

An updated checklist of marine copepoda from Peninsular Malaysia with notes on their functional traits and distributional records

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Abstract

An up-to-date checklist of marine zooplankton copepods from the waters of Peninsular Malaysia is presented. It contains 235 species of copepods consisting of 89 genera and 44 families. Each species is bibliographically referenced with synonymy, detailed information on their functional groups, and distributional data. The checklist is up to date as of 28 May 2020 and is based on taxonomic and ecological literature. Calanoida recorded the most diverse order, with 101 species, followed by Harpacticoida, with 70 species, and Cyclopoida, with 61 species. Canuelloida, Monstrilloida and Siphonostomatoida were all recorded with 1 species, respectively. As many as 192 species of copepods were recorded along the west coast (Malacca Strait) and 123 species along the east coast (South China Sea). Endemicity at the species level is 1% for the whole Peninsular Malaysian coast, with 2 genera restricted to the east coast (*Kensakia parva* Harris V.A. and Iwasaki, 1997 and *Brachiella malayensis* Ohtsuka, Piasecki, Ismail and Kamarudin, 2020) and 1 genus to the west coast (*Labidocera jaafari* Othman, 1986). Nine dominant species can be found along the coast of Peninsular Malaysia (*Acartia erythraea* Giesbrecht, 1889, *Acartia pacifica* Steuer, 1915, *Bestiolina similis* (Sewell, 1914), *Euterpina acutifrons* (Dana, 1848), *Microsetella norvegica* (Boeck, 1865), *Paracalanus aculeatus* Giesbrecht, 1888, *Oithona nana* Giesbrecht, 1893, *Oithona simplex* Farran, 1913 and *Temora discaudata* Giesbrecht, 1889).

Keywords: Copepoda, Zooplankton, Checklist, Distribution, Peninsular Malaysia

Introduction

Malaysia is situated in the Indo-Pacific region, which has a high zooplankton diversity (Yoshida et al., 2012), bounded on the west coast by the Malacca Straits and the east coast faces the South China Sea. Together with Indonesia and the Philippines, Malaysia is one of the three mega-diversity countries in the ASEAN region, blessed with several high biological productivity areas and extensive fishing grounds (Yoshida et al., 2012). The Southeast Asia region is home to more than 550 species of pelagic copepod, accounting for one-fourth of pelagic copepod species worldwide. Hence, this region is regarded as the centre of worldwide marine biodiversity (Nishida et al., 2011).

Copepoda is the most dominant group in the zooplankton community (Johan et al., 2013), and it is also acknowledged as the most abundant metazoan on earth (Alcaraz et al., 2003). Zooplankton also acts as an ecological indicator (Metillo et al., 2019), responsive to changes in water parameters such as salinity, pH and temperature (Shuaib et al., 2019). Changes in zooplankton may disrupt and alter the food chain, having a detrimental effect on not only fisheries yield but also on their stability and sustainability, considering that this

group (zooplankton) occupies the secondary trophic level that connects primary producers to higher trophic levels (Alcaraz et al., 2003; Shuaib et al., 2018).

According to Yoshida et al. (2012), Sewell (1933) was the first researcher to study copepods in Malaysian waters in the Straits of Malacca, collecting calanoid copepod from Penang and Sungai Kurau Estuary in Perak. Wickstead (1961) then completed an extensive plankton collection in the Malacca Straits-Singapore Straits-South China Sea areas. On the other hand, Othman (1988) was the earliest to study copepods along the east coast of Peninsular Malaysia, concentrating primarily on the Exclusive Economic Zone (EEZ) in the South China Sea and identified 74 species of copepods. Hence, the objective of this paper was to compile and update the checklist of this noteworthy zooplankton group found in the waters of Peninsular Malaysia.

Materials and Methods

The checklist is based on taxonomic and ecological literature reviewed until 28 May 2020 for species recorded in the coastal waters of Peninsular Malaysia (Figure 1). The data were obtained via an intensive literature review (130 published papers were extracted

roughly) concentrating on recorded copepod, published from Peninsular Malaysia at the species level. Some biodiversity knowledge can be accessed through databases such as World Register of Marine Species - WoRMS (<http://www.marinespecies.org>), Biodiversity of Marine Planktonic Copepod (<https://copepodes.obs-banyuls.fr/en/index.php>), and the University of Tasmania, Australia - Zooplankton (<https://www.imas.utas.edu.au/zooplankton/download>

[able-species-fact-sheets](#)). The family and species in the checklist were arranged following Rezai et al. (2004). Within a family, the species and genera were alphabetically ordered. References and distribution records of the checked species were detailed, including their spawning strategies, feeding method and biogeographical distribution for those species with expanded range of distribution, beyond Malaysian waters.

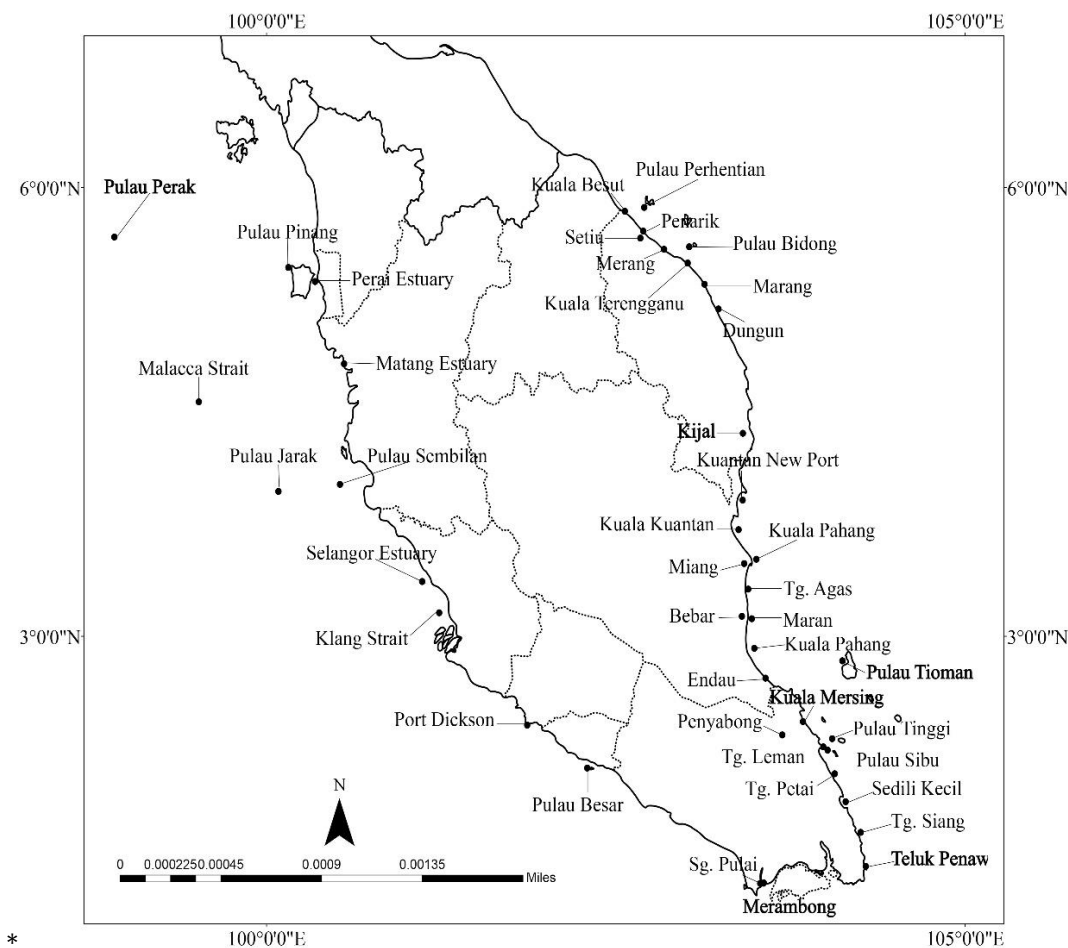


Figure 1. A map of Peninsular Malaysia with localities considered in the present study.

