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ORIGINAL ARTICLE

Diversity of coastal mysids from Pulau Tinggi, Sultan Iskandar Marine Park, Malaysia

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ABSTRACT

A checklist of the order Mysida from Pulau Tinggi, Sultan Iskandar Marine Park, Johor, Malaysia is presented. With the aid of an epibenthic sledge, a total number of 9,239 mysids were collected during years 2012–2013 from two fixed stations of seagrass bed in Pulau Tinggi. So far there are 13 species, 10 genera, and 6 subfamilies of mysids. Of these, one species *Siriella media* Hansen, 1910 is recorded as new to Pulau Tinggi. The checklist presented herein includes the reference to each species' original description, type locality, information on geographical distribution.

KEY WORDS

Mysida, biodiversity, checklist, Johor, seagrass

INTRODUCTION

A total of 15 studies related to mysids from Malaysian waters were conducted to date. The first study on Mysidacea from Malaysian waters has recorded 18 species and one new species, *Acanthomysis ornata* O. Tattersall, 1965, from Northern Malacca Straits (Tattersall, 1965). Later, Zalina and Othman (1994) recorded 16 species from coral reefs around Malaysia. Hanamura *et al.* (2007; 2008a; 2008b; 2008c; 2009; 2012) added some more records in terms of reproductive biology, seasonal distribution and taxonomic aspects. Ramarn *et al.* (2012a; 2012b) made an invaluable addition to Mysidacea in Malaysian waters focusing on abundance, diversity, population structure, and breeding of mysid species from mangrove habitats. In 2014, Tan *et al.* (2014) provided a list of mysid species, present in Peninsular Malaysia waters based on the literature published previously.

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This checklist, however, is the first one regarding the order Mysida occuring around the coastal waters of Pulau Tinggi at Sultan Iskandar Marine Park (SIMP).

Pulau Tinggi in Johor has revealed an overwhelming diversity of crustaceans. Numerous newly described crustacean species have been named after the locality since 2010 (see Lim *et al.*, 2010; Azman and Melvin, 2011; Lim *et al.*, 2015; Lim *et al.*, 2017; Chew *et al.*, 2016). In addition, Lim *et al.* (2012) and Chew *et al.* (2014) also added two new genera named *Microtripus* Lim, Rahim and Takeuchi, 2012 (Amphipoda) and *Tinggianthura* Chew, Rahim and bin Haji Ross, 2014 (Isopoda) to the diversity of small crustaceans in Pulau Tinggi. To date, only studies by Gan *et al.* (2010) and Tan *et al.* (2015) have been done on mysids of Pulau Tinggi with one recently new published record of *Rhopalophthalmus longipes* Ii, 1964 (Tan and Azman, 2017).

Mysids or opossum shrimps are one of the most morphologically diverse groups among crustaceans. Probably because of their small size, cryptic and swimming behavior, they remain unnoticed. It is our hope that this checklist will further assist potential research on taxonomy, biodiversity, ecology, and biogeography. The main objective of this paper is to provide an updated list of the coastal mysids occurring in the seagrass area of Pulau Tinggi. In addition, this work revisits the mysid biodiversity of Pulau Tinggi with the goal of complementing and updating previous contributions, and identifying venues for future research.

Material and Methods

Sultan Iskandar Marine Park (SIMP) (Fig. 1) comprises 13 main islands (Pulau Tinggi, Pulau

