



Updated checklist of polychaete species (Annelida) recorded from Malaysia, with remarks on the research history

Raz Shauqeena Batrisyeya Razmi Shah[‡], Yusof Shuaib Ibrahim[‡], Tulio F. Villalobos-Guerrero[§], Masanori Sato^{||}

[‡] Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, 21030, Kuala Nerus, Kuala Terengganu, Malaysia

[§] Department of Marine Ecology, Centro de Investigación Científica y de Educación Superior de Ensenada, 22860, Ensenada, Baja California, Mexico

^{||} Department of Earth and Environmental Sciences, Graduate School of Engineering and Science, Kagoshima University, 1-21-35 Korimoto, 890-0065, Kagoshima, Japan

Corresponding author: Yusof Shuaib Ibrahim (yusofshuaib@umt.edu.my)

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Abstract

Background

An updated comprehensive checklist of polychaete species, which have been recorded from Malaysian waters, is provided, with their geographic distributions and the research history for them. A total of 57 species belonging to 30 families have been reported since the early 1870s, with Nereididae as the most dominant family with ten species; however, more than half of the total are questionable species in the country. Despite the increased efforts of polychaete studies in the past decade, the taxonomic endeavour of discovering and describing species in the country could be higher. Malaysian polychaetes were mostly recorded from Peninsular Malaysia, whereas very few were from Borneo Island. Most previously recorded species were associated with intertidal and estuarine habitats and a few were found in the subtidal and freshwater environments. We stress the need for urgent

research on this biologically, ecologically and culturally relevant taxonomic group as the species accumulation curve grows exponentially in this megadiverse country.

New information

The current checklist has been updated since the previous one in 2013. Many species previously listed were judged as doubtful and not taxonomically reliable.

Keywords

bathymetric, bristleworm, compilation, freshwater, inventory, marine, north Borneo, new records, Strait of Malacca

Introduction

Polychaetes are predominantly marine, with some species inhabiting fresh and terrestrial groundwaters (Glasby et al. 2021). This taxon is one of the most abundant and diverse groups in the benthic community of marine environments, with more than 12,000 valid species within over 80 families worldwide (Read and Fauchald 2023). They include sensitive and tolerant species that are useful as bioindicators to detect some changes in habitat environments (Reish 1984, Pocklington and Wells 1992). Some polychaetes have been economically utilised as bait worms and aquaculture feed for fish (Olive 1994, Olive 1999).

Malaysia is one of the world's megadiverse countries (Convention on Biological Diversity (CBD) 2023). Despite being very well represented in the marine environment (Glasby et al. 2000), the records of polychaetes are quite unsatisfactory. This is due to the lack of efforts in former and current expeditions. Besides, very few researchers are interested in studying the taxonomy of Malaysian polychaete species.

The latest previous checklist of polychaetes in Malaysia was published by Idris and Arshad (2013), which included the records and distribution of species from the earliest in 1866 to the latest in 2013. The records were done by scientists from numerous countries and research collaborations. This pioneering study was relevant to understand the knowledge of polychaetes in the country. However, some records were overlooked and many were still considered cosmopolitan species, which was the paradigm until the late 1980s (see Salazar-Vallejo (2020), Salazar-Vallejo and González-Vallejo (2020)). The studies on Malaysian polychaetes have increased and the systematics of polychaetes have improved considerably in the past ten years. To generate a checklist of polychaete only for Malaysia is important for ecological management, biodiversity assessment and monitoring and other analyses pertinent to biodiversity. Therefore, a more comprehensive compilation checklist of polychaete species in Malaysian waters that analyses their current taxonomic status and distribution is still required.

Here, an updated checklist of Malaysian polychaetes is provided, re-evaluating the previous checklist and adding current information.

Materials and methods

Previous taxonomic and ecological papers (until 2022), in which Malaysian polychaetes were identified to the species level by taxonomic specialists with or without descriptions of specific characteristics, were analysed. In the cases where records were tentatively treated at genus level in literature, only those with taxonomic remarks were here included (e.g. *Prionospio* sp. in Ong (1995)). This checklist comprises marine, estuarine and freshwater species reported in Malaysia. Species originally described outside the Central and Western Indo-Pacific biogeographic regions, realms to which Malaysian coastal waters belong, are regarded as questionable records until their present distribution in the country is reassessed. These species are noted in Suppl. material 1. The information about each species described was confirmed with the original description and subsequent literature. Additionally, an indication of the specimens' repository deposition used in the species original record was incorporated to the list (Table 4), when available. This paper divides Malaysia into two main geographic parts: Peninsular Malaysia (including the east and west coasts of Peninsular Malaysia) and Borneo (including Sabah and Sarawak).

Table 1.

References with records of polychaete species in Malaysian waters.

Author (Year)	Number of species listed/mentioned/collected from Malaysian waters
de Quatrefages (1866)	1
Grube (1875)	1
Horst (1911)	1
Dales (1959)	14
Chuang (1961)	2
Rullier (1969), Rullier (1970), Rullier (1976)	3
Jones (1974)	1
Nakao et al. (1989a), Nakao et al. (1989b)	10
Ong (1995)	13
Nishi (2001)	1
Paxton (2002)	1
Glasby and Hsieh (2006)	1
Idris et al. (2012)	2
Idris and Arshad (2013)	2
Idris et al. (2014)	2

Author (Year)	Number of species listed/mentioned/collected from Malaysian waters
Nishi et al. (2015)	1
Ibrahim et al. (2017)	1
Ibrahim et al. (2019)	1

Table 2.

Number of species per family reported in Malaysian waters.

Family	Number of species
Nereididae de Blainville, 1818	10
Tomopteridae Grube, 1850	4
Lopadorrhynchidae Claparède, 1870	3
Phyllodocidae Örsted, 1843	3
Polynoidae Kinberg, 1856	3
Chaetopteridae Audouin and Milne Edwards, 1833	2
Eunicidae Berthold, 1827	2
Glyceridae Grube, 1850	2
Lumbrineridae Schmarda, 1861	2
Onuphidae Kinberg, 1865	2
Orbiniidae Hartman, 1942	2
Sabellidae Latreille, 1825	2
Sigalionidae Kinberg, 1856	2
Spionidae Grube, 1850	2
Amphinomidae Savigny in Lamarck, 1818	1
Aphroditidae Malmgren, 1867	1
Capitellidae Grube, 1862	1
Cirratulidae Ryckholt, 1851	1
Dorvilleidae Chamberlin, 1919	1
Eulepethidae Chamberlin, 1919	1
Iospilidae Bergström, 1914	1
Oeonidae Kinberg, 1865	1
Pilargidae de Saint-Joseph, 1899	1
Poecilochaetidae Hannerz, 1956	1
Sabellariidae Johnston, 1865	1
Scalibregmatidae Malmgren, 1867	1
Sternaspidae Carus, 1863	1
Syllidae Grube, 1850	1

Family	Number of species
Terebellidae Johnston, 1846	1
Typhloscolecidae Uljanin, 1878	1

Table 3.

Number of families and species reported in neighbouring countries or regions.