Table 1 contains the detailed information: The hierarchical taxonomic position of the family (in alphabetical order), indicating the following data: a) list of species synonyms (in superscript); b) distributional characteristic of the taxa; c) spawning strategies which are broadcaster (individuals continuously releasing eggs or as clutches on a daily basis (Hopcroft and Roff, 1996) and sac-spawner (individuals that carry their eggs in sac until hatching (Kjørboe and Sabatini, 1994); d) trophic group (i.e. Carnivorous, Herbivorous, Omnivorous, Detritivorous, Omnivorous-Carnivorous, Herbivorous-Omnivorous, Herbivorous-Detritivorous and

Omnivorous-Detritivorous (Benedetti et al., 2018, Campos et al., 2017, Nakajima et al., 2014); e) feeding method, including ambush, cruise, filter-feeders and mixed (species which can switch their feeding strategies based on food availability) (Kjørboe, 2011), scrapers (Heinle, 2013) and predator (Uye, 1994; f) biogeographic distribution of copepod fauna based of their region suitability (i.e. Indian Ocean, Atlantic, Pacific and others) (Carola, 1994). Nomenclature follows recent taxonomic changes tracked using the WoRMS (World Register of Marine Species, hosted by the Belgian Institute of Marine Science (VLIZ), accessed in November 2020).

Table 1. An updated checklist (November 2020) of the order of Copepoda Milne Edwards, 1840 recorded from Peninsular Malaysia.

FAMILY/SPECIES	SPAWNING STRATEGY	TROPHIC GROUP	FEEDING METHOD	GENERAL BIOGEOGRAPHY
ACARTIIDAE				
<i>Acartia amboinensis</i> (Carl, 1907) ^{1,27,31,36}	Broadcaster	Herbivorous-omnivorous	NA	SEA, SWP, ID
<i>Acartia bispinosa</i> (Carl, 1907) ^{26,31}	Broadcaster	Omnivorous	NA	ID, NWP, SWP
<i>Acartia danae</i> Giesbrecht, 1889 ³¹	Broadcaster	Omnivorous	Mixed	Atl, ID, Pacific, A
<i>Acartia erythraea</i> Giesbrecht, 1889 ^{1,2,3,4,5,20,22,23,26,27,28,35,36}	Broadcaster	Omnivorous	NA	Nat, ID, NWP, SWP
<i>Acartia pacifica</i> Steuer, 1915 ^{1,20,23,26,27,28,31,34,35,36}	Broadcaster	Omnivorous	NA	Pacific, ID, Tropical and Sub-tropical
<i>Acartia spinicauda</i> Giesbrecht, 1889 ^{1,2,3,4,5,9,11,19,27,34,35,36}	Broadcaster	Omnivorous	NA	SWP, ID
AMEIRIDAE				
<i>Nitocra spinipes armata</i> Lang, 1965 ^{12,13}	Sac-spawner	Detritivorous-herbivorous	NA	NEA, ID, NWP
<i>Nitocra typica</i> Boeck, 1865 ^{12,13}	Sac-spawner	Herbivorous	NA	NA, ID
ARITELLIDAE				
<i>Metacalanus aurivilli</i> Cleve, 1901 ^{2,3,4,5,20}	Broadcaster	Carnivorous	NA	ID, NWP
CANDACIIDAE				
<i>Candacia bradyi</i> Scott A., 1902 ^{20,23,27}	Broadcaster	Carnivorous	NA	ID, SWP, NWP, SEA
<i>Candacia catula</i> Giesbrecht, 1889 ^{1,23}	Broadcaster	Carnivorous	Piercing and sucking	ID, SEA, NEA, NWP, SWP
<i>Candacia curta</i> (Dana, 1849) ²⁷	Broadcaster	Carnivorous	NA	Atl, ID, Pacific
<i>Candacia discaudata</i> Scott A., 1909 ^{1,3,5,27}	Broadcaster	Carnivorous	NA	ID, NP
<i>Candacia ethiopica</i> (Dana, 1849) ²⁷	Broadcaster	Carnivorous	Ambush	ID, Pacific, NA
<i>Candacia pachydactyla</i> (Dana, 1849) ²⁷	Broadcaster	Carnivorous	Piercing and sucking	Atl, ID, NWP, Sub-Antarctic
<i>Canthocalanus pauper</i> (Giesbrecht, 1888) ^{1,3,4,5,9,20,21,23,26,27,28}	NA	Herbivorous	Filter-feeders	ID, Pacific, SWA
<i>Neocalanus gracilis</i> (Dana, 1852) ³¹	Broadcaster	Herbivorous	Filter-feeders	ID, Pacific, NA
<i>Nannocalanus minor</i> (Claus, 1863) ^{23,26,27}	Broadcaster	Herbivorous-omnivorous	Filter-feeders	AA, ID, NA, Pacific
<i>Undinula vulgaris</i> (Dana, 1849) ^{1,23,26,27}	Broadcaster	Herbivorous-omnivorous	Filter-feeders	ID, SEA, NA, Pacific
CANUELLIDAE				
<i>Brianola stebleri</i> (Monad, 1926) ^{10,13}	Sac-spawner	NA	NA	Mediterranean Sea, ID
CENTROPAGIDAE				
<i>Centropages dorsispinatus</i> Thompson I.C. and Scott A., 1903 ^{1,2,3,4,5,9,27}	Broadcaster	Omnivorous	NA	ID, NWP

