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Diving into Diversity: Copepod Crustaceans in Octocoral Associations

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Abstract: This research provides an extensive analysis of the biodiversity and distribution patterns of copepod crustaceans associated with octocoral species. A comprehensive dataset comprising 966 records pertaining to 233 copepod species, encompassing 54 genera, 18 families, and 3 orders, was compiled from 92 scientific papers published between 1858 and 2023, and updated as open data to GBIF. These copepods were found to be closely associated with 183 octocoral species, representing 72 genera and 28 families. The analysis revealed a total of 393 distinct interspecific associations between copepods, classified under the orders Cyclopoida, Harpacticoida, and Siphonostomatoida, and diverse octocorals. Approximately 60% of these associations were reported only once in the literature, which poses challenges to assessing the level of host specificity among the majority of copepod species linked with octocorals. Notably, over 91% of the recorded copepod species were found at depths not exceeding 30 m, with only four copepod species reported at greater depths surpassing 500 m. The presence of these symbiotic copepods was documented across 215 sampling sites situated within 8 of the 12 defined marine ecoregions, with particular attention to the Western Indo-Pacific, Central Indo-Pacific, and Temperate Northern regions. Despite the comprehensive examination of available data, this study highlights substantial gaps in our comprehension of copepod crustacean diversity and distribution in association with octocorals. Moreover, crucial information concerning symbiotic copepods is conspicuously absent for approximately 94% of potential octocoral host species. These disparities emphasize the imperative need for further scientific inquiry to unveil the intricacies of symbiotic relationships and to contribute to a more holistic understanding of copepod–octocoral associations.

Keywords: Cnidaria; Octocorallia; Copepoda; biodiversity; distribution; marine symbiosis; parasitism; coral ecosystems; benthic organisms; coral–crustacean interactions

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1. Introduction

Copepoda (Crustacea) are diminutive crustaceans renowned for their remarkable diversity and pivotal roles in aquatic ecosystems [1–3]. They adapted to thrive in an array of environments and often established commensal and parasitic associations across a broad spectrum of animal taxa [1,4–7]. This intrinsic capability to forge intimate bonds with an extensive repertoire of animal taxa has contributed to the extraordinary morphological diversity observed within copepods, an outcome of their colonization of diverse host groups. Nevertheless, despite persistent endeavors to elucidate the phylogenetic underpinnings of copepods and the evolutionary trajectories governing their symbiotic liaisons with various organismal assemblages [6,8,9], a multitude of questions remains unresolved or encircled by controversy [10,11]. Much of this predicament is rooted in the paucity or absence of

comprehensive molecular and other empirical datasets encompassing numerous copepod taxa participating in symbiotic associations with diverse invertebrates [3,12].

Extensive investigations have been conducted into the diversity of ecto- and endosymbiotic copepods affiliated with Cnidaria, particularly within hexacorals and octocorals [2,13,14]. The wealth of published data, including our own yet-to-be-published findings, unveils an exceptionally high and comparatively underexplored diversity of copepods cohabiting with cnidarians and other invertebrate cohorts such as sponges and echinoderms, among others. Nevertheless, the extant knowledge concerning these copepods dwelling amidst cnidarians predominantly comprises taxonomic characterizations, occurrence records, depth-related information, host nomenclature, and several check lists [13,15–18]. The compiled data allude to the potential occurrence of numerous instances of host switching and a multifarious spectrum of geographical distribution patterns and host specificity among copepods that form associations with cnidarians and other invertebrates [12,13,19,20].

The class Octocorallia (Cnidaria: Anthozoa), characterized by its considerable size and diversity, thrives across marine ecosystems spanning from tropical shallow waters to abyssal depths, contributing significantly to the provision of habitats for a myriad of marine single-cell and multicellular organisms [21–25]. Despite their ecological importance, both octocorals and their symbiotic counterparts have garnered relatively less scientific scrutiny when juxtaposed with reef-building scleractinian corals. The limited understanding of octocoral species diversity, a predicament shared with numerous other invertebrate groups, can primarily be ascribed to the scarcity of taxonomists and the existence of numerous cryptic or yet-undescribed species [12,26]. Currently, a tally of approximately 3500 validated octocoral species exists; however, it is posited that this figure merely accounts for 30% of the total species that await formal taxonomic delineation. Nevertheless, recent investigations have underscored the pivotal role played by Octocorallia in shallow and deep-water ecosystems, shed light on the adverse repercussions of shallow and deep-water fishing, and bolstered biomaterials science research, while also unveiling disease outbreaks that impact octocoral populations [22,25,27].

Octocorals like scleractinians are susceptible to diseases, although their study in this regard remains relatively limited [28–30]. These diseases may manifest as discoloration, tissue impairment, lesions, or atypical growth patterns within coral colonies. The etiologies of octocoral diseases are multifarious, encompassing microbial pathogens, environmental stressors, shifts in water quality, or interactions with other organisms. Notably, the presence of gall-forming and other symbiotic copepods on octocorals raises pertinent queries concerning the potential implication of copepods in the genesis and transmission of coral diseases. An exemplar of significance is the pervasive multifocal purple spots observed in the Caribbean Sea fan *Gorgonia ventalina*, an occurrence recently attributed to the presence of gall-inducing lamippid copepods [24,28,31,32]. This accentuates the conceivable role of ostensibly parasitic copepods in the realm of coral diseases, thereby beckoning further investigations into their interactions and ramifications for coral health.

The primary objective of this research paper is to undertake a pioneering endeavor in collating and scrutinizing all extant records pertaining to the association between copepods and octocorals. Given the dispersed nature of these data and the conceivable significance of these minuscule symbionts in the context of corals and coral communities, this endeavor aspires to enhance our comprehension of the intricate interplay between copepods and octocorals. Through this initiative, we aim to furnish insights into the breadth of diversity and the contemporary state of knowledge regarding these relationships, while also envisaging prospects and potential avenues for further exploration in this domain.

2. Materials and Methods

To compile the requisite information, we conducted a comprehensive review of all 92 identified papers, which provide descriptions and/or document records of copepods associated with octocoral corals (Tables 1, A1 and S1). Subsequently, we integrated these

data into an original database utilizing Microsoft Access software. (Version 16.0) The database "Global diversity and distributions of symbiotic copepod crustaceans living on octocorallians" is structured around five primary tables: Host Taxonomy, Host Synonymy, Symbiont Taxonomy, Symbiont Synonymy, and Symbiont Descriptions. These tables are intricately linked through the Records table. Within the database, each entry encompasses comprehensive details regarding the taxonomy of both the host and its symbiont, and these details are cross-referenced with unique identifiers for each taxon as listed in the World Register of Marine Species (WoRMS database) [33].

Table 1. List of references reporting records of copepods, divided by world ocean regions and countries (for more details see Tables A1 and S1).

Region	Country	Reference
Arctic	Denmark (Greenland)	[34–36]
	Russia	[37]
Central Indo-Pacific	Indonesia	[38–48]
	Marshall Islands	[49]
	Philippines	[41–43,50]
	New Caledonia	[42,43,50–55]
	Singapore	[56]
Eastern Indo-Pacific	Indonesia	[57,58]
	Marshall Islands	[49,59]
	USA	[60]
Southern Ocean (Antarctica)		[61]
Temperate Northern Atlantic	Canada	[36,62–64]
	France	[65–75]
	Iceland	[35]
	Ireland	[76]
	Italy	[77]
	Japan	[78]
	Norway	[70,79]
	Spain	[70,80–83]
	Sweden	[80,81]
	USA	[36,73,83–85]
	United Kingdom	[73,83,86–88]
Temperate Northern Pacific	Canada	[89]
	Japan	[90,91]
	Republic of Korea	[54,92–95]
	USA	[96]
Tropical Atlantic	Barbados	[52]
	Bermuda	[49,96,97]
	Bonaire	[97]
	Brazil	[98]
	Bahamas	[60]
	Cuba	[99–105]
	Curaçao	[81,97]
	Jamaica	[52]
	Puerto Rico	[52,81]
	Saba	[97]
	Saint Martin	[52,97]
	Sint Eustatius	[31,97]
	USA	[106,107]
	United Kingdom	[96]
Western Indo-Pacific	Eritrea	[108]
	Israel	[108]
	Madagascar	[15,41–43,52,93,109–118]
	Mayotte	[15,52,112–115]

The dataset employed for the analysis features 62 columns filled with metadata and details relevant to taxonomy, habitat features, and associations with host species, as detailed in Table A2. For the purpose of elucidating the methodologies employed in the collection of these records. These collection techniques encompass a spectrum of approaches, including SCUBA diving, bottom trawling, utilization of Remotely Operated Vehicles (ROVs), dredging operations, snorkeling, and manual hand sampling. Sampling locations, including geographical names and coordinates, sampling depths, and dates, have been incorporated into the dataset entries, conforming to Darwin Core standards [119]. This meticulous approach ensures a comprehensive and standardized representation of crucial contextual information associated with each record, thereby facilitating a deeper understanding and improved interoperability.

The classification of oceanic ecoregions aligns with the methodology advocated by Spalding et al. [120]. To visualize and generate plots, we employed RStudio version 1.2.5001, harnessing the capabilities of various packages such as tidyverse [121], dplyr [122], ggplot2 [123], ggExtra [124], ggpubr [125], gridExtra [126], magrittr [127], maps [128], stringr [129], and RColorBrewer [130]. Additionally, all graphical representations were crafted using Adobe Photoshop CC.

2.1. Dataset Description

The dataset is organized following the Darwin Core Standard [119]. Each row within the dataset represents a record of a copepod taxon obtained from various samples, as documented in the literature. The columns within the dataset encompass both the original and revised taxon names, supplementary taxonomic details, as well as data regarding the geographical location, environmental parameters, and the source of the data.

Object name: Global diversity and distributions of symbiotic copepod crustaceans living on octocorallians.

Occurrence dataset: https://doi.org/10.15468/msp4n8 (accessed on 1 October 2023).

GBIF:

Character encoding: UTF-8

Format name: csv

Format version: 1.5

Distribution: https://www.gbif.org/dataset/be8f0b51-2030-4402-80e9-01095875de64 (DOI: doi.org/10.15468/msp4n8)

Date of creation: 11 November 2020

Date of last revision: 2 October 2023

Date of publication: 3 October 2023

Update policy: The dataset in GBIF is updated as additional data are accumulated.

Language: English

Licence of use: Access and use are free to any user (CC-BY 4.0). The authors would appreciate users providing a link to the original dataset (GBIF: https://www.gbif.org/dataset/be8f0b51-2030-4402-80e9-01095875de) or citing the present paper when using the data in research projects.

Metadata language: English

2.2. Management Details

Project title: Global diversity and distributions of symbiotic copepod crustaceans living on octocorallians.

Temporal coverage: The present dataset includes all the records of copepods published in the literature between 1858 and 2023.

Record basis: Literature records

2.3. Geographic Coverage

Geographical Scope: World Ocean. The information is georeferenced using WGS 84 standards. Where coordinates were provided in the source, they were retained. When

only a sampling site description was available, coordinates were determined to the highest degree of precision possible, and any uncertainty was noted in a separate column. In certain instances, there was no georeferenced information.

Geographical Subcategories: The World Ocean.

Sampling Approach: The overarching approach was to acquire all the published records of copepods known across the entirety of the World Ocean.

Habitat Classification: Details on habitat types were extracted from the source literature and are represented as originally denoted. There was no effort made to standardize the habitat classifications.

Biogeographical Regions: Following the categorization by Spalding et al. [120], the dataset encompasses 8 of 12 biogeographical domains: Arctic, Central Indo-Pacific, Eastern Indo-Pacific, Southern Ocean, Temperate Northern Atlantic, Temperate Northern Pacific, Tropical Atlantic, and Western Indo-Pacific.

Countries: Barbados, Bermuda, Bonaire, Brazil, Canada, Bahamas, Cuba, Curaçao, Eritrea, France, Greenland, Iceland, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Madagascar, Marshall Islands, Mayotte, New Caledonia, Norway, Philippines, Puerto Rico, Republic of Korea, Russia, Saba, Saint Martin, Singapore, Sint Eustatius, Spain, Sweden, United Kingdom, USA.

Verification of Geographic Data: Coordinate reliability was evaluated using Google Maps to confirm the accuracy of the provided locations. This process involved verifying the format of geographic coordinates, ensuring that the coordinates fell within the appropriate regional boundaries, and checking for any irregular ASCII symbols in the dataset.

2.4. Literature Review

General Overview: The data regarding copepod living on octocorals discoveries are sourced from articles published in scientific publications.

Literature Search Methods: A comprehensive literature search was performed using academic search engines Google Scholar, Scopus, and Web of Science. Various keywords were utilized to refine the search and target specific organism pairs, such as Copepoda, copepods, copepod crustaceans, Octocorallia, octocorals, Alcyonacea, Gorgoniidae, sea pens, and gorgonians. Each identified publication underwent a thorough examination to extract relevant information, and any supplementary references cited within these publications were also meticulously reviewed and assessed.

Compilation of Literature: The 92 identified references contain information on copepods, at least at the family level (Table 1).

Quality Assurance for Literary Data: The search for additional literature concluded when no further references could be identified in the bibliographies of the analyzed papers.

2.5. Taxonomic Coverage

General Overview: The dataset is exclusively comprised of crustaceans from the subclass Copepoda, which serve as symbionts, and those from the class Octocorallia, which act as hosts.

Taxonomic Levels: Information in the dataset spans entries with taxonomic classification ranging from the subspecies to the order level.

Taxonomic Approaches: The accuracy and validity of taxonomic names mentioned in the published literature were verified using the World Register of Marine Species (WoRMS database) [33]. Names that were marked as "accepted" were retained in the "Records" table. In cases where a name had undergone a taxonomic change, the proposed alternative with an "accepted" status in the WoRMS database was adopted in the "Records" table. The original name mentioned in the initial article was recorded as a synonym in either the "Symbiont synonyms" or "Host synonyms" table, as appropriate. Only names that held the "accepted" status in the WoRMS database were included in the GBIF dataset, and synonyms were excluded from the dataset.

Quality Assurance for Taxonomic Data: The verification and updating of nomenclature were performed by cross-referencing the data with the WoRMS database.

3. Results

The dataset regarding copepods inhabiting octocorals in the World Ocean is derived from an extensive analysis of scholarly articles published between 1858 and 2023. Remarkably, the rate of publication was rather low until the 1960s, with an average of two articles per decade. Subsequently, there was a notable increase in reported research during the 1960s–1970s and 2000s–2010s, with 12, 18, 17, and 11 articles published during these respective decades (Figure 1). This dataset has been curated and made accessible via the GBIF website (https://doi.org/10.15468/msp4n8). Within this dataset, a total of 966 occurrence records have been documented, with a remarkable 961 records (constituting 99.5%) accompanied by georeferenced coordinates, ensuring precise spatial referencing.

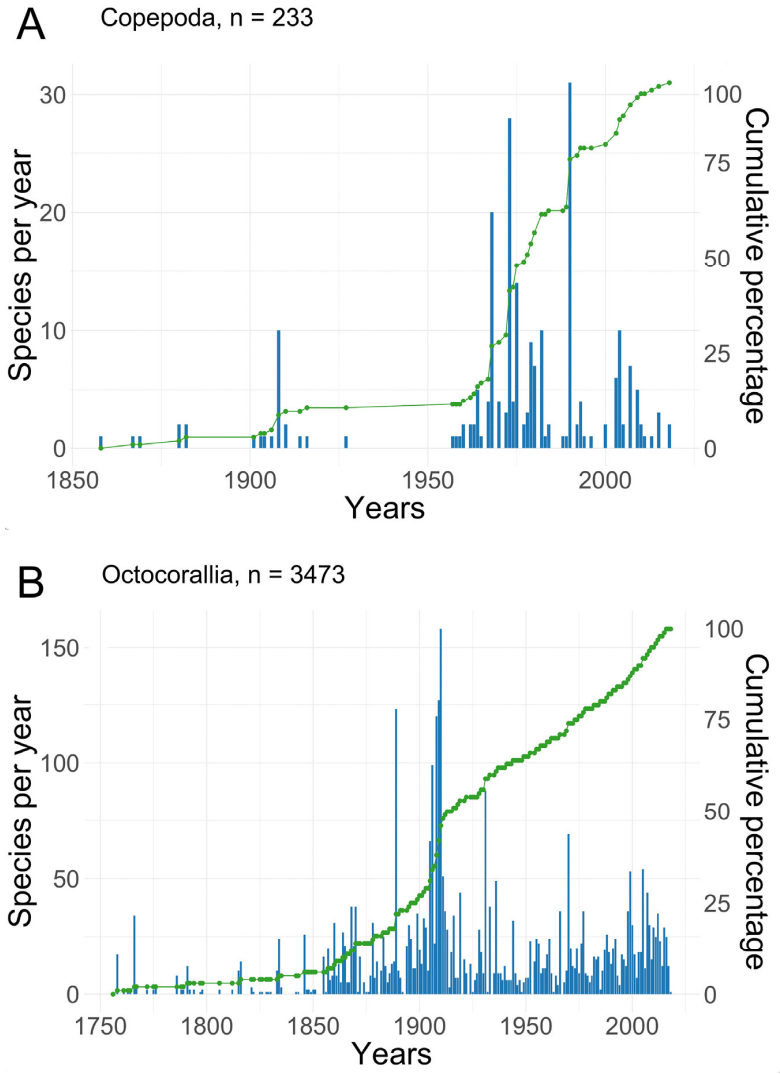

Figure 1. Numbers of new species and cumulative percentage (green line) of known species of (**A**) octocorals and associated with them (**B**) symbiotic copepods described published over time. Based on the WoRMS database [33].