Country/Region	Families	Species	Reference
Australia	81	1139	Beesly et al. (2000)
The China and Philippines Seas	60	1037	Salazar-Vallejo et al. (2014)
Indonesia	51	580	Pamungkas and Glasby (2019)
South China Sea	54	661	Paxton and Chou (2000)
Philippines	36	219	Paxton and Chou (2000), Salazar-Vallejo et al. (2014)
Andaman and Nicobar Islands	29	193	Rajasekaran and Fernando (2012), Muruganatham et al. (2015), Gopal et al. (2016)
Vietnam	38	191	Paxton and Chou (2000), Salazar-Vallejo et al. (2014)
Thailand	37	145	Aungtonya et al. (2002)
Singapore	28	74	Tan and Chou (1993), Chan (2009)
Malaysia	30	57	Idris and Arshad (2013); Present study

A bathymetry distribution map of species was constructed using [ArcGIS 10.8](#) and the bathymetry data provided by the General Bathymetric Chart of the Oceans ([GEBCO](#)). The bathymetric information of the polychaete was arranged by a 10 m depth interval. The distribution was shown by the following five habitat zones: estuary, intertidal, subtidal, freshwater and unknown zones (Suppl. material 2). The single freshwater species was not given to its exact locality and type habitat; however, it was still shown in a separate map since it has important significance in this checklist. The unknown zone category consisted of species whose habitat was not mentioned or unknown and their locality and depth were estimated, based on the location given by the original author. Most species were plotted to their specific depth and locality. Meanwhile, some species' depth, locality or both were estimated, based on location recorded. A accumulative curve of species recorded over time and the exponential curve line were plotted using Microsoft Excel.

History of polychaete research in Malaysia

The earliest studies of polychaetes in Malaysia began with scientists of different nationalities before the independence era (the 1950s). The first study focused on polychaetes at the Strait of Malacca, considered as one of the busiest shipping lanes in the world, following behind the Dover Strait back in those days (Freeman 2003, Ismail and Mohd Sani 2010). The eminent French naturalist Armand de Quatrefages, who worked in the Muséum National d'Histoire Naturelle, Paris (MNHN), described the first polychaete species from this region, *Iphione cimex* de Quatrefages, 1866 (= *Gaudichaudius cimex*

sensu Pettibone, 1986). The single specimen is currently deposited at the MNHN (IA-TYPE 0326), which was collected probably in Pulau Pinang (Malaysia) or Singapore on any date between 17 and 26 February 1836 by Charles Gaudichaud-Beaupré in a circumnavigation carried out on board the French corvette *La Bonite* (Eydox and Souleyet 1842).

Table 4.

List of Malaysian polychaete species collected from taxonomical and ecological literature from 1960s until recently. Repository of specimens listed, based on original literature, when available. The symbol '-' indicates either no information provided or difficulty to obtain the information as the literature is not directly accessible. The questionmark likely suggests the institution, based on the author's workplace.

Acronyms of repository (in alphabetical order):

AM: Australian Museum, Sydney; **CBM:** Natural History Museum and Institute, Chiba; **KMNH:** Kitakyushu Museum of Natural History, Kitakyushu, Fukuoka; **ICHUM:** Hokkaido University Museum, Sapporo, Hokkaido; **IEA:** Institut d'Écologie Appliquée, Université Catholique de l'Ouest, Angers; **MNHN:** Muséum National d'Histoire Naturelle, Paris, France; **NML:** Naturalis Museum, Leiden, Netherlands; **NSMT:** National Museum of Nature and Science, Tsukuba, Japan; **NTM:** Art Gallery of Northern Territory, Australia; **PMBC:** Phuket Marine Biological Centre, Phuket, Thailand; **SFRS:** Singapore Fisheries Research Station; **UM:** University of Malaya, Malaysia; **UMT:** South China Sea Repository and Reference Centre of Universiti Malaysia Terengganu, Malaysia; **USM:** Central Marine and Coastal Studies, University of Science, Malaysia; **YNU-M:** Yokohama National University Museum, Yokohama; **ZMB:** Zoologischen Museums, Berlin, Germany.

Family	Species	Authorship, Year	Repository	Reference(s)
Amphinomidae	<i>Notopygos cirratus</i>	Horst, 1911	NML	Salazar-Vallejo et al. (2014)
Aphroditidae	<i>Aphrodita sondaica</i>	Grube, 1875	ZMB	Salazar-Vallejo et al. (2014)
Capitellidae	<i>Notomastus latericeus</i>	Sars, 1851	-	Nakao et al. (1989b)
Chaetopteridae	<i>Mesochaetopterus selangora</i>	(Claparède, 1869)	UM & CBM	Rullier (1976), Nishi (1999)
Chaetopteridae	<i>Spiochaetopterus costarum</i>	(Rullier, 1976)	-	Nakao et al. (1989a)
Cirratulidae	<i>Cirriformia tentaculata</i>	(Montagu, 1808)	-	Nakao et al. (1989b)
Dorvilleidae	<i>Protodorvillea egena</i>	(Ehlers, 1913)	USM	Ong (1995)
Eulepethidae	<i>Grubeulepis malayensis</i>	Nishi, 2001	UM	Nishi (2001)
Eunicidae	<i>Marphysa cf. mossambica</i>	Idris, Hutchings & Arshad, 2014	AM & NTM	Idris et al. (2014)
Eunicidae	<i>Marphysa moribidii</i>	(Peters, 1854)	AM & NTM	Idris et al. (2014)
Glyceridae	<i>Glycera alba</i>	(O.F. Müller, 1776)	-	Nakao et al. (1989a)
Glyceridae	<i>Glycera cinnamomea</i>	Grube, 1874	USM	Ong (1995)
Iospilidae	<i>Phalacrophorus uniformis</i>	Reibisch, 1895	SFRS?	Dales (1959)
Lopadorrhynchidae	<i>Lopadorrhynchus brevis</i>	Grube, 1855	SFRS?	Dales (1959)