<i>Centropages furcatus</i> (Dana, 1849) ^{1,3,4,5,11,20,23,26,27,29}	Broadcaster	Omnivorous	Mixed	A, Atl, ID, Pacific
<i>Centropages orsinii</i> Giesbrecht, 1889 ^{1,20,23,26,27}	Broadcaster	Omnivorous	NA	ID, SWP, NWP
<i>Centropages sinensis</i> Chen and Zhang, 1965 ²⁶	Broadcaster	Omnivorous	NA	NWP
<i>Centropages tenuiremis</i> Thompson I.C. and Scott A., 1903 ^{5,20,26,27}	Broadcaster	Omnivorous	NA	ID, NWP
CLAUSOCALANIDAE				
<i>Clausocalanus arcuicornis</i> (Dana, 1849) ²⁷	Sac-spawner	Detritivorous-herbivorous	Filter-feeders	ID, SEP, NP, NA
<i>Clausocalanus farrani</i> Sewell, 1929 ²⁶	Sac-spawner	Herbivorous	NA	ID, NEA, NP, SEP
<i>Clausocalanus furcatus</i> (Brady, 1883) ^{26,27}	Sac-spawner	Herbivorous	Filter-feeders	Atl, Pacific, ID
<i>Clausocalanus jobei</i> Frost and Fleminger, 1968 ²⁷	Sac-spawner	Herbivorous	Filter-feeders	NWP, NP, SEP, ID
<i>Clausocalanus minor</i> Sewell, 1929 ²⁶	Sac-spawner	Herbivorous	NA	SWP, NWP, ID
<i>Clausocalanus pergens</i> Farran, 1926 ²⁷	Sac-spawner	Herbivorous	NA	NA, Pacific, ID
CLETODIDAE				
<i>Enhydrosoma longifurcatum</i> Sars G.O., 1909 ³²	NA	NA	NA	ID, WCP, Atl
CORYCAEIDAE				
<i>Corycaeus affinis</i> McMurrich, 1916 ^{1,27}	Sac-spawner	Carnivorous	NA	ID, NP, SWA
<i>Corycaeus agilis</i> Dana, 1849 ^{1,27,31}	Sac-spawner	Carnivorous	NA	NA, ID, Pacific
<i>Corycaeus andrewsi</i> Farran, 1911 ^{1,2,3,4,9,20,27}	Sac-spawner	Carnivorous	Predator	ID, NWP
<i>Corycaeus asiaticus</i> Dahl F., 1894 ^{1,20,27,31}	Sac-spawner	Carnivorous	Predator	SEA, ID, NWP, NEA
<i>Corycaeus catus</i> Dahl F., 1894 ^{1,20,27}	Sac-spawner	Carnivorous	NA	NA, ID, NP, SEP
<i>Corycaeus crassiusculus</i> Dana, 1849 ^{20,26,31}	Sac-spawner	Carnivorous	Predator	NA, ID, NWP, SEP
<i>Corycaeus dahl</i> Tanaka, 1857 ^{1,3,4,9,20,27}	Sac-spawner	Carnivorous	Predator	SEA, ID, NWP
<i>Corycaeus dubius</i> Farran, 1911 ²⁷	Sac-spawner	Carnivorous	NA	SEP
<i>Corycaeus erythraeus</i> Cleve, 1904 ^{1,3,4,20,27}	Sac-spawner	Carnivorous	NA	NEA, ID, NWP, SEP
<i>Corycaeus latus</i> Dana, 1849 ²⁰	Sac-spawner	Carnivorous	NA	SEA, NA, ID, Pacific
<i>Corycaeus lautus</i> Dana, 1849 ^{1,27}	Sac-spawner	Carnivorous	NA	NA, ID, NP, SEP
<i>Corycaeus limbatus</i> Brady, 1883 ^{1,27}	Sac-spawner	Carnivorous	Ambush	NA, ID, NP, SEP
<i>Corycaeus longistylis</i> (Dana, 1849) ^{26,31}	Sac-spawner	Carnivorous	NA	NA, ID, Pacific
<i>Corycaeus lubbocki</i> Giesbrecht, 1891 ²⁰	Sac-spawner	Carnivorous	Predator	NA, ID, NP
<i>Corycaeus pacificus</i> Dahl F., 1894 ^{26,27,31}	Sac-spawner	Carnivorous	NA	SEA, NA, ID, NWP
<i>Corycaeus pumilus</i> Dahl M., 1912 ¹	Sac-spawner	Carnivorous	NA	SEA, NEA, ID, NWP

<i>Corycaeus speciosus</i> Dana, 1849 ^{1,3,5,20,26,27,31}	Sac-spawner	Carnivorous	NA	SWA, NA, ID, Pacific
<i>Corycaeus robustus</i> Giesbrecht, 1892 ³¹	Sac-spawner	Carnivorous	NA	NA, ID, SEP, NWP
<i>Corycaeus subtilis</i> Dahl M., 1912 ^{9,27}	Sac-spawner	Carnivorous	Predator	NEA, ID, NWP
<i>Ditrichocorycaeus affinis</i> (McMurrich, 1916) ⁵	Sac-spawner	Carnivorous	NA	ID, NP
<i>Ditrichocorycaeus andrewsi</i> (Farran, 1911) ⁵	Sac-spawner	Carnivorous	Predator	ID, NWP, SWP
<i>Ditrichocorycaeus asiaticus</i> (Dahl F., 1894) ⁵	Sac-spawner	Carnivorous	Predator	ID, NWP, SWP, NWA
<i>Ditrichocorycaeus dahli</i> (Tanaka, 1957) ⁵	Sac-spawner	Carnivorous	Predator	ID, NWP, SWP
<i>Ditrichocorycaeus erythraeus</i> (Cleve, 1904) ⁵	Sac-spawner	Carnivorous	NA	ID, NWP, SWP, SEP, SWA
<i>Farranula concinna</i> (Dana, 1849) ²⁰	Sac-spawner	Carnivorous	NA	NWA, SEA, ID, NWP
<i>Farranula gibbula</i> (Giesbrecht, 1891) ^{20,21,27}	Sac-spawner	Carnivorous	NA	NP, SEP, ID
<i>Farranula rostratus</i> (Claus, 1863) ²⁷	Sac-spawner	Carnivorous	NA	NA, ID, NP, SEP
<i>Onychocorycaeus catus</i> (Dahl F., 1894) ^{3,5}	Sac-spawner	Carnivorous	NA	NWA, ID, NWP, SWP
<i>Onychocorycaeus pumilus</i> (Dahl M., 1912) ⁵	Sac-spawner	Carnivorous	NA	NEA, ID, NWP, SWP
CYCLOPIDAE				
<i>Apocyclops ramkhamhaengi</i> Chullasorn, Kangtia, Pinkaew and Ferrari, 2008 ³³	Broadcaster	Omnivorous	NA	WCP
DACTYLOPUSIIDAE				
<i>Dactylopusia crassicornis</i> Brady, 1910 ¹³	Sac-spawner	NA	NA	The Southern Ocean, WCP
<i>Dactylopusia crassipes</i> (Lang, 1965) ^{10,13}	Sac-spawner	Herbivorous	NA	ID
<i>Diarthrodes tetrastachyus</i> Yeatman, 1976 ^{12,13}	NA	NA	NA	NA, NWP
<i>Paradactylopodia oculata</i> (Gurney, 1927) ^{14,16}	NA	NA	NA	Cosmopolite
DARCYTHOMPSONIIDAE				
<i>Darcythompsonia fairliensis</i> (Scott T., 1899) ³²	NA	NA	NA	NA, NWP
<i>Darcythompsonia inopinata</i> Smirnov, 1934 ³²	NA	NA	NA	ID, WCP, NA
ECTINOSOMATIDAE				
<i>Ectinosoma melaniceps</i> Boeck, 1865 ^{12,13}	Sac-spawner	Detritivorous-herbivorous	NA	NEA, ID
<i>Halectinosoma brunneum</i> (Brady, 1905) ^{10,13}	Sac-spawner	Detritivorous-herbivorous	NA	NA, NWP
<i>Microsetella norvegica</i> (Boeck, 1865) ^{1,2,3,4,5,9,11,20,21,23,27,31}	Sac-spawner	Detritivorous-herbivorous	Predator	AA, A, ID, NWP
<i>Microsetella rosea</i> (Dana, 1847) ^{11,20,27}	Sac-spawner	Detritivorous-omnivorous	Predator	AA, NA, ID, Pacific
EUCALANIDAE				
<i>Eucalanus attenuatus</i> (Dana, 1849) ^{1,27}	Broadcaster	Herbivorous	NA	ID, Pacific

