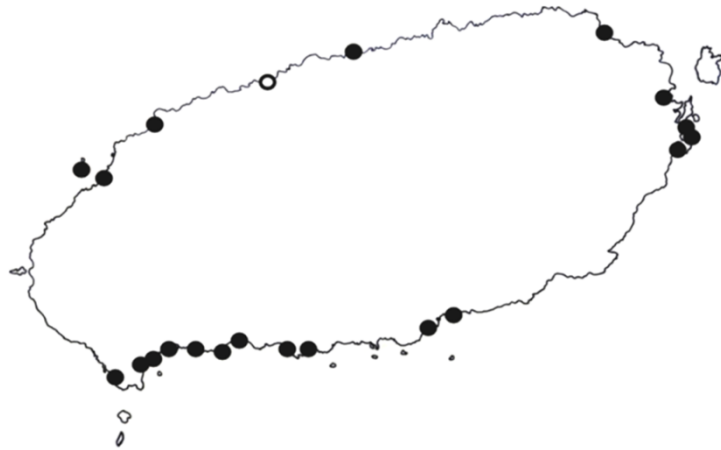


Fig. 31: Distribution of *G. aspersa*

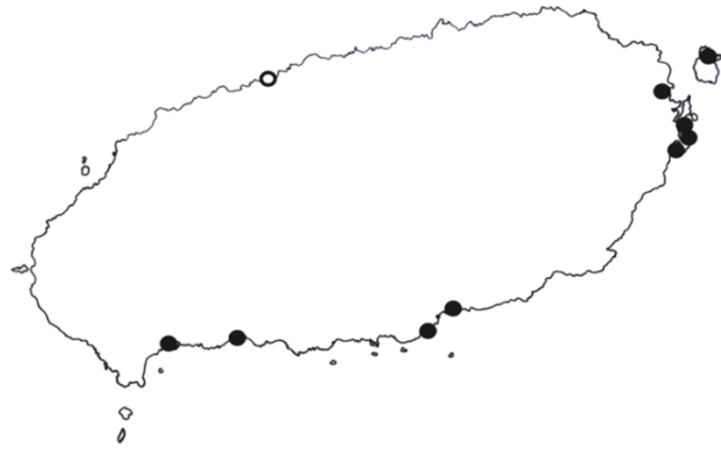


Fig. 32: Distribution of *G. albolineata*

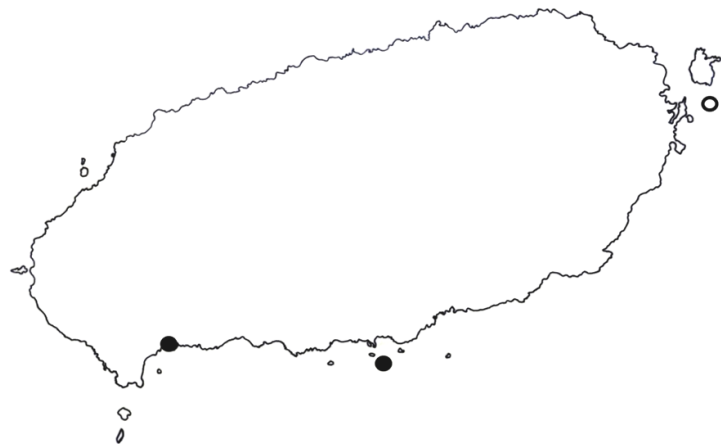


Fig. 33: Distribution of *G. rotunda*

Fischer, p. 236, pl. 16; figs, 9, 10. (As *Pectunculus rotundus* Dunker, 1882)

TYPE LOCALITY: Tokyo Bay, Japan

HABITAT: Fine sand and sandy mud, from depths of 20-300 m

GENERAL DISTRIBUTION: Korea and Japan to E. China Sea; **JEJU:** East of Songsan, South of Seogwipo, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Family: NOETIIDAE Stewart, 1930

Genus: *Striarca* Conrad, 1862

43 *Striarca symmetrica* (Reeve, 1844)

(Fig. 34) (Plate 1: K-N)

ORIGINAL DESCRIPTION: Reeve, L. A. 1844. Descriptions of new species of *Arca*, chiefly collected by H. Cuming, Esq. in the Philippine Islands. *Proceedings of the Zoological Society of London*, 12: 127, 128. (As *Arca symmetrica* Reeve, 1844) (Without illustration)

TYPE LOCALITY: Manila Bay, Philippines

HABITAT: Attached to rocks from the intertidal zone to depth of 30m

GENERAL DISTRIBUTION: Korea and Japan to tropical West Pacific; Burma; **JEJU:** Jeju-shi, Hamdeok, Gimnyeong, Wolpyeong, Sehwa, Haengwon, Handong, Sehwa, Udo (Hagosudong), Udo (Sanhosa), Jongdal-ri, Seongsan, Shinyang, Pyoseon, Bomok, Seogundo, Gangjeong, Jungmun, Yerae, Daepyeong, Hwasoon, Sagyei, Hamo, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Arcopsis symmetrica* (Reeve, 1844) is a synonym.

Genus: *Didimacar* Iredale, 1939

44 *Didimacar tenebrica* (L. A. Reeve 1844)

(Fig. 35)

ORIGINAL DESCRIPTION: Reeve, L. A. 1844. Descriptions of new species of *Arca*, chiefly collected by H. Cuming, Esq. in the Philippine Islands. *Proceedings of the Zoological Society of London*, 12, 126. (As *Arca tenebricum* Reeve, 1844) (Without illustration)

TYPE LOCALITY: Samar Island, Eastern Philippines

HABITAT: Attached to the underside of large rocks, on or under stones or dead corals from the intertidal zone to depth of 31m;

GENERAL DISTRIBUTION: Korea and Japan to Indo-West Pacific; **JEJU:** Udo (Hagosudong), Udo (Sanhosa), Seongsan, Hamo, Biyangdo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS:. *D. tenebrica* is extremely variable in shape. The more elongate Indian Ocean forms seem at first glance distinct from the very humped, inflated Chinese and Japanese forms, but Australian specimens (= *repenta*) are just in between and intermediate well (Huber, 2010). *Didimacar tenebricum* (Reeve, 1844) is a synonym.

Family: PARALLELODONTIDAE Dall, 1898

Genus: *Porterius* B. L. Clark, 1925

45 *Porterius dalli* (E. A. Smith, 1885)

(Fig. 36) (Plate 4: I, J)

ORIGINAL DESCRIPTION: Smith, E.A., (1885) Report on the Lamellibranchiata collected by HMS Challenger, 1873-76, Challenger Reports (Zoology) Vol. 13: 269, pl. 17. figs. 10-10b. (As *Arca (Macrodon) dalli* E. A. Smith, 1885)

TYPE LOCALITY: Off Kobe, Japan

HABITAT:; Byssally attached to rocks and stones on gravelly substrate, from depth of 20-300 m

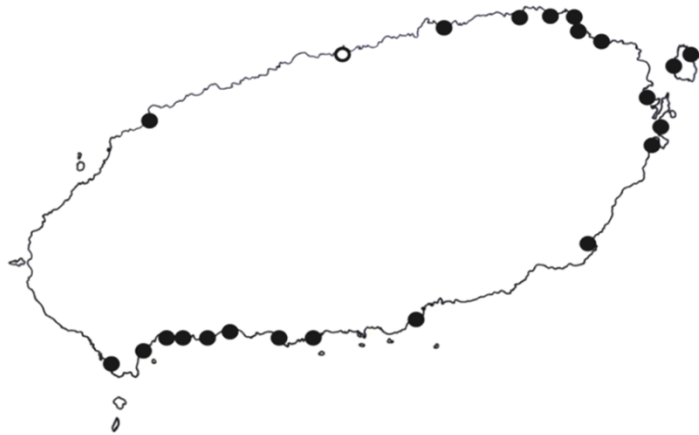


Fig. 34: Distribution of *S. symmetrica*



Fig. 35: Distribution of *D. tenebrica*

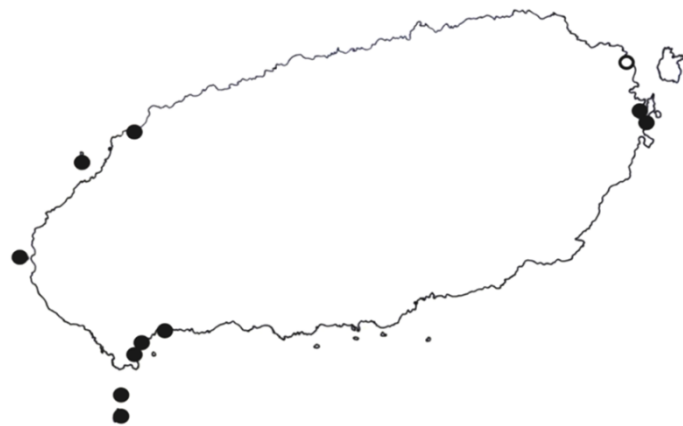


Fig. 36: Distribution of *P. dalli*

GENERAL DISTRIBUTION: Yellow Sea to Bering Sea; **JEJU:** Hado, Ojo-ri, Seongsan, Hwasoon, Sagyei, Songaksan, Gapado, Marado, Chagwi-do, Biyangdo, Gwideok

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Resembles *Barbatia trapezina* but can be identified by its hinge teeth which are arranged radially anteriorly and horizontal posteriorly.

Superfamily: Limopsoidea Dall, 1895

Family: LIMOPSIDAE Dall, 1895

Genus: *Limopsis* Sassi, 1827

46 *Limopsis (Oblimopa) japonica* A. Adams, 1863

(Fig. 37) (Plate 4: (A-H))

ORIGINAL DESCRIPTION: Adams, A. 1863. Descriptions of Some New Species of *Limopsis* from the Cumingian Collection. *Proceedings of the Zoological Society of London*. 1862: 229. (As *Limopsis japonica* A. Adams, 1863) (Without illustration)

TYPE LOCALITY: Kuroshima, Kyushu, Japan

HABITAT: Muddy sand from depth of 26 – 290 m.

GENERAL DISTRIBUTION: Korea and Japan to East China Sea; **JEJU:** Wolpyeong, Songsan, Seopjikoji, Seogwipo, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Hamo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: A common species on the south coast of Jeju. *Oblimopa japonica* (A. Adams, 1863) is a synonym.

47 *Limopsis (Nipponolimopsis) azumana* Yokoyama, 1910

(Fig. 37)

ORIGINAL DESCRIPTION: Yokoyama, M. 1910. On species of *Limopsis* found in the Neogene of Koshiha. Journal of the Geological Society of Japan. 17:3, 4, pl. 9, figs. 16-18.

(As : *Limopsis azumana* M. Yokoyama, 1910)

TYPE LOCALITY: Koshiha, Kanagawa Prefecture, Japan

HABITAT: In sand; at depths of 100-250 m

GENERAL DISTRIBUTION: Korea; E. Japan; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Shell large for genus. *Nipponolimopsis azumana* (Yokoyama, 1910) is a synonym.

Order: PTERIIDA Newell, 1965

Superfamily: Pterioidea Gray, 1847

Family: PTERIIDAE Gray, 1847

Genus: *Pteria* Scopoli, 1777

48 *Pteria heteroptera* (Lamarck 1819)

(Fig. 38)

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. partie. Paris. 148. (As *Avicula heteroptera* Lamarck 1819) (Without illustration)

TYPE LOCALITY: Java

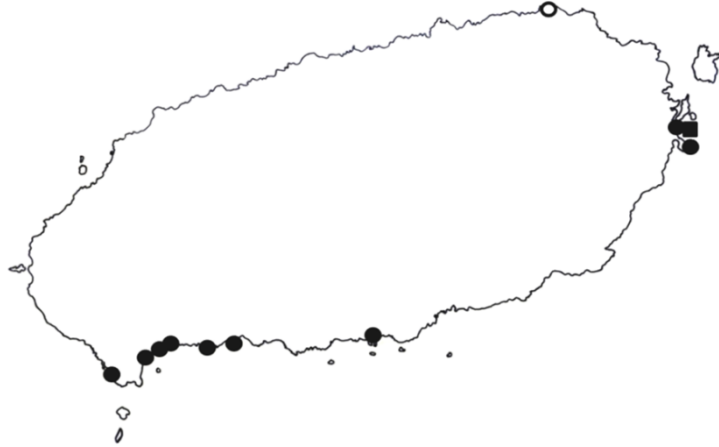


Fig. 37: Distribution of *L. (O.) japonica* (●) and *L. (N.) azumana* (■)



Fig. 38: Distribution of *P. heteroptera* (●), *P. gregata* (■), and *P. maura* (▲)



Fig. 39: Distribution of *P. albina* (●), *P. imbricata* (■), *P. nigra* (▲), and *Electroma physoides* (★)

HABITAT: Byssally attached to gorgonians *Sphaerococcus coronopifolius*, on mud, sand, and fine gravel, also coral substrate from depth of 10-350 m

GENERAL: Southern Korea and Japan to Indo-West Pacific; northern New Zealand; **JEJU:** Munseom

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: This reddish, broad form with size in excess of 100 mm was described earlier than *Avicula breviaalata* Dunker, 1872. Lamarck gave no type locality for *heteroptera*; but the Geneva specimens are correctly labelled “Oc. Indien”. Consequently *P. heteroptera* is here applied for the brownish-red, duller, more quadrate forms, often with strongly twisted wings (Huber, 2010). *Pteria breviaalata* (Dunker, 1872) is a synonym.

49 *Pteria gregata* (Reeve 1857)

(Fig. 38)

ORIGINAL DESCRIPTION: Reeve, L. A. 1857: Monograph of the genus *Avicula*. Conchologia Iconica; or, illustrations of the shells of molluscous animals, vol. 10. London, L. A. Reeve. 17 pl. with captions. [June, 1857], pl. 16, fig. 63. (As *Avicula gregata* L. A. Reeve 1857)

TYPE LOCALITY: Tutuilla (Tutuila), Samoa

HABITAT: Reef slopes, byssally attached to gorgonians, from depth of 2-144 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-West Pacific; **JEJU:** Seogwipo, Munseom (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: As *loveni* occurs commonly and is widely distributed, it seemed highly unlikely that Reeve, disposing of Cuming’s rich Indo-Pacific collection, one of the largest ever assembled, should not have described this widespread species. Here the earlier *A.*

gregata is selected to represent this species. *P. loveni* (Dunker, 1872) is a junior synonym (Huber, 2010).

50 *Pteria maura* (Reeve 1857)

(Fig. 38)

ORIGINAL DESCRIPTION: Reeve, L. A. 1857: Monograph of the genus *Avicula*. Conchologia Iconica; or, illustrations of the shells of molluscous animals, vol. 10. London, L. A. Reeve. 17 pl. with captions. [June, 1857], pl. 17, fig. 72. (As *Avicula maura* L. A. Reeve 1857)

TYPE LOCALITY: Sydney

HABITAT: Byssally attached to alcyonarians *Dendronephythya* sp., gorgonians, or shell debris from depth of 10-180 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-West Pacific; **JEJU:** Munseom, "All around" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: From shape, size, habitat, and from the material analysed throughout the Indo-Pacific, there is no doubt that *maura* is the earlier name for Dunker's species. As such, *Pteria maura* (Reeve, 1857) is the valid earlier, not preoccupied name, and *Pteria coturnix* (Dunker, 1879) is a synonym (Huber, 2010).

Genus: *Pinctada* Röding, 1798

51 *Pinctada albina* (Lamarck, 1819)

(Fig. 39)

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux,

leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. partie. Paris. 152. (As *Meleagrina albina* Lamarck, 1819) (Without illustration)

TYPE LOCALITY: Tasmania (error? – Huber, 2010)

HABITAT: Sand, gravel, or rocky bottoms, also among eelgrass, from the intertidal zone to depth of 30 m

GENERAL DISTRIBUTION: S. Japan to Tropical W. Pacific (Western Australia only) (Huber, 2010); **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Huber (2010) regards this species as restricted to Western Australia only. “This is a large species and grows to at least 130 mm. As such the original locality, Tasmania, is erroneous and *albina* appears distributed along the Western Australian coast only.” However, Temkin (2010) states, with reference to his phylogenetic analysis: “This study also suggested that *Pinctada albina* and *P. nigra*, generally distinguished by shell color (as their names imply), represent two colormorphs of the same species. This finding was consistent with other molecular studies that invariably resolved these species (represented by single exemplars) as sister taxa.” Not cited by Huber who may not have been aware of this study. Thus, these taxa may be conspecific and, if so, then “*albina*”, as the oldest name, must take priority, with a much wider distribution.

52 *Pinctada imbricata* Röding, 1798

(Fig. 39)

ORIGINAL DESCRIPTION: Röding, P. F. (1798) *Museum Boltenianum sive catalogus*

*cimeliorum e tribus regnis naturae quae olim collegerat Joa. Fried Bolten, M.D.p.d. Pars Secunda continens conchylia sive testacea univalvia, bivalvia & multivalvia. Johan. Christi. Trappii., Hamburgi. 167. (As *Pinctada imbricata* Röding, 1798) (Without illustration)*

TYPE LOCALITY: India and West Indies (Huber, 2010)

HABITAT: Byssally attached to rocks or corals, occasionally estuarine attached to mangrove roots; in muddy areas attached to seagrass or shells, from the intertidal zone to depth of 60 m

GENERAL DISTRIBUTION: Japan to Indo-Pacific; Hawaii; Caribbean; Mediterranean;

JEJU: Hwasoon, Biyangdo, Hyeopjae, "All around" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Huber (2010) states that the original listed specimen came from the West Indies, whereas the depicted specimen came from Tranquebar, India. Thus, the original type locality of Röding can be understood as India **and** West Indies. This makes *Avicula fucata* Gould, 1850 (Fiji), *Avicula martensii* Dunker, 1872 (Japan) and) about a dozen Dunkerian “species” synonymous. Therefore, *Pinctada fucata* (Gould, 1850 is also a synonym.

53 *Pinctada nigra* (Gould, 1850)

(Fig. 39)

ORIGINAL DESCRIPTION: Gould, A. A. 1850. [Shells from the United States Exploring Expedition]. Proceedings of the Boston Society of Natural History 3(19): 309. (As *Avicula nigra* Gould, 1850) (Without illustration: see Atlas (1856) pl. 38 (40), figs. 554, 544 b)

TYPE LOCALITY: Singapore

HABITAT: Byssally attached to rocks, among stones, corals or gorgonians, also on wrecks, from the intertidal zone to depth of 35 m

GENERAL DISTRIBUTION: Southern Korea and southern Japan to Indo-Pacific; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: See comments on *P. albina*.

Genus: *Electroma* Stoliczka, 1871

54 *Electroma physoides* (Lamarck 1819)

(Fig. 39)

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. partie. Paris. 149. (As *Avicula physoides* Lamarck, 1819) (Without illustration)

TYPE LOCALITY: Northern Australia

HABITAT: Coral reefs, rocky and gravel substrate, byssally attached to whip corals *Lytocarpus phoeniceus*, *Plumularia badia*, and *Ophiodes dichotomus*, at depth of 3-150m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-W. Pacific; **JEJU:** Seogwipo, Munseom (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Pterelectroma zebra* (Reeve, 1857) and *Electroma zebra* (Reeve, 1857) are synonyms.

Family: ISOGNOMONIDAE Woodring, 1925

Genus: *Isognomon* Lightfoot, 1786

55 *Isognomon (Isognomon) ephippium* (Linnaeus, 1758)

(Fig. 40)

ORIGINAL DESCRIPTION: Linnaeus, C. 1758. *Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis.* Tomus I. Editio decima, reformata. Holmiæ. (Salvius).700. (As *Ostrea ephippium* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: “M. Asiatico” (Indo-Pacific) (Linnaeus)

HABITAT: Byssally attached to rocks or shells from the intertidal zone to depth of 10 m

GENERAL DISTRIBUTION: Southern Korea and southern. Japan to Indo-W. Pacific;

JEJU: Seongsan, Bomok, Seogwipo, Munseom, Seogundo, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Songaksan, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Easily identified by comb-like dentition and coarse, blackish byssus.

Superfamily: Pinnoidea Leach, 1819

Family: PINNIDAE Leach, 1819

Genus: *Pinna* Linnaeus, 1758

56 *Pinna (Quantulopinna) muricata* Linnaeus, 1758

(Fig. 41)

ORIGINAL DESCRIPTION: *Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis.* Tomus I. Editio decima, reformata. Holmiæ. (Salvius). 707. (As *Pinna muricata* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Hawaii/India (“Mediterranean” (Linnaeus –error))

HABITAT: Sandy mud, also among gravel or rocks and on *Thalassia* sandflats, from the intertidal zone to depth of 60 m

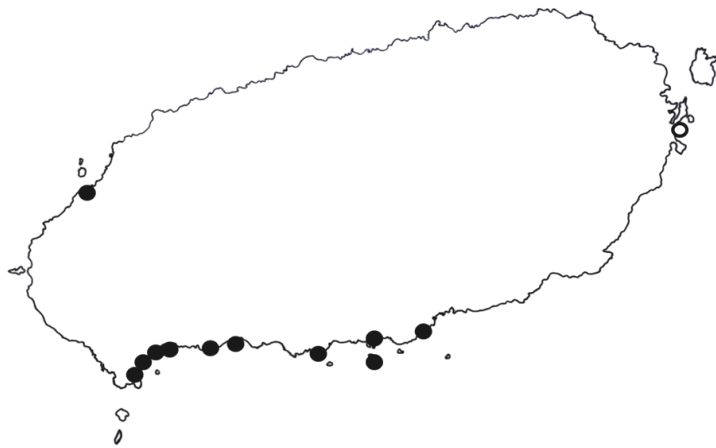


Fig. 40: Distribution of *I. ephippium*

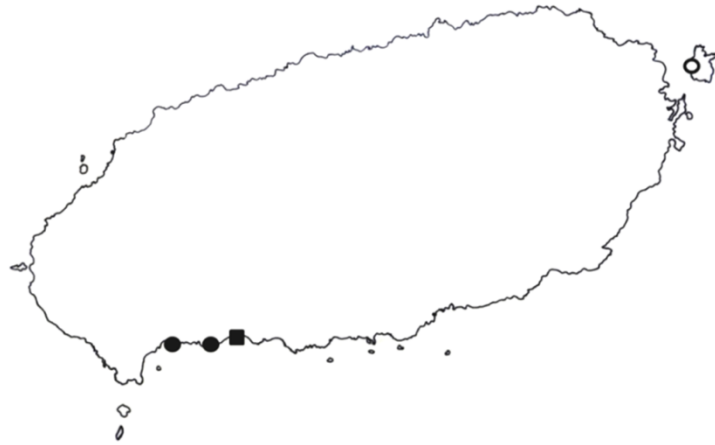


Fig. 41: Distribution of *P. (Q.) muricata* (●) and *P. saccata* (■)



Fig. 42: Distribution of *O. denselammelosa*

GENERAL DISTRIBUTION: Southern Korea and southern Japan to Indo-Pacific; Hawaii; South Africa; **JEJU:** Udo (Sanhosa), Yerae, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: No marked differences were detected between East African, Indian, Australian and Hawaiian material. *P. muricata* is perceived as very widely distributed and one of the most common Indo-Pacific pinnids (Huber, 2010).

57 *Pinna saccata* Linnaeus, 1758

(Fig. 41)

ORIGINAL DESCRIPTION: Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Holmiæ. (Salvius). 707. (As *Pinna saccata* Linnaeus, 1758) (Without illustration)

HABITAT: Byssally attached to gorgonians, *Sphaerococcus coronopifolius*, on mud, sand and fine gravel, also in coralline algae, from depth of 10–350 m

GENERAL DISTRIBUTION: Japan to Indo-Pacific; Hawaii; South Africa; Isla del Coco, Costa Rica; **JEJU:** Jungmun, "All around" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Used for food in China. *Streptopinna saccata* is the only species currently included in the genus *Streptopinna*, and is Panpacific, being recorded from from the Red Sea to offshore Panamic islands. *Streptopinna saccata* (Linnaeus, 1758) is a synonym.

Order: OSTREIDA Férussac, 1822

Superfamily: Ostreoidea Rafinesque, 1815

Family: OSTREIDAE Rafinesque, 1815

Subfamily: Ostreinae Rafinesque, 1815

Genus: *Ostrea* Linnaeus, 1758

58 *Ostrea denselammelosa* Lischke, 1869

(Fig. 42)

ORIGINAL DESCRIPTION: Lischke, C. E. 1869. Diagnosen neuer Meeres-Konchylien aus Japan. *Malakozoologische Blätter* 16: 109. (As *Ostrea denselammelosa* Lischke, 1869) (Without illustration; Figured in Lischke (1869b) (Pl. 13, figs a-b; pl. 14, fig. 1)

TYPE LOCALITY: Nagasaki, Kyushu, Japan

HABITAT: Left valve cemented to rocks and pebbles, on sand and gravel bottoms from the intertidal zone to depth of 35 m

GENERAL DISTRIBUTION: East Sea to Indonesia; **JEJU:** Hamdeok, Hado, Jongdal-ri, Ojo-ri, Seongsan, Seogwipo, Jungmun, Hwasoon, Gapado, Marado, Gosan, Chagwido, Biyangdo, Gwideok

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

Subfamily: Lophinae Vyalov, 1936

Genus: *Dendrostrea* Swainson, 1835

59 *Dendrostrea folium* (Linnaeus 1758)

(Fig. 43)

ORIGINAL DESCRIPTION: Linnæus, C. 1758. *Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis.* Tomus I. Editio decima, reformata. Holmiæ. (Salvius) p. 699. (As *Mytilus folium* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Pacific Ocean (“Jamaica” (error - Linnaeus))

HABITAT: Cemented by finger-like processes to stems of gorgonians, sea fans, rocks or corals, from depths of 5-50 m

GENERAL DISTRIBUTION: Southern Korea and southeastern Japan to Indo-Pacific; eastern Mediterranean; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Type species of *Dendostrea*.

60 *Dendostrea sandvichensis* (G. B. Sowerby II 1871)

(Fig. 43)

ORIGINAL DESCRIPTION: Sowerby, G.B. 1871. Monograph of the genus *Ostraea*, in: G. B. Sowerby II, ed., *Conchologia Iconica; or, Illustrations of the Shells of Molluscos Animals* Vol. 18: p. 27, figs. 66 (a-b) (As *Ostraea sandvichensis* G.B. Sowerby II, 1871)

TYPE LOCALITY: “Sandwich Islands” (Hawaii)

HABITAT: Attached to other shells, on pilings, rocky substrate, or coral rubble, from the intertidal zone to depth of 40 m

GENERAL DISTRIBUTION: Japan to Indo-W. Pacific, eastern Mediterranean; Hawaii, Mexico (Gulf of California); **JEJU:** Jongdal-ri, Munseom, Hwasoon, Yongmeori

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: “Several authors have studied *sandvichensis*, and now regard *O. crenulifera* Sowerby, 1878 as a synonym of this species” (Huber, 2010). *Dendostrea crenulifera* (Sowerby, 1878) is a synonym.

Subfamily: Crassostreinae Scarlato & Starobogatov, 1979

Genus: *Crassostrea* Sacco, 1897

61 *Crassostrea gigas* (Thunberg, 1793)

(Fig. 44)

ORIGINAL DESCRIPTION: Thunberg C. P. (1793). Tekning och Beskrifning på en stor Ostronsort ifrån Japan. *Kongliga Vetenskaps Academiens Nya Handlingar*, 14(4-6): 140-142, pl. 6, figs 1-3. (As *Ostrea gigas* Thunberg, 1793)

TYPE LOCALITY: Japan

HABITAT: Sheltered, often brackish, bays with low salinity; on rocks, often in mud, from intertidal zone to depth of 30 m

GENERAL DISTRIBUTION: Eastern Asia; **JEJU:** Hamdeok. Wolpyeong. Jongdal-ri, Seopjikoji. Shinyang. Wimi. Bomok, Beophwan, Jungmun. Yerae. Daepyeong, Hwasoon. Yongmeori. Sagyei. Hamo, Hyeopjae. Gwideok. Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: *Crassostrea* are quite unanimously recognized as nonincubatory, without chomata. However, *Crassostrea* is not affixed with clasper spines to wood, other shells or stones (Huber, 2010)

62 *Crassostrea nippona* (H. Seki 1934)

(Fig. 44)

ORIGINAL DESCRIPTION: Seki, H., 1934: Description of *Ostrea nippona* n. sp. with remarks on *Ostrea circumpicta* Pilsbry. *Venus*, Kyoto, 4 (5), 276, text figs. 1-5. (As *Ostrea nippona* Seki, 1934.

TYPE LOCALITY: ???

HABITAT: Marine environment; left valve cemented to rocks, from the intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: East Sea to Yellow Sea; **JEJU:** Jungmun (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

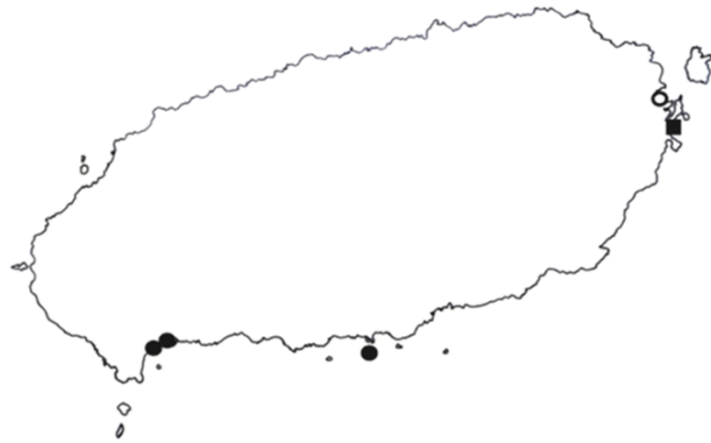


Fig. 43: Distribution of *D. folium* (■) and *D. sandvichensis* (●)



Fig. 44: Distribution of *C. gigas* (●) and *C. nippona* (■)

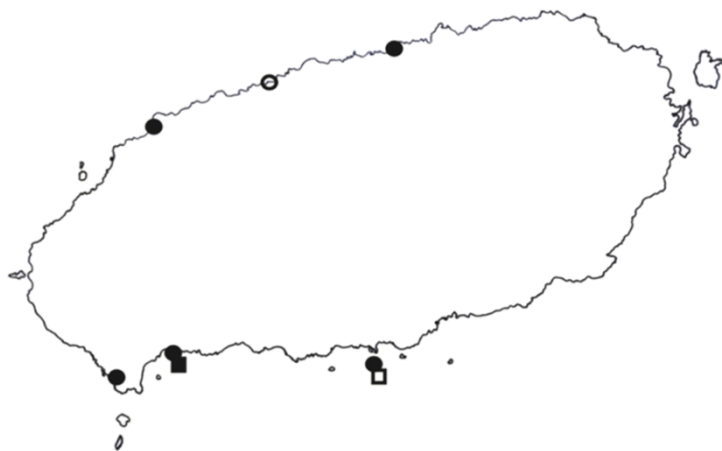


Fig. 45: Distribution of *S. kegaki* (●) and *S. echinata* (■)

REMARKS: *Crassostrea nipponica* (Seki, 1934) is a misspelling.

Genus: *Saccostrea* Dollfus & Dautzenberg, 1920

63 *Saccostrea echinata* (Quoy & Gaimard, 1835)

(Fig. 45)

ORIGINAL DESCRIPTION: Quoy, J. R.'e. and Gaimard, J. P. 1835. Mollusca. Voyage de decouvertes de l'Astrolabe, execute par ordre du rois, pendant les annees 1826-29, sous le commandement de M. J. Dumont d'Urville. *Zoologie* 3: 455, pl. 76, figs. 13-14. (As *Ostrea echinata* Quoy & Gaimard, 1835)

TYPE LOCALITY: Amboina, (Ambon, Indonesia)

HABITAT:; Marine-estuarine; attached to rocks, mangrove roots, and trees, in the intertidal zone

GENERAL DISTRIBUTION: Korea and Southern Japan to Indo-West Pacific; **JEJU:** Munseom, Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Crassostrea nigromarginata* (Sowerby, 1871) is a synonym.

64 *Saccostrea kegaki* Torigoe and Inaba, 1981

(Fig. 45)

ORIGINAL DESCRIPTION: Torigoe, K. and A. Inaba. 1981. On the scientific name of Japanese spiny oyster "kegaki". *Venus* 40: 126-134. Pl. 1, figs. 1-7; Pl. 2, figs. 1-9) (As *Saccostrea kegaki* Torigoe and Inaba, 1981)

TYPE LOCALITY: Seto Inland Sea, Japan

HABITAT: Attached to rocks and other hard substrate in the intertidal zone

GENERAL DISTRIBUTION: East Sea to East China Sea; **JEJU:** Iho, Samyang, Munseom,

Hwasoon, Hamo, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: The usually strongly spinose, comparatively small, and rather fragile *S. kegaki*, though morphologically quite close to *echinata*, has been genetically isolated by Lam & Morton (2006). Compared to *echinata* which also occurs in mangrove areas or mud flats, *kegaki* has only been found intertidally attached to stones on rocky shores (Huber, 2010). Okutani (2000) states that juvenile individuals of *S. echinata* may resemble *S. kegaki*; however, the shell of *S. echinata* becomes much larger and elongate-oval, as opposed to the generally subcircular shape of *S. kegaki*. See Torigoe and Inaba (1981) for a detailed comparison.

Genus: *Striostrea* Vialov, 1936

65 *Striostrea circumpicta* (Pilsbry, 1904)

(Fig. 46)

ORIGINAL DESCRIPTION: Pilsbry, H. A. 1904. New Japanese Marine Mollusca: Pelecypoda. Proceedings of the Academy of Natural Sciences Philadelphia 56: 559, pl. 40, fig. 12-13. (As *Ostrea circumpicta* Pilsbry, 1904).

TYPE LOCALITY: Hirado, Nagasaki Prefecture, Kyushu, Japan

HABITAT: Exposed shores; attached to non-calcareous rocks, forming dense banks, from intertidal zone to depth of 7 m

GENERAL DISTRIBUTION: Korea and Japan to Taiwan; **JEJU:** Iho, Jeju-shi, Jongdal-ri, Seongsan, Supseom, Seogwipo, Munseom, Bumseom, Jungmun, Daepyeong, Hwasoon, Sagyei, Keumneung, Biyangdo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Very characteristic of *Striostrea* are divaricate riblets on the lamellae, but these

are usually worn off; then a regular commarginal sculpture is visible. According to Huber (2010), *S. circumpecta* is heavy and solid with an iridescent, often whitish gray-green, interior and reddish margins.

Family: GRYPHAEIDAE Vialov, 1936

Subfamily: Pycnodonteinae Stenzel, 1959

Genus: *Hyotissa* Stenzel, 1971

66 *Hyotissa hyotis* (Linnaeus, 1758)

(Fig. 47)

ORIGINAL DESCRIPTION: Linnaeus, C. 1758. Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Holmiæ. (Salvius). p. 704. (As *Mytilus hyotis* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Coral and rocky reefs, often attached to rocks and corals, occasionally free living, at depths from 2-30 m

GENERAL DISTRIBUTION: Southern Korea and Southern Japan to Indo-W. Pacific; Florida (introduced); **JEJU:** Jeju-shi, Seongsan, Seogwipo, Munseom, Bumseom, Yerae, Hwasoon, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: “Easiest for distinction in *Hyotissa* are the muscle scars in adults which are yellowish-brown and markedly elevated in *hyotis*” (Huber, 2010).

Genus: *Parahyotissa* Harry, 1985

67 *Parahyotissa inermis* (Sowerby II, 1871)

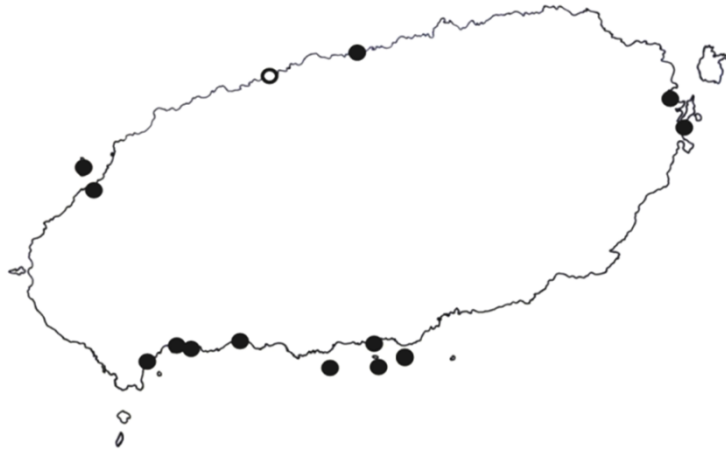


Fig. 46: Distribution of *S. circumpicta*

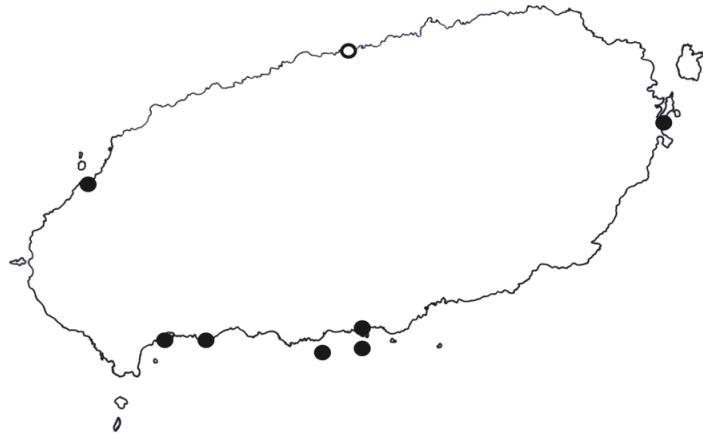


Fig. 47: Distribution of *H. hyotis*

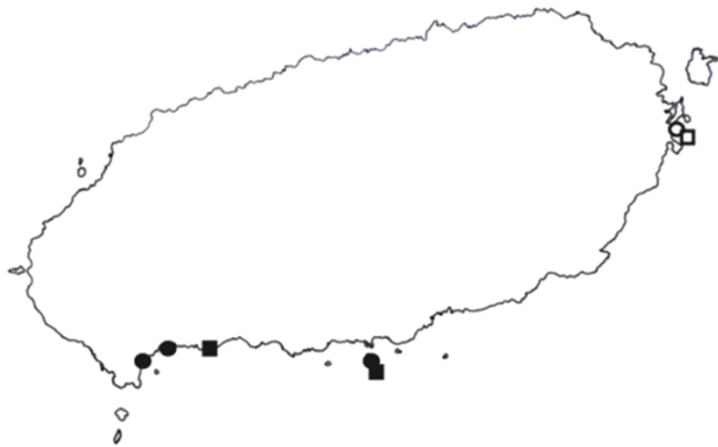


Fig. 48: Distribution of *P. inermis* (●) and *P. (Pliohyotissa) sp.* (■)

(Fig. 48)

ORIGINAL DESCRIPTION: Sowerby, G.B. 1871. Monograph of the genus *Ostraea*. *Conchologia Iconica* Vol. 18: pl. 28, fig. 70. (As *Ostrea inermis* G.B. Sowerby II, 1871)

TYPE LOCALITY: No original type locality; Hota, Chiba Pref., Honshu, Japan (selected by (Huber, 2010)

HABITAT: Cemented by left valve to rocks and corals, rocky bottoms, from the intertidal zone to depth of 30 m

GENERAL DISTRIBUTION: Southern Korea and Japan to W. Pacific; Hawaii (introduced); **JEJU:** Seongsan, Munseom, Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Ostrea imbricata* Lamarck, 1819 is preoccupied by *O. imbricata* Gmelin, 1791 (= *Caribachlamys pellucens*). *Ostrea inermis* Sowerby II, 1871, described from an unknown locality, is accepted by modern authors as a synonym and the next available valid name for this widely distributed *Parahyotissa*. The rough purple-brown forms depicted by Sowerby II (1871) are typically found in Japan. Thus, Hota, Honshu, Chiba Prefecture, is designated as type locality for *Ostrea inermis*. *P. inermis* is the most commonly found gryphaeid in the Indo-Pacific, and extremely variable in colors (white, yellow, brown, grey, golden, silvery, red, purple and in all shades in between). It is also extremely variable in shape, usually rather flat and ovate, but some small specimens even approach *Dendostrea sandvichensis*. It is always quite easily differentiated by its spongy shell structure, usually best seen on the inside borders in fresh specimens, and the round, whitish muscle scar (Huber, 2010).

68 *Parahyotissa (Pliohyotissa)* sp.

(Fig. 48)

HABITAT: At depth of 3 m

GENERAL DISTRIBUTION: Korea and Japan to North Borneo (Sabah); **JEJU:** Seongsan, Munseom Yerae (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: A *Parahyotissa* (*Pliohyotissa*) species present in Borneo, S Chi Sea, to Sagami Bay Honshu, Japan, is often named *chemnitzii* auctt. This species has a more elongated muscle scar than *inermis*. This Indo-Pacific species is understood as undescribed. At present, as the very limited Asian material prevents progress, this species is therefore listed as *P. (Pliohyotissa) sp.*, and *P. chemnitzii* auctt. non Hanley, 1846 is a synonym (Huber, 2010).

Order: PECTINIDA Gray, 1854

Superfamily: Anomioidea Rafinesque, 1815

Family: ANOMIIDAE Rafinesque, 1815

Genus: *Isomon* Dautzenberg & Fischer, 1897

69 *Isomon* *umbonata* (A. A. Gould 1861)

(Fig. 49)

ORIGINAL DESCRIPTION: Gould, A.A. 1861. *Descriptions of shells collected by the North Pacific Exploring Expedition (continued)*. Proceedings of the Boston Society of Natural History 8: 39, 40. (As *Placunanomia umbonata* Gould 1861) (Without illustration)

TYPE LOCALITY: Kagosima Bay, Japan

GENERAL DISTRIBUTION: Korea and Japan to East China Sea; **JEJU:** Udo (Hagosudong), Seongsan, Bomok, Seogwipo, Munseom, Seogundo, Jungmun, Yongmeori, Sagyei, Keumneung, Biyangdo, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Monia umbonata* (Gould, 1861) is a synonym.

Superfamily: Dimyoidea P. Fischer, 1886

Family: DIMYIDAE P. Fischer, 1886

Genus: *Dimya* Rouault, 1850

70 *Dimya japonica* Habe, 1971

(Fig. 49)

ORIGINAL DESCRIPTION: Habe, T. 1971. Dimyidae in Japan and its adjacent areas. The Veliger, 13: 331, 332, p l. 1, figs. 9-19. (As *Dimya japonica* Habe, 1971)

TYPE LOCALITY: Tomioka, Kyushu, Japan

HABITAT: Attached to other shells or gravel at depths of 20 600 m

GENERAL DISTRIBUTION: Southern Korea and Japan to East China Sea; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Superfamily: Pectinoidea Rafinesque, 1815

Suborder: Pectinidina Gray, 1854

Family: PROPEAMUSSIIDAE Abbott, 1954

Genus: *Parvamussium* Sacco, 1897

71 *Parvamussium intuscostatum* (Yokoyama 1920)

(Fig. 50)

ORIGINAL DESCRIPTION: Yokoyama, M. 1920. Fossils from the Miura Peninsula and its immediate north. Journal of the College of Science, Imperial University, Tokyo. Vol. 39 (6) pp. 156, 157, pl. 13, figs. 9, 10. (As *Pecten intuscostatus* Yokoyama, 1920)

TYPE LOCALITY: Miura, Honshu, Japan

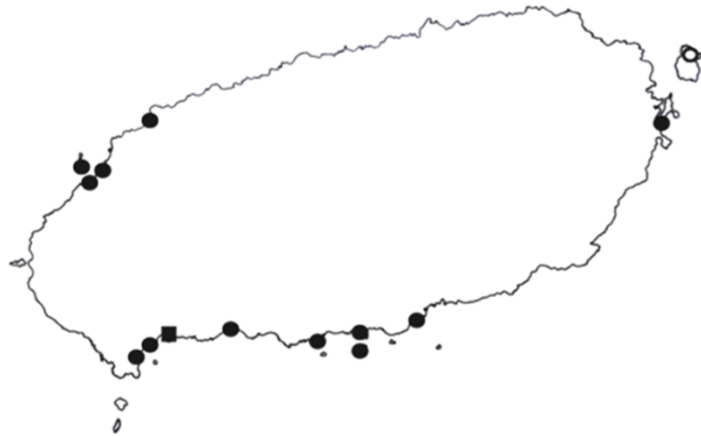


Fig. 49: Distribution of *I. umbonata* (●) and *Dimya japonica* (■)

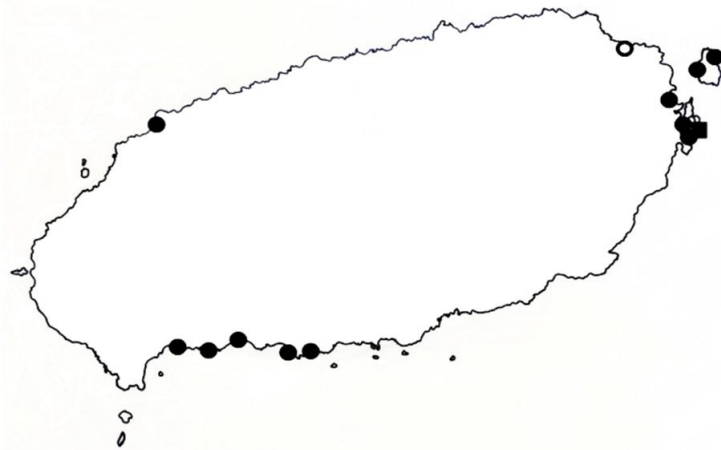


Fig. 50: Distribution of *P. albicans* (●) and *Parvamussium intuscostatum* (■)

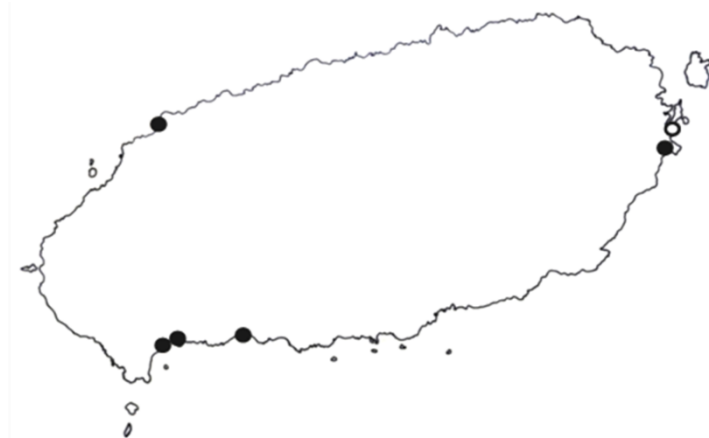


Fig. 51: Distribution of *P. excavatus*

HABITAT: Fine sand and mud, coarse sand and gravel, at depths of 50-500 m

GENERAL DISTRIBUTION: Southern Korea and Japan to East China Sea; **JEJU:**

Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Parvamussium intuscostatus* (Yokoyama, 1920) is a synonym.

