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Magelonidae Cunningham & Ramage, 1888 (Annelida, Polychaeta)—Worldwide Identification Keys and the Re-Establishment of *Maea* Johnston, 1865

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Abstract

Shovel head worms (Annelida: Magelonidae) have long presented challenges to polychaete systematists due to their unique morphology and relative uniformity. This has been compounded by a lack of taxonomic work across key biogeographic regions. However, over the past few decades, a series of studies has progressively addressed these issues, refining our understanding of magelonid taxonomy and making taxonomic revisions of several regions. Whilst a standardised framework for morphological characters across the family has been produced, a worldwide review of taxonomic knowledge has been warranted. The information is herein presented alongside the first worldwide identification key in over 50 years. The much-needed key is presented in two formats: a dichotomous key divided by marine realms, and a pictorial key based on putative morphological groups. The key is additionally supplemented by the provision of an interactive map providing type locality data and links to taxonomic works. The pictorial key provides additional support for the unique terminology historically applied to the group. The genus *Maea* Johnston, 1865 is herein re-established for fifteen species possessing long rounded prostomia without horns, but possessing mucronate chaetae of the ninth chaetiger, and lateral abdominal pouches.

Keywords: shovel head worms; taxonomy; *Maea*; *Magelona*; interactive type locality map

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1. Introduction

The Magelonidae Cunningham & Ramage, 1888 [1], a relatively small family within the marine polychaete annelids, derive their common name, "shovel head worms," from the distinctive morphology of their head region. This characteristic feature—a dorsoventrally flattened, spade-like head—is adapted for burrowing within soft substrates [2] (Figures 1 and 2A–I, see Abbreviations section). Alongside their characteristic head regions, they have two long feeding tentacles, termed palps (Figure 1C–E,I), which are uniquely papillated with finger-like projections used in the manipulation of food particles [3,4]. The palps are additionally distinctive in their insertion on the ventral side of the head, on either side of the mouth (Figure 1D). Members of the Magelonidae are elongate and relatively delicate polychaetes (Figure 1E), typically not exceeding 1 mm in width. Species have been documented to reach lengths of up to 15 cm consisting of as many as 170 chaetigerous segments [5,6]. Nevertheless, accurate assessments of the total body length are unknown

for numerous species due to frequent fragmentation during collection and handling [7]. Magelonid polychaetes typically exhibit a pale coloration ranging from white to pinkish orange [3,6], although the abdominal region may display a greenish colouration [8]. Several species are known to carry reddish-brown pigmentation, either as a band in the thoracic region (e.g., *Magelona alleni* Wilson, 1958, *Magelona equilamellae* Harmelin, 1964, *Magelona japonica* Okuda, 1937 or *Magelona cincta* Ehlers, 1908), or along the body (e.g., *Magelona fasciata* Mortimer, Kongsrud & Willassen, 2021 or *Magelona koreana* Okuda, 1937 [2,9–14] (see Figure 1G,H and Figure 14).

Magelonid polychaetes are predominantly documented in coastal habitats and across continental shelf regions, spanning temperate to tropical latitudes [15,16]. Although the majority of species are described from shallow waters, typically less than 20 m [6,16], several taxa have been identified from deeper marine environments: *Magelona bizkaiensis* (Aguirrezabalaga, Ceberio & Fiege, 2001) (1000–1040 m), *Magelona borowskii* (Fiege, Knebelsberger & Meißner in Meißner et al., 2023) (4124–4257 m), *Magelona minuta* Eliason, 1962 (1000 m; identification warrants verification, first author pers. comm.), *Magelona capax* Hartman, 1965 (4769 m) and *Magelona* spp. (3753–5000 m) [5,17–21]. Magelonids principally inhabit sandy and muddy substrates [7,8,16,22]. However, species-specific sediment preferences have been documented, indicating ecological variations within the family [3,23–27]. The presence of coarse sediments, such as gravel, may act as a limiting factor for distribution in certain taxa [8,27]. Small geographic areas can host a relatively high number of species [13,16,28], implying that global species diversity may be significantly underestimated [6]. Records of previously purported cosmopolitan species such as *Magelona papillicornis* Müller, 1858 [29] have been shown to be erroneous [5,30], with most magelonid species showing restricted distributions (first author, pers. comm.). However, *Magelona alleni* was shown to extend from Northern Europe to the Gulf of Guinea, off West Africa by morphological and molecular analyses [2].

Their distinctive morphology has frequently complicated efforts to relate magelonids to other annelid groups. Although previously placed with the Spioniform taxa [31–34] recent analyses suggest a placement alongside the Oweniidae Rioja, 1917 [35] and as a sister group to all other Annelida [36].