<i>Eucalanus crassus</i> Giesbrecht, 1888 ^{27,28}	Broadcaster	Herbivorous	NA	NA, ID, NWP, SEP
<i>Eucalanus elongatus</i> (Dana, 1848) ³¹	Broadcaster	Herbivorous	Filter-feeders	ID, NWP, SEP
<i>Eucalanus pileatus</i> Giesbrecht, 1888 ²⁷	Broadcaster	Herbivorous	NA	SWA, NA, ID, NP
<i>Eucalanus subcrassus</i> Giesbrecht, 1888 ^{1,3,4,9,27,28}	Broadcaster	Herbivorous	NA	NA, ID, NP, SEP
<i>Eucalanus subtenuis</i> Giesbrecht, 1888 ^{1,9,27}	Broadcaster	Herbivorous	NA	NWA, ID, NP, SEP
EUCHAETIDAE				
<i>Euchaeta concinna</i> Dana, 1849 ^{1,5,27}	Broadcaster	Carnivorous	NA	NEA, ID, NWP, SEP
<i>Euchaeta marinella</i> Bradford, 1974 ^{27,29}	Broadcaster	Carnivorous	NA	ID, NWP, SEP, SWP
<i>Euchaeta wolfendeni</i> Scott A., 1909 ¹	Broadcaster	Carnivorous	NA	SWP, ID, NWP, SEP
<i>Paraeuchaeta concinna</i> (Dana, 1849) ²³	NA	NA	NA	Atl, ID, NWP
HARPACTICIDAE				
<i>Harpacticus clausi</i> Scott A., 1909 ¹³	NA	NA	NA	ID, WCP
<i>Harpacticus spinulosus</i> Lang, 1965 ^{12,13}	NA	Herbivorous	NA	NWP
<i>Harpacticus uniremis</i> Krøyer in Gaimard, 1842-1845? ^{12,13}	NA	Herbivorous	NA	Atl
IDYANTHIDAE				
<i>Idyanthe pusilla</i> (Sars G.O., 1905) ¹⁶	NA	NA	NA	NA, NWP
LAOPHONTIDAE				
<i>Heterolaophonte longifurcata</i> Lang, 1965 ^{12,13}	NA	Herbivorous	NA	SWP, NWP
<i>Laophonte cornuta</i> Philippi, 1840 ³⁰	NA	Herbivorous	NA	NEA, NWP
<i>Laophonte expansa</i> Fiera, 1986 ¹⁷	NA	Herbivorous	NA	ID, NWP
<i>Paralaophonte brevisrostris</i> (Claus, 1863) ^{12,13}	NA	Herbivorous	NA	Atl, NWP
<i>Paralaophonte octavia</i> (Monard, 1935) ^{7,10,13}	NA	Herbivorous	NA	Atl, NWP
<i>Quinquelaophonte quinquespinosa</i> (Sewell, 1924) ¹⁷	NA	NA	NA	WCP
LERNAEPOPIDAE				
<i>Brachiella malayensis</i> Ohtsuka, Piasecki, Ismail and Kamarudin, 2020 ²⁴	NA	NA	NA	Endemic to Malaysia
LONGIPEDIIDAE				
<i>Longipedia weberi</i> Scott A., 1909 ^{12,13}	NA	NA	NA	Atl, ID, NWP, WCP
LOURINIIDAE				
<i>Lourinia armata</i> (Claus, 1866) ^{12,13}	NA	NA	NA	Atl, NWP
LUCICUTIIDAE				
<i>Lucicutia flavicornis</i> (Claus, 1963) ^{5,27,29}	Broadcaster	Herbivorous- omnivorous	Filter- feeders	NA, ID, Pacific, AA
<i>Lucicutia gaussae</i> Grice, 1963 ^{1,5,27}	Broadcaster	Herbivorous- omnivorous	NA	NA, ID, NWP, SEP

MACROCHIRONIDAE

<i>Paramacrochiron amboinense</i> Mulyadi, 2005 ^{3,4}	NA	NA	NA	The South China Sea, Java Sea
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METIDAE

<i>Metis jousseaumei</i> (Richard, 1892) ^{12,13}	NA	NA	NA	ID, NA
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MIRACIIDAE