Family: PECTINIDAE Rafinesque, 1815

Subfamily: Pectininae

Genus: *Pecten* O. F. Müller, 1776

72 *Pecten albicans* (Schroter, 1802)

(Fig. 50) (Plate 6: E-H)

ORIGINAL DESCRIPTION: Schroter, J. S. 1802. *Neue Cochylienarten und Abenderutzgen, Antnerkungen und Berichfigungeri rzuch deti~L intzeischen Sysrern.* Wiedmann Archiv. Zoological Zootomie 3:227-283. (As *Ostrea albicans* Schröter, 1802)

TYPE LOCALITY: Unknown

HABITAT: Sand and sandy mud at depths of 10 – 150 m

GENERAL DISTRIBUTION: Korea and Japan to Taiwan; **JEJU:** Sehwa, Udo (Hagosudong), Udo (Sanhosa), Jongdal-ri, Seongsan, Seopjikoji, Beophwan, Gangjeong, Jungmun, Yerae, Hwasoon, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

73 *Pecten excavatus* Anton, 1838

(Fig. 51)

ORIGINAL DESCRIPTION: Anton, H. E. (1838) Verzeichniss der Conchylien welche sich in der Sammlung von Herrmann Eduard Anton befinden. Herausgegeben von dem Besitzer.

Halle: Anton. 19. (As *Pecten excavatus* Anton, 1838) (Without illustration)

TYPE LOCALITY: China

HABITAT: Sandy substrate at depth of 10-50 m;

GENERAL DISTRIBUTION: Korea and Japan to East China Sea (Check); **JEJU:** Seongsan, Shinyang, Jungmun, Hwasoon, Yongmeori, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: This species exhibits strong radial ribbing.also in the interstices of the right valve, not found in the closely-related species *P. puncticulatus* and *P. sinensis*. Also, "*P. excavatus* has a stronger radiate grooved structure, flatter squarish ribs on the left valve, is much more excavated than the other two, with a larger umbo, and is only known in dark reddish-white with a brown border inside. It has a similar size as *puncticulatus*, about 60 mm." (Huber, 2010). Min (2004) lists only "Jejudo". *Pecten puncticulatus* Dunker, 1877 and *Pecten sinensis* Sowerby II, 1842 have been confused with this species.

Genus: *Ylistrum* Mynhardt and Alejandrino, 2014

74 *Ylistrum japonicum* (Gmelin, 1791)

(Fig. 52) (Plate 6: A-D)

ORIGINAL DESCRIPTION: Gmelin, J. F. 1791. Caroli a Linné, systema naturae. Lipsiae (Leipzig), (Beer). 13. Tom. I. Pars VI. (Vol. 1, part 6) p. 3317. (As *Ostrea japonica* Gmelin, 1791) (Without illustration)

TYPE LOCALITY: Japan

HABITAT: In fine sand, at depths of 10-100 m

GENERAL DISTRIBUTION: Western area of East Sea to East China Sea; **JEJU:** Wimi, Seogwipo, Munseom, Beophwan, Gangjeong, Jungmun, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

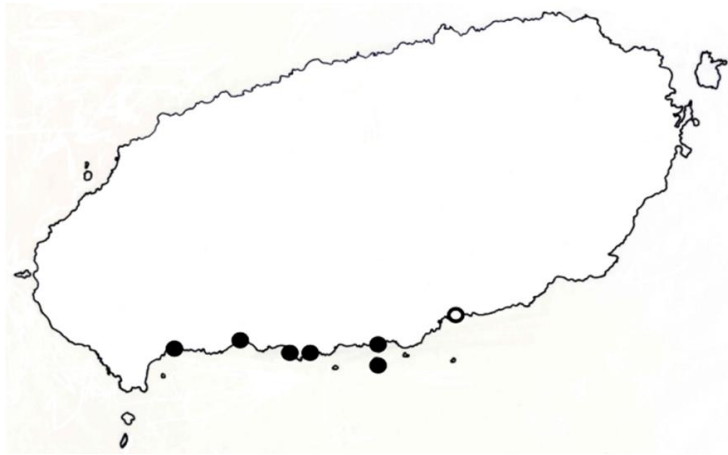


Fig. 52: Distribution of *Y. japonicum*



Fig. 53: Distribution of *D. plica*



Fig. 54: Distribution of *V. jousseaumei*

REMARKS: Jeju populations are too small to be commercially viable. Mynhardt *et al.* (2014) have demonstrated that phylogenetic and morphological evidence suggests that *A. japonicum* should be placed in a separate genus, *Ylistrum*. *Amusium japonicum* (Gmelin, 1791) is a synonym.

Subfamily: Decatopectininae Waller, 1986

Genus: *Decatopecten* G. B. Sowerby II, 1839

75 *Decatopecten plica* (Linnaeus 1758)

(Fig. 53)

ORIGINAL DESCRIPTION: Linnaeus, C. 1758. Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Holmiæ. (Salvius). 697. (As *Ostrea plica* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Indian Ocean

HABITAT: Free living; sandy substrate, also under rocks and coral slabs, at depths of 20-120 m

GENERAL DISTRIBUTION: Japan to Indo-West Pacific; **JEJU:** Jungmun, Yongmeori, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: “Japanese authors usually differentiate a narrow, heavy, thick and strongly convex form as *Decatopecten striatus* (Schumacher 1817). In hinge, dentition, internal color, and usually 5 ribs, Japanese specimens are considered within the variability of *plica*” (Huber, 2010).

Subfamily: Chlamydinae Teppner, 1922

Genus: *Veprichlamys* Iredale, 1929

76 *Veprichlamys jousseaumei* (Bavay 1904)

(Fig. 54)

ORIGINAL DESCRIPTION: Bavay, A. (1904). Descriptions de quelques nouvelles espèces du genre *Pecten* et rectifications. *Journal de Conchyliologie*. LII, P.-H. Fischer: Paris: 203, pl. 6, figs, 9, 10. (As *Chlamys jousseaumei* Bavay, 1904)

TYPE LOCALITY: Japan

HABITAT: On coarse sand and stones, at depth of 50-600 m

GENERAL DISTRIBUTION: Southern Korea and Japan; East Sea to South China Sea;

JEJU: Hamdeok, Seongsan, Hwasoon, Yongmeori, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Chlamys* (*Coralichlamys*) *jousseaumei* (Bavay, 1904); *Chlamys empressae* Kuroda, Habe & Oyama, 1971 are synonyms.

Genus: *Azumapecten* Habe, 1977

77 *Azumapecten farreri* (Jones & Preston 1904)

(Fig. 55)

ORIGINAL DESCRIPTION: Jones, K. H. and Preston, H. B. 1904. List of Mollusca collected during the commission of H.M.S. "Waterwitch" in the China Seas, 1900-1903, with descriptions of new species. Proceedings of the Malacological Society of London 6: 149; text fig. (As *Pecten* (*Chlamys*) *farreri* Jones & Preston 1904)

TYPE LOCALITY: Shandong Peninsula, China

HABITAT: Byssally attached to rocks and gravel, able to swim, at depth of 0.5-60 m

GENERAL DISTRIBUTION: Sea of Okhotsk to off Taiwan; **JEJU:** Seongsan, Beophwan, Gangjeong, Jungmun, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical?

REMARKS: *Chlamys (Azumapecten) farreri farreri* (Jones and Preston, 1904); *Chlamys (Azumapecten) farreri nipponensis* (Kuroda, 1932) are synonyms.

Genus: *Scaechlamys* Iredale, 1929

78 *Scaechlamys squamea* Dijkstra & Maestrati, 2009

(Fig. 56)

ORIGINAL DESCRIPTION: Dijkstra H. H. & Maestrati P. 2009. New bathyal species and records of Pectinoidea (Bivalvia: Propeamussiidae and Pectinidae) from Taiwan. Bulletin of Malacology, Taiwan, 33:45-48. pl. 4, figs 32-36. (As *Scaechlamys squamea* Dijkstra & Maestrati, 2009)

TYPE LOCALITY: Taiwan

HABITAT: Sand and gravel substrate at depth of 30-300 m

GENERAL DISTRIBUTION: Southern Korea and southern Japan to tropical Western Pacific; **JEJU:** Jeju-shi, Udo (Hagosudong), Seongsan, Bomok, Jungmun, Hwasoon, Sagyei, Hyungjaeseom, Biyangdo, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: This species has been attributed to *Laevichlamys lemniscata* (Reeve, 1853) from the south-western Indian Ocean, and is closely related to it, but the right valve of *L. lemniscata* has more irregular ribs (40-50) compared to *S. squamea* (30-35). On the left valve of *S. squamea* there is a shagreen microstructure on the early growth stage which is lacking in *L. lemniscata* (Dijkstra and Maestrati, 2009). *Chlamys (Azumpecten) larvata* (Reeve, 1853) (= *Laevichlamys squamosa* (Gmelin, 1791)) in Min (2004) is a misidentification of *S. squamea* (Dijkstra pers. comm.)



Fig. 55: Distribution of *A. farreri*

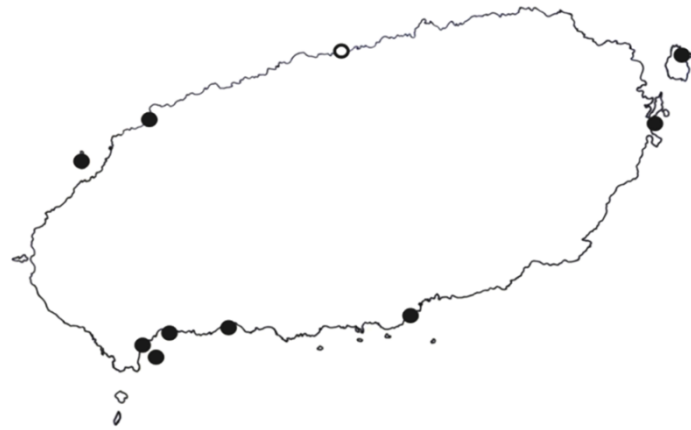


Fig. 56 Distribution of *S. squamea*

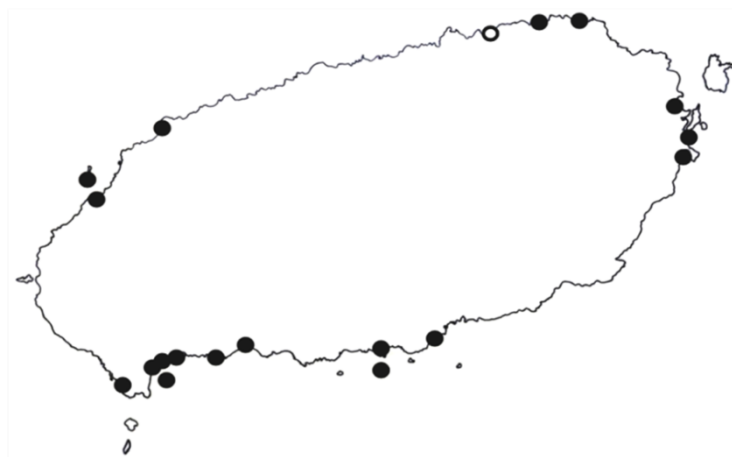


Fig. 57: Distribution of *L. cuneata*

Genus: *Laevichlamys* Waller, 1993

79 *Laevichlamys cuneata* (Reeve, 1853)

(Fig. 57)

ORIGINAL DESCRIPTION: Reeve, L. A. 1852–1853. Monograph of the genus *Pecten* In *Conchologica Iconica: or, Illustrations of the Shells of Molluscous Animals*, vol. 8. Lovell Reeve, London: [unnumbered page], pl. 24, figs. 94, 94a, 95. (As *Pecten cuneata* Reeve, 1853)

TYPE LOCALITY: Maluku, Indonesia

HABITAT: Byssally attached under corals or among coral rubble, on sandy substrate, at depths of 2-150 m

GENERAL DISTRIBUTION: East Sea to Northern Australia; **JEJU:** Bukchon-ri, Gimnyeong, Wolpyeong, Jongdal-ri, Seongsan, Shinyang, Bomok, Seogwipo, Munseom, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Hyungjaeseom, Hamo, Keumneung, Biyangdo, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: This species was formerly known as *Pecten irregularis* Sowerby, 1842. Dijkstra (2013) redescribed *L. cuneata*, gave a complete synonymy, and stated that “*Pecten irregularis* Sowerby II, 1842” is a junior primary homonym of *Pecten irregularis* Schlotheim, 1813. Most common Jeju pectinid; usually only single valves found on beaches. *Chlamys* (*Scaechlamys*) *irregularis* (Sowerby II, 1842), *Pecten irregularis* Sowerby, 1842 are synonyms.

Family: SPONDYLIDAE Gray, 1826

Genus: *Spondylus* Linnaeus, 1758

80 *Spondylus varius* Sowerby I, 1827

(Fig. 58)

ORIGINAL DESCRIPTION: Sowerby, G. B., I, 1827. Catalogue of the whole of that splendid collection of rare shells, madrepores, carved paddles, and other curiosities formed by Mr Samuel Stutchbury: 1-4, 1 pl. (Sowerby, London). Page ????, pls. 1-2. (As *Spondylus varius* Sowerby I, 1827)

TYPE LOCALITY: Polynesia

HABITAT: Attached to dead corals, rocks, debris, shipwrecks, or living free, at depth of 3-60 m

GENERAL DISTRIBUTION: Japan to Indo-W. Pacific; **JEJU:** Srongsan, Jungmun, Hwasoon, Yongmeori, Hamo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Usually possesses reddish area around umbones.

81 *Spondylus squamosus* K. Schreibers, 1793

(Fig. 59)

ORIGINAL DESCRIPTION: Schreibers, K. 1793. Versuch einer vollständigen Conchylienkenntniß nach Linnes System. Zweyter Band [Vol. 2]. Von den Muscheln. Wien. (Kurzbeck). 157. (As *Spondylus squamosus* K. Schreibers, 1793) (Without illustration)

TYPE LOCALITY: East Indies

HABITAT: Attached to corals and rocks, at depth of 1–50 m

GENERAL DISTRIBUTION: East Sea to Northern Australia; **JEJU:** Iho, Haengwon, Handong, Hado, Udo (Hagosudong), Udo (Sanhosa), Jongdal-ri, Seongsan, Shinyang, Pyoseon, Bomok, Seogwipo, Munseom, Jungmun, Yerae, Hwasoon, Yongmeori, Hamo, Keumneung, Biyangdo, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Lamprell and Willan (2000) designated and figured lectotypes of *S. barbatus* and *S. squamosus*, and also described the lectotype of the latter species. “The lectotype of *Spondylus squamosus* Schreibers, 1793 appears inseparable from the lectotype of *S. barbatus* Reeve, 1856, although the former possesses less interstitial spining” (Lamprell and Willan, 2000). They further state that, although the name *S. barbatus* has been generally applied to this species in the literature, the number of usages over the last century has not been enough, in their opinion, to justify an application to the ICZN to suppress *S. squamosus* and retain *S. barbatus*. Huber (2010) also lists *S. cruentus* Lischke, 1868 as a synonym of *S. squamosus*. *Spondylus barbatus cruentus* Lischke, 1868 is a synonym.

82 *Spondylus butleri* L. A. Reeve, 1856

(Fig. 60)

ORIGINAL DESCRIPTION: Reeve, L. A. 1856: Monograph of the genus *Spondylus*. Conchologia Iconica; or, illustrations of the shells of molluscous animals, vol. 9. London, L. A. Reeve. 18 plates with captions. [Jan. 1856], pl. 4, fig. 14. (As *Spondylus butleri* L. A. Reeve, 1856)

TYPE LOCALITY: Philippines

HABITAT: Attached to rocks and corals in sheltered areas, from the intertidal zone to depth of 38 m

GENERAL DISTRIBUTION: Korea and Japan to Indo-W. Pacific; **JEJU:** Seongsan, Munseom, Jungmun, Yerae, Hwasoon, Yongmeori, Hamo, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: This species has also been known as *S. longitudinalis* Lamarck, 1819.



Fig. 58: Distribution of *S. varius*

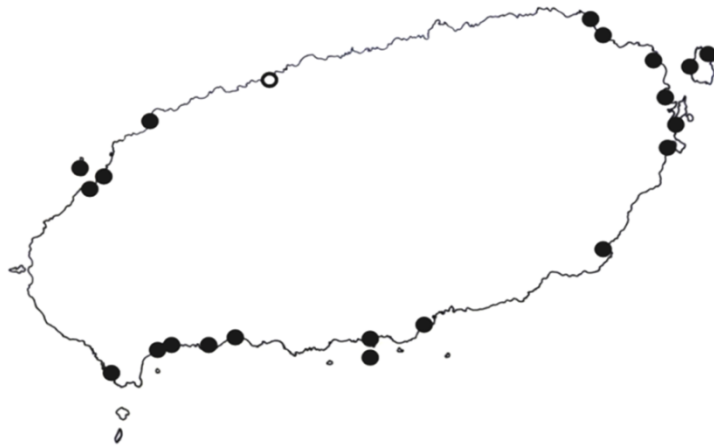


Fig. 59: Distribution of *S. squamosus*

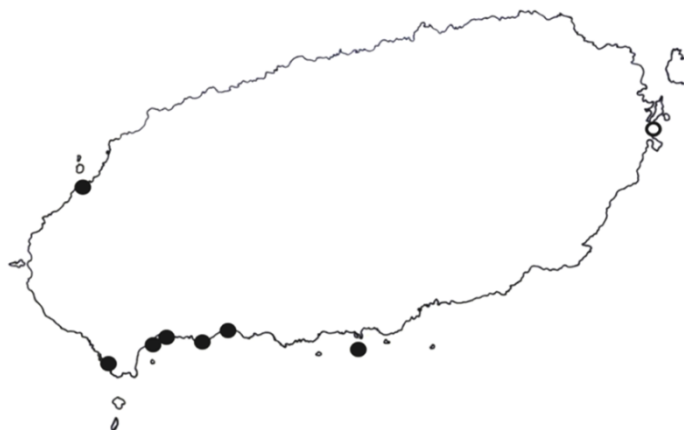


Fig. 60: Distribution of *S. butleri*

However, Finet and Lamprell (2008) discuss problems in selecting a holotype for this species, give figures of the two most likely specimens, and place it in the synonymy of *S. americanus* Hermann, 1791. Subsequently, Huber (2010) states that the type specimen of *Spondylus longitudinalis* Lamarck, 1819 has been lost, the locality and reference are dubious, and accepts *S. butleri* as a valid species. Thus, *Spondylus longitudinalis* Lamarck, 1819 is a synonym.

Superfamily: Plicatuloidea Gray, 1854

Family: PLICATULIDAE Gray, 1854

Genus: *Plicatula* Lamarck, 1801

83 *Plicatula australis* Lamarck, 1819

(Fig. 61)

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. partie. Paris. 185. (As *Plicatula australis* Lamarck, 1819) (Without illustration)

TYPE LOCALITY: Australia (“Ile Fourneau [near Mauritius]” (Lamarck – error))

HABITAT: Attached to rocks, dead coral, and gravel, often encrusted, from the intertidal zone to depth of 25 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-W. Pacific: **JEJU:** Shinyang, Bomok, Seogwipo, Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

84 *Plicatula horrida* Dunker, 1882

(Fig. 61)

ORIGINAL DESCRIPTION: Dunker, W. 1882. Index Molluscorum Maris Japonici. Cassel: Fischer, 247, pl. 11, figs. 6, 7. (As *Plicatula horrida* Dunker, 1882)

TYPE LOCALITY: Japan/China

HABITAT: Rubble and coral, at depth of 10-20 m

GENERAL DISTRIBUTION: Southern Korea and Japan to East China Sea; **JEJU:** Sagyei (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Order: LIMIDA Moore, 1852

Superfamily: Limoidea Rafinesque, 1815

Family: LIMIDAE Rafinesque, 1815

Genus: *Lima* Bruguière, 1797

85 *Lima (Allolima) vulgatula* Yokoyama, 1922

(Fig. 62)

ORIGINAL DESCRIPTION: Yokoyama, M. (1922) Fossils from the Upper Musashino of Kazusa and Shimosa. Journal of the College of Science, Tokyo Imperial University, 44, 179, pl. 17; figs 18, 19. (As *Lima vulgatula* Yokoyama, 1922)

TYPE LOCALITY: Shito. Chiba Prefecture? Japan (fossil)

HABITAT: On sand and gravel, at depth of 50 - 150m

GENERAL DISTRIBUTION): Korea; Japan, **JEJU:** Hwasoon, Gwakji

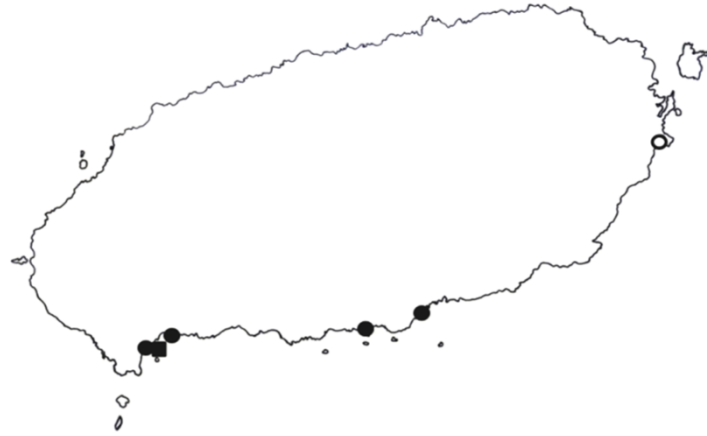


Fig. 61: Distribution of *P. australis* (●) and *P. horrida* (■)



Fig. 62: Distribution of *L. (A.) vulgatula* (●), *L. (A.) fujitai* (■), and *L. (Lima) zushiensis* (▲)

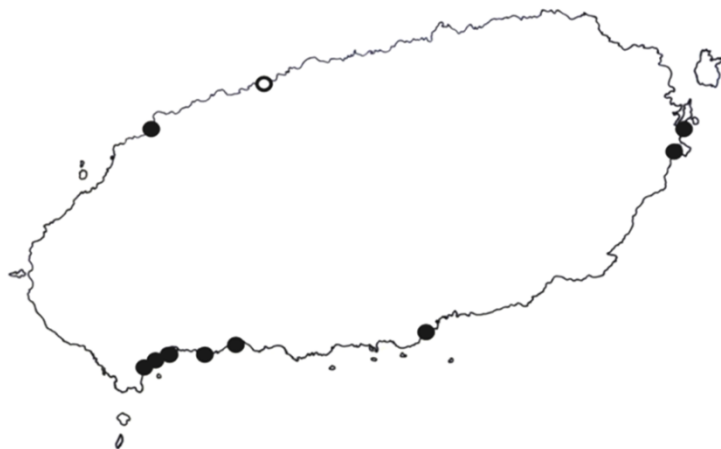


Fig. 63: Distribution of *C. annulata*

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *L. fujitai* is smaller and more convex with more ribs, 28-35, than *L. vulgatula*. Yokoyama, 1922 described *L. vulgatula* as a Honshu fossil; Okutani (2000 pl. 443 fig. 5) depicted it living from Honshu. Although attempts have been made to synonymize both species, they are regarded as separate (Huber, 2010). *Lima vulgata* Yokoyama, 1922 (misspelling) is a synonym.

86 *Lima (Allolima) fujitai* K. Oyama, 1943

(Fig 62)

ORIGINAL DESCRIPTION: Oyama, K. 1943. Conchologia Asiatica, 1, Pt. 1, Limidae, 1-74, pls. 1-14, 12 figs. in text. (As *Lima fujitai* Oyama, 1943)

TYPE LOCALITY: Japan

HABITAT: Byssally attached to sand and gravel, at depth of 40 – 300 m

GENERAL DISTRIBUTION: Korea and Japan to S. China Sea; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: This species possesses 28-35 ribs; a similar species, *L. vulgatula*, has 22 broad, flattish ribs. “The synonymy of *vulgatula* with *fujitai* as proposed by Koyama *et al.* (1981) and Higo *et al.* (1999) appears from size and ribbing unlikely” (Huber, 2010).

87 *Lima (Lima) zushiensis* Yokoyama, 1920

(Fig. 62)

ORIGINAL DESCRIPTION: Yokoyama, M. 1920. Fossils from the Miura Peninsula and its immediate north. Journal of the College of Science, Imperial University, Tokyo. Vol. 39 (6), p. 148, pl. XII, fig. 8. (As *Lima zushiensis* Yokoyama, 1920)

TYPE LOCALITY: Yokosuka Zone, Zuschi, Sagami Bay, Japan (fossil)

HABITAT: Byssally attached to rock and stones; at depth of 30-200 m

GENERAL DISTRIBUTION: Southern Korea and Japan; **JEJU:** Seongsan

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

Genus: *Ctenoides* Mörch, 1853

88 *Ctenoides annulata* (Lamarck, 1819)

(Fig. 63)

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. partie. Paris. 157. (As *Lima annulata* Lamarck, 1819) (Without illustration)

TYPE LOCALITY: Mauritius

HABITAT: Loosely byssally attached to corals, rocks, and gravel, in crevices, at depth of 5 200 m

GENERAL DISTRIBUTION: Southern Korea and southern Japan to Indo-W. Pacific; (Check); **JEJU:** Iho, Seongsan, Shinyang, Bomok, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: The main differences between *C. annulata* and *C. lischkei* are larger size, with fewer and prickly-scaled ribs in the former, whereas the latter has more and smoother ribs and stays smaller. *Annulata* is much more common.

89 *Ctenoides lischkei* (Lamy, 1930)

(Fig. 64)

ORIGINAL DESCRIPTION: Lamy, E., 1930. Quelques cas teratologiques chez des gasteropodes. *Journal of Conchyliologie* 74(3):222-225, pls. 2, 3. (As *Lima lischkei* Lamy, 1930 (New name for *Lima japonica* Dunker, 1877))

TYPE LOCALITY: Japan

HABITAT: Attached to rocks and gravel, from depths of 2-160 m

GENERAL DISTRIBUTION: Japan to Western Pacific; **JEJU:** Iho, Gimnyeong, Wolpyeong, Seongsan, Shinyang, Gangjeong, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Hamo, Keumneung, Biyangdo, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Often quite common on beaches as dead, single valves. *C. lischkei* is smaller with more and smoother ribs than *C. annulata*. *Lima japonica* Dunker, 1877. *Lima dunkeri* Smith, 1885, *Lima lischkei* Lamy, 1930 are synonyms.

Genus: *Limaria* Link, 1807

90 *Limaria (Platilimaria) hirasei* (Pilsbry, 1901)

(Fig. 65)

ORIGINAL DESCRIPTION: Pilsbry, H.A. 1901. *New Mollusca from Japan, the Loo Choo Islands, Formosa and the Philippines*. *Proceedings of the Academy of Natural Sciences of Philadelphia* 53: 209. (As *Lima hirasei* Pilsbry, 1901) (Without illustration)

TYPE LOCALITY: Hirado, Hizen (Nagasaki Prefecture, Kyushu, Japan)

HABITAT: Among rocks and gravel, at depths of 1-50 m

GENERAL DISTRIBUTION: Korea and Japan to Hong Kong; **JEJU:** Seongsan, Munseom,

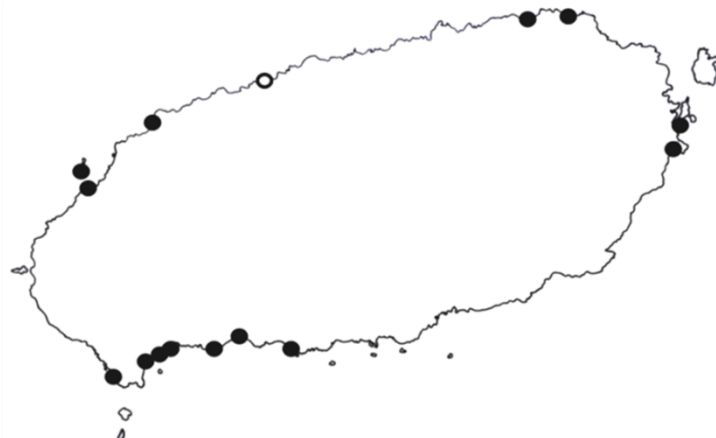


Fig. 64: Distribution of *C. lischkei*

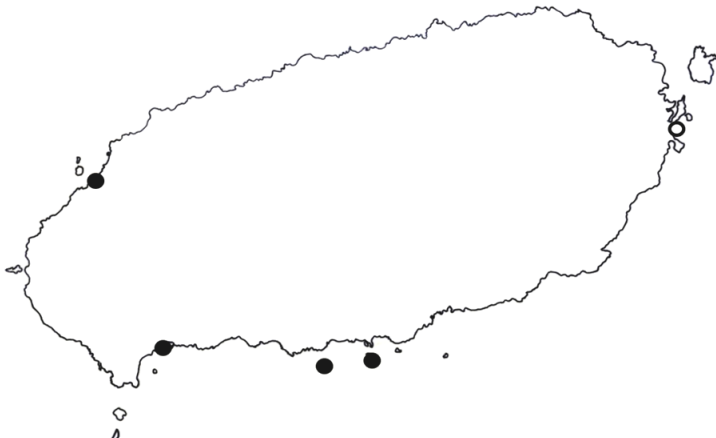


Fig. 65: Distribution of *L. (P.) hirasei*

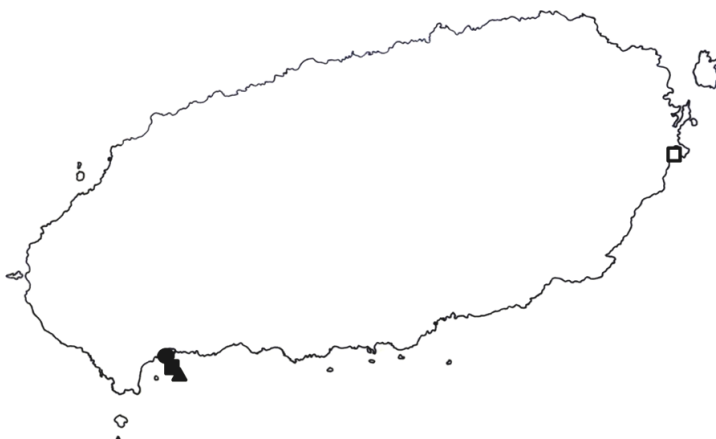


Fig. 66: Distribution of *L. (L.) vladivostokensis* (●), *L. (l.) nippona* (■), and *L. (s.l.) kurodai* (▲)

Bumseom, Hwasoon, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical (Check)

REMARKS: Usually found dead on beaches after storms; very fragile. *L. hirasei*, is the type species of *Platilimaria*.

Genus: *Limatula* S. V. Wood, 1839

91 *Limatula (Limatula) vladivostokensis* (Scarlato, 1955)

(Fig. 66)

ORIGINAL DESCRIPTION: Scarlato, O. 1955. Atlas of the Invertebrates of the Far-Eastern Seas of the U.S.S.R.: 19, pl. 51, f. 4. (As *Lima vladivostokensis* Scarlato, 1955)

TYPE LOCALITY: Vladivostok, Eastern Russia

HABITAT: Fine sand, at depths of 50-400 m

GENERAL DISTRIBUTION: Southern Kamchatka and East Sea to Korea Strait; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-boreal

REMARKS: *Limaria vladivostokensis* is a somewhat humped species, growing up to 18.2 mm in Russian waters. *L. vladivostokensis* does not appear to occur on the Japanese side of the East Sea (Huber, 2010)

92 *Limatula (Limatula) nippona* Habe, 1960

(Fig. 66)

ORIGINAL DESCRIPTION: Habe, T., 1960. Eleven new bivalves from Tanabe Bay, Wakayama Prefecture, Japan. *Publications of the Seto Marine Biological Laboratory* 8: 282.

(As *Limatula nippona* Habe, 1960) (Without illustration)

TYPE LOCALITY: Tanabe Bay, Wakayama Prefecture, Japan

HABITAT: Fine sand and sandy mud, at depths of 5-30 m

GENERAL DISTRIBUTION: Korea and Japan to East China Sea; **JEJU:** Shinyang, Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: *Limaria nipponica*, used by some authors, is an error for *L. nippona*.

93 *Limatula (s.l.) kurodai* K. Oyama, 1943

(Fig. 66)

ORIGINAL DESCRIPTION: Oyama, K. 1943. Conchologia Asiatica, 1, Pt. 1, Limidae, 24, 25. (As *Limatula kurodai* Oyama, 1943)

TYPE LOCALITY: Ibaraki Prefecture, Honshu, Japan

HABITAT: Fine sand and sandy mud, from depths of 10-300 m

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

94 *Limatula (Limatuleta) japonica* A. Adams, 1864

(Fig. 67)

ORIGINAL DESCRIPTION: A. Adams. 1863b. Description of a New Genus and of Twelve New Species of Mollusca. Proceedings of the Zoological Society of London, p. 509. (As *Limatula japonica* A. Adams, 1864 (Check date)) (Without illustration)

TYPE LOCALITY: Japan

HABITAT: Sandy bottoms, at depths of 20-600 m

GENERAL DISTRIBUTION: Aleutian Islands to Southern Japan; **JEJU:** Shinyang (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Lowboreal

REMARKS: This is the type of *Limatuletta*. This genus includes species which are ovate, inflated, and strongly radially ribbed, with weak auricles, a smooth hinge, and broad resilifer.

95 *Limatula (Stabilima) bullata* (Born, 1778)

(Fig. 67)

ORIGINAL DESCRIPTION: Born, I. 1778. Index rerum naturalium Musei Cæsarei Vindobonensis. Pars I.ma. Testacea. Verzeichniß der natürlichen Seltenheiten des k. k. Naturalien Cabinets zu Wien. Erster Theil. Schalthiere. Pp. [1-40]. 95. 96, (As *Ostrea bullata* Born, 1778). (Without illustration)

TYPE LOCALITY: Sorsogon, Philippines (corrected)

HABITAT: On coral sand and fine sand, at depths of 8 - 100m

GENERAL DISTRIBUTION: East Sea to Indonesia; **JEJU:** Seongsan, Shinyang, Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Born's holotype of *bullata*, a single valve from "Barbados", is 37 mm. The corrected type locality is Sorsogon, Philippines. (Huber, 2010)

Subclass: HETERODONTA Newmayr, 1884

Order: Lucinida Gray, 1854

Superfamily: Lucinoidea J. Fleming, 1828

Family: LUCINIDAE J. Fleming, 1828

Subfamily: Lucininae Fleming, 1828

Genus: Ctena Mörch, 1861

96 *Ctena bella* (Conrad, 1837)

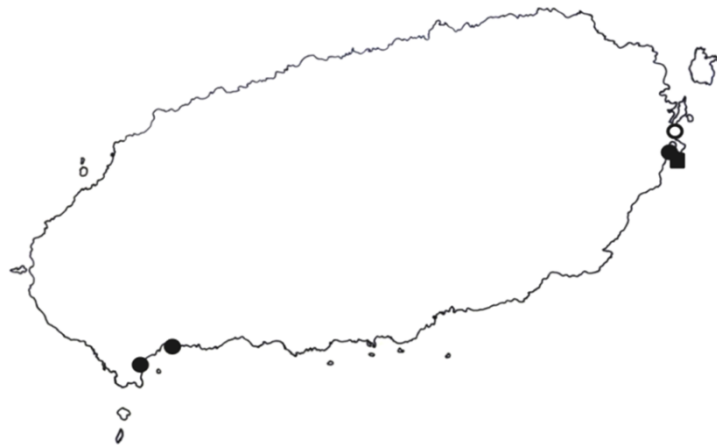


Fig. 67: Distribution of *L. (S.) bullata* (●) and *L. (Limatuletta.) japonica* (■)

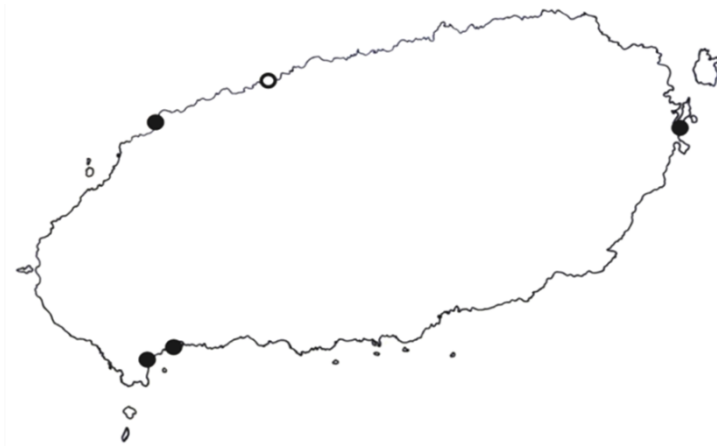


Fig. 68: Distribution of *C. bella*

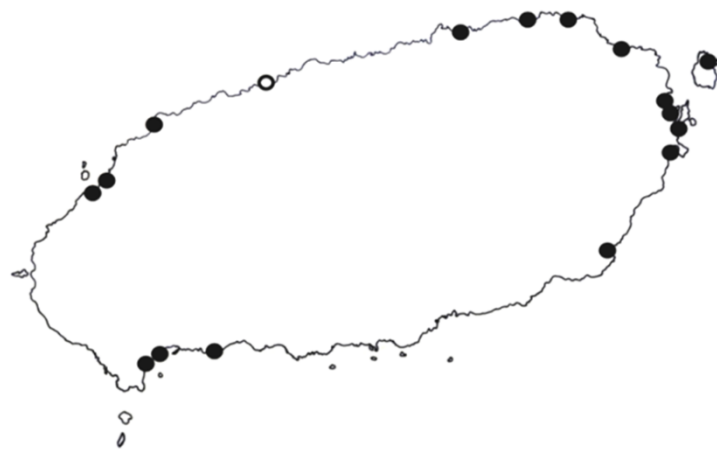


Fig. 69: Distribution of *P. pisidium*

(Fig. 68)

ORIGINAL DESCRIPTION: Conrad, T. A. (1837). Descriptions of new marine shells, from Upper California . Journal of the Academy of Natural Sciences Philadelphia. 7 (2): 254, pl. 19, fig. 11. (As *Lucina bella* Conrad, 1837)

TYPE LOCALITY: San Diego, California, U.S.A.

HABITAT: Sand in lower intertidal zone to depth of 20 m; “Common in muddy marshes (Conrad, 1837)

GENERAL DISTRIBUTION: Southern Korea and southern. Japan to Indo-W. Pacific; Hawaii; **JEJU:** Iho, Seongsan, Hwasoon, Sagyei, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Epicodakia bella* (Conrad, 1837) is a synonym.

Genus: *Pillucina* Pilsbry, 1921

97 *Pillucina pisidium* (Dunker, 1860)

(Fig. 69)

ORIGINAL DESCRIPTION: Dunker, G. 1859-1860. Neue japanische Mollusken. *Malakozoologische Blatter*, volume 6, page 227. (Illustration in Dunker, 1861: 28, pl. 3, fig. 9) (As *Lucina pisidium* Dunker 1860)

TYPE LOCALITY: Dejima, Nagasaki City, Japan

HABITAT: Mud and fine sand from the intertidal zone to depth of 90 m

GENERAL DISTRIBUTION: Korea and Japan to Indo-West Pacific; **JEJU:** Iho, Hamdeok, Gimnyeong, Wolpyeong, Sehwa, Udo (Hagosudong), Jongdal-ri., Ojo-ri, Seongsan, Shinyang, Pyoseon, Yerae, Yongmeori, Sagyei, Keumneung, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: A widely-distributed species, it is similar to *P. neglecta*.

98 *Pillucina neglecta* Habe, 1960

(Fig. 70)

ORIGINAL DESCRIPTION: Habe, T., 1960b. Eleven new bivalves from Tanabe Bay, Wakayama Prefecture, Japan. *Publications of the Seto Marine Biological Laboratory* 8: 282, figs. 7-9. (As *Pillucina neglecta* Habe, 1960)

TYPE LOCALITY: Tanabe Bay, Wakayama Prefecture, Japan

HABITAT: Sandy mud at depth of 10-30 m

GENERAL DISTRIBUTION: Korea; S. Japan (Check); **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: This species is similar to *P. pisidium* but can be distinguished by the smaller size, greater inflation, more deeply impressed lunule, and the presence of a strong lateral tooth in the right valve.

Genus: *Parvilucina* Dall, 1901

99 *Parvilucina yamakawai* (Yokoyama, 1920)

(Fig. 70)

ORIGINAL DESCRIPTION: Yokoyama, M. 1920. Fossils from the Miura Peninsula and its immediate north. *Journal of the College of Science, Imperial University, Tokyo*. Vol. 39 (6) p. 135; pl. 10, fig. 9. (As *Lucina yamakawai* Yokoyama, 1920)

TYPE LOCALITY: Shimo-Miyata, Yokosuka City, Honshu, Japan (fossil)

HABITAT: Sandy mud, at depth of 5-50 m

GENERAL DISTRIBUTION: Korea and Japan to East China Sea; Hawaii; **JEJU:** Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: This species belongs to the genus *Parvilucina* and can be easily distinguished from *Pillucina* by the absence of an internal ligament. *Pillucina* (*Sydlorina*) *yamakawai* (Yokoyama, 1920) is a synonym,

Genus: *Chavania* Glover & J. D. Taylor, 2001

100 *Chavania striata* (Tokunaga, 1906)

(Fig. 71)

ORIGINAL DESCRIPTION: Tokunaga, S., 1906. Fossils from the environs of Tokyo. *Journal of the College of Science, Imperial University, Tokyo* 21: 53–54. pl. 3, fig. 14. (As *Lasaea striata* Tokunaga, 1906

TYPE LOCALITY: Oji, Tokyo City, Japan (Pleistocene fossil)

HABITAT: Sandy mud, from the intertidal zone to depth of 250 m

GENERAL DISTRIBUTION: Central Indo-West Pacific (India to Japan, Marshall Is.);

JEJU: Jongdal-ri, Seongsan, Shinyang, Pyoseon, Jungmun, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Chavania striata* shows considerable variation in shape, and this is likely typical of the species throughout its range. Differs from *Pillucina* in the lack of prominent radial ribs. *Pillucina* (*Wallucina*) *striata* (Tokunaga, 1906) and *Wallucina striata* (Tokunaga, 1906) are synonyms.