The compiled database encompasses 966 entries, providing a comprehensive overview of the symbiotic associations between copepods and octocorals (Tables 2, A1 and S1). These entries include data on 236 copepod species, spanning 54 genera and 18 families within the orders Cyclopoida, Harpacticoida, and Siphonostomatoida (Figure 2). These copepods

exhibit diverse forms of association, ranging from residing in host tissues, galls, and the digestive tract to residing on the surfaces of 183 octocoral species, representing 72 genera and 28 families.

Table 2. Numbers of Copepoda taxa known and recorded on octocorals *.

Taxa	Number of Families Associated with Octocorals	Number of Genera Associated with Octocorals	Number of Species Associated with Octocorals	Number of Records Associated with Octocorals
Order Cyclopoida	12	44	219	909
Order Harpacticoida	2	3	3	3
Order Siphonostomatoida	3	7	19	41
Total	18	54	236	966

* WoRMS database [33].

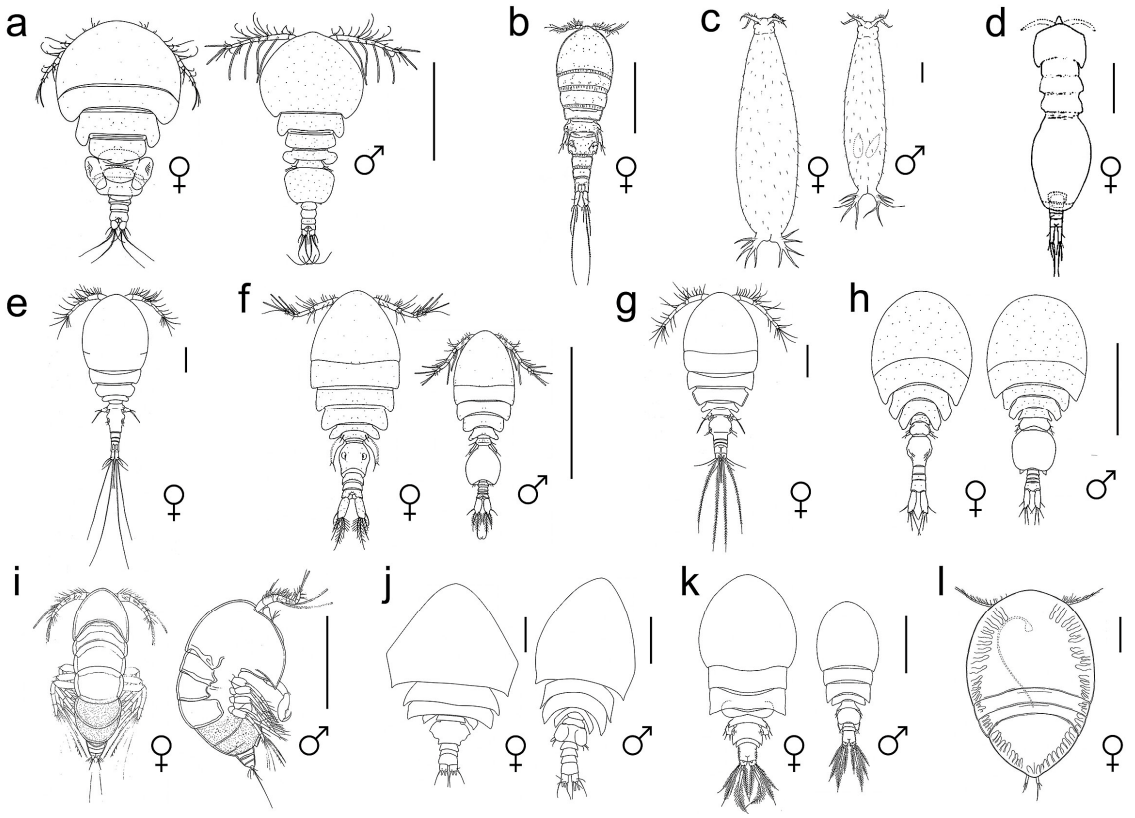

Figure 2. Habitus of copepod crustaceans living on octocorals: (**a**)—*Panjakus auriculatus* (Anchimolgidae), dorsal view, scale bar 0.5 mm [44]; (**b**)—*Hippomolgus latipes* (Clausidiidae), dorsal view, scale bar 0.5 mm [112]; (**c**)—*Enalcyonium digitigerum* (Lamippidae), dorsal view, scale bar 0.1 mm [91]; (**d**)—*Paranotodelphys procax* (Notodelphyidae), dorsal view, scale bar 0.2 mm [116]; (**e**)—*Tubiporicola inflatus* (Pseudanthessiidae), dorsal view, 0.5 mm [117]; (**f**)—*Paramolgus litophyticus* (Rhynchomolgidae), dorsal view, 0.5 mm [44]; (**g**)—*Eupolymniphilus brevicaudatus* (Sabelliphilidae), dorsal view, 0.2 mm [117]; (**h**)—*Forhania philippinensis* (Thamnomolgidae), dorsal view, 0.4 mm [56]; (**i**)—*Parategastes conexus* (Tegastidae), dorsal view, 0.2 mm [40]; (**j**)—*Cryptopontius phyllogorgius* (Artotrogidae), dorsal view, 0.2 mm [98]; (**k**)—*Orecturus finitimus* (Asterocheridae), dorsal view, 0.3 mm [95]; (**l**)—*Entomopsyllus takara* (Entomolepididae), dorsal view, 0.2 mm [98] (**a**–**h**)—Cyclopoida, (**i**)—Harpacticoida, (**j**–**l**)—Siphonostomatoida.

The analysis shows that 955 entries underwent species-level identification of copepods discovered in association with octocorals. Moreover, eight entries were ascribed to taxa categorized at the genus level, while an additional six entries were linked to taxa positioned at

the family level within the taxonomic hierarchy. The data indicate that precise identification at the species level was applied to 912 entries, encompassing a diverse spectrum of 183 distinct species. Furthermore, 51 entries were intricately connected with taxa classified at the genus level, and a solitary entry was affiliated with a taxon categorized at the order level.

A total of 74 copepod species and 53 coral species had undergone changes in their species or generic names since their description in the original papers. Two genera (*Alcyonicola* and *Metaxymolgus*) of copepods and nine genera of corals have been synonymized with other genera as junior synonyms since their description. Taking account of these taxonomic and nomenclatorial changes is essential when evaluating data from primary sources. Failing to accommodate these changes can significantly skew the results of the analyzed data, potentially resulting in flawed conclusions and misinterpretations.

The primary methods employed for collecting copepod–octocoral association data are available for 423 records, encompassing 44% of the entire dataset. These include SCUBA diving (30% of cases), bottom trawling (9.5% of cases), and the use of Remotely Operated Vehicles (ROVs) (1% of cases). Other collection techniques, such as dredging, snorkeling, and hand sampling were also used, each account for less than one percent of all records. Additionally, in 15 cases (1.5% of cases), multiple collection methods were utilized, making precise classification challenging.

Additionally, insights into the methods employed for detecting copepods on their hosts are documented in 334 instances, accounting for 33.5% of the dataset's records. The sampling methods encompass rinsing procedures employing ethanol or formalin solutions in conjunction with seawater, as well as the dissection of galls and host tissues for thorough examination and analysis. The predominant method for detecting copepods involved rinsing (30.6% of cases), with the majority of rinsing procedures employing a 5% ethanol solution (28% of cases), while others used 10% or 4% formalin in seawater. Only six instances mentioned opening of galls, and four instances described the process of dissecting hosts. Some records also documented the utilization of multiple detection methods.

Among the copepod species, 91% were classified under Cyclopoida, 8% under Harpacticoida, and 10% under Siphonostomatoida (Table 3). Among copepods, the most frequently encountered families in the samples were the mainly ectosymbiotic Rhynchomolgidae (686 records and 146 species) and the gall-inducing and endoparasitic Lamippidae (209 records and 54 species), along with the ectosymbiotic siphonostomatoid copepods of the family Asterocheridae (37 records and 15 species) (Figure 3 and Tables 3–5). Notably, both families of Cyclopoida were previously categorized within the order Poecilostomatoida, and the decision to merge Poecilostomatoida into Cyclopoida as a junior synonym remains a topic of ongoing discussion [11]. It is noteworthy that the mention of representatives of the family Corallovexiidae on these corals is considered possibly misclassified as Lamippidae [63]. Only two species were identified as Harpacticoida. Harpacticoids are represented by *Amphiascus pallidus*, residing on *Eunicella singularis* of the family Gorgoniidae, and *Parategastes conexus*, found on *Plexaurella grisea* of the family Plexauridae [40,131].

Table 3. Octocorallia families in relation to copepods.

Host Taxa	Number of Known Coral Genera	Number of Coral Genera (%)	Number of Known Coral Species	Number of Host Coral Species (%)	Number of Records	Number of Copepod Species Found on Octocorals	Number of Host Species with Copepod Species								
							1	2	3	4	5	6	7	8	9
Alcyonacea															
Acanthogorgiidae	7	4 (57.14%)	108	2 (1.85%)	19	5	2								
Alcyoniidae	33	8 (24.24%)	469	49 (10.45%)	351	80	17	9	8	5	3	1	4	2	
Anthothelidae	10	1 (10%)	34	1 (2.94%)	1	1	1								
Briareidae	3	1 (33.33%)	9	2 (22.22%)	5	3	1	1							
Chrysogorgiidae	13	1 (7.69%)	101	1 (0.99%)	3	1	1								
Clavulariidae	30	2 (6.67%)	138	2 (1.45%)	2	2	2								
Coelogorgiidae	1	1 (100%)	1	1 (100%)	15	4				1					
Ellisellidae	10	1 (10%)	108	1 (0.93%)	2	1	1								
Gorgoniidae	19	6 (31.58%)	224	12 (5.36%)	41	19	6	4		2					

Table 3. *Cont.*

Host Taxa	Number of Known Coral Genera	Number of Coral Genera (%)	Number of Known Coral Species	Number of Host Coral Species (%)	Number of Records	Number of Copepod Species Found on Octocorals	Number of Host Species with Copepod Species								
							1	2	3	4	5	6	7	8	9
Isididae	42	2 (4.76%)	140	3 (2.14%)	3	2	3								
Melithaeidae	2	1 (50%)	114	2 (1.75%)	4	3	1	1							
Nephtheidae	20	8 (40%)	441	46 (10.43%)	221	40	21	9	5	5	5	1			
Nidaliidae	7	1 (14.29%)	73	3 (4.11%)	14	8		1	1		1				
Paragorgiidae	2	1 (50%)	20	1 (5%)	11	1	1								
Paralcyoniidae	7	2 (28.57%)	16	2 (12.5%)	9	4		2							
Plexauridae	43	12 (27.91%)	383	21 (5.48%)	71	33	12	3	2		2				
Primnoidae	43	2 (4.65%)	249	1 (0.4%)	4	2	1								
Subergorgiidae	3	2 (66.67%)	13	2 (15.38%)	5	3	1		1						
Tubiporidae	1	1 (100%)	5	1 (20%)	21	9									1
Xeniidae	18	6 (33.33%)	113	13 (11.5%)	36	15	10	1	2						
Helioporacea															
Helioporidae	1	1 (100%)	1	1 (100%)	1	1	1								
Pennatulacea															
Anthoptilidae	1	1 (100%)	5	1 (20%)	84	1	1								
Kophobelemnidae	3	1 (33.33%)	20	1 (5%)	1	1	1								
Pennatulidae	7	4 (57.14%)	56	7 (12.5%)	27	14	5	1			1				
Renillidae	1	1 (100%)	5	1 (20%)	1	1	1								
Veretillidae	5	1 (20%)	36	1 (2.78%)	2	1	1								
Virgulariidae	6	1 (16.67%)	48	3 (6.25%)	9	3	3								
Scleralcyonacea															
Balticinidae		1		1	1										
Veretillidae		1		1	1	1	1								
	338	75	2930	183	966	259	95	32	19	13	12	2	4	2	1

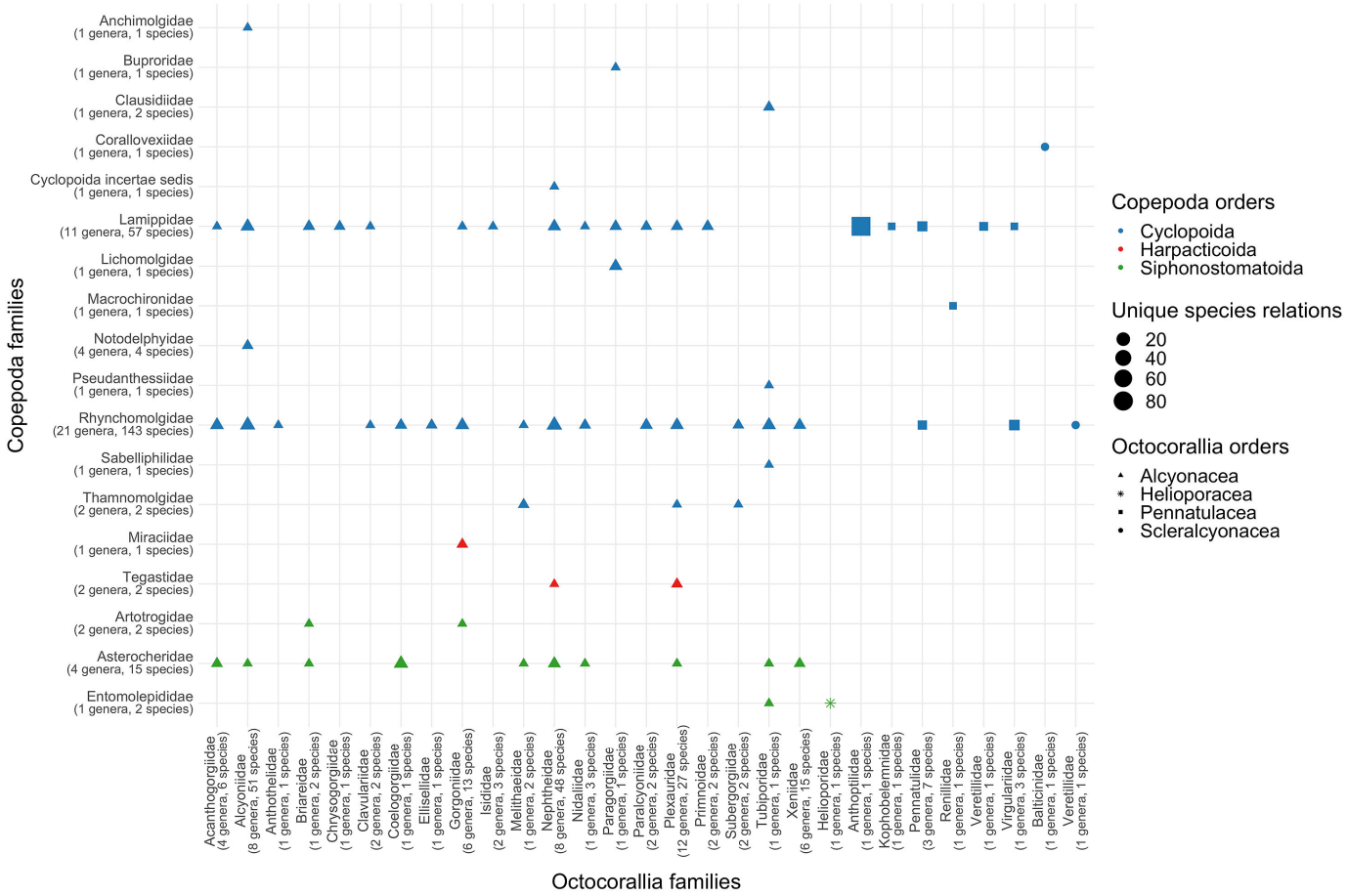

Figure 3. Number of records per association of symbiotic copepod families with octocoralian families. Size of figure means number of records. Color of figure means order of copepods.