<i>Amphiascoidessubdebilis</i> (Willey, 1935) ⁷	NA	NA	NA	NA, NWP
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<i>Amphiascopsis coralicola</i> (Sewell, 1940) ^{12,13}	NA	NA	NA	NA, NWP
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<i>Amphiascopsis thalestroides</i> (Sars G.O., 1911) ^{12,13}	NA	NA	NA	ID, NA
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<i>Amphiascus cinctus</i> (Claus, 1866) ^{10,12,13}	NA	Herbivorous	NA	NWP, NA
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<i>Amphiascus rebus</i> Sewell, 1940 ^{12,13}	NA	Herbivorous	NA	ID, NA, NWP
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<i>Amphiascus robinsonii</i> (Scott A., 1902) ^{12,13}	NA	Herbivorous	NA	NA, WCP
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<i>Delavalia clavus</i> (Wells and Rao, 1987) ²⁹	NA	NA	NA	ID
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<i>Distioculus minor</i> (Scott T., 1894) ²⁷	Sac-spawner	Carnivorous	NA	NA, ID
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<i>Macrosetella gracilis</i> (Dana, 1864) ^{1,3,4,20,21,23,26,27,31}	Sac-spawner	Herbivorous- omnivorous	Filter- feeders	Atl, ID, NP
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<i>Metamphiascopsis hirsutus</i> (Thompson I.C. and Scott A., 1903) ^{8,13}	NA	NA	NA	WCP
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<i>Metamphiascopsis hirsutus bermudae</i> (Willey, 1930) ¹³	NA	NA	NA	WCP
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<i>Miracia efferata</i> Dana, 1849 ²⁶	Sac-spawner	Herbivorous- omnivorous	NA	Atl, ID, NWP
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<i>Paramphiascella calcarifer</i> (Sewell, 1940) ³²	NA	NA	NA	Atl, WCP
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<i>Paramphiascella robinsonii</i> (Scott A., 1902) ¹³	NA	NA	NA	ID, WCP
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<i>Rhyncholagena levantina</i> Por, 1964 ^{10,13}	NA	NA	NA	NA, NWP
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<i>Robertgurneya diversa</i> (Lang, 1965) ^{12,13}	NA	NA	NA	NWA, NWP
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<i>Robertgurneya oligochaeta</i> (Noodt, 1955) ^{12,13}	NA	NA	NA	NA, NWP
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<i>Robertgurneya smithi</i> Hamond, 1973 ²⁹	NA	NA	NA	NEA, WCP
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<i>Robertsonia knoxi</i> (Thompson I.C. and Scott A., 1903) ¹⁴	NA	NA	NA	WCP
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<i>Schizopera knabeni</i> Lang, 1965 ¹⁴	NA	NA	NA	At, Pacific
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<i>Stenhelia clavus</i> Wells and Rao, 1987 ^{10,13}	NA	NA	NA	NA, NWP
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<i>Typhlamphiascus lutincola</i> Soyer, 1963 ²⁹	NA	NA	NA	NA, NWP
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<i>Typhlamphiascus typhloides</i> (Sars G.O., 1911) ²⁹	NA	NA	NA	WCP
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MONSTRILLIDAE				
<i>Cymbasoma bullatus</i> (Scott A., 1909) ¹	NA	NA	NA	NWP
OITHONIDAE				
<i>Dioithona rigida</i> (Giesbrecht, 1890) ⁵	Sac-spawner	Herbivorous	NA	NEA, ID, NP
<i>Oithona aruensis</i> Früchtl, 1923 ^{2,3,4,11,26}	Sac-spawner	Omnivorous	NA	NWP
<i>Oithona attenuata</i> Farran, 1913 ^{1,2,3,4,5,20,27}	Sac-spawner	Omnivorous	NA	SA, NEA, ID, NP
<i>Oithona brevicornis</i> Giesbrecht, 1891 ^{1,2,3,4,5,26,27}	Sac-spawner	Omnivorous	NA	SEA, NEA, ID, NWP
<i>Oithona decipiens</i> Farran, 1913 ²⁰	Sac-spawner	Omnivorous	Ambush	NA, ID, NP, SEP
<i>Oithona dissimilis</i> Lindberg, 1940 ^{2,3,4,5}	Sac-spawner	Omnivorous	NA	ID, NWP
<i>Oithona fallax</i> Farran, 1913 ³¹	Sac-spawner	Omnivorous	NA	SEA, ID, NP, SEP
<i>Oithona nana</i> Giesbrecht, 1893 ^{9,11,20,27,31}	Sac-spawner	Omnivorous	Predator	Atl, ID, Pacific
<i>Oithona oculata</i> Farran, 1913 ^{20,27}	Sac-spawner	Omnivorous	NA	
<i>Oithona plumifera</i> Baird, 1843 ^{1,3,5,20,27}	Sac-spawner	Carnivorous- omnivorous	Ambush	AA, Atl, ID, Pacific
<i>Oithona rigida</i> Giesbrecht, 1896 ^{1,3,4,11,20,26,27,31}	Sac-spawner	Omnivorous	NA	
<i>Oithona setigera</i> (Dana, 1849) ²⁰	Sac-spawner	Omnivorous	Ambush	Atl, ID, Pacific
<i>Oithona similis</i> Claus, 1866 ²⁷	Sac-spawner	Omnivorous	Ambush	AA, Pacific, ID
<i>Oithona simplex</i> Farran, 1913 ^{1,2,3,4,5,9,20,23,26,27}	Sac-spawner	Omnivorous	NA	SEA, NEA, ID, NP
ONCAEIDAE				
<i>Oncaea clevei</i> Früchtl, 1923 ^{1,3,4,5,27}	Sac-spawner	Omnivorous	NA	NEA, ID, NWP
<i>Oncaea conifera</i> Giesbrecht, 1891 ^{20,21,23}	Sac-spawner	NA	NA	
<i>Oncaea media</i> Giesbrecht, 1891 ^{1,11,26,27,31}	Sac-spawner	Detritivorous- omnivorous	Predator	Atl, ID, NP
<i>Oncaea mediterranea</i> (Claus, 1863) ²⁰	Sac-spawner	Detritivorous- omnivorous	Predator	SWP, ID, NEP, NWP
<i>Oncaea paraclevei</i> Böttger-Schnack, 2001 ²⁷	Sac-spawner	Omnivorous	NA	ID
<i>Oncaea scottodiarloi</i> Heron and Bradford-Grieve, 1995 ^{1,27}	Sac-spawner	Detritivorous- herbivorous	NA	NEA, ID, NWP
<i>Oncaea similis</i> Sars G.O., 1918 ¹	Sac-spawner	Omnivorous	NA	SWP, ID, WCP, NWP
<i>Oncaea venusta</i> Philippi, 1843 ^{1,11,27}	Sac-spawner	Detritivorous- omnivorous	Predator	NP, ID, SEP, AA, A
PARACALANIDAE				
<i>Acrocalanus gibber</i> Giesbrecht, 1888 ^{1,2,3,4,5,9,11,20,23,26,27,28}	NA	Herbivorous	Filter- feeders	NA, ID, NP, SEP
<i>Acrocalanus gracilis</i> Giesbrecht, 1888 ^{1,3,4,9,11,20,23,26,27,28}	NA	Herbivorous- omnivorous	Filter- feeders	ID, Pacific
<i>Acrocalanus longicornis</i> Giesbrecht, 1888 ^{1,9,26,27,28}	NA	Herbivorous	Filter- feeders	ID, NA, NP, SEP