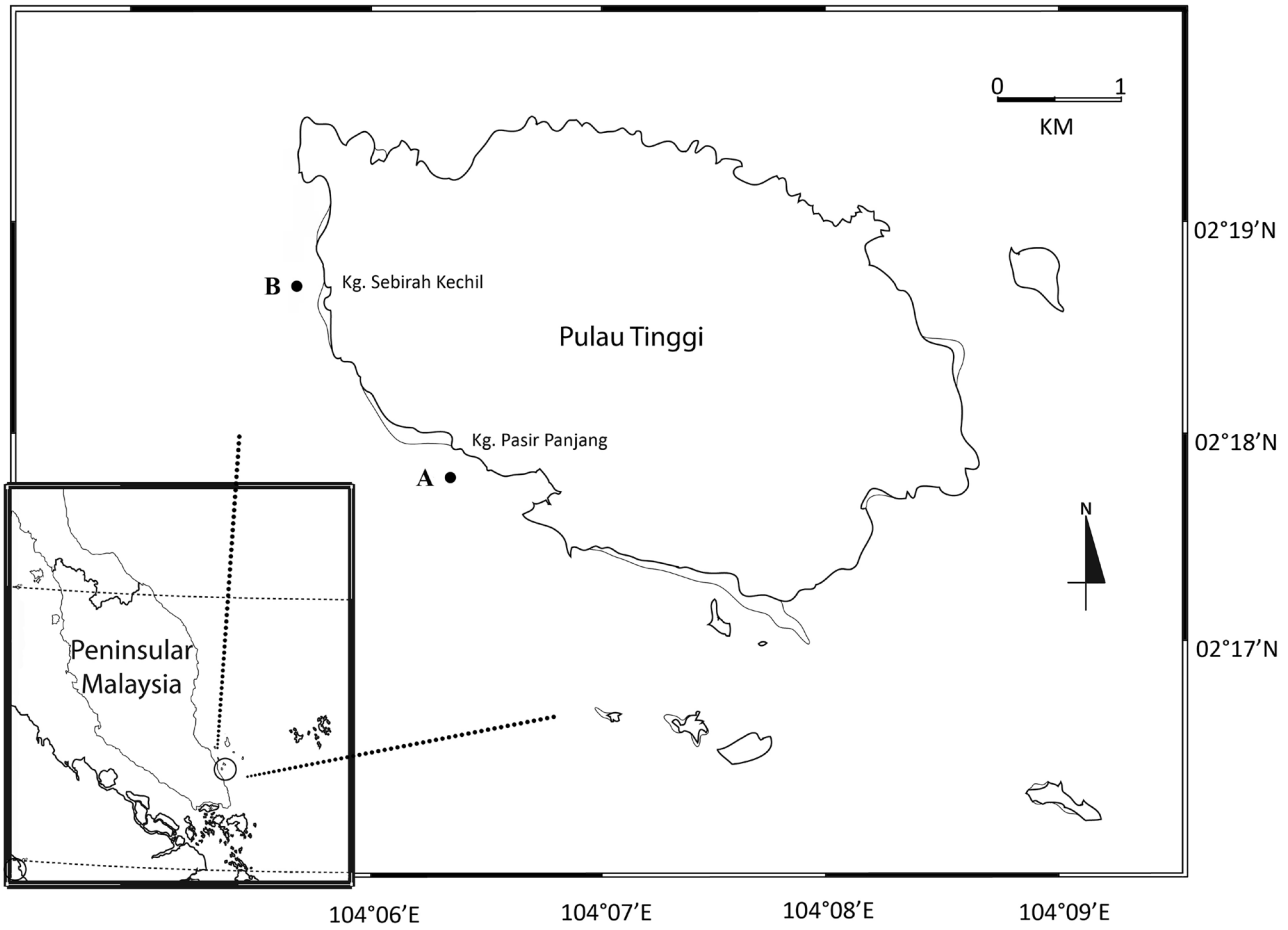

Figure 1. Map of the study area. A. Kampung Pasir Panjang. B. Kampung Sebirah Kechil, Pulau Tinggi, Sultan Iskandar Marine Park, Johor.

Rawa, Pulau Besar, Pulau Tengah, Pulau Hujung, Pulau Mensirip, Pulau Harimau, Pulau Goal, Pulau Mentinggi, Pulau Sibu, Pulau Sibu Hujung, Pulau Aur and Pulau Pemanggil), that are also known as East Johor Island Archipelago (EJIA) (Jacqueline, 2013). Pulau Tinggi is considered one of the biggest islands in the SIMP, with a total area of about 16 km^2 (Azman *et al.*, 2008) off the East Coast of Peninsular Malaysia (South China Sea).

Samplings were carried out every month from March, 2012 until May, 2013 at two fixed stations, *i.e.*, Kampung Pasir Panjang; KPP (02°17.567'N 104°06.070'E) and Kampung Sebirah Kechil; KSK (02°18.490'N 104°05.575'E) of seagrass bed in Pulau Tinggi. All the samples were collected and recorded by H.S. Tan, Azman, B.A.R. and Shamsul, B. A list of code with field parameter details is shown in Tab. 1. A two-tiered epibenthic sledge (140 µm) was utilized when collecting the specimens with three replicates at each station. The epibenthic sledge is illustrated in Fig. 2. All samples were preserved in 5% formaldehyde-seawater buffered solution. Mysid individuals were grouped into several stages according to Mauchline (1980): (i) juvenile: secondary sexual characteristics absent; (ii) immature male: secondary sexual characteristics in development; (iii) immature female: marsupium without embryo and still in development stage with a size smaller than mature females; (iv) mature male: secondary sexual characteristics developed completely; (v) mature female: marsupium developed completely but without embryos.