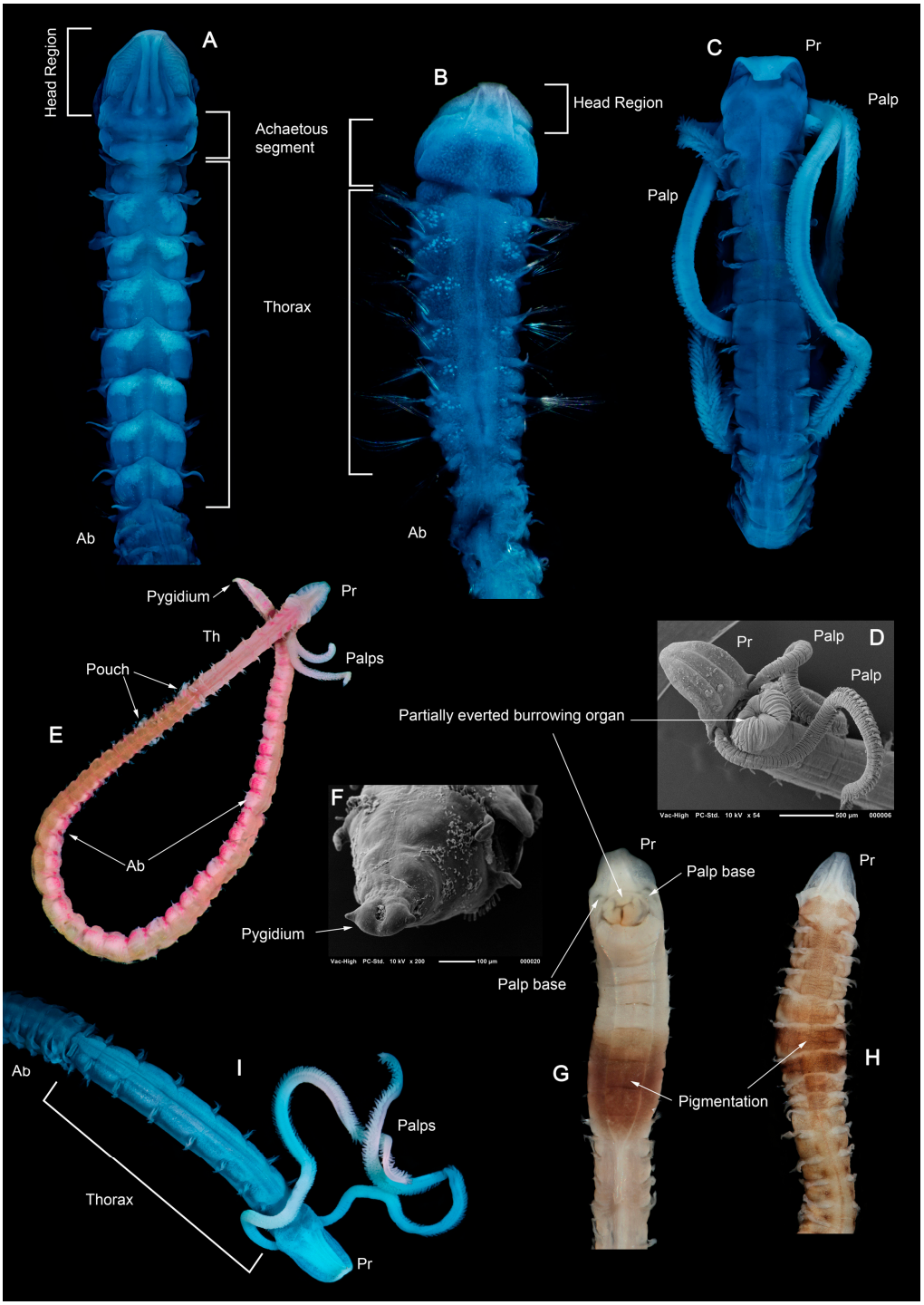


Figure 1. Magelonid morphology (see Table 1): (**A**) anterior end (thorax and first few abdominal chaetigers) of *Magelona capensis* (dorsal view); (**B**) anterior end (thorax and anterior abdomen) of an undescribed species of *Magelona* with eight thoracic chaetigers (dorsal view); (**C**) anterior fragment of *Magelona cincta*, both palps attached, prostomium tip curled upwards (dorsal view); (**D**) head region and first few thoracic chaetigers of *Maea johnstoni* showing partially everted burrowing organ and ventral attachment of the palps (ventral view); (**E**) whole specimen of *Maea brachypalpata*, both palps attached and showing abdominal lateral pouches (dorsal view); (**F**) posterior end of *Maea johnstoni* showing pygidium (posterior view, ventral side up); (**G**) anterior of *Magelona guineensis* showing pigment band of posterior thorax (ventral view); (**H**) anterior of *Magelona fasciata* showing stripy pigmentation along body (dorsal view); and (**I**) anterior end of *Maea johnstoni*, both palps attached (dorso-lateral view). (**A**–**C**,**I**), stained with methyl green; (**E**), stained with rose Bengal; (**D**,**F**), (SEM).