Table 4. The families of Copepoda in relation to Octocorallia.

Taxa	Number of Known Copepod Species	Number of Copepod Species	Number of Copepod Records Found on Octocorals	Number of Coral Families	Number of Coral Genera	Number of Coral Species	Mean of Records per Copepod Species ± SE	Mean of Host Species per Copepod Species ± SE	% Copepod Species with a Single Octocorallia Host
Cyclopoida									
Anchimolgidae	138	1	1	1	1	1	1 ± NA	1 ± NA	100
Buproridae	2	NA *	1	1	1	1	NA	NA	NA
Clausidiidae	112	2	4	1	1	1	2 ± 0	1 ± 0	100
Cyclopoida *incertae sedis*	12	1	2	2	2	2	1 ± NA	1 ± NA	100
Lamippidae	53	53	209	18	34	43	3.85 ± 1.56	1.37 ± 0.12	69,81
Lichomolgidae	149	NA	5	1	1	1			
Macrochironidae	33	1	1	1	1	1	1 ± NA	1 ± NA	100
Notodelphyidae	184	4	5	1	1	1	1.25 ± 0.25	1 ± 0	100
Pseudanthessiidae	61	1	1	1	1	1	1 ± NA	1 ± NA	100
Rhynchomolgidae	270	146	686	19	51	141	4.7 ± 0.46	2.06 ± 0.18	56,16
Sabelliphilidae	25	1	1	1	1	1	1 ± NA	1 ± NA	100
Thamnomolgidae	4	2	5	3	3	3	2.5 ± 1.5	2 ± 1	50
Harpacticoida									
Miraciidae	426	1	2	1	1	1	2 ± NA	1 ± NA	100
Tegastidae	79	1	2	2	2	2	1 ± NA	1 ± NA	100
Siphonostomatoida									
Artotrogidae	107	2	2	2	2	2	1 ± 0	1 ± 0	100
Asterocheridae	271	15	37	10	13	14	2.47 ± 0.77	1.14 ± 0.14	86,67
Entomolepididae	16	2	2	2	2	2	1 ± 0	1 ± 0	100
Total	1952	233	966	67	118	218			

* NA—Not Available.

Table 5. The distribution of symbiotic copepods and their hosts in the ecoregions *.

Region	Number of Localities	Number of Records	Number of Symbiont Orders	Number of Symbiont Families	Number of Symbiont Genera	Number of Symbiont Species	Number of Host Families	Number of Host Genera	Number of Host Species
Unidentified	1	3	2	2	2	3	2	2	3
Arctic	5	5	1	2	4	4	3	3	4
Central Indo-Pacific	50	328	3	7	23	106	10	24	51
Eastern Indo-Pacific	5	7	2	3	5	4	4	4	3
Southern Ocean	1	2	1	1	1	1	1	1	2
Temperate Northern Atlantic	129	186	3	7	12	33	14	16	23
Temperate Northern Pacific	8	14	2	4	7	9	8	8	7
Tropical Atlantic	35	64	3	6	10	27	6	14	25
Western Indo-Pacific	58	358	2	8	28	80	16	35	90

* WoRMS database [33].

Of the 167 host species, 71.7% belonged to Alcyonacea, 6% to Pennatulacea, 0.9% to Scleralcyonacea, and 0.4% to Helioporacea. The octocoral families Pennatulidae, Alcyoniidae, Nephtheidae, and Plexauridae are the most extensively studied (Table 3). There are no recorded observations of symbiotic copepods associated with 94% of potential octocoral host species.

Data on the diversity of copepods, coral symbionts, are mainly represented by data on copepods collected at depths of up to 30 m (705 out of 966 records) (Figure 4, Tables A1 and S1). The use of deep-sea submersibles led to the discovery of copepods at depths of more than 250 m. Ten species from deep-water corals were reported in eight publications [34–36,60–63,132]. Among deep-sea copepods, representatives of the family Lamippidae stand out, which were found at depths of more than 1000 m and have a strongly modified morphology [18]. Data on symbiotic copepods living on deep-sea octocorals are fragmentary and allow us to state their existence, but do not allow us to assess the diversity of symbionts of deep-sea Octocorallia.

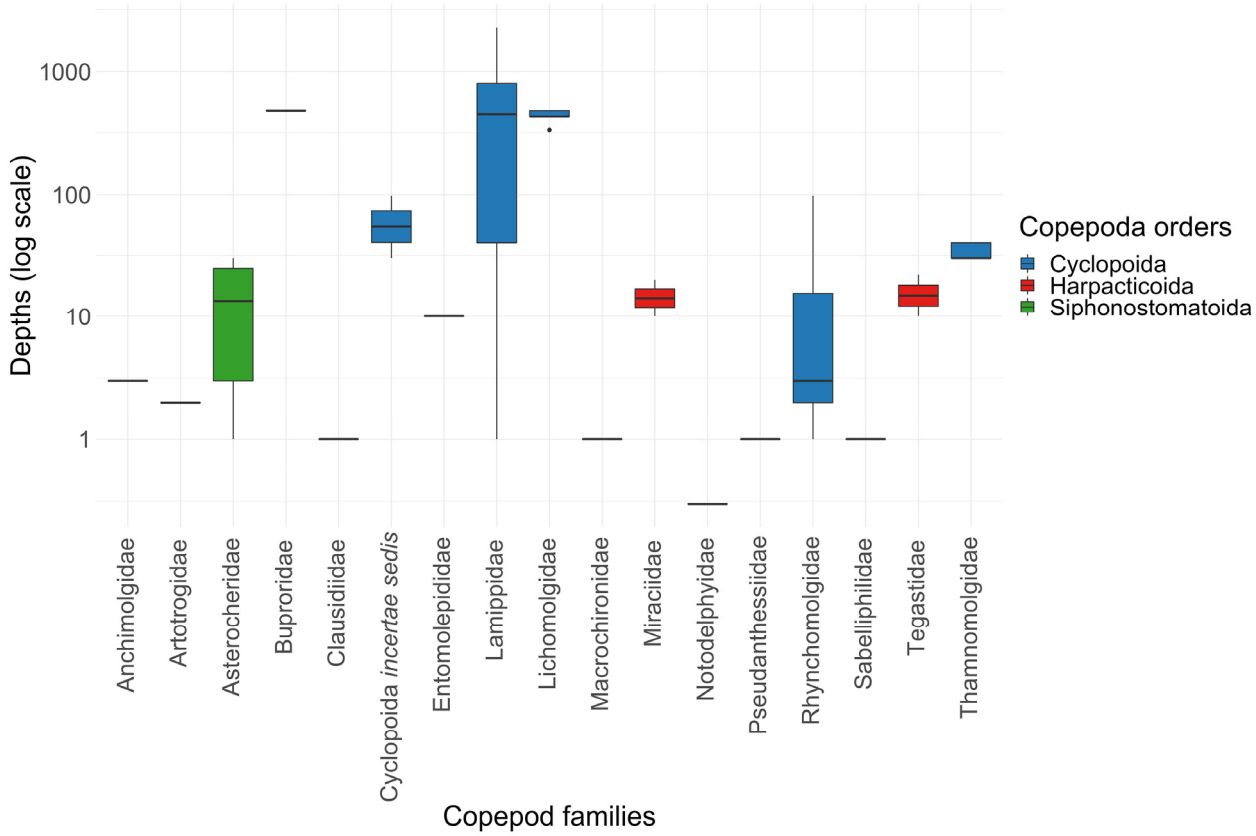

Figure 4. Distribution of symbiotic copepods associated with octocorals by depth (see also Tables 5, A1 and S1). The horizontal line within each box represents the median of the dataset. The box defines the interquartile range, covering the 25th to 75th percentiles. Whiskers extending from each box show the minimum and maximum data values. Data points appearing outside of these whiskers are identified as outliers.

A comprehensive inventory has documented a total of 393 distinct interspecies interactions involving copepods and various octocorals. Remarkably, a significant majority, approximately 60%, of these unique associations are supported by isolated recorded instances (Table 5). These recorded associations encompass copepods originating from three distinct orders: Cyclopoida, Siphonostomatoida, and Harpacticoida, engaged in symbiotic relationships with octocorals representing four different orders, specifically Alcyonacea, Helioporacea, Pennatulacea, and Scleralcyonacea (Tables 3 and 4). Notably, copepods from all three orders have been identified in association with octocorals belonging to the order Alcyonacea. Additionally, Cyclopoids have been observed in interactions with both Pennatulacea and Scleralcyonacea, while Siphonostomatoida have been documented in association with Helioporacea (Figure 3). It is essential to highlight those interactions involving Cyclopoida and Pennatulacea, as well as those involving Siphonostomatoida and Scleralcyonacea, are sparsely documented, with only two and one instances recorded, respectively. The prevalence of numerous isolated records of these unique symbiotic associations underscores the limited extent of research concerning copepod symbiosis, rendering them unsuitable for analyzing host specificity and distribution patterns at this juncture.

Despite the inherent limitations in the available dataset, it is evident that copepods exhibit a notable density and diversity within individual octocoral colonies. A compelling example comes from the Molucca Islands, where a remarkable assemblage of 830 specimens of *Colobomolgus bandensis* was extracted from a solitary colony of *Sinularia polydactyla* [56]. Furthermore, the data also reveal that up to nine copepod species can coexist within a single host species colony (as detailed in Table 4). Within a sample obtained from a colony of *Litophyton cupressiformis*, five copepod species were identified, namely *Paramolgus*

nephtheanus, *P. prominulus*, *P. accinctus*, *Metaxymolgus lumarius*, and *M. aculeatus* [42]. These and other observations strongly suggest that copepods associated with octocorals likely utilize various microhabitats provided by the coral, where the coral colony serves as both their habitat and a potential food source.

The analysis of data concerning the global geographic distribution of copepods associated with octocorals reveals that the available information is relatively fragmented and concentrated in 215 locations within eight of the 12 ecoregions found in the World Ocean (Figure 5 and Tables 5, A1 and S1). Remarkably, certain regions, such as the Mediterranean coast of France, the northern part of Madagascar, and Curaçao, have been subject to more extensive research efforts. The Western Indo-Pacific, Central Indo-Pacific, and Temperate North Atlantic regions exhibit the highest numbers of sampling sites and recorded data, with 58 localities and 358 records, 51 localities and 328 records, and 50 localities and 104 records, respectively. However, it is important to note that no published records are available from vast territories, including the Tropical East Pacific, Temperate South America, Temperate South Africa, and Temperate Australia ecoregions, highlighting significant gaps in our knowledge of copepod–octocoral associations in these areas.

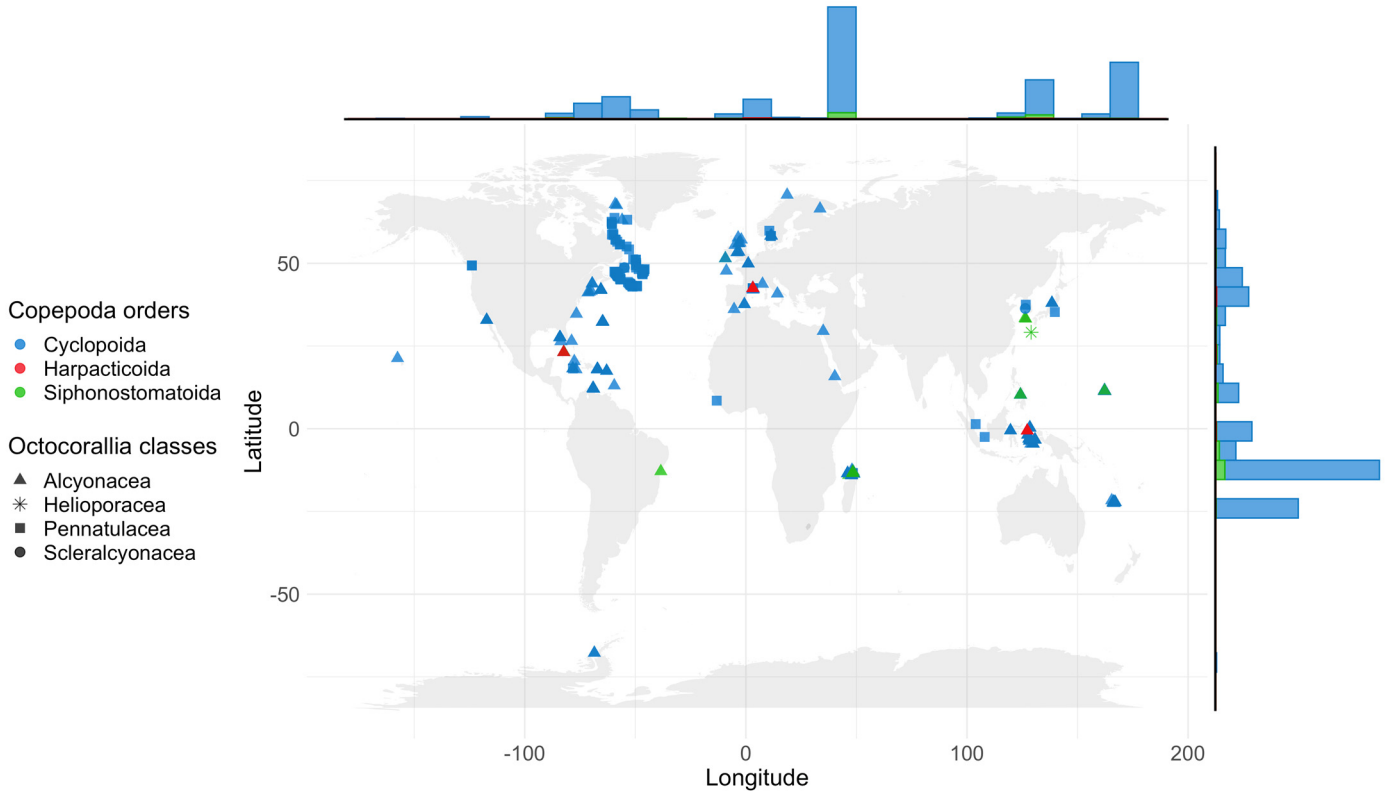

Figure 5. Distribution of the copepods associated with octocorals in the World Ocean (Tables 5, A1 and S1). The marginal histogram illustrates the latitudinal and longitudinal distribution of the reports of copepods.

4. Discussion

The historical trajectory of research pertaining to the diversity of copepods associated with corals can be bifurcated into two distinct phases. The inaugural phase commenced in 1858 with the initial documentation of the gall-inducing endosymbiont *Lamippe rubra* residing on the sea pen *Pennatula rubra* [80]. During this period, investigations into copepods were primarily centered around species inhabiting coral galls, predominantly collected through trawling expeditions. Over the course of this two-century epoch, 26 instances of symbiotic copepods were identified prior to the early 1960s (Figure 1), marking the advent of the second phase.

The second phase, which endures to the present day, ushered in the utilization of SCUBA diving within scientific research and the refinement of methodologies for capturing loosely associated symbionts. This transformative shift resulted in the recording and description of a substantial array of copepod species (comprising 158 species, encompassing 588 out of 966 records) inhabiting diverse shallow-water octocorals at depths of up to 30 m. Approximately 60% of copepod species discovered in association with octocorals amounting to 144 species from shallow tropical octocorals have been described by Arthur Humes and his coauthors [132]. Furthermore, the integration of both manned and remotely operated underwater vehicles in deep-sea biodiversity research unveiled the presence of copepods dwelling within deep-sea octocorals at depths exceeding 250 and 1000 m [17]. These insights underscore the existence of considerable biodiversity among symbiotic copepods and other invertebrates inhabiting the depths of the ocean, a realm that remains underexplored.

Evidently, the exploration of copepod diversity in association with octocorals significantly lags behind the research endeavors focused on their host organisms. The protracted decline in research activity pertaining to the description of novel taxa can, in our assessment, be attributed to a diminishing pool of specialists and a dearth of integrated research endeavors encompassing the biodiversity of corals and copepods, culminating in the characterization of new taxa (Figure 1). Another indicator of this trend could be data obtained from studying the molecular diversity of copepods and corals from various marine communities [11].

The data indicate that octocorals provide a wide range of microhabitats for both ecto- and endosymbiotic copepods, and there are reports of various copepod species coexisting within a single colony. However, quantifying the density of copepods of a specific species associated with a particular octocoral colony is often challenging due to the microscopic size of copepods (Figure 2). Additionally, in the case of gall-inducing copepods, the presence of galls makes it difficult to accurately determine symbiont density without dissection. As a result, information regarding the co-occurrence of different copepod species on a single octocoral colony is exceedingly scarce, hindering a comprehensive analysis of copepod species cohabitation.