In this study, a complete list of coastal mysid species recorded in Pulau Tinggi, Johor is presented. Species within each family were listed alphabetically, followed by authority name. References and distribution records of the checked species were given in details, including

Table 1. Coding and field parameters of each examined material

Station	UKMMZ	Date	Depth (m)	Temp (°C)	Salinity (PSU)
KSK	1571, 1573, 1575–1580, 1593, 1594	22nd March 2012	6	30	30
	1595–1597, 1601–1607	19th December 2012	5–8	29	30–32
	1587–1589	9th February 2013	7	27	29
	1553–1556	25th March 2013	7	30	30
	1590–1592	26th March 2013	7	30	30
KPP	1581–1586, 1598–1600	22nd March 2012	6	30	30
	1608–1611	19th December 2012	5	30	30

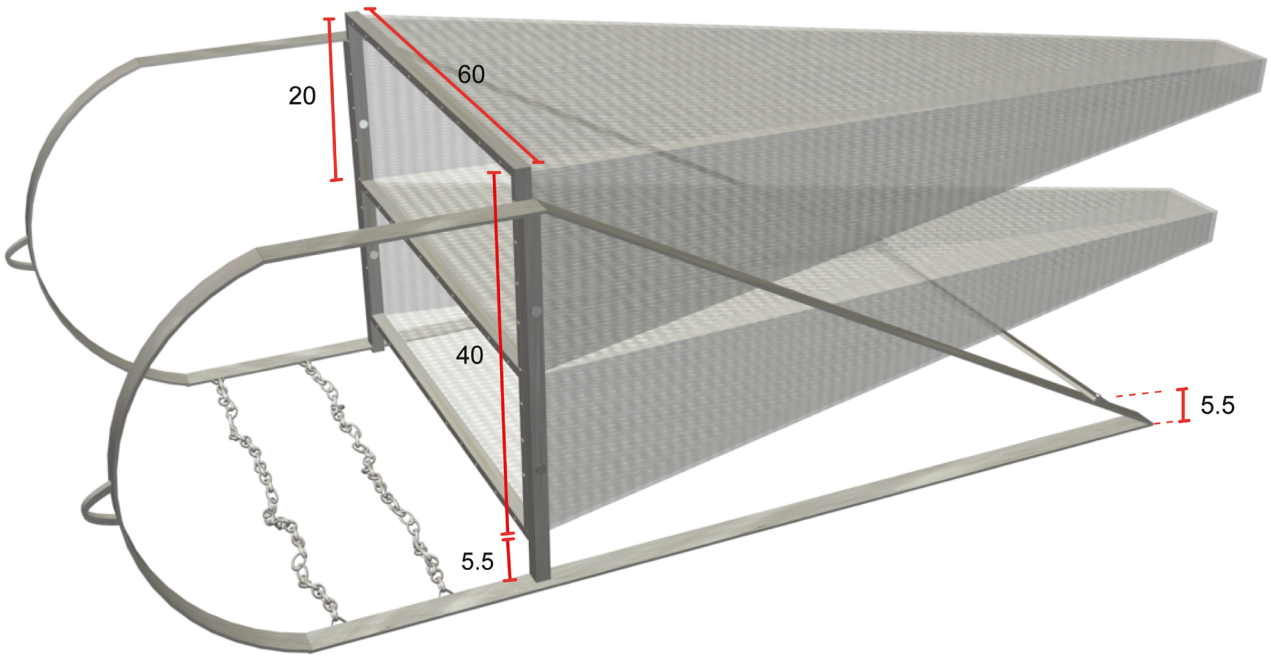

Figure 2. A Diver Operated Epibenthic Sledge. Dimensions are in centimeters.

the local distribution of those species, denoting which species they were from that found locally in Malaysian waters. In the next category, information on general distribution was summarized on the basis of all the available published articles. Habitus drawings of all the species were prepared with aid of a *camara lucida* attached to a Leica DMLB light microscope and they were digitally inked using the methods described in Coleman (2003; 2009). Materials were deposited in the Muzium Zoologi, Universiti Kebangsaan Malaysia (UKMMZ), Malaysia.