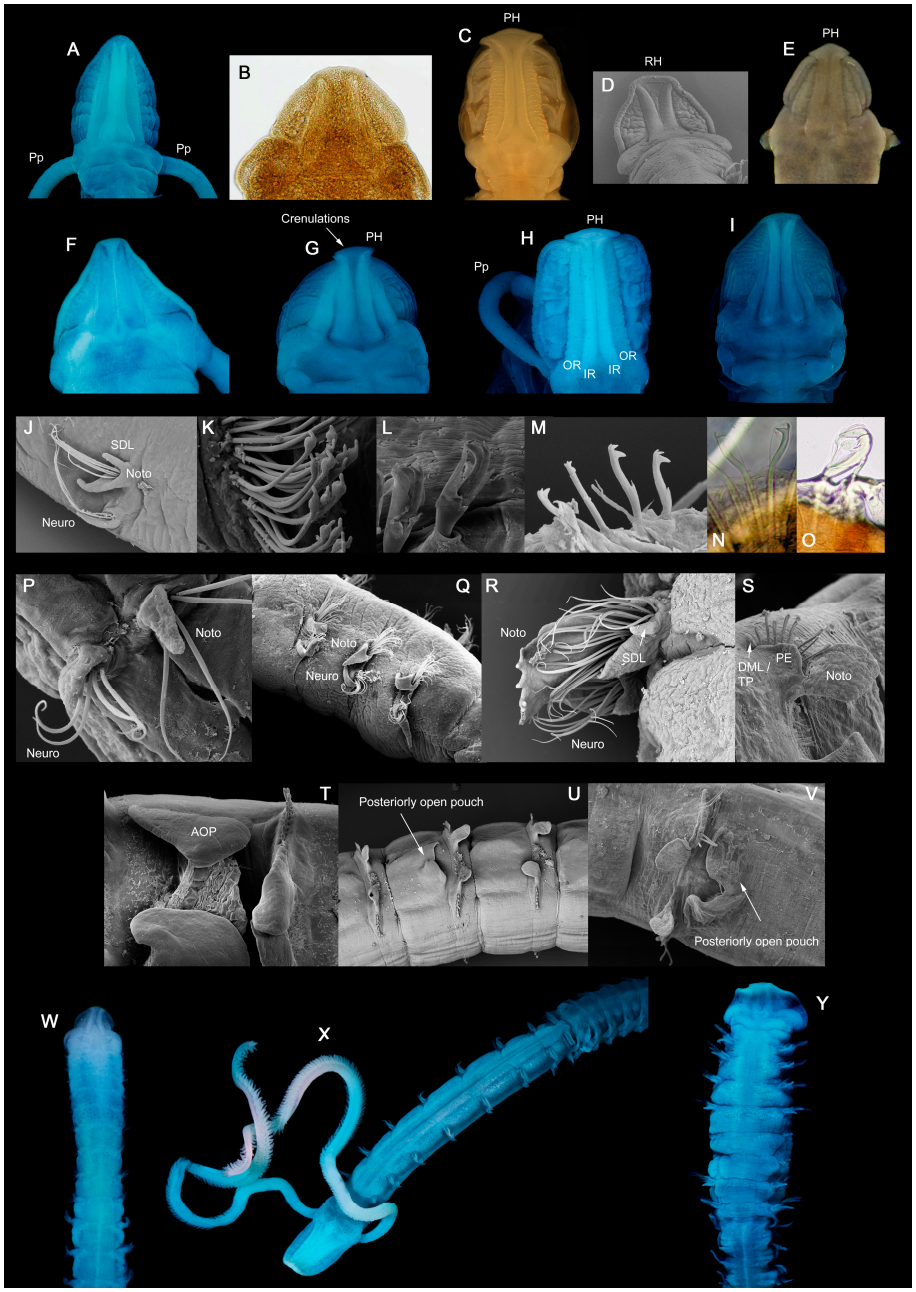


Figure 2. Main morphological characters used in identification of magelonids (see Table 1): (**A**–**I**) prostomia of varying length to width ratios (*Maea johnstoni*, *Magelona fauchaldi*, *Magelona pacifica*, *Magelona filiformis*, *Magelona annulata* (**top row**, **left to right**), *Magelona alleni*, *Magelona wilsoni*, *Magelona anuheone*, *Magelona capensis* (**second row**, **left to right**) (dorsal views). (**C**,**E**,**G**,**H**), with distinct prostomial horns, and (**D**), showing rudimentary horns. Anterior prostomial margin of G with minute crenulations; (**J**) thoracic capillary chaetae of *Magelona filiformis* (anterior view); (**K**) mucronate chaetae of the 9th chaetiger of *Maea johnstoni* (lateral view); (**L**–**O**) abdominal chaetae (tri-, poly-, and bidentate, and enlarged hooded hooks respectively, from *Maea johnstoni*, *Magelona fauchaldi* and *Magelona falcifera* (**left to right**)); (**P**) thoracic parapodium of *Magelona fauchaldi* (lateral view); (**Q**) first three thoracic chaetigers of *Magelona equilamellae* (lateral view); (**R**) parapodium of the 4th chaetiger of *Maea johnstoni* (anterior view); (**S**) abdominal notopodium of *Magelona boninensis* (posterior view); (**T**) anteriorly open abdominal pouch of *Maea johnstoni* (lateral view, ∑ of [5]); (**U**,**V**) posteriorly open abdominal pouches of *Maea johnstoni* (lateral views, C-shaped pouch of [5]); (**W**) example of a minute magelonid (*Magelona minuta*, dorsal view); (**X**) example of a moderate magelonid (*Maea johnstoni*, antero-lateral view) and (**Y**) example of a stout magelonid (*Magelona variolamellata*, dorsal view).

The family currently contains 83 extant species (plus at least 15 undescribed species, see [2,22]), and a single putative fossil species from the early Cambrian, *Dannychaeta tucolus* Chen et al., 2020 [37]. As it stands the family is monotypic, all species residing within *Magelona*. Several previously introduced genera have been synonymised: *Maea* Johnston, 1865 [38]; *Rhynophylla* Carrington, 1865 [39]; *Papillaria* Sveshnikov, 1963 (larval form) [40]; *Meredithia* Hernández-Alcántara & Solís-Weiss, 2000 [41] and *Octomagelona* Aguirrezabalaga, Ceberio & Fiege, 2001 [17,42–46]. Two phylogenetic analyses have been conducted on the Magelonidae [43,45], both confirming its monophyly but not making any further proposals (see also [46]). A forthcoming updated analysis [47] is likely to provide further clarification on the generic delimitations within the family; however, the genus *Maea* will be discussed below.

1.1. Overview of the Genus Maea Johnston, 1865

Dr. George Johnston, a physician and naturalist based in Berwick-upon-Tweed, is widely regarded as the earliest individual to document a species of shovel head worm. In his catalogue of the British non-parasitical worms in the collection of the British Museum, Johnston [38] described a species of worm which was "difficult to assign a place. . .in our present classifications". He coined the name *Maea mirabilis* stating that "in these doubts, there really seems no alternative but to make this genus the representative of a distinct family", proposing the family name Maeadae (a name that was never adopted, and later synonymised with Magelonidae Cunningham & Ramage, 1888 [1]). Johnson compiled his catalogue during the 1850s; however, he passed away in 1855 prior to its publication. Although his catalogue was published posthumously, its release in 1865 occurred a decade after his death. During the intervening period (1858), Dr Fritz Müller [29] introduced the name *Magelona papillicornis* for a shovel head worm species from the Island of St. Catherine (off Brazil) which shared some morphological similarities to *Maea mirabilis* in possessing a shovel-shaped prostomium and papillated palps. Whilst several subsequent authors utilised the name *Maea mirabilis* (e.g., [39,48,49], later publications [50] began using the name *Magelona papillicornis* for the species in Europe, despite the distance from its type locality in Brazil (based on the early concept of cosmopolitan polychaete species). This became the accepted name for the European magelonid species (e.g., [8,51–54]), and the genus *Maea* was subsequently synonymised. However, during a redescription of *M. papillicornis*, Jones [30] suggested that any records of the species from Europe should be referred to *Magelona mirabilis* (Johnston, 1865) [38], the species name which Johnston had erected but now referred to the genus of Müller (1858), *Magelona* [29]. This was later established in the redescription of *Magelona mirabilis* by Fiege et al. [5], alongside a description of a morphologically similar species *Magelona johnstoni* Fiege, Licher & Mackie, 2000. The latter authors additionally indicated that historic European records of *M. papillicornis* may in fact refer to either *M. mirabilis* or *M. johnstoni*. However, the status of *Maea* was not discussed at that time. The rationale for and the subsequent re-establishment of the genus will be presented below.

1.2. Principal Taxonomic Work on the Magelonidae

Key taxonomic contributions and revisions pertaining to the Magelonidae are summarised in Table 2 and Figure 3. Jones [55] produced the first comprehensive review of the group, proposing a suite of diagnostic morphological characters—subsequently refined by Jones in 1971 [56]—and developed the inaugural global identification key for the family. These publications established the benchmark for magelonid taxonomy and emphasised the significance of chaetal variation in species delineation. In the process of character standardisation, Jones introduced novel terminology, particularly in reference to parapodial

morphology. Later, Blake [57] expanded the diagnostic characters, incorporating additional morphological features such as the presence or absence of abdominal lateral pouches.

Building on the works of Jones [30,55,57,58] and Blake [57], Brasil [43] expanded the list of external morphological characters in an unpublished cladistic analysis of the group. The research recognised that magelonid species could be divided based on the division of the thorax into three blocks (chaetigers 1–7, 8 and 9). Building on this concept, Brasil [43] proposed taxonomists should fully illustrate and describe all magelonid thoracic chaetigers, something not routinely done previously.