Copepods belonging to the large family Rhynchomolgidae, which comprises cyclopoid copepods, have been extensively documented in symbiotic relationships with scleractinian corals and various other invertebrates [2,133]. In stark contrast, the gall-inducing Lamippidae, another family within the cyclopoid copepod group, exhibit obligate symbiosis exclusively with octocorals [17,18,64,79]. The discoveries of siphonostomatoid copepods from the vast family Asterocheridae are particularly intriguing due to their association with a diverse range of host organisms, encompassing both ectosymbiotic and endosymbiotic species, as well as gall-inducing ones [133,134]. The identification of harpacticoid copepods belonging to the Tegastidae family residing on octocorals is of significant interest, given that these copepods have previously been observed in symbiotic relationships with other shallow-water cnidarians and in deep-sea chemosynthetic environments [40,135,136]. All these diverse findings provide insights into the intricate yet insufficiently explored evolutionary history of copepods associated with octocorals (Figures 3 and 4 and Tables 3 and 4). Further, more rigorous research on copepods associated with corals is expected to uncover interesting cases of adaptations and instances of transitions from one host group to another.

The absence of published records from vast territories such as the Tropical East Pacific, Temperate South America, Temperate South Africa, and Temperate Australia ecoregions may be due to a lack of infrastructure, such as research stations, like it has been described in other groups of aquatic invertebrates [137,138], creating a shortage of specialists with expertise in microscopic copepods [139] (Figure 5, Tables 1, 5, A1 and S1). The prevalence of copepods symbiotic with octocorals in the tropical Indo-Pacific region could be partially attributed to greater research activity in this area and the relatively high diversity of shallow-water alcyonaceans.

5. Conclusions

The existing data highlight the significant gap in knowledge regarding the extensive copepod diversity associated with octocorals worldwide, with approximately 94% of potential octocoral host species lacking sufficient data. Based on the available morphological data, it is conceivable that the number of copepod species with potential associations with octocorals may exceed 4400 species. This estimation, however, should be regarded as provisional and subject to modification, particularly in the light of potential advancements stemming from molecular analysis techniques. Furthermore, the refinement of this estimate may also depend on a more comprehensive investigation into the host specificity, a facet that remains inadequately explored thus far. As research progresses, incorporating molecular methodologies and delving deeper into the intricacies of copepod–octocoral interactions, we can anticipate a more precise quantification of copepod diversity within this ecological context.

Many aspects of copepod feeding behaviors and their potential influence on octocorals warrant further investigation. To unravel the intricacies of copepod–octocoral relationships, additional research is imperative. The examination of corals and their associated fauna is crucial for assessing the ecological significance of both shallow and deep-water communities and for providing scientifically substantiated recommendations for sustainable habitat management.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/d15111140/s1, Table S1: Octocorals as hosts of copepod crustaceans.

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Appendix A

Table A1. Copepod crustaceans recorded as associated with octocorals (see also Table S1. Octocorals as hosts of copepod crustaceans).