Results

All specimens were collected at two stations (Fig. 1). Most of the species have been previously recorded by Gan *et al.* (2010), although there was only one new record of *Rhopalophthalmus longipes* (Tan and Azman 2017) that has been added on the species list of mysid from Pulau Tinggi. As a result of this study, another species, *Siriella media* Hansen, 1910, has been added on the list. Total number of individuals for each collected species are shown in Tab. 2.

Table 2. Mysids from seagrass bed in Pulau Tinggi (Kampung Sebirah Kechil- KSK; Kampung Pasir Panjang-KPP).

Subfamily	Species	Number of individuals		
		KSK	KPP	Total
Erythropinae	*Erythrops minutus*	6	-	6
Gastrosaccinae	*Anchialina dentata*	118	12	130
	Haplostylus bengalensis	57	14	71
	Pseudanchialina inermis	13	42	55
Leptomysinae	*Prionomysis aspera*	512	27	539
Mysinae	*Acanthomysis longispina*	3	2	5
	Acanthomysis platycauda	-	3	3
	Acanthomysis quadrispinosa	6861	429	7290
	Anisomysis (Anisomysis) aikawai	431	21	452
	Lycomysis spinicauda	2	-	2
Rhopalophthalminae	*Rhopalophthalmus longipes*	294	3	297
Siriellinae	*Siriella media*	3	-	3
	Siriella vulgaris	232	154	386
Total		8532	707	9239

Order Mysida Boas, 1883

Mysidae Haworth, 1825

Erythropinae Hansen, 1910

Erythrops G.O. Sars, 1869

Erythrops minutus Hansen, 1910

(Fig. 3A)

Type locality. Ko Kham, Gulf of Siam, Thailand (Hansen, 1910).

Material examined. 2 juveniles, UKMMZ –1604, UKM I.D. 9579; 2 immature females, UKMMZ –1602, UKM I.D. 9591; 1 immature female, UKMMZ – 1603, UKM I.D. 9589; 1 male, UKMMZ–1601, UKM I.D. 9591. Body size: 2.9–3.7 mm.

Local distribution. Straits of Malacca (Tattersall, 1965); Port Dickson, Sembilan (Zalina and Othman, 1994); Matang, Perak – Matang Mangrove Forest Reserve (MMFR) (Ramarn *et al.*, 2012a); Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010; Tan *et al.*, 2015; this study).

General distribution. Ko Kham, Gulf of Siam (Hansen, 1910); Gulf of Manaar, India (Tattersall W.M., 1922; Pillai, 1965); Singapore Straits (Tattersall O.S., 1960); Port of Tainan, Taiwan (Ii, 1964); Gulf of Siam (Pillai, 1965); Arabian Sea (Pillai, 1973); Waltair waters (Shyamasundari, 1973); South China Sea (Liu and Wang, 1986); East China Sea (Liu and Wang, 1997); Andaman Sea (Fukuoka and Murano, 2002); Jeollabuk-do and Gunsansi, Korea (Kim *et al.*, 2012).

Recorded habitat. Coastal shallow-water and often found among seaweed and in seagrass bed.

Depth range. 0–93.5 m.