<i>Acrocalanus monachus</i> Giesbrecht, 1888 ^{5,11,27}	NA	Herbivorous	Filter-feeders	ID, NP, SEP, NEA
<i>Bestiolina similis</i> (Sewell, 1914) ^{1,2,3,4,5,9,11,20,23,27,28}	Broadcaster	Herbivorous	NA	ID, NWP, SWA
<i>Calocalanus pavo</i> (Dana, 1852) ²⁷	Broadcaster	Herbivorous-omnivorous	Filter-feeders	ID, NA, NP, SEP
<i>Calocalanus pavoninus</i> Farran, 1936 ²³	Broadcaster	Herbivorous-omnivorous	Filter-feeders	SWP, SEP, ID, WCP, NWP
<i>Calocalanus styliformis</i> Giesbrecht, 1888 ^{27,29}	Broadcaster	Omnivorous	NA	SWA, ID, NP, NWA, SEP
<i>Paracalanus aculeatus</i> Giesbrecht, 1888 ^{1,2,3,4,5,11,20,23,26,27,28}	Broadcaster	Omnivorous	Filter-feeders	Atl, ID, Pacific
<i>Paracalanus crassirostris</i> Dahl F., 1894 ^{1,9,23,26}	Broadcaster	Omnivorous	NA	Atl, ID, NP
<i>Paracalanus denudatus</i> Sewell, 1929 ^{1,3,9,20,27,28}	Broadcaster	Herbivorous-omnivorous	Filter-feeders	SEA, NEA, ID, NWP
<i>Paracalanus elegans</i> (Andronov, 1972) ^{1,9,23,26,32}	Broadcaster	Omnivorous	NA	ID, WCP
<i>Paracalanus indicus</i> Wolfenden, 1905 ³¹	Broadcaster	Omnivorous	Suspension feeders	Pacific, NEA, ID
<i>Paracalanus parvus</i> (Claus, 1863) ^{3,9,11,20,26,27,28,31}	Broadcaster	Herbivorous	Filter-feeders	ID, Atl, AA, Pacific
<i>Parvocalanus crassirostris</i> (Dahl F., 1894) ^{2,3,4,5,20,27,28}	Broadcaster	Detritivorous-omnivorous	Filter-feeders	Atl, ID, NP
<i>Parvocalanus elegans</i> Andronov, 1972 ^{2,3,4,20,28,31}	Broadcaster	NA	NA	ID, NWP
PARASTENHELLIDAE				
<i>Parastenhelia hornelli</i> Thompson I.C. and Scott A., 1903 ^{10,13}	NA	NA	NA	NA, SWP, NWP
<i>Parastenhelia littoralis</i> (Sars G.O., 1911) ^{12,13}	NA	NA	NA	NA, WCP
PELTIDIIDAE				
<i>Clytemnestra scutellata</i> Dana, 1847 ^{1,3,4,5,11,20,23,26,27}	NA	Herbivorous	NA	ID, SWA, NWP
PHAENNIDAE				
<i>Phaenna spinifera</i> Claus, 1863 ^{1,11,31}	Broadcaster	Herbivorous-omnivorous	Mixed	Atl, ID, NWP, SEP
PONTELLIDAE				
<i>Calanopia australica</i> Bayly and Greenwood, 1996 ²⁰	Broadcaster	Carnivorous	NA	ID
<i>Calanopia aurivilli</i> Cleve, 1901 ²⁰	Broadcaster	Carnivorous	NA	ID, SWA
<i>Calanopia elliptica</i> (Dana, 1849) ^{5,20,23,27,29}	Broadcaster	Omnivorous	NA	NA, ID, NP
<i>Calanopia minor</i> Scott A., 1902 ^{1,23,27,29}	Broadcaster	Carnivorous	NA	ID, NWP
<i>Calanopia thompsoni</i> Scott A., 1909 ^{3,4,5,20,23,27}	Broadcaster	Carnivorous	NA	ID, NWP
<i>Labidocera acuta</i> (Dana, 1849) ^{1,3,5,11,20,26,27,29}	Broadcaster	Carnivorous	NA	NEA, ID, NP, SEP
<i>Labidocera bengalensis</i> Krishnaswamy, 1952 ^{5,20,27}	Broadcaster	Carnivorous	NA	ID, SWP
<i>Labidocera euchaeta</i> Giesbrecht, 1889 ^{3,4,5,9,26,27}	Broadcaster	Carnivorous	NA	ID, NP
<i>Labidocera jaafari</i> Othman, 1986 ^{3,4,5,25,26}	Broadcaster	Carnivorous	NA	Malacca Straits

<i>Labidocera javaensis</i> Mulyadi, 1997 ²⁶	Broadcaster	Carnivorous	NA	Java Seas, The South China Sea, Malacca Straits
<i>Labidocera kroyeri</i> (Brady, 1883) ^{1,5,20,26,27}	Broadcaster	Carnivorous	NA	NEA, ID, NWP
<i>Labidocera minuta</i> Giesbrecht, 1889 ^{20,21,23,26,27,29}	Broadcaster	Carnivorous	NA	NEA, ID, NP
<i>Labidocera pavo</i> Giesbrecht, 1889 ⁵	Broadcaster	Carnivorous	NA	NEA, ID, NWP
<i>Labidocera pectinata</i> Thompson I.C. and Scott A., 1903 ^{1,3,4,5,27}	Broadcaster	Carnivorous	NA	ID, South China Sea
<i>Labidocera rotundata</i> Mori, 1929 ²⁷	Broadcaster	Carnivorous	NA	ID, South China Sea
<i>Pontella danae</i> Giesbrecht, 1889 ³	NA	NA	NA	ID, NWP
<i>Pontella fera</i> Dana, 1849 ^{1,31}	NA	NA	NA	ID, NP
<i>Pontella investigatoris</i> Sewell, 1912 ⁵	NA	NA	NA	ID
<i>Pontella securifer</i> Brady, 1883 ⁵	NA	NA	NA	NA, ID, NWP, SEP
<i>Pontellina plumata</i> (Dana, 1849) ^{1,27}	NA	Carnivorous- omnivorous	Ambush	NA, ID, Pacific
<i>Pontellopsis herdmani</i> Thompson I.C. and Scott A., 1903 ²⁰	NA	NA	NA	ID, South China Sea
<i>Pontellopsis krameri</i> (Giesbrecht, 1896) ^{3,20}	NA	NA	NA	ID, South China Sea
<i>Pontellopsis macronyx</i> Scott A., 1909 ²⁰	NA	NA	NA	NA, ID, NWP, SEP
<i>Pontellopsis regalis</i> (Dana, 1849) ²⁶	NA	NA	NA	ID, NWP
<i>Pontellopsis tenuicauda</i> (Giesbrecht, 1889) ^{1,3}	NA	NA	NA	ID, WCP
PORCELLIDIIDAE				
<i>Dilatatiocauda medialis</i> Harris V.A., 2002 ¹⁵	NA	NA	NA	WCP
<i>Kensakiaparva</i> Harris V.A. and Iwasaki, 1997 ⁶	NA	NA	NA	Endemic to Malaysia
<i>Porcellidium aiiroa</i> (Harris V.A. and Iwasaki, 1997) ¹⁵	NA	NA	NA	NWP
<i>Porcellidium brevicaudatum</i> Thompson I.C. and Scott A., 1903 ¹⁵	NA	NA	NA	WCP
<i>Porcellidium fimbriatum</i> Claus, 1863 ^{12,13}	NA	NA	NA	NA, NWP
<i>Porcellidium poorei</i> Walker-Smith, 2001 ¹³	NA	NA	NA	WCP
<i>Porcellidium ofunatense</i> Harris V.A. and Iwasaki, 1996 ¹⁵	NA	NA	NA	NA, NWP
<i>Porcellidium yoroium</i> (Harris V.A. and Iwasaki, 1997) ¹⁵	NA	NA	NA	NWP
PSEUDODIAPTOMIDAE				
<i>Pseudodiaptomus annandalei</i> Sewell, 1919 ^{3,4,18,19}	NA	Detritivorous- herbivorous	NA	ID, NWP
<i>Pseudodiaptomus aurivilli</i> Cleve, 1901 ^{27,29}	NA	Omnivorous	NA	ID
<i>Pseudodiaptomus bowmani</i> Walter, 1984 ^{1,3,4,5}	NA	Herbivorous	NA	ID