Subfamily: Myrteniae

Genus: *Myrtea* Turton, 1822

101 *Myrtea delicatula* A. Adams, 1862

(Fig. 71)

ORIGINAL DESCRIPTION: Adams, A. 1862. On Some New Species of Acephalous

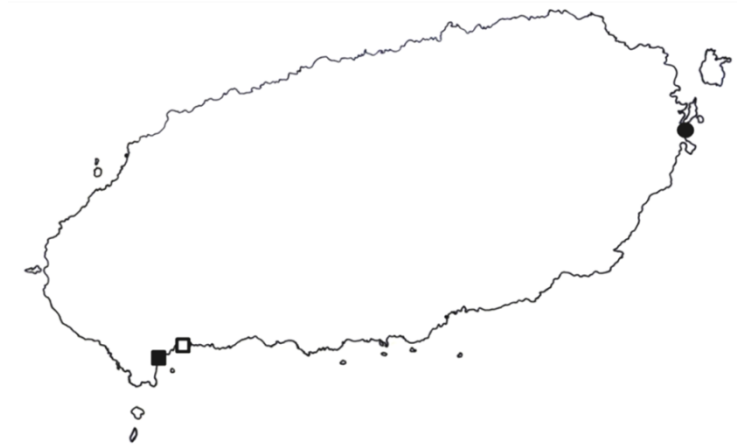


Fig. 70: Distribution of *P. neglecta* (●) and *Parvilucina yamakawai* (■)

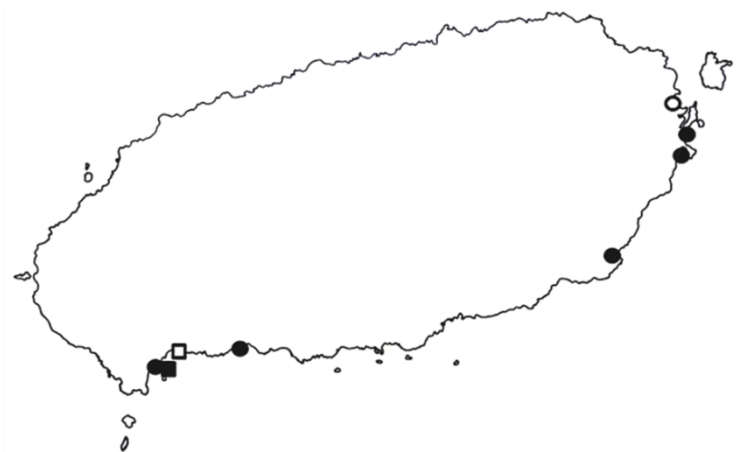


Fig. 71: Distribution of *C. striata* (●) and *Myrtea delicatula* (■)



Fig. 72: Distribution of *L. japonica* (●) and *Leucosphaera oyamai* (■)

Mollusca from the Sea of Japan. Annals and Magazine of Natural History, series 3, volume 9, page 226, (As *Myrtea delicatula* A. Adams, 1862) (Without illustration)

TYPE LOCALITY: Korea Strait

HABITAT: Coarse sand, from intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical (Check)

REMARKS: May be confused with *Ctena bella*, but *M. delicatula* is smaller and not as strongly ribbed.

Genus: *Lucinoma* Dall, 1901

102 *Lucinoma japonica* Habe, 1958

(Fig. 72)

ORIGINAL DESCRIPTION: Habe, T. (1958). Report on the Mollusca chiefly collected by the S. S. Soyo-Maru of the Imperial Fisheries Experimental Station on the continental shelf bordering Japan during the years 1922-1930. Part 4. Lamellibranchia (2). Seto Marine Biological Laboratory, Publications [Kyoto University]. 7(1) 28, (As *Lucinoma japonica* Habe, 1958) (Without illustration)

TYPE LOCALITY: Off Yamaguchi Prefecture, Honshu, Japan

HABITAT: Sandy-mud at depth of 100-150 m

GENERAL DISTRIBUTION: Southern Korea and southern Japan; East Sea (western area));

JEJU: Bukchon-ri, Seongsan, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Gonimyrtaea japonicum* (Habe, 1958) is a synonym.

Subfamily: Leucosphaerinae J. D. Taylor & Glover, 2011

Genus: *Leucosphaera* J. D. Taylor & Glover, 2005

103 *Leucosphaera oyamai* (Habe, 1962)

(Fig. 72)

ORIGINAL DESCRIPTION: Habe, T. 1962 *Leptinaxis oyamai* Habe. 1962. Colored Illustrations of the Shells of Japan, 2 (ed. 2), 142-143, app. 46, pl. 64, fig. 8. (As *Leptinaxis oyamai* Habe, 1962)

TYPE LOCALITY: Unavailable

HABITAT: Sandy mud bottom at depth of 10-50 m

GENERAL DISTRIBUTION: Korea; Japan; East Sea (western area); **JEJU:** Shinyang, Sagyei (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical (Check)

REMARKS: Lutaenko and Noseworthy (2012) do not record this species in the western area of the East Sea. Moved from Thyasiridae (Okutani, 2000; Min, 2004) to Lucinidae (Taylor, 2014); according to Taylor, *Leucosphaera oyamai* (Habe, 1962) is a temporary name. *Leptinaxis oyamai* Habe, 1962 is a synonym.

Superfamily: Thyasiroidea Dal, 1900

Family: THYASIRIDAE Dall, 1900

Genus: *Thyasira* Lamarck, 1818

104 *Thyasira tokunagai* (Kuroda & Habe, 1951)

(Fig. 73)

ORIGINAL DESCRIPTION: Kuroda, T. & T. Habe, 1951. Nomenclatorial notes. In: T. Kuroda, (ed.). Illustrated catalogue of Japanese shells 13: (As *Thyasira tokunagai* Kuroda and Habe, 1951)

TYPE LOCALITY: Unavailable

HABITAT: Mud, at depth of 5-50 m

GENERAL DISTRIBUTION : Korea and Japan; **JEJU:** Shinyang, Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

105 *Thyasira kawamurai* (Habe, 1951)

ORIGINAL DESCRIPTION: Habe, T. 1951. Genera of Japanese Shells; Pelecypoda. Kyoto : T. Habe. Vol. 1, pp. 1-96, figs. 1-192. (As *Thyasira kawamurai* Habe, 1951

TYPE LOCALITY: Unavailable

HABITAT: Fine sand, at depth of 50-200 m

GENERAL DISTRIBUTION: Korea; Japan (Check); **JEJU:** ("Jejudo" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Parathyasira kawamurai* (Habe, 1951) is a synonym.

Order Carditida Dall, 1889

Superfamily Carditoidea Férussac, 1822

Family: CARDITIDAE Férussac, 1822

Subfamily: Carditinae Férussac, 1822

Genus: *Cardita* Bruguière, 1792

106 *Cardita leana* Dunker, 1860

(Fig. 74)

ORIGINAL DESCRIPTION: Dunker, G. 1859-1860. Neue japanische Mollusken. *Malakozoologische Blatter*, volume 6, 223. (As *Cardita leana* Dunker, 1860) (Without illustration)



Fig. 73: Distribution of *T. tokunagai*

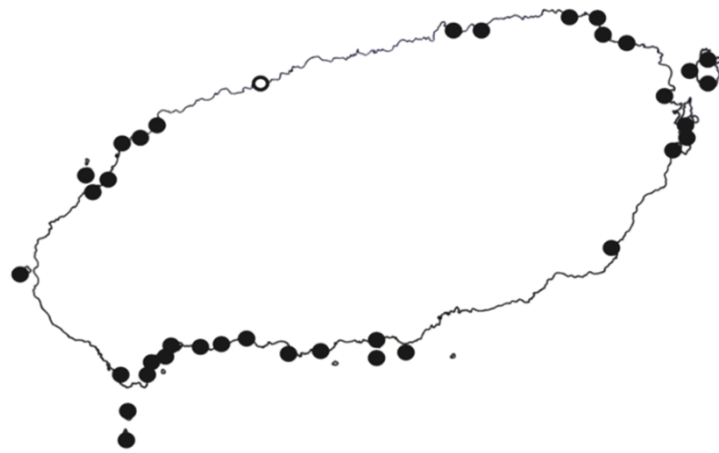


Fig. 74: Distribution of *C. leana*

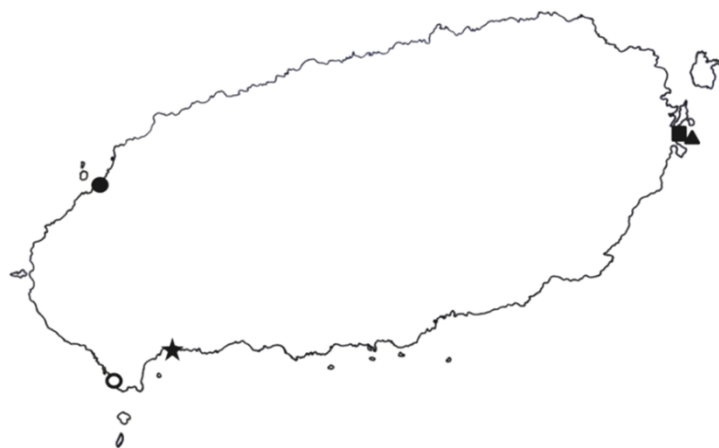


Fig. 75: Distribution of *C. ferruginosa* (●), *Pleuromeris pygmaea* (■), *Centrocardita sovoae* (▲), and *Carditellona pulchella* (★)

TYPE LOCALITY: Western Kyushu, Japan

HABITAT: Byssally attached to stones among gravel, on underside of rocks, from the intertidal zone to depth of 20m

GENERAL DISTRIBUTION: Korea and Japan to Taiwan; **JEJU:** Iho, Hamdeok, Bukchon-ri, Wolpyeong, Haengwon, Handong, Sehwa, Udo (Hagosudong), Udo (Sanhosa), Udo (Geomeollae), Jongdal-ri, Songsan, Seopjikoji, Shinyang, Pyoseon, Supseom, Seogwipo, Munseom, Seogundo, Gangjeong, Jungmun, Yerae, Daepyeong, Hwasoon, Yongmeori, Sagyei, Songaksan, Gapado, Marado, Hamo, Chagwi-do, Keumneung, Biyangdo, Hyeopjae, Suwon, Gwideok, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Cardita cumingiana* Dunker, 1860 is a synonym.

107 *Cardita (s.l.) ferruginosa* (Adams & Reeve 1850)

(Fig. 75)

ORIGINAL DESCRIPTION: Adams, A. & Reeve, L. 1848–50. Mollusca. In: A. Adams, ed. The Zoology of the voyage of H.M.S. Samarang; under the command of Captain Sir Edward Belcher, C.B., F.R.A.S., F.G.S. during the years 1843–1846. Reeve, Benham, and Reeve, London. 76., pl. 21, fig. 21. (As *Cardita ferruginosa* Adams and Reeve, 1850).

TYPE LOCALITY: “Philippine Archipelago” (“erroneous” (Huber, 2010))

HABITAT: In sand and mud at depth of 5-120 m

GENERAL DISTRIBUTION: Korea and southern Japan to East China Sea; **JEJU:** Hamo, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: This is a small, quadrate form, quite variable in color and shape with rounded ribs which are smooth or with a very weak commarginal sculpture.

Subfamily: Carditamerinae Chavan, 1969

Genus: *Pleuromeris* Conrad, 1867

108 *Pleuromeris pygmaea* (Kuroda & Habe 1951)

(Fig. 75)

ORIGINAL DESCRIPTION:; Kuroda and Habe. 1951. Genera of Japanese Shells; Pelecypoda. 2. Kairui-Bumken-Kankokai, Kyoto. pp 97-186. (As *Venericardia pygmaea* Kuroda & Habe, 1951)

TYPE LOCALITY: Western Kyushu, Japan

HABITAT: Byssally attached to stones, among rubble, from the intertidal zone to depth of 100 m,

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Venericardia pygmaea* is a new name for *Cardita abbreviata*. Sowerby III, 1903 (Huber, 2010).

Genus: *Centrocardita* Sacco, 1899

109 *Centrocardita soyoae* (T. Habe, 1958)

(Fig. 75)

ORIGINAL DESCRIPTION: Habe, T. 1958. Report on the Mollusca chiefly collected by the S. S. Soyo-Maru of the Imperial Fisheries Experimental Station on the continental shelf bordering Japan during the years 1922-1930. Part 4. Lamellibranchia (2). Seto Marine Biological Laboratory, Publications [Kyoto University]. 7(1) 23. (As *Venericardita (Megacardita) soyoae* Habe, 1958) (Without illustration)

TYPE LOCALITY: Off Shimane Prefecture, East Sea

HABITAT: Among coarse sand and stones at depth of 50-300 m

GENERAL DISTRIBUTION: East Sea to East China Sea; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: This species is neither a *Megacardita* nor a *Pleuromeris*, but instead resembles *Centrocardita* better in key features. *C. soyoae* is a small species, approximately 10 mm in length, and found at depths of 100-200 m. It is also known from the East China Sea, but with several different names (Huber, 2010). *Pleuromeris soyoae* (Habe, 1958) is a synonym.

Subfamily: Carditellinae Kuroda, Habe & Oyama, 1971

Genus: *Carditellona* Iredale, 1936

110 *Carditellona pulchella* (Lynge 1909)

(Fig. 75)

ORIGINAL DESCRIPTION: Lynge. 1909. The Danish Expedition to Siam, (1899-1900. IV. Marine Lamellibranchiata. Kongelige Danske, Videnskabernes Selskabs Skrifter, 7. Raekke, Naturvidenskabelig og Matematisk Afdeling, Kjobenhavn, 5(3): 164, pl.III, Figs. 6-8. (As *Carditella pulchella* Lynge, 1909 (Astartidae))

TYPE LOCALITY: Gulf of Thailand

HABITAT: In fine to coarse sand at depth of 2-150 m

GENERAL DISTRIBUTION: East Sea to South China Sea; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: *Carditella (Carditellona) hanzawai* (Nomura, 1933) is a synonym

Genus: *Carditellopsis* Iredale, 1936

111 *Carditellopsis toneana* (Yokoyama, 1922)

(Fig. 76)

ORIGINAL DESCRIPTION: Yokoyama, M. 1922. Fossils from the Upper Musashino of Kazusa and Shimosa. Journal of the College of Science, Tokyo Imperial University, 44, 163, pl. 13; figs. 6, 7. (As *Venericardia toneana* Yokoyama, 1922)

TYPE LOCALITY: Shito, Boso Peninsula, Japan (fossil)

HABITAT: In fine sand at depth of 20-150 m

GENERAL DISTRIBUTION: Japan to South China Sea; **JEJU:** Supjikoji, Bomok, Munseom, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

Superfamily: Crassatelloidea Férussac, 1822

Family: CRASSATELLIDAE Férussac, 1822

Subfamily: Crassatellinae Férussac, 1822

Genus: *Indocrassatella* Chavan, 1952

112 *Indocrassatella oblongata* (Yokoyama, 1920)

(Fig. 76)

ORIGINAL DESCRIPTION: Yokoyama, M. 1920. Fossils from the Miura Peninsula and its immediate north. Journal of the College of Science, Imperial University, Tokyo. Vol. 39 (6), 142, pl. 11; figs. 8, 9. (As *Crassatella oblongata* Yokoyama, 1920)

TYPE LOCALITY: Koshiha (formation), Miura Peninsula, Honshu, Japan (fossil)

GENERAL DISTRIBUTION: Southern Japan to East China Sea; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Indocrassatella* contains species which are rather inflated, subquadrate, quite thin and small with well-marked, impressed, almost smooth, lunule and escutcheon, and a crenulate margin. They have a rather dense commarginal sculpture. All species live in deeper water.

Order: VENERIDA Gray, 1854

Superfamily: Arcticoidea Newton, 1891

Family: TRAPEZIDAE Lamy, 1920

Genus: *Coralliophaga* Blainville, 1824

113 *Coralliophaga coralliophaga* (Gmelin, 1791)

(Fig. 76)

ORIGINAL DESCRIPTION: Gmelin, J. F. 1791. Caroli a Linné, systema naturae. Lipsiae (Leipzig), (Beer). 13. Tom. I. Pars VI. (Vol. 1, part 6) p. 3305. (As *Chama coralliophaga* Gmelin, 1791) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Embedded in *Porites* coral and other calcareous substrate, from intertidal zone to depth of 20 m.

GENERAL DISTRIBUTION: Korea and Northern Japan to Indo-Pacific; North Carolina to Brazil; South Africa; **JEJU:** Jongdal-ri

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

RELEVANT COMMENTS: Species of *Coralliophaga* are quite variable as a result of their boring behaviors.

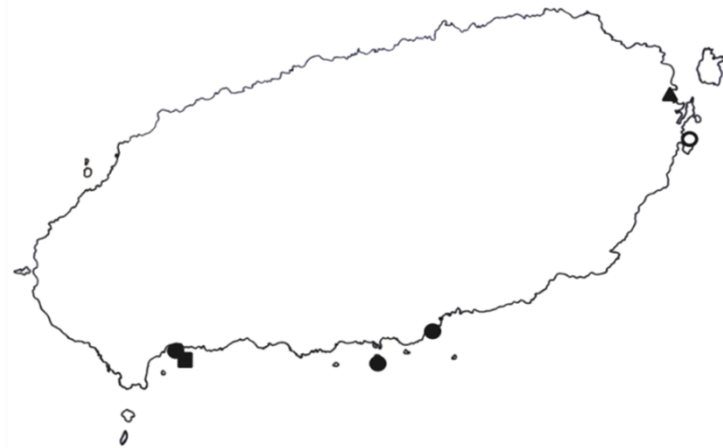


Fig. 76: Distribution of *C. toneana* (●), *Indocrassatella oblongata* (■), and *Coralliophaga coralliophaga* (▲)

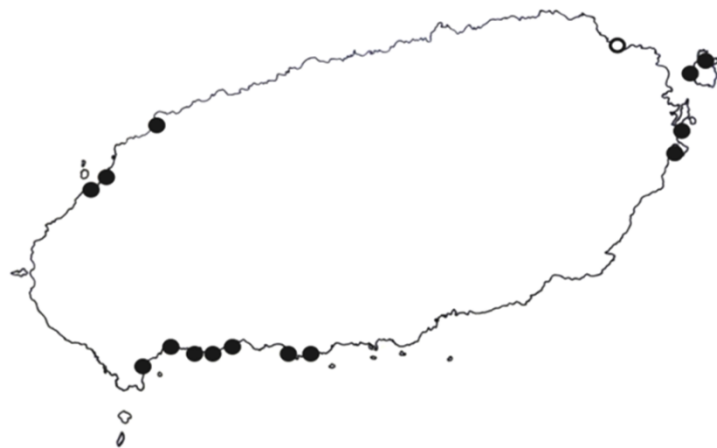


Fig. 77: Distribution of *A. burchardi*



Fig. 78: Distribution of *A. maculosum*

Superfamily: Cardioidea Lamarck, 1809

Family: CARDIIDAE Lamarck, 1809

Subfamily: Cardiinae Lamarck, 1809

Genus: *Acrosterigma* Dall, 1900

114 *Acrosterigma burchardi* (W. R. Dunker 1877)

(Fig. 77) (Plate 3: K-N)

ORIGINAL DESCRIPTION: Dunker, W.1877. Mollusca nonnulla nova maris japonici. Malakozoologische Blätter, 24: 67. (As *Cardium burchardi* Dunker, 1877) (Without illustration)

TYPE LOCALITY: Sagami Bay, Japan

HABITAT: In sand, from intertidal zone to depth of 30m

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Sehwa, Udo (Hagosudong), Udo (Sanhosa), Seongsan, Shinyang, Beophwan, Gangjeong, Jungmun, Yerae, Daepyeong, Hwasoon, Sagyei, Keumneung, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Acrosterigma (Vasticardium) burchardi* (Dunker, 1877); *Vasticardium burchardi* (Dunker, 1877) are synonyms.

115 *Acrosterigma maculosum* (Wood 1815)

(Fig. 78) (Plate 3: G-J, O-P)

ORIGINAL DESCRIPTION: Wood, W. 1814-1815. General conchology; or, a description of shells, arranged according to the Linnaean system, and illustrated with plates, drawn and coloured from nature ...vol. 1 [all issued]. London (Booth), 218, pl. 52, figs. 1, 3. (As *Cardium maculosum* Wood, 1815)

TYPE LOCALITY: Unknown

HABITAT: Coral reefs, coarse sand and rubble, also fine sand, at depth of 5 – 106 m

GENERAL DISTRIBUTION: Korea and Japan to Indo-West Pacific; **JEJU:** Sehwa, Seongsan, Jungmun, Hwasoon, Yongmeori, Sagye, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *A. arenicola* has been recognized as a valid species by virtually all Japanese authors (e.g. Okutani, 2000; Higo *et al.*, 1999). However Japanese specimens are similar to *Cardium maculosum* Wood, 1815, thus *arenicola* is a synonym of the earlier species. The Japanese specimens are typically larger end-of-range forms (Huber, 2010). *Acrosterigma* (*Vasticardium*) *arenicola* (Reeve, 1845), *Cardium arenicolum* Reeve, 1845 are regarded as synonyms.

Genus: *Afrocardium* Tomlin, 1931

116 *Afrocardium richardi* (V. Audouin 1826)

(Fig. 79) (Plate 3: Q-R)

ORIGINAL DESCRIPTION: Audouin, V. 1826. Explication sommaire des planches de Mollusques de l'Egypte et de Syrie publiees par J.C. Savigny. Description de l'Egypte ou recueil des observations et des recherches qui ont été faites en Egypte pendant l'expédition de l'armée française, publiée par les ordres de sa majesté l'empereur Napoleon le grand. *Histoire Naturelle, Animaux invertebres*, 1(4) 51. Imprimerie imperiale: Paris. (Illustration in Savigny, 1817; Pl. 9, fig. 14 (Holotype). (As *Cardium richardi* Audouin, 1826

TYPE LOCALITY: Egypt

HABITAT: Reefs, coarse sand, coral rubble, at depth of 2 – 140 m

GENERAL DISTRIBUTION: Japan to Indo-West Pacific; Mediterranean; **JEJU:** Seongsan, Shinyang, Hwasoon, Yongmeori, Sagye

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *A. richardi* is quadrate to elongate and highly variable in color: white, red, yellow, purplish, and intermediate shades. *Afrocardium carditaeforme* (Reeve, 1845); *Cardium carditaeforme* Reeve, 1845 are synonyms.

Subfamily: Laevicardiinae Keen, 1951

Genus: *Trifaricardium* Kuroda & Habe, 1951

117 *Trifaricardium nomurai* Kuroda and Habe, 1951

(Fig. 80)

ORIGINAL DESCRIPTION: Kuroda, T. & T. Habe, 1951. Nomenclatorial notes. In: T. Kuroda, (ed.). Illustrated catalogue of Japanese shells 13:86, pl. 3 figs 9a-b (In Nomura, 1933: 81-82). (As *Trifaricardium nomurai* Kuroda and Habe, 1951)

TYPE LOCALITY: Unavailable

HABITAT: In mud and sand, at depth of 80 – 350 m

GENERAL DISTRIBUTION: Southern Japan to tropical West Pacific; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: The differences in shell morphology between Philippine and Japanese material appear slight, and can be regarded as falling within the range of intraspecific variation (Huber, 2010). New name for “*Cardium cancellatum* Nomura, 1933” non Gmelin, 1791 (*nom. dub.*).

Genus: *Microcardium* Thiele, 1934

118 *Microcardium sakuraii* (Habe, 1961)

(Fig. 80)

ORIGINAL DESCRIPTION: Habe, T., 1961. Four new bivalves from Japan. *Venus* 21 (2):152-156. (As *Nemocardium (Microcardium) sakurai* Habe, 1961)



Fig. 79: Distribution of *A. richardi*



Fig. 80: Distribution of *T. nomurai* (●) and *Microcardium sakuraii* (■)

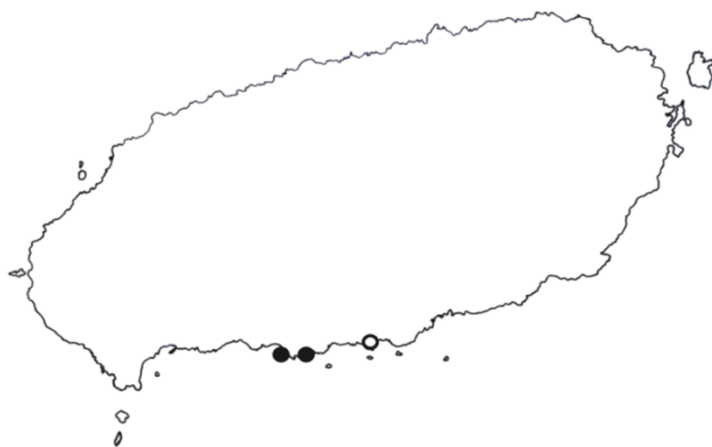


Fig. 81: Distribution of *N. australojaponicum*

TYPE LOCALITY: Shikoku, Japan

HABITAT: In sand at depth from 100 - 200 m

GENERAL DISTRIBUTION: Southern Korea and southern Japan to Tropical West Pacific;

JEJU: Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

Genus: *Nemocardium* Thiele, 1934

119 *Nemocardium australojaponicum* Ter Poorten, 2013

(Fig. 81)

ORIGINAL DESCRIPTION: Poorten (T.), 2013 - Revision of the Recent species of the genus *Nemocardium* Meek, 1876 (Bivalvia, Cardiidae), with the descriptions of three new species. *Basteria*, t. 77, vol. 4-6, p. 59, 60, 62; figs. 24-27. (As *Nemocardium australojaponicum* Ter Poorten, 2013.

TYPE LOCALITY: Off Fukuoka, Kyushu, Japan

HABITAT: Mainly sandy substrate, at depth of 10-100 m

GENERAL DISTRIBUTION: Southern Korea and southern Japan; **JEJU:** Seogwipo, Beopwhan, Gangjeong (Choi, *et al.*, 2000)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Juvenile “*bechei*” from Japan, Philippines, and Australia are quite similar and easily confused. However, adults show significant differences in shape, color, and periostracum. Fully adult Japanese specimens differ from those from the Philippines by having a particularly dark periostracum, rose instead of orange colors, and a comparatively high shape. They represent an undescribed species (Huber, 2010). *Nemocardium* (*Nemocardium*) *bechei* (Reeve, 1847) (Min *et al.*, 2004; Noseworthy *et al.*, 2007) is a synonym.

Genus: *Fulvia* J. E. Gray, 1853

120 *Fulvia (Fulvia) mutica* (Reeve 1844)

(Fig. 82)

ORIGINAL DESCRIPTION: Reeve, L.A., 1844. *Conchologia Iconica* 2. Monograph of the genus *Cardium*: sp. Pl. 6; fig 32; pl. 6, fig. 32. (As *Cardium muticum* Reeve, 1847)

TYPE LOCALITY: Unknown

HABITAT: In bays with sheltered waters and muddy substrate; at depth of 5 – 60 m

GENERAL DISTRIBUTION: Southern Japan and Korea to East China Sea; **JEJU:** Hamdeok, Shinyang, Gapado, Marado

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-low boreal

REMARKS: *Cardium japonicum* Dunker, 1860 is a synonym.

121 *Fulvia (Laevifulvia) hungerfordi* (G. B. Sowerby III 1901)

(Fig. 82)

ORIGINAL DESCRIPTION: Sowerby, G.B. III, 1901. Descriptions of five new species of shells. *Journal of Malacology* 8 (3):.103, pl. 9, fig. 5. (As *Cardium (Papyridea) hungerfordi* Sowerby, 1901)

TYPE LOCALITY: Japan

HABITAT: Sheltered waters with organic mud substrate, from intertidal zone to depth of 75 m

GENERAL DISTRIBUTION: Southern Korea and Southern Japan to Indonesia; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Fulvia hungerfordi* (Sowerby III, 1901); *Cardium (Papyridia)* [error for *Papyridea*] *hungerfordi* G.B. Sowerby III, 1901 are synonyms.

122 *Fulvia (Laevifulvia) undatopicta* (H. A. Pilsbry 1904)

(Fig. 82)

ORIGINAL DESCRIPTION: Pilsbry, H.A., 1904. New Japanese Marine Mollusca: Pelecypoda. Proceedings of the Academy of Natural Sciences of Philadelphia 56: 556, pl. 40 figs 14-15. (As *Cardium hungerfordi undatopictum* Pilsbry, 1904)

TYPE LOCALITY: Western Kyushu, Japan

HABITAT: Coral reefs, calcareous and coarse sand, also in sandy mud, from depths of 2-120 m

GENERAL DISTRIBUTION: Korea and Japan to Tropical West Pacific; **JEJU:** Sagyei, Kwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Photos of live specimens (Okutani, 2000: 954-955) clearly show the large guard tentacles carrying ocular organs on their tips. (Ter Poorten, 2009). *Fulvia undatopicta* (Pilsbry, 1904) is a synonym.

Superfamily: Chamoidea Lamarck, 1809

Family: CHAMIDAE Lamarck, 1809

Genus: *Chama* Linnaeus, 1758

123 *Chama dunkeri* Lischke, 1870

(Fig. 83)

ORIGINAL DESCRIPTION: Lischke, C.E., 1870. Diagnosen neuer Meeres-Conchylien von Japan. Malakozoologische Blätter 17: 27. (As *Chama dunkeri* Lischke, 1870) (Without illustration)



Fig.82: Distribution of *F. mutica* (●), *F. hungerfordi* (■), and *F. undatopicta* (▲)

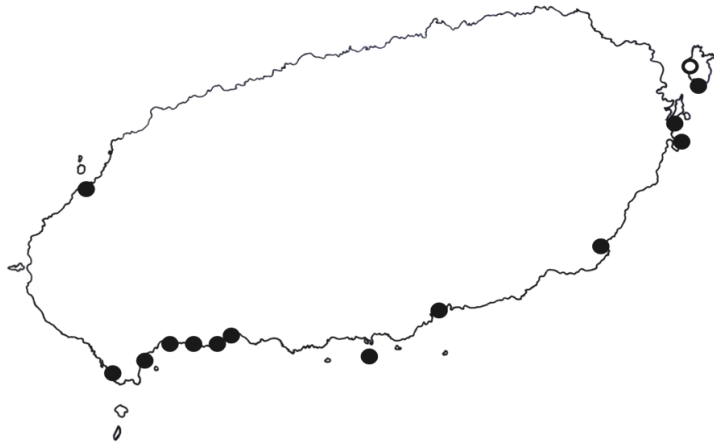


Fig. 83: Distribution of *C. dunkeri*

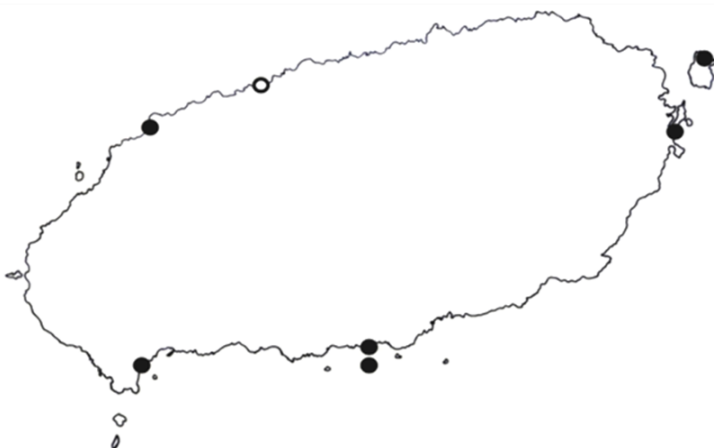


Fig. 84: Distribution of *C. asprella*

TYPE LOCALITY: Nagasaki, Kyushu, Japan

HABITAT: Attached with left valve to rocks at depth of 1-30 m

GENERAL DISTRIBUTION: Southern Korea and Japan to South China Sea; **JEJU:** Udo (Sanhosa), Udo (Geomeollae), Songsan, Seopjikoji, Pyoseon, Wimi, Munseom, Jungmun, Yerae, Daepyeong, Hwasoon, Sagyei, Hamo, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Okutani (2000) did not mention *C. dunkeri*. Shell may be reddish-white or reddish, with short spines. Internally specimens are white or only the dorsal border is colored.

124 *Chama asperella* Lamarck, 1819

(Fig. 84)

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. partie. Paris. 95. (As *Chama asperella* Lamarck, 1819) (Without illustration)

TYPE LOCALITY: “Les mers australes?” (Lamarck) (South Seas)

HABITAT: Cemented to rocks, corals, or shells, also in rock crevices, from the intertidal zone to a depth of 107 m

GENERAL DISTRIBUTION: Japan Indo-Pacific; South Africa; Mediterranean; Hawaii;

JEJU: Iho, Udo (Hagusodong), Seongsan, Seogwipo, Munseom, Sagyei, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: “The holotype of *Chama japonica* Lamarck, 1819 is in poor condition and

cannot be properly determined, hence the taxon must be understood as *nom. dub. Chama japonica* of Japanese authors non Lamarck, 1819 is *asperella*” (Huber, 2010).

125 *Chama cerinorhodon* Hamada & Matsukuma, 2005

(Fig. 85)

ORIGINAL DESCRIPTION: Hamada N. & Matsukuma A. 2005. A new species of Japanese *Chama* (Bivalvia: Heterodonta) with a calcitic outermost layer. *Venus*, 64(1-2): 11-21, figs. 1-4. (As *Chama cerinorhodon* Hamada & Matsukuma, 2005)

TYPE LOCALITY: Off Himeshima Islet, Shima-machi, Itoshima-gun, Fukuoka Prefecture, Japan (Long. 130° 03' 10" E, Lat. 33° 33' 30" N).

HABITAT: Cemented to hard substrate in the subtidal zone

GENERAL DISTRIBUTION): Southern Korea and Japan to East China Sea; **JEJU:** Iho, Wolpyeong, Haengwon, Handong, Hado, Udo (Sanhosa), Udo (Geomeollae), Seongsan, Seopjikoji, Shinyang, Bomok, Munseom, Seogundo, Gangjeong, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Hamo, Keumneung, Biyangdo, Hyeopjae, Gwakji, Gwideok

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Okutani (2000, p. 945) mentions that *Chama "fragum"* has an outermost shell layer consisting of calcite, and states that “true *C. fragum* has the shell solely consisting of aragonite.” Huber (2010) states: “The type of Reeve’s ... *fragum* is lost. What is present under “*fragum*” BMNH1995182 from unknown origin, even Caribbean is possible, does not conform to Reeve’s species. Type material is missing and this species was differently interpreted by various authors; *C. fragum* Reeve, 1847 is here formally declared *nom.dub.*”, hence Hamada and Matsukuma’s description of *C. cerinorhodon*. *Chama fraga* Reeve, 1846 is a synonym.

126 *Chama limbula* Lamarck, 1819

(Fig. 86)

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. Partie, Paris. p. 95. (As *Chama limbula* Lamarck, 1819) (Without illustration)

TYPE LOCALITY: Australia

HABITAT: Attached to stones in the subtidal zone

GENERAL DISTRIBUTION: Korea and S. E. Japan to Indo-Pacific; Hawaii; **JEJU:** Udo (Sanhosa), Seongsan, Shinyang, Pyoseon, Munseom, Jungmun, Hwasoon, Yongmeori, Sagyei, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: A rather heavy, quite large species, often encrusted, usually strongly furrowed, with smooth, purplish margins. Large, rather ovate, weakly furrowed, strong scaled forms may also occur; these may have whitish or yellowish-purple margins. *Chama iostoma* Conrad, 1837 is a synonym.

Genus: *Pseudochama* Odhner, 1917

127 *Pseudochama retroversa* (Lischke, 1870)

(Fig. 87)

ORIGINAL DESCRIPTION: Lamarck, J. P. B. A de Monet de 1819. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux,

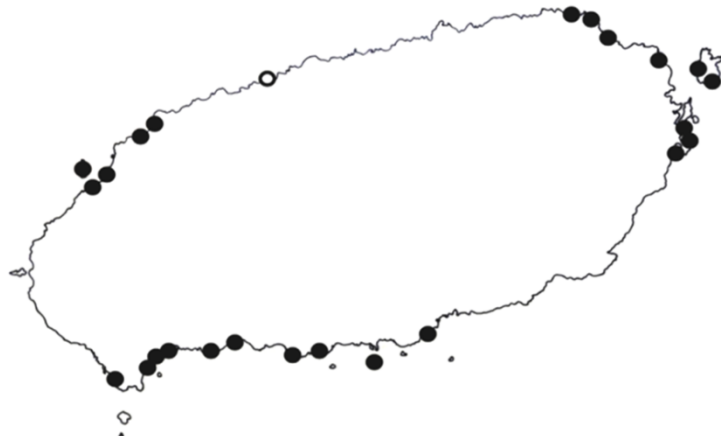


Fig. 85: Distribution of *C. cerinohodon*

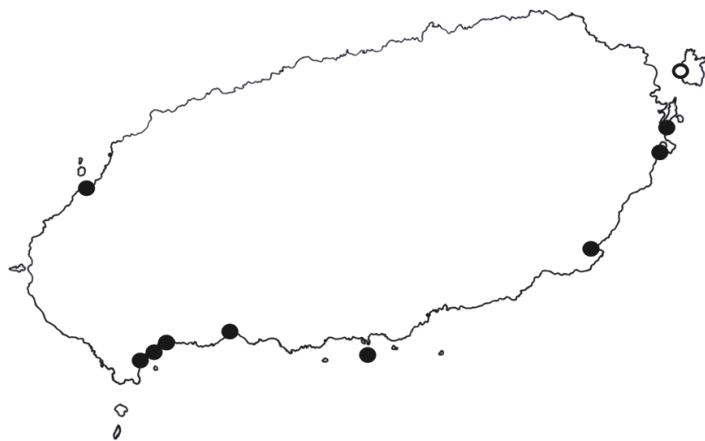


Fig. 86: Distribution of *C. limbula*

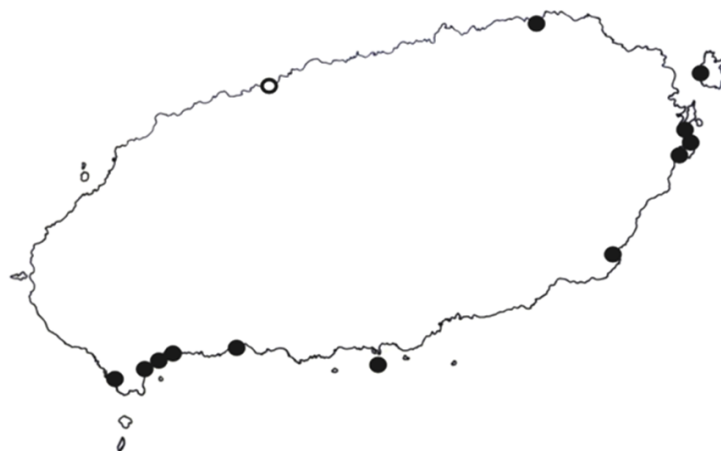


Fig. 87: Distribution of *P. retroversa*

leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie. Tome sixième. Ire. partie. Paris. 95. (As *Chama retroversa* Lischke, 1870) (Without illustration)

TYPE LOCALITY: Nagasaki, Kyushu, Japan

HABITAT: Cemented by right valve to rocks from the intertidal zone to depth of 20m

GENERAL DISTRIBUTION: East Sea to Taiwan; **JEJU:** Gimnyeong, Udo (Sanhosa), Seongsan, Seopjikoji, Shinyang, Pyoseon, Munseom, Jungmun, Hwasoon, Yongmeori, Sagyei, Hamo, Iho

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Species of *Pseudochama* are exclusively or largely attached by the right valve with the apex pointing to the left. *P. retroversa* has a very large ventral scar and a ventrally smooth margin.

Genus: *Amphichama* Habe, 1964

128 *Amphichama argentata* (Kuroda and Habe, 1958)

(Fig. 88)

ORIGINAL DESCRIPTION: Kuroda and Habe. 1958. Report on the Mollusca Chiefly Collected by the S. S. Soyo-Maru of the Imperial Fisheries Experimental Station on the Continental Shelf Bordering Japan During the Years 1922-1930. Part 4. Lamellibranchia (2). Publications of the Seto Marine Biological Laboratory 7(1): 31. (As *Chama argentata* Kuroda and Habe, 1958) (Without illustration)

TYPE LOCALITY: Tosa Bay, Shikoku, Japan

HABITAT: Cemented to rocks, pebbles, and corals by right or left valve at depths of 50-300

m

GENERAL DISTRIBUTION: Korea and Japan to Taiwan; **JEJU:** Supseom, Munseom, Keumneung, Biyangdo,

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: “This deep sea species is very characteristic in having a pearly shell on which distinct lamellae are placed distantly. The growth lines are lamellate but not fimbriate. The attachment area is by either by the left or right valves.” (Kuroda and Habe, 1958)

Superfamily: Galeommatoidea Gray, 1840

Family: GALEOMMATIDAE Gray, 1840

Genus: *Scintilla* Deshayes, 1856

129 *Scintilla violescens* Kuroda & Iw. Taki, 1961

(Fig. 89)

ORIGINAL DESCRIPTION: Kuroda, T. and Taki, I. 1961. On a new species of *Scintilla* (Galeommatidae) from Japan. Venus 21: 141. (As *Scintilla violescens* Kuroda and I. W. Taki, 1961) (Without illustration)

TYPE LOCALITY: Shirahama, southern Kii Peninsula, central Japan

HABITAT: Attached to gorgonians, from middle intertidal zone to depth of 100 m

GENERAL DISTRIBUTION: Korea; Japan; East Sea, Thailand; **JEJU:** Pyoseon, Munseom, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

130 *Scintilla timoriensis* Deshayes, 1856

(Fig. 89)

ORIGINAL DESCRIPTION: Deshayes G. P. 1856. Sur le genre *Scintilla*. Proceedings of
145

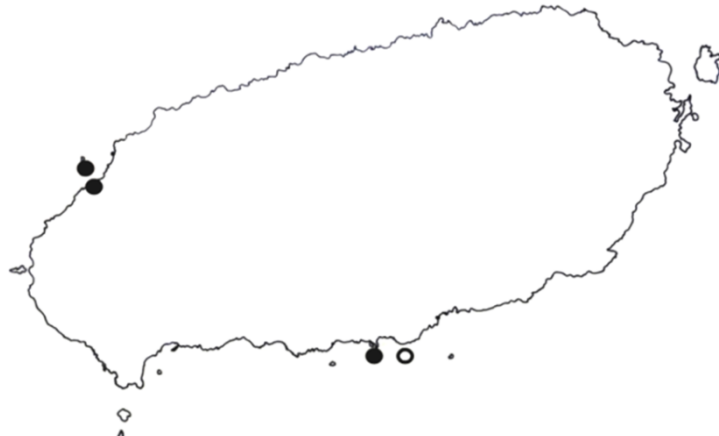


Fig. 88: Distribution of *A. argentata*

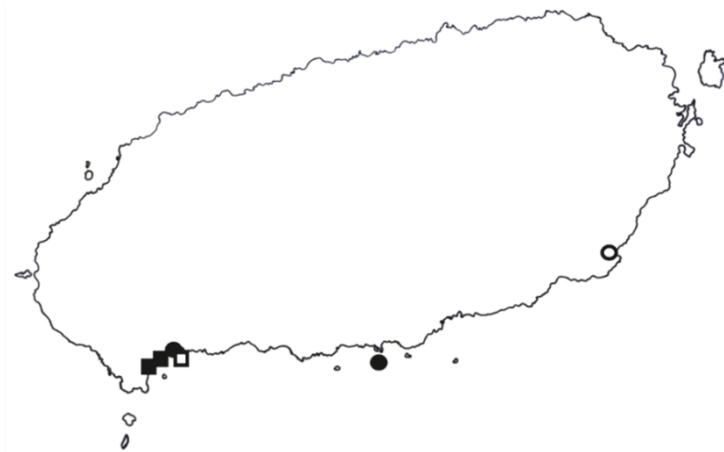


Fig. 89: Distribution of *S. violescens* (●) and *S. timoriensis* (■)

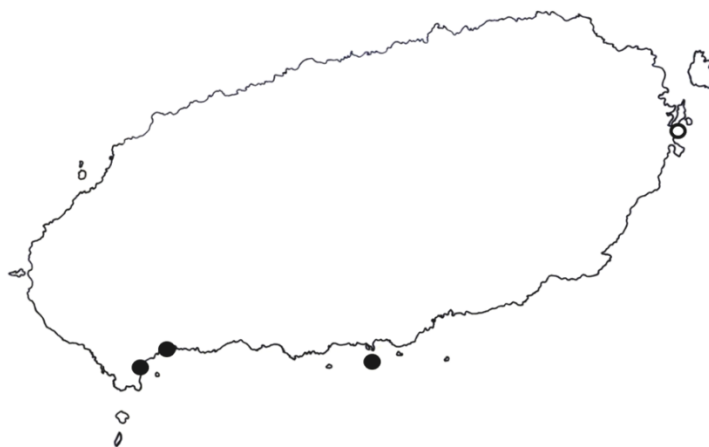


Fig. 90: Distribution of *S. niditella*

the Zoological Society of London 1855: 174. (As *Scintilla timoriensis* Deshayes, 1856)
(Without illustration)

TYPE LOCALITY: Timor Island

HABITAT: Under rocks just below intertidal zone

GENERAL DISTRIBUTION: Southern Korea and southern Japan to Indo-W. Pacific;

JEJU: Hwasoon, Yongmeori, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

131 *Scintilla nitidella* Habe, 1962

(Fig. 90)

ORIGINAL DESCRIPTION: Habe T. 1962. Coloured illustrations of the shells of Japan, II, 2nd edn. Osaka: Hoikusha (in Japanese). p. 46, pl. 57, fig. 14. (As *Scintilla nitidella* Habe, 1962)

TYPE LOCALITY: Tanabe Bay, Wakayama Prefecture, Japan

HABITAT: Fine sand bottom, from intertidalzone to 20 m.