Family	Species	Authorship, Year	Repository	Reference(s)
Lopadorrhynchidae	<i>Maupasia coeca</i>	Viguier, 1886	SFRS?	Dales (1959)
Lopadorrhynchidae	<i>Pelagobia longicirrata</i>	Greeff, 1879	SFRS?	Dales (1959)
Lumbrineridae	<i>Gesaneris malaysiae</i>	(Verrill, 1875)	MNHN & IEA	Carrera-Parra (2006)
Lumbrineridae	<i>Lumbrinerides acuta</i>	(Rullier, 1969)	-	Nakao et al. (1989b)
Nereididae	<i>Dendronereis arborifera</i>	Peters, 1854	-	Nakao et al. (1989a)
Nereididae	<i>Namalycastis cf. abiuma</i>	(Baird, 1863)	AM & NTM	Idris et al. (2012)
Nereididae	<i>Namalycastis rhodochorde</i>	(Grube, 1840)	AM & NTM	Idris et al. (2012)
Nereididae	<i>Neanthes glandicincta</i>	(Grube & Kröyer in Grube, 1858)	UMT, PMBC & NSMT	Ibrahim et al. (2019), Azmi et al. (2021)
Nereididae	<i>Perinereis aibuhitensis</i>	(Grube, 1872)	UMT	Ibrahim et al. (2017)
Nereididae	<i>Perinereis cf. nuntia</i>	Glasby, Miura, Nishi & Junardi, 2007	AM & NTM	Idris et al. (2012)
Nereididae	<i>Perinereis cultrifera</i>	(Lamarck, 1818)	-	Chuang (1961)
Nereididae	<i>Perinereis rhombodonta</i>	Wu, Sun & Yang, 1981	NTM	Glasby and Hsieh (2006)
Nereididae	<i>Platynereis bicanaliculata</i>	(Southern, 1921)	-	Nakao et al. (1989b)
Nereididae	<i>Pseudonereis variegata</i>	(Grube, 1878)	-	Chuang (1961)
Oeononidae	<i>Halla okudai</i>	Imajima, 1967	AM & NTM	Okuda (1933), Idris and Arshad (2013)
Onuphidae	<i>Diopatra claparedii</i>	Grube, 1878	AM & NTM	Idris and Arshad (2013)
Onuphidae	<i>Diopatra neapolitana</i>	delle Chiaje, 1841	USM	Ong (1995)
Orbiniidae	<i>Leodamas chevalieri</i>	(Fauvel, 1902)	USM	Ong (1995)
Orbiniidae	<i>Naineris kalkudaensis</i>	(De Silva, 1965)	USM	Ong (1995)
Phyllodocidae	<i>Plotohelms capitata</i>	(Greeff, 1876)	SFRS?	Dales (1959)
Phyllodocidae	<i>Rhynchonereella moebii</i>	(Apstein, 1893)	SFRS?	Dales (1959)
Phyllodocidae	<i>Vanadis minuta</i>	Treadwell, 1906	SFRS?	Dales (1959)
Pilargidae	<i>Sigambra ocellata</i>	(Hartmann-Schröder, 1959)	-	Nakao et al. (1989a)
Poecilochaetidae	<i>Poecilochaetus serpens</i>	Allen, 1904	USM	Ong (1995)
Polynoidae	<i>Drieschia pelagica</i>	(de Quatrefages, 1866)	SFRS?	Dales (1959)
Polynoidae	<i>Gaudichaudius cimex</i>	(Rullier, 1970)	MNHN	Salazar-Vallejo et al. (2014)
Polynoidae	<i>Olgalepidonotus kumari</i>	Michaelsen, 1892	MNHN	Salazar-Vallejo et al. (2014)
Sabellariidae	<i>Sabellaria jeramae</i>	Nishi, Matsuo, Capa, Tomioka, Kajihara, Kupriyanova & Polgar, 2015	AM, CBM, KMNH, YNU-M & ICHUM	Nishi et al. (2015)

Family	Species	Authorship, Year	Repository	Reference(s)
Sabellidae	<i>Branchiomma nigromaculatum</i>	(Baird, 1865)	USM	Ong (1995)
Sabellidae	<i>Caobangia abbotti</i>	Jones, 1974	USNM, NHM, MNHN & NML	Salazar-Vallejo et al. (2014)
Scalibregmatidae	<i>Parasclerocheilus branchiatus</i>	Fauvel, 1928	USM	Ong (1995)
Sigalionidae	<i>Euthalenessa digitata</i>	(McIntosh, 1885)	USM	Ong (1995)
Sigalionidae	<i>Pisione oerstedii</i>	Grube, 1857	USM	Ong (1995)
Spionidae	<i>Paraprionospio pinnata</i>	(Ehlers, 1901)	-	Nakao et al. (1989a), Nakao et al. (1989b)
Spionidae	<i>Prionospio</i> sp.		USM	Ong (1995)
Sternaspidae	<i>Sternaspis scutata</i>	(Ranzani, 1817)	-	Nakao et al. (1989a)
Syllidae	<i>Syllis cornuta</i>	Rathke, 1843	USM	Ong (1995)
Terebellidae	<i>Lanice socialis</i>	(Willey, 1905)	USM	Ong (1995)
Tomopteridae	<i>Tomopteris (Johnstonella) aloysii sabaudiae</i>	Rosa, 1908	SFRS?	Dales (1959)
Tomopteridae	<i>Tomopteris (Johnstonella) dunckeri</i>	Rosa, 1908	SFRS?	Dales (1959)
Tomopteridae	<i>Tomopteris mariana</i>	Greeff, 1885	SFRS?	Dales (1959)
Tomopteridae	<i>Tomopteris nisseni</i>	Rosa, 1908	SFRS?	Dales (1959)
Typhloscolecidae	<i>Typhloscolex muelleri</i>	Busch, 1851	SFRS?	Dales (1959)

There were expeditions in the IMPA (Indo-Malay-Philippines Archipelago) or the Malay Archipelago (Wallace 1869). One of them was the Dutch “Siboga” (1899–1900) expedition that gathered 782 polychaete species from Indonesia, 269 species being considered new to science (see Bleeker and van der Spoel (1992), Glasby and Al Hakim (2017)). A few decades later, more international expeditions to the Malay Archipelago were carried out, such as the Dutch “Snellius” expedition (1929–1930), which visited the same area as “Siboga”, the U.S. Fisheries steamer “Albatross” in late 1907, collected most samples from the Gulf of Tomini (northern Sulawesi), the Philippines waters, the northern coast of Borneo and the Moluccas and the Danish “Dana” expedition sampled in Indo-Malay waters in 1929 (Dana-Report 1934). In the post-1960s, there were numerous collaborative research studies, particularly from adjacent countries (Thailand, Indonesia and the Philippines) with the United States, Australia and European countries (Glasby and Al Hakim 2017). However, records of polychaetes in Malaysian waters from these expeditions were insufficient.

Various national and international research studies were undertaken in the early 1960s up to recent years (Table 1). Most were carried out on the west coast of Peninsular Malaysia. Chuang (1961), Sasekumar (1974), Nakao et al. (1989a), Ong (1995), Nishi (1999), Rezai et al. (2002) and Glasby and Hsieh (2006) collected polychaetes along the coastlines of

the Strait of Malacca. On the other hand, Nakao et al. (1989b) collected from the east coast of Peninsular Malaysia.

Almost a decade later, Idris and Arshad (2013) compiled the first polychaete checklist in Malaysia, based on literature records. They reported 64 species belonging to 31 families and included a re-description of two commercially exploited onuphid species: *Diopatra claparedii* Grube, 1878 and *Halla okudai* Imajima, 1967. Afterwards, two new species were described from the west coast of Peninsular Malaysia: the eunicid *Marphysa moribidii* Idris, Hutchings and Arshad, 2014 from the mangrove area of Morib (Idris et al. 2014) and the sabellariid *Sabellaria jeramae* Nishi, Matsuo, Capa, Tomioka, Kajihara, Kupriyanova and Polgar, 2015 from the intertidal zone of Jeram (Nishi et al. 2015). Later on, new recorded species were done by Ibrahim et al. (2019) who registered the nereidid *Neanthes glandicinca* (Southern, 1921), originally described from Indian waters, in the eastern coast of Peninsular Malaysia, whose reproductive biology, epitokal morphology and swimming behaviour was later described in detail (Azmi et al. 2021). In addition, Idris et al. (2022) studied the serpulid *Spirobranchus corniculatus* (Grube, 1862) from the east coast of Peninsular Malaysia.