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Cyclopoida					
Buproridae					
Buprorus sp.	*Paragorgia arborea* (Linnaeus, 1758)	Parg	CA	475; 477	[62]
Cyclopoida *incertae sedis*					
Ruthra humesi Kim, 2003	*Stereonephthya inordinata* Tixier-Durivault, 1970	Nep	NC	30	[53]
Anchimolgidae					
Panjakus auriculatus Humes, Dojiri, 1979	*Lobophytum crassum* von Marenzeller, 1886	Alc	ID	3	[44]
Clausidiidae					
Hippomolgus cognatus Humes, Ho, 1967	*Tubipora musica* Linnaeus, 1758	Tub	MG	1	[112]
Hippomolgus cognatus Humes, Ho, 1967	*Tubipora musica* Linnaeus, 1758	Tub	YT	1	[112]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Hippomolgus latipes Humes, Ho, 1967 Lamippidae	*Tubipora musica* Linnaeus, 1758	Tub	YT	1	[112]
Enalcyonium affinis (Zulueta, 1908) (=*Lamippe affinis* Zulueta, 1908)	*Eunicella verrucosa* (Pallas, 1766) (=*Gorgonia verrucosa* Pallas)	Gor	FR		[74]
Enalcyonium albidum (Zulueta, 1908) (as *Lamippe albida* Zulueta, 1908)	*Pteroeides griseum* (Linnaeus, 1767)	Pen	FR		[67,74]
Enalcyonium alcyonii (Joliet, 1882) (=*Lamippe alcyonii* Joliet, 1882)	*Paralcyonium spinulosum* (Delle Chiaje, 1822)	Parl			[69]
Enalcyonium auriculatum Kim, 2004	*Lobophytum schoedei* Moser, 1919	Alc	NC	1	[54]
Enalcyonium bullatum Kim, 2004	*Siphonogorgia variabilis* (Hickson, 1903)	Nid	NC	30	[54]
Enalcyonium caledonensis Kim, 2004	*Lobophytum schoedei* Moser, 1919	Alc	NC	1	[54]
Enalcyonium capillatum Kim, 2004	*Rumphella antipathes* (Linnaeus, 1758)	Gor	NC	1	[54]
Enalcyonium carrikeri Dudley, 1973	*Gersemia rubiformis* (Ehrenberg, 1834)	Nep	US	25–28.4; 29; 35	[84]
Enalcyonium ceramensis Kim, 2007	*Rumphella aggregata* (Nutting, 1910)	Gor	ID	10	[47]
Enalcyonium ciliatum Stock, 1972	*Dendronephthya hemprichi* Klunzinger, 1877	Nep	ER; IL	3	[108]
Enalcyonium circulatum Kim, 2007	*Muricella* sp.	Aca	ID	2	[47]
Enalcyonium concinnum (Humes, 1957) (=*Lamippe concinna* Humes, 1957)	*Virgularia schultzei* Kükenthal, 1910	Vir	SL	5	[92]
Enalcyonium confusum Stock, 1988	*Alcyonium acaule* Marion, 1878	Alc	FR	10	[73]
Enalcyonium confusum Stock, 1988	*Alcyonium palmatum* Pallas, 1766	Alc	FR	60; 80	[73]
Enalcyonium digitigerum Ho, 1984	*Bellonella rigida* Putter, 1900	Alc	JP		[91]
Enalcyonium euniceae Stock, 1973	*Eunicea mammosa* Lamouroux, 1816 (=*Eunicea (Eunicea) mammosa* Lamouroux)	Ple	PR	3	[85]
Enalcyonium forbesi (T. Scott, 1901)	*Alcyonium digitatum* Linnaeus, 1758	Alc	FR; GB; IE	20	[73,77,86,87]
Enalcyonium forbesi (T. Scott, 1901)	*Chrysogorgia flexilis* (Wright, Studer, 1889)	Chr	ID		[57]
Enalcyonium grandisetigerum Kim, 2009	*Dendronephthya cirsium* Kükenthal, 1905 *Dendronephthya cirsium* (Kükenthal, 1905)	Nep	MG		[117]
Enalcyonium heegaardi Bouligand, 1960	*Gersemia rubiformis* (Ehrenberg, 1834)	Nep	GL	2258	[34]
Enalcyonium humesi Kim, 2004	*Lobophytum schoedei* Moser, 1919	Alc	NC	1	[54]
Enalcyonium kohsiangi Uyeno, 2015	*Pteroeides griseum* (Linnaeus, 1767)	Pen	SG	10.3; 10.6	[57]
Enalcyonium lobophyti Kim, 2004	*Lobophytum schoedei* Moser, 1919	Alc	NC	1	[54]
Enalcyonium nudum Stock, 1973	*Plexaura homomalla* (Esper, 1794) (=*Plexaura homomalla* f. *homomalla* Esper, 1794)	Ple	PR	3	[85]
Enalcyonium olssoni (Zulueta, 1908)	*Alcyonium* sp.	Alc	SE		[81]
Enalcyonium olssoni (Zulueta, 1908)	*Alcyonium digitatum* Linnaeus, 1758	Alc	SE		[70]
Enalcyonium olssoni (Zulueta, 1908)	*Primnoa resedaeformis* (Gunnerus, 1763)	Pri	US	334–367; 432; 476	[62]
Enalcyonium pusillum (Zulueta, 1908) (=*Lamippe pusilla* Zulueta, 1908)	*Gorgonia sarmentosa* Esper, 1789 (=*Gorgonella sarmentosa* (Lamarck))	Gor	FR		[74]
Enalcyonium pusillum (Zulueta, 1908)	*Leptogorgia sarmentosa* (Esper, 1789)	Gor	FR	40; 200	[66]
Enalcyonium ramosum Stock, 1973	*Plexaura homomalla* (Esper, 1794) (=*Plexaura homomalla f. homomalla* Esper, 1794)	Ple	PR	3	[85]
Enalcyonium robustum Kim, 2009	*Dendronephthya regia* Verseveldt, 1968	Nep	MG		[117]
Enalcyonium rubicundum Olsson, 1869	*Alcyonium acaule* Marion, 1878	Alc	FR	40; 200	[66]
Enalcyonium rubicundum Olsson, 1869	*Alcyonium* sp.	Alc	SE		[81]
Enalcyonium rubicundum Olsson, 1869 (as *Alcyonicola fusiformis* Scott T., Scott A., 1895)	*Alcyonium digitatum* Linnaeus, 1758	Alc	GB		[70,73,86,88]
Enalcyonium rubicundum Olsson, 1869 (=*Lamippe rubicunda* (Olsson, 1869))	*Alcyonium palmatum* Pallas, 1766	Alc	FR		[74]
Enalcyonium rubicundum Olsson, 1869	*Pennatula rubra* (Ellis, 1761)	Pen	SE		[70]
Enalcyonium scorpio Stock, 1973	*Leptogorgia sarmentosa* (Esper, 1789)	Gor	US	5	[85]
Enalcyonium setigerum (Zulueta, 1908) (=*Lamippe setigera* Zulueta, 1908)	*Alcyonium coralloides* (Pallas, 1766) (=*Sympodium coralloides* (Pallas))	Alc	FR		[74]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Enalcyonium setigerum (Zulueta, 1908)	*Paramuricea clavata* (Risso, 1826) (as *Muricea chamaeleon* Koch, 1882; *Paramuricea chamaeleon* (Koch, 1887))	Ple	FR	40–200	[66,82]
Enalcyonium sp.	*Plexaurella nutans* (Duchassaing, Michelotti, 1860)	Ple	CU	20	[102]
Enalcyonium sympodii (Zulueta, 1910) (=*Lamippe sympodii* Zulueta, 1910)	*Leptogorgia sarmentosa* (Esper, 1789) (=*Sympodium coralloides* (Pallas))	Gor	FR		[75]
Enalcyonium variicauda Stock, 1973	*Briareum asbestinum* (Pallas, 1766)	Bri	PR	1; 4; 6–8	[85]
Gorgonophilus canadensis Buhl-Mortensen, Mortensen, 2004	*Paragorgia arborea* (Linnaeus, 1758)	Parg	CA; GL	445; 475; 520; 560	[36]
Isidicola antarctica Gravier, 1914	*Primnoisis (Delicatisis) formosa* Gravier, 1913	Isi	AQ	254	[61]
Isidicola antarctica Gravier, 1914	*Primnoisis (Delicatisis) gracilis* (Gravier, 1913)	Isi	AQ	254	[61]
Lamippe bouligandi Laubier, 1972	*Anthoptilum grandiflorum* (Verrill, 1879)	Antp	CA; GL; IS	90; 98; 136; 600; 1210; 1347	[35,63]
Lamippe proteus Claparède, 1867	*Alcyonium digitatum* Linnaeus, 1758	Alc	GB; IT		[77,87]
Lamippe proteus Claparède, 1867	*Alcyonium* sp.	Alc	GB		[87]
Lamippe pteroidis Zulueta, 1910	*Pteroeides griseum* (Linnaeus, 1767)	Pen	FR		[75]
Lamippe rubra Bruzelius, 1858	*Gersemia rubiformis* (Ehrenberg, 1834)	Nep	FR		[70]
Lamippe rubra Bruzelius, 1858	*Pennatula phosphorea* Linnaeus, 1758	Pen	FR; NO; SE		[67,70,80]
Lamippe rubra decolor Zulueta, 1908	*Pennatula phosphorea* Linnaeus, 1758	Pen	FR		[74]
Lamippe sp.	*Chrysogorgia flexilis* (Wright, Studer, 1889)	Chr	ID		[57,58]
Lamippella acanellae Grygier, 1983	*Acanella arbuscula* (Johnson, 1862)	Isi	FR	1010	[68]
Lamippella delamarei Bouligand, 1965	Kophobelemnon stelliferum (Müller, 1776)	Kop	FR		[67]
Lamippella faurei Bouligand, Delamare Deboutteville, 1959	*Alcyonium coralloides* (Pallas, 1766) (=*Parerythropodium coralloides* (Pallas, 1766))	Alc	FR	0; 2,2	[65]
Lamippella faurei Bouligand, Delamare Deboutteville, 1959	*Alcyonium palmatum* Pallas, 1766	Alc	FR	0; 2,2	[65]
Lamippella faurei Bouligand, Delamare Deboutteville, 1959	*Eunicella verrucosa* (Pallas, 1766)	Gor	FR	0; 2,2	[65]
Lamippella faurei Bouligand, Delamare Deboutteville, 1959	*Rolandia coralloides* de Lacaze Duthiers, 1900	Cla	FR		[65]
Lamippella faurei Bouligand, Delamare Deboutteville, 1959	*Swiftia rosea* (Grieg, 1887)	Ple	SE	40	[81]
Lamippina aciculifera (Zulueta, 1908) (as *Lamippe brementi* Zulueta, 1910)	*Alcyonium coralloides* (Pallas, 1766) (as *Parerythropodium coralloides* (Pallas, 1766); Sympodium coralloides (Pallas))	Alc	FR		[65,75]
Lamippina aciculifera (Zulueta, 1908)	*Alcyonium palmatum* Pallas, 1766	Alc	FR		[65,74]
Lamippina aequalis Stock, 1973	*Antillogorgia acerosa* (Pallas, 1766) (=*Pseudopterogorgia acerosa* (Pallas, 1766))	Gor	CW	3; 4	[85]
Lamippina aequalis Stock, 1973	*Antillogorgia* sp. (=*Pseudopterogorgia* Kükenthal, 1919)	Gor	CW	3	[85]
Lamippina laubieri Bouligand, 1960	*Leptogorgia sarmentosa* (Esper, 1789)	Gor	FR	40; 200	[66]
Lamippula chattoni (Zulueta, 1908) (as *Enalcyonium chaltoni*; *Lamippe chattoni* Zulueta, 1908)	*Pennatula phosphorea* Linnaeus, 1758	Pen	FR		[67,74]
Lamippula duthiersi (Joliet, 1882) (as *Lamippe duthiersi* Joliet, 1882)	*Paralcyonium spinulosum* (Delle Chiaje, 1822) (*Paralcyonium elegans* Milne Edwards, 1857)	Parl	FR		[69,74]
Lamippula pallida (Zulueta, 1908)	*Pteroeides griseum* (Linnaeus, 1767)	Pen			[65]
Lamippula pallida (Zulueta, 1908) (as *Lamippe pallida* Zulueta, 1908)	*Veretillum cynomorium* (Pallas, 1766)	Ver	FR		[67,74]
Lamippula parva (Zulueta, 1908) (as *Lamippe parva* Zulueta, 1908)	*Paramuricea clavata* (Risso, 1826) (as *Muricea chamaeleon* Koch, 1882)	Ple	FR		[74,82]
Linaresia bouligandi Stock, 1979	*Placogorgia* sp.	Ple	US	73; 78	[107]
Linaresia magna Grygier, 1980	Placogorgia sp.	Ple	US	366	[60]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Linaresia mammillifera Zulueta, 1908	*Paramuricea clavata* (Risso, 1826) (=*Muricea chamaeleon* Koch, 1882)	Ple	FR		[74,82]
Magnippe caputmedusae Stock, 1978	*Thesea citrina* Deichmann, 1936	Ple	US	54.9	[106]
Magnippe caputmedusae Stock, 1978	*Thesea parviflora* Deichmann, 1936	Ple	US	73.2	[106]
Magnippe caputmedusae Stock, 1978	*Thesea rugosa* Deichmann, 1936	Ple	US	54.9	[106]
Ptilosarcoma athyrmata Williams, Anchaluisa, Boyko, McDaniel, 2018	*Ptilosarcus gurneyi* (Gray, 1860)	Pen	CA	5; 10	[89]
Sphaerippe caligicola Grygier, 1980	*Callogorgia* sp.	Pri	BS	366	[60]
Sphaerippe sp.	*Gorgonia ventalina* Linnaeus, 1758	Gor	NL-BQ3	2; 21	[31]
Lichomolgidae					
Lichomolgidae	*Paragorgia arborea* (Linnaeus, 1758)	Parg	CA	332; 426; 446; 475; 477	[62]
Macrochironidae					
Macrochiron sargassi Sars G.O., 1916	*Renilla reniformis* (Pallas, 1766)	Ren	MF	1	[52]
Notodelphyidae					
Bysone operculatus Stock, Humes, 1970	*Rhytisma fuscum* (Thomson, Henderson, 1906)	Alc	MG	0.3	[116]
Demoixys affinis Stock, Humes, 1970	*Rhytisma fuscum* (Thomson, Henderson, 1906)	Alc	MG	0.3	[116]
Paranotodelphys procax Stock, Humes, 1970	*Rhytisma fuscum* (Thomson, Henderson, 1906)	Alc	MG	0.3; 0.6	[116]
Thoracodelphys uniseta Stock, Humes, 1970	*Rhytisma fuscum* (Thomson, Henderson, 1906)	Alc	MG	0.5	[116]
Pseudanthessiidae					
Tubiporicola inflatus Kim, 2009	*Tubipora musica* Linnaeus, 1758	Tub	MG	1	[117]
Rhynchomolgidae					
Acanthomolgus aequiseta Stock, 1975	*Muricea laxa* Verrill, 1864	Ple	CW	34; 41	[97]
Acanthomolgus affinis Stock, 1975	*Eunicea flexuosa* (Lamouroux, 1821) (=*Plexaura flexuosa* Lamouroux, 1821)	Ple	CW	2	[97]
Acanthomolgus affinis Stock, 1975	*Plexaura homomalla* (Esper, 1794)	Ple	CW	3	[97]
Acanthomolgus affinis Stock, 1975	*Plexaura* sp.	Ple	CU		[104]
Acanthomolgus ambonensis Kim, 2007	*Litophyton striatum* (Kükenthal, 1903)	Nep	ID	3	[47]
Acanthomolgus arctatipes Humes, 1974	*Echinogorgia sassapo* (Esper, 1791)	Ple	MG	10; 13; 25	[109]
Acanthomolgus astrictus Humes, Stock, 1973	*Acanthogorgia aspera* Pourtalès, 1867	Aca	MG	4; 8; 20; 23; 24; 40	[52,109]
Acanthomolgus astrictus Humes, Stock, 1973	*Acanthogorgia* sp.	Aca	ID	25	[43]
Acanthomolgus astrictus Humes, Stock, 1973	*Anthogorgia* sp. (=*Acalycigorgia* Kükenthal, Gorzawsky, 1908)	Aca	ID	10	[43]
Acanthomolgus astrictus Humes, Stock, 1973	*Muricella rubra robusta* Thomson and Simpson	Aca	MG	10; 15	[109]
Acanthomolgus astrictus Humes, Stock, 1973	*Muricella* sp.	Aca	ID; PH	10; 40	[43]
Acanthomolgus astrictus Humes, Stock, 1973	*Rumphella antipathes* (Linnaeus, 1758)	Gor	NC	2	[43]
Acanthomolgus astrictus Humes, Stock, 1973	*Villogorgia intricata* (Gray, 1870)	Ple	PH	30	[43]
Acanthomolgus bandaensis Kim, 2007			ID	25	[47]
Acanthomolgus bayeri Humes, 1973	*Pseudoplexaura porosa* (Houttuyn, 1772)	Ple	BM; GB	1; 3	[49,96]
Acanthomolgus bayeri Humes, 1973	*Pseudoplexaura* sp.	Ple	CU		[101]
Acanthomolgus bilobipes Humes, Stock, 1973	*Antillogorgia acerosa* (Pallas, 1766)	Gor	BB; CW; JM	3; 4	[52,97]
Acanthomolgus bilobipes Humes, Stock, 1973	*Antillogorgia acerosa var. elastica* Bielschowsky, 1929 (=*Antillogorgia elastica* Bielschowsky, 1929)	Gor	PR		[52]
Acanthomolgus boholensis Humes, 1990	*Dendronephthya pütteri* Kükenthal, 1905 (=*Dendronephthya puetteri*)	Nep	PH	40	[50]
Acanthomolgus brevifurca Humes, 1990	*Siphonogorgia variabilis* (Hickson, 1903)	Nid	ID	10	[50]
Acanthomolgus combinatus Humes, 1974	*Echinogorgia sassapo* (Esper, 1791)	Ple	MG	10; 13; 25	[109]
Acanthomolgus combinatus Humes, 1974	*Echinogorgia* sp.	Ple	ID	10	[43]
Acanthomolgus cuneipes (Humes, Ho, 1968)	*Dendronephthya mucronata* (Pütter, 1900)	Nep	MG	1	[52]
Acanthomolgus cuneipes (Humes, Ho, 1968) (=*Lichomolgus cuneipes* (Humes, Ho, 1968))	*Stereonephthya acaulis* Verseveldt, 1968	Nep	MG	1; 2; 10	[113]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Acanthomolgus dionyx Stock, 1975	*Antillogorgia americana* (Gmelin, 1791) (=*Pseudopterogorgia americana* (Gmelin, 1791))	Gor	CW	4	[97]
Acanthomolgus dispadactylus Kim, 2007	*Dendronephthya grandiflora* Henderson, 1909	Nep	ID	10	[47]
Acanthomolgus eminulus Humes, Lewbel, 1977	*Muricea californica* Aurivillius, 1931	Ple	US	20	[95]
Acanthomolgus exilipes (Humes, Ho, 1968)	*Dendronephthya grandiflora* Henderson, 1909	Nep	ID	10	[47]
Acanthomolgus exilipes (Humes, Ho, 1968) (=*Lichomolgus exilipes* (Humes, Ho, 1968))	*Dendronephthya koellikeri* Kükenthal, 1905	Nep	MG	8	[113]
Acanthomolgus exilipes (Humes, Ho, 1968) (=*Lichomolgus exilipes* (Humes, Ho, 1968))	*Dendronephthya mucronata* (Pütter, 1900)	Nep	ID; MG; NC	25; 1; 1,5; 3; 4; 10; 24; 25	[50,52,55, 113]
Acanthomolgus exilipes (Humes, Ho, 1968) (=*Lichomolgus exilipes* (Humes, Ho, 1968))	*Dendronephthya regia* Verseveldt, 1968	Nep	MG	23–26; 40	[52,113]
Acanthomolgus exilipes (Humes, Ho, 1968)	*Dendronephthya* sp.	Nep	MG	27	[52]
Acanthomolgus exilipes (Humes, Ho, 1968)	*Dendronephthya speciosa* Kükenthal, 1905	Nep	MG	17; 24	[52]
Acanthomolgus exilipes (Humes, Ho, 1968) (=*Lichomolgus exilipes* (Humes, Ho, 1968))	*Dendronephthya stocki* Verseveldt, 1968	Nep	MG	25; 40	[52,113]
Acanthomolgus exilipes (Humes, Ho, 1968)	*Stereonephthya cordylophora* Verseveldt, 1973	Nep	MG	24	[52]
Acanthomolgus fissisetiger (Humes, Ho, 1968) (=*Lichomolgus fissisetiger* (Humes, Ho, 1968))	*Lemnalia elegans* (May, 1899)	Nep	MG	1	[113]
Acanthomolgus fissisetiger (Humes, Ho, 1968)	*Lemnalia humesi* Verseveldt, 1969	Nep	MG	10	[52]
Acanthomolgus fissisetiger (Humes, Ho, 1968) (=*Lichomolgus fissisetiger* (Humes, Ho, 1968))	*Stereonephthya acaulis* Verseveldt, 1968	Nep	MG	1; 2; 10; 15	[52,113]
Acanthomolgus fissisetiger (Humes, Ho, 1968) (=*Lichomolgus fissisetiger* (Humes, Ho, 1968))	*Stereonephthya papyracea* Kükenthal, 1905	Nep	MG	6	[113]
Acanthomolgus gentilis (Humes, Ho, 1968) (=*Lichomolgus gentilis* (Humes, Ho, 1968))	*Dendronephthya koellikeri* Kükenthal, 1905	Nep	MG	8	[113]
Acanthomolgus gentilis (Humes, Ho, 1968)	*Dendronephthya lokobeensis* Verseveldt, 1973	Nep	MG	4	[52]
Acanthomolgus gentilis (Humes, Ho, 1968) (=*Lichomolgus gentilis* (Humes, Ho, 1968))	*Dendronephthya mucronata* (Pütter, 1900)	Nep	MG; NC	1; 1,5; 2; 3; 4; 10; 20; 24	[52,55, 113]
Acanthomolgus gentilis (Humes, Ho, 1968)	*Dendronephthya* sp.	Nep	MG	27	[52]
Acanthomolgus gentilis (Humes, Ho, 1968)	*Dendronephthya speciosa* Kükenthal, 1905	Nep	MG	17; 22	[52]
Acanthomolgus gentilis (Humes, Ho, 1968) (=*Lichomolgus gentilis* (Humes, Ho, 1968))	*Dendronephthya stocki* Verseveldt, 1968	Nep	MG	20	[113]
Acanthomolgus gentilis (Humes, Ho, 1968)	*Siphonogorgia variabilis* (Hickson, 1903)	Nid	NC	30	[53]
Acanthomolgus gentilis (Humes, Ho, 1968) (=*Lichomolgus gentilis* (Humes, Ho, 1968))	*Stereonephthya acaulis* Verseveldt, 1968	Nep	MG	1; 2; 10; 20	[113]
Acanthomolgus gentilis (Humes, Ho, 1968)	*Stereonephthya acaulis* Verseveldt, 1968	Nep	MG	2; 4; 8	[52]
Acanthomolgus gentilis (Humes, Ho, 1968)	*Stereonephthya acaulis* Verseveldt, 1968	Nep	MG	17	[52]
Acanthomolgus gentilis (Humes, Ho, 1968)	*Stereonephthya cordylophora* Verseveldt, 1973	Nep	MG	24	[52]
Acanthomolgus gentilis (Humes, Ho, 1968) (=*Lichomolgus gentilis* (Humes, Ho, 1968))	Stereonephthya papyracea Kükenthal, 1905	Nep	MG	6	[113]