GENERAL DISTRIBUTION: Southern Korea and Japan; **JEJU:** Seongsan, Munseom, Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: (New name for *Scintilla vitrea* Habe, 1961 preoccupied by *Scintilla vitrea* Quoy and Gaimard, 1832)

Family: LASAEIDAE Gray, 1842

(Kelliidae Forbes and Hanley, 1849 and Montacutidae W. Clark, 1855, often used in regional literature (eg. Min, 2004), are both synonyms of this family (Lutaenko and Noseworthy, 2012). “There is as yet insufficient information to divide this family into supported clades” (Bieler et al., 2010).

Genus: *Lasaea* Brown, 1827

132 *Lasaea undulata* (Gould, 1861)

(Fig. 91)

ORIGINAL DESCRIPTION: Gould, A.A. 1861 Description of shells collected by the North Pacific exploring expedition. Proceedings of the Boston Society of Natural History 8:34. (As *Kellia undulata* Gould, 1861) (Without illustration)

TYPE LOCALITY: Kagoshima, Kyushu, Japan

HABITAT: On rocks in intertidal zone

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Udo (Sanhosa), Seongsan, Munseom. Hyeopjae. Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: One of the smallest bivalves found in Jeju Island.

Genus: *Squillaconcha* Kuroda & Habe, 1971

133 *Squillaconcha subsinuata* (Lischke, 1871)

(Fig. 91)

ORIGINAL DESCRIPTION: Lischke, C. E. 1871. Diagnosen neuer Meeres-Conchylien von Japan. Malakozologische Blatter, xviii 1871: pp. 43, 44. (As *Kellia subsinuata* Lischke, 1871) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Bysally attached to ventral side of *Squilla ornata* (Stomatopoda) in middle to lower intertidal zone.

GENERAL DISTRIBUTION): Korea and Japan; East Sea (Western area); **JEJU):** Handong, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Genus: *Melliteryx* Iredale, 1924

134 *Melliteryx puncticulata* (Yokoyama, 1924)

(Fig. 91)

ORIGINAL DESCRIPTION: Yokoyama, M. 1924. Journal of the College of Science, Imperial University of Tokyo. Mollusca from the Coral bed of Awa. Vol. 45, art. 1, pp. 48, 49, pl. IV, figs. 8, 8a, 9. (As *Lepton puncticulatum* Yokoyama, 1924)

TYPE LOCALITY: Numa, Chiba Prefecture, Japan

HABITAT: In sand, from depth of 5-50 m

GENERAL DISTRIBUTION: Southern Korea and Japan; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

Genus: *Kellia* Turton, 1822

135 *Kellia porculus* Pilsbry, 1904

(Fig. 92)

ORIGINAL DESCRIPTION: Pilsbry. 1904, New Japanese Marine Mollusca: Pelecypoda. Proceedings of the Academy of Natural Sciences, Philadelphia 56: 558, pl. 41, fig. 18-20 (As *Kellia porculus* Pilsbry, 1904)

TYPE LOCALITY: Hirado, Hizen" (Nagasaki Prefecture, Kyushu, Japan)

HABITAT: Shelly gravel and sand bottom from intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Iho, Hamdeok, Handong, Sehwa, Udo (Sanhosa), Jongdal-ri, Seongsan, Shinyang

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: May be a thickened form of *K. japonica* Pilsbry, 1895; the former possesses

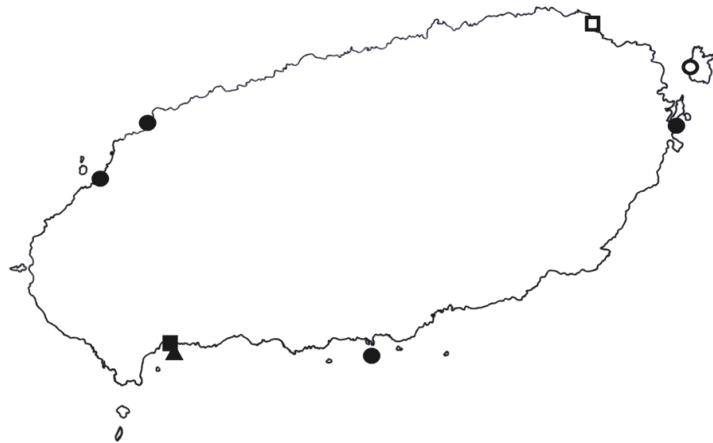


Fig. 91: Distribution of *L. undulata* (●), *Squillaconcha subsinuata* (■), and *Melliteryx puncticulata* (▲)



Fig. 92: Distribution of *K. porculus*



Fig. 93: Distribution of *Nesobornia bulla*

much heavier teeth and a thicker, more inflated shell (Lutaenko and Noseworthy, 2012).

Genus: *Nesobornia* Dall, Bartsch & Rehder, 1938

136 *Nesobornia bulla* (Gould, 1861)

(Fig. 93)

ORIGINAL DESCRIPTION: Gould, A.A. 1861 Description of shells collected by the North Pacific exploring expedition. Proceedings of the Boston Society of Natural History 8: 34, (As *Kellia bulla* Gould, 1861) (Without illustration)

TYPE LOCALITY: Ryukyu Islands, Japan

HABITAT: In sand and mud at depths of 50-100 m

GENERAL DISTRIBUTION: Korea and Southern Japan; **JEJU:** Udo (Sanhosa), Yongmeori, Sagyei, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-low boreal

REMARKS: There is some confusion concerning the family to which this species belongs. It has been placed in the Kelliidae (Bouchet, 2015) and also the Lasaeidae (Okutani, 2000). Some authors have regarded Kelliidae as a synonym of Lasaeidae (Lutaenko & Noseworthy, 2012).

Genus: *Pseudopythina* P. Fischer, 1878

137 *Pseudopythina tsurumaru* (Habe, 1959)

(Fig. 94)

ORIGINAL DESCRIPTION: Habe, T., 1959. Five new minute bivalves from Japan (Erycinacea, Pelecypoda). *Publ. Seto Mar. Biol. Lab.*, 7(2): 292, text figs. 10-12. (As : *Borniopsis tsurumaru* Habe, 1959)

TYPE LOCALITY: Ariake Sea, Kyushu

HABITAT: In mud and sand at depths of 10-50 m

GENERAL DISTRIBUTION: Southern Korea and Japan; **JEJU:** Munseom, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

Genus: *Nipponomysella* Yamamoto & Habe, 1959

138 *Nipponomysella oblongata* (Yokoyama, 1922)

(Fig. 94)

ORIGINAL DESCRIPTION: Yokoyama, M., 1922: Fossils from the upper Musashino of Kazusa and Shimosa. Journal of the College of Science, Imperial University of Tokyo, vol. 44, art. 1, p. 157, pl. 13, figs. 9, 10. (As *Montacuta oblongata* Yokoyama, 1922)

TYPE LOCALITY: "Shito" (Boso Peninsula), "Oji" (Tokyo), Japan (fossil)

HABITAT: Commensal on ophiuroids in sandy mud from lower intertidal zone to depth of 14 m.

GENERAL DISTRIBUTION: Korea and Japan (Check); **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Superfamily: Glossoidea Gray, 1847

Family: GLOSSIDAE Gray, 1847

Genus: *Meiocardia* H. Adams & A. Adams, 1857

139 *Meiocardia hawaiiiana* Dall, Bartsch, and Rehder, 1938

(Fig. 95)

ORIGINAL DESCRIPTION: Dall, W. H., Bartsch, P., and Rehder, H. A., 1938. A Manual of the Recent Pelecypod Mollusks of the Hawaiian Islands. Bernice P. Bishop Museum Bulletin, (153): 1-233, 58 pl. (As *Meiocardia hawaiiiana* Dall, Bartsch, and Rehder, 1938)

TYPE LOCALITY: Kauai, Hawaii

HABITAT: On sand and mud bottoms, also gravelly bottom with corals, at depth from 30-600 m

GENERAL DISTRIBUTION: Korea and Japan to SE. Asia; Hawaii; Indian Ocean (Reunion); **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

Family: KELLIELLIDAE P. Fischer, 1887

Genus: *Alveinus* Conrad, 1865

140 *Alveinus ojanus* (Yokoyama, 1927)

(Fig. 95)

ORIGINAL DESCRIPTION: Yokoyama, M. 1927. Mollusca from the Upper Musashino of Western Shimosa and Southern Musaski. Journal of the Faculty of Science, University of Tokyo. 1: 432, pl. 50, figs, 7, 8. (Holotype and paratype: Taki, Is. and Oyama, K. 1954. Matajiro Yokoyama's "The Pliocene and Later Faunas from The Kwanto Region in Japan". Palaeontological Society of Japan. Special Papers Number 2, pl. 47, figs, 7, 8) (As *Kellia* (?) *ojiana* Yokoyama, 1927)

TYPE LOCALITY: Unknown

HABITAT: Sandy mud and fine sand, byssally attached to sand grains; at depth of 2-150 m

GENERAL DISTRIBUTION: Sea of Okhotsk to Thailand; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

Superfamily: Mactroidea Lamarck, 1809

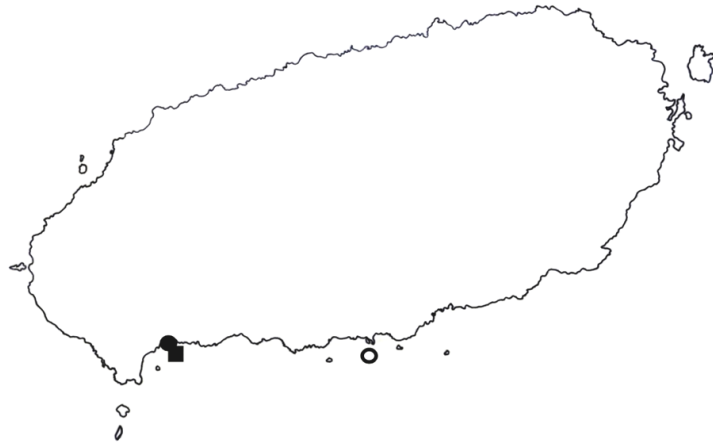


Fig. 94: Distribution of *P. tsurumaru* (●) and *Nipponomysella oblongata* (■)

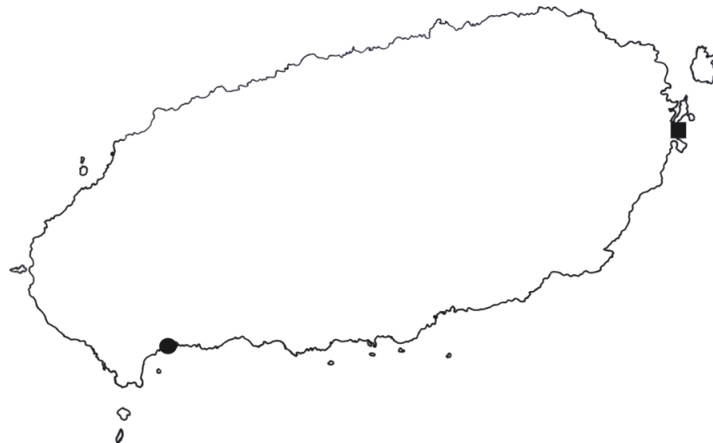


Fig. 95: Distribution of *M. hawaiiana* (●) and *Alveinus ojanus* (■)

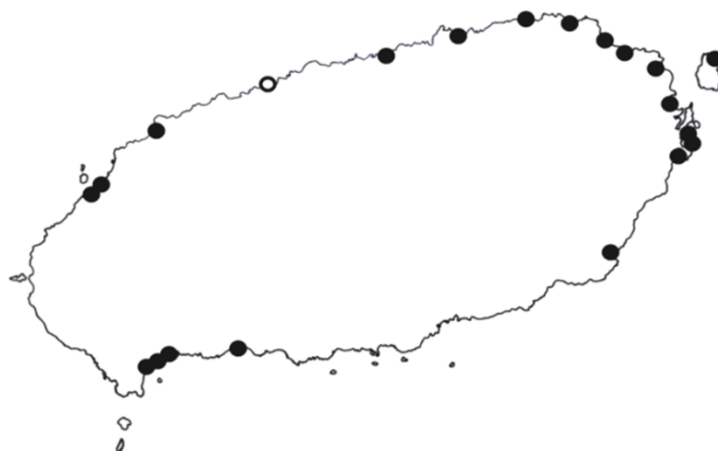


Fig. 96: Distribution of *M. chinensis*

Family: MACTRIDAE Lamarck, 1809

Subfamily: Mactrinae Lamarck, 1809

Genus: *Mactra* Linnaeus, 1767

141 *Mactra (Mactra) chinensis* Philippi, 1846

(Fig. 96)

ORIGINAL DESCRIPTION: Philippi, R. A. 1846. *Mactra* Tab. II. In *Abbildungen und Beschreibungen neuer oder wenig bekannter Conchylien*, Cassel (Theodor Fischer). 1847, 2: 73, Pl. II, fig. 1. (As *Mactra chinensis* Philippi, 1846)

TYPE LOCALITY: China

HABITAT: Burrowed in sand and mud; in bays, from intertidal zone to depth of 30 m

GENERAL DISTRIBUTION: Sea of Okhotsk to South China Sea; **JEJU:** Iho, Samyang, Hamdeok, Gimnyeong, Wolpyeong, Handong, Sehwa, Hado, Udo (Hagosudong), Jongdal-ri, Seongsan, Seopjikoji, Shinyang, Pyoseon, Jungmun, Hwasoon, Yongmeori, Sagyei, Keumneung, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: There appear to be two forms, a northern one which is more triangular (Eastern Russia) and a southern one (Korea) which is more rounded.

142 *Mactra (Mactra) achatina* "Chemnitz" Holten, 1802

(Fig. 97) (Plate 7: C, D)

ORIGINAL DESCRIPTION: Holten, H. S. 1802. *Enumeratio systematica conchyliorum J. H. Chemnitzii*. - pp. I-VI [= 1-6], 1-88. Havniæ. (As *Mactra achatina* Holten, 1802)

TYPE LOCALITY: Unknown

HABITAT: Shelly and fine sand, at depth of 5-60 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-West Pacific; **JEJU:**

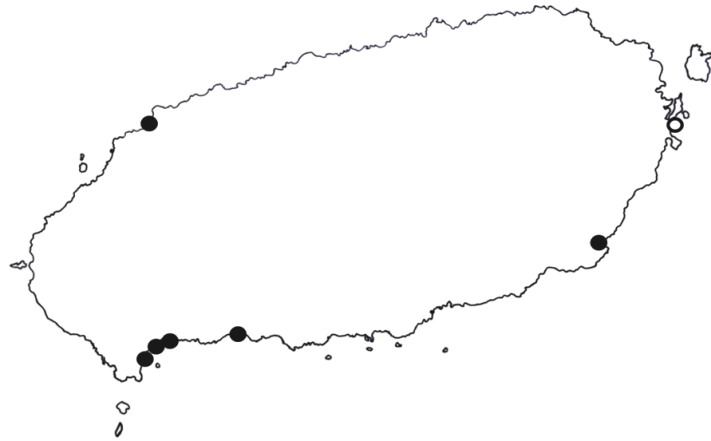


Fig. 97: Distribution of *M. achatina*

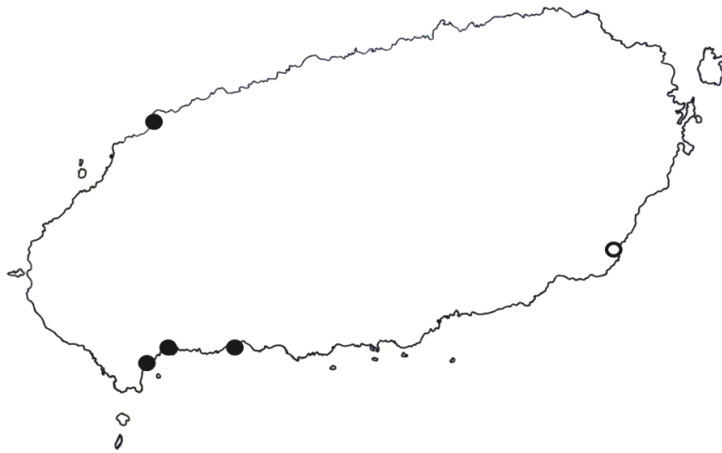


Fig. 98: Distribution of *M. iridescens*

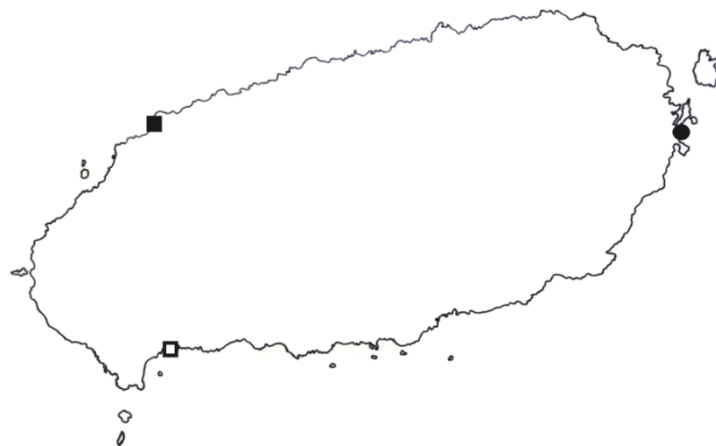


Fig. 99: Distribution of *O. bernardi* (●) and *Lutraria maxima* (■)

Seongsan, Pyoseon, Jungmun, Hwasoon, Yongmeori, Sagye, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Specimens of *M. ornata* from the Indo-West Pacific are similar to *M. achatina*, the oldest name being *achatina* (Huber, 2010). *Mactra ornata* Gray, 1837 is a synonym

143 *Mactra (Mactra) iridescens* Kuroda & Habe in Habe, 1958

(Fig. 98)

ORIGINAL DESCRIPTION: Habe, T. 1958. Report on the Mollusca chiefly collected by the S. S. Soyo-Maruru of the Imperial Fisheries Experimental Station on the continental shelf bordering Japan during the years 1922-1930. Part 4. Lamellibranchia (2). Seto Marine Biological Laboratory, Publications [Kyoto University]. 7(1) 48. (As *Mactra iridescens* Kuroda and Habe in Habe, 1958) (Without illustration)

TYPE LOCALITY: Off Yakushima, Kyushu, Japan

HABITAT: Fine sand, at depth of 20 - 250 m

GENERAL DISTRIBUTION: Korea and Southern Japan to East China Sea; **JEJU:** Pyoseon, Jungmun, Hwasoon, Sagyei, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Mactra (Telemacra) iridescens* Kuroda and Habe in Habe, 1958 is a synonym.

Genus: *Oxyperas* Mörch, 1853

144 *Oxyperas bernardi* (Pilsbry, 1904)

(Fig. 99)

ORIGINAL DESCRIPTION: Pilsbry, H.A., 1904. New Japanese Marine Mollusca: Pelecypoda. Proceedings of the Academy of Natural Sciences of Philadelphia 56: 550-551, pl. 39, figs. 4-6. (As *Spisula (Oxyperas) bernardi* Pilsbry, 1904

TYPE LOCALITY: Awaji Island, Hyōgo Prefecture, Japan

HABITAT: Coarse and shelly sand, at depth of 6-100 m

GENERAL DISTRIBUTION: East Sea to Taiwan; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: The genus *Oxyperas* currently encompasses uncommon, comparatively large, elongated species with striated lateral teeth and commarginal ribbing of varying strength (Huber, 2010).

Subfamily: Lutrariinae Gray, 1853

Genus: *Lutraria* Lamarck, 1799

145 *Lutraria (Lutraria) maxima* J. H. Jonas, 1844

(Fig. 99) (Plate 7: A, B)

ORIGINAL DESCRIPTION: Jonas, J. H. (1844). Vorläufige diagnosen neuer conchylien, welvhe ausführlicher beschrieben und abgebildet nachstens erscheinen werden . Zeitschrift für Malakozoologie. 1844: 34. (As *Lutraria maxima* Jonas, 1844) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Deeply burrowed in fine sand and mud, from intertidal zone to depth of 14 m

GENERAL DISTRIBUTION: Japan to South China Sea; **JEJU:** Hwasoon, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Lutraria (Psammophila) maxima* Jonas, 1844 is a synonym,

Family: MESODESMATIDAE Gray, 1840

Subfamily: Mesodesmatinae Gray, 1840

Genus: *Coecella* Gray, 1853

146 *Coecella chinensis* Deshayes, 1855

(Fig. 100)

ORIGINAL DESCRIPTION: Deshayes, G. P., 1855, Descriptions of new shells from the collection of Hugh Cuming, Esq. *Proceedings of the Zoological Society of London*, 23: 334. (As *Caecella chinensis* Deshayes, 1855 [*Caecella* H. & A. Adams, 1856 is an error.]) (Without illustration)

TYPE LOCALITY: Chinese Seas

HABITAT: Cobble beaches, coarse sand and stones, also muddy sand in intertidal zone

GENERAL DISTRIBUTION: East Sea to South China Sea; **JEJU:** Iho, Hamdeok, Gimnyeong, Haengwon, Handong, Sehwa, Jongdal-ri, Ojo-ri, Seongsan, Shinyang, Pyoseon, Hwasoon, Sagyei, Yongnak, Keumneung, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Locally common; edible. Dead specimens frequently found on beaches; often obtained live in sandy bottoms in tidepools.

Superfamily: Sphaerioidea Deshayes, 1855

Family: SPHAERIIDAE Deshayes, 1855

Subfamily: Sphaeriinae Deshayes, 1854 (

Genus: *Sphaerium* Scopoli, 1777

147 *Sphaerium japonicum* (Westerlund, 1883)

(Fig. 101)

ORIGINAL DESCRIPTION: Westerlund C.A., 1883. Von der Vega-Expedition in Asien gesammelte Binnenmollusken. *Nachrichtsblatt der Deutschen Malacozoologischen Gesellschaft*, 15: 58. (As *Calyculina japonica* Westerlund, 1883) (Without illustration)

TYPE LOCALITY: Yokogava (Yokogawa), Honshu, Japan

HABITAT: In mud among the roots of aquatic plants, usually in stagnant pools or small,

slow-flowing streams

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Seogwipo (edible aquatic plant (minaree) fields), Gangjeong (muddy stream)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-low boreal

REMARKS: First freshwater bivalve species record for Jeju Island. *Sphaerium lacustre japonicum* (Westerlund, 1883); *Sphaerium (Musculium) japonicum* (Westerlund, 1883); *Musculium japonicum* (Westerlund, 1883) are synonyms.

Superfamily Tellinoidea Blainville, 1814

Family: TELLINIDAE Blainville, 1814

Subfamily: Tellininae Blainville, 1814

Genus: *Pharaonella* Lamy, 1918

148 *Pharaonella sieboldii* (Deshayes, 1855)

(Fig. 102) (Plate 9: E, F)

ORIGINAL DESCRIPTION: Deshayes, G. P., 1855, Descriptions of new shells from the collection of Hugh Cuming, Esq. *Proceedings of the Zoological Society of London*, 23: 368. (As *Tellina sieboldii* Deshayes, 1855) (Without illustration)

TYPE LOCALITY: Japan

HABITAT: Fine sand, in lower intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Southern Korea and Japan; **JEJU:** Hado, Seongsan Pyoseon, Jungmun, Hwasoon, Sagyei, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical



Fig. 100: Distribution of *C. chinensis*



Fig. 101: Distribution of *S. japonicum*

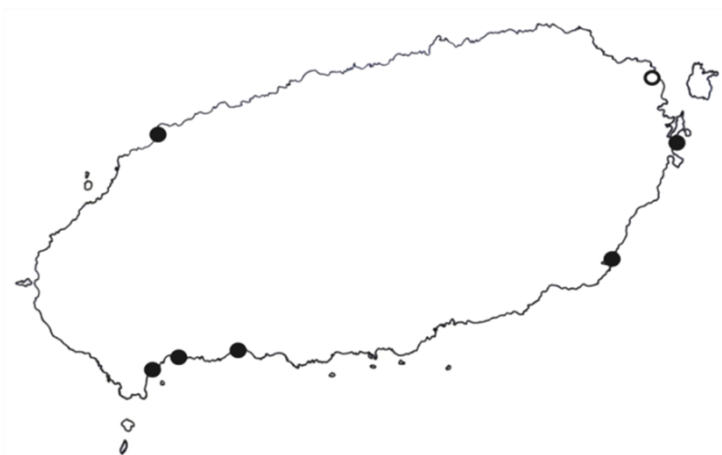


Fig. 102: Distribution of *P. sieboldi*

Genus: *Pristipagia* Iredale, 1936

149 *Pristipagia subtruncata* (Hanley, 1844)

(Fig. 103) (Plate 9: K, L)

ORIGINAL DESCRIPTION: Hanley S. C. T. (1844-1845). Descriptions of new species of the genus *Tellina* chiefly collected by H. Cuming Esq. in the Philippine Islands and Central America. *Proceedings of the Zoological Society of London*, 12 (139): 147-149 [December, 1844], 149. (As *Tellina subtruncata* Hanley, 1844) (Without illustration)

TYPE LOCALITY: Bohol, Philippines

HABITAT: Fine sand bottom at depth of 10-300 m

GENERAL DISTRIBUTION: Southern Korea and Japan; **JEJU:** Supseom, Hwasoon, Yeongmeori

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Merisca (Pistris) subtruncata* (Hanley, 1844); *Pistris subtruncata* (Hanley, 1844) are synonyms.

Genus: *Cadella* Dall, Bartsch & Rehder, 1938

150 *Cadella narutoensis* Habe, 1960

(Fig. 104) (Plate 9: Q, R)

ORIGINAL DESCRIPTION: Habe, T. 1960. New species of molluscs from the Amakusa Marine Biological Laboratory, Reihoku-cho, Amakusa, Kumamoto Pref., Japan. *Publications of the Seto Marine Biological Laboratory* 8(2): 292, 293, p. 294, fig. 1. (As *Cadella narutoensis* Habe, 1960)

TYPE LOCALITY: Naruto, Honshu, Japan

HABITAT: Sand bottom at depth of 10-100m

GENERAL DISTRIBUTION: Southern Korea and Japan; **JEJU:** Jungmun, Hwasoon,

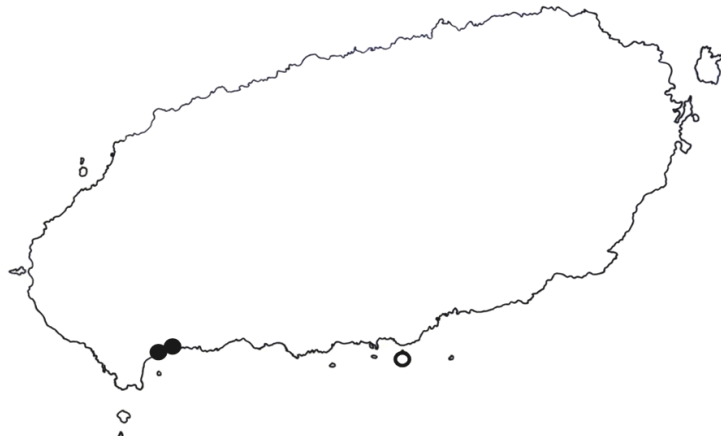


Fig. 103: Distribution of *P. subtruncata*



Fig. 104: Distribution of *C. naurotensis*

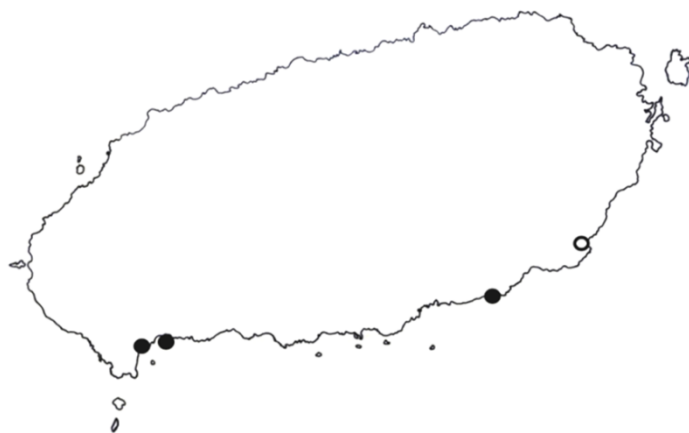


Fig. 105: Distribution of *C. delta*

Yongmeori, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

151 *Cadella delta* (Yokoyama, 1922)

(Fig. 105)

ORIGINAL DESCRIPTION: Yokoyama, M. (1922) Fossils from the Upper Musashino of Kazusa and Shimosa. Journal of the College of Science, Tokyo Imperial University, 44, 141, pl. 1, figs. 8-10. (As *Tellina delta* Yokoyama, 1922)

TYPE LOCALITY: Kazusa Province (Chiba Prefecture), Honshu, Japan (fossil)

HABITAT: Sand bottom at depth of 5-160 m

GENERAL DISTRIBUTION: Southern Korea and Japan; **JEJU:** Pyoseon, Bomok, Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Okutani (2000) mentions that this species is also found in the western part of the East Sea. However, Lutaenko and Noseworthy (2012) omit this species from their catalogue of continental East Sea bivalve species.

Genus: *Jactellina* Iredale, 1929

152 *Jactellina clathrata* (Deshayes, 1835)

(Fig. 106) (Plate 9: M-P)

ORIGINAL DESCRIPTION: Deshayes, G. P. 1835–1845. [in] J. B. Lamarck, Histoire Naturelle des Animaux sans Vertèbres, ou tableau général des classes, des ordres et des genres de ces animaux (deuxième édition). Tome 6–11. Histoire des mollusques. J.B. Ballière, Paris. 208, 209. (As *Tellina clathrata* Deshayes, 1835) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Fine sand bottom in lower intertidal zone to depth of 30 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-Pacific; **JEJU:** Gimnyeong, Seongsan, Pyoseon, Bomok, Jungmun, Hwasoon, Yongmeori, Sagyei, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: There appears to be some confusion over the status of the genera *Jactellina* Iredale, 1929 and *Loxoglypta* Dall, Bartsch, and Rehder, 1938, as well as the species names *clathrata* Deshayes, 1835 and *lauta* Gould, 1850. According to Huber (pers. comm.), *Loxoglypta* is treated as a synonym of *Jactellina*, and *lauta* cannot be separated from *clathrata*, the older taxon. Thus, *Jactellina lauta* (Gould, 1850) and *Loxoglypta lauta* (Gould, 1850) are synonyms.

Genus: *Herouvalia* Cossmann, in Harris & Burrows, 1891

153 *Herouvalia caelata* (A. Adams, 1854)

(Fig. 106)

ORIGINAL DESCRIPTION: Adams, A. 1854. Descriptions of new shells from the collection of H. Cuming, Esq. Proceedings of the Zoological Society of London 21: 69. (As *Gafrarium caelatum* A. Adams, 1854) (Without illustration)

TYPE LOCALITY: Sorsogon, Luzon, Philippines

HABITAT: Sand bottom in lower intertidal zone to depth of 300 m

GENERAL DISTRIBUTION: Southern Korea and Southern Japan to Indian Ocean; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Elliptotellina euglypta* (Gould, 1861) is a synonym.

Genus: *Tellina* Linnaeus, 1758

154 *Tellina iridella* Martens, 1865

(Fig. 107)

ORIGINAL DESCRIPTION: Von Martens. 1865. Descriptions of New Species of Shells. Annals and Magazine of Natural History, Vol. 16, Ser. 3, London: Taylor and Francis. 431. (As *Tellina iridella* Martens, 1865) (Without illustration)

Iredale, 1929 and *Loxoglypta* Dall, Bartsch, and Rehder, 1938, as well as the species names *clathrata* Deshayes, 1835 and *lauta* Gould, 1850. According to Huber (pers. comm.), *Loxoglypta* is treated as a synonym of *Jactellina*, and *lauta* cannot be separated from

GENERAL DISTRIBUTION: Southern Korea and Japan to Taiwan; **JEJU:** Hado, Udo (Hagosudong), Seongsan, Shinyang, Jungmun, Hwasoon, Sagyei, Keumneung, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Nitidotellina iridella* (Martens, 1865) is a synonym.

Subfamily: Macominae Olsson, 1961

Genus: *Heteromacoma* Habe, 1952

155 *Heteromacoma irus* (Hanley, 1845)

(Fig. 108) (Plate 9: (A-D; G-J))

ORIGINAL DESCRIPTION: Hanley S. C. T. (1844-1845). Descriptions of new species of the genus *Tellina* chiefly collected by H. Cuming Esq. in the Philippine Islands and Central America. *Proceedings of the Zoological Society of London*, 12 (134): 164-166 [February, 1845], 166. (As *Tellina irus* Hanley, 1845) (Without illustration – see Hanley, 1846, pl lx (60), fig. 145)

TYPE LOCALITY: Unknown

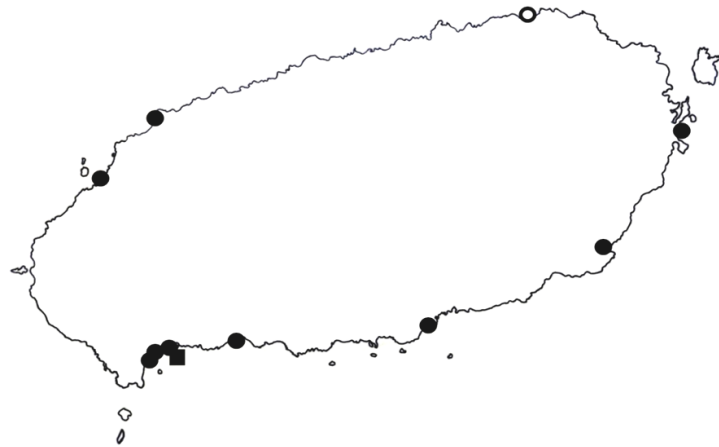


Fig. 106: Distribution of *J. clathrata* (●) and *Herouvalia caelata* (■)

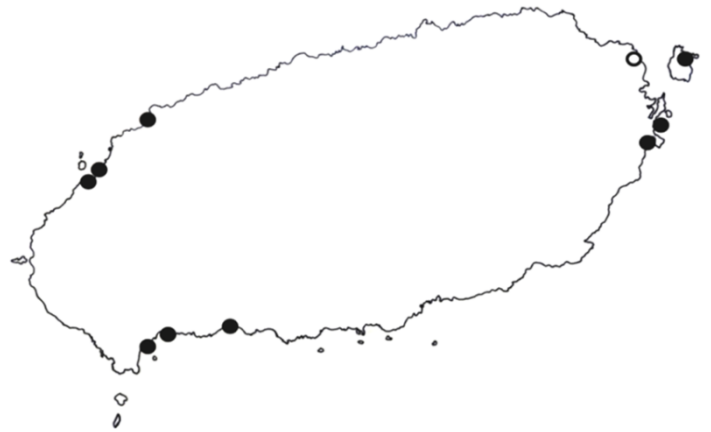


Fig. 107: Distribution of *T. iridella*

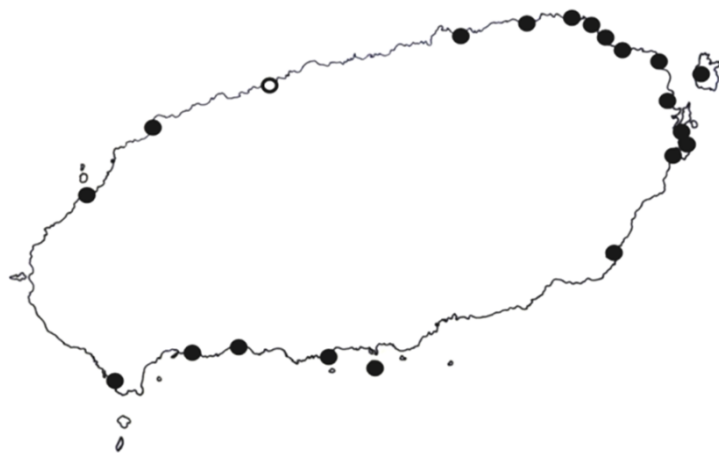


Fig. 108: Distribution of *H. irus*

HABITAT: Sandy-mud bottom with pebbles in intertidal zone

GENERAL DISTRIBUTION: Korea; Japan; China; **JEJU:** Iho, Hamdeok, Gimnyeong, Wolpyeong, Haengwon, Handong, Sehwa, Hado, Udo (Sanhosa), Jongdal-ri, Supjikoji, Seongsan, Shinyang, Pyoseon, Munseom, Seogundo, Jungmun, Daepyeong, Hamo, Keumneung, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Locally harvested for food. The annual reproductive cycle of *H. irus* was investigated for the first time by Limpanont *et al.* (2011) from the northern coast of Jeju Island.

Family: DONACIDAE J. Fleming, 1828

Genus: *Donax* Linnaeus, 1758

156 *Donax cuneatus* Linnaeus, 1758

(Fig. 109)

ORIGINAL DESCRIPTION: Linnaeus, C. 1758. Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Holmiæ. (Salvius), 683. (As *Donax cuneatus* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Unknown

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-West Pacific; **JEJU:** Hwasoon (See Fig. 109)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: New species record for Jeju Island. As far as can be ascertained, this species has not been previously recorded from the Korean mainland, so it may be also considered as

a new species record for the country. *Latona cuneata* (Linnaeus, 1758); *Donax (Latona) cuneatus* (Linnaeus, 1758) are synonyms.

Family: PSAMMOBIIDAE J. Fleming, 1828

Genus: *Heteroglypta* Martens in Möbius, 1880

157 *Heteroglypta contraria* (Deshayes in Maillard 1863)

(Fig. 109)

ORIGINAL DESCRIPTION: Deshayes G. P. 1863. Catalogue des mollusques de l'Île de la Réunion (Bourbon). Annexes E, in Maillard L. (ed.), *Notes sur l'Île de la Réunion (Bourbon)*. Dentu, Paris, p. 11, pl. 1, fig. 20, 21. (As *Psammobia contraria* Deshayes in Maillard, 1863)

TYPE LOCALITY: Reunion

HABITAT: Shallowly buried in sand or nestling among coral rubble, also in coarse sand, from the intertidal zone to depth of 35m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-West Pacific; **JEJU:** Sagyei (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

Genus: *Hiatula* Modeer, 1793

158 *Hiatula atrata* L. A. Reeve, 1857

(Fig. 110) (Plate 8: A-F)

ORIGINAL DESCRIPTION: Reeve, L. A. 1857: Monograph of the genus *Soletellina*. *Conchologia Iconica; or, illustrations of the shells of molluscous animals*, vol. 10. London, L. A. Reeve. Pl, 3; fig 14. (As *Soletellina atrata* L. A. Reeve, 1857)

TYPE LOCALITY: Luzon, Philippines

HABITAT: Deeply burrowed in fine sandy mud and clean sand, at depth of 5-100 m

GENERAL DISTRIBUTION: East Sea to South China Sea; **JEJU:** Gimnyeong, Udo (Hagosudong), Jungmun, Hwasoon, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Matsubara (2013), after a careful examination of the original description of *Hiatula*, and the type species of *Soletellina* and *Hiatula*, has concluded that *Hiatula* and *Soletellina* are objective synonyms and the senior name *Hiatula* must be used.

159 *Hiatula boeddinghausi* Lischke, 1870

(Fig. 110)

ORIGINAL DESCRIPTION: Lischke, C. E. 1870 Diagnosen neuer Meeres-Conchylien von Japan. Malakozologische Blatter, 17: 26, 27. (As *Soletellina boeddinghausi* Lischke, 1870) (Without illustration)

TYPE LOCALITY: Nagasaki, Japan

HABITAT: Sandflats; deeply buried in clean fine sand from intertidal zone to depth of 50 m

GENERAL DISTRIBUTION: Southern Korea and Japan; **JEJU:** Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: New species record for Jeju Island.

Genus: Nuttallia

160 *Nuttallia japonica* (L. A. Reeve 1857)

(Fig. 111)

ORIGINAL DESCRIPTION: Reeve, L. A. 1857: Monograph of the genus *Soletellina*. Conchologia Iconica; or, illustrations of the shells of molluscous animals, vol. 10. London, L. A. Reeve. Pl. 4, fig. 16. (As *Soletellina japonica* Deshayes in Reeve, 1857)

TYPE LOCALITY: Japan

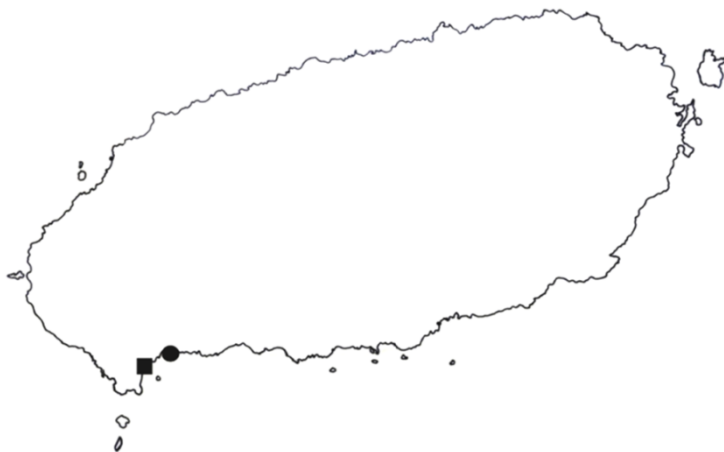


Fig. 109: Distribution of *D. cuneatus* (●) and *Heteroglypta contraria* (■)

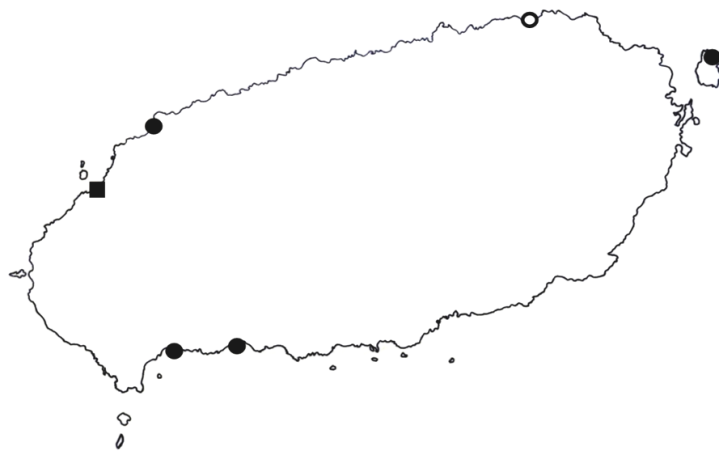


Fig. 110: Distribution of *H. atrata* (●) and *H. boeddinghausi* (■)

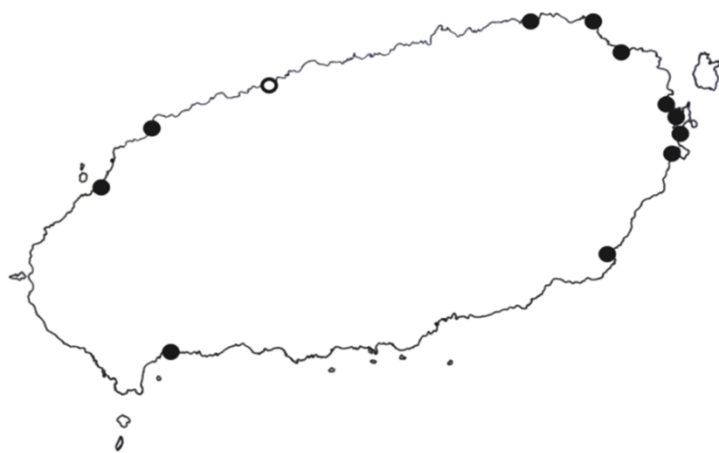


Fig. 111: Distribution of *N. japonica*

Genus: *Nuttallia* Dall, 1898

HABITAT: Sand and sandy mud, from intertidal zone to depth of 10 m

GENERAL DISTRIBUTION: Southern Kurile Islands and Sakhalin to Kyushu; **JEJU:** Iho, Gimnyeong, Haengwon, Sehwa, Jongdal-ri, Ojo-ri, Seongsan, Shinyang, Pyoseon, Hwasoon, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: This species has been misreported by a number of authors as *N. olivacea* (= *N. obscurata*) and, in turn, *N. olivacea* has been figured as *N. japonica* in some Japanese works. The distribution of *N. japonica* in Korea is unclear (Lutaenko and Noseworthy, 2012). *Soletellina olivacea* Lischke, 1874 non Jay 1857 is a synonym.