A series of papers by Mortimer & Mackie [44,59,60] provided further proposals for the standardisation of morphological characters. They highlighted that the unique terminology introduced by Jones [55,57] had been inconsistently and inaccurately applied by various authors, and along with Rouse [34] proposed its discontinuation. Mortimer [7] and Mortimer et al. [45] addressed the issue by describing all morphological characters and character states, terminology which was later followed by Rouse et al. [6]. Following on from this, all major morphological characters that should be considered in magelonid species descriptions are highlighted in Table 1. Although recent magelonid taxonomic studies have moved away from the distinct terminology introduced by Jones [55,57], these terms appear in many historic species descriptions. Recognising the issue that this has created, Taylor & Mortimer [61,62] produced an illustrated guide for European species to emphasis these characters. A more comprehensive guide is in preparation [63].

1.3. Regional Taxonomic Works

The number of published works on the Magelonidae from the Temperate Northern Pacific, Temperate Northern Atlantic, and Western Indo-Pacific have been comparably greater than any other region [16]. Magelonid taxonomic works encompassing identification keys for each of the marine realms of Spalding et al. [64] are highlighted in Table 3 and include portions of the United States, Gulf of Mexico, Brazil, Europe, southern and western Africa, Japan, Vietnam, Thailand, Korea, the Western Indian Ocean, and the Seychelles. Despite this coverage, many existing keys require substantial revision to reflect current taxonomic understanding, and keys remain absent for many other biogeographic areas, underscoring the need for expanded and updated global taxonomic revisions.

Table 1. Standard morphological characters that should be considered in magelonid species descriptions.

Body Region/Character	Characters to Detail
Body proportions	Slender, moderate, stout species (Figure 2W–Y)
Prostomium	Shape, length to width ratio, presence/absence of horns (rudimentary or distinct), presence/absence of crenulations of the prostomial anterior margin, number of longitudinal dorsal ridges (1 or 2 pairs), prostomial markings, presence/absence of eyes (Figure 2A–I)
Burrowing organ	If fully or partially everted, shape; presence/absence of ridges inferiorly and superiorly (Figure 1D)
Palps	Number of papillae distally, medially and proximally. Size and shape of papillae, total palp length (in mm and chaetiger they reach), length of non-papillated region, palp thickness (slender to robust)
Achaetous region	Size (in comparison to chaetiger 1) (Figure 1A,B)
Chaetigers 1–7	Lamellar shape and position (in relation to chaetal bundle, e.g., postchaetal, subchaetal, prechaetal), whether margins are smooth, crenulate, or bi-lobed. Size variation between the notopodia and neuropodia, and along the length of the thorax. Presence/absence of superior dorsal lobes (Figure 2J,P–R)

Table 1. *Cont.*

Body Region/Character	Characters to Detail
Chaetiger 8	Variation to preceding chaetigers, particularly in the neuropodia.
Chaetiger 9	Lamellar shape, position and size in the notopodia and neuropodia and in comparison to preceding chaetigers. Presence/absence of superior dorsal lobes. Any constriction of the body between the two body regions (Figure 1I)
Thoracic chaetae	Uni- or bilimbate capillaries, morphological variation along the thorax or within a ramus. Variation in length of chaetae between rami and along the thorax. Whether limbations are smooth or irregular. Presence/absence of pennoned or mucronate chaetae of the 9th chaetiger (Figure 2J,K)
Ventral swellings	Presence/absence of swellings on ventral side of the thorax, shape and location (Figure 17)
Abdominal chaetigers	Chaetiger length in comparison to those of the thorax, any changes in length along the body
Abdominal parapodia	Lamellar shape and size, and variation between the two rami of a parapodium (equal vs. subequal). Presence/absence of lamellar basal constrictions, and postchaetal expansions behind chaetal rows. Presence/absence (and size) of triangular processes at the inner margins of chaetal rows (DML, VML of Jones [56]) (Figure 2S,U,V)
Abdominal chaetae	Dentition of abdominal hooded hooks (bi-, tri- or polydentate). Presence/absence of enlarged chaetae and their morphology (e.g., unidentate, bidentate, spines or hooks). Number of chaetae per ramus and orientation (unidirectional, or *vis-à-vis*). Presence/absence of smaller hooks adjacent to lamellae, and internal support chaetae (aciculae) (Figure 2L–O,S)
Lateral pouches	Presence/absence of abdominal pouches, and morphology (e.g., anteriorly or posteriorly open). Pouch location, e.g., paired (on both sides of the body), or unpaired (alternating from one side of the body to the other) and exact location along the body (e.g., consecutive or alternating segments) and chaetiger of first occurrence (e.g., anterior abdomen or extreme posterior end). Any morphological differences such as medial splits (Figures 1E and 2T–V)
Pygidium	Description of the pygidial cirri and their number (Figure 1E,F)
Colour	Colour, presence/absence of pigmentation (Figure 1G,H), presence/absence of speckled areas on the dorsal or ventral surface (e.g., patches or transverse stripes) (Figure 1A,B). Methyl Green staining pattern (Figure 2W–Y)
Tube	Presence/absence of sediment tube (Figure 14)
Habitat	Depth, sediment type

1.4. Taxonomic Issues Within the Magelonidae

Misidentification of magelonid polychaetes has been documented by multiple authors [5,13,14,65], reflecting the persistent challenges in accurate species delineation. Contributing factors include the morphological uniformity across the family, the use of unique taxonomic terminology, and the family's monotypic status. However, the most significant impediment to reliable identification stems from the lack of taxonomic research in many regions. Inadequate regional taxonomic knowledge and the absence of localised identification keys frequently cause reliance on resources developed for other geographic areas—for example, Day's *Polychaeta of Southern Africa* [66] is still widely applied beyond its intended scope [14,67]. This practice often results in erroneous species assignments and artificially inflated distribution ranges, with such inaccuracies commonly reproduced in subsequent surveys. Improving the accuracy of magelonid identification is essential, particularly in ecological and monitoring surveys, which often inform conservation decisions,

guide marine resource management, and contribute to the understanding of the impacts of global environmental change [14,68].

Notably, nearly a quarter of all described magelonid species predate the seminal revisions by Jones [55,57] (Figure 3). These early descriptions frequently lack key morphological features (Table 1) and require much needed redescription. However, despite the importance of redescriptions in facilitating the recognition of novel taxa, they are often omitted from taxonomic practices.