Acanthomolgus gentilis (Humes, Ho, 1968)	Umbellulifera striata (Thomson, Henderson, 1905)	Nep	MG	17	[52]
Acanthomolgus gomumuensis Kim, 2007	*Dendronephthya grandiflora* Henderson, 1909	Nep	ID	10	[47]
Acanthomolgus gorgoniae Humes, 1973	*Gorgonia ventalina* Linnaeus, 1758	Gor	BM; BQ; CW	2; 3	[49,96, 97]
Acanthomolgus hales Humes, Stock, 1973	*Solenocaulon tortuosum* Gray, 1862	Antt	MG	18	[109]
Acanthomolgus hians (Humes, Ho, 1968) (=*Lichomolgus hians* (Humes, Ho, 1968))	*Siphonogorgia pendula* Studer, 1889	Nid	MG	10; 12; 20	[114]
Acanthomolgus hians (Humes, Ho, 1968)	*Siphonogorgia pichoni* Verseveldt, 1971	Nid	MG	17; 25	[52]
Acanthomolgus intermedius Stock, 1975	*Eunicea laciniata* Duchassaing, Michelotti, 1860	Ple	CW	6	[97]
Acanthomolgus intermedius Stock, 1975	*Muricea* sp.	Ple	CU		[101]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Acanthomolgus longidactylus Stock, 1975	*Eunicea flexuosa* (Lamouroux, 1821) (=*Plexaura flexuosa* Lamouroux, 1821)	Ple	CW	3	[97]
Acanthomolgus longifurca Stock, 1975	*Eunicea tourneforti* Milne Edwards, Haime, 1857	Ple	CW	3	[97]
Acanthomolgus longispinifer (Humes, Ho, 1968)	*Dendronephthya* sp.	Nep	ID	17	[47]
Acanthomolgus longispinifer (Humes, Ho, 1968) (=*Lichomolgus longispinifer* (Humes, Ho, 1968))	*Siphonogorgia pendula* Studer, 1889	Nid	MG	10; 12; 20	[114]
Acanthomolgus longispinifer (Humes, Ho, 1968)	*Siphonogorgia pichoni* Verseveldt, 1971	Nid	MG	17; 25	[52]
Acanthomolgus mononyx Stock, 1975	*Eunicea clavigera* Bayer, 1961	Ple	CW	22; 24; 33; 40; 41	[97]
Acanthomolgus mopsellae Humes, 1974	*Melithaea rubeola* (Wright, Studer, 1889) (=*Mopsella rubeola* (Wright, Studer, 1889))	Mel	MG	3	[109]
Acanthomolgus muriceanus Humes, 1973	*Eunicea flexuosa* (Lamouroux, 1821) (=*Plexaura flexuosa* Lamouroux, 1821)	Ple	GB	1; 2	[96]
Acanthomolgus muriceanus Humes, 1973	*Muricea atlantica* (Kükenthal, 1911)	Ple	BM	3	[49,97]
Acanthomolgus plantei Humes, Stock, 1973	*Umbellulifera striata* (Thomson, Henderson, 1905)	Nep	MG	17; 47	[52]
Acanthomolgus seticornis Stock, 1975	*Plexaurella dichotoma* (Esper, 1791)	Ple	MF	3	[97]
Acanthomolgus telestophilus (Humes, Ho, 1968)	*Coelogorgia palmosa* Milne Edwards, Haime, 1857	Coe	MG	1; 2	[1]
Acanthomolgus telestophilus (Humes, Ho, 1968)	*Telesto (Carijoa) arborea* Wright, Studer, 1889	Cla	MG	4	[114]
Acanthomolgus tenuispinatus Kim, 2009	*Litophyton striatum* (Kükenthal, 1903)	Nep	MG	25	[117]
Acanthomolgus triangulipes Stock, 1975	*Gorgonia mariae* Bayer, 1961	Gor	CU	20	[103]
Acanthomolgus triangulipes Stock, 1975	*Gorgonia ventalina* Linnaeus, 1758	Gor	BQ; CW; MF	2; 3	[97]
Acanthomolgus varirostratus (Humes, Ho, 1968)	*Dendronephthya cirsium* Kükenthal, 1905	Nep	MG	35	[52]
Acanthomolgus varirostratus (Humes, Ho, 1968) (=*Lichomolgus varirostratus* (Humes, Ho, 1968))	*Dendronephthya koellikeri* Kükenthal, 1905	Nep	MG	8	[113]
Acanthomolgus varirostratus (Humes, Ho, 1968)	*Dendronephthya lokobeensis* Verseveldt, 1973	Nep	MG	15	[52]
Acanthomolgus varirostratus (Humes, Ho, 1968) (=*Lichomolgus varirostratus* (Humes, Ho, 1968))	*Dendronephthya mucronata* (Pütter, 1900)	Nep	MG; NC	1; 1,5; 2; 4; 10; 20; 24; 25	[52,55, 114]
Acanthomolgus varirostratus (Humes, Ho, 1968) (=*Lichomolgus varirostratus* (Humes, Ho, 1968))	*Dendronephthya regia* Verseveldt, 1968	Nep	MG	25; 40	[52,113]
Acanthomolgus varirostratus (Humes, Ho, 1968)	*Dendronephthya* sp.	Nep	MG	27	[52]
Acanthomolgus varirostratus (Humes, Ho, 1968)	*Dendronephthya speciosa* Kükenthal, 1905	Nep	MG	10	[52]
Acanthomolgus varirostratus (Humes, Ho, 1968) (=*Lichomolgus varirostratus* (Humes, Ho, 1968))	Dendronephthya stocki Verseveldt, 1968	Nep	MG	20; 25; 40	[52,113]
Acanthomolgus varirostratus (Humes, Ho, 1968)	*Siphonogorgia variabilis* (Hickson, 1903)	Nid	NC	30	[53]
Acanthomolgus varirostratus (Humes, Ho, 1968)	*Stereonephthya cordylophora* Verseveldt, 1973	Nep	MG	24	[52]
Acanthomolgus verrucipes Humes, 1973	*Eunicea calyculata* (Ellis, Solander, 1786)	Ple	BM	1	[49]
Acanthomolgus verseveldti (Humes, Ho, 1968) (=*Lichomolgus verseveldti* (Humes, Ho, 1968))	*Heteroxenia elisabethae* Kölliker, 1874	Xen	MG; YT	1	[114]
Acanthomolgus verseveldti (Humes, Ho, 1968)	*Heteroxenia fuscescens* (Ehrenberg, 1834)	Xen	MG	20	[52]
Acanthomolgus verseveldti (Humes, Ho, 1968)	*Xenia lepida* Verseveldt, 1971	Xen	MG	10	[52]
Alcyonomolgus bicrenatus (Humes, 1982) (=*Anisomolgus bicrenatus* Humes, 1982)	*Sarcophyton ehrenbergi v.* Marenzeller, 1886	Alc	NC	1	[39]
Alcyonomolgus dissimilis (Humes, 1982)	*Lobophytum depressum* Tixier-Durivault, 1966	Alc	MG	25	[50]
Alcyonomolgus dissimilis (Humes, 1982) (=*Anisomolgus dissimilis* (Humes, 1982))	*Sarcophyton ehrenbergi* v. Marenzeller, 1886	Alc	MG	25	[39]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Alcyonomolgus incisus (Humes, Ho, 1968)	*Sarcophyton ehrenbergi* v. Marenzeller, 1886	Alc	ID; MG	0.5; 3; 4	[39,52,115]
Alcyonomolgus insolens (Humes, Ho, 1968) (=*Lichomolgus insolens* (Humes, Ho, 1968))	*Lobophytum crassum* von Marenzeller, 1886	Alc	MG; NC	1; 2	[50,55,115]
Alcyonomolgus insolens (Humes, Ho, 1968)	*Lobophytum crebriplicatum* von Marenzeller, 1886	Alc	NC	2; 3	[55]
Alcyonomolgus insolens (Humes, Ho, 1968)	*Lobophytum pauciflorum* (Ehrenberg, 1834)	Alc	NC	0.5; 1; 2; 4	[50]
Alcyonomolgus lumellifer Humes, 1990	*Lobophytum pauciflorum* (Ehrenberg, 1834)	Alc	MG; NC	0.5; 17	[50]
Alcyonomolgus petalophorus (Humes, 1982) (=*Anisomolgus petalophorus* (Humes, 1982))	*Sarcophyton ehrenbergi* v. Marenzeller, 1886	Alc	NC	3	[39]
Alcyonomolgus relativus (Humes, 1982) (=*Anisomolgus relativus* (Humes, 1982))	*Sarcophyton ehrenbergi* v. Marenzeller, 1886	Alc	ID; NC	1; 3	[39]
Alcyonomolgus sarcophyticus (Humes, 1982) (=*Anisomolgus sarcophyticus* (Humes, 1982))	*Sarcophyton cornispiculatum* Verseveldt, 1971	Alc	MG	17	[39]
Alcyonomolgus sarcophyticus (Humes, 1982) (=*Anisomolgus sarcophyticus* (Humes, 1982))	*Sarcophyton elegans* Moser, 1919	Alc	NC	1; 2	[39]
Alcyonomolgus sarcophyticus (Humes, 1982) (=*Anisomolgus sarcophyticus* (Humes, 1982))	*Sarcophyton glaucum* (Quoy, Gaimard, 1833)	Alc	ID; MG	2; 3; 5	[39]
Alcyonomolgus sarcophyticus (Humes, 1982) (=*Anisomolgus sarcophyticus* (Humes, 1982))	*Sarcophyton trocheliophorum* von Marenzeller, 1886	Alc	NC	2	[39]
Anisomolgus ensifer Humes, 1982 (=*Anisomolgus ensiferus* (Humes, 1982))	*Sarcophyton glaucum* (Quoy, Gaimard, 1833)	Alc	NC	1	[39]
Anisomolgus goniodes Humes, 1982	*Sarcophyton trocheliophorum* von Marenzeller, 1886	Alc	NC	2	[39]
Anisomolgus limbatus Humes, Dojiri, 1979	*Lobophytum crassum* von Marenzeller, 1886	Alc	ID	3	[44]
Anisomolgus protentus (Humes, Frost, 1964)	*Sarcophyton elegans* Moser, 1919	Alc	NC	1	[55]
Anisomolgus protentus (Humes, Frost, 1964)	*Sarcophyton glaucum* (Quoy, Gaimard, 1833)	Alc	ID; MG	1; 2; 3; 4; 10; 17	[39,52]
Anisomolgus protentus (Humes, Frost, 1964) (=*Lichomolgus protentus* (Humes, Frost, 1964))	*Sarcophyton* sp.	Alc	MG	3	[111]
Anisomolgus protentus (Humes, Frost, 1964)	*Sarcophyton trocheliophorum* von Marenzeller, 1886	Alc	NC	2	[39]
Anisomolgus pterolobatus Humes, 1982	*Sarcophyton crassum* Tixier-Durivault, 1946	Alc	NC	1.5	[39]
Anisomolgus pterolobatus Humes, 1982	*Sarcophyton elegans* Moser, 1919	Alc	NC	1; 2	[39]
Anisomolgus pterolobatus Humes, 1982	*Sarcophyton glaucum* (Quoy, Gaimard, 1833)	Alc	ID	5; 10	[39]
Ascetomolgus plicatus Humes, Stock, 1972	*Studeriotes semperi* (Studer, 1888)	Parl	MG	17	[52]
Colobomolgus bandensis Humes, 1990	*Sinularia polydactyla* (Ehrenberg, 1834)	Alc	ID	2; 3	[50]
Colobomolgus cristatus (Humes, Ho, 1968)	*Sinularia firma* Tixier-Durivault, 1970	Alc	NC	3; 4	[50]
Colobomolgus cristatus (Humes, Ho, 1968) (=*Lichomolgus cristatus* (Humes, Ho))	*Sinularia leptoclados* (Ehrenberg, 1834)	Alc	MG; NC	1; 2; 10; 15; 20	[50,52,115]
Colobomolgus dentipes (Thompson I.C., Scott A., 1903)	*Sinularia firma* Tixier-Durivault, 1970	Alc	NC	3	[50]
Colobomolgus dentipes (Thompson I.C., Scott A., 1903)	*Sinularia humesi* Verseveldt, 1968	Alc	MG	2; 13; 18	[52,115]
Colobomolgus dentipes (Thompson I.C., Scott A., 1903)	*Sinularia polydactyla* (Ehrenberg, 1834)	Alc	NC	2	[55]
Colobomolgus epaxius Humes, 1990	*Sinularia firma* Tixier-Durivault, 1970	Alc	NC	3	[50]
Colobomolgus laboutei Humes, Stock, 1973)	*Sinularia leptoclados* (Ehrenberg, 1834)	Alc	MG	1; 20	[52]
Contomolgus lokobeensis Humes, Stock, 1973	*Dendronephthya stocki* Verseveldt, 1968	Nep	MG	25	[52]
Contomolgus lokobeensis Humes, Stock, 1973	*Studeriotes semperi* (Studer, 1888)	Parl	MG	17; 18	[50,52]
Critomolgus antennulus Humes, 1990	*Cladiella humesi* Verseveldt, 1974	Alc	NC	2	[53]
Critomolgus antennulus Humes, 1990	*Cladiella pachyclados* (Klunzinger, 1877)	Alc	NC	0.5; 1; 2	[50]
Critomolgus bulbipes (Stock, Kleeton, 1963)	*Alcyonium acaule* Marion, 1878	Alc	FR	10; 12	[72]
Critomolgus bulbipes (Stock, Kleeton, 1963)	Alcyonium coralloides (Pallas, 1766)	Alc	ES; FR	20; 23; 26	[72]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Critomolgus cladiellae Humes, 1990	*Cladiella humesi* Verseveldt, 1974	Alc	NC	2	[53]
Critomolgus cladiellae Humes, 1990	Cladiella pachyclados (Klunzinger, 1877)	Alc	NC	0.5; 1; 2	[50]
Critomolgus foxi (Gurney, 1927)	*Cladiella humesi* Verseveldt, 1974	Alc	NC	2	[50]
Critomolgus foxi (Gurney, 1927)	*Cladiella krempfi* (Hickson, 1919)	Alc	MG	1	[115]
Critomolgus foxi (Gurney, 1927) (=*Doridicola foxi* (Gurney, 1927))	*Cladiella laciniosa* (Tixier-Durivault, 1944)	Alc	MG	2	[52]
Critomolgus foxi (Gurney, 1927) (=*Doridicola foxi* (Gurney, 1927))	*Cladiella latissima* (Tixier-Durivault, 1944)	Alc	MG	1; 18	[52]
Critomolgus foxi (Gurney, 1927)	*Cladiella pachyclados* (Klunzinger, 1877)	Alc	ID; NC	0.5; 2; 10	[50]
Critomolgus foxi (Gurney, 1927) (=*Doridicola foxi* (Gurney, 1927))	*Cladiella sphaerophora* (Ehrenberg, 1834)	Alc	MG	1	[52]
Critomolgus linguifer Kim, 2003	*Cladiella humesi* Verseveldt, 1974	Alc	NC	2	[53]
Critomolgus orectopus Humes, 1990	*Cladiella pachyclados* (Klunzinger, 1877)	Alc	NC	0.5; 1; 2	[50]
Critomolgus orectopus Humes, 1990	*Lobophytum pauciflorum* (Ehrenberg, 1834)	Alc	NC	0.5; 1	[50]
Critomolgus pteropadus (Humes, 1978) (=*Doridicola pteropadus* Humes, 1978)	*Pteroeides oblongum* Gray, 1860	Pen	MG	17	[110]
Critomolgus virgulariae (Humes, 1978) (=*Doridicola virgulariae* Humes, 1978)	*Virgularia juncea* (Pallas, 1766)	Vir	MG	17; 18; 34	[110]
Doridicola aculeatus (Humes, Ho, 1968) (=*Metaxymolgus aculeatus* (Humes, Ho, 1968))	*Litophyton amentaceum* (Studer, 1894)	Nep	MG	2; 13	[52]
Doridicola aculeatus (Humes, Ho, 1968) (=*Lichomolgus aculeatus* (Humes, Ho, 1968))	*Litophyton arboreum* Forskål, 1775	Nep	MG	3	[113]
Doridicola aculeatus (Humes, Ho, 1968) (=*Metaxymolgus aculeatus* (Humes, Ho, 1968))	*Litophyton bumastum* (Verseveldt, 1973)	Nep	MG	8	[52]
Doridicola aculeatus (Humes, Ho, 1968)	*Litophyton chabrolii* (Andouin, 1828)	Nep	ID	2	[38]
Doridicola aculeatus (Humes, Ho, 1968) (=*Lichomolgus aculeatus* (Humes, Ho, 1968))	*Litophyton crassum* (Kükenthal, 1903)	Nep	MG	2	[113]
Doridicola aculeatus (Humes, Ho, 1968)	*Litophyton cupressiformis* (Kükenthal, 1903)	Nep	ID	3	[38]
Doridicola aculeatus (Humes, Ho, 1968) (=*Metaxymolgus aculeatus* (Humes, Ho, 1968))	*Litophyton filamentosum* (Verseveldt, 1973)	Nep	MG	23	[52]
Doridicola aculeatus (Humes, Ho, 1968) (=*Metaxymolgus aculeatus* (Humes, Ho, 1968))	*Litophyton lanternarium* (Verseveldt, 1973)	Nep	MG	15	[52]
Doridicola aculeatus (Humes, Ho, 1968) (=*Lichomolgus aculeatus* (Humes, Ho, 1968))	*Litophyton savignyi* (Ehrenberg, 1834)	Nep	ID; MG	3; 8; 10	[38,113]
Doridicola aculeatus (Humes, Ho, 1968) (=*Lichomolgus aculeatus* (Humes, Ho, 1968))	*Litophyton sphaerophorum* (Kükenthal, 1903)	Nep	ID; MG	2; 3	[38,113]
Doridicola aculeatus (Humes, Ho, 1968) (=*Metaxymolgus aculeatus* (Humes, Ho, 1968))	*Litophyton striatum* (Kükenthal, 1903)	Nep	ID; MG; YT	1; 3; 22; 25	[38,52]
Doridicola aculeatus (Humes, Ho, 1968)	*Litophyton viridis* (May, 1899)	Nep	ID	3; 10	[45]
Doridicola aculeatus (Humes, Ho, 1968) (=*Metaxymolgus aculeatus* (Humes, Ho, 1968))	*Stereonephthya nosybearia* Verseveldt, 1973	Nep	MG	10	[52]
Doridicola aculeatus (Humes, Ho, 1968) (=*Metaxymolgus aculeatus* (Humes, Ho, 1968))	*Stereonephthya scaphis* Verseveldt, 1973	Nep	MG	25	[52]
Doridicola antheliae (Humes, Stock, 1973) (=*Metaxymolgus antheliae* (Humes, Stock, 1973))	*Anthelia glauca* Lamarck, 1816	Xen	MG	8; 12	[50,52]
Doridicola antheliae (Humes, Stock, 1973) (=*Metaxymolgus antheliae* (Humes, Stock, 1973))	*Anthelia ternatana* (Schenk, 1896)	Xen	MG	18	[52]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Doridicola botulosus (Stock, Kleeton, 1963)	*Eunicella singularis* (Esper, 1791)	Gor	ES; FR	10; 25; 30	[72,83]
Doridicola botulosus (Stock, Kleeton, 1963)	*Paramuricea clavata* (Risso, 1826)	Ple	ES	20; 23	[72]
Doridicola capnellae Humes, 1990	*Capnella imbricata* (Quoy, Gaimard, 1833)	Nep	ID	10	[50]
Doridicola cincinnatus (Humes, 1975)	*Cladiella humesi* Verseveldt, 1974	Alc	NC	3	[50]
Doridicola cincinnatus (Humes, 1975) (=*Metaxymolgus cincinnatus* Humes, 1975)	*Cladiella pachyclados* (Klunzinger, 1877)	Alc	NC	0.5; 1; 2	[55]
Doridicola cincinnatus (Humes, 1975)	*Cladiella rotundata* Tixier-Durivault, 1970	Alc	NC		[50]
Doridicola cincinnatus (Humes, 1975)	*Cladiella similis* (Tixier-Durivault, 1944)	Alc	NC	2	[50]
Doridicola cincinnatus (Humes, 1975)	*Cladiella sphaerophora* (Ehrenberg, 1834)	Alc	NC	0.2	[50]
Doridicola cinctus (Humes, Stock, 1973) (=*Metaxymolgus cinctus* Humes, Stock, 1973)	*Psammogorgia ramosa* Kiikenthal	Ple	MG	2; 12; 15	[52,109]
Doridicola cinctus (Humes, Stock, 1973)	*Rumphella antipathes* (Linnaeus, 1758)	Gor	NC	1; 2	[43]
Doridicola comai Conradi, Megina, López-González, 2004	*Paramuricea clavata* (Risso, 1826)	Ple	ES; GB	20; 25; 30	[83]
Doridicola comparatus (Humes, 1975) (=*Metaxymolgus comparatus* (Humes, 1975))	*Xenia membranacea* Schenk, 1896	Xen	NC	15 cm	[55]
Doridicola hetaericus (Humes, Ho, 1968) (=*Lichomolgus hetaericus* (Humes, Ho, 1968))	*Cladiella krempfi* (Hickson, 1919)	Alc	MG	1	[115]
Doridicola hetaericus (Humes, Ho, 1968) (=*Metaxymolgus hetaericus* (Humes, Ho, 1968))	*Cladiella laciniosa* (Tixier-Durivault, 1944)	Alc	MG	2	[52]
Doridicola hetaericus (Humes, Ho, 1968) (=*Lichomolgus hetaericus* (Humes, Ho, 1968))	*Cladiella pachyclados* (Klunzinger, 1877)	Alc	MG	1	[115]
Doridicola indistinctus Ho, Ivanenko, 2013	*Gersemia fruticosa* (Sars, 1860)	Nep	RU	24	[37]
Doridicola lumarius (Humes, 1980) (=Metaxymolgus lumarius (Humes, 1980))	*Litophyton cupressiformis* (Kükenthal, 1903)	Nep	ID	3	[38]
Doridicola lumarius (Humes, 1980) (=*Metaxymolgus lumarius* (Humes, 1980))	*Litophyton striatum* (Kükenthal, 1903)	Nep	ID	3	[38]
Doridicola mimicus (Humes, 1975)	*Cladiella humesi* Verseveldt, 1974	Alc	NC	2	[53]
Doridicola mimicus (Humes, 1975) (=*Metaxymolgus mimicus* (Humes, 1975))	*Cladiella pachyclados* (Klunzinger, 1877)	Alc	NC	0.5; 1; 2	[55]
Doridicola parvicaudatus Kim, 2003	*Stereonephthya inordinata* Tixier-Durivault, 1970	Nep	NC	30	[53]
Doridicola patulus (Humes, 1958) (=*Metaxymolgus patulus* (Humes, 1958))	*Sinularia mayi* Lüttschwager, 1915	Alc	MG	20	[52]
Doridicola petalopus Humes, 1990	*Heteroxenia* sp.	Xen	NC	0.5	[50]
Doridicola petalopus Humes, 1990	*Xenia* Lamarck, 1816	Xen	ID	3	[50]
Doridicola praelongipes (Humes, 1975) (=*Metaxymolgus praelongipes* (Humes, 1975))	*Xenia membranacea* Schenk, 1896	Xen	NC	15 cm	[55]
Doridicola praelongipes (Humes, 1975)	*Xenia viridis* Schenk, 1896	Xen	ID	3	[50]
Doridicola rostripes Humes, 1990	*Heteroxenia* sp.	Xen	NC	0.5	[50]
Doridicola rostripes Humes, 1990	*Xenia* Lamarck, 1816	Xen	ID	3	[50]
Doridicola rumphellae Humes, 1993	*Rumphella antipathes* (Linnaeus, 1758)	Gor	NC	1; 2	[43]
Doridicola senticauda Humes, 1990	*Paralemnalia thyrsoides* (Ehrenberg, 1834)	Nep	NC	3	[50]
Doridicola singularipes (Humes, Ho, 1968) (=*Metaxymolgus singularipes* (Humes, Ho, 1968))	*Alcyonium* sp.	Alc	MG	1	[52]