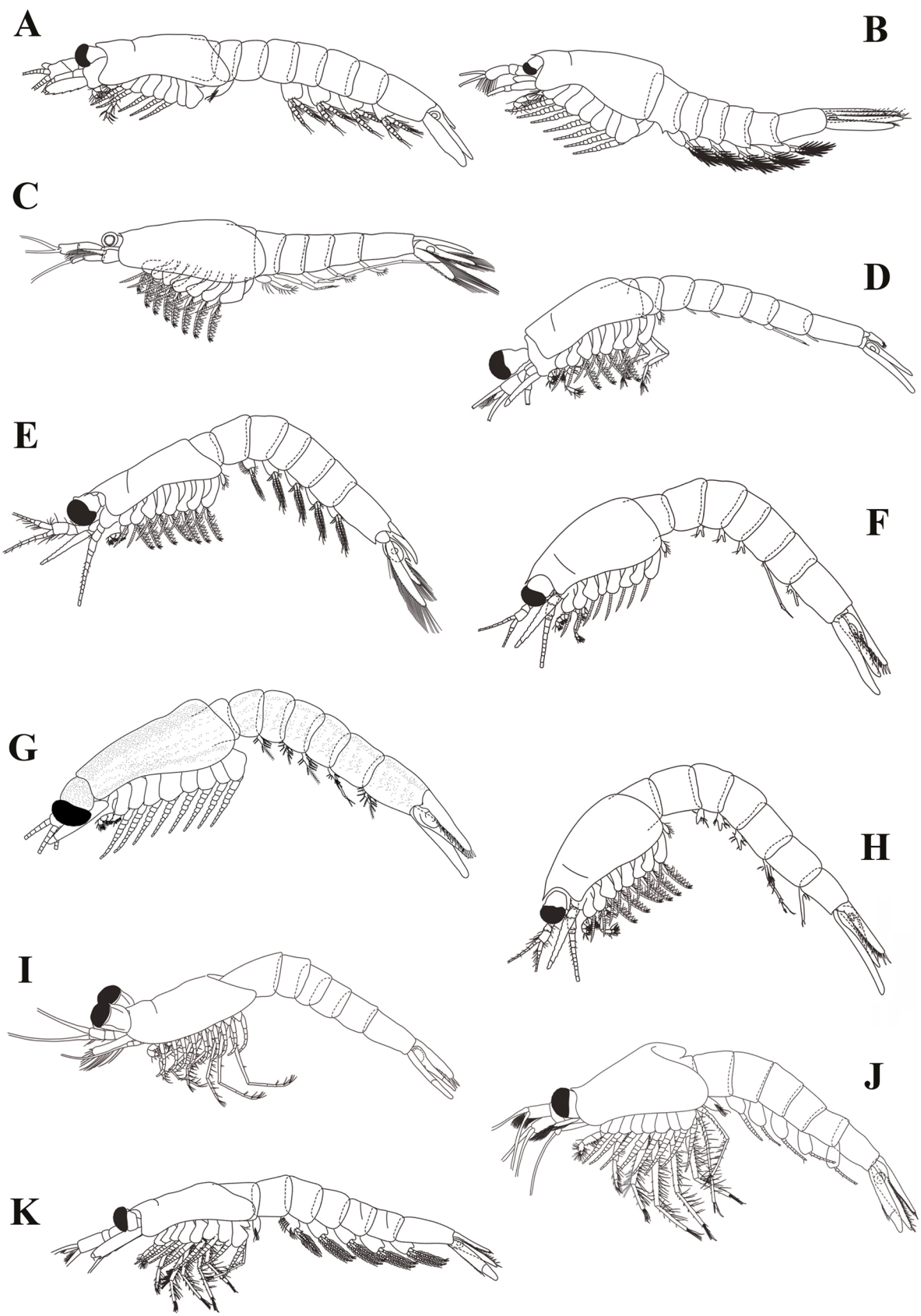

Figure 3. A. *Erythrops minutus* Hansen, 1910. B. *Anchialina dentata* Pillai, 1964. C. *Haplostylus bengalensis* (Hansen, 1910); D. *Anisomysis (Anisomysis) aikawai* Ii, 1964. E. *Prionomysis aspera* Ii, 1937. F. *Acanthomysis longispina* Fukuoka and Murano, 2002. G. *Acanthomysis platycauda* (Pillai, 1961). H. *Acanthomysis quadrispinosa* Nouvel, 1965. I. *Rhopalophthalmus longipes* Ii, 1964. J. *Siriella vulgaris* Hansen, 1910. K. *Siriella media* Hansen, 1910.

Gastrosaccinae Norman, 1892

Anchialina Norman and Scott, 1906

Anchialina dentata Pillai, 1964

(Fig. 3B)

Type locality. Arabian Sea (Pillai, 1964).

Material examined. 1 male, UKMMZ–1605, UKM I.D. 9555; 4 males, UKMMZ–1606, UKM I.D. 9555; 5 females, UKMMZ–1607, UKM I.D. 9555. Body size: 3.9–5.4 mm.

Local distribution. Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010; Tan *et al.*, 2015; this study).

General distribution. Arabian Sea (Pillai, 1964); South China Sea (Ii, 1964; Jocqué, 2002); Indonesia (Ii, 1964); India (Pillai, 1973); Andaman Sea (Pillai, 1973; Fukuoka and Murano, 2002); Java, Indonesia (Pillai, 1973); Akajima Island, Japan (Murano, 1990).

Recorded habitat. Pelagic, seagrass bed.

Depth range. Shallow water.

Haplostylus Kossmann, 1880

Haplostylus bengalensis (Hansen, 1910)

(Fig. 3C)

Type locality. Bay of Bengal (Hansen, 1910).

Material examined. 1 male, UKMMZ–1608, UKM I.D. 9595; 2 males, UKMMZ–1611, UKM I.D. 9621; 2 females, UKMMZ–1609, UKM I.D. 9593; 2 females, UKMMZ–1610, UKM I.D. 9597. Body size: 5.5–7.0 mm.