<i>Pseudodiaptomus clevei</i> Scott A., 1909 ²⁰	NA	Herbivorous	NA	ID
<i>Pseudodiaptomus dauglishi</i> Sewell, 1932 ⁹	NA	Herbivorous	NA	ID
<i>Pseudodiaptomus incisus</i> Shen and Le, 1963 ²⁰	NA	Herbivorous	NA	WCP
<i>Pseudodiaptomus thailandensis</i> (Walter, 1984) ^{3,4,5}	NA	Herbivorous	NA	WCP
<i>Pseudodiaptomus trihamatus</i> Wright S., 1937 ^{3,4,19}	NA	Herbivorous	NA	WCP
SAPPHIRINIDAE				
<i>Copilia lata</i> Dana, 1849 ²⁶	NA	Cornivorous	NA	NEA, NWP, SWP
<i>Copilia longistylis</i> Mori, 1932 ³	NA	Cornivorous	NA	ID, NWP, SEP
<i>Copilia mirabilis</i> Dana, 1849 ^{23,26,27}	Sac-spawner	Cornivorous	NA	SEA, NEA, ID, NP, SEP
<i>Copilia mirabilis platyonyx</i> Paiva, 1971 ^{1,3}	Sac-spawner	Cornivorous	NA	ID, NWP
<i>Copilia quadrata</i> Dana, 1849 ²⁷	Sac-spawner	Cornivorous	NA	SEA, NA, NP
<i>Sapphirina agusta</i> Dana, 1849 ²⁷	Sac-spawner	Carnivorous	NA	SEA, NA, ID, NWP, SEP
<i>Sapphirina gastrica</i> Giesbrecht, 1891 ^{5,27}	Sac-spawner	Carnivorous	NA	SEA, ID
<i>Sapphirina metallina</i> Dana, 1849 ²⁷	Sac-spawner	Carnivorous	NA	AA, NA, ID, NP, SEP
SCOLECITRICHIDAE				
<i>Scolecithricella minor</i> (Brady, 1883) ¹	NA	Detritivorous	NA	AA, SWA, SWP, SEP, A, ID
<i>Scolecithrix nicobarica</i> Sewell, 1929 ¹	NA	NA	NA	SEA, ID, NP
SUBEUCALANIDAE				
<i>Subeucalanus subcrassus</i> (Giesbrecht, 1888) ^{5,11,20,23}	Broadcaster	Herbivorous	NA	NA, ID, NP, SEP
<i>Subeucalanus subtenuis</i> (Giesbrecht, 1888) ^{20,23}	Broadcaster	Herbivorous	Filter-feeders	NWA, ID, NP, SEP
TACHIDIIDAE				
<i>Euterpina acutifrons</i> (Dana, 1848) ^{1,2,3,4,5,9,11,20,21,23,26,27,31}	Sac-spawner	Detritivorous-omnivorous	Grazers	Atl, Pacific, ID
<i>Tachidius discipes</i> Giesbrecht, 1881 ³²	NA	NA	NA	WCP, ID, NEP, NEA
TEMORIDAE				
<i>Temora discaudata</i> Giesbrecht, 1889 ^{1,3,4,5,11,20,21,23,26,27}	Broadcaster	Herbivorous-omnivorous	Filter-feeders	Atl, Pacific, ID
<i>Temora stylifera</i> (Dana, 1849) ^{1,11,26,27,31}	Broadcaster	Herbivorous-omnivorous	Filter-feeders	Atl, Pacific, ID
<i>Temora turbinata</i> (Dana, 1849) ^{1,3,4,5,20,23,26,27,29,31}	Broadcaster	Herbivorous-omnivorous	NA	Pacific, NA, ID
TISBIDAE				
<i>Tisbe bermudensis</i> Willey, 1930 ¹³	NA	NA	NA	Atl, NWP
TETRAGONICIPITIDAE				
<i>Phyllopodopsyllus borutskyi</i> Lang, 1965 ^{10,13}	NA	NA	NA	NWP

THALESTRIDAE

<i>Eudactylopus andrewi</i> Sewell, 1940 ^{7,12,13}	NA	NA	NA	NA, ID, WCP
<i>Eudactylopus fasciatus</i> Sewell, 1940 ^{12,13}	NA	NA	NA	NA, ID, WCP
<i>Eudactylopus latipes</i> (Scott T., 1893) ²⁰	NA	NA	NA	NA, ID, WCP
<i>Phyllothalestris mysis</i> (Claus, 1863) ^{7,12,13}	NA	NA	NA	NA, ID, WCP
<i>Phyllothalestris sarsi</i> Sewell, 1904 ¹³	NA	NA	NA	ID, WCP
<i>Rhynchothalestris rufocincta</i> (Brady, 1880) ¹³	NA	NA	NA	Atl, NWP

TORTANIDAE

<i>Tortanus barbatus</i> (Brady, 1883) ^{2,3,4,5,9,20,26}	NA	Carnivorous	NA	ID, NWP
<i>Tortanus forcipatus</i> (Giesbrecht, 1889) ^{1,2,3,4,5,9,20,26,27,28}	NA	Carnivorous	NA	ID, NWP
<i>Tortanus gracilis</i> (Brady, 1883) ^{20,23,26,27}	NA	Carnivorous	NA	ID, NWP
<i>Tortanus longipes</i> Brodsky, 1948 ²³	NA	NA	NA	NWP

General biogeography: NWP= NW Pacific; NEA= NE Atlantic; NA= North Atlantic; NP=North Pacific; SEA= SE Atlantic; SWA=SW Atlantic; SEP=SE Pacific; SWP= SW Pacific; ID=Indian Ocean; WCP= Western Central Pacific; WCA= Western Central Atlantic; Pacific= whole Pacific; Atl= whole Atlantic; A=Arctic; AA=Antarctic; NA=not available.

1=Chew et al. (2008)	10=Kassim et al. (2006)	19=Liu et al. (2015)	28=Rezai et al. (2005)
2=Chew et al. (2011)	11=Kassim et al. (2008)	20=Metillo et al. (2019)	29=Sham (2019)
3=Chew (2012)	12=Kassim et al. (2010)	21=Nakajima et al. (2009)	30=Sham et al. (2020)
4=Chew et al. (2015)	13=Kassim et al. (2011)	22=Nakajima et al. (2013)	31=Shuaib et al. (2019)
5=Chew et al. (2016)	14=Kassim et al. (2012)	23=Nakajima et al. (2015)	32=Somerfield et al. (1998)
6=Harris et al. (2009)	15=Kassim et al. (2013)	24=Ohtsuka et al. (2020)	33=W.Rasdi et al. (2018)
7=Ishak et al. (2005)	16=Kassim et al. (2018)	25=Othman (1986)	34=Yoshida et al. (2006)
8=Ishak et al. (2009)	17=Kassim et al. (2019)	26=Peralta et al. (2015)	35=Yoshida et al. (2012)
9=Ismail et al. (2012)	18=Lehette et al. (2016)	27=Rezai et al. (2004)	36=Zuraire et al. (2018)

Result

Table 1 shows the list of copepods found along the coast of Peninsular Malaysia. A total of 235 species were recorded, belonging to 89 genera, 44 families and 6 orders. One hundred and ninety-four species were recorded on the West Coast, an increase of about 38% (75 species) over previous studies by Rezai et al. (2004, 2005, 2009), with Chew et al. (2008, 2011, 2012, 2015, 2016) focusing on copepods distribution in Malacca Strait's estuaries. In contrast, the East Coast contributed approximately 43% (53 species) to the increment of species discovered, and 131 species were recorded (Metillo et al., 2019).