Doridicola singularipes (Humes, Ho, 1968)	*Rhytisma fulvum* (Forskål, 1775) (=*Parerythropodium fulvum obtusispiculatum* Verseveldt)	Alc	MG	0.2; 0.5	[50]
Doridicola singularipes (Humes, Ho, 1968) (=*Lichomolgus singularipes* (Humes, Ho, 1968); *Metaxymolgus singularipes* (Humes, Ho, 1968))	*Rhytisma rubiginosum* (Verseveldt, 1968)	Alc	MG	1; 2	[52,115]
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Lemnalia africana* (May, 1899)	Nep	MG; YT	2; 12	[52,113]
Doridicola spinulifer (Humes, Frost, 1964)	*Lemnalia amabilis* Tixier-Durivault, 1966	Nep	YT	3	[113]
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Lemnalia cervicornis* (May, 1898)	Nep	MG	20	[52]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Lemnalia crassicaulis* Verseveldt, 1969	Nep	MG	20	[52]
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Lemnalia digitata* (May, 1898)	Nep	MG	2; 17	[52]
Doridicola spinulifer (Humes, Frost, 1964)	*Lemnalia elegans* (May, 1899)	Nep	MG; NC	0.15; 3	[55,113]
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Lemnalia flava* (May, 1898)	Nep	MG; YT	1; 1.5; 2	[52,113]
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Lemnalia longiramus* Verseveldt, 1969	Nep	MG	12	[52]
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Lemnalia madagascarensis* Verseveldt, 1969	Nep	MG	24	[52]
Doridicola spinulifer (Humes, Frost, 1964) (=*Lichomolgus spinulifer* (Humes, Frost, 1964))	*Lemnalia* sp.	Nep	MG	1	[111]
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Lemnalia tenuis* Verseveldt, 1969	Nep	MG	50	[52]
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Paralemnalia clavata* Verseveldt, 1969	Nep	MG	2	[52]
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Paralemnalia thyrsoides* (Ehrenberg, 1834)	Nep	ID; MG; NC	3; 10; 12; 18; 20	[50,52,55, 113]
Doridicola spinulifer (Humes, Frost, 1964) (=*Metaxymolgus spinulifer* (Humes, Frost, 1964))	*Sinularia polydactyla* (Ehrenberg, 1834)	Alc	MG	2	[52]
Doridicola vulcanius Humes, 1990	*Paralemnalia thyrsoides* (Ehrenberg, 1834)	Nep	ID	3	[50]
Mecra ellipsaria Humes, 1980	*Litophyton sphaerophorum* (Kükenthal, 1903)	Nep	ID	2	[38]
Meringomolgus devotus Humes, Stock, 1973	*Sinularia leptoclados* (Ehrenberg, 1834)	Alc	MG	1	[52]
Meringomolgus facetus Humes, Stock, 1973	*Sinularia minima* Verseveldt, 1971	Alc	MG	15	[52]
Meringomolgus facetus Humes, Stock, 1973	*Sinularia polydactyla* (Ehrenberg, 1834)	Alc	MG	2; 12	[52]
Meringomolgus hamatus Humes, Stock, 1973	*Sinularia humesi* Verseveldt, 1968	Alc	MG	13; 18	[52]
Meringomolgus hamatus Humes, Stock, 1973	*Sinularia leptoclados* (Ehrenberg, 1834)	Alc	MG; NC	1; 2; 15; 20	[42,52]
Meringomolgus hamatus Humes, Stock, 1973	*Sinularia maxima* Verseveldt, 1971	Alc	MG	1	[52]
Monomolgus unihastatus Humes, Frost, 1964	*Rhytisma fulvum* (Forskål, 1775) (=*Parerythropodium fulvum* (Forskål, 1775))	Alc	MG	1	[52]
Notoxynus mundus Humes, 1975	*Xenia membranacea* Schenk, 1896	Xen	NC	0.15	[55]
Paradoridicola adelphus (Humes, Ho, 1968) (=*Lichomolgus adelphus* Humes, Ho, 1968)	*Sinularia pedunculata* Tixier-Durivault, 1945	Alc	YT	3	[115]
Paradoridicola adelphus (Humes, Ho, 1968) (=*Lichomolgus adelphus* Humes, Ho, 1968)	*Sinularia polydactyla* (Ehrenberg, 1834)	Alc	MG; MH; NC	0.2; 0.5; 1; 2 15	[52,55, 115]
Paradoridicola adelphus (Humes, Ho, 1968) (=*Lichomolgus adelphus* Humes, Ho, 1968)	*Sinularia whiteleggei* Lüttschwager, 1914	Alc	MG	2	[115]
Paradoridicola angularis Humes, 1990	*Klyxum flaccidum* (Tixier-Durivault, 1966) (=*Alcyonium flaccidum* Tixier-Durivault, 1966)	Alc	MG	12; 20	[50]
Paradoridicola angularis Humes, 1990	*Klyxum molle* (Thomson, Dean, 1931) (=*Alcyonium molle* Thomson, Dean, 1931)	Alc	ID	3	[50]
Paradoridicola angularis Humes, 1990	*Klyxum simplex* (Thomson, Dean, 1931) (=*Alcyonium simplex* Thomson, Dean, 1931)	Alc	NC	2	[50]
Paradoridicola angularis Humes, 1990	*Klyxum utinomii* (Verseveldt, 1971) (=*Alcyonium utinomii* Verseveldt, 1971)	Alc	MG	12	[50]
Paradoridicola contiguus Humes, 1990	*Sinularia flexibilis* (Quoy, Gaimard, 1833)	Alc	ID	3; 4	[50]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Paradoridicola drepanophorus Humes, 1990	*Klyxum flaccidum* (Tixier-Durivault, 1966) (=*Alcyonium flaccidum* Tixier-Durivault, 1966)	Alc	MG	12; 20	[50]
Paradoridicola drepanophorus Humes, 1990	*Klyxum molle* (Thomson, Dean, 1931) (=*Alcyonium molle* Thomson, Dean, 1931)	Alc	ID	3	[50]
Paradoridicola drepanophorus Humes, 1990	*Klyxum simplex* (Thomson, Dean, 1931) (=*Alcyonium simplex* Thomson, Dean, 1931)	Alc	NC	2	[50]
Paradoridicola glabripes (Humes, Ho, 1968)	*Ovabunda macrospiculata* (Gohar, 1940) (=*Xenia macrospiculata* Gohar, 1940)	Xen	MG	20	[52]
Paradoridicola glabripes (Humes, Ho, 1968)	*Xenia umbellata* Lamarck, 1816	Xen	MG	1	[115]
Paradoridicola glabripes (Humes, Ho, 1968)	Xenia viridis Schenk, 1896	Xen	MG		[52]
Paradoridicola hystricosus Humes, 1990	*Sinularia gravis* Tixier-Durivault, 1970	Alc	NC	1	[50]
Paradoridicola simulator Humes, 1990	*Klyxum simplex* (Thomson, Dean, 1931) (=*Alcyonium simplex* Thomson, Dean, 1931)	Alc	NC	0.5; 2	[50]
Paradoridicola sinulariae Humes, Stock, 1973	*Sinularia arborea* Verseveldt, 1971	Alc	MG	2; 12; 13; 23	[52]
Paradoridicola sinulariae Humes, Stock, 1973	*Sinularia flexibilis* (Quoy, Gaimard, 1833)	Alc	NC	3	[55]
Paradoridicola sinularianus Humes, 1990	*Sinularia gravis* Tixier-Durivault, 1970	Alc	NC	1	[50]
Paradoridicola sinularianus Humes, 1990	*Sinularia nanolobata* Verseveldt, 1977	Alc	ID	2	[50]
Paradoridicola spinulatus Humes, 1982	*Sarcophyton glaucum* (Quoy, Gaimard, 1833)	Alc	ID	5; 10	[39]
Paradoridicola squamiger (Humes, Frost, 1964)	*Sinularia ceramensis* Verseveldt, 1977	Alc	ID	2	[50]
Paradoridicola squamiger (Humes, Frost, 1964) (=*Lichomolgus squamiger* Humes, Frost, 1964)	*Sinularia polydactyla* (Ehrenberg, 1834)	Alc	MG; NC	20 cm; 0.5; 1; 2; 15	[52,55, 111]
Paradoridicola squamiger (Humes, Frost, 1964)	*Sinularia whiteleggei* Lüttschwager, 1914	Alc	MG	2	[115]
Paradoridicola triquetrus (Humes, Ho, 1968) (=*Lichomolgus triquetrus* Humes, Ho, 1968)	*Anthelia gracilis* (May, 1898)	Xen	MG	0.5	[114]
Paradoridicola virgulifer Humes, 1990	*Sinularia polydactyla* (Ehrenberg, 1834)	Alc	ID	2; 3	[50]
Paramolgus abruptus Humes, 1990	*Lobophytum crassum* von Marenzeller, 1886	Alc	MG	25	[50]
Paramolgus accinctus Humes, 1980	*Litophyton cupressiformis* (Kükenthal, 1903)	Nep	ID	3	[38]
Paramolgus accinctus Humes, 1980	*Litophyton savignyi* (Ehrenberg, 1834)	Nep	ID	3	[38]
Paramolgus accinctus Humes, 1980	*Litophyton sphaerophorum* (Kükenthal, 1903)	Nep	ID	2	[38]
Paramolgus accinctus Humes, 1980	*Litophyton striatum* (Kükenthal, 1903)	Nep	ID	3	[38]
Paramolgus accinctus Humes, 1980	*Litophyton viridis* (May, 1899)	Nep	ID	3	[45]
Paramolgus alcyoniicus Humes, 1990	*Klyxum legitimum* (Tixier-Durivault, 1970)	Alc	NC	2; 30	[50]
Paramolgus alcyoniicus Humes, 1990	*Klyxum simplex* (Thomson, Dean, 1931) (=*Alcyonium simplex* Thomson, Dean, 1931)	Alc	NC	0.5; 2	[50]
Paramolgus centor Humes, 1990	*Paralemnalia thyrsoides* (Ehrenberg, 1834)	Nep	ID; NC	3; 10	[50]
Paramolgus clavatus (Humes, Ho, 1968) (=*Lichomolgus clavatus* Humes, Ho, 1968)	*Coelogorgia palmosa* Milne Edwards, Haime, 1857	Coe	MG	1; 2	[114]
Paramolgus clavatus (Humes, Ho, 1968)	*Lemnalia cervicornis* (May, 1898)	Nep	MG	20	[52]
Paramolgus clavatus (Humes, Ho, 1968)	*Lemnalia crassicaulis* Verseveldt, 1969	Nep	MG	20	[52]
Paramolgus clavatus (Humes, Ho, 1968)	*Lemnalia longiramus* Verseveldt, 1969	Nep	MG	12	[52]
Paramolgus clavatus (Humes, Ho, 1968)	*Sinularia polydactyla* (Ehrenberg, 1834)	Alc	NC	2	[53]
Paramolgus clavatus (Humes, Ho, 1968)	*Stereonephthya inordinata* Tixier-Durivault, 1970	Nep	NC	30	[55]
Paramolgus congruus Humes, 1990	*Rhytisma fulvum* (Forskål, 1775) (=*Parerythropodium fulvum obtusispiculatum* Verseveldt)	Alc	MG	0.15; 0.2; 0.5; 1	[50]
Paramolgus congruus Humes, 1990	*Rhytisma fuscum* (Thomson, Henderson, 1906) (=*Parerythropodium fulvum fuscum* (Thomson, Henderson, 1906))	Alc	MG	0.15; 0.2; 0.5; 1	[50]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Paramolgus dapsilis Humes, 1993	*Annella reticulata* (Ellis, Solander, 1786) (=*Suberogorgia reticulata*)	Sub	ID; PH	10; 30	[43]
Paramolgus ellisellae Humes, 1974	*Ctenocella ramosa* (Simpson, 1910) (=*Ellisella ramosa* (Simpson, 1910))	Ell	MG	24; 25	[109]
Paramolgus eniwetokensis Humes, 1973	*Lobophytum crassum* von Marenzeller, 1886	Alc	NC		[55]
Paramolgus eniwetokensis Humes, 1973	*Lobophytum crebriplicatum* von Marenzeller, 1886	Alc	NC	2; 3	[55]
Paramolgus eniwetokensis Humes, 1973	*Lobophytum pauciflorum* (Ehrenberg, 1834)	Alc	MH; NC	0.5; 1; 2; 3; 5	[49,50]
Paramolgus extendens Humes, Dojiri, 1979	*Cespitularia multipinnata* (Quoy, Gaimard, 1833)	Xen	ID	5	[46]
Paramolgus galeatus Kim, 2003	*Sarcophyton ehrenbergi* v. Marenzeller, 1886	Alc	NC		[53]
Paramolgus inconstans Humes, Dojiri, 1979	*Lobophytum crassum* von Marenzeller, 1886	Alc	ID	2	[44]
Paramolgus inconstans Humes, Dojiri, 1979	*Lobophytum pauciflorum* (Ehrenberg, 1834)	Alc	NC	2	[50]
Paramolgus litophyticus Humes, Dojiri, 1979	*Litophyton viridis* (May, 1899)	Nep	ID	10	[45]
Paramolgus modicus Humes, 1990	*Lobophytum latilobatum* Verseveldt, 1971	Alc	MG	1	[50]
Paramolgus nephthaenus Humes, 1980	*Litophyton chabrolii* (Andouin, 1828)	Nep	ID	2	[38]
Paramolgus nephthaenus Humes, 1980	*Litophyton cupressiformis* (Kükenthal, 1903)	Nep	ID	3	[38]
Paramolgus nephthaenus Humes, 1980	*Litophyton savignyi* (Ehrenberg, 1834)	Nep	ID	3	[38]
Paramolgus nephthaenus Humes, 1980	*Litophyton sphaerophorum* (Kükenthal, 1903)	Nep	ID	2	[38]
Paramolgus nephthaenus Humes, 1980	*Litophyton striatum* (Kükenthal, 1903)	Nep	ID	3	[38]
Paramolgus nephthaenus Humes, 1980	*Stereonephthya inordinata* Tixier-Durivault, 1970	Nep	NC	30	[53]
Paramolgus ostentus Humes, 1973	*Lobophytum pauciflorum* (Ehrenberg, 1834)	Alc	MH	2	[49]
Paramolgus pollicaris Humes, Dojiri, 1979	*Cespitularia multipinnata* (Quoy, Gaimard, 1833)	Xen	ID	5	[46]
Paramolgus promiculus Humes, 1980	*Litophyton cupressiformis* (Kükenthal, 1903)	Nep	ID	3	[38]
Paramolgus promiculus Humes, 1980 (=*Paramolgus prominulus* Humes, 1980)	*Litophyton savignyi* (Ehrenberg, 1834) (=*Nephthea aberrans* (Verseveldt, 1968))	Nep	ID; NC	3; 30	[38]
Paramolgus promiculus Humes, 1980	*Litophyton sphaerophorum* (Kükenthal, 1903)	Nep	ID	2	[38]
Paramolgus promiculus Humes, 1980	*Litophyton viridis* (May, 1899)	Nep	ID	3; 10	[45]
Paramolgus promiculus Humes, 1980	*Stereonephthya inordinata* Tixier-Durivault, 1970	Nep	NC	30	[53]
Paramolgus quadrangulus Humes, 1990	*Sinularia brassica* May, 1898 (=*Sinularia dura* (Pratt, 1903))	Alc	ID; NC	2; 3; 10	[50]
Paramolgus resectus Humes, Dojiri, 1979	*Litophyton viridis* (May, 1899)	Nep	ID	3	[45]
Paramolgus spathophorus (Humes, Ho, 1968)	Lobophytum crebriplicatum von Marenzeller, 1886	Alc	NC	2; 3	[55]
Paramolgus spathophorus (Humes, Ho, 1968)	*Lobophytum pauciflorum* (Ehrenberg, 1834)	Alc	MG; NC	0.5; 1; 2; 4; 17	[50]
Paramolgus spathophorus (Humes, Ho, 1968)	*Sarcophyton ehrenbergi* v. Marenzeller, 1886 (=*Sarcophyton acutangulum* (v. Marenzeller, 1886))	Alc	MG; NC	3; 4; 25	[39,52]
Paramolgus spathophorus (Humes, Ho, 1968)	*Sarcophyton elegans* Moser, 1919	Alc	NC	1; 2	[39]
Paramolgus spathophorus (Humes, Ho, 1968)	*Sarcophyton glaucum* (Quoy, Gaimard, 1833)	Alc	MG; NC	0.5; 1; 3; 17	[39,52, 115]
Paramolgus spathophorus (Humes, Ho, 1968)	*Sarcophyton stolidotum* Verseveldt, 1971	Alc	MG	17	[39]
Paramolgus subincisus Humes, 1990	*Heteroxenia* sp.	Xen	NC		[50]
Paramolgus subincisus Humes, 1990	*Xenia* Lamarck, 1816	Xen	ID	3	[50]
Paramolgus timendus Humes, 1990	*Klyxum molle* (Thomson, Dean, 1931) (=*Alcyonium molle* Thomson, Dean, 1931)	Alc	ID	3	[50]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Paramolgus timendus Humes, 1990	*Klyxum simplex* (Thomson, Dean, 1931) (=*Alcyonium simplex* Thomson, Dean, 1931)	Alc	NC	0.5; 2	[50]
Paredromolgus decorus (Humes, Frost, 1964)	*Cladiella humesi* Verseveldt, 1974	Alc	NC	2	[50]
Paredromolgus decorus (Humes, Frost, 1964)	*Cladiella laciniosa* (Tixier-Durivault, 1944)	Alc	MG	2	[50]
Paredromolgus decorus (Humes, Frost, 1964)	*Cladiella latissima* (Tixier-Durivault, 1944)	Alc	MG	1; 18	[52]
Paredromolgus decorus (Humes, Frost, 1964)	*Cladiella rotundata* Tixier-Durivault, 1970	Alc	NC	5	[50]
Paredromolgus decorus (Humes, Frost, 1964)	*Cladiella sphaerophora* (Ehrenberg, 1834)	Alc	MG	1	[52]
Pennatulicola piscatorius Itoh, Kim, 2015	*Pteroeides* sp.	Pen	JP	15	[78]
Pennatulicola pteroidis (Della Valle, 1880)	*Pteroeides griseum* (Bohadsch, 1761) (=*Pteroides spinulosus*)	Pen			[140]
Pennatulicola pterophilus (Stock, 1962)	*Pteroeides* sp.	Pen	ID		[48]
Pennatulicola pterophilus (Stock, 1962)	*Pteroeides sagamiense* Moroff, 1902	Pen	MG	18	[110]
Pennatulicola robustclavus Uyeno, 2015	*Pteroeides* sp.	Pen	SG	0; 6.2; 10.3; 10.6; 12.9	[57]
Pennatulicola serratipes (Ummerkutty, 1962)	*Pteroeides esperi* Herklots, 1858	Pen			[141]
Perosyna indonesica Humes, 1982	*Sarcophyton glaucum* (Quoy, Gaimard, 1833)	Alc	ID	5	[39]
Plesiomolgus conjunctus (Humes, Ho, 1967) (=*Lichomolgus conjunctus* Humes, Ho, 1967)	*Tubipora musica* Linnaeus, 1758	Tub	MG; YT	15 cm; 1; 2	[112]
Plesiomolgus organicus (Humes, Ho, 1967) (=*Lichomolgus organicus* Humes, Ho, 1967)	*Tubipora musica* Linnaeus, 1758	Tub	MG; YT	15 cm; 1; 2	[112]
Telestacicola angoti Humes, Stock, 1973	*Annella reticulata* (Ellis, Solander, 1786)	Sub	MG	8	[109]
Telestacicola angoti Humes, Stock, 1973	*Coelogorgia palmosa* Milne Edwards, Haime, 1857	Coe	MG	1; 3	[1]
Telestacicola angoti Humes, Stock, 1973	*Subergorgia suberosa* (Pallas, 1766)	Sub	MG	17	[109]
Telestacicola lobophyti Humes, 1990	*Lobophytum pauciflorum* (Ehrenberg, 1834)	Alc	MG	17	[50]
Zamolgus acanthodes Humes, Stock, 1973	*Sinularia arborea* Verseveldt, 1971	Alc	MG	2; 12; 13; 23	[52]
Zamolgus cracens Humes, Dojiri, 1979	*Cespitularia multipinnata* (Quoy, Gaimard, 1833)	Xen	ID	5	[46]
Zamolgus tridens Humes, Stock, 1973	*Caementabunda simplex* (Thomson, Dean, 1931)	Xen	MG		[52]
Sabelliphilidae					
Eupolymniphilus brevicaudatus Kim, 2009	*Tubipora musica* Linnaeus, 1758	Tub	MG	1	[117]
Thamnomolgidae					
Forhania philippinensis Humes, 1990	*Annella reticulata* (Ellis, Solander, 1786) (=*Subergorgia reticulata* (Ellis, Solander, 1786))	Sub	PH	30	[42]
Forhania philippinensis Humes, 1990	*Melithaea rubeola* (Wright, Studer, 1889) (=*Acabaria rubeola* (Wright, Studer, 1889))	Mel	PH	40	[42]
Forhania philippinensis Humes, 1990	*Villogorgia intricata* (Gray, 1870)	Ple	PH	30	[43]
Thamnomolgus nodulus Humes, 1990	*Villogorgia intricata* (Gray, 1870)	Ple	PH	30	[43]
Siphonostomatoida					
Artotrogidae					
Metapontius walteri Johnsson, Neves, 2005	*Briareum violaceum* (Quoy, Gaimard, 1833)	Bri	MH	2	[59]
Asterocheridae					
Asterocheres indivisus Kim, 2010	*Cespitularia erecta* Macfadyen, 1936	Xen	MG	12; 24	[118]
Asterocheres nudicoxus Kim, 2010	*Tubipora musica* Linnaeus, 1758	Tub	MG	1	[118]
Orecturus ampulus Humes, 1996	*Siphonogorgia variabilis* (Hickson, 1903)	Nid	NC	30	[51]
Orecturus antillensis Varela, 2011	*Eunicea mammosa* Lamouroux, 1816	Ple	CU	3	[105]
Orecturus excavatus (Humes, 1989) (=*Acontiophorus excavatus* Humes, 1989)	*Dendronephthya koellikeri* Kükenthal, 1905	Nep	ID	10; 25	[41]
Orecturus excavatus (Humes, 1989) (=*Acontiophorus excavatus* Humes, 1989)	*Dendronephthya mucronata* (Pütter, 1900)	Nep	MG	8; 25	[41]
Orecturus excavatus (Humes, 1989) (=*Acontiophorus excavatus* Humes, 1989)	*Dendronephthya* sp.	Nep	ID; PH	17; 30	[1,41]
Orecturus excavatus (Humes, 1989)	*Siphonogorgia pichoni* Verseveldt, 1971	Nid	MG	20	[1]
Orecturus finitimus Humes, 1993	*Acanthogorgia* sp.	Aca	ID	17; 25	[43]
Orecturus finitimus Humes, 1993	*Villogorgia intricata* (Gray, 1870)	Ple	PH	30	[43]