Although significant progress has been made in magelonid taxonomy, further research is still required to address the remaining gaps, particularly in regions such as South America, eastern and western Africa, southern and southeastern Asia, and Oceania. The only global key to magelonid species—published by Jones in 1963 [55]—included just 21 species known at the time, compared to over 90 recognised today (Figure 3). A major update to cover all known species and to reflect all morphological characters is therefore included herein.

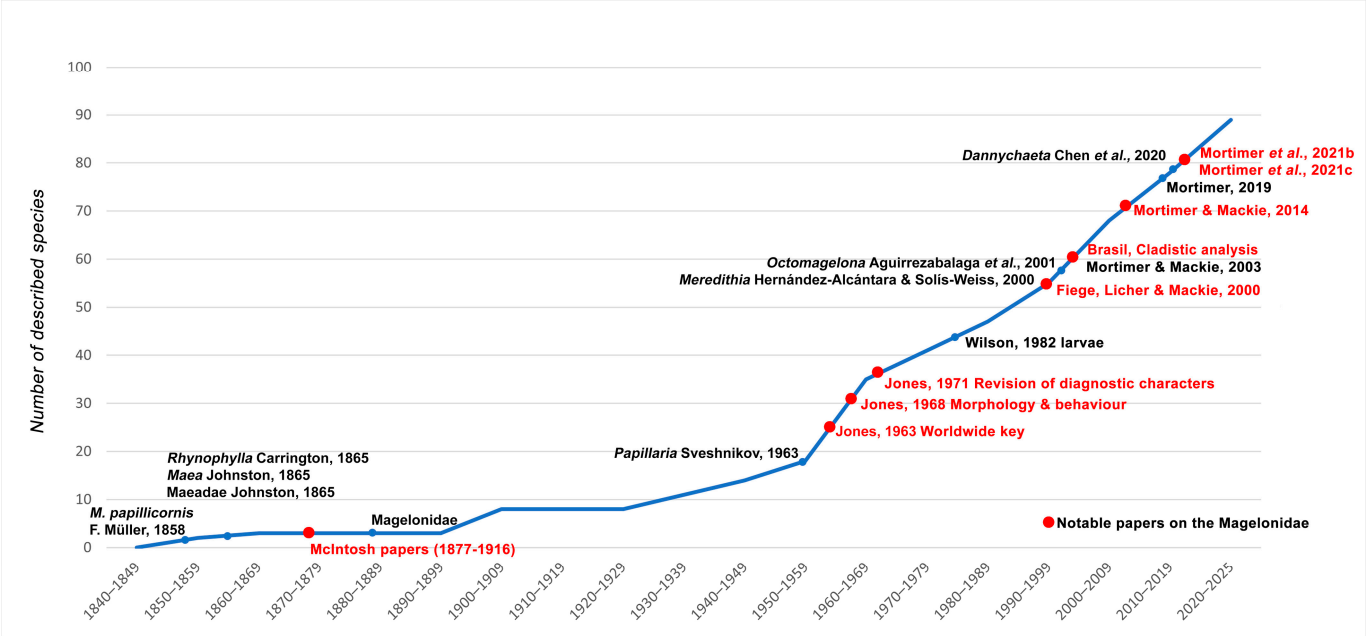


Figure 3. The cumulative number of described species within the Magelonidae, charting notable published works and key taxonomic dates for the family [2,3,5,7,17,29,37–41,43,45,55,57,59,69,70].

Table 2. Major taxonomic works and decisions on the Magelonidae.

Year	Notes	Reference
1858	First formally described magelonid species	*Magelona papillicornis* F. Müller, 1858 [29], see Figure 4
1865	*Maea mirabils* described from the UK. Maeadae proposed but never adopted	*Maea* Johnston, 1865 Maeadae Johnston, 1865 [38]
1865	*Rhynophylla bitentaculata* described (later synonymised [42], accepted as *Maea mirabilis*)	*Rhynophylla* Carrington, 1865 [39]
1888	Family name Magelonidae introduced	Cunningham & Ramage, 1888 [1]

Table 2. *Cont.*

Year	Notes	Reference
1959	*Papillaria* introduced for larval form (later synonymised [42])	*Papillaria* Sveshnikov, 1959 [40]
1963	Preliminary revision of the family, introduction of possible diagnostic characters, first worldwide key of the family	[55]
1971	Revision of diagnostic characters	[56]
2000	*Meredithia* introduced (later synonymised [44,59])	*Meredithia* Hernández-Alcántara & Solís-Weiss, 2000 [41]
2000	Recognition of pouch morphologies	[5]
2001	*Octomagelona* introduced (later synonymised [45])	*Octomagelona* Aguirrezabalaga, Ceberio & Fiege, 2001 [17]
2003	First cladistic analysis (unpublished) and advancement of external morphological characters. *Meredithia* and *Octomagelona* deemed to be paraphyletic	[43]
2003	Further proposals on the standardisation of morphological characters utilised in magelonid species descriptions. Discussions on *Meredithia* and *Octomagelona*	[59]
2014	Recognition of varying pouch morphologies (five groups based on morphology, location and pattern)	[3]
2020	*Dannychaeta tucolus*, putative fossil species described	*Dannychaeta* Chen et al., 2020 [37]
2021	First published account of phylogenetic hypotheses within Magelonidae, synonymising *Octomagelona* with *Magelona*. Several key features for species descriptions provided	[45]

Table 3. Taxonomic works containing magelonid identification keys for each marine realm. Major taxonomic works highlighted in bold.

Marine Realm of Spalding et al. [64]	Region Covered by Taxonomic Work	Publication Reference
Temperate Northern Pacific	Japan	[11,71,72]
	Korea	**[73]**
	California	**[57]**
Tropical Eastern Pacific	Mexican Pacific	[15,41]
Temperate South America	Brazil	**[74]**
Tropical Atlantic	Bahamas	[55]
	NE USA	[20]
	Gulf of Mexico	**[22]**
	West Africa	**[2]**
Temperate Northern Atlantic	Europe	[5]
	Gulf of Mexico	**[15,22,41]**
	Portugal	[75]
	East Coast USA	**[28]**
	Europe	**[13]**

Table 3. *Cont.*

Marine Realm of Spalding et al. [64]	Region Covered by Taxonomic Work	Publication Reference
Temperate South Africa	southern Africa	[14,66,76]
Western Indo-Pacific	Thailand	[77]
	Seychelles	[44]
	Western Indian Ocean	[25,78]
Central Indo-Pacific	Vietnam	[60,79]
Eastern Indo-Pacific	Hawaii, Easter Island, Guam	[80]
Temperate Australasia	New South Wales	[58]

2. Materials and Methods

Magelonidae specimens were observed from numerous museum collections including Amgueddfa Cymru–Museum Wales, American Museum of Natural History, Smithsonian National Museum of Natural History, and Museum of Nature Hamburg. Images of fluid-preserved specimens were taken using a Canon EOS 80D (24-megapixel, Canon, Norwich, UK) DSLR camera attached to a Leica Z6 APO Macroscope with trinocular head. All images were stacked using Helicon Focus version 8.01 extended depth of field software (Helicon Soft Ltd., Kharkov, Ukraine), with calibrated scale bars added using Adobe Photoshop version 23.1.1.