Local distribution. Straits of Malacca (Tattersall O.S., 1965); Port Dickson, Negeri Sembilan (Zalina and Othman, 1994); Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010, Tan *et al.*, 2015; this study).

General distribution. Bay of Bengal (Hansen, 1910); Ceylon to New Guinea (Zimmer, 1915); Takao, Formosa, Taiwan (Zimmer, 1918); Andaman Sea (Tattersall W.M., 1922; Pillai, 1973; Fukuoka and Murano, 2002); Luzon Island, Philippines (Tattersall W.M., 1951); Exclusive Economic Zone of Philippines (Tattersall W.M., 1951; Pillai, 1973); South China Sea, Indonesia (Ii, 1964); Moreton Bay, Australia (Băcescu and Uderscu, 1982); Enewetak Atoll, Marshall Island (Murano, 1983); East China Sea (Wang and Liu, 1997).

Recorded habitat. Oceanic, pools on sandy coral reefs and seagrass bed.

Depth range. 0–50 m.

Pseudanchialina Hansen, 1910

Pseudanchialina inermis (Illig, 1906)

(Fig. 3F)

Type locality. Bay of Bengal (Hansen, 1910).

Material examined. 1 male, UKMMZ–1571, UKM I.D. 9485; 1 male, UKMMZ–1573, UKM I.D. 9485; 1 female, UKMMZ–1575, UKM I.D. 9581; 5 females, UKMMZ–1576, UKM I.D. 9583; 2 females, UKMMZ–1577, UKM I.D. 9585. Body size: 2.0–2.2 mm.

Local distribution. Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010; Tan *et al.*, 2015; this study).

General distribution. Indian Ocean (Illig, 1906; 1930; Pillai, 1973); Bay of Bengal (Hansen, 1910); Suez Canal (Tattersall W.M., 1927); Tanabe Bay (Valbonesi and Murano, 1980); Enewetak Lagoon, Micronesia (Murano, 1983; Hobson and Chess, 1986); South China Sea (Wang and Liu, 1994); Akajima Island, Japan (Murano, 1990); Ryuku Island (Fukuoka and Murano, 1997); Palau Island (Hanamura and De Grave, 2004); Exclusive Economic Zone of India (Biju and Panampunnayil, 2011).

Recorded habitat. Coastal, oceanic, soft coral, seagrass bed.

Depth range. 3–54 m.

Leptomysinae Hansen, 1910

Prionomysis Tattersall, W.M., 1922

Prionomysis aspera Ii, 1937

(Fig. 3E)

Type locality. Ajiro, Shizuoka, Japan (Ii, 1937).

Material examined. 1 male, UKMMZ–1578, UKM I.D. 9481; 4 males, UKMMZ–1579, UKM I.D. 9481; 5 females, UKMMZ–1580, UKM I.D. 9481. Body size: 8.0–9.5 mm.

Local distribution. Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010; Tan *et al.*, 2015; this study).

General distribution. Ajiro, Shizuoka, Japan (Ii, 1937; 1964); South China Sea (Liu and Wang, 1986).

Recorded Habitat. Seagrass bed.

Depth range. 3–87 m.

Mysinae Haworth, 1825

Acanthomysis Czerniavsky, 1882

Acanthomysis longispina Fukuoka and Murano, 2002

(Fig. 3F)

Type locality. Andaman Sea (Fukuoka and Murano, 2002).

Material examined. 3 juveniles, UKMMZ–1583, UKM I.D. 9603; 1 immature female, UKMMZ–1582, UKM I.D. 9488; 1 male, UKMZ–1581, UKM I.D. 9489. Body size: 5.8–6.7 mm.

Local distribution. Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010; Tan *et al.*, 2015; this study).

General distribution. Andaman Sea (Fukuoka and Murano, 2002).

Recorded habitat. Seagrass bed.

Depth range. 3–8 m.

Acanthomysis platycauda (Pillai, 1961)

(Fig. 3G)

Type locality. Arabian Sea (Pillai, 1961).

Material examined. 1 male, UKMMZ – 1584, UKM I.D. 9487; 1 female, UKMMZ – 1585, UKM I.D. 9487; 1 female, UKMMZ – 1586, UKM I.D. 9631. Body size: 6.0–6.7 mm.

Local distribution. Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010; Tan *et al.*, 2015; this study).

General distribution. Arabian Sea (Pillai, 1961; 1965), India (Pillai, 1964; 1973); South China Sea (Liu and Wang, 1986), Andaman Sea (Fukuoka and Murano, 2002)

Recorded habitat. Coastal, seagrass bed.