The accumulative curve of the records of species in Malaysia (Fig. 2) indicates that studies on polychaetes attracted the attention of researchers during the 1960s. From there, the records started to increase gradually until 2019. In the past decade, a markedly drastic increase in studies of polychaetes on different topics (ecology, environment and diversity-related) was upscaled due to the efforts carried out by local scientists (e.g. Gholizadeh et al. (2012), Shi et al. (2014), Polgar et al. (2015), Hamzah et al. (2021)). Contrarily, there have been only a few studies addressing taxonomy throughout the years. Malaysia is the type locality for ten species, which were mostly described from the Peninsular Malaysia (de Quatrefages 1866, Grube 1875, Horst 1911, Rullier 1969, Rullier 1970, Jones 1974, Rullier 1976, Nishi 2001, Idris et al. 2014, Nishi et al. 2015). After the 1950s, researchers such as Sasekumar (1974), Nakao et al. (1989a), Nakao et al. (1989b) and Ong (1995) contributed to increasing the number of Malaysian species with various literature.

Checklist of Polychaeta from Malaysia

Family Amphinomidae

Notopygos cirratus Horst, 1911

Distribution: Type locality. North Ubian Islands, Malaysia.

Distribution in Malaysia. North Ubian Islands, Malaysia.

Distribution outside Malaysia. Only from type locality (Horst 1911, Salazar-Vallejo et al. 2014).

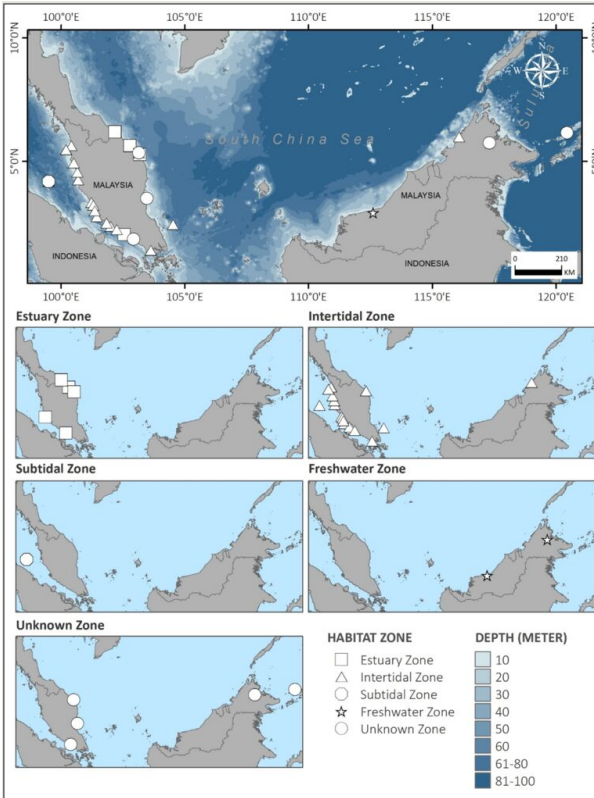


Figure 1. [doi](#)
 Bathymetric map distribution of Malaysian polychaetes on their type of habitat. Data provided by the General Bathymetric Chart of the Oceans (GEBCO).

Family Aphroditidae

Aphrodita sondaica Grube, 1875

Distribution: Type locality. North Borneo, Malaysia; Palawan, Philippines.

Distribution in Malaysia. North Borneo, Malaysia (Grube 1875).

Distribution outside Malaysia. Philippines (Grube 1875); Indonesia (Pamungkas and Glasby 2019).

Family Capitellidae

Notomastus latericeus Sars, 1851

Distribution: Type locality. Komagfjord, Norway.

Distribution in Malaysia. Questionable record: Kuala Terengganu River estuary, Terengganu (Nakao et al. 1989b, Idris and Arshad 2013).

Distribution outside Malaysia. Italy (Giangrande and Fraschetti 1993); England (Pienkowski 1983); Turkey (Çinar et al. 1998); Around India (Fauvel 1953); China (Yang and Sun 1988); Japan (Imajima and Hartman 1964).

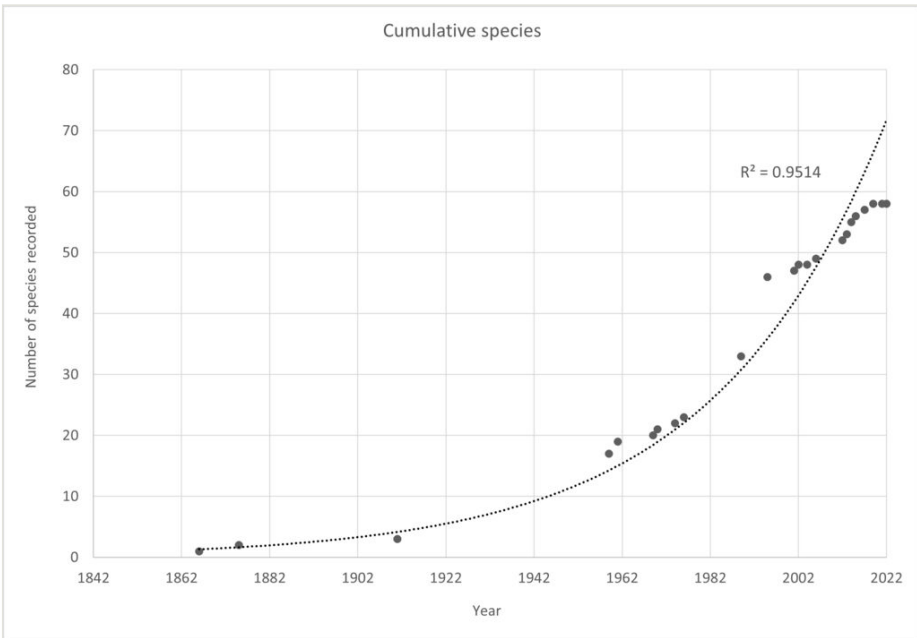


Figure 2. [doi](#)

Cumulative number of species recorded over time in the Malaysian waters.

Family Chaetopteridae

Mesochaetopterus selangora (Rullier, 1976)

Distribution: Type locality. Morib, Selangor, Malaysia.

Distribution in Malaysia. Only from type locality (Rullier 1976, Nishi 1999, Idris and Arshad 2013).

Notes: Endemic species. Previously recorded as *Sasekumaria selangora* Rullier, 1976. The porcellanid crab *Polyonyx vermicola* Ng & Sasekumar, 1993 is an obligate commensal of tubes of the chaetopterid worm (Ng and Sasekumar 1993).

***Spiochaetopterus costarum* (Claparède, 1869)**

Distribution: Type locality. Mediterranean Sea, Italy.

Distribution in Malaysia. Questionable record: Selangor River estuary (Nakao et al. 1989a).

Distribution outside Malaysia. Japan (Nishi and Arai 1996).

Family Cirratulidae***Cirriformia tentaculata* (Montagu, 1808)**

Distribution: Type locality. South coast of Devonshire, United Kingdom.

Distribution in Malaysia. Questionable record: Kuala Terengganu River estuary, Terengganu (Nakao et al. 1989b, Idris and Arshad 2013).