An interactive web-based map was developed in R using RStudio (Version 4.4.0), with R Shiny providing the reactive user interface and leaflet enabling interactive geospatial visualisation. Type locality data were imported from an Excel file using readxl and cleaned using dplyr and tidyr, including numeric coercion of coordinates, standardisation of categorical fields and normalisation of morphological group by separating multiple group entries. Marine realm polygons from Spalding et al. [64] were incorporated as ESRI shapefiles and processed with the sfpackage. Marine realms were displayed as semi-transparent polygons, while type localities were shown as point markers coloured by marine realm using a ColorBrewer palette. User-controlled filters for species, marine realm and morphological group updated the displayed records dynamically. Interactive pop-ups provided associated metadata with each point and links to external references and GBIF records where available. The application was deployed using Posit, which allowed for browser-based access.

3. Results

3.1. Main Morphological Characters of the Magelonidae

As noted above several authors have noted key morphological features used in identification of magelonid species [7,16,45,55–57]. These will be discussed below, with further details on all morphological characters available in [7,45] (see Table 1).

3.1.1. Body

The magelonid body (Figure 1) is divided into three main regions: the head, thorax, and abdomen. A noticeable constriction typically marks the thoracic/abdominal boundary (Figure 1I), which is further distinguished by a transition in chaetal types—from capillary chaetae (Figure 2J,K,P) in the thorax to hooded hooks (Figure 2L–O,U) in the abdomen. While the total body length is likely species-specific, the frequent use of incomplete specimens in the description of species makes it an unreliable character for identification. However, general body size, breadth and proportions can be indicative of species, e.g., slender to stout species (Figure 2W–Y). Some species such as *Magelona pygmaea* Nateewathana

& Hylleberg, 1991 [77] rarely attain a width greater than 0.5 mm, whilst others such as *Magelona armatis* Taylor, Mortimer & Jimi, 2022 [72] can reach 1.5 mm.

3.1.2. Head Region

The head region, comprising the prostomium and peristomium, plays a key role in the initial recognition of species. Important diagnostic characters are the shape, the ratio between length and width (Figure 2A–I), the presence/absence of prostomial horns (rudimentary or distinct, Figure 2C–E,G,H) and/or crenulations of the anterior prostomial margin (Figure 2G). Other distinguishing features include the number of dorsal muscular ridges—either one (Figure 2B) or two pairs (Figure 2C)—and the presence or absence of prostomial markings on either side of these ridges (Figure 2A,C,G–I). As previously noted, the long papillated palps are inserted ventrally, on either side of the mouth (Figure 1D,I). The number of papillae along the length of the palp from proximal to distal tip is variable between species.

3.1.3. Thorax

The thorax includes an achaetous region located immediately behind the head, followed by either eight (Figure 1B) or nine chaetigers (Figure 1A). Parapodia are biramous, each consisting of two branches, a notopodium and a neuropodium (Figure 2J,P–R). Within the Magelonidae, parapodial structures are usually termed lamellae (flattened, often foliaceous structures), and their dimensions, morphology, and placement—whether prechaetal, subchaetal, or postchaetal—play a crucial role in distinguishing between species (Figure 2J,P–R). As previously mentioned, variation in lamellar morphology throughout the thorax is an important character, particularly differences pertaining to chaetigers eight and nine [43]. In addition, differences between the lamellae of the notopodia and neuropodia contribute to species-level distinctions. For example, the lamellae of both rami may be similar (Figure 2P) or vary from one another (Figure 2J,R). The margins may be smooth (Figure 2Q), crenulate (Figure 2R) or bi-lobed (e.g., *Maea obockensis*). Superior dorsal lobes may be entirely absent (Figure 2P,Q) or occur on some (Figure 2J,R) or all thoracic chaetigers. Mortimer et al. [45] provides a full account of the parapodial structures and their variations.

3.1.4. Abdomen

The magelonid abdomen is elongated, consisting of numerous chaetigers and ending with the pygidium (Figure 1E,F). Parapodia are biramous (Figure 2S,U,V), and with few exceptions (e.g., *Magelona alleni*, see group 5 below) their lateral lamellae are symmetrical between both rami. The shape and size of parapodial lamellae are important in distinguishing between species. Additionally, the presence or absence of specific morphological characteristics should be carefully examined, including the postchaetal expansion of lamellae posterior to the chaetal rows (Figure 2S), the occurrence of triangular processes at the outer margins of chaetal rows (DML and VML of Jones [56] (Figure 2S), and the presence/absence of basal constrictions of the lamellae (Figure 2S). A notable feature of the abdominal region of many magelonid species are lateral abdominal pouches (recorded in ~30 species), pocket-like protrusions of the body wall situated between parapodia (Figure 2T–V). Early species descriptions frequently neglected the presence of these structures or failed to recognise the value of thorough examination. Fiege et al. [5] identified two distinct pouch morphologies—∑ (Figure 2T) and C-shaped (Figure 2U,V)—and were the first to present Scanning Electron Microscopy images of these features. Building on this, Mortimer [78] proposed that greater variation existed and recommended discarding the terminology of Fiege et al. [5] to allow for broader morphological classification. Subsequently, Mortimer & Mackie [3] conducted a comprehensive review of pouch morphologies, cat-

egorising all known magelonid species into five distinct groups based on pouch shape, position, and location pattern.

3.1.5. Chaetae

Chaetal morphology in both the thoracic (Figure 2J,K,P–R) and abdominal regions (Figure 2L–O) serves as a key diagnostic feature. The thoracic region carries capillary chaetae only, though in certain species like *M. johnstoni*, those of the ninth chaetiger are distinctly specialised (mucronate, Figure 2K, see discussions around *Maea* and group 1 below), whilst in others, such as *Magelona hartmanae* Jones, 1978 [58], they may be pennoned (see group 4 below). Abdominal chaetae consist of hooded hooks that may be bi-, tri-, or polydentate in form (Figure 2L–M). Additional key features include possession of internal support chaetae (aciculae), the presence and morphological characteristics of enlarged chaetae (Figure 2O), and the presence of smaller hooks situated at the base of the lateral lamellae (e.g., *Magelona filiformis*, see group 4). A recent review of magelonid chaetae is provided by Müller & Bartolomaeus [81].