Table A1. *Cont.*

Copepod	Host Species: Valid Name (and as in Original Record)	Host Abbreviation *	Site Abbreviation **	Depth (m)	Reference
Orecturus forticulus Humes, 1993	*Melithaea ochracea* (Linnaeus, 1758) (=*Melitodes ochracea* (Linnaeus))	Mel	ID	3	[43]
Orecturus grandisetiger Humes, 1992	*Acanthogorgia* sp.	Aca	ID	17; 25	[43]
Orecturus grandisetiger Humes, 1992	*Stereonephthya cordylophora* Verseveldt, 1973	Nep	MG	24	[1]
Orecturus longicaudatus Kim, Song, 2003	*Calicogorgia granulosa* Kükenthal, Gorzawsky, 1908	Aca	KR	10	[94]
Orecturus ortizi Varela, Lalana, 2007	*Briareum asbestinum* (Pallas, 1766)	Bri	CU		[100]
Orecturus sakalavicus Humes, 1994	*Coelogorgia palmosa* Milne Edwards, Haime, 1857	Coe	MG; YT	1; 2; 3; 8; 15; 18	[1]
Orecturus similis Kim, Song, 2003	*Dendronephthya* sp.	Nep	KR		[94]
Parasteropontius latus (Humes, 1992) (=*Asteropontius latus* Humes, 1992)	*Villogorgia intricata* (Gray, 1870)	Ple	PH	30	[43]
Acontiophorus armatus Brady, 1880	*Alcyonium digitatum* Linnaeus, 1758	Alc	IE	10	[77]
Asterocheres tubiporae Kim, 2004	*Tubipora musica* Linnaeus, 1758	Tub	MG	1	[93]
Entomolepididae					
Entomopsyllus stocki Kim, 2004	*Tubipora musica* Linnaeus, 1758	Tub			[93]
Entomopsyllus takara Uyeno, Johnsson, 2018	*Heliopora coerulea* (Pallas, 1766)	Hel	JP	10	[92]
Harpacticoida					
Tegastidae					
Parategastes conexus Humes, 1984	*Stereonephthya ulicoides* Thomson, Dean, 1931	Nep	ID	10	[40]

* Octocoral family: Aca—Acanthogorgiidae, Alc—Alcyoniidae, Antp—Anthoptilidae, Antt—Anthothelidae, Bri—Briareidae, Chr—Chrysogorgiidae, Cla—Clavulariidae, Coe—Coelogorgiidae, Ell—Ellisellidae, Gor—Gorgoniidae, Hel—Helioporidae, Isi—Isididae, Kop—Kophobelemnidae, Mel—Melithaeidae, Nep—Nephtheidae, Nid—Nidaliidae, Parg—Paragorgiidae, Parl—Paralcyoniidae, Pen—Pennatulidae, Ple—Plexauridae, Pri—Primnoidae, Ren—Renillidae, Sub—Subergorgiidae, Tub—Tubiporidae, Ver—Veretillidae, Vir—Virgulariidae, Xen—Xeniidae. ** Sites: AQ—Antarctica, BB—Barbados, BM—Bermuda, BQ—Bonaire, St. Eustatius and Saba, BS—Bahamas, CA—Canada, CU—Cuba, CW—Curacao, ER—Eritrea, ES—Spain, FR—France, GB—Great Britain, GL—Greenland, ID—Indonesia, IE—Ireland, IL—Israel, IS—Iceland, IT—Italy, JM—Jamaica, JP—Japan, KR—Republic of Korea, MF—Saint Martin (Fr.), MG—Madagascar, MH—Marshall Islands, NC—New Caledonia, NL-BQ3—Sint Eustatius, NO—Norway, PH—Philippines, PR—Puerto Rico, RU—Russia, SE—Sweden, SG—Singapore, SL—Sierra Leone, US—USA, YT—Mayott.

Table A2. Description of the dataset with specific information relative to column names, description, units, and attribute type.

Attribute	Column_Name	Description	Units	Attribute_Type
Record number	rID	Unique number corresponding to specific occurrence		Integer
Record ID	recordID	A structured code incorporating a concise article reference, region and country observation identifiers, shorthand for the location coordinates, and specific abbreviations for the symbiont and host families, complemented by a distinct number.		Text
Aphia ID of symbiont	aphiaID_Symbiont	Unique number for taxon from WoRMS database		Integer
Kingdom of symbiont	kingdom_Symbiont	Taxonomic rank below Domain		Text
Phylum of symbiont	phylum_Symbiont	Taxonomic rank below Kingdom		Text
Class of symbiont	class_Symbiont	Taxonomic rank below Phylum		Text
Order of symbiont	order_Symbiont	Taxonomic rank below Class		Text
Family of symbiont	family_Symbiont	Taxonomic rank below Order		Text
Genus of symbiont	genus_Symbiont	Taxonomic rank below Family and first element in the Latin binomial name		Text
Specific epithet of symbiont	specificEpithet_Symbiont	Second element in the Latin binomial name		Text
Scientific name authorship of symbiont	scientificNameAuthorship_Symbiont	Third element in the Latin binomial name		Text
Symbiont ID	symbiontID	Reviewed species name		Text
Taxon rank of symbiont	taxonRank_Symbiont	Taxonomic rank information (e.g., genus, species)		Text

Table A2. *Cont.*

Attribute	Column_Name	Description	Units	Attribute_Type
Taxonomic status of symbiont	taxonomicStatus_Symbiont	Taxonomic status information (e.g., accepted, unaccepted)		Text
Link of symbiont	link_Symbiont	Link to taxon in WoRMS database		Text
Female Body Length	femaleLength	The length of the female specimen, measured from head to tail	µm	Text
Female Body Weight	femaleWeight	The total weight of the female specimen	µm	Text
Male Body Length	maleLength	The length of the male specimen, measured from head to tail	µm	Text
Male Body Weight	maleWeight	The total weight of the male specimen	µm	Text
Aphia ID of host	aphiaID_Host	Unique number for taxon from WoRMS database [33]		Integer
Kingdom of host	kingdom_Host	Taxonomic rank below Domain		Text
Phylum of host	phylum_Host	Taxonomic rank below Kingdom		Text
Class of host	class_Host	Taxonomic rank below Phylum		Text
Order of host	order_Host	Taxonomic rank below Class		Text
Family of host	family_Host	Taxonomic rank below Order		Text
Genus of host	genus_Host	Taxonomic rank below Family and first element in the Latin binomial name		Text
Specific epithet of host	specificEpithet_Host	Second element in the Latin binomial name		Text
Scientific name authorship of host	scientificNameAuthorship_Host	Third element in the Latin binomial name		Text
Host ID	hostID	Reviewed species name		Text
Taxon rank of host	taxonRank_Host	Taxonomic rank information (e.g., genus, species)		Text
Taxonomic status of host	taxonomicStatus_Host	Taxonomic status information (e.g., accepted, unaccepted)		Text
Link of host	link_Host	Link to taxon in WoRMS database		Text
Site ID	siteID	Unique number for locality		Text
Region code	regionCode	Unique number for region		Text
Region	region	Division of the World Ocean [120]		Text
Ocean	ocean	The name of the ocean in which the locality occurs.		Text
Water body	waterBody	The name of the water body in which the locality occurs.		Text
Island	island	The name of the island near which the locality occurs.		Text
Country	country	The name of the country in which the locality occurs.		Text
Country code	countryCode	The standard code (ISO 3166-1-alpha-2) for the country in which the locality occurs.		Text
Locality	locality	Particular area where the taxon was found		Text
Exact Location Description	verbatimLocalition	A comprehensive description of the location from the original article		Text
Geocoordinates	geocoordinates	A combined representation of both latitude and longitude	Degrees Minutes Seconds (DMS)	Text
Latitude	latitude	Coordinate that specifies the N–S position of a point on the Earth surface	Degrees Minutes Seconds (DMS)	Text
Longitude	longitude	Coordinate that specifies the E–W position of a point on the Earth surface	Degrees Minutes Seconds (DMS)	Text
Decimal geocoordinates	decimalGeocoordinates	A combined representation of both latitude and longitude	Decimal degrees, WGS84	Numeric
Decimal latitude	decimalLatitude	Coordinate that specifies the N–S position of a point on the Earth surface	Decimal degrees, WGS84	Numeric
Decimal longitude	decimalLongitude	Coordinate that specifies the E–W position of a point on the Earth surface	Decimal degrees, WGS84	Numeric

Table A2. *Cont.*

Attribute	Column_Name	Description	Units	Attribute_Type
Coordinate uncertainty	coordinateUncertainty InMeters	The horizontal distance from the given decimal latitude and longitude describing the smallest circle containing the whole of the Location.	m	Integer
Minimum depth	minimumDepthInMeters	Vertical distance under sea level	m	Integer
Maximum depth	maximumDepthInMeters	Vertical distance under sea level	m	Integer
Collecting method	collectingMethod	The method of taking sample		Text
Finding method	findingMethod	The method of finding copepods in sample		Text
Type of association	note	Describes the nature of the interaction.		Text
Host interaction site	locationAtHost	The general location or site on the host where the copepod interacts or resides.		Text
Detailed host interaction site	fullLocationAtHost	A more specific or detailed description of the copepod's interaction site on the host.		Text
Copepod nutritional source	copepodNutritionSourse	The primary source from which the copepod derives its nutrition.		Text
Event date	eventDate	Date of sampling.		Date
Year	year	The four-digit year in which the Occurence recorded. Format: yyyy.		Integer
Month	month	The ordinal month in which the Occurence recorded. Format: mm.		Integer
Article ID	articleID	Short reference		Text
Reference	reference			Text

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