Distribution outside Malaysia. China (Yang and Sun 1988); Thailand (Angsupanich and Kuwabara 1999); India (Murugesan and Balasubramanian 2021); Canary Islands (Esquete et al. 2016); Western coast of Tunis Bay (Afli et al. 2013).

Family Dorvilleidae***Protodorvillea egena* (Ehlers, 1913)**

Distribution: Type locality. Simonstown, South Africa.

Distribution in Malaysia. Questionable record: Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Distribution outside Malaysia. Australia (Lewis et al. 1981); India (Murugesan and Balasubramanian 2021).

Family Eulepethidae***Grubeulepis malayensis* Nishi, 2001**

Distribution: Type locality. Morib Beach, Selangor, Malaysia.

Distribution in Malaysia. Only from type locality (Nishi 2001, Idris and Arshad 2013).

Notes: Living in chaetopterid tubes.

Family Eunicidae

Marphysa cf. mossambica (Peters, 1854)

Distribution: Distribution in Malaysia. Along west of Peninsular Malaysia (Idris et al. 2014).

Marphysa moribidii Idris, Hutchings & Arshad, 2014

Distribution: Type locality. Morib, Selangor, Malaysia.

Distribution in Malaysia. Morib, Selangor and Pengkalan Balak, Malacca (Idris et al. 2014).

Notes: Locally known as 'Ruat bakau' and harvested as bait worms. Previously identified as *Marphysa cf. sanguinea* by Idris et al. (2014).

Family Glyceridae

Glycera alba (O.F. Müller, 1776)

Distribution: Type locality. Norway (no precise locality).

Distribution in Malaysia. Questionable record: Selangor River estuary; Kuala Terengganu River estuary, Terengganu (Nakao et al. 1989a, Nakao et al. 1989b, Böggemann 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Mozambique (Macnae and Kalk 1962); Vietnam (Phan 2015); Scotland (Blackstock and Barnes 1982); India (Harkantra and Parulekar 1985).

Glycera cinnamomea Grube, 1874

Distribution: Type locality. Indian Ocean, Sri Lanka.

Distribution in Malaysia. Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Distribution outside Malaysia. Andaman, Nicobar coast (Böggemann and Eibye-Jacobsen 2002); Myanmar (Böggemann 2002); Arabian Gulf (Wehe and Fiege 2002); Indian Ocean, Red Sea, Persian Gulf, East and South China Sea (Böggemann and Eibye-Jacobsen 2002); Australia (Neave et al. 2013).

Notes: Previously recorded as *Glycera prashadi* Fauvel, 1932.

Family Iospilidae

Phalacrophorus uniformis Reibisch, 1895

Distribution: Type locality. Tropical Atlantic.

Distribution in Malaysia. Questionable record: Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Mexico (Fernández-Álamo and Sanvicente-Añorve 2005); Eastern Brazilian coast (Tovar-Faro et al. 2013).

Family Lopadorrhynchidae

Lopadorrhynchus brevis Grube, 1855

Distribution: Type locality. Mediterranean Sea.

Distribution in Malaysia. Questionable record: Strait of Malacca (Dales 1959, Rezai et al. 2002, Wehe and Fiege 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Red Sea, Gulf of Aden (Wehe and Fiege 2002); Mexican Pacific (Hernández-Alcántara et al. 2008); Gulf of California (Fernández-Álamo 1991).

Maupasia coeca Viguier, 1886

Distribution: Type locality. Algiers Bay, Algeria.

Distribution in Malaysia. Questionable record: Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Western North Pacific (Amei et al. 2020); Off Northeast Brazil (Neumann-Leitão et al. 2008).

Pelagobia longicirrata Greeff, 1879

Distribution: Type locality. Canary Islands, Tropical Atlantic.

Distribution in Malaysia. Questionable record: Strait of Malacca; Selangor River estuary (Dales 1959, Nakao et al. 1989a, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Gulf of Aden, Arabian Sea (Wehe and Fiege 2002); Vietnam (Kolbasova and Neretina 2021); Atlantic Ocean (Pleijel and Dales 1991); Mediterranean Sea (Fauvel 1923, Pinca and Dallot 1995); South Adriatic (Batistić et al. 2004); Southern Chile (Bilbao et al. 2008); Mexico (Fernández-Álamo and Sanvicente-

Añorve 2005); Scotia Front region (Siciński 1988); Strait of Magellan (Guglielmo et al. 2014).

Family Lumbrineridae

Gesaneris malaysiae (Rullier, 1969)

Distribution: Type locality. Port Swettenham (currently known as Port Klang), Selangor, Malaysia.

Distribution in Malaysia. Kapar mangrove forest, Klang, Selangor; Kuala Lumpur (Rullier 1969, Carrera-Parra 2006, Idris and Arshad 2013).

Notes: Previously recorded as *Lumbriconereis malayensis* (sic) Rullier, 1969 (Carrera-Parra 2006).

Lumbrinerides acuta (Verrill, 1875)

Distribution: Type locality. Rhode Island, United States.

Distribution in Malaysia. Questionable record: Kuala Terengganu River estuary, Terengganu (Nakao et al. 1989b, Idris and Arshad 2013).

Distribution outside Malaysia. Delaware Bay, United States (Kinner and Maurer 1978).

Notes: Previously recorded as *Lumbrineris acuta* Verrill, 1875.

Family Nereididae

Dendronereides arborifera Peters, 1854

Distribution: Type locality. Mozambique, Indian Ocean.

Distribution in Malaysia. Selangor River estuary (Nakao et al. 1989a).

Distribution outside Malaysia. Singapore (Chan 2009); Africa (Pillay and Perissinotto 2008); Vasishta Godavari Estuary (Sarma and Rao 1982); India (Roy and Nandi 2012).

Namalycastis cf. abiuma

Distribution: Distribution in Malaysia. Pekan, Pahang (Idris et al. 2012, Idris and Arshad 2013).

Namalycastis rhodochorde Glasby, Miura, Nishi & Junardi, 2007

Distribution: Type locality. Kalimantan, Indonesia.

Distribution in Malaysia. West coast of Peninsular Malaysia and Kota Kinabalu, Sabah, Borneo (Idris et al. 2012, Idris and Arshad 2013).

Distribution outside Malaysia. West Kalimantan, Indonesia (Junardi 2020).

Notes: Known as nypa palm worm and locally known as 'Ruat nipah' and 'Punpun nipah'. Used as bait for fish and shrimp (Junardi et al. 2014).

***Neanthes glandicinca* (Southern, 1921)**

Distribution: Type locality. Near Calcutta, India.

Distribution in Malaysia. Jeram Beach, Selangor; Tumpat, Kelantan Delta, Kelantan; Setiu Lagoon, Terengganu; Kuala Ibai, Terengganu (Polgar et al. 2015, Ibrahim et al. 2019, Azmi et al. 2021).

Distribution outside Malaysia. India (Southern 1921, Lee and Glasby 2015); Myanmar (Monro 1937, Lee and Glasby 2015); Western Singapore (Lee and Glasby 2015); Thailand (Azmi et al. 2021).