Depth range. 0–70 m.

Acanthomysis quadrispinosa Nouvel, 1965

(Fig. 3H)

Type locality. Madagascar (Nouvel, 1965).

Material examined. 1 male, UKMMZ–1587, UKM I.D. 9599; 4 males, UKKMZ–1588, UKM I.D. 9603; 5 males, UKKMZ–1589, UKM I.D. 9603. Body size: 6.3–8.5 mm.

Local distribution. Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010; Tan *et al.*, 2015; this study).

General distribution. Madagascar (Nouvel, 1965); South China Sea (Liu and Wang, 1986; Wang and Liu, 1997); Shijiki Bay, Hiroda and Omura Bay, Kyushu (Murano, 1991); Shimane Prefecture, Enshu-nada, Kii Channel and Osaka Bay (Fukuoka and Murano, 2000); Andaman Sea (Fukuoka and Murano, 2002).

Recorded habitat. Coastal, seagrass bed.

Depth range. 3–131 m.

Anisomysis Hansen, 1910

Anisomysis (Anisomysis) aikawai Ii, 1964

(Fig. 3D)

Type locality. Japan (Ii, 1964).

Material examined. 1 male, UKMMZ–1590, UKM I.D. 9625; 2 males, UKMMZ–1591, UKM I.D. 9625; 7 females, UKMMZ–1592, UKM I.D. 9623. Body size: 3.3–3.9 mm.

Local distribution. Port Dickson, Sembilan (Zalina and Othman, 1994); Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010; Tan *et al.*, 2015; this study).

General distribution. Japan (Ii, 1964); Tanabe Bay, Japan (Valbonesi and Murano, 1980); Nomo, Nagasaki, Japan (Murano and Fukuoka, 2003).

Recorded habitat. Shallow water, seagrass bed.

Depth range. 0–8 m.

Lycomysis Hansen, 1910

Lycomysis spinicauda Hansen, 1910

Type locality. Buton Strait, Indonesia (Hansen, 1910).

Material examined. 1 immature male, UKMMZ–1593, UKM I.D. 9483; 1 immature male, UKMMZ–1594, UKM I.D. 9483. Body size: 4.1–4.3 mm.

Local distribution. Port Dickson, Negeri Sembilan (Zalina and Othman, 1994); Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010; Tan *et al.*, 2015; this study).

General distribution. Buton Strait, Indonesia (Hansen, 1910); in between Sri Lanka and New Guinea (Zimmer, 1915); South China Sea (Colosi, 1917; Liu and Wang, 1986); Andaman islands (Tattersall W.M., 1922); Andaman Sea (Fukuoka and Murano, 2002; Biju and Panampunnayil, 2011).

Recorded habitat. Pelagic, seagrass bed.

Depth range. 0–34 m.

Rhopalophthalminae Hansen, 1910

***Rhopalophthalmus* Illig, 1906**

***Rhopalophthalmus longipes* Ii, 1964**

(Fig. 3I)

Type locality. Shizuoka, Nagasaki, Japan (Ii, 1964).

Material examined. 6 juveniles, UKMMZ–1554; 3 juveniles, UKMMZ–1555; 4 juveniles, UKMMZ–1556; 1 immature female, UKMMZ–1553; 8 immature females, UKMMZ–1554; 2 immature females. Body size: 1.9–6.9 mm.

Local distribution. Pulau Tinggi, Johor, Malaysia (Tan and Azman, 2017).

General distribution. Shizuoka, Nagasaki, Japan (Ii, 1964); Nansha Islands, the Spratlys (Wang and Liu, 1994); East China Sea (Wang and Liu, 1997); off Amami Island, South-Western Japan; South-Western part of South China Sea and Western part of Timor Sea (Hanamura *et al.*, 2011).

Recorded habitat. Coastal, seagrass bed.

Depth range. 8–98 m.

Siriellinae Norman, 1892

***Siriella* Dana, 1850**

***Siriella media* Hansen, 1910**

(Fig. 3K)

Type locality. Indian archipelagoes (Hansen, 1910).

Material examined. 1 male, UKMMZ–1595, UKM I.D. 9589; 1 female, UKMMZ–1596, UKM I.D. 9589; 1 female, UKMMZ–1597, UKM I.D 9601. Body size: 6.9–7.3 mm.