161 *Nuttallia obscurata* (L. A. Reeve 1857)

(Fig. 112)

ORIGINAL DESCRIPTION: Reeve, L. A. 1857: Monograph of the genus *Soletellina*. Conchologia Iconica; or, illustrations of the shells of molluscous animals, vol. 10. London, L. A. Reeve. Pl. 4; fig. 21. (As *Soletellina obscurata* Reeve, 1857)

TYPE LOCALITY: Unknown

HABITAT: Sandy mud, from intertidal zone to depth of 10 m

GENERAL DISTRIBUTION: Eastern Russia to Taiwan; **JEJU:** Gimnyeong, Hado, Jongdal-ri, Seongsan, Shinyang, Pyoseon, Hwasoon, Keumneung, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Similar to *N. japonica*, and often confused with that species. *Nuttallia olivacea* (Jay, 1856) is a synonym.

162 *Nuttallia cf. ezonis* Kuroda & Habe in Habe, 1955

(Fig. 112) (Plate 8: G-J)

ORIGINAL DESCRIPTION: Kuroda T. & Habe, T. *In* Habe, 1955. Publications of the Akkeshi Marine Biological Station, no. 4, pp. 17-18, pl. I, figs. 12, 13. (As *Nuttallia ezonis* Kuroda & Habe in Habe, 1955)

TYPE LOCALITY: Hokkaido, Japan

HABITAT: Fine sand and sandy mud, from the intertidal zone to depth of 6 m

GENERAL DISTRIBUTION: Sakhalin to Korea and Yellow Sea; **JEJU:** Handong, Shinyang

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Lowboreal

REMARKS: *Ezonis* is more fragile, more elongate, and the valves markedly unequal compared to *olivacea* Jay (= *obscurata* Reeve) (Huber, 2010). New species record for Jeju Island.

Family: SEMELIDAE Stoliczka, 1870

Subfamily: Semelinae Stoliczka, 1870

Genus: *Abra* Lamarck, 1818

163 *Abra philippinensis* (E. A. Smith 1885)

(Fig. 113)

ORIGINAL DESCRIPTION: Smith, E. A. 1885. Report on the Lamellibranchiata collected by HMS Challenger, 1873-76, Challenger Reports (Zoology) Vol. 13: 86, 87, pl. 5, figs. 4, 4b. (As *Semele (Abra) philippinensis* E. A. Smith 1885)

TYPE LOCALITY: Panay Island, Philippines

HABITAT: Sandy mud with plant debris at depth of 412-1240 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-West Pacific; **JEJU:** Hwasoon (Min *et al.*, 2004)

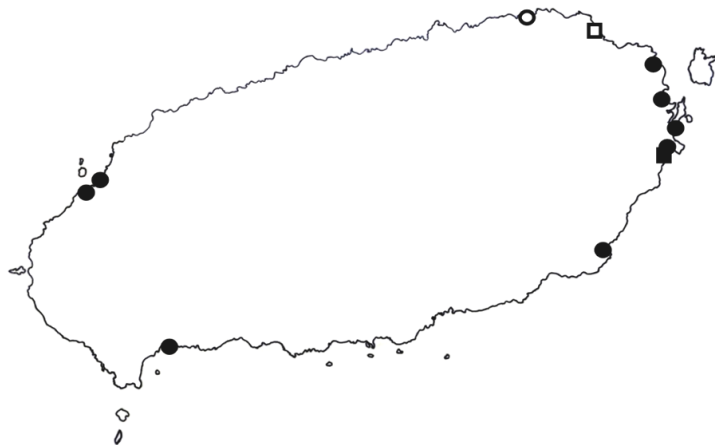


Fig. 112: Distribution of *N. obscurata* (●) and *N. cf. ezonis* (■)



Fig. 113: Distribution of *A. philippinensis* (●), *A. kinoshitai* (■), and *Abrina lunella* (▲)



Fig. 114: Distribution of *S. divaricatus*

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Huber (2010) stated that he could not detect significant differences between *philippinensis* and *maxima*, both of which have been reported by different authors from Japan. It appears that *maxima* was founded on large specimens of *philippinensis*. *Abra maxima* (Sowerby, III, 1894) is a synonym.

164 *Abra kinoshitai* Kuroda & Habe in Habe, 1958

(Fig. 113)

ORIGINAL DESCRIPTION: Habe, T. 1958. Report on the Mollusca chiefly collected by the S. S. Soyo-Maru of the Imperial Fisheries Experimental Station on the continental shelf bordering Japan during the years 1922-1930. Part 4. Lamellibranchia (2). *Seto Marine Biological Laboratory, Publications* [Kyoto University]. 7(1) 42, 43. (As *Abrina kinoshitai* Kuroda and Habe, 1958) (Without illustration)

TYPE LOCALITY: Off Miyazaki Prefecture, Kyushu, Japan

HABITAT: Sandy mud at depth of 50-500 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Yellow Sea; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Abra skinoshitai* Kuroda and Habe, 1958 [sic] is a misspelling.

165 *Abra lunella* (Gould, 1861)

(Fig. 113)

ORIGINAL DESCRIPTION: Gould, A.A. 1861. Descriptions of shells collected by the North Pacific Exploring Expedition (*continued*). Proceedings of the Boston Society of Natural History 8: 29. (As *Macoma lunella* Gould, 1861) (Without illustration)

TYPE LOCALITY: Taiwan, 24°N

HABITAT: Fine sand and mud, at depth of 10-210 m

GENERAL DISTRIBUTION: East Sea to Taiwan; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Family: SOLECURTIDAE d'Orbigny, 1846

Genus: Solecortus Blainville, 1824

166 *Solecortus divaricatus* (Lischke, 1869)

(Fig. 114) (Plate 7: E, F)

ORIGINAL DESCRIPTION: Lischke, C. E. 1869. Diagnosen neuer Meeres-Konchylien aus Japan. *Malakozoologische Blätter* 16: 108. (As *Macha divaricata* Lischke, 1869)

(Without illustration -- see Lischke, 1869, Jap. Meeres-Conch., pl. 10, figs. 1, 2.)

TYPE LOCALITY: Japan

HABITAT: Fine sand and sandy mud, from intertidal zone to depth of 80 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Taiwan; **JEJU:** Jeju-shi, Hamdok, Gimnyeong, Ojo-ri, Shinyang, Pyoseon, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: True *S. divaricatus* appears biogeographically restricted, confined to Japan, Taiwan, and the Yellow Sea. From this latter location the largest specimens are known (Huber, 2010).

Superfamily: Ungulinoidea Gray, 1854

Family UNGULINIDAE Gray, 1854

Genus: *Cycladicama* Valenciennes in Rousseau, 1854

167 *Cycladicama lunaris* (Yokoyama, 1927)

(Fig 115)

ORIGINAL DESCRIPTION: Yokoyama, M. 1927a. Mollusca from the Upper Musashino of Tokyo

and its suburbs. Journal of the Faculty of Science, Imperial University of Tokyo, Geology, Mineralogy, Geography, Seismology: 433. (As *Diplodonta lunaris* Yokoyama, 1927)

TYPE LOCALITY: Unavailable

HABITAT: Sandy-mud bottom at depth of 10-500 m

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Shinyang, Pyoseon, Munseom, Yerae, Sagyei, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Genus: *Diplodonta* Bronn, 1831

168 *Diplodonta sowerbyi* Kuroda & Habe, 1952

(Fig. 116)

ORIGINAL DESCRIPTION: Kuroda, T. and Habe, T. 1952. Checklist and Bibliography of the Recent Marine Mollusca of Japan. Tokyo: Stach. (As *Felaniella sowerbyi* Kuroda and Habe, 1952)

TYPE LOCALITY: Unavailable

HABITAT: Coral reefs, sand, and silt and mud, from intertidal zone to depth of 33 m.

GENERAL DISTRIBUTION: Korea; Indo-W. Pacific; **JEJU:** Hamdeok, Hado, Udo (Sanhosa), Pyoseon, Munseom, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: A moderately common species in beach drift, usually found with single valves.

169 *Diplodonta gouldi* Yokoyama, 1920

(Fig. 117)

ORIGINAL DESCRIPTION: Yokoyama, M. 1920. Fossils from the Miura Peninsula and its immediate north. Journal of the College of Science, Imperial University, Tokyo. Vol. 39 (6): 132, pl. 10; fig.5. (As *Diplodonta gouldi* Yokoyama, 1920)

TYPE LOCALITY: Miyata, Japan

HABITAT: Fine sand bottom, at depth of 10-50 m

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Haengwon, Handong, Jongdal-ri, Ojo-ri, Seongsan, Munseom, Hwasoon, Yongmeori, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

170 *Diplodonta japonica* (Pilsbry, 1895)

(Fig. 118)

ORIGINAL DESCRIPTION: Pilsbry, H. A. 1895. Catalogue of the Marine Mollusks of Japan with descriptions of new species and notes on others collected by Frederick Stearns. Detroit, F. Stearns: 132, 133, pl. 3; figs 6, 7. (As *Diplodonta* (?*semiaspera* var.) *japonica* Pilsbry, 1895).

TYPE LOCALITY: Unknown

HABITAT: Boring in mudstone from lower intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Iho, Sehwa, Udo (Hagosudong), Seeongsan, Jungmun, Hwasoon, Sagyei, Hyeopjae

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Phylctiderma japonicum* (Pilsbry, 1895) is a synonym.

Superfamily: Veneroidea Rafinesque, 1815

Family: VENERIDAE Rafinesque, 1815

Subfamily: Venerinae Rafinesque, 1815

Genus: *Venus* Linnaeus, 1758

171 *Venus (Ventricoloidea) cassinaeformis* (Yokoyama, 1926)

(Fig. 119) (Plate 10: E, F)

ORIGINAL DESCRIPTION: Yokoyama, M. (1926b) Tertiary Mollusca from southern Tôtômi. Journal of the Faculty of Science, Tokyo Imperial University, section 2, 1, 352, pl. 39, figs. 8-9. (As *Chione cassinaeformis* Yokoyama, 1926)

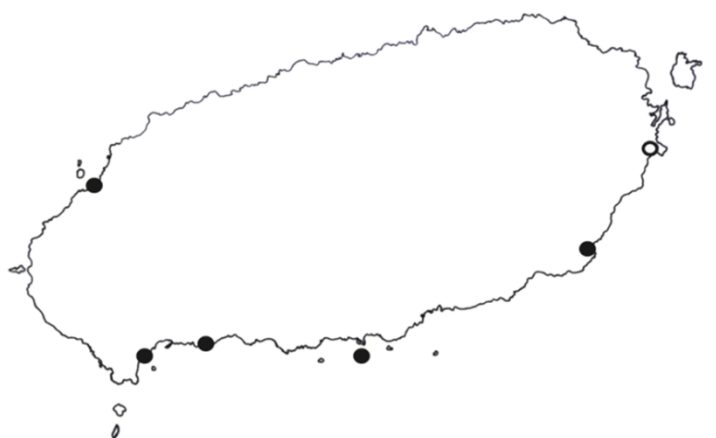


Fig. 115: Distribution of *C. lunaris*

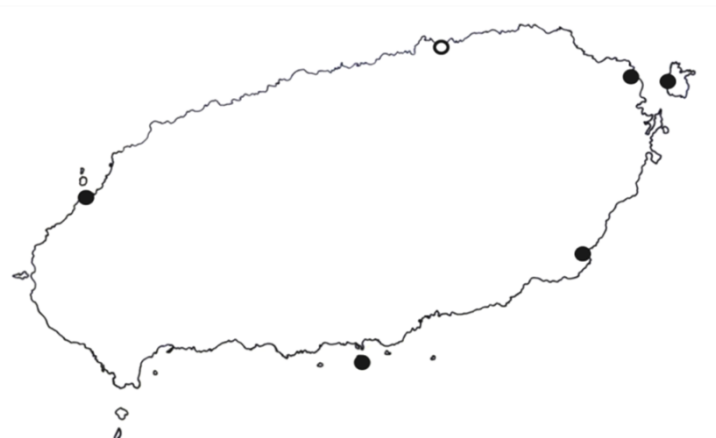


Fig. 116: Distribution of *D. sowerbyi*



Fig. 117: Distribution of *D. gouldi*

TYPE LOCALITY: Unavailable

HABITAT: Sand and coarse sand, also muddy substrate, at depth of 5-200 m

GENERAL DISTRIBUTION: Korea and Japan to Indo-W. Pacific; **JEJU:** East of Songsan, Shinyang, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Venus cassinaeformis* is the correct name for the compressed Japanese species. Higo *et al.* (1999) did not accept *V. foveolata* an Asian species. Reeve's *V. foveolata* (1864, vol. 14, sp. 11), despite an erroneous type locality, is quite similar to *cassinaeformis*. However, no *foveolata* type is available and none has been found; thus *Venus foveolata* is regarded as a *nom. dub.* *V. foveolata* Reeve, 1863 non Sowerby II, 1853 is a synonym.

Genus: *Globivenus* Coen, 1934

172 *Globivenus toreuma* (Gould, 1850)

(Fig. 120)

ORIGINAL DESCRIPTION: Gould, A.A. 1850. [Shells from the United States Exploring Expedition]. Proceedings of the Boston Society of Natural History 3(19): 277. (As *Venus toreuma* Gould, 1850) (Without illustration)

TYPE LOCALITY: Mangsi Island, Philippines

HABITAT: Coarse sand and fine gravel, and coral sand around rocks; from intertidal zone to depth of 54 m

GENERAL DISTRIBUTION: Japan to Indo-Pacific; Hawaii; **JEJU:** Pyoseon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

Genus: *Placamen* Iredale, 1925

173 *Placamen lamellata* (Röding, 1798)

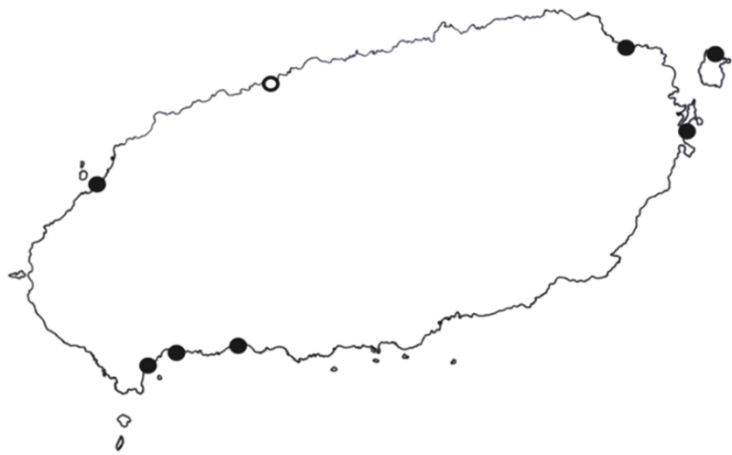


Fig. 118: Distribution of *D. japonica*



Fig. 119: Distribution of *V. cassinaeformis*

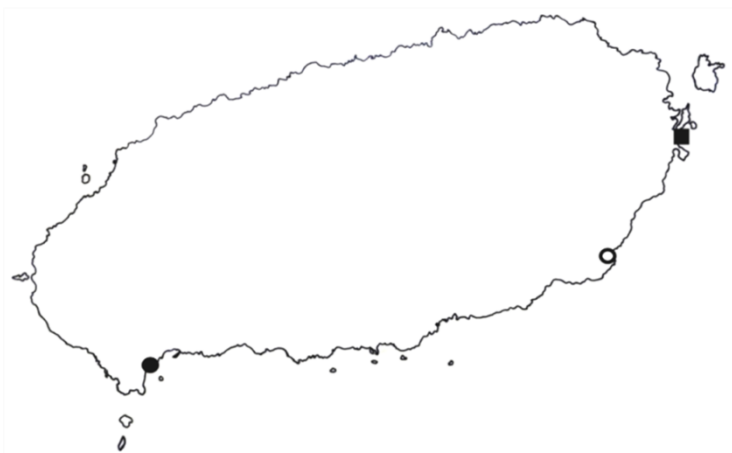


Fig. 120: Distribution of *G. toreuma* (●) and *Placamen lamellata* (■)

(Fig. 120)

ORIGINAL DESCRIPTION: Röding, P. F. (1798) *Museum Boltenianum sive catalogus cimeliorum e tribus regnis naturae quae olim collegerat Joa. Fried Bolten, M.D.p.d. Pars Secunda continens conchylia sive testacea univalvia, bivalvia & multivalvia*. Johan. Christi. Trappii.,Hamburgi. p. 183. (As *Venus lamellatum* Roding, 1798) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Various sandy or muddy substrates, from intertidal zone to depth of 100 m

GENERAL DISTRIBUTION: Southern Korea and southern Japan to tropical West Pacific; western Indian Ocean; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: The specimen figured by Okutani (2000) as *P. tiara* is actually *P. lamellosum* (Roding, 1798. (Huber, 2010). *Placamen tiara* (Dillwyn, 1817) is a synonym.

Genus: *Timoclea* T. Brown, 1827

174 *Timoclea marica* (Linnaeus 1758)

(Fig. 121)

ORIGINAL DESCRIPTION: Linnaeus, C. 1758. *Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Tomus I. Editio decima, reformata. Holmiæ. (Salvius). 685. (As *Venus marica* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Unknown (Caribbean – Linnaeus (1758) is erroneous) (Huber, 2010)

HABITAT: Shallowly buried in sand flats and sea grass beds, from intertidal zone to depth of 27 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-Pacific; **JEJU:** Iho, Udo (Hagosudong), Jongdal-ri, Seongsan, Pyoseon, Hwasoon, Sagyei, Keumneung, Hyeopjae,

Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Timoclea (Glycydonta) marica* (Linnaeus, 1758); *Glycydonta marica* (Linnaeus, 1758); *Veremolpa marica* (Linnaeus, 1758) are synonyms.

175 *Timoclea costellifera* (Adams & Reeve 1850)

(Fig. 121)

ORIGINAL DESCRIPTION: Adams, A. & Reeve, L. 1850. Mollusca in The Zoology of the Voyage of H.M.S. Samarang, under the command of Captain Sir Edward Belcher C. B., F. R. A. S., F. G. S., during the years 1843-1846. Edited by Arthur Adams. London: Reeve and Benham, 1848-1850. 84, pl. 21; fig. 18. (As *Venus costellifera* Adams and Reeve, 1850)

TYPE LOCALITY: Philippines

HABITAT: Coarse sand and among gravel and coral rubble, from intertidal zone to depth of 80 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-W. Pacific; South Africa (Check); **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Timoclea (Chioneryx) costellifera* (A. Adams and Reeve, 1850); *Veremolpa costellifera* (A. Adams and Reeve, 1850) are synonyms.

Genus: *Leukoma* Römer, 1857

176 *Leukoma jedoensis* (C. E. Lischke 1874)

(Fig. 122)

ORIGINAL DESCRIPTION: Lischke, C. E. 1874. Japanische Meers-Conchylien. Ein Beitrag zur Kenntnis der Mollusken Japans, mit besonderer Rücksicht auf die Geographische

Verbreitung derselben, 3: 84, pl. 7; figs. 1-9. (As *Venus jedoensis* Lischke, 1874)

TYPE LOCALITY: Tokyo, Japan

HABITAT: Coarse sand with stones, also sandy mud substrate, from intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: East Sea to Yellow Sea; **JEJU:** Jeju-shi, Jongdal-ri, Seongsan

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Protothaca (Notochione) jedoensis* (Lischke, 1874) is a synonym.

Subfamily: Callocardiinae Dall, 1895

Genus: *Pitar* Römer, 1857

177 *Pitar inflatus* (G. B. Sowerby II, 1851)

(Fig. 123)

ORIGINAL DESCRIPTION: Sowerby, G. B. II. 1851. Thesaurus Conchyliorum, or Monograph of Genera of Shells. Vol. II. Monograph of Genus *Cytherea* - Fam. Veneridae - p. 637, pl. CXXXIII (133); figs. 127, 128 (Vol. II (plates)) (As *Cytherea inflata* Sowerby II, 1851)

TYPE LOCALITY: Malaku, Indonesia; Cebu, Philippines

HABITAT: Sandy mud with coral debris, from intertidal zone to depth of 40 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Tropical West Pacific; **JEJU:** Jeju-shi, Shinyang, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Min (2004) includes *P. affine* in the Korean fauna; however, according to Huber, it occurs only in the Indian Ocean. Okutani (2000) includes a figure (31) with the

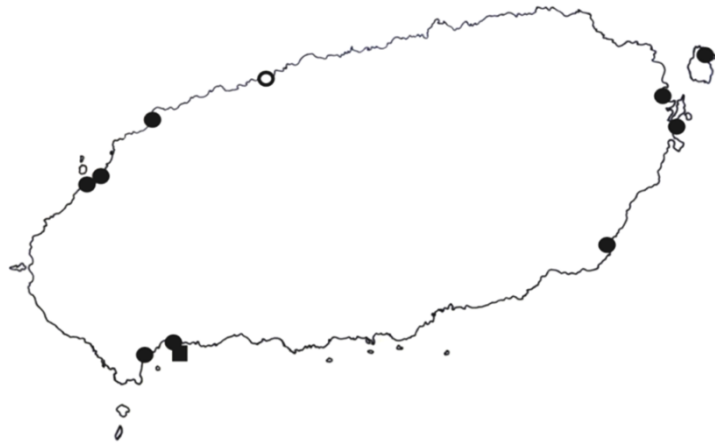


Fig. 121: Distribution of *T. marica* (●) and *T. costellifera* (■)



Fig. 122: Distribution of *L. jedoensis*

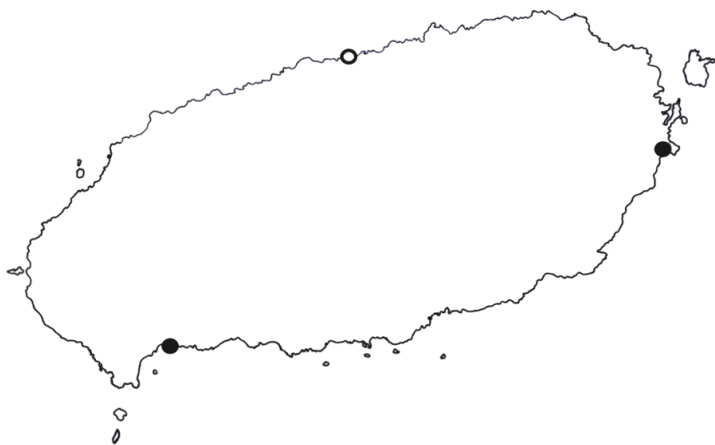


Fig. 123: Distribution of *P. inflatus*

synonym *P. variegatus* Kuroda & Habe in Kuroda *et al.*, 1971. “*P. affinis* does not occur in the Philippines or in Australia. Instead, the large, rounded, smooth *Pitar* named “*affinis*” by most authors is instead *Cytherea inflata* Sowerby II, 1851” (Huber, 2010). *P. affinis* auctt. non Gmelin, 1791; *Pitar variegatum* Kuroda & Habe in Kuroda *et al.*, 1971 are synonyms.

178 *Pitar (Pitar) sulfureus* H. A. Pilsbry, 1904

(Fig. 124)

ORIGINAL DESCRIPTION: Pilsbry, H.A., 1904. New Japanese Marine Mollusca: Pelecypoda. Proceedings of the Academy of Natural Sciences of Philadelphia 56: 553, 554, pl. 39; figs 7-9. (As *Pitar sulfurea* Pilsbry, 1904)

TYPE LOCALITY: Awaji Island, southern Japan

HABITAT: In bays, on sandy and muddy substrate, from intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Southern Korea and Japan to tropical West Pacific; **JEJU:** Seongsan, Jungmun, Sagyei, Hamo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Pitar (Pitarina) sulfureum* Pilsbry, 1904 is a synonym.

Genus: *Callista* Poli, 1791

179 *Callista (Callista) chinensis* ("Chemnitz" Holten 1802)

(Fig. 125)

ORIGINAL DESCRIPTION: Holten, H. S. 1802. Enumeratio systematica conchyliorum beat J. H. Chemnitzii quondam ecclesiae Zebaothi Havniae pastoris, plurim societum sodialis p. p. quae publica auctione venduntur die 7me Decembris ano pres. Copenhagen: K. H. Scidelini, 20. (As *Venus chinensis* Holten, 1802) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Fine sandy bottom, at depth of 3-50 m

GENERAL DISTRIBUTION): Korea and Northern Japan to South China Sea; **JEJU:**
Hwasoon, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

180 *Callista (Callista) pilsbryi* Habe, 1960

(Fig. 125)

ORIGINAL DESCRIPTION: Habe, T. 1960a. New species of molluscs from the Amakusa Marine Biological Laboratory, Reihoku-cho, Amakusa, Kumamoto Pref., Japan. Publications of the Seto Marine Biological Laboratory 8(2): 291. (As *Callista pilsbryi* Habe, 1960) (Without illustration)

TYPE LOCALITY: Tomioka, Honshu, Japan

HABITAT: In coral rubble, coarse sandy substrate, at depth of 10-100 m

GENERAL DISTRIBUTION: East Sea to South China Sea; **JEJU:** Supseom, Seogwipo, Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Huber (2010) states that *Callista pilsbryi* has been described from W. Kyushu. However, Habe (1960) includes this area only in its distribution range, stating: “West coast of Kyushu, Shikoku, and Pacific coast of Honshu”, with Tomioka as the type locality.

Genus: *Saxidomus* Conrad, 1837

181 *Saxidomus purpurata* (Sowerby II, 1852)

(Fig. 126)

ORIGINAL DESCRIPTION: Sowerby, G. B. II. 1851. Thesaurus Conchyliorum, or Monograph of Genera of Shells. Vol. II. Monograph of Genus Tapes (Fam. Veneridae), p. 692,



Fig. 124: Distribution of *P. sulfureus*

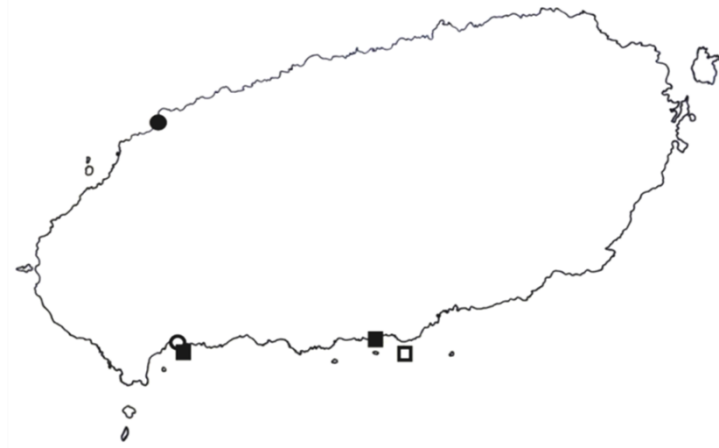


Fig. 125: Distribution of *C. chinensis* (●) and *C. pilsbryi* (■)

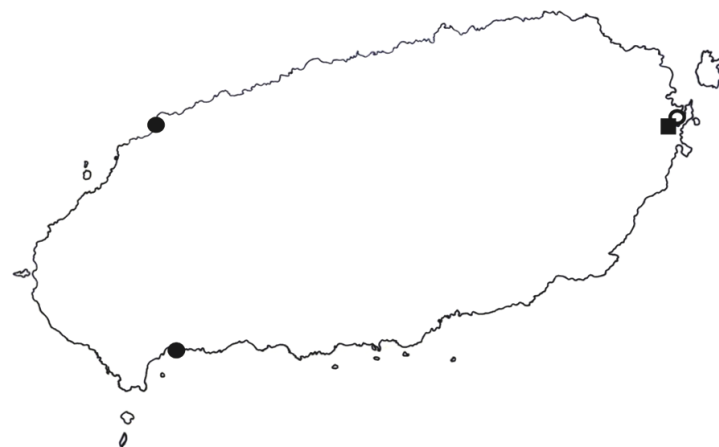


Fig. 126: Distribution of *D. (A.) japonica* (●) and *S. purpuratus* (■)

pl. 150; figs. 124, 125. (As *Tapes purpurata* Sowerby II, 1852)

TYPE LOCALITY: Unknown (Karachi, Pakistan (Sowerby) is erroneous) (Huber, 2010)

HABITAT: Mud, sandy mud, and gravel, from intertidal zone to depth of 50 m

GENERAL DISTRIBUTION: East Sea to Yellow Sea, **JEJU:** Ojo-ri (Choi *et al.*, 2000)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Subfamily: Dosiniinae Deshayes, 1853

Genus: *Dosinia* Scopoli, 1777

182 *Dosinia (Asa) japonica* (L. A. Reeve 1850)

(Fig. 126)

ORIGINAL DESCRIPTION: Reeve, L. A. 1850. Monograph of the genus *Artemis* In Conchologica Iconica: or, Illustrations of the Shells of Molluscous Animals, vol. 6. Lovell Reeve, London: 10 pls. with captions [April, 1850], pl. 3; fig. 17. (As *Artemis japonicus* Reeve, 1850)

TYPE LOCALITY: Ibusuki, Kyushu, Japan

HABITAT: Sandy substrate, from intertidal zone to depth of 70 m

GENERAL DISTRIBUTION: East Sea to East China Sea; **JEJU:** Ojo-ri, Hwasoon, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Phacosoma japonicus* (Reeve, 1850) is a synonym.

183 *Dosinia (Asa) troscheli* C. E. Lischke, 1873

(Fig. 127)

ORIGINAL DESCRIPTION: Lischke, C. E. 1873. Diagnosen neuer Meeres-Conchylien aus Japan. *Malakozoologische Blatter*, 21: 24-25. (As *Dosinia troscheli* Lischke, 1873)

(Without illustration)

TYPE LOCALITY: Southern Japan

HABITAT: Sand, at depth of 10-35 m

GENERAL DISTRIBUTION: Korea and Japan to South China Sea; **JEJU:** Seongsan, Beophwan, Gangjeong, Hwasoon, Sagyei, Kwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Phacosoma troscheli* (Lischke, 1873) is a synonym.

184 *Dosinia (Dosinella) cf. angulosa (Philippi, 1847)*

(Fig. 127)

ORIGINAL DESCRIPTION Philippi, R.A. 1847. Abbildungen und Beschreibungen neuer oder wenig gekannter Conchylien. Cassel: Theodor Fischer. Vol.2, p. 229, pl. 6, fig. 1. (As *Cytherea (Artemis) angulosa* Philippi, 1847)

TYPE LOCALITY: Off North Borneo

HABITAT: On coarse sand, and coral sand, at depths of 3-25 m

GENERAL DISTRIBUTION: Korea and Japan; East China Sea to Indonesia; **JEJU:** Sagyei, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Min, *et al.* (2004) includes *Pardosinia amphidesmoides* from Jeju Island. Huber (2010) gives a range for this species from East Africa to the Southwestern Pacific; Okutani (2000) does not include this species. The inclusion of *P. amphidesmoides* in Min *et al.* may be a misidentification of *D. (D). angulosa*, which resembles the former species. *Dosinella angulosa* (Philippi, 1847) is a synonym.

185 *Dosinia (Bonartemis) histrio* (Gmelin, 1791)

(Fig. 128)

ORIGINAL DESCRIPTION: Gmelin, J. F. 1791. Caroli a Linné, systema naturae. Lipsiae (Leipzig), (Beer). 13. Tom. I. Pars VI. (Vol. 1, part 6), 3287. (As *Venus histrio* Gmelin, 1791) (Without illustration)

TYPE LOCALITY: India

HABITAT: On medium and coarse sand, often in coral reefs, at depth of 3-60 m

GENERAL DISTRIBUTION: East Sea to Indo-West Pacific; **JEJU:** Sehwa, Udo (Hagosudong), Seongsan, Shinyang, Jungmun, Yerae, Hwasoon, Yongmeori, Sagye, Hamo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: This species is similar to *B. iwakawai*; the latter species has thin commarginal lamellae as compared to *B. histrio*, which has commarginal ribs. *Bonartemis* is used for the colorful, lamellate Indo-Pacific species. *Bornatemis histrio* (Gmelin, 1791) is a synonym.

186 *Dosinia (Bonartemis) iwakawai* Oyama & Habe in Habe, 1961

(Fig. 129) (Plate 10: G, H)

ORIGINAL DESCRIPTION: Oyama, K. and Habe, T. in Habe, 1962, Colored Illustrations of the Shells of Japan 2 [2]: 131, App. 38, pl. 59. fig. 11. (As *Dosinia (Bonartemis) iwakawai*, Oyama & Habe, 1961)

TYPE LOCALITY: Ibusuki, Kyushu, Japan

HABITAT: Coarse sand and coral sand substrate, from intertidal zone to depth of 50 m

GENERAL DISTRIBUTION: Southern Korea and Japan to East China Sea; **JEJU:** Seongsan, Shinyang, Bomok, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Bonartemis histrio iwakawai* Oyama and Habe, 1971 is a synonym.

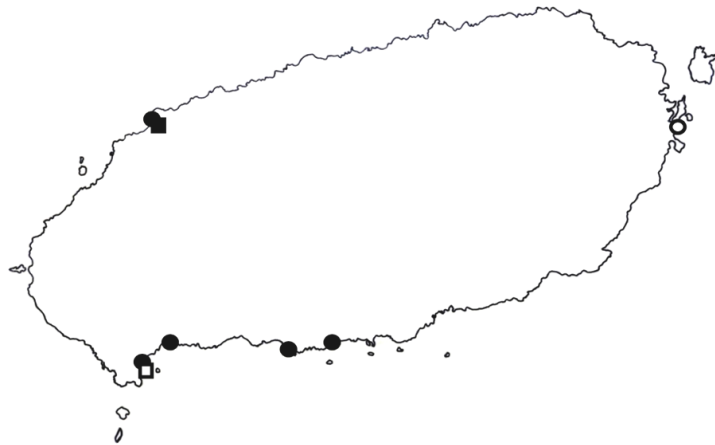


Fig. 127: Distribution of *D. (A.) troscheli* (●) and *D. (D.) cf. angulosa* (■)

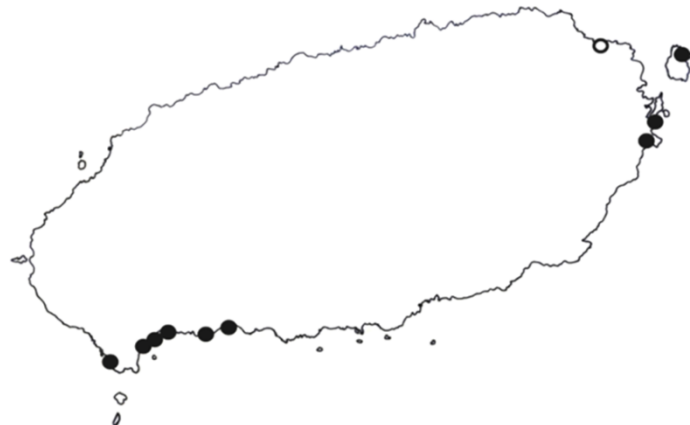


Fig. 128: Distribution of *D. (B.) histrio*

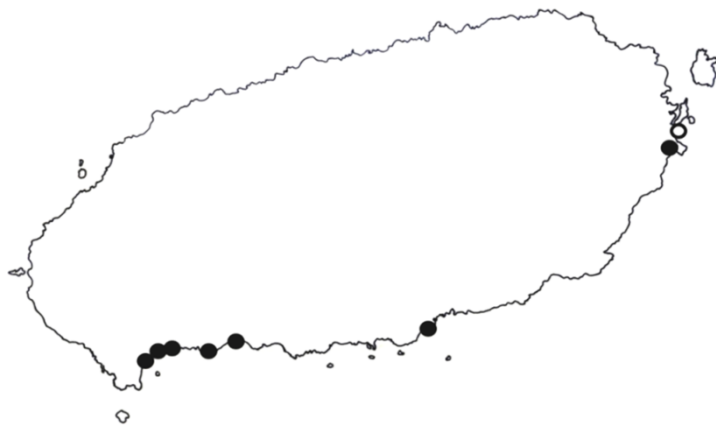


Fig. 129: Distribution of *D. (B.) iwakawai*

Subfamily: Tapetinae Gray, 1851

Genus: *Venerupis* Lamarck, 1818

187 *Venerupis (Ruditapes) philippinarum* (Adams & Reeve 1850)

(Fig. 130)

ORIGINAL DESCRIPTION: Adams, A. & Reeve, L. 1850. Mollusca in The Zoology of the Voyage of H.M.S. Samarang, under the command of Captain Sir Edward Belcher, C. B., F. R. A. S., F. G. S., during the years 1843-1846. Edited by Arthur Adams. London: Reeve and Benham, 1848-1850. 79, pl. 22; fig. 10. (*Venus philippinarum* Adams & Reeve, 1850)

TYPE LOCALITY: “Philippine Archipelago” – erroneous (Higo *et al.*, 1999)

HABITAT: Bays, estuaries, and protected coasts; shallowly burrowed in coarse sand or mud with gravel, from the intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Sea of Okhotsk to South China Sea; Hawaii, Western and Southern Europe, western North America (introduced); **JEJU:** Iho, Jeju-shi, Samyang, Hamdeok Gimnyeong Wolpyeong Haengwon Handong Sehwa Udo (Sanhosa), Jongdal-ri, Ojo-ri, Seongsan, Seopjikoji, Shinyang, Pyoseon, Bomok, Munseom, Seogundo, Gangjeong ,Jungmun, Yerae, Daepyeong, Hwasoon, Yongmeori, Sagyei, Hyungjaeseom,, Hamo, Keumneung, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: “Despite the many *philippinarum* records throughout the IND [Indo-Pacific], also in most recent literature, *philippinarum* is a temperate Japanese and Chinese species, introduced now in various other parts of the world, and also globally commercially sold as food. As stated by Higo *et al.* (1999) the original type locality “Philippine Archipelago” could never be verified and is erroneous. No true *philippinarum* was found on the many Philippine Islands visited, nor were any seen reliably from there. Many of these *philippinarum* records represent instead the tropical *aspera*” (Huber, 2010). *Ruditapes philippinarum* (A. Adams

and Reeve, 1850) is a synonym.

188 *Venerupis (Ruditapes) aspera* (Quoy & Gaimard 1835)

(Fig. 131)

ORIGINAL DESCRIPTION: Quoy, J. R. C. & Gaimard J. P. 1835. Voyage de découvertes de l’Astrolabe exécuté par ordre du Roi, pendant les années 1826–1827–1828–1829, sur le commandement de M. J. Dumont d’Urville. J. Tastu, Paris. Zoologie, Mollusques. Volume 3: 524, pl. 84; figs. 3, 4. (As *Venus aspera* Quoy & Gaimard, 1835)

TYPE LOCALITY: Port Dorey, New Guinea

HABITAT: Fine to coarse sandy or gravelly substrate, from intertidal zone to depth of 5 m

GENERAL DISTRIBUTION: Korea and Japan to Indo-Pacific; **JEJU:** Iho, Jeju-shi, Samyang Gimnyeong, Wolpyeong, Haengwon, Handong, Sehwa, Hado, Udo (Hagosudong), Udo (Sanhosa), Jongdal-ri, Ojo-ri, Seongsan, Shinyang, Pyoseon, Wimi, Munseom, Seogundo, Gangjeong, Jungmun, Yerae, Daepyeong, Hwasoon, Yongmeori, Songaksan, Gapado, Hamo, Sinchang, Keumneung, Biyangdo, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *R. bruguieri* appears restricted to the Indian Ocean. The pallial sinus is generally deeper than in *aspera*, extending to or surpassing the midline; the shell is generally more elongate. From Japan and Australia only *R. aspera* is known. The well known *Venus variegata* Sowerby II, 1852 from the Philippines is preoccupied by *Venus variegata* Gmelin, 1791 which represents the European *Ruditapes*. Thus, the valid earliest name for this well-known but preoccupied *variegata* is *Venerupis (Ruditapes) aspera* (Quoy & Gaimard 1835) (Huber, 2014). *Ruditapes bruguieri* (Min, 2004 non Hanley, 1845). *Ruditapes variegata*. (Sowerby II, 1852) are synonyms.

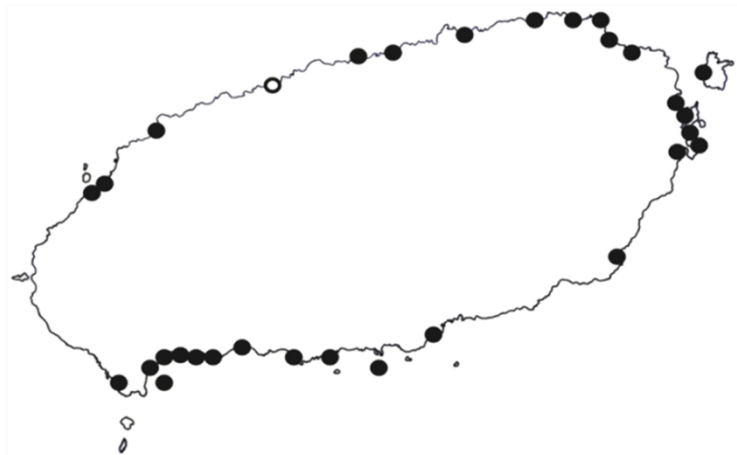


Fig. 130: Distribution of *V. (R.) philippinarum*

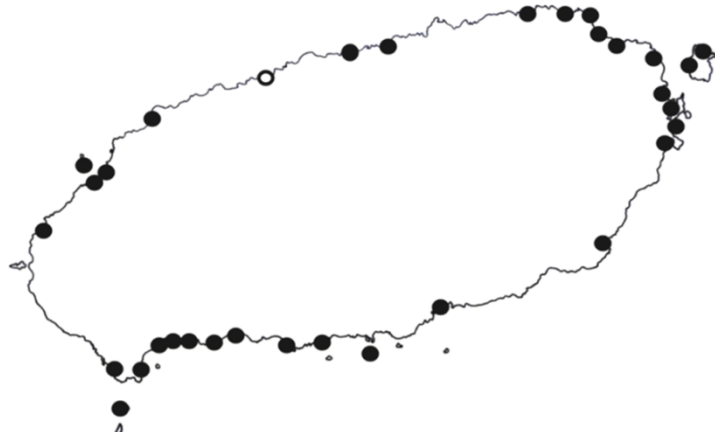


Fig. 131: Distribution of *V. (R.) aspera*



Fig. 132: Distribution of *P. euglypta* (●) and *P. schnelliana* (■)

Genus: *Paphia* Röding, 1798

189 *Paphia euglypta* (Philippi, 1847)

(Fig. 132)

ORIGINAL DESCRIPTION: Philippi R. A. 1847. Testaceorum novorum centuria. *Zeitschrift für Malakozoologie*, 4: 89. (As *Venus euglypta* Philippi, 1847)

TYPE LOCALITY: Unknown

HABITAT: Fine sand and mud, at depth of 10-40 m

GENERAL DISTRIBUTION: East Sea to South China Sea; **JEJU:** Beophwan, Gangjeong, Biyangdo (Choi *et al.*, 2000)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

190 *Paphia schnelliana* (Dunker, 1865)

(Fig. 132)

ORIGINAL DESCRIPTION: Dunker, W .R. 1858-1878. *Novitates conchologicae. Abbildung und Beschreibung neuer Conchylien. 11. Abtheilung. Meeres-Conchylien.* Cassel (Fischer) 75, pl. 25; figs. 7-9) (As *Tapes schnellianus* Dunker, 1865)

TYPE LOCALITY: Western Kyushu, Japan

HABITAT: Fine sand and mud, at depth of 10-160 m;

GENERAL DISTRIBUTION: Southern Korea and Japan to East China Sea, **JEJU:** Ojo-ri (Choi *et al.*, 2000)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

191 *Paphia amabilis* (Philippi, 1847)

(Fig. 133)

ORIGINAL DESCRIPTION: Philippi R. A. 1847. Testaceorum novorum centuria.

Zeitschrift fur Malakozoo logie, **4**: (June, 1847), 90. 91. (As *Venus amabilis* Philippi, 1847)

(Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Fine sand, at depth of 10–80 m

GENERAL DISTRIBUTION: East Sea to East China Sea; **JEJU:** East of Seongsan, Seongsan, Bomok, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

192 *Paphia vernicosa* (Gould 1861)

(Fig. 134)

ORIGINAL DESCRIPTION: Gould, A.A. 1861. Descriptions of shells collected by the North Pacific Exploring Expedition (*continued*). Proceedings of the Boston Society of Natural History 8: 30. (As *Tapes vernicosa* Gould 1861) (Without illustration)

TYPE LOCALITY: S. Kyushu-S. Hokkaido, Japan

HABITAT: Shallowly burrowed in coarse sand, at depth of 5-50 m

GENERAL DISTRIBUTION: East Sea to Yellow Sea; **JEJU:** Jongdal-ri, Seongsan, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Genus: *Gomphinella* Marwick, 1927

193 *Gomphinella neastartoides* (Yokoyama 1922)

(Fig. 135)

ORIGINAL DESCRIPTION: Yokoyama, M., 1922a. Fossils from the upper Musashino of Kazusa and Shimosa. Journal of the College of Science, Imperial University of Tokyo, vol. 44, art. 1, 149, pl. 11, figs. 9, 10. (As *Venus neastartoides* Yokoyama, 1922)

TYPE LOCALITY: Boso Peninsula (Kazusa and Shimosa), Honshu, Japan

HABITAT: Sand, at depth of 10-70 m

GENERAL DISTRIBUTION: Southern Korea (Jeju Island) and Japan to East China Sea;

JEJU: Handong, Seongsan, Bomok, Jungmun, Hwasoon, Sagyei, Hamo, Biyangdo, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *G. neastartoides* is smaller and more elongate than *G. aequilatera*, with lower umbones and different pattern, often with two complete or broken radials; however, dentition and pallial sinus are quite similar to the latter species. *G. neastartoides* is also known from off S. Korea (Huber, 2014). *Gomphina (Gomphina) neastartoides* (Yokoyama, 1922) is a synonym.