Notes: Previously recorded as *Ceratonereis* (*Composetia*) *burmensis* Monro, 1937 (Polgar et al. 2015).

***Perinereis aibuhitensis* (Grube, 1878)**

Distribution: Type locality. Aibuhit, Philippines.

Distribution in Malaysia. Setiu Wetlands, Terengganu (Ibrahim et al. 2017).

Distribution outside Malaysia. Taiwan, Philippines, Thailand, Indonesia, Australia (Grube 1878, Horst 1924, Russell 1962, Wu 1967, Hylleberg et al. 1986, Hutchings et al. 1991).

***Perinereis cf. nuntia* (Lamarck, 1818)**

Distribution: Distribution in Malaysia. Batu 4, Port Dickson, Negeri Sembilan (Idris et al. 2012, Idris and Arshad 2013).

Notes: Locally known as 'Ruat pasir' and 'Punpun pasir'.

***Perinereis cultrifera* (Grube, 1840)**

Distribution: Type locality. Gulf of Naples, Italy.

Distribution in Malaysia. Questionable record: Pulau Aur, Johor (Chuang 1961, Idris and Arshad 2013).

Distribution outside Malaysia. Algerian Mediterranean coast (Rouabah and Scaps 2003); Italy (Maltagliati et al. 2001); India (Elayaraja et al. 2010); France (Baert and Slomianny 1987); Morocco (Rouhi et al. 2008).

***Perinereis rhombodonta* Wu, Sun & Yang, 1981**

Distribution: Type locality. Aotou, Guangdong; Beihai, Beilongwei and Qisha, GuangXi, China.

Distribution in Malaysia. Blue Lagoon, Port Dickson, Negeri Sembilan (Glasby and Hsieh 2006, Idris and Arshad 2013).

Distribution outside Malaysia. China (Wu et al. 1981); Hong Kong, Thailand, Singapore, Indonesia (Glasby and Hsieh 2006).

***Platynereis bicanaliculata* (Baird, 1863)**

Distribution: Type locality. Vancouver, Canada.

Distribution in Malaysia. Questionable record: Kuala Terengganu River estuary, Terengganu (Nakao et al. 1989b, Idris and Arshad 2013).

Distribution outside Malaysia. United States (Roe 1975, Fong 1993); Japan (Fukao 1996).

***Pseudonereis variegata* (Grube & Kröyer in Grube, 1857)**

Distribution: Type locality. Valparaíso, Chile.

Distribution in Malaysia. Questionable record: Pulau Aur, Johor (Chuang 1961, Idris and Arshad 2013).

Distribution outside Malaysia. Chile (Grube 1857); southern Africa (Herwerden 1989); Egypt (Abdelnaby 2020b); Pakistan (Siddiqui and Mustaqim 1988).

Family Oeonidae

***Halla okudai* Imajima, 1967**

Distribution: Type locality. Seto Inland Sea, Japan.

Distribution in Malaysia. Questionable record: Malacca (Okuda 1933, Idris and Arshad 2013).

Distribution outside Malaysia. Japan (Okuda 1933, Kobayashi et al. 2020); China (Saito et al. 2014); southern Australia (Paxton 2009).

Notes: Locally known as 'Ruat beting' in Malacca, Malaysia.

Family Onuphidae

Diopatra claparedii Grube, 1878

Distribution: Type locality. Sungei Buloh, Singapore.

Distribution in Malaysia. Along mud-flats on the west coast of Peninsular Malaysia; Jeram Beach, Selangor (Paxton 2002, Idris and Arshad 2013, Polgar et al. 2015).

Distribution outside Malaysia. Singapore (Grube 1878); India (Pati et al. 2015).

Notes: Locally known as 'Ruat sarung'.

Diopatra neapolitana delle Chiaje, 1841

Distribution: Type locality. Gulf of Naples, Italy.

Distribution in Malaysia. Questionable record: Kapar mangrove forest, Klang; Teluk Aling, Penang (Sasekumar 1974, Ong 1995, Idris and Arshad 2013, Paxton and Arias 2017).

Distribution outside Malaysia. Red Sea, Indian Ocean (Wehe and Fiege 2002); Mediterranean Sea (Gambi and Giangrande 1986, Arvanitidis 2000, Dağlı et al. 2005).

Family Orbiniidae

Leodamas chevalieri (Fauvel, 1902)

Distribution: Type locality. Casamance, Senegal.

Distribution in Malaysia. Questionable record: Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Distribution outside Malaysia. Western Africa (Fauvel 1902); Gulf of California (Hernández-Alcántara and Solís-Weiss 2013).

Naineris kalkudaensis (De Silva, 1965)

Distribution: Type locality. Kalkudah, Sri Lanka.

Distribution in Malaysia. Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Distribution outside Malaysia: Sri Lanka (De Silva 1965).

Family Phyllodocidae

Plotohelmis capitata (Greeff, 1876)

Distribution: Type locality. Algeria, Mediterranean Sea.

Distribution in Malaysia. Questionable record: Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Mediterranean, warm North Atlantic, Japan (Day 1967).

Rhynchonereella moebii (Apstein, 1893)

Distribution: Type locality. Sicily, Italy.

Distribution in Malaysia. Questionable record: Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Mediterranean Sea, tropical and subtropical Atlantic and Pacific Oceans, India (Jiménez-Cueto and Suárez-Morales 2008).

Vanadis minuta Treadwell, 1906

Distribution: Type locality. Mediterranean Sea.

Distribution in Malaysia. Questionable record: Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Pacific and Atlantic Oceans (Dales 1957b); Bangka Straits, East of Sumatra, West of Borneo, Singapore, Natuna Islands, South China (including Hong Kong, southern Taiwan, Paracel Islands) (Glasby et al. 2016).

Family Pilargidae

Sigambra ocellata (Hartmann-Schröder, 1959)

Distribution: Type locality. El Salvador, Pacific Ocean.

Distribution in Malaysia. Questionable record: Selangor River estuary (Nakao et al. 1989a).

Distribution outside Malaysia. Central America (Pettibone 1966); El Salvador (Rivera and Rivera 2008).

***Poecilochaetus serpens* Allen, 1904**

Distribution: Type locality. Plymouth, England.

Distribution in Malaysia. Questionable record: Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Distribution outside Malaysia. English Channel, Irish Sea, Skagerrak Azores, Canary Island, Mediterranean Sea, South Africa, Gulf of Mannar, Waltair (Achari 1968); Arabian Gulf (Mohammad 1980); Egypt (Abdelnaby 2020a).

Family Poecilochaetidae

Family Polynoidae

***Drieschia pelagica* Michaelsen, 1892**

Distribution: Type locality. Sri Lanka, Indian Ocean.

Distribution in Malaysia. Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. New England (Pettibone 1963); Marmara, Aegean Seas (Wesenberg-Lund 1939, Çinar et al. 2014).

***Gaudichaudius cimex* (de Quatrefages, 1866)**

Distribution: Type locality. Strait of Malacca, Malaysia.

Distribution in Malaysia. Only from type locality (Pettibone 1986, Solis-Weiss et al. 2004, Idris and Arshad 2013, Salazar-Vallejo et al. 2014).