Local distribution. Straits of Malacca (Tattersall O.S., 1965); Port Dickson, Sembilan (Zalina and Othman, 1994); Pulau Tinggi, Johor, Malaysia (this study).

General distribution. Indonesia (Hansen, 1910); Gilbert Island (Hansen, 1912); Philippines (Hansen, 1910; Tattersall, 1951); Guam (Tattersall W.M., 1943); Nagatsuro, Shizuoka (Ii, 1964); Japan (Fukuoka and Murano, 1997; Murano and Fukuoka, 2008); South China Sea (Wang and Liu, 1994; Liu and Wang, 2000; Murano and Fukuoka, 2008).

Remarks. First record for Pulau Tinggi, Johor.

Recorded habitat. Pelagic, coral rubble, seagrass bed.

Depth range. 0–27 m.

***Siriella vulgaris* Hansen, 1910**

(Fig. 3J)

Type locality. Coastal waters of the Dutch East Indies (Hansen, 1910).

Material examined. 1 mature male, UKMMZ–1598, UKM I.D. 9485; 6 females, UKMMZ–1599, UKM I.D. 9487; 3 males, UKMMZ–1600, UKM I.D 9489. Body size: 6.5–9.0 mm.

Local distribution. Straits of Malacca (Tattersall O.S., 1965); Pulau Tinggi, Johor, Malaysia (Gan *et al.*, 2010; Tan *et al.*, 2015; this study).

General distribution. Coastal waters of the Dutch East Indies (Hansen, 1910); Philippines (Hansen, 1910; Tattersall W.M., 1951; Murano and Fukuoka, 2008); Andaman Islands (Tattersall W.M., 1922); Arabian Sea (Colosi, 1924); Queensland, Australia (Tattersall W.M., 1928); Great Barrier Reef (Tattersall W.M., 1936); Peru and Hong Kong (Coifmann, 1937); Samoa (Tattersall W.M., 1943); Guam (Tattersall W.M., 1943); Caroline and Marshall archipelago (Tattersall W.M., 1951); Palau (Hanamura and De Grave, 2004); Micronesia, Taiwan (Tattersall W.M., 1951); Singapore Strait (Tattersall O.S., 1960); Northern Australia (Băcescu, 1986a; Murano and Fukuoka, 2008); Okinawa (Murano, 1990; Fukuoka

and Murano, 1997; Murano and Fukuoka, 2008); Andaman Sea (Fukuoka and Murano, 2002); Nomo, Nagasaki, Japan (Murano and Fukuoka, 2008).

Recorded habitat. Coastal, pelagic, seagrass bed.

Depth range. 0–82 m.

Discussion

With a total of 13 species, 10 genera and 6 subfamilies of mysids, the present study compiles the largest biodiversity of mysids, recorded for East Coast of Peninsular Malaysia. As pointed out by Tan *et al*. (2014), out of 41 species recorded from the waters of Peninsular Malaysia, 36 species were from the West Coast of Peninsular Malaysia. Nevertheless, differences in species composition are mostly related to the sampling effort and the method used when collecting mysids. For example, the emergence traps are very efficient in collecting infaunal forms from the soft sediments in subtidal areas, including the smaller mysid species and the juveniles; these forms comprise most of the tropical species, which are not collected with epibenthic sledge (Zalina and Othman, 1994; Gan *et al*., 2010). Therefore, different sampling methods employed in the different localities and habitats complement each other to have a better collection in terms of the diversity of mysids from Malaysian coast.

Although the species richness of the patchy seagrass bed reported here was significantly higher than in other studies, the diversity and distribution patterns of mysids clearly corresponded to those observed in similar ecosystems. To mention previous related studies, Gan et al. (2010) identified 11 species from the seagrass bed of Pulau Tinggi and Barberá-Cebrián *et al.* (2002) identified seven species in the seagrass beds of *Posidonia oceanica* and *Cymodocea nodosa* from the Mediterranean coast of Alicante (Spain). It seems that a greater habitat complexity implies an increase in species diversity and abundance (Orth 1977, 1992; Young, 1981; Stoner, 1983; Orth *et al*., 1984; Stoner and Lewis, 1985).

The number of species found herein, however, still underestimates the diversity of mysids of this region due to lack of adequate sampling, especially along the Northern Coast of Peninsular Malaysia, and also Sabah and Sarawak. In addition, appropriate equipment and expertise are particularly required, and then diverse habitats along the shoreline regions would certainly present different groups of species that need to be documented.

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Authors' Contributions

Both authors were involved in sampling, illustration and manuscript preparation.

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