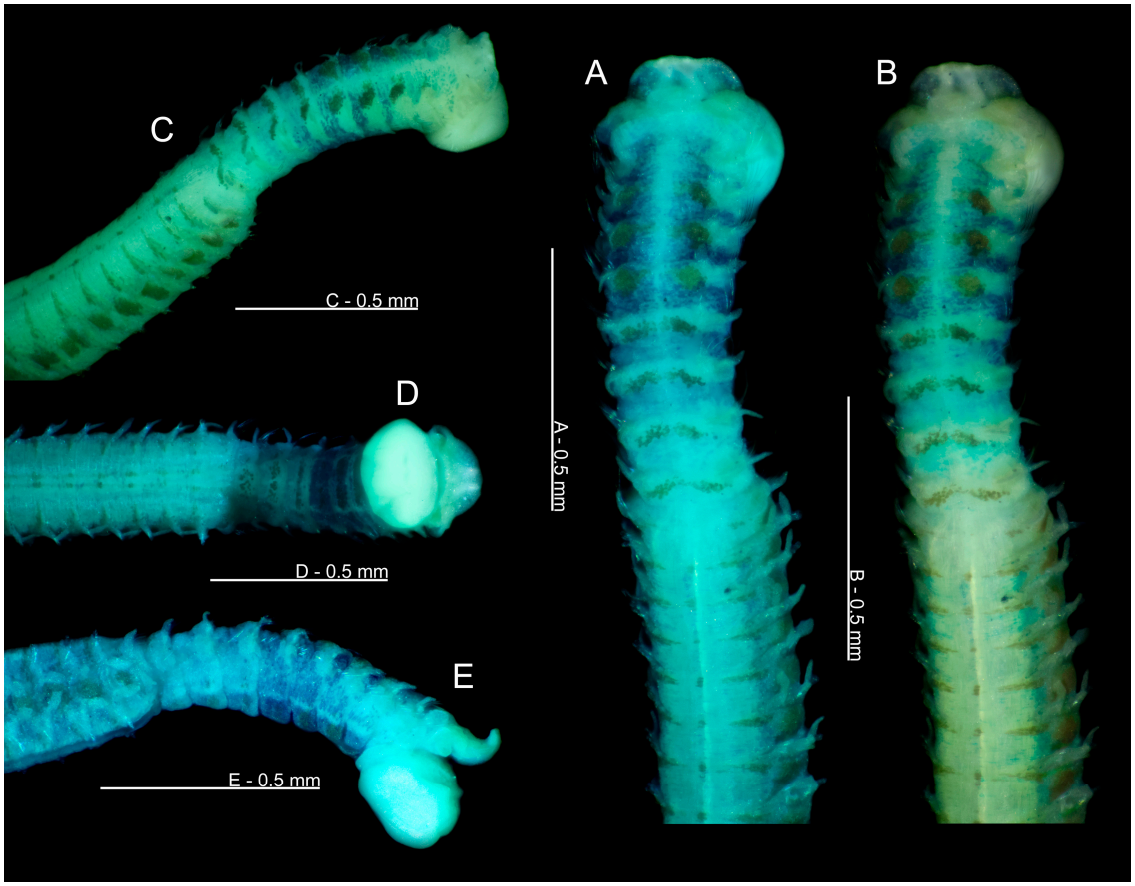


Figure 4. *Magelona papillicornis* F. Müller, 1858 from Maciel, Baía de Paranaguá, Paraná, Brazil (NMW.Z.1998.032.0007). (**A**–**E**) Anterior, burrowing organ partially everted, prostomium tip curled upwards (dorsal, dorso-lateral, ventral and lateral views respectively). Stained with Methyl Green, (**B**,**C**) stain dissipating.

TAXONOMIC ACCOUNT

Family MAGELONIDAE Cunningham & Ramage, 1888

Genus *Magelona* F. Müller, 1858, emended

Type species: *Magelona papillicornis* F. Müller, 1858 by monotypy

Gender: Feminine

Figure 4

Diagnosis: Body long, slender to stout, tapering posteriorly; divided into a head region (prostomium and peristomium), achaetous region, a thorax of eight or nine chaetigers, and an abdomen of numerous chaetigers. Dorsoventrally flattened prostomium, of varying shapes and sizes, with or without prostomial horns; anterior margin smooth or crenulate. One or two pairs of longitudinal prostomial ridges, with or without prostomial markings either side. Pair of long, papillose palps inserted ventrolaterally at posterior margin of the prostomium, on either side of the mouth. Parapodia biramous, with various combinations of lamellae or lobes. Thoracic chaetigers with limbate capillary chaetae only; those of chaetiger nine may be pennoned. Abdominal chaetae hooded hooks which may be bi-, tri- or polydentate; *vis-à-vis*. Hooks may be similar or vary in size; support chaetae may be present or absent. Lateral abdominal pouches may be absent; however, when present, are posteriorly open. Pygidium with 2 anal cirri.

Remarks: Several authors have provided amendments to the diagnosis of the genus (e.g., [5,30,45]). A forthcoming analysis [47] is likely to provide further generic delimitations within the family.

Genus *Maea* Johnston, 1865, emended
Type species: *Maea mirabilis* Johnston, 1865 by monotypy
Gender: Feminine
Figure 5

Diagnosis: Body long and moderately slender; divided into a head region (prostomium and peristomium), achaetous region, thorax of nine chaetigers, and an abdomen of numerous chaetigers. Long, dorsoventrally flattened prostomium, rounded without prostomial horns, anterior margin smooth. Two pairs of longitudinal prostomial ridges surrounded by distinct prostomial markings. Pair of long, papillose palps inserted ventrolaterally at posterior margin of the prostomium, on either side of the mouth. Parapodia biramous, those of the thorax bearing foliaceous notopodial lamellae in a postchaetal position, margins of which may be smooth, crenulate, pectinate or bi-lobed. Superior dorsal lobes may be entirely absent, present on chaetigers 1–8 or absent from anterior thorax. Thoracic neuropodial lamellae generally more slender; prechaetal, subchaetal or postchaetal in position. An additional neuropodial lobe may be present on thoracic chaetigers. Lamellae of chaetiger nine shorter than preceding chaetigers, margins of which may be smooth or crenulate, but without superior dorsal lobes. Abdominal parapodia biramous, generally spatulate with a slight basal constriction. Triangular processes at the end of chaetal rows absent or present. Postchaetal expansion of lamellae posterior to chaetal rows absent or present. Thoracic chaetigers with limbate capillary chaetae only; those of chaetiger nine mucronate. Abdominal chaetae hooded hooks of a similar size, bi- or tridentate; unidirectional or *vis-à-vis*. Lateral abdominal pouches present; anteriorly and posteriorly open, or the latter form only. Pygidium with two anal cirri.

Remarks: In both phylogenetic analyses carried out on the Magelonidae [43,45] the type species of the genus *Maea*, *M. mirabilis* Johnston, 1865, appears in a clade clearly different from the one including the type species of *Magelona*, *M. papillicornis* F. Müller, 1858 (see Figure 6). The two type species vary greatly in terms of size, prostomial shape, presence/absence of abdominal lateral pouches, and parapodial lamellar shape and position (see Table 4, Figures 4 and 5). Several authors have previously discussed a suite of species under the name the '*Magelona mirabilis* group' [5,28,45,59] for magelonid species possessing specialised chaetae of the ninth chaetiger, rounded long prostomia without prostomial horns, and possessing lateral abdominal pouches. Given the major morphological differences between the two type species, and the results of [43,45], Johnston's *Maea* is herein re-established for 15 species: *Maea conversa* (Mortimer & Mackie, 2003); *Maea crenulata* (Bolívar & Lana, 1986); *Maea debeerei* (Clarke, Paterson, Florence, & Gibbons, 2010);

Maea johnstoni (Fiege, Licher & Mackie, 2000); *Maea mirabilis* Johnston, 1865; *Maea obockensis* (Gravier, 1905) [82]; *Maea pectinata* (Nateewathana & Hylleberg, 1991); *Maea parochilis* (Zhou & Mortimer, 2013) [83]; *Maea riojai* (Jones, 1963); *Maea sacculata* (Hartman, 1961) [84]; *Maea sachalinensis* (Buzhinskaja, 1985) [85]; *Maea tinae* (Nateewathana & Hylleberg, 1991); *Maea brachypalpata* (Mortimer, Blake & Harrendence, 2021); and two unnamed species (*Maea* spp. A & B) of Uebelacker & Jones [22] (Figure 5 and Figure 10). A pictorial key to all species within *Maea* is provided by Mortimer et al. [28].

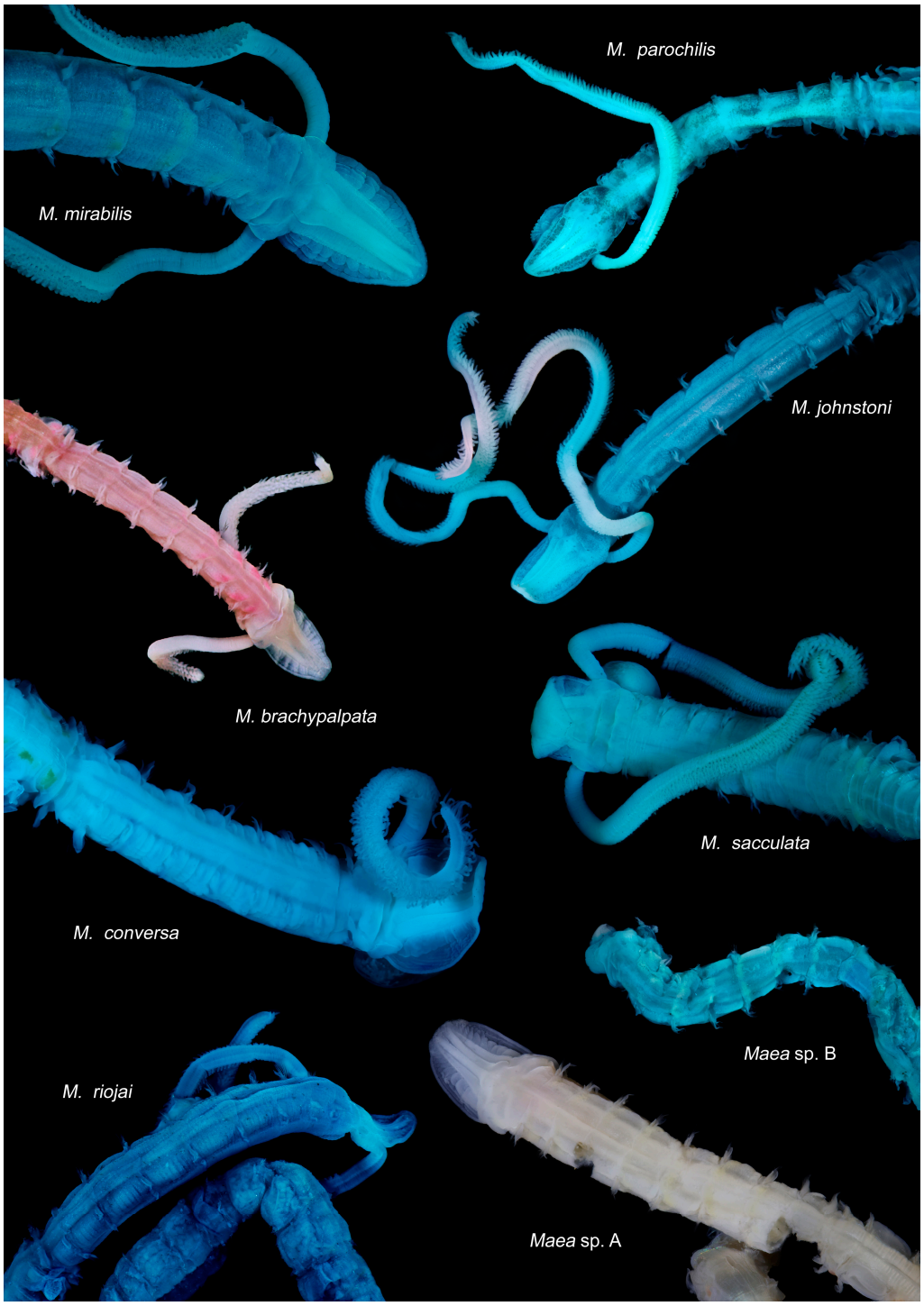


Figure 5. Nine of the fifteen species included in *Maea* Johnston, 1865.