Distribution outside Malaysia. Digha coast (Sarkar and Talukdar 2003); Indo-West Pacific (Pettibone 1986, Martin and Britayev 1998); Yellow Sea, South China Sea, Vietnam (Fauvel 1932, Uschakov and Wu 1959, Uschakov and Wu 1965, Uschakov and Wu 1979, Yang and Sun 1988); Hainan Island (Barnich et al. 2004).

Notes: Originally recorded as *Iphione cimex* de Quatrefages, 1866.

***Olgalepidonotus kumari* (Rullier, 1970)**

Distribution: Type locality. Port Swettenham (currently known as Port Klang), Selangor, Malaysia.

Distribution in Malaysia. Kapar mangrove forest, Klang; Port Klang, Selangor (Rullier 1970, Sasekumar 1974, Pettibone 1995, Idris and Arshad 2013).

Distribution outside Malaysia. Thailand (Sasekumar 1974).

Notes: Previously recorded as *Lepidonotus kumari* Rullier, 1970.

Family Sabellariidae

***Sabellaria jeramae* Nishi, Matsuo, Capa, Tomioka, Kajihara, Kupriyanova & Polgar, 2015**

Distribution: Type locality. Jeram Beach, Selangor, Malaysia.

Distribution in Malaysia. Only from type locality (Nishi et al. 2015).

Family Sabellidae

***Branchiomma nigromaculatum* (Baird, 1865)**

Distribution: Type locality. Saint Vincent and the Grenadines, Caribbean Sea.

Distribution in Malaysia. Questionable record: Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Distribution outside Malaysia. Colombian Caribbean (Londoño-Mesa et al. 2002).

***Caobangia abbotti* Jones, 1974**

Distribution: Type locality. Ranau, Sabah, Malaysia.

Distribution in Malaysia. Kinabatangan and Gunung Kinabalu, Sabah and Sarawak (Jones 1974, Idris and Arshad 2013).

Distribution outside Malaysia. Philippines (Rouse 2004).

Notes: Currently, the only freshwater species in Malaysia. Paratypes collected from the Robin River at Dana Amu in Sarawak (Jones 1974).

Family Scalibregmatidae

***Parasclerocheilus branchiatus* Fauvel, 1928**

Distribution: Type locality. Shingle Island, India.

Distribution in Malaysia. Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Distribution outside Malaysia. Gulf of Oman (Fauvel 1932, Cantone 1982); Israel, India, Somalia (Cantone 1982).

Family Sigalionidae

***Euthalenessa digitata* (McIntosh, 1885)**

Distribution: Type locality. Admiralty Islands, Bismarck Archipelago, Papua-New Guinea.

Distribution in Malaysia. Teluk Aling, Penang (Ong 1995, Wehe and Fiege 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Western Pacific Ocean, Red Sea, Persian Gulf, Gulf of Oman, Andaman Sea, Gulf of Thailand, Japan (Aungtonya et al. 2010).

***Pisione oerstedii* Grube, 1857**

Distribution: Type locality. Valparaíso, Chile.

Distribution in Malaysia. Questionable record: Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Distribution outside Malaysia. Peru, Chile, New Zealand, India, South China Sea (Wu et al. 1998).

Family Spionidae

***Paraprionospio pinnata* (Ehlers, 1901)**

Distribution: Type locality. Talcahuano, Chile.

Distribution in Malaysia. Questionable record: Selangor River estuary; Kuala Terengganu River estuary (Nakao et al. 1989a, Nakao et al. 1989b, Idris and Arshad 2013).

Distribution outside Malaysia. Korea (Lim and Hong 1997); Gulf of Mexico (Baustian et al. 2018).

***Prionospio* sp.**

Distribution: Distribution in Malaysia. Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Notes: It showed similar features to *P. malmgreni* Claparède, 1869; however, the author, Ong (1995) needed clarification and samples were undetermined.

Family Sternaspidae

Sternaspis scutata (Ranzani, 1817)

Distribution: Type locality. Turkey, Izmar Bay, Aegean Sea.

Distribution in Malaysia. Questionable record: Selangor River estuary; Kuala Terengganu River estuary (Nakao et al. 1989a, Nakao et al. 1989b, Idris and Arshad 2013).

Distribution outside Malaysia. Mediterranean Sea to the English Channel (Townsend et al. 2006, Sendall and Salazar-Vallejo 2013); Korea (Lim and Hong 1997).

Notes: It was re-described by Sendall and Salazar-Vallejo (2013) using neotype material, who suggested that records from non-Mediterranean or north-eastern Atlantic localities might belong to other, probably undescribed species.

Family Syllidae

Syllis cornuta Rathke, 1843

Distribution: Type locality. Norway

Distribution in Malaysia. Questionable record: Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Distribution outside Malaysia. Norway (Rathke 1843); Iberian coasts (San Martin and López 2000).

Family Terebellidae

Lanice socialis (Willey, 1905)

Distribution: Type locality. Galle, Sri Lanka.

Distribution in Malaysia. Teluk Aling, Penang (Ong 1995, Idris and Arshad 2013).

Distribution outside Malaysia. Benin (Srikrishnadas et al. 1987); India (Soota et al. 1981).

Family Tomopteridae

Tomopteris (Johnstonella) aloysii subsp. *sabaudiae* Rosa, 1908

Distribution: Type locality. Off Oaxaca, Mexico, Pacific Ocean.

Distribution in Malaysia. Questionable record: Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Mexican Pacific (Hernández-Alcántara et al. 2008).

***Tomopteris (Johnstonella) dunckeri* Rosa, 1908**

Distribution: Type locality. Sri Lanka, Indian Ocean.

Distribution in Malaysia. Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Sri Lanka (Rosa 1908); Vietnam (Phan 2015).

***Tomopteris mariana* Greeff, 1885**

Distribution: Type locality. Tropical Atlantic.

Distribution in Malaysia. Questionable record: Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. China (Wu et al. 1980).

***Tomopteris nisseni* Rosa, 1908**

Distribution: Type locality. Off Brazil.

Distribution in Malaysia. Questionable record: Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. California (Dales 1955); Spain (Dales 1957a).

Family Typhloscolecidae

***Typhloscolex muelleri* Busch, 1851**

Distribution: Type locality. Trieste, Adriatic Sea.

Distribution in Malaysia. Questionable record: Strait of Malacca (Dales 1959, Rezai et al. 2002, Idris and Arshad 2013).

Distribution outside Malaysia. Atlantic Ocean (Orensanz and Ramírez 1973, Fernández-Álamo and Thuesen 1999); Southern Ocean (Rozbaczylo 1985); Pacific Ocean (Treadwell 1943, Dales 1957b, Tebble 1962).

Analysis

Polychaetes of Malaysian waters

A total of 57 species belonging to 47 genera in 30 families of polychaetes were recorded from Malaysian coastal waters; 53 species were recorded from Peninsular Malaysia, three species from Borneo and one species from both geographical regions. Amongst them, ten species (17% of total) were originally described from Malaysia, whereas the presence of other 30 (53%) species is questionable.