Calanoida is the most diverse, 43% (Figure 2) with 101 species (30 genera), followed by Harpacticoida (29%) with 70 species (45 genera). Moreover, Cyclopoida (25%) has 61 species (8 genera). Canuelloida, Siphonostomatoida and Monstrilloida are the least diverse orders, each with 1 genus and 1 species, respectively.

Overall, there are four dominant genera in the list: *Corycaeus* with 19 species, *Oithona* (13 species),

Labidocera (10 species), *Oncaea* (8 species) and *Pseudodiaptomus* (8 species). Additionally, 6 distinct species are dominant throughout the coast of Peninsular Malaysia: *Acartia erythraea* (Giesbrecht, 1998), *Bestiolina similis* (Sewell, 1914), *Euterpina acutifrons* (Dana, 1848), *Microsetella norvegica* (Boeck, 1865), *Paracalanus aculeatus* (Giesbrecht, 1888) and *Oithona simplex* (Farran, 1913).

Interestingly, 3 species on this checklist can be categorised as endemic: 1 species was found on the West Coast, while 2 species were discovered on the East Coast. All the 3 species belonged to different orders: *Kensakia parva* (Harris V.A. and Iwasaki, 1997) belongs to the order of Harpacticoida, and *Brachiella malayensis* (Ohtsuka, Piasecki, Ismail and Kamarudin, 2020) is from the order Siphonostomatoida which was most recently found on the East Coast of Peninsular Malaysia (Ohtsuka et al., 2020). Meanwhile, *Labidocera jaafari* Othman, 1986, was found in the Straits of Malacca, becoming the first endemic species reported in Peninsular Malaysia (Othman, 1986). In addition, 34 taxa of commonly found copepods from the coast of Peninsular Malaysia were photo-documented (Figure 3).

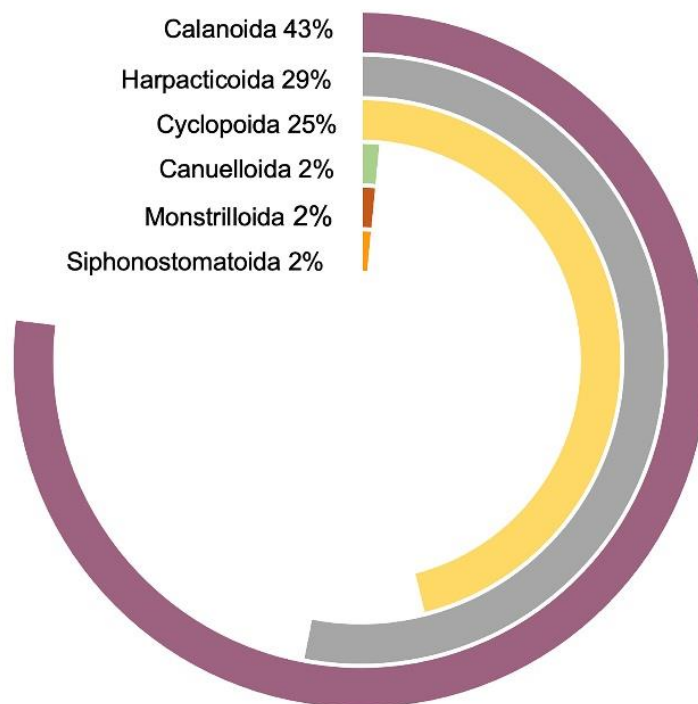


Figure 2. The percentage of copepod orders presented in the checklist.



Figure 3. Microphotograph of one of the most abundant copepods along the coast of Peninsular Malaysia. A-*Candacia* sp., B-*Oncaea* sp., C-*Phaenna* sp., D-*Calanopia* sp., E-*Oithona* sp., F-*Oithona* sp., G-*Oncaea* sp., H-*Subeucalanus* sp., I-*Corycaeus* sp., J-*Oncaea* sp., K-Isopod, L-*Paracalanus* sp., M-*Macrosetella* sp., N-*Oithona* sp., O-*Corycaeus* sp., P-*Centropages* sp., Q-*Temora* sp., R-*Oithona* sp., S-*Centropages* sp., T-*Metacalanus* sp., U-Isopod. V-Copepodites, W-Nauplius, X-*Subeucalanus* sp., Y-*Candacia* sp., Z-Copepodites, Aa-*Microsetella* sp., Ab-Panaeid protozoa, Ac-*Acartia* sp., Ad-*Paracalanus* sp., Ae-*Microsetella* sp., Af-*Acartia* sp., Ag-*Corycaeus* sp., Ah-*Centropages* sp.

Discussion

Rezai et al. (2004) identified a total of 117 species of copepods from 37 genera and 25 families. *Oithona simplex*, *Euterpina acutifrons* and *Paracalanus parvus* (Claus, 1863) were the dominant species. Additionally, Yoshida et al. (2006) reported 6 dominant genera of copepods in the Straits of Malacca: *Acartia*, *Acrocalanus*, *Corycaeus*, *Euterpina*, *Paracalanus* and *Oithona*. This discovery was supported by the identification of 71 species of copepods by Chew et al. (2008). There were 7 dominant species of copepods, namely *Corycaeus andrewsi* (Farran, 1911), *E. acutifrons*, *M. norvegica*, *Oithona attenuate* (Farran, 1913), *Oithona brevicornis* (Giesbrecht, 1891), *Oncaea clevei* (Früchtl, 1923) and *Parvocalanus crassirostris* (Dahl F., 1894). Compared to Rezai et al. (2004), this current study lacked 46 species but discovered 2 new families (Phaenidae and Montrilloidae).

Furthermore, *Acrocalanus*, *Bestiolina*, *Paracalanus* and *Oithona* were the dominant copepods identified among 48 species (33 genera and 23 families) of the East Coast zooplankton recorded (Nakajima et al., 2015). Moreover, Metillo et al. (2019) stated that *Paracalanus elegans* (Andronov, 1972) and *O. simplex* were the dominant species among 69 copepod species recorded. Kassim et al. (2006) conducted an ecological study and documented a total of 12 species belonging to 8 families and 10 genera.

This reflects a dearth of research on the distribution of copepods on the East Coast. South China Sea is estimated to house one-third of the world's marine biodiversity, making it a critical ecosystem (Yoshida et al., 2012). If not thoroughly explored, many species will stay undiscovered and remain unknown.

Conclusion

While extensive databases for zooplankton are being developed with more precise taxonomy and geographical distributions, the knowledge of marine copepods continues to have significant gaps due to the remoteness of some coastal states and the technical difficulty of studying copepods fauna in this region. Further field studies should be conducted in the area with more intensive samplings in a comprehensive bathymetric range.

This checklist is crucial because it establishes a foundation for baseline data for further studies. It provides information on species distribution, including the widespread species and possible invasive or endemic species. When the distribution of species is not adequately researched in a high diversity area, a lack of taxonomists becomes an issue. The species occurrence is not well documented.

In light of the effects of climate change on biodiversity, we believe that this checklist would serve as a reference for taxonomists, ecologists and other researchers, as well as for future follow-up studies, particularly for substantiating the distribution of climatically-significant species.

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