Genus: *Gomphina* Mörch, 1853

194 *Gomphina aequilatera* (G. B. Sowerby I, 1825)

(Fig. 136) (Plate 10: A-D)

ORIGINAL DESCRIPTION: Sowerby, G. B., I. 1825b. *A Catalogue of the shells contained in the collection of the late Earl of Tankerville arranged according to the Lamarckian Conchological System; together with an appendix, containing descriptions of many new species. Illustrated with several coloured plates.* London. 12. (As *Donax aequilatera* G. B. Sowerby I 1825) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Fine and medium sand substrate, from intertidal zone to depth of 60m

GENERAL DISTRIBUTION: East Sea to East China Sea; **JEJU:** Iho, Samyang, Hamdeok, Gimnyeong, Wolpyeong, Hado, Udo (Hagosudong), Udo (Geomeollae), Jongdal-ri, Seongsan, Seopjikoji, Shinyang, Pyoseon, Bomok, Jungmun, Hwasoon, Yongmeori, Sagyei, Hamo, Keumneung, Hyeopjae, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

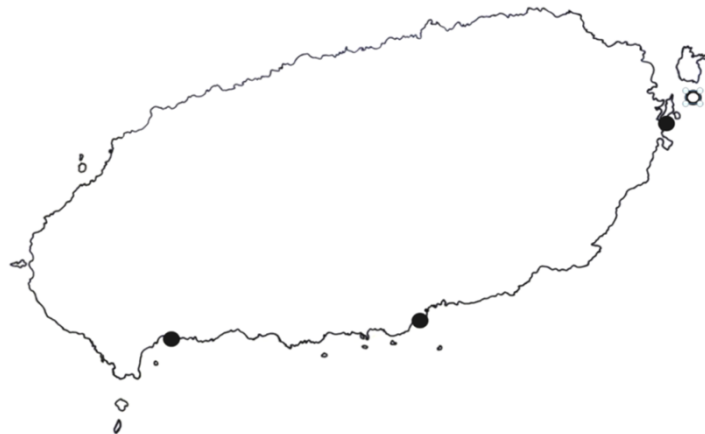


Fig. 133: Distribution of *P. amabilis*



Fig. 134: Distribution of *P. vernicosa*

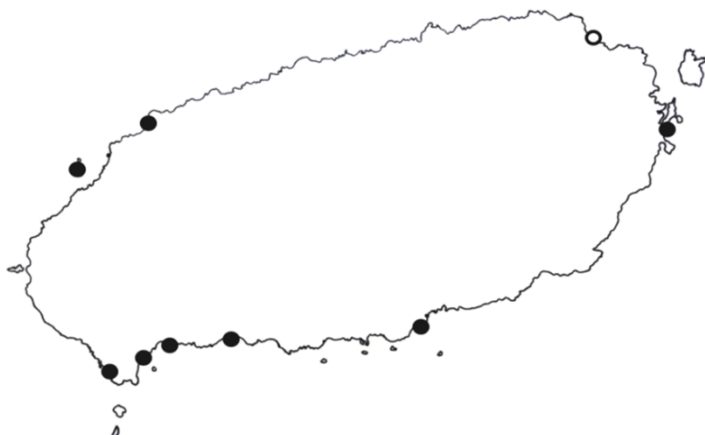


Fig. 135: Distribution of *G. neastartoides*

REMARKS: Although some authors have recognized two consistent forms, it appears that only one highly variable species in shape, thickness, color, and ribbing, *G. aequilatera* Sowerby I, 1825, occurs in and around Japanese waters (Huber, 2010). *Gomphina* (*Macridiscus*) *veneriformis* (Lamarck, 1818); *Gomphina melanaegis*, Römer, 1861 are synonyms.

Genus: *Irus* F. C. Schmidt, 1818

195 *Irus irus* (Linnaeus, 1758)

(Fig. 137)

ORIGINAL DESCRIPTION: Linnaeus, C. 1758. Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Holmiæ. (Salvius). 683. (As *Donax irus* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Mediterranean Sea

HABITAT: Nestling or byssally attached in crevices, coral heads, holes in rocks, and also in roots of *Laminaria*, from intertidal zone to depth of 40 m

GENERAL DISTRIBUTION: Korea and Japan to Indo-Pacific; Western Europe and Mediterranean to South Africa; **JEJU:** Iho, Hamdeok, Gimnyeong, Wolpyeong, Haengwon, Handong, Sehwa, Hado, Udo (Hagosudong), Udo (Sanhosa), Jongdal-ri, Seongsan, Shinyang, Pyoseon, Bomok, Munseom, Seogundo, Gangjeong, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei, Songaksan, Hamo, Keumneung, Hyeopjae, Gwakji,

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Irus macrophyllus* (Deshayes, 1853) is a synonym.

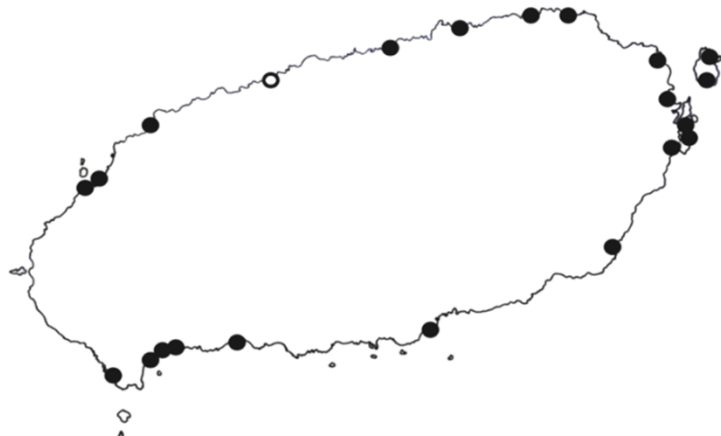


Fig. 136: Distribution of *G. aequilatera*

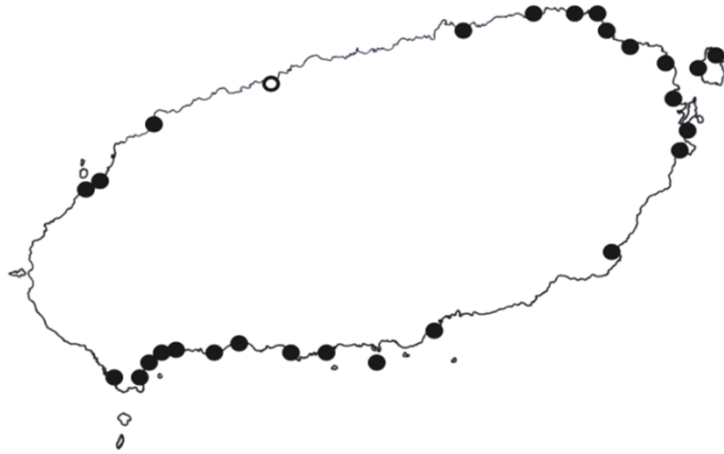


Fig. 137: Distribution of *I. irus*

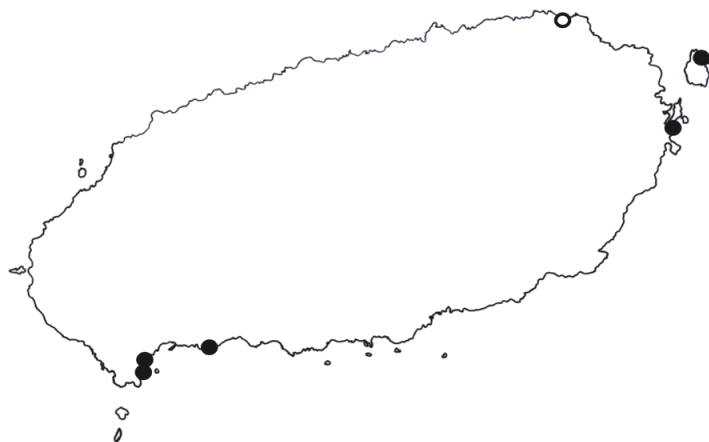


Fig. 138: Distribution of *I. mitis*

196 *Irus mitis* (Deshayes, 1853)

(Fig. 138)

ORIGINAL DESCRIPTION: Deshayes G.P. 1853. Descriptions of new species of shells in the collection of Mr. Cuming. *Proceedings of the Zoological Society of London*, 21: 5. (As *Venerupis mitis* Deshayes, 1853) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Nestling in holes bored by pholad species in soft rocks, sand, and mudstone, from intertidal zone to depth of 1 m

GENERAL DISTRIBUTION: East Sea to East China Sea; **JEJU:** Wolpyeong, Udo (Hagosudong), Seongsan, Yerae, Sagyei, Songaksan

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Similar to *Irus irus* and may be confused with this species; the concentric lamellae are more evenly spaced in *I. irus*.

197 *Irus ishibashianus* Kuroda and Habe, 1952

(Fig. 139)

ORIGINAL DESCRIPTION: Kuroda, T. and Habe, T. 1952. Checklist and Bibliography of the Recent Marine Mollusca of Japan. L.W. Stach, Tokyo. 21. (As *Irus ishibashianus* Kuroda and Habe, 1952) (Without illustration)

TYPE LOCALITY: Yokosuka, Honshu, Japan (fossil and living). (With the introduction of a new name for the species attributed to Linnaeus, this area became the type locality of *I. ishibashianus*.)

HABITAT: Nestling in holes in soft rock, mudstone, and coral stones, from intertidal zone to depth of 6 m

GENERAL DISTRIBUTION: Eastern Russia to Korea and Japan; **JEJU:** Wolpyeong, Jongdal-ri, Seongsan, Bomok, Munseom, Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: Yokoyama (1920) recognized *Venerupis irus*, Linnaeus, 1758) from the Upper Musashino fossil bed, and also redescribed it (Yokoyama, 1924). However, Kuroda and Habe (1952) regarded it as different from Linnaeus' species, and renamed it as *Irus ishibashianus*. *Venerupis irus* Yokoyama, 1920 non Linnaeus, 1758 is a synonym.

Subfamily: Cyclininae Frizzell, 1936

Genus: *Cyclina* Deshayes, 1850

198 *Cyclina sinensis* (Gmelin, 1791)

(Fig. 140)

ORIGINAL DESCRIPTION: Gmelin, J. F. 1791. Caroli a Linné, systema naturae. Lipsiae (Leipzig), (Beer). 13. Tom. I. Pars VI. (Vol. 1, part 6) p. 3285. (As *Venus sinensis* Gmelin, 1791) (Without illustration)

TYPE LOCALITY: China

HABITAT: Muddy sand, from intertidal zone to depth of-20 m

GENERAL DISTRIBUTION: Korea and Northern Japan to South China Sea; **JEJU:** Hado, Jongdal-ri, Ojo-ri, Shinyang, Yongmeori, Hamo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *C. sinensis* is common, quite variable in shape, and moderately variable in color. It has a radial sculpture, and is usually purplish at the finely denticulate margin. It is a small species, generally 30-40 mm. in length.

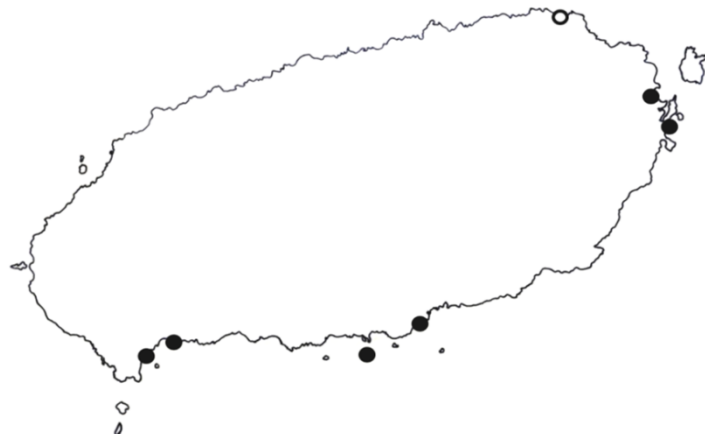


Fig. 139: Distribution of *I. ishibashianus*



Fig. 140: Distribution of *C. sinensis* (●) and *P. habei* (■)

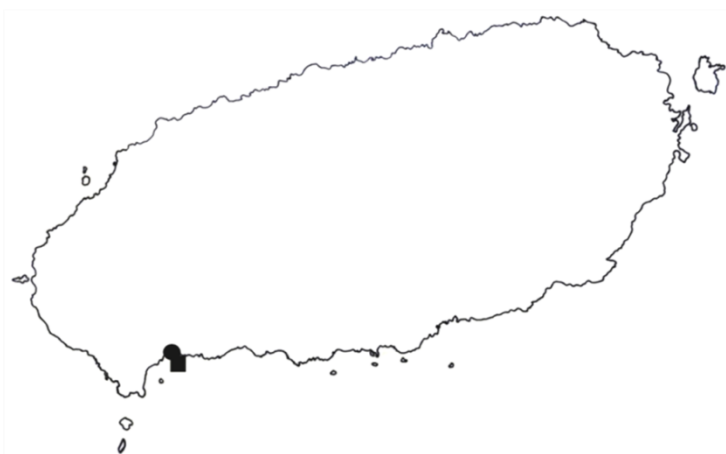


Fig. 141: Distribution of *S. coreanica* (●) and *Paramya recluzi* (■)

Subfamily: Petricolinae d'Orbigny, 1840

Genus: *Petricola* Lamarck, 1801

199 *Petricola (Petricola) habei* (Huber, 2010)

(Fig. 140)

ORIGINAL DESCRIPTION: Huber M. (2010) Formal description and designation of holotypes for 23 bivalve species and type species for 2 bivalve genera (Mollusca: Bivalvia). *Conchylia* 41(1): 1-32. (As *Petricola (Petricola) habei* (Huber, 2010))

TYPE LOCALITY: Suiken, Wakayama Prefecture

HABITAT: Burrowing in soft mudstone and coral debris, from intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Northern Japan to Yellow Sea; **JEJU:** Shinyang (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Coan (1997, type fig. 9) demonstrated that *Venerupis mirabilis* Deshayes, 1853, described from Monterey, is indeed living in California and a synonym of *Petricola carditoides*. He stated that the species referred to as *P. mirabilis* by Japanese authors was distinct. Coan also considered *Pseudoirus* a synonym of *Petricola*. *Pseudoirus mirabilis* Habe, 1951 non Deshayes, 1853 is here renamed *Petricola (Petricola) habei* (Huber, 2010). *Pseudoirus mirabilis* Habe, 1951 (Honshu) non *Venerupis mirabilis* Deshayes, 1853 is a synonym.

Order: MYIDA Stoliczka, 1870

Superfamily: Myoidea Lamarck, 1809

Family: MYIDAE Lamarck, 1809

Genus: *Sphenis* Turton, 1822

200 *Sphenia coreanica* Habe, 1951

(Fig. 141)

ORIGINAL DESCRIPTION: Habe, T. 1951. Donacidae and Myidae in Japan, In: T. Kuroda, ed., Illustrated Catalogue of Japanese Shells 1 (12): 71-76 (As *Sphenia coreanica* Habe, 1951)

TYPE LOCALITY: Ulsan, South Korea

HABITAT: Among roots of seaweed on rocks, from intertidal zone to depth of 20m;

GENERAL DISTRIBUTION: Southern Korea and Japan to Yellow Sea; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

Genus: *Paramya* Conrad, 1861

201 *Paramya reclusi* (A. Adams, 1864)

(Fig. 141)

ORIGINAL DESCRIPTION: Adams, A. 1864. On some new genera and species of Mollusca from the seas of China and Japan. Annals and Magazine of Natural History, 3rd ser. 13, 309. (As *Eucharis reclusi* A. Adams, 1864) (Without illustration)

TYPE LOCALITY: Yobuku, Kyushu, Japan

HABITAT: Fine sand and sandy mud, in bays, at depth of 5-50 m

GENERAL DISTRIBUTION: Korea, Japan and East Sea (western area) to Yellow Sea;

JEJU: Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Family: CORBULIDAE Lamarck, 1918

Subfamily: Corbulinae Lamarck, 1818

Genus: *Corbula* Bruguière, 1797

202 *Corbula (Varicorbula) rotalis* Hinds, 1843

(Fig. 142)

ORIGINAL DESCRIPTION: Hinds, R. B, 1843. On new species of *Corbula* and *Potamomya*. Proceedings of the Zoological Society of London, part 11: 56, 57. (As *Corbula rotalis* Hinds, 1843) (Without illustration)

TYPE LOCALITY: Mindoro, Philippines

HABITAT: Coarse sand at depth of 20–450 m.

GENERAL DISTRIBUTION: East Sea to Tropical West Pacific; **JEJU:** Songsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: *Varicorbula rotalis* (Reeve, 1843) is a synonym. *Corbula bifrons* A. Adams, 1860, another synonym, has been reported from Korea Strait.

203 *Corbula (Varicorbula) yokoyamai* (Habe 1949)

(Fig. 142)

ORIGINAL DESCRIPTION: Habe, T. 1949. Illustrated Catalogue of Japanese Shells, 1 (1), p. 2. pl. 1, fig. 5. (As *Varicorbula yokoyamai* Habe, 1949)

TYPE LOCALITY: Unavailable

HABITAT: Sandy mud at depth of 5–101 m

GENERAL DISTRIBUTION: Southern Korea and Japan to East China Sea; North Borneo;

JEJU: Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical



Fig. 142: Distribution of *C. (V.) rotalis* (●) and *C. (V.) yokoyamai* (■)



Fig. 143: Distribution of *M. striata* (●) and *Barnea (A.) manilensis* (■)



Fig. 144: Distribution of *T. princessae* (●), *T. malleolus* (■), and *Uperotus clavus* (▲)

Superfamily: Pholadoidea Lamarck, 1809

Family: PHOLADIDAE Lamarck, 1809

Subfamily: Pholadinae Lamarck, 1809

Genus: *Barnea* Risso, 1826

204 *Barnea (Anchomasa) manilensis* (Philippi, 1847)

(Fig. 143)

ORIGINAL DESCRIPTION: Philippi R.A., 1847. Testaceorum novorum centuria. *Zeitschrift fur Malakozoologie*, 4: 72. (As *Pholas manilensis* Philippi, 1847) (Without illustration)

TYPE LOCALITY: Manila, Philippines

HABITAT: Boring in soft rocks, hard mud, clay, or shale, from the intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Sakhalin to Yellow Sea; Indo-West Pacific; South Africa;

JEJU: Hamo

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: New species record for Jeju Island.

Subfamily: Martesiinae Grant & Gale, 1931

Genus: *Martesia* Sowerby I, 1824

205 *Martesia striata* (Linnaeus, 1758)

(Fig. 143)

ORIGINAL DESCRIPTION: Linnæ us, C. 1758. Systema naturæ per regna tria naturæ , secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Holmiæ . (Salvius). 669. (As *Pholas striata* Linnaeus, 1758) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Boring in old pilings, waterlogged tree trunks, also in driftwood, rarely in soft rocks, from intertidal zone to depth of 20 m

GENERAL DISTRIBUTION: Japan to Indo-Pacific; Hawaii; Australia; West Mexico to Peru; North Carolina to Brazil; Western Europe and Mediterranean; South Africa; **JEJU:** Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Worldwide

REMARKS: Many specimens, juvenile to adult, burrowed into piece of palm log at Gwakji Beach, Jeju Island.

Subfamily: Xylophaginae Purchon, 1941

Genus: *Xylophaga* Turton, 1822

206 *Xylophaga rikuzenica* Taki & Habe, 1945

ORIGINAL DESCRIPTION: Taki, I. & Habe, T. 1945. Classification of the superfamily Pholadacea from Japan. *Venus*, 14 (1-4), 108–117. (As *Xylophaga rikuzenica* Iw. Taki & Habe, 1945)

TYPE LOCALITY: Rikuzen Province, Honshu, Japan

HABITAT: Boring in wood, at depth of 183-1400 m

GENERAL DISTRIBUTION: Korea and Japan to East China Sea; **JEJU:** "Jejudo" (Kwon and Lee, 1993)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Kwon and Lee (1993) list only "Jejudo", with no specific locality.

Neoxylophaga rikuzenica (Iw. Taki and Habe, 1945) is a synonym.

Family: TEREDINIDAE Rafinesque, 1815

Subfamily: Teredininae Rafinesque, 1815

Genus: *Teredora* Bartsch, 1921

207 *Teredora princessae* (Sivickis, 1928)

(Fig. 144)

ORIGINAL DESCRIPTION: Sivickis, P. B. 1928. New Philippine shipworms. Philippine Journal of Science, Manila, 37: 291, pl. 3; fig. 11. (As *Teredo princessae* Sivickis, 1928)

TYPE LOCALITY: Philippines

HABITAT: Submerged wood

GENERAL DISTRIBUTION: Japan to Indo-W. Pacific; E. Pacific; **JEJU:** Sagyei (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

208 *Teredora malleolus* (Turton, 1822)

(Fig. 144)

ORIGINAL DESCRIPTION: Turton, W. 1822, Conchylia Insularum Britannicarum. The Shells of the British Islands, Systematically arranged. Exeter, 255; pl. 2; fig. 19. (As *Teredo malleolus* Turton, 1822)

TYPE LOCALITY: Torbay, Devon, England

HABITAT: Submerged wood

GENERAL DISTRIBUTION: Korea; Atlantic; Mediterranean (Check); **JEJU:** Sagyei (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: An eastern Atlantic species, not in Okutani (2000). Specimens in Min (2004) may belong to *T. princessae*.

Genus: *Uperotus* Guettard, 1770

209 *Uperotus clava* (Gmelin, 1791)

(Fig. 144)

ORIGINAL DESCRIPTION: Gmelin, J. F. 1791. Caroli a Linné, systema naturae. Lipsiae (Leipzig), (Beer). 13. Tom. I. Pars VI. (Vol. 1, part 6), p. 3748. (As *Teredo clava* Gmelin, 1791) (Without illustration)

TYPE LOCALITY: Tranquebar, Madras, India

HABITAT: Submerged wood

GENERAL DISTRIBUTION: Korea; Indo-W. Pacific; **JEJU:** Sagyei (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Uperotus clavus* (Gmelin, 1791) is a synonym.

Superfamily: Hiattelloidea Gray, 1824

Family: HIATELLIDAE Gray, 1824

Genus: *Hiatella* Bosc, 1801

210 *Hiatella arctica* (Linnaeus, 1767)

(Fig. 145)

ORIGINAL DESCRIPTION: Linnaeus, C. 1767. Systema naturae sive regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Laurentii Salvii, Holmiae. 12th ed. v. 1 (pt 2): 1113. (As *Mya arctica* Linnaeus, 1767) (Without illustration)

TYPE LOCALITY: Norway

HABITAT: Nestler, living byssally attached in crevices of rocks and other shells, also in subtidal caves, attached to rocks, pebbles, algae or other shells, or nestling in sponges; from intertidal zone to depth of 523 m

GENERAL DISTRIBUTION: Korea; Japan; Taiwan; S. E. Asia; Circumarctic; Northeastern North America; Caribbean, Mediterranean; West Africa, South Africa; Uruguay; Chile, Australia; Washington, U. S. A.; **JEJU:**, Udo (Geomeollae), Jungmun, Yongmeori, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Worldwide

REMARKS: Japanese and Chinese authors usually use *Hiatella orientalis* (Yokoyama, 1920) when referring to this species. Coan *et al.* (2000) stated that full taxonomic understanding of *Hiatella* is a complex problem; there may be more than one species in the genus. "Still lacking an extended analysis and convincing criteria for more than one species, Coan's course is followed" (Huber, 2010). Marshall and Gofas (2015) also accept one species and list more than 60 synonyms!

Superfamily: Solenoidea Lamarck, 1809

Family: SOLENIDAE Lamarck, 1809

Genus: *Solen* Linnaeus, 1758

211 *Solen strictus* Gould, 1861

(Fig. 146)

ORIGINAL DESCRIPTION: Gould, A.A. 1861. Descriptions of shells collected by the North Pacific Exploring Expedition (*continued*). Proceedings of the Boston Society of Natural History 8: 26. (As *Solen strictus* Gould, 1861) (Without illustration)

TYPE LOCALITY: Southern Hokkaido, Japan

HABITAT: Bays and lagoons; in sand on sandflats, from intertidal zone to depth of 3 m

GENERAL DISTRIBUTION: Sea of Okhotsk to East China Sea; **JEJU:** Gimnyeong, Jongdal-ri, Ojo-ri, Pyoseon



Fig. 145: Distribution of *H. arctica*



Fig. 146: Distribution of *S. strictus*

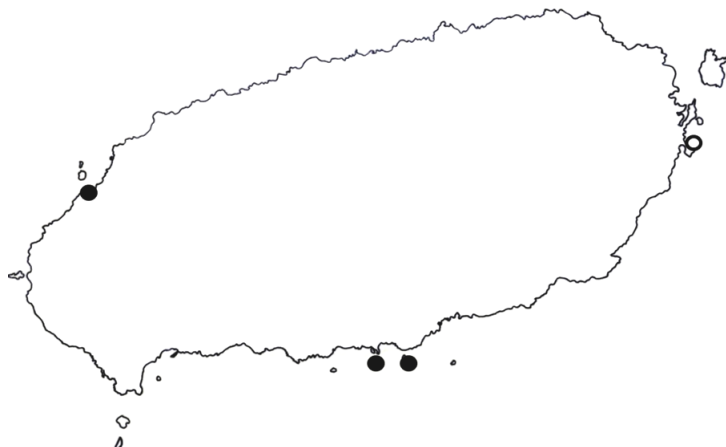


Fig. 147: Distribution of *G. cuneiformis*

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: Once moderately common at Ojo-ri (Tongbatarl Lagoon), it has now become quite rare because of over collecting (Lee *et al.*, 2014). *Solen gouldi* Conrad, 1868 is a synonym.

Superfamily: Gastrochaenoidea Gray, 1840

Family: GASTROCHAENIDAE Gray, 1840

Genus: *Gastrochaena* Spengler, 1783

212 *Gastrochaena cuneiformis* L. Spengler, 1783

(Fig. 147)

ORIGINAL DESCRIPTION: Spengler L. 1783. Beskrivelse over en nye Slægt af toskallede Muskeler, som kan kaldes Gastrochæna, i tre foranderlige Arter, hvoraf hver boer i et forskielligt Ormehuus.. Nye Samling af det Kongelige Danske Videnskabers Selskabs Skrifter : 2: 174-183, pl. 1. (As *Gastrochaena cuneiformis* L. Spengler, 1783)

TYPE LOCALITY: Nicobar Islands, Andaman Sea

HABITAT: Coral reefs, chemically boring in dead corals (*Porites* sp.) or shells, from intertidal zone to depth of 58 m

GENERAL DISTRIBUTION: Japan to Indo-Pacific; Hawaii; **JEJU:** Seopjikoji, Supseom, Munseom, Keumneung

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Found at Keumneung, Jeju Island, in crevices of the encrusting coral *Alveopora japonica* Eguchi, 1968.

Genus: *Cucurbitula* Gould, 1861

213 *Cucurbitula cymbium* (Spengler 1783)

(Fig. 148)

ORIGINAL DESCRIPTION: Spengler L. 1783. Beskrivelse over en nye Slægt af toskallede Muskeler, som kan kaldes Gastrochæna, i tre foranderlige Arter, hvoraf hver boer i et forskielligt Ormehuus.. Nye Samling af det Kongelige Danske Videnskabers Selskabs Skrifter : 2: 174-183, pl. 1. (As *Gastrochaena cymbium* Spengler, 1783)

TYPE LOCALITY: Tranquebar, Southeastern India

HABITAT: Calcareous igloo-tube containing the shell fixed to other shells (*Pecten*, *Corbula*) or sand-dollars, at depth of 2-91 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Indo-West Pacific; Mediterranean; **JEJU:** Udo, Supjikoji, Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Cucurbitula cymbium* has a unique habitat and characteristically quadrangular, widely open valves. In *Cucurbitula* the valves occupy about 2/3 of the space. *Gastrochaena* (*Curcubitula*) *cymbium* (Spengler, 1783) is a synonym.

Order: ANOMALODESMATA Dall, 1889

Superfamily: Myochamoidea Carpenter, 1861

Family: MYOCHAMIDAE Carpenter, 1861

Genus: Myadora Gray, 1840

214 *Myadora fluctuosa* Gould, 1861

(Fig. 149)

ORIGINAL DESCRIPTION: Gould, A.A. 1861. *Descriptions of shells collected by the North Pacific Exploring Expedition (continued)*. Proceedings of the Boston Society of



Fig. 148: Distribution of *C. cymbium*



Fig. 149: Distribution of *M. fluctosa* (●) and *Hunkydora soyoae* (■)

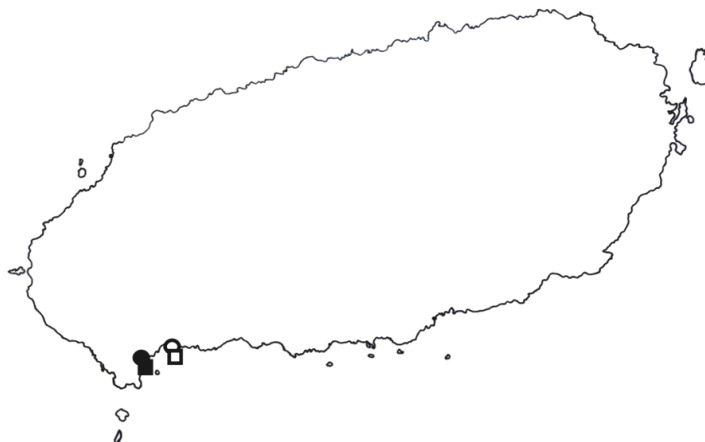


Fig. 150: Distribution of *M. transmontana* (●), and *M. dissimilis* (■)

Natural History 8: 23. (Holotype figured in Johnson (1964) (As *Myodora fluctuosa* A. A. Gould, 1861)

TYPE LOCALITY: Kagoshima Bay, Kyushu, Japan

HABITAT: Fine sand and mud, at depth of 10-990m

GENERAL DISTRIBUTION: East Sea to East China Sea; **JEJU:** Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Species of *Myadora* are quite variable, as as can be seen in *M. fluctuosa*. *Myadora japonica* Habe, 1950 is a synonym.

Genus: *Hunkydora* Fleming, 1948

215 *Hunkydora soyoae* (Habe 1950)

(Fig. 149)

ORIGINAL DESCRIPTION: Habe, T. 1950. Myochamidae in Japan. Illustrated Catalogue of Japanese Shells (4): 25-30, 1 pl. (As *Myadora soyoae* Habe, 1950)

TYPE LOCALITY: Bungo Strait, southern Japan

HABITAT: Coarse sand and stones, at depths of 50–300 m

GENERAL DISTRIBUTION: Southern Korea and southern Japan to East China Sea; **JEJU:** Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Beu (2006) has placed this species in the genus *Hunkydora* Fleming, 1948, due to differences in the resilifer and pallial sinus (Fleming, 1948).

Genus: *Myadoropsis* Habe, 1960

216 *Myadoropsis transmontana* (M. Yokoyama 1922)

(Fig. 150)

ORIGINAL DESCRIPTION: Yokoyama, M. 1922. Fossils from the Upper Musashino of Kazusa and Shimosa. Journal of the College of Science, Tokyo Imperial University, 44, 172, pl. 14, figs. 13, 14 (As *Thracia transmontana* Yokoyama, 1922)

TYPE LOCALITY: Unknown

HABITAT: Sand, at depth of 10-300 m

GENERAL DISTRIBUTION: Korea; Japan; E. Sea; **JEJU:** Hwasoon, Sagyei (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Myadropsis transmontana* (Yokoyama, 1922) (Min, 2004) is a misspelling.

217 *Myadoropsis dissimilis* Habe, 1960

(Fig. 150)

ORIGINAL DESCRIPTION: Habe T. 1960. New species of molluscs from the Amakusa Marine Biological Laboratory, Reihoku-cho, Amakusa, Kumamoto Pref., Japan. Publications of the Seto Marine Biological Laboratory 8(2): 293. (As *Myadoropsis dissimilis* Habe, 1960) (Without illustration)

TYPE LOCALITY: Western Kyushu, Japan

HABITAT: Fine sand, at depth of 10-30 m

GENERAL DISTRIBUTION: Southern Korea and southern Japan; **JEJU:** Hwasoon, Sagyei (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Myadropsis dissimilis* Habe, 1960 (Min, 2004) is a misspelling.

218 *Myadoropsis brevispinosa* T. Habe, 1962

(Fig. 151)

ORIGINAL DESCRIPTION: Habe, T. 1962 *Myadoropsis brevispinosus* Habe. 1962. Colored Illustrations of the Shells of Japan, 2 (ed. 2), 142-143, app. 46, pl. 64, fig. 8. (As *Myadoropsis brevispinosa* Habe, 1962)

TYPE LOCALITY: Western Kyushu, Japan

HABITAT: Fine sand, at depth of 10-300 m;;

GENERAL DISTRIBUTION: East Sea to Southern Japan; **JEJU:** Hwasoon, Sagyei (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Myadropsis brevispinosa* Habe, 1962 (Min, 2004) is a misspelling.

Superfamily: Pandoroidea Rafinesque, 1815

Family: PANDORIDAE Rafinesque, 1815

Genus: *Pandora* Bruguière, 1797

219 *Pandora otukai* Habe, 1952

(Fig. 151)

ORIGINAL NAME: Habe, T. 1952. Pholadomyidae, Clavagellidae, Pandoridae, Juliidae, and Condyllocardiidae in Japan. In: Kuroda, T. (ed.) Illustrated Catalogue of Japanese Shells 1(18): 121-129. (As *Pandora otukai* Habe, 1952)

TYPE LOCALITY: Unavailable

HABITAT: Fine sand, at depths of 10-300 m

GENERAL DISTRIBUTION: Southern Korea and Japan to northeastern China; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: Huber (2010) doubts the usefulness of subgeneric separation in the Pandoridae.



Fig. 151: Distribution of *M. brevispinosa* (●) and *Pandora otukai* (■)

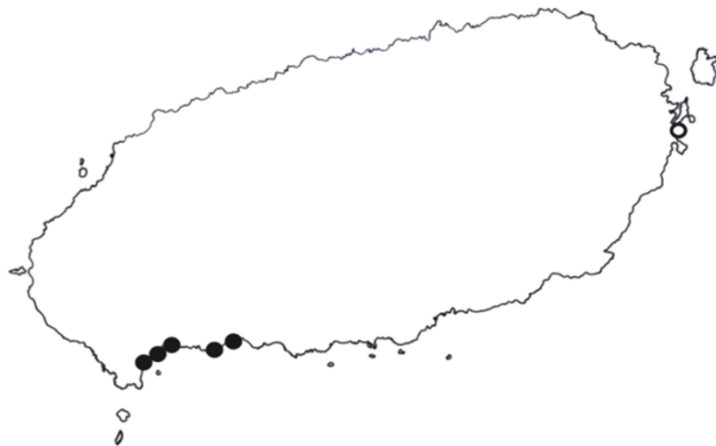


Fig. 152: Distribution of *E. navicula*

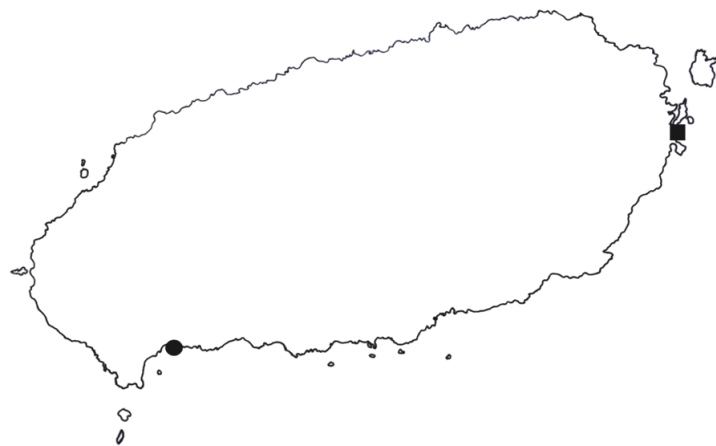


Fig. 153: Distribution of *T. pusilla* (●) and *Parvithracia (Pseudoasthenothaerus) sematana* (■)

Pandora (Pandorella) otukai T. Habe, 1952 is a synonym.

Family: LYONSIIDAE P. Fischer, 1887

Genus: *Entodesma* Philippi, 1845

220 *Entodesma navicula* (Adams & Reeve 1850)

(Fig. 152) (Plate 7: G-J)

ORIGINAL DESCRIPTION: Adams, A. & Reeve, L. 1850. Mollusca *in* The Zoology of the Voyage of H.M.S. Samarang, under the command of Captain Sir Edward Belcher, C. B., F. R. A. S., F. G. S., during the years 1843-1846. Edited by Arthur Adams. London: Reeve and Benham, 1848-1850. i-x, 83, pl. 23, fig. 11, (As *Lyonsia navicula* Adams and Reeve, 1850)

TYPE LOCALITY: Borneo

HABITAT: Nestling in rock crevices and coarse rubble, and in kelp holdfasts, from intertidal zone to depth of 60 m

GENERAL DISTRIBUTION: Bering Sea to Yellow Sea; Alaska to California; New Zealand (introduced); **JEJU:** Seongsan, Jungmun, Yerae, Hwasoon, Yongmeori, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Widely distributed boreal

REMARKS: Holotype is figured in Lutaenko and Noseworthy (2012). *Agriodesma navicula* (Adams and Reeve, 1850) is a synonym.

Superfamily: Thracioidea Stoliczka, 1870

Family: THRACIIDAE Stoliczka, 1870

Subfamily: Asthenothaerinae P. Fischer, 1887

Genus: *Trigonothracia* Yamamoto & Habe, 1959

221 *Trigonothracia pusilla* (Gould, 1861)

(Fig. 153)

ORIGINAL DESCRIPTION: Gould, A.A. 1861. Descriptions of shells collected by the North Pacific Exploring Expedition (*continued*). Proceedings of the Boston Society of Natural History 8: 23. (As *Thracia pusilla* Gould, 1861) (Without illustration)

TYPE LOCALITY: Shimoda, Honshu, Japan

HABITAT: Bays; fine sand, sandy mud and silty-clay substrate, at depth of 7–80 m

GENERAL DISTRIBUTION: Southern Korea and Japan to Yellow Sea; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

Genus: *Parvithracia* Finlay, 1926

222 *Parvithracia (Pseudoasthenothaerus) sematana* (Yokoyama 1922)

(Fig. 153)

ORIGINAL DESCRIPTION: Yokoyama, M. 1922. Fossils from the Upper Musashino of Kazusa and Shimosa. Journal of the College of Science, Tokyo Imperial University, 44, 173, pl. 14; figs. 17, 18. (As *Thracia sematana* Yokoyama, 1922)

TYPE LOCALITY: Shito, eastern Japan (fossil)

HABITAT: Fine sand, at depth of 20-300 m

GENERAL DISTRIBUTION: East Sea to Yellow Sea; **JEJU:** Songsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Asthenothaerus sematana* (Yokoyama, 1922) is a synonym.

Superfamily: Cuspidarioidea Dall, 1886

Family: CUSPIDARIIDAE Dall, 1886

Subfamily: Cuspidariinae Dall, 1886

Genus: *Cardiomya* A. Adams, 1864

223 *Cardiomya kashimana* Okutani and Sakura, 1964

(Fig. 154)

ORIGINAL DESCRIPTION: Okutani, T. & K. Sakurai. 1964. Genus *Cardiomya* (Mollusca, Lamellibranchiata) from Japanese waters. Bulletin of the National Science Museum, Tokyo, 7 (1) 20, pl. 1. (As *Cardiomya kashimana* Okutani and Sakura, 1964)

TYPE LOCALITY: Ibaraka, Southern Hokkaido

HABITAT: Sandy mud at depth of 100–1030 m

GENERAL DISTRIBUTION: Korea and Japan; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

Genus: *Plectodon* Carpenter, 1865

224 *Plectodon ligula* (Yokoyama 1922)

(Fig. 154)

ORIGINAL DESCRIPTION: Yokoyama, M. (1922) Fossils from the Upper Musashino of Kazusa and Shimosa. Journal of the College of Science, Tokyo Imperial University, 44, 169, pl. XIV, figs.3,4. (As *Cuspidaria ligula* (M. Yokoyama 1922)

TYPE LOCALITY: Shito (fossil), Chiba Prefecture, Japan

HABITAT: Sandy mud at depth of 10–300 m

GENERAL DISTRIBUTION: Northern Japan to East China Sea; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: The placement of this species in *Plectodon* has been questioned (Marshall, 2002). However, according to Huber (2010), the extant Japanese species taken to represent Yokoyama's fossil is minutely granulate, and as such correctly placed here. *Plectodon ligulus*

(Yokoyama, 1922 is a synonym.

Superfamily: Poromyoidea Dall, 1886

Family: POROMYIDAE Dall, 1886

Genus: *Poromya* Forbes, 1844

225 *Poromya flexuosa* Yokoyama, 1922

(Fig. 154)

ORIGINAL DESCRIPTION: Yokoyama, M., 1922a: Fossils from the upper Musashino of Kazusa and Shimosa. Journal of the College of Science, Imperial University of Tokyo, vol. 44, art. 1, 173, pl. 14, figs. 15, 16. (As *Poromya flexuosa* Yokoyama, 1922)

TYPE LOCALITY: Shito, Chiba Prefecture, Japan

HABITAT: Fine sand and sandy mud, at depth of 20-350 m

GENERAL DISTRIBUTION: East Sea to South China Sea; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical



Fig. 154: Distribution of *C. kashimana* (●), *Plectodon ligula* (■), and *P. flexuosa* (▲)

SCAPHOPODA

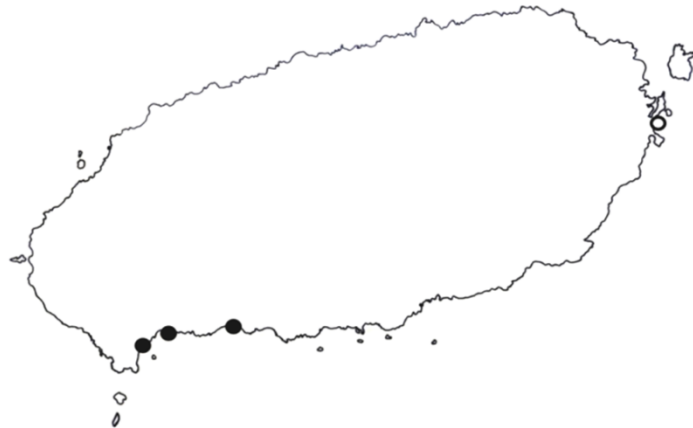


Fig. 1: Distribution of *D. buccinulum*



Fig. 2: Distribution of *A. tibana*

CLASS: SCAPHOPODA Bronn, 1862

Order: DENTALIIDA da Costa, 1776

Family: DENTALIIDAE Children, 1834

Genus: *Dentalium* Linnaeus, 1758

1 *Dentalium buccinulum* Gould, 1859

(Fig. 1)

ORIGINAL DESCRIPTION: Gould, A. A. 1859. Descriptions of shells collected by the North Pacific Exploring Expedition. Proceedings of the Boston Society of Natural History 7: 166. (As *Dentalium buccinulum* Gould, 1859) Without illustration.

TYPE LOCALITY: Kagosima, Kyushu, Japan

HABITAT: Sand, from intertidal zone to depth of 50 m

GENERAL DISTRIBUTION: Korea and Japan to China and Indo-Pacific; **JEJU:** Seongsan, Jungmun, Hwasoon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Lectotype in USNM; paralectotypes in MCZ (Steiner and Kabat (2004). *Graptacme buccinula* (Gould, 1859); *Dentalium (Paradentalium) buccinulum* Gould, 1859 are synonyms.

Genus: *Antalis* H. And A. Adams, 1854

2 *Antalis tibana* (Nomura, 1940)

(Fig.2)

ORIGINAL DESCRIPTION: Nomura, S. 1940. Mollusca dredged by the Husa-Marui from the Pacific coast of Tiba Prefecture, Japan. Records of the Oceanographic Works in Japan 12 (1): 101, 102, pl. 1, fig. 11 (As *Dentalium tibanum* Nomura, 1940)

TYPE LOCALITY: East of Cape Inubozaki, Honshu, Japan; Husa-Maru station 15, 40 m.

HABITAT: Fine sand bottom at depth of 10-200 m.

GENERAL DISTRIBUTION: Korea and Japan to Indonesia and Vanuatu; **JEJU:**,
Samyang, Seongsan, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Syntypes in SHM (Steiner and Kabat, 2004).

Genus: *Striidentalium* Habe, 1964

3 *Striidentalium tosaensis* (Habe, 1963)

(Fig. 3)

ORIGINAL DESCRIPTION: Habe, T. 1963. A classification of the scaphopod molluscs found in Japan and its adjacent areas. Bulletin of the National Science Museum Tokyo 6 (3): 264, pl. 38, fig. 2. (As *Antalis tosaensis* Habe, 1963)

TYPE LOCALITY: Off Tosa Bay, Shikoku, Japan, 200 m.

HABITAT: Mud, at depth of 200-620 m

GENERAL DISTRIBUTION: Korea and S. Japan to Indo-Pacific; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Holotype and paratype in NSMT (Steiner and Kabat, 2004).

4 *Striidentalium rhabdotum* (Pilsbry, 1905)

(Fig. 3)

ORIGINAL DESCRIPTION: Pilsbry, H. A. 1905. New Japanese Marine Mollusca. Proceedings of the Academy of Natural Sciences of Philadelphia 57: 116, 117, pl. 5, figs 45-47. (As *Dentalium rhabdotum* Pilsbry, 1905)

TYPE LOCALITY: Heda, Izu, Honshu, Japan.

HABITAT: Mud, at depth of 61-1350 m

GENERAL DISTRIBUTION: Korea and Japan to E. China Sea and New Caledonia; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: “Syntypes in ANSP. Scarabino (1995: 240) stated that ANSP 88319 was the “holotype” but there are two syntypes in that lot, so Scarabino’s statement does not constitute a valid lectotype designation” (Steiner and Kabat, 2004).

Order: GADILIDA Starobogatov, 1974

Suborder: Entalimorpha Steiner, 1992

Family: ENTALINIDAE Chistikov, 1979

Subfamily: Entalininae Chistikov, 1979

Genus: *Entalina* Monterosato, 1872

5 *Entalina mirifica* (E.A. Smith, 1895)

(Fig. 4)

ORIGINAL DESCRIPTION: Smith, E. A. 1895. Natural history notes from H.M. Indian marine survey steamer Investigator, Commander C. F. Oldham, R.N. Series II, No. 19. Report upon the Mollusca dredged in the Bay of Bengal and the Arabian Sea during the season 1893-94. Annals and Magazine of Natural History (series 6) 16: 9, pl. 2, fig. 1. (As *Dentalium mirificum* E. A. Smith, 1895)

TYPE LOCALITY: Off Trincomalee, Ceylon (Sri Lanka)

HABITAT: Sand and rubble from depth of 55-2050 m

GENERAL DISTRIBUTION: Japan to Tropical W. Pacific (New Caledonia); Africa;



Fig. 3: Distribution of *S. tosaensis* (●) and *S. rhabdotum* (■)



Fig. 4: Distribution of *E. mirifica*



Fig. 5: Distribution of *E. intercostata* (●), *Megaentalina cornucopiae* (■), and *Siphonodentalium isaotakii* (▲)

JEJU: Seogwipo, Hwasoon, Seongsan

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Lectotype in BMNH (Steiner and Kabat, 2004).

Subfamily: Heteroschismoidinae Chistikov, 1982

Genus: *Entalinopsis*

6 *Entalinopsis intercostata* (Boissevain, 1906)

(Fig. 5)

ORIGINAL DESCRIPTION: Boissevain, M. 1906. The Scaphopoda of the Siboga Expedition, treated together with the known Indo-Pacific Scaphopoda. Uitkomsten op Zoologisch, Botanisch, Oceanographisch en Geologisch Gebied verzameld in Nederlandsch Oost-Indië 1899-1900 aan boord H.M. Siboga onder commando van Luitenant ter zee 1e. kl. G. F. Tydeman 54 (Livraison 32): 14, pl. 6, fig. 4, text-fig. 11. (As *Dentalium intercostatum* Boissevain, 1906)

TYPE LOCALITY: Ceram Sea, Indonesia

HABITAT: In fine sand, at depth of 50-1500 m

GENERAL DISTRIBUTION: Korea and Japan to Indonesia; **JEJU:** Seongsan (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: “Lamprell & Healy (1998: 48) considered *Dentalium intercostatum* to be a junior synonym of *Dentalium thetidis* Hedley, 1903 (currently in the genus *Striodentalium*), thus rejecting Habe’s assignment of this species to *Entalinopsis*.” Lectotype and paralectotypes in ZMA (Steiner and Kabat, 2004).

Suborder: Gadilimorpha Steiner, 1992

Family: GADILIDAE Stoliczka, 1868

Subfamily Siphonodentaliinae Simroth, 1894

Genus: *Siphonodentalium* M. Sars, 1859

7 *Siphonodentalium isaotakii* Habe, 1953

(Fig. 5)

ORIGINAL DESCRIPTION: Habe, T. 1953. Genera of Japanese Shells. Pelecypoda and Scaphopoda. Tokyo 4: 299. (As *Siphonodentalium isaotakii* Habe, 1953) (Without illustration?)

TYPE LOCALITY: Tokyo Bay, Honshu, Japan

HABITAT: Mud bottoms in embayments, at depth of 5-30 m

GENERAL DISTRIBUTION: Korea and Japan to Indo-Pacific; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Holotype in NSMT; paratypes in NSMT, and AMNH (Steiner and Kabat, 2004)..

Subfamily: Gadilinae, Stoliczka, 1868

Genus: *Megaentalina* Habe, 1963

8 *Megaentalina cornucopiae* (Boissevain, 1906)

(Fig. 5)

ORIGINAL DESCRIPTION: Boissevain, M. 1906. The Scaphopoda of the Siboga Expedition, treated together with the known Indo-Pacific Scaphopoda. Uitkomsten op Zoologisch, Botanisch, Oceanographisch en Geologisch Gebied verzameld in Nederlandsch Oost-Indië 1899-1900 aan board H.M. Siboga onder commando van Luitenant ter zee 1e. kl.

G. F. Tydeman 54 (Livraison 32): 63, 64, pl. 6, fig. 89, text-fig. 30. (As *Entalina cornucopiae* Boissevain, 1906.

TYPE LOCALITY: Indonesia

HABITAT: Fine sand, at depth of 200-3250 m

GENERAL DISTRIBUTION: Korea and S. Japan to Indonesia; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Holotype in ZMA (Steiner and Kabat, 2004).

Class: CEPHALOPODA Cuvier, 1795

Subclass: COLEOIDEA Bather, 1888

Order: SEPIIDA Zittel, 1895

Family: SEPIIDAE Leach, 1817

Genus: *Metasepia* Hoyle, 1885

1 *Metasepia tullbergi* (Appellöf, 1886)

ORIGINAL DESCRIPTION: *Sepia tullbergi* Appellöf, 1886, *Svenska Vetenskaps-Akademiens Handlingar*, 21(13): 26 (As *Sepia tullbergi* Appellöf, 1886).,

TYPE LOCALITY: Nagasaki, Japan

HABITAT: Sandy to muddy substrate on continental shelf, at depth of 20 to 100 m

GENERAL DISTRIBUTION: Korea, southern Japan, and Yellow Sea to Gulf of Thailand;

JEJU: "Jejudo" (Jereb and Roper, 2005)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Jereb and Roper (2005) include Jejudo in their distribution map for this species.

Provisionally regarded as part of Jeju Island fauna.

Genus: *Sepia* Linnaeus, 1758

2 *Sepia esculenta* Hoyle, 1885

(Fig. 1)

ORIGINAL DESCRIPTION: Hoyle, W. E. 1885, Diagnoses of new Species of Cephalopoda collected during the Cruise of H.M. 8. 'Challenger.'—Part II. The Decapoda. *Annals and Magazine of Natural History*, (Series 5) 16: 188-189. (As *Sepia esculenta* Hoyle, 1885) (Without illustration)

TYPE LOCALITY: Japan

HABITAT: On sand, sometimes burrowing into the substrate at depth from 10 to 100 m.

GENERAL DISTRIBUTION: Korea and Southern Japan to South China Sea, and possibly Singapore and western Indonesia; **JEJU:** Dong-gwi, Seongsan, Pyoseon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Most common sepiid in Jeju Island. *Sepia (Platysepia) esculenta* Hoyle, 1885 is a synonym.

3 *Sepia lorigera* Wülker, 1910

ORIGINAL DESCRIPTION: Wülker, 1910, *Abhandlungen der mathematisch-physikalische Klasse der Königlich Bayerischen Akademie der Wissenschaften*, 3(Suppl. 1): 12 (As *Sepia lorigera* Wülker, 1910)

TYPE LOCALITY: Misaki, Japan

HABITAT: Depth range from 100 to 300 m.

GENERAL DISTRIBUTION: Southern Korea and southern Japan to Vietnam; **JEJU:** "Jejudo" (Jereb and Roper, 2005)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Reported from the southwest coast of the Korean mainland (The World's Marine Life, 2009). Jereb and Roper (2005) include Jejudo in their distribution map for this species. Provisionally regarded as part of Jeju Island fauna

4 *Sepia lycidas* Gray, 1849

ORIGINAL DESCRIPTION: Gray, 1849. *Catalogue of the Mollusca in the British Museum. Part I. Cephalopoda Antepedia*, 103 (As *Sepia lycidas* Gray, 1849) (Without illustration)

CEPHALOPODA



Fig. 1: Distribution of *S. esculenta*



Fig. 2: Distribution of *S. peterseni* (●) and *S. kobiensis* (■)

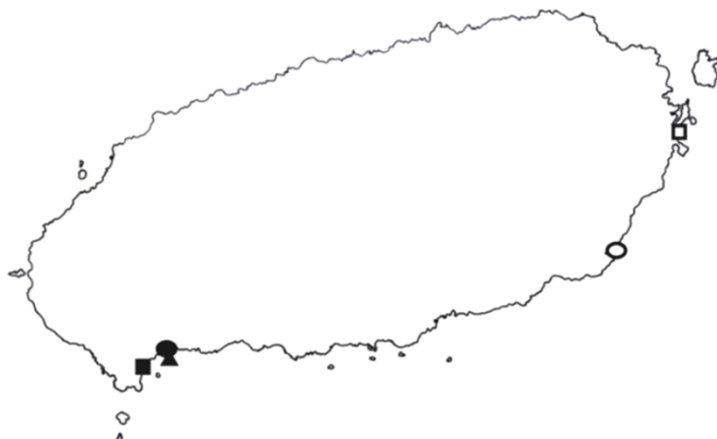


Fig. 3: Distribution of *S. longipes* (●), *S. tenuipes*, (■) and *Euprymna morsei* (▲)

TYPE LOCALITY: Guangzhou, China

HABITAT: *Sepia lycidas* is a neritic demersal species with a depth range of 15 to 100 m.

GENERAL DISTRIBUTION: Korea, southern Japan, and Yellow Sea to Inonesia and Andaman Sea, Eastern Indian Ocean; **JEJU:** "Jejudo" (Jereb and Roper, 2005)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Jereb and Roper (2005) include Jejudo in their distribution map for this species; Min (2004), records it from the Korean mainland. Provisionally regarded as part of Jeju Island fauna

5 *Sepia peterseni* Appellöf, 1886

(Fig. 2)

ORIGINAL DESCRIPTION: Appellöf, A. 1886, Japanska Cephalopoder. *Svenska Vetenskaps-Akademiens Handlingar*, 21(13): 23, Pl. 2, figs. 1-6; pl. 3, fig. 21 (As *Sepia peterseni* Appellof, 1886)

TYPE LOCALITY: Japan

HABITAT: Inner continental shelf at depth from 20 to 100 m.

GENERAL DISTRIBUTION: Korea; Japan; **JEJU:** Seongsan, Pyoseon, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Sepia (Doratosepion) peterseni* Appellof, 1886 is a synonym.

6 *Sepia kubiensis* Hoyle, 1885

(Fig. 2)

ORIGINAL DESCRIPTION: Hoyle, W. E. 1885, Diagnoses of new Species of Cephalopoda collected during the Cruise of H.M. 8. 'Challenger.'—Part II. The

Decapoda. *Annals and Magazine of Natural History*, (series 5) 16: 195-196. (As *Sepia kubiensis* Hoyle, 1885) (Without illustration)

TYPE LOCALITY: Bay of Kobe, Honshu, Japan

HABITAT: Occurs from subtidal zone to depth of 200 m.

GENERAL DISTRIBUTION: Korea and Japan to Indo-West Pacific; **JEJU:** Samyang, "Jejudo" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: *Sepia kubiensis* is probably a species complex (Jereb and Roper, 2005). *Sepia (Doratosepion) kubiensis* Hoyle, 1885 is a synonym.

7 *Sepia longipes* Sasaki, 1914

(Fig. 3)

ORIGINAL DESCRIPTION: Sasaki, M. 1913, Decapod cephalopods in Japan. *Doubutsugaku Zasshi* [Zoological Magazine, Tokyo] 25(292): 78 (As *Sepia longipes* Sasaki, 1914) (Illustration?)

TYPE LOCALITY: Choshi, Ibaraki Prefecture (Chiba Peninsula), Japan

HABITAT: Depth from 100 to 300 m

GENERAL DISTRIBUTION: Southern Japan to E. China Sea; **JEJU:** Pyoseon, Hwasoon

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: *Sepia (Doratosepion) longipes* Sasaki, 1913 is a synonym.

8 *Sepia tenuipes* Sasaki, 1929

(Fig. 3)

ORIGINAL DESCRIPTION: Sasaki, M. (1929), "A Monograph of the dibranchiate cephalopods of the Japanese and adjacent waters," *Journal of the College of Agriculture*,

Tohoku Imperial University, Sapporo, 20 (supplement 10): 193. (As *Sepia tenuipes* Sasaki, 1929) (Illustration ?)

TYPE LOCALITY: Isohama, Ibaraki Prefecture, Japan

HABITAT: Depth of 100 to 250 m.

GENERAL DISTRIBUTION: East Sea to East China Sea; **JEJU:** Seongsan, Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical-lowboreal

REMARKS: *Sepia (Doratosepion) tenuipes* Sasaki, 1929 is a synonym.

Order: SEPIOLIDA Fioroni, 1981

Family: SEPIOLIDAE Leach, 1817

Genus: *Euprymna* Steenstrup, 1887

9 *Euprymna morsei* (Verrill, 1881)

(Fig. 3)

ORIGINAL DESCRIPTION: Verrill, A. E. 1881. The Cephalopods of the Northeastern Coast of North America. *Transactions of the Connecticut Academy of Sciences*, 5(6): 417.

(As *Iniotheuthis morsei* Verrill, 1881) (Without illustration)

TYPE LOCALITY: Tokyo Bay, Japan

HABITAT: Pelagic; neritic zone

GENERAL DISTRIBUTION: Korea and Japan to Indo-West Pacific; **JEJU:** Hwasoon (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Verrill (1881) described a new genus and a new species from Japan, and reported on another, in a footnote to his North American monograph.

Order: MYOPSIDA Naef, 1916

Family: **LOLIGINIDAE** Lesueur, 1821

Genus: *Sepioteuthis* Blainville, 1824

10 *Sepioteuthis lessoniana* Ferussac, 1831, in Lesson, 1830–1831

ORIGINAL DESCRIPTION: Férussac A. E. J. P. J. F. d'Audebard de. 1831. *in* Lesson, R.P. 1830–1831. Mollusques, Anellides et Vers. *In: Voyage autour du monde sur la corvette de la Majeste, la Coquille, pendant les annees 1822–1825 sous le commandement du capitaine Duperry. Paris, Zoologie*, 2(1): 241 (As *Sepioteuthis lessoniana* Ferussac, 1831, in Lesson, 1830–1831) (Illustration Pl. 11)

TYPE LOCALITY: Unknown

HABITAT: Occurs from the surface to about 100 m depth; rather common in coastal environments on sea grass beds, coral reefs and sandy bottoms.

GENERAL DISTRIBUTION: Northern Japan to Indo-West-Pacific; New Zealand; **JEJU:** "Around Jejudo" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Both morphological and molecular evidence indicate that *S. lessoniana* may be a complex of cryptic species, and a number of “types” are morphologically distinct, even in hatchlings. (Jereb and Roper, 2010).

Genus: *Heterololigo* Natsukari, 1984

11 *Heterololigo bleekeri* (Keferstein, 1866)

ORIGINAL DESCRIPTION: Keferstein, W. M. 1866. Kopffüsser: Cephalopoda Cuvier *In* Bronn, *Die Klassen und Ordnungen des Thier-reiches: Weichthiere (Malacozoa)*, 1402, pls.122 (figs. 9, 10), 127 (fig. 14). (As *Loligo bleekeri* Keferstein, 1866)

TYPE LOCALITY: Japan

HABITAT: From surface waters to depths of approximately 150 m; it has never been recorded beyond the continental shelf.

GENERAL DISTRIBUTION: Japan to Yellow and East China Seas; **JEJU:** ("Jejudo" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical- lowboreal

REMARKS: Ontogenetic differences occur, with juveniles eating mostly copepods, young squids between 50 and 90 mm mantle length preying mostly on crustaceans, and adult squid over 200 mm mantle length feeding on fishes and other cephalopods (Jereb and Roper, 2010).

Genus: *Uroteuthis* Rehder, 1945

12 *Uroteuthis edulis* (Hoyle, 1885)

ORIGINAL DESCRIPTION: Hoyle, W. E. 1885, Diagnoses of new Species of Cephalopoda collected during the Cruise of H.M. S. 'Challenger'. Part II. The Decapoda. *Annals and Magazine of Natural History*, (series 5) 16: 186. (As *Loligo edulis* Hoyle, 1885 (Without illustration)

TYPE LOCALITY: Purchased in market, Yokohama, Japan

HABITAT: Inhabits continental shelf waters in Japan and winters inshore in shallow water. Although reported as one of the most oceanic species of the Japanese loliginids, it does not occur in the waters beyond the continental shelf (Jereb and Roper (2005).

GENERAL DISTRIBUTION: East Sea to Indo-West Pacific; **JEJU:** Around Jejudo" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Jereb and Roper (2005) accept *Uroteuthis (Photololigo) edulis* (Hoyle, 1885)

as the correct taxon; WoRMS (2014) accepts this as an “alternate representation”.

Order: OEGOPSIDA d'Orbigny, 1845

Family: CRANCHIIDAE Prosch, 1849

Genus: *Liocranchia* Pfeffer, 1884

13 *Liocranchia reinhardti* (Steenstrup, 1856)

ORIGINAL DESCRIPTION: Hectoctyldannelsen hos Octopodslægterne *Argonauta* og *Tremoctopus*, oplyst ved Iagttagelse af lignende Dannelser hos Blacksprutterne i Almindelighed. Kongelige Danske Videnskabernes Selskabs Skrifter, 5 Række. *Naturvidenskabelig og Mathematisk*, 4: 200. (As *Leachia reinhardti* Steenstrup, J. 1856)
(Without illustration)

TYPE LOCALITY: 15° 19'N, 24°54'W and 23°N, 32°W (North Atlantic Ocean)

HABITAT: Lower epipelagic, mesopelagic, and bathypelagic zones (surface to 1 200 m)

GENERAL DISTRIBUTION: Circumglobally in tropical and subtropical waters, **JEJU:** “Vicinity of Jeju Island” (Son, 2009)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Widespread tropical-subtropical

OTHER SPECIES

Jereb and Roper (2010) include Jeju Island in their distribution maps for many other squid species. Unlike cuttlefish, which are generally more benthic in habitat and leave evidence of their occurrence in the form of cuttlebone, the pelagic nature of squid makes it difficult to ascertain whether or not these species have been reported from Jeju Island. The following are listed by Jereb and Roper followed by page numbers in their publication.

Uroteuthis (Photololigo) chinensis Gray, 1849 (p. 106)

Ancistrocheirus lesueurii (d'Orbigny, 1842) (p. 119)

Brachioteuthis riisei (Steenstrup, 1882) (p. 130)

Ctenopteryx sicula (Verany, 1851) (p. 146)

Cranchia scabra Leach, 1817 (p. 151)

Bathothauma lyromma Chun, 1906 (p. 161)

Egea inermis Joubin, 1933 (p. 162)

Helicocranchia pfefferi Massy, 1907 (p. 167)

Liguriella podophthalma Issel, 1908 (p. 169)

Sandalops melancholicus Chun, 1906 (p. 174)

Discoteuthis discus Young and Roper, 1969 (p. 181)

Abraliopsis hoylei (Pfeffer, 1884) (p. 195)

Watasenia scintillans (Berry, 1911) (p. 199)

Histioteuthis hoylei (Goodrich, 1896) (p. 228)

Lepidoteuthis grimaldii Joubin, 1895 (p. 239)

Taningia danae Joubin, 1931 (p. 265)

Ommastrephes bartramii (Lesueur, 1821) (p. 295)

Eucloteuthis luminosa (Sasaki, 1915) (p. 305)

Hyaloteuthis pelagica (Bosc, 1802) (p. 307)

Todarodes pacificus (Steenstrup, 1880) (p. 328)

Onychoteuthis banksii (Leach, 1817) (p. 350)

Onychoteuthis borealijaponica Okada, 1927 (p. 352)

Onykia lönnbergi (Ishikawa and Wakiya, 1914) (p. 362)

Walvisteuthis virilis Nesis and Nikitina, 1986 (p. 367)

Pyroteuthis margaritifera (Rüppel, 1844) (p. 380)

Pterygioteuthis giardi Fischer, 1896 (p. 382)

Thysanoteuthis rhombus Troschel, 1857 (p. 385)

Order: OCTOPODA Leach, 1818

Family: OCTOPODIDAE d'Orbigny, 1840

Genus: *Octopus* Cuvier, 1798

14 *Octopus vulgaris* Cuvier, 1797

(Fig. 4)

ORIGINAL DESCRIPTION: Cuvier, 1797, *Tableau Elementaire de l'Histoire Naturelle des Animaux*, 380. (As *Octopus vulgare* Cuvier, 1797) (Without illustration)

TYPE LOCALITY: Presumed western Mediterranean Sea

HABITAT: In dens on rocky, sandy, or muddy substrates at depths ranging from 0 to 250 m, typically occurring shallower than 100 m; primarily night active..

GENERAL DISTRIBUTION: Worldwide in temperate and tropical waters. (In the coastal subtropical and temperate waters of northwest Pacific Ocean, from at least Hong Kong and Taiwan in the south, to mid-Japan.) **JEJU:** Munseom (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: Classed as “*Octopus vulgaris* Type IV” (Jereb *et al.*, 2014)

15 “*Octopus parvus*” Sasaki, 1917

ORIGINAL DESCRIPTION: Sasaki, M. 1917. Notes on the Cephalopoda. *Annotationes Zoologicae Japonenses*, 9(3): 365, 366. (As *Polypus parvus* Sasaki, 1917) (Illustration???)

TYPE LOCALITY: Japan, Satsuma Prefecture

HABITAT: Depth range unknown.

GENERAL DISTRIBUTION: Korea and Southern Japan; northwest Pacific; **JEJU:** "Jejudo" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Lowboreal

REMARKS: Provisionally placed in the genus '*Octopus*'. Types are in the Agricultural College, Sapporo, Japan (Sasaki, 1917)

Genus: *Callistoctopus* Iw. Taki, 1964

16 *Callistoctopus luteus* (Sasaki, 1929)

ORIGINAL DESCRIPTION: Sasaki, M. (1929), "A Monograph of the dibranchiate cephalopods of the Japanese and adjacent waters," Journal of the College of Agriculture, Tohoku Imperial University, Sapporo, 20 (suppl. 10): p. 45 (As *Polypus luteus* Sasaki, 1929) (Check illustration)

TYPE LOCALITY: Taiwan, Pescadore Islands (Peng-hu)

HABITAT: Sand, seaweed, and rubble areas, to depth of 82 m.

GENERAL DISTRIBUTION: Eastern Japan to Philippines, Indonesia, and Thailand; **JEJU:** "Jejudo" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Type material in Hokkaido Imperial Museum (Norman, 1993). "At present known only from Taiwan and Philippines, south to Sulawesi, Indonesia, and Thailand. Awaits detailed description. May represent more than one species. (Jereb *et al.*, 2014)

Genus: *Enteroctopus* Rochebrune & Mabille, 1889

17 *Enteroctopus dofleini* (Wülker, 1910)

(Fig. 4)

ORIGINAL DESCRIPTION: Wulker, G. 1910. Über japanische Cephalopoden. Beiträge zur Kenntnis der Systematik und Anatomie der Dibranchiaten. Abhandl. II. Klasse d. K. Bayer. Akad. Wiss. Ill. Suppl. Bd.1: pp. 7, 8. Pl. 2, figs 1,2; pl. 3, fig. 10. (As *Polypus dofleini* Wulker, 1910)

TYPE LOCALITY: Hokkaido

HABITAT: Mainly in dens on rocky reefs or boulder areas with sand-shell substrate, at depths from 0 to 1, 500 m. Individuals also have been observed in sand and mud habitats. Often occurs intertidally at the northern end of its range but at the southern end it has been recorded to depths over 1, 500 m (Jereb *et al.*, 2014).

GENERAL DISTRIBUTION: Korea and Japan to Alaska southward to northern California;

JEJU: Munsom (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Widely distributed boreal

REMARKS: The largest of all octopods. *Octopus (Enteroctopus) dofleini* (Wülker, 1910) is a synonym.

Genus: *Haplochaena* Robson, 1929

18 *Haplochaena fasciata* (Hoyle, 1886)

ORIGINAL DESCRIPTION: Hoyle, W.E. 1886. Report on the Cephalopoda collected by H.M.S. Challenger during the years 1873-76. In Report of the scientific results of the voyage of H.M.S. Challenger during the years 1873-76: a summary of the scientific results, Zoology. 16(44): 94, pl. 8; fig. 3. (As *Octopus pictus* var. *fasciata* Hoyle, 1886)

TYPE LOCALITY: Port Jackson, Sydney, Australia

HABITAT: Intertidal and shallow rocky reefs at depth from 0 to at least 20 m.

GENERAL DISTRIBUTION: Korea and Southern Japan to Taiwan and Hong Kong

(Australia: Southern Queensland to NSW); **JEJU**: "Jejudo" (Min *et al.*, 2004)

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Subtropical

REMARKS: According to Norman and Lu (2000), genuine *H. fasciata* is restricted to the warm temperate waters of the eastern Australian coast, and Korean and Japanese records probably represent a different, possibly new, species (Norman and Hochberg, 1994). However, Gleadall and Salcedo-Vargas (2004) state that inspection of the holotype of *H. fasciata* provides no reason to doubt that these Japanese specimens are the same species, despite the punctuated distribution of known specimens in Honshu (Japan), Hong Kong, and Eastern Australia. "A related undescribed species with blue lines is also present in Japan" (Jereb *et al.*, 2014).

Extremely venomous; tetrodotoxin venom produced in the salivary glands is distributed throughout the body organs and skin of this species. Responsible for at least one human death (Jereb *et al.*, 2014).

OTHER SPECIES

Although the following species have not yet been reported from Jeju Island, Jereb *et al.* (2014) include the island in their distribution maps for the following species:

Amphioctopus fangsiao (d'Orbigny, 1839-1841) (p. 72)

Amphitretus pelagicus Hoyle, 1885 (p. 217)

Vitreledonella richardi Joubin, 1918 (p. 220)

Bolitaena pygmaea (Verrill, 1884) (p. 223)

Japetella diaphana Hoyle, 1885 (p. 224)

Haliphron atlanticus Steenstrup, 1861 (p. 226)



Fig. 4: Distribution of *O. vulgaris* (●) and *Enteroctopus dofleini* (■)

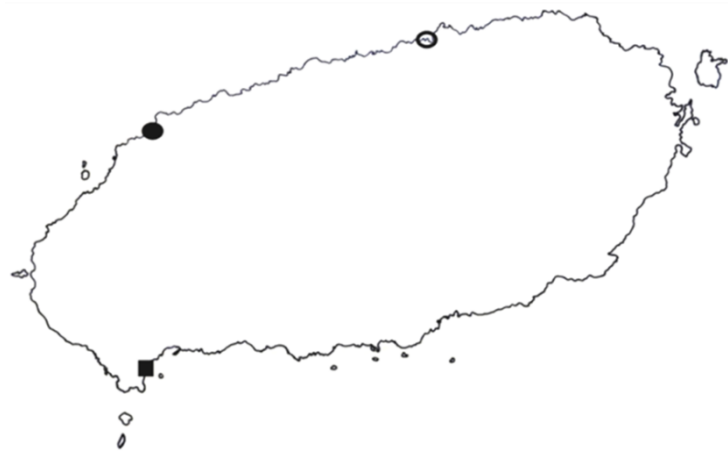


Fig. 5: Distribution of *A. argo* (●) and *A. hians* (■)

Suborder: Incirrata Grimpe, 1916

Superfamily: Argonautoidea Cantraine, 1841

Family: ARGONAUTIDAE Cantraine, 1841

Genus: *Argonauta* Linnaeus, 1758

19 *Argonauta argo* Linnaeus, 1758

(Fig. 5)

ORIGINAL DESCRIPTION: Linnaeus, 1758, *Systema Naturae per Regna Tria Naturae, Secundum Classes, Ordines, Genera, Species cum Characteribus, Differentiis, Synonymis, Locis, Holmiae: 708. (As *Argonauta argo* Linnaeus, 1758) (Without illustration)*

TYPE LOCALITY: Mediterranean Sea

HABITAT: Pelagic. Females use the shell to trap air, gathered at the sea surface, to attain neutral buoyancy (Jereb *et al.*, 2014).

GENERAL DISTRIBUTION: Worldwide in tropical and warm temperate seas. **JEJU:** Gimnyeong, Gwakji

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: Edible. Males are quite small. Females are occasionally found in markets in India, Japan, and Taiwan (Jereb *et. al.*, 2014).

20 *Argonauta hians* Lightfoot, 1786

(Fig. 5)

ORIGINAL DESCRIPTION: [Lightfoot, John]. 1786. A catalogue of the Portland Museum, lately the property of the Duchess Dowager of Portland, deceased, which will be sold at auction, by Mr. Skinner and Co London, pp. 12, 29 (As *Argonauta hians* Lightfoot, 1786) (Without illustration)

TYPE LOCALITY: Unknown

HABITAT: Pelagic. Females have been observed 'riding' jellyfish (Jereb *et al.*, 2014).

GENERAL DISTRIBUTION: Tropical and subtropical waters worldwide; **JEJU:** Sagyei

ZONAL-GEOGRAPHICAL CHARACTERISTICS: Tropical-subtropical

REMARKS: It is an extremely variable species and there appear to exist at least two distinct forms; a "southern" form and "northern" form. The former is most abundant in the Philippines and South China Sea. It is a much smaller animal, with a shell that rarely exceeds 80 mm and lacks the winged protrusions for which this species is named. The "northern" form, which is found in the waters surrounding Taiwan, Hong Kong and Japan, produces a much larger, darker and more robust shell that can reach 120 mm and has the characteristic winged protrusions. It is usually less elongated than that of the "southern" form and lacks its porcelain-like shine. Further research is needed to determine whether or not these forms represent two separate species (Norman, 2000).

DISCUSSION

A total of 272 species in the four classes studied are reported from Jeju Island. There are 225 bivalves, with only one freshwater species. Among the smaller classes there are twenty Cephalopoda, nineteen Polyplacophora, and eight Scaphopoda. The best represented bivalve families are the Veneridae, Mytilidae, and Arcidae, with 29, 21, and 13 species respectively. The Cardiidae have nine species, and the Ostreidae, Pectinidae, Lucinidae, and Tellinidae have eight species each. Twenty families have only one species. The most speciose family in the Polyplacophora is the Acanthochitonidae with five species, followed by the Chitonidae and Mopaliidae with four each. The Sepiidae are the most speciose of the cephalopods with eight species followed by the Octopoda with five. Jereb and Roper (2005); Jereb and Roper (2010); Jereb *et al.* (2014), in the three-volume *Cephalopods of the World*, include Jeju Island in their distribution maps for 27 squid species and six octopus species. As far as can be ascertained, these species have not yet been reported from Jeju Island but, given the pelagic nature of squid and with more sampling of benthic organisms, some or most of these species may become part of the Jeju cephalopod fauna. Among the Scaphopoda, the Dentaliidae have the most species with four. Of particular note is the absence of some of the more common, edible mainland bivalve species, e.g. *Meretrix* spp., because of the relative lack of muddy substrates.

Of specific interest is a comparison between a previous Jeju Island mollusk catalogue (Noseworthy, 2007) and the present study. The first catalogue enumerated 225 bivalves, and sixteen cephalopods, eleven chitons, and eight scaphopods. This study reports the same number of bivalves; however, there are some changes to the composition of the fauna. Several misidentifications and synonyms have been removed from the previous catalogue and replaced with new species records. The number of cephalopods has increased slightly from

16 to 20 because of possible additions by Jereb and Roper (2005); Jereb and Roper (2010); Jereb *et al.* (2014), and the reporting of a new squid species (Son, 2009). Species previously reported (Hong, S. Y. *et al.*, 2006; Hong, J. S. *et al.*, 1990) but unlisted in the previous catalogue, and new species records, have also raised the number of chiton species from 11 to 19. The number of scaphopods remains unchanged. Thus, whereas the total number of species in the four classes in the previous catalogue was 260, the total number in this survey is 272, with the increase in species number in the Polyplacophora and Cephalopoda.

CLASS ANALYSIS

BIVALVIA

The Jeju bivalve fauna consists of three subclasses, Protobranchia, Pteriomorphia, and Heterodonta. The latter subclass is by far the largest with 34 families, with the Protobranchia and Pteriomorphia having three and 18 families respectively. The maps clearly show the distribution of each species on the island. In general, the families, eg. Chamidae, with a tropical-subtropical distribution, to Southeast Asia and the Indo-Pacific, tend to occur more often on the southern coast of the island where the water temperature is somewhat warmer. Also, some individual species have been found only on certain parts of the coastline; eg. *Kellia porculus*, a subtropical-lowboreal species, occurs only on the north and east coasts, while *Ylistrum japonicum* (= *Amusium japonicum*), a subtropical species, has been found only on the south coast. This may indicate water temperature preferences; however, more extensive sampling may result in the occurrence of those, and other, species on other coasts of the island.

Apart from adjustments in nomenclature because of new taxonomic studies, there are a number of new species records for the island. In the bivalves the boring mytilid

Lithophaga cf. *malaccana* (Reeve 1857) was obtained from the encrusting coral *Alveopora japonica* Eguchi, 1968 from several localities around the island and *Donax cuneatus* Linnaeus, 1758, a single fresh valve, was obtained from Hwasoon Beach. These have not been previously reported from Korea and represent new species records for the country.

Several species have been reported from the Korean mainland but not previously from Jeju Island, such as *Barnea (Anchomasa) manilensis* (Philippi, 1847) from hard-packed sandy mud at Hamo Beach, southwest corner of the island, *Hiatula boeddinghausi* Lischke, 1870, a single fresh valve from Hyupjae, on the northwest coast, and several live specimens of *Sphaerium japonicum* (Westerlund, 1883) from two small, muddy streams on the southern coast of the island. The latter is the first freshwater bivalve species reported from Jeju Island. This freshwater fauna may possibly be increased with the addition of a species of *Pisidium*; at present only a single worn valve has been obtained from one of the *S. japonicum* localities. Although it was previously believed that no freshwater bivalves occurred here (Noseworthy *et al.*, 2007), it now appears that the few muddy streams and ponds on the island may support a somewhat richer mollusk fauna than was previously believed.

Two other species previously reported from mainland Korea are possible new records. The arcid *Tegillarca granosa* (Linnaeus, 1758), has been found at several localities but most specimens (single valves) appear subfossil, although some seem to be fresh. Another species is the psammobiid *Nuttallia* cf. *ezonis* Kuroda & Habe in Habe, 1955, also found at several localities. Species of *Nuttallia* can be quite difficult to differentiate based on shape, periostracal color, and depth of pallial sinus.

Arca boucardi Jousseaume, 1894 may not occur on Jeju Island. K. Lutaenko, who has extensively studied the Arcidae, is of the opinion that what has been previously regarded as Jeju Island specimens of *A. boucardi* may instead be elongated specimens of *A. avellana*

Lamarck, 1819. The author of this study has collected specimens of *A. boucardi* from several localities in Peter the Great Bay, Eastern Russia, and those specimens appear somewhat different from Jeju Island specimens of *A. boucardi*, being larger with stronger radial ribs. Thus, until a more detailed examination of Russian and Jeju specimens can be implemented, *A. boucardi* is provisionally regarded as part of the Jeju Island fauna.

Three species that may also become part of the Jeju bivalve fauna are *Anadara kagoshimensis* (Tokunaga, 1906) (Plate 2: G, H), *Glycymeris imperialis* Kuroda, 1934 (Plate 3: E, F), and *Macoma incongrua* (von Martens, 1865), previously reported from the Korean mainland. Lutaenko (pers. comm.) has examined several valves of *Anadara*, *Glycymeris*, and *Macoma* from several Jeju localities and believes that they may represent these species. However, a more careful examination is needed before those species are accepted as part of the island fauna.

Taxonomic changes

The taxonomy of the Jeju Island bivalves has undergone many changes since the 2007 catalogue was published, mainly due to the work of Huber (2010), Temkin (2010), Dijkstra (2013), and Bieler *et al.* (2010). Changes in the number of species in bivalve families in this survey are due mainly to the discovery of new species records as well as taxonomic modifications. The increase in species numbers in the Psammobiidae, from four to six, and the Pholadidae, from two to three, is the result of new species records being added. The number of species in the Pectinidae has decreased from 12 to eight because of the synonymization of three species and the misidentification of another in Min (2004). Misidentifications are also the cause of the reduction in species number in the Glycymerididae from five to three. Changes in the systematics of other families have led to

the number of species in the Lucinidae increasing from seven to eight, with the addition of the subfamily Leucosphaerinae from the Thyasiridae (Taylor, 2014), and the Veneridae from 28 to 29, with the addition of the Petricolidae as a subfamily, Petricolinae (Bieler and Mikkelsen, 2006). The number of species in the Lasaeidae has increased from two to seven because of confusion in separating this family from the Kelliidae, Montacutidae, and Melliterycidae (Bieler *et al.*, 2010; Lutaenko and Noseworthy, 2012; Bouchet, 2015).

OTHER CLASSES

The Jeju Polyplacophora fauna, which has increased with the addition of three new species records, consists of one subclass, Neoloricata, and two orders, Lepidopleurina and Chitonina, with the latter containing all species except one, *Leptochiton japonicus* (Thiele, 1909). Apart from adjustments in nomenclature because of new taxonomic studies, there are other changes in the composition of the families. The Chitonidae now has four species with one new species record; the Mopaliidae now has four, also with a new record, the Acanthochitonidae with two additional records, and the Cryptoplacidae, now regarded as a separate family, from one to two with the addition of a new species record. It is possible that even more chiton species, particularly the smaller ones, may be found with more intensive sampling.

There have been no new Jeju species records in the Scaphopoda, and the only taxonomic change has been the moving of the genus *Megaentalina* from the Entalinidae to the Gadilidae (Steiner and Kabat (2004). Jeju scaphopods are not well known; most being subtidal to bathyal in depth. Only one species, *Dentalium buccinulum* Gould, 1859 occurs in the intertidal zone and is the one most often encountered as dead specimens in beach drift. The number of cephalopod species has increased from 16 to 20, mainly with the addition of

three species in the Sepiidae, one in the genus *Metasepia* and three in *Sepia*. However, as there have been no confirmed records of those species from Jeju Island, they are regarded only provisionally as part of the fauna. The squid family, Cranchiidae, has been added to the cephalopod fauna with the report of *Liocranchia reinhardti* (Steenstrup, 1856) from “vicinity of Jeju Island” (Son, 2009).

ZONAL-GEOGRAPHICAL ANALYSIS

In order to show more specifically the biogeographical affinities of the Jeju mollusk fauna, each species was assigned a zonal-geographical grouping based on their known distribution ranges: 1. tropical-subtropical (southward to Southeast Asia), 2. subtropical (southward to Taiwan and the northern part of the South China Sea), 3. subtropical-lowboreal (subtropical areas, the Yellow and East Seas, southeastern Sakhalin and southern Kuril Islands), 4. lowboreal (limited to the East Sea from Peter the Great Bay, northern Korea, northern Honshu to southwestern Sakhalin, Aniva and Terpenya Bays, and the southern Kuril Islands), 5. widely distributed boreal (limited within the East Sea and Hokkaido to Bering Strait along the Asian coast and along the northern American coast southward to California) and circumboreal (limited mainly to temperate latitudes, in both Atlantic and Pacific Oceans, but partly to subtropical and arctic zones), and 6. boreal-arctic (limited both to the temperate zone of the Pacific Ocean, and to the Arctic and partly to the temperate Atlantic) (Lutaenko *et al.*, 2006).

More extensive information concerning the distribution of Jeju mollusks has allowed a revision of some of the zonal-geographical groupings. After an analysis of the zonal-geographic features of each species in the four classes, based on their geographic ranges, some interesting results were obtained showing the biogeographical affinities of each class.

In general, the Scaphopoda preferred warm water areas, being mainly tropical-subtropical and subtropical species; the Cephalopoda, as well, favored warm waters, while the Polyplacophora preferred somewhat cooler waters, with more northern ranges (Table 1). The three orders of the Bivalvia, Protobranchia, Pteriomorphia, and Heterodonta all exhibit the same preference for mainly warm water, with most species ranging from the tropical and subtropical areas to the warmer parts of the East Sea (Table 2).

The main bivalve families, those with five or more species, exhibit more clearly this preference for warm water. In the Pteriomorphia the Mytilidae, Arcidae, and Ostreidae show a strong preference while all species of the Pteriidae and Pectinidae prefer warm water. However, while most species of Limidae are warm water in preference, a significant number of species, 37%, prefer cooler water. The heterodont families Carditidae, Cardiidae, Lasaeidae, Psammobiidae, and Veneridae are mainly warm water, with 93% of the latter family exhibiting this preference. All species in the Lucinidae, Chamidae, Tellinidae, and Myochamidae prefer warm water. Only the Mactridae have a significant number of moderately warm to cool water species (40%). (Table 2).

Of the seven bivalve species added to the Jeju fauna six are warm water species (tropical-subtropical and subtropical), and only one, *Nuttallia cf. ezonis*, prefers cooler water (Table 3). The newly reported cephalopods, confirmed and provisional, also have southern distributions. It appears that, with climate change, more mollusk species with southern ranges are being newly reported, mainly for Jeju Island but also for mainland Korea (eg. Son, 2009). Although this is indicated in the Bivalvia, it is most noticeable in the Gastropoda, such as the Ranellidae and Strombidae.

Two previous faunal studies (Noseworthy *et al.*, 2007; Noseworthy and Choi, 2010) arrived at similar conclusions. The Scaphopoda had mainly warm water affinities, while the

Table 1: Zonal-geographical characteristics (%) for all families of Polyplacophora, Scaphopoda, and Cephalopoda)

CLASS AND FAMILY	TROPICAL-SUBTROPICAL	SUBTROPICAL	SUBTROPICAL-LOWBOREAL	OTHER *
POLYPLACOPHORA				
LEPTOCHITONIDAE	0	0	100	0
ISCHNOCHITONIDAE	0	0	100	
CHITONIDAE	50	0	50	
MOPALIIDAE	0	25	50	25
ACANTHOCHITONIDAE	0	20	80	0
CRYPTOPLACIDAE	0	50	50	0
SCAPHOPODA				
DENTALIIDAE	50	50	0	0
ENTALINIDAE	100	0	0	0
GADLIDIDAE	50	50	0	0
CEPHALOPODA				
SEPIIDAE	63	24	13	0
SEPIOLIDAE	100	0	0	0
LOLIGINIDAE	67	0	33	0
CRANCHIIDAE	100	0	0	0
OCTOPODA	20	40	20	20
ARGONAUTIDAE	100	0	0	0

(*Lowboreal, Subtropical-boreal, Widely-distributed boreal, Circumboreal-subtropical, Circumboreal, Worldwide)

Table 2: Zonal-geographical characteristics (%) for the Bivalvia (Pteriomorpha and Heterodonta)
(Families with five or more species)

FAMILY	TROPICAL-SUBTROPICAL	SUBTROPICAL	SUBTROPICAL-LOWBOREAL	OTHER*
MYTILIDAE	66	19	5	10
ARCIDAE	77	8	15	0
PTERIIDAE	100	0	0	0
OSTREIDAE	50	37	13	0
PECTINIDAE	50	50	0	0
LIMIDAE	36	27	19	18
LUCINIDAE	50	50	0	0
CARDITIDAE	50	33	17	0
CARDIIDAE	78	11	11	0
CHAMIDAE	83	17	0	0
LASAEIDAE	42	29	29	0
MACTRIDAE	40	20	40	0
TELLINIDAE	25	75	0	0
PSAMMOBIIDAE	33	50	17	0
VENERIDAE	52	41	7	0
MYOCHAMIDAE	0	100	0	0

(*Lowboreal, Subtropical-boreal, Widely-distributed boreal, Circumboreal-subtropical, Circumboreal, Worldwide)

Polyplacophora, with the exception of *Ischnochiton (Haploplax) comptus*, preferred somewhat cooler waters (warm temperate = subtropical-low boreal). In the 2007 study the Cephalopoda, however, were also regarded as having similar water temperature preferences whereas, after a more detailed revision of their ranges, and the addition of new species, it now appears that the Jeju cephalopods, in general, prefer warmer water areas. The Bivalvia also were regarded as mainly tropical-subtropical, with only a few having a northern distribution. Thus, in general, the Jeju Island fauna in the four classes examined can be considered to be warm water in nature with most species ranging southward to the East China Sea and Southeast Asia.

In this regard, it can be seen that species from the tropical and subtropical areas follow the northeastward flow of the Kuroshio Current and its branch, the Tsushima Current, which washes the shores of Jeju Island. A possible reason for the preponderance of warm water species in the Bivalvia is the fact that bivalve larvae can stay viable in the water column for a relatively long time (Brusca and Brusca, 2003), enabling them to travel longer distances northward than most species from the other classes. The Cephalopoda, in general, are the most active of all mollusks, and their distribution in the Western Pacific generally follows not only the continental shelf but also the Kuroshio and Tsushima Currents (Jereb and Roper, 2005; Jereb and Roper, 2010; Jereb *et al.*, 2014). The only exception is the Polyplacophora. A few species range as far south as Hong Kong (Bullock and Harper, 1994) or Taiwan (Yeh, *et al.*, 2005) but most are concentrated around Korea and Japan with some ranging as far north as the Sea of Okhotsk. Only two species of *Liolophura* range as far south as Southeast Asia. Little is known about the distribution patterns of Jeju Scaphopoda.

Marine Ecoregions of the World (MEOW) (Spalding *et al.*, 2007) is a detailed, comprehensive biogeographic system to classify coastal and continental shelf areas.

According to this classification, Jeju Island is a part of the Temperate North Pacific Realm (Region) and the Warm Temperate Northwest Pacific Province. This mainly subtropical province extends from eastern Japan to the South Korean coast, then south to eastern China and Taiwan (Ecoregions 51 and 52). Jeju Island is situated in the northeastern part of the East China Sea Ecoregion 52 (Fig. 5).

Thus there is a strong affinity with the subtropical mollusk fauna of southern Japan and eastern China, and also northeast Taiwan (Noseworthy *et al*, 2010). However, a large number of species (approximately 50%) also extend even further south in the tropical West Pacific to Southeast Asia and throughout the Indo-Pacific region. In fact, most of the species, 55%, newly reported for the Jeju fauna, in the four classes studied, have a similar distribution (Table 3).

It appears that, with climate change, the Jeju Island Bivalvia, Polyplacophora, Scaphopoda, and Cephalopoda generally exhibit a slight shift towards a warmer water fauna. Preliminary studies on the Jeju Gastropoda indicate that the change, in this class, may be even greater.

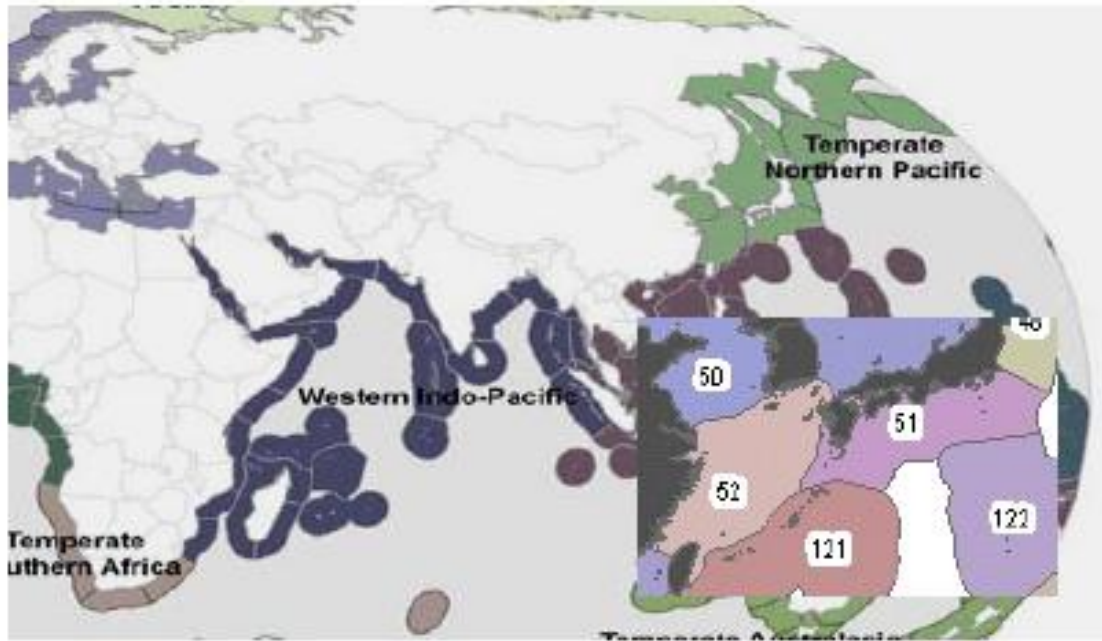


Fig. 5: Biogeography of Jeju Island (After Spalding et al., 2007)

Table 3: Distribution ranges of newly-reported species records for Jeju Island

CLASS AND FAMILY	SPECIES	From Jeju south to S.E. Asia; Indo-Pacific	From Jeju south to Taiwan	Korea and Japan	From Jeju to East Sea and northward
BIVALVIA	Lithophaga cf. malaccana	*			
	Tegillarca granosa	*			
	Sphaerium japonicum (freshwater)	*			
	Donax cuneatus	*			
	Hiatula boeddinghausi		*		
	Nuttallia cf. ezonis				*
	Barnea manilensis		*		
POLYPLACOPHORA	Liolophura cf. tenuispinosa	*			
	Mopalia cf. schrencki				*
	Cryptoplax propior			*	
CEPHALOPODA	Liocranchia reinhardtii	*			
SCAPHOPODA	No new species records				

CONCLUSION

The study of molluscan taxonomy is always a “work in progress”. Although there may be a desire to keep the “old names” in spite of advances in various classes based on detailed phylogenetic studies employing molecular and morphological data, it is important to know the current status of the systematics and nomenclature of any groups selected for research. Names are being changed, new species are being described, and some names fall into synonymy. This present study reveals many name changes with some newly-described species as well as additions to the fauna.

The number of mollusk species attributed to the Jeju Island fauna is steadily increasing. In this study, new species records have been added to the Polyplacophora, Bivalvia, and Cephalopoda, and a future study including the Gastropods will increase the number even further. Regarding the new records, there are two types: those previously reported from the Korean mainland but not from Jeju Island and those new to the Korean fauna which, of course, includes the island. Furthermore, there are several possible new species records for the Jeju fauna which require more study, especially in the Bivalvia and Cephalopoda.

There is now a preponderance of warm-water species in the four families studied, mainly with subtropical and tropical affinities. This trend holds true for the species newly reported for the island. Older studies (Noseworthy et al., 2007; Noseworthy and Choi, 2010) showed primarily a somewhat moderately warm to cooler water fauna. In the latter study a comment was made that: “...there is an increasingly urgent need for another type of comparative study, over periods of time, to examine the effects of climate change.” This study has demonstrated a slight shift toward a warmer water mollusk fauna for Jeju Island, and preliminary studies on the numerous species of island gastropods indicate an even

stronger southern influence (eg. Lee and Park, 2014). Furthermore, new species reports from the Korean mainland (eg. Lee *et al.*, 2013) suggest that the effects of climate change are being felt there as well.

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Specialists from around the world were of assistance in identification and taxonomy, particularly with bivalves. I would like to thank Henk Dijkstra, Leiden, The Netherlands, for his help with identification and taxonomy of the Pectinidae, Harry Lee, Florida, U. S. A., for taxonomic assistance, and the late, and much-missed, taxonomic guru, Richard E. (Dick) Petit, South Carolina, U. S. A. who helped to unravel some challenging bivalve nomenclature. Many other knowledgeable members of the Conch-L listserve were always ready to answer any of the many queries I made concerning my mollusk research.

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My family, who has helped me for many years of collecting and research, both here and in my home province of Newfoundland and Labrador, Canada, were of great help in the fieldwork leading to this study. My wife, Joy, and my younger daughter, Lori, accompanied me on many of my fieldtrips, and obtained good collections of mollusks from various localities. Lori was adept at finding the small specimens, and Joy was skilled at finding a wide variety of species. My grandchildren, Kim Yenna, and Kim Yae-jeun, although young in years, have received their beach training and have contributed some interesting specimens for my study, including several new locality records.

I have been blessed with so many people willing to assist me in the study of Jeju Island's rich mollusk fauna. I extend my heartfelt gratitude to them all.

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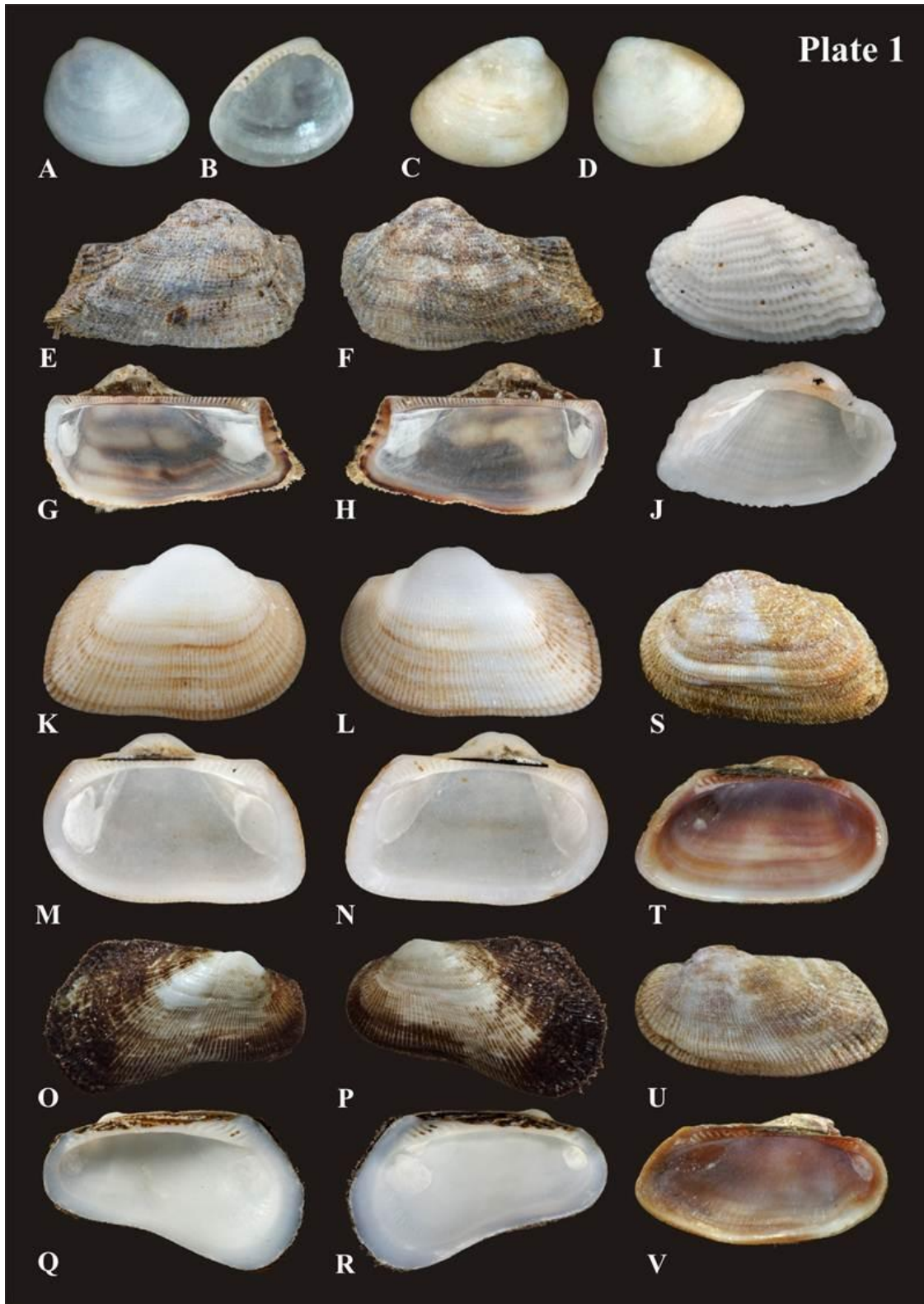


Plate 1: A-D – *Nucula (Nucula) paulula*; E-H - *Arca avellana*; I, J – *Acar plicata*; K-N – *Striarca symmetrica*; S-V – *Barbatia stearnsii*; O-R – *Barbatia virescens*

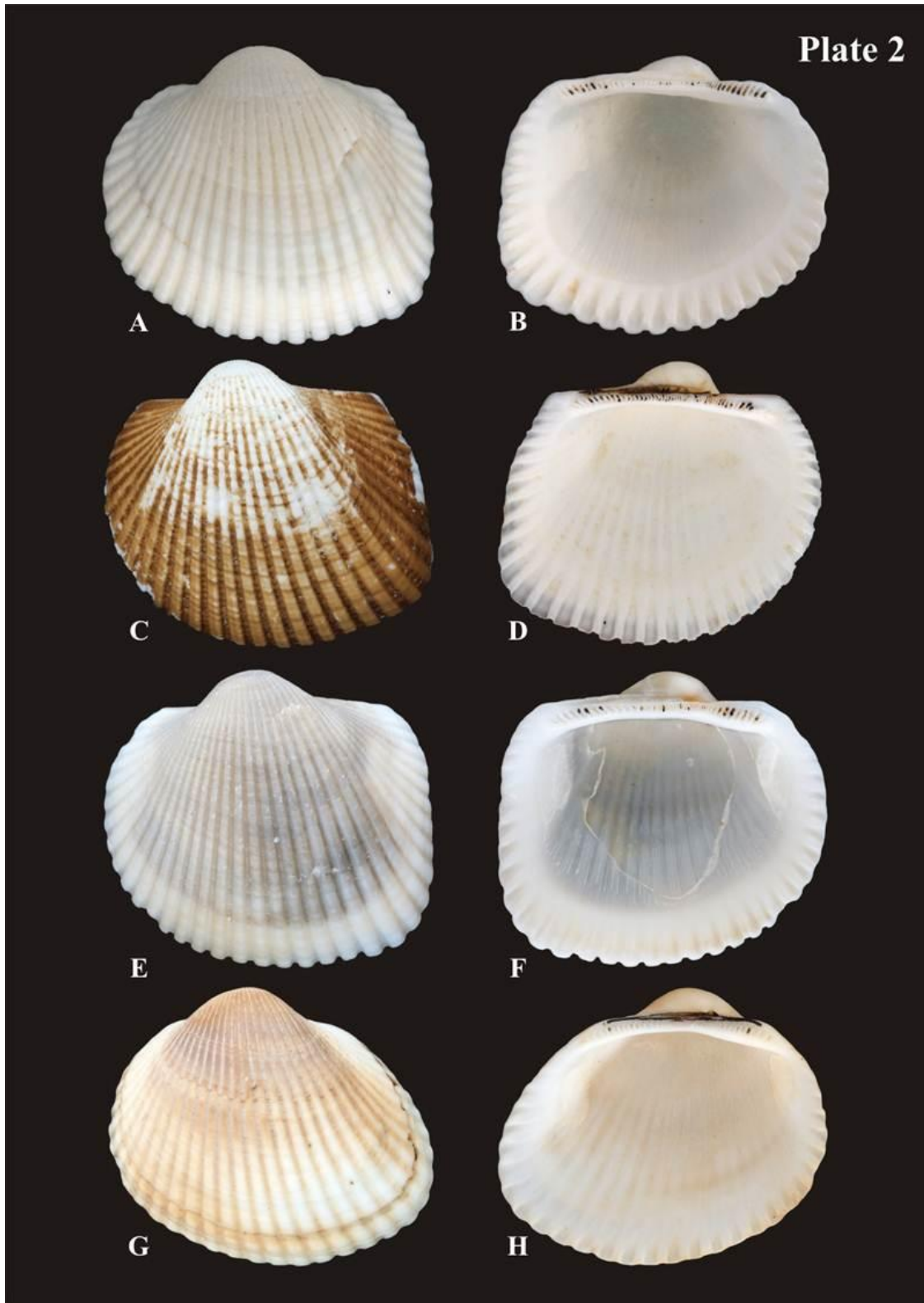


Plate 2: A-F – *Anadara* cf. *cornea* (= “*inaequivalvis*” aucct.); G, H – *Anadara kagoshimensis*

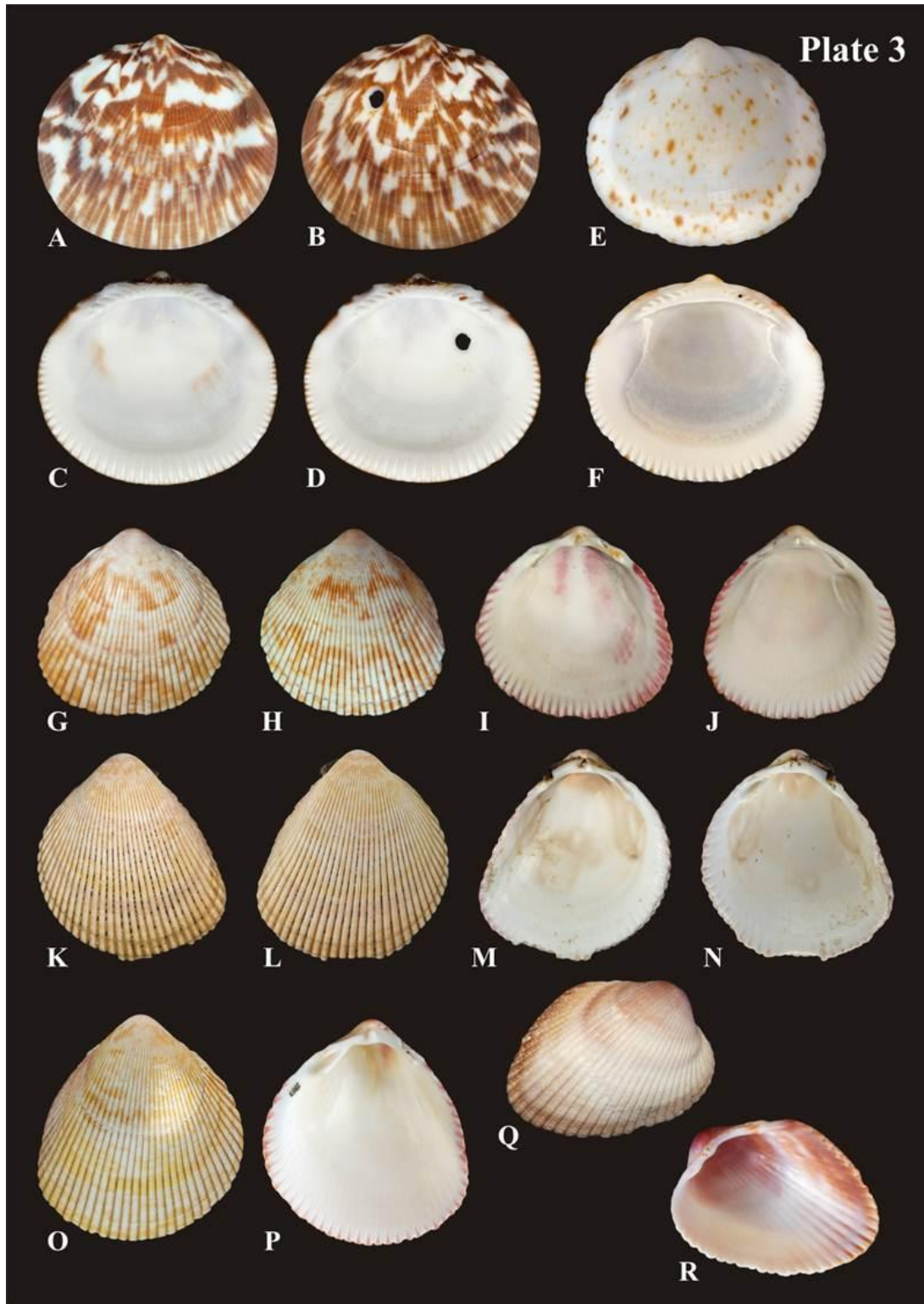


Plate 3: A-D – *Glycymeris albolineata*; E, F – *G. cf. imperialis*; G-J – *Acrosterigma maculosum*; K-N – *Acrosterigma burchardi*; O, P - *A. maculosum*; Q, R – *Afrocardium richardi*

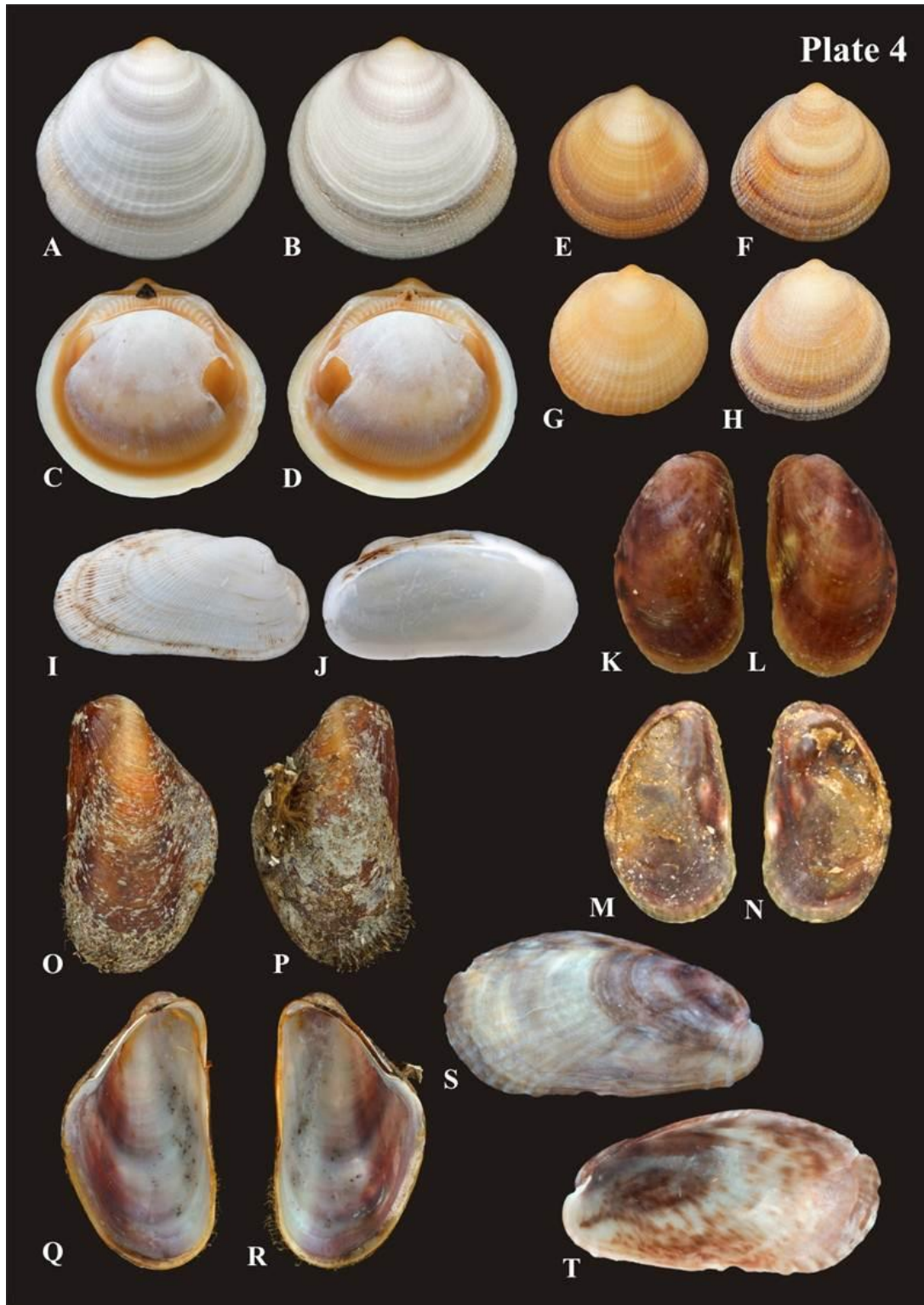


Plate 4: A-H – *Limopsis japonica*; I, J – *Porterius dalli*; K-N – *Musculus nanus*; O-R – *Modiolus cf. nipponicus*; S, T – *Musculus viridulus*

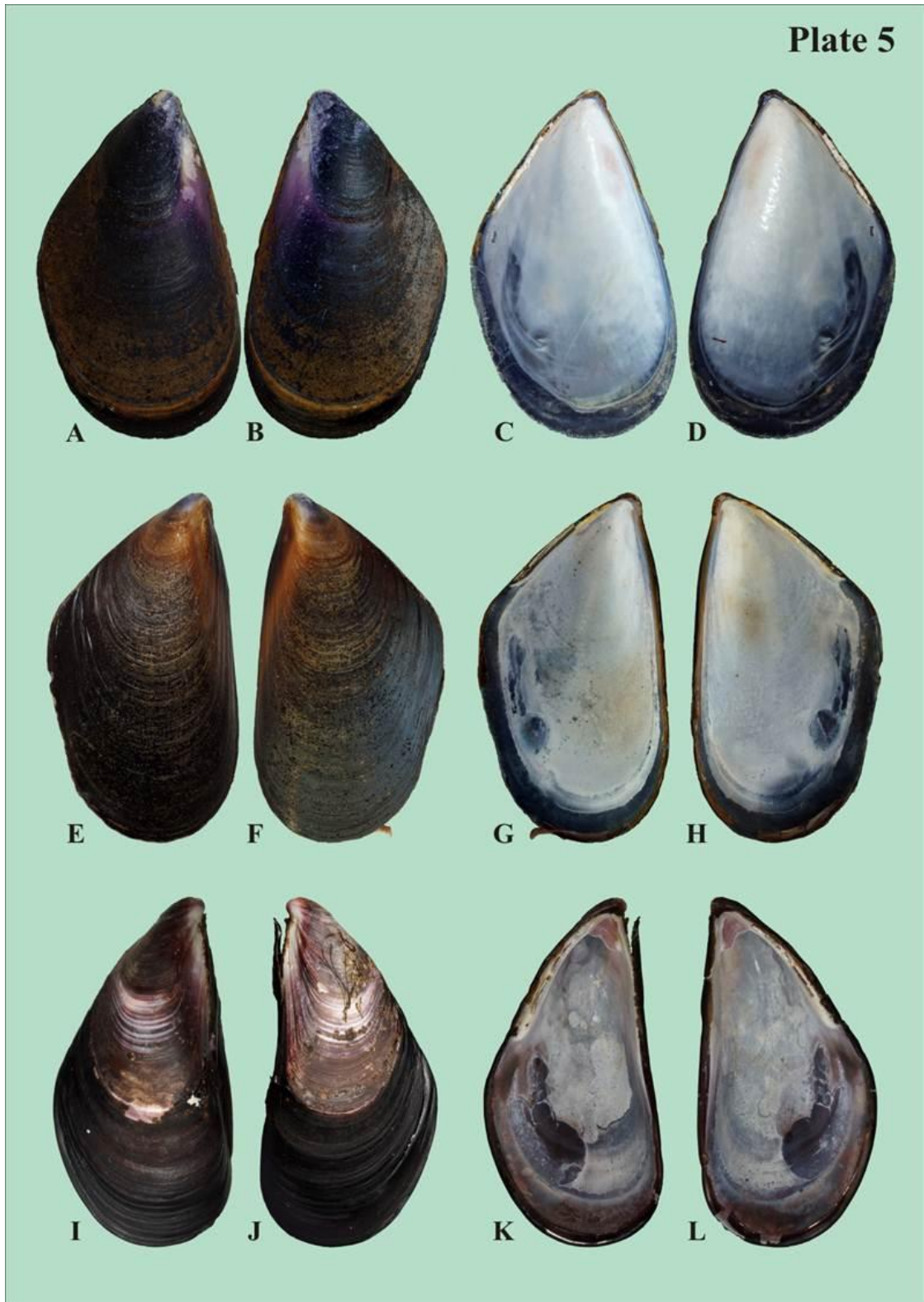


Plate 5: A-D – *Mytilus galloprovincialis*; E-H – *M. coruscus*; I-L – *Septifer virgatus*

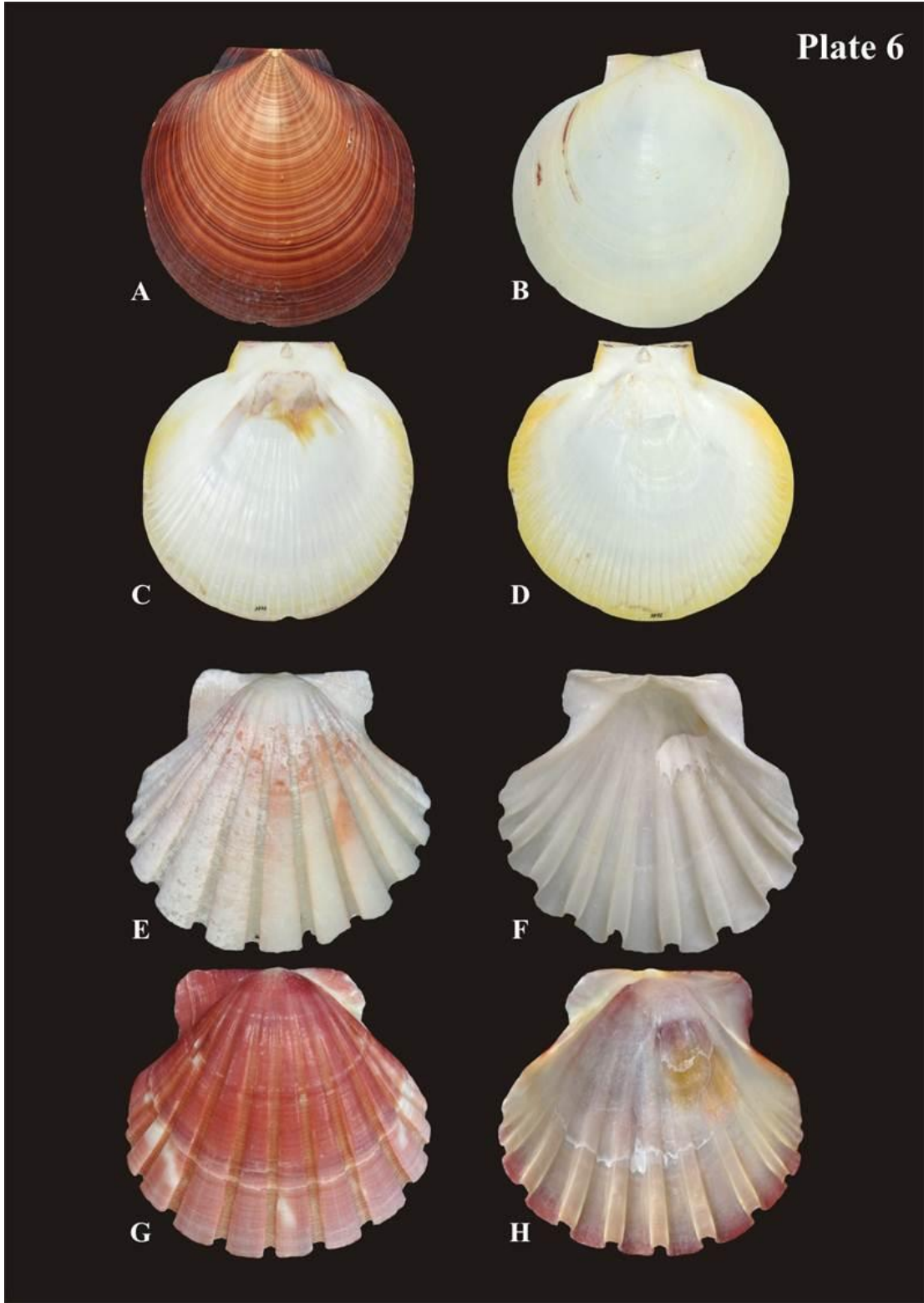


Plate 6: A-D – *Ylistrum japonicum*; E, F – *Pecten albicans*; G, H – *P. albicans*

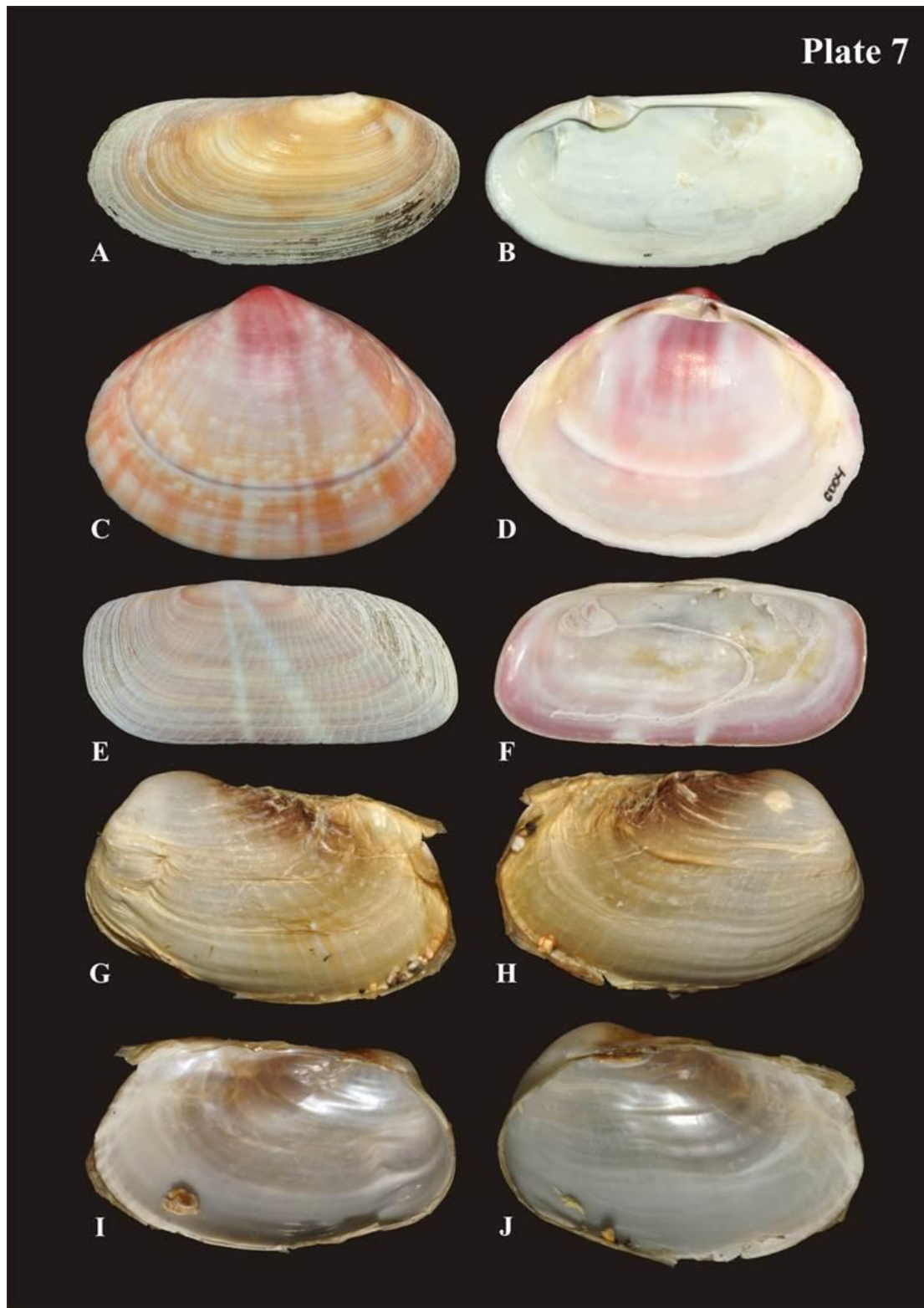


Plate 7: A, B – *Lutraria maxima*; C, D – *Mactra achatina*; E, F – *Solecurtus divaricatus*; G-J – *Entodesma navicula*

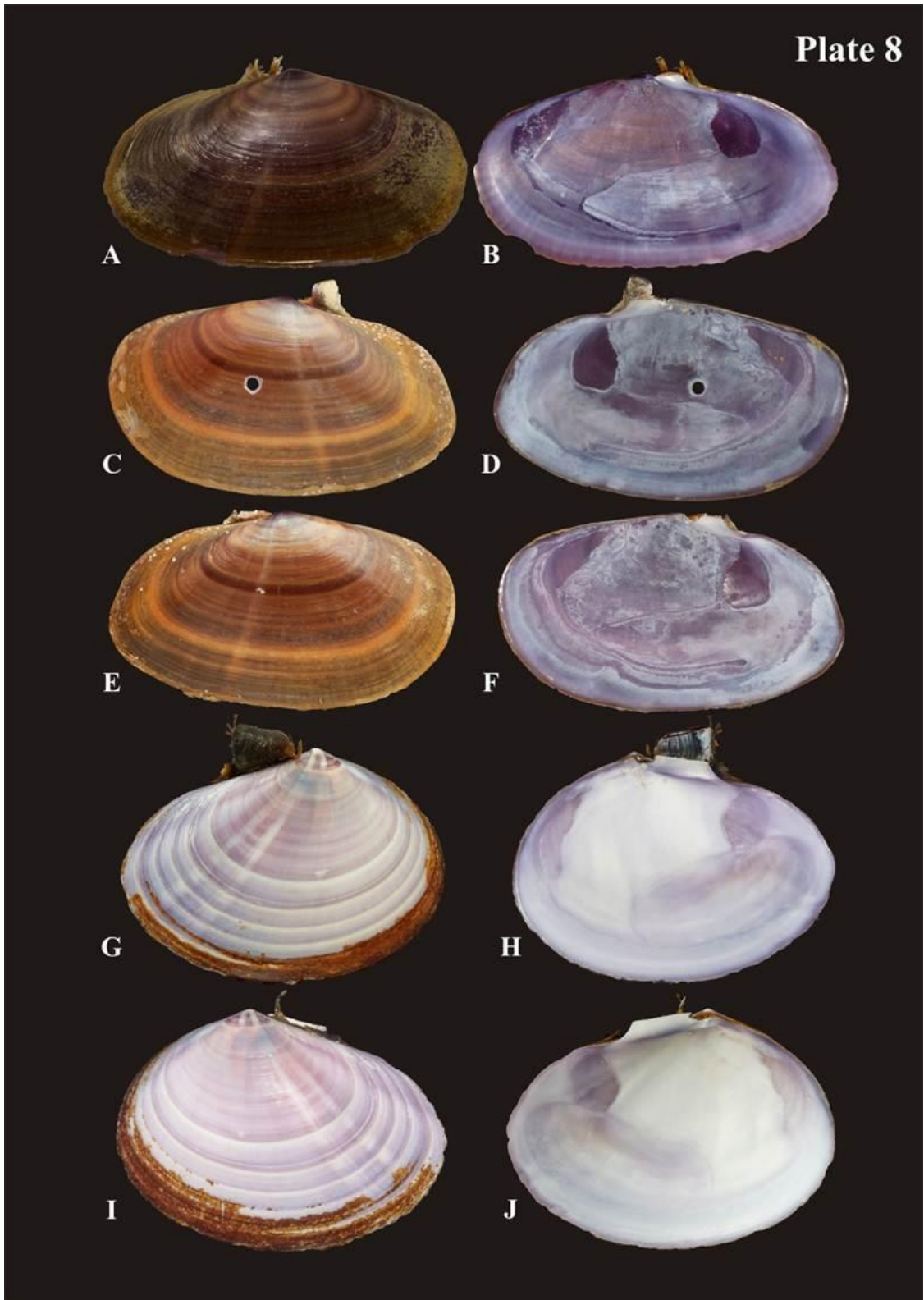


Plate 8: A-F – *Hiatula atrata*; G-J – *Nuttallia ezonis*



Plate 9: A-D, G-J – *Heteromacoma irus*; E, F – *Pharaonella sieboldi*; K, L – *Pristipagia subtruncata*; Q, R – *Cadella narutoensis*; M-P – *Jactellina clathrata*

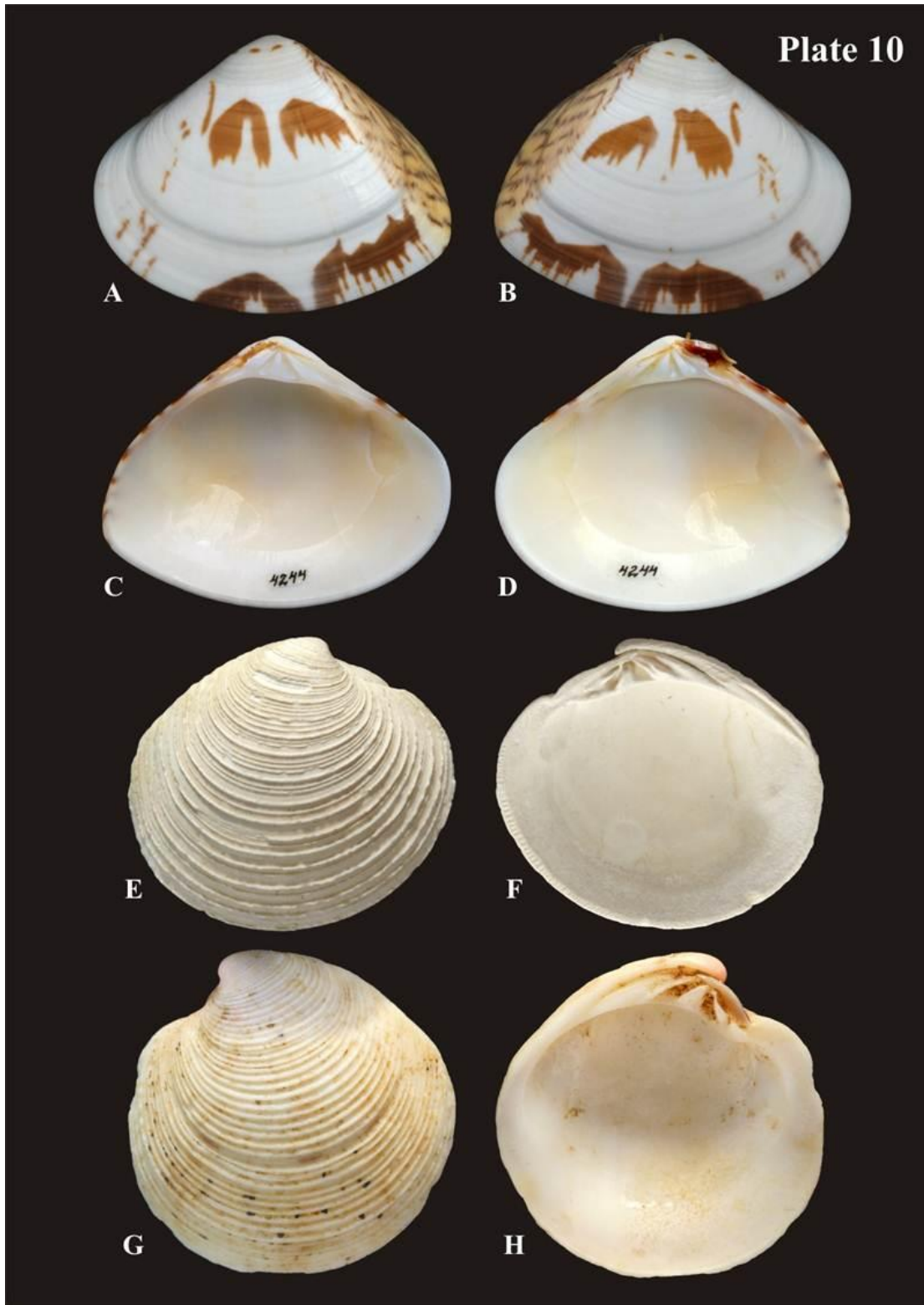


Plate 10: A-D – *Gomphina aequilatera*; E, F – *Venus cassinaeformis*; G, H – *Dosinia iwakawai*