Bathymetric distribution of polychaetes in Malaysian waters

The bathymetric information (Fig. 1) indicates that almost all species were recorded in less than 10 m depth, distributed at the estuarine and intertidal zones from the coastlines of Peninsular Malaysia. Species recorded at the subtidal zone were from the Strait of Malacca, with an estimated depth range of 30 m. The only freshwater species were recorded from Sabah and Sarawak. Notably, some species including those from Sabah, Sarawak and North Borneo, were not given their specific habitat type. Some species were collected from local bait shops. Other than that, *Caobangia abboti*, *Marphysa moribidii*, *Neanthes glandicincta* and *Namalycastis rhodochorde* were recorded at more than one location in Malaysia.

Species richness of polychaetes in Malaysian waters

The topmost species-rich polychaete family is Nereididae, with ten species (Table 2). Nereidids are amongst the most-rich species of polychaete families worldwide, alongside Syllidae, Polynoidae, Spionidae, Serpulidae and Terebellidae (Pamungkas et al. 2019), whereas, 16 families recorded one species only, all collected from Peninsular Malaysia: Amphinomidae, Aphroditidae, Capitellidae, Cirratulidae, Dorvilleidae, Eulepethidae, Iospilidae, Oeononidae, Pilargidae, Poecilochaetidae, Sabellariidae, Scalibregmatidae, Sternaspidae, Syllidae, Terebellidae and Typhloscolecidae.

Discussion

Studies on marine annelids were mainly done by international scientists and through collaborations. Most local researchers focused on ecological and diversity studies. Over the past decades, few taxonomy studies were published particularly by Malaysian taxonomists (Ong 1995, Idris et al. 2012, Idris and Arshad 2013, Idris et al. 2014, Ibrahim et al. 2019). Although the number of recorded species has increased over the years, the number of described species is relatively low. Pamungkas and Glasby (2019) stated that Indonesia, Singapore and Malaysia have a common lack of funding by the government in direct taxonomic investigations unless linked to other economic or ecological focus research. This is understandable as marine taxonomy might not concern policy-makers (Pamungkas and Glasby 2019). To our concern, very few polychaete taxonomists and

ecologists are currently active in Malaysia. As quoted by Buyck (1999), taxonomists are “endangered species”.

A total of 57 species of Malaysian polychaetes has been reported since 1866 until 2019. This current checklist included species from the previous one (Idris and Arshad 2013) excluding few species that were judged as doubtful. The species excluded were not provided with taxonomical description and species validation. After that, a few new species and records were reported (e.g. Idris et al. (2014), Nishi et al. (2015), Ibrahim et al. (2019)) and included in this current checklist. Comparing records in Malaysia with other countries, the former still falls behind on the polychaete species recorded amongst most of Southeast Asian countries (Table 3). The accumulation curve of polychaete species in Malaysia has not reached the asymptote, implying that more species are yet to be discovered (Fig. 2). The accumulative curve of the records of species in Malaysia and polychaete families reported less than ten species might also suggest that more research is needed to be done in both Peninsular Malaysia and Borneo Island.

More studies on polychaetes in Malaysia need to be carried out, mainly related to identifying and describing species. Additionally, there should be follow-up studies on several previous research to validate the species recorded in ecological and environmental studies. Rosli et al. (2018) recorded 340 polychaete species from the offshore of Pekan-Dungun, Kuala Terengganu and Kudat-Balambangan Island in both Peninsular Malaysia and Borneo, while Alias et al. (2022) reported 43 species in the Kuala Terengganu River estuary. However, their records consisted of unknown species. A further taxonomic investigation of polychaetes of these sites will increase the checklist considerably.

The presence of polychaete species considered to be widely distributed or cosmopolitan in Malaysian coastal waters has not been previously considered by this study. It is estimated that, of the total number of polychaete species recorded in Malaysia (57 species), approximately 53% (e.g. *Notomastus latericeus*, *Spiochaetopterus costarum*, *Cirriiformia tentaculata*) require a detailed revision since some may belong to cryptic or pseudocryptic species (Knowlton 1993, Knowlton 2000), judging by their type locality. Global and regional revisions of polychaetes have revealed deficient taxonomy that caused the “cosmopolitan syndrome” (Williams 1984, Dauvin and Thiebaut 1994). Species from other distinct regions have been recorded in local waters using identification guides from distant areas, without carefully examining or comparing specimens or both. However, the detailed taxonomic revisions have aided in amending this syndrome and favoured the description of other local species. Unfortunately, as pointed out previously, Malaysia has been of limited interest to fellow polychaetologists throughout its natural history and the fact that more than half of the polychaete species recorded so far are questionable is a consequence of this gap in taxonomic studies.

International collaborations may help expand polychaete taxonomic research in the country. For instance, the involving of international and local polychaete taxonomists in identifying species and depositing biological materials in domestic and internationally recognised collections for future studies (Pamungkas and Glasby 2019). Besides, molecular taxonomy could also be applied in identifying species alongside morphological

taxonomy. It has been demonstrated that the use of morphological and genomic techniques aids not only in understanding the polychaete biodiversity in particular regions, but also in disentangling the species hidden or obscured within cryptic species (Hutchings and Kupriyanova 2018, Simon et al. 2019). Moreover, to assess the effect of climate change, sea level rise and human-induced sea-level coastal zones, it is required to document species diversity on a regional basis (Al-Kandari et al. 2019).

In Malaysia, there is a need for more to be done in polychaete research. More studies on polychaete systematics, genetics, ecology, physiology and reproductive biology are urged to be undertaken. Acknowledging this taxonomic group as a vital member or the 'keystone' in the ecosystem is also essential. Their feeding behaviour, metabolic activities and distinct characteristics while modifying their habitats and surrounding made them known as the ecosystem engineer (Buchman et al. 2007, Fadhullah and Syakir 2016). Thus far, polychaetes have been applied in nanoscience technology and medicine (see Hussain et al. (2018), Pei et al. (2020), Che Soh et al. (2020)). By accentuating their importance and potential in various sectors, more research on polychaetes could be done in the future. This study is intended to aid in the assessment of marine biodiversity with a view to the protection and conservation of Malaysian waters.

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Author contributions

Raz Shauqeena Batrisyea Razmi Shah: Writing - Original draft, Methodology, Software, Formal analysis, Review and Editing

Yusof Shuaib Ibrahim: Conceptualisation, Writing - Original draft, Methodology, Validation, Formal analysis, Writing - Review and Editing, Supervision, Funding Acquisition

Tulio F. Villalobos-Guerrero: Writing - Review and Editing, Methodology, Validation

Masanori Sato: Writing - Review and Editing, Methodology, Validation

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Supplementary materials

Suppl. material 1: Checklist of species with additional information [doi](#)

Authors: Raz Shauqeena Batrisyeya Razmi Shah

Data type: Table

Brief description: Contains species listed in the checklist with remarks of species with type locality in Malaysia and species that were originally described outside of the Central and Western Indo-Pacific. The species that were listed in the latter were regarded as questionable species. Information on the repository and voucher materials of species were listed. On a separate sheet is a list of species that were excluded from the previous checklist by Idris and Arshad (2013).

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Suppl. material 2: Occurrences of species [doi](#)

Authors: Raz Shauqeena Batrisyeya Razmi Shah

Data type: Table

Brief description: Contains the occurrences of the species with their location, depth and habitat. These data have been used to construct the bathymetry distribution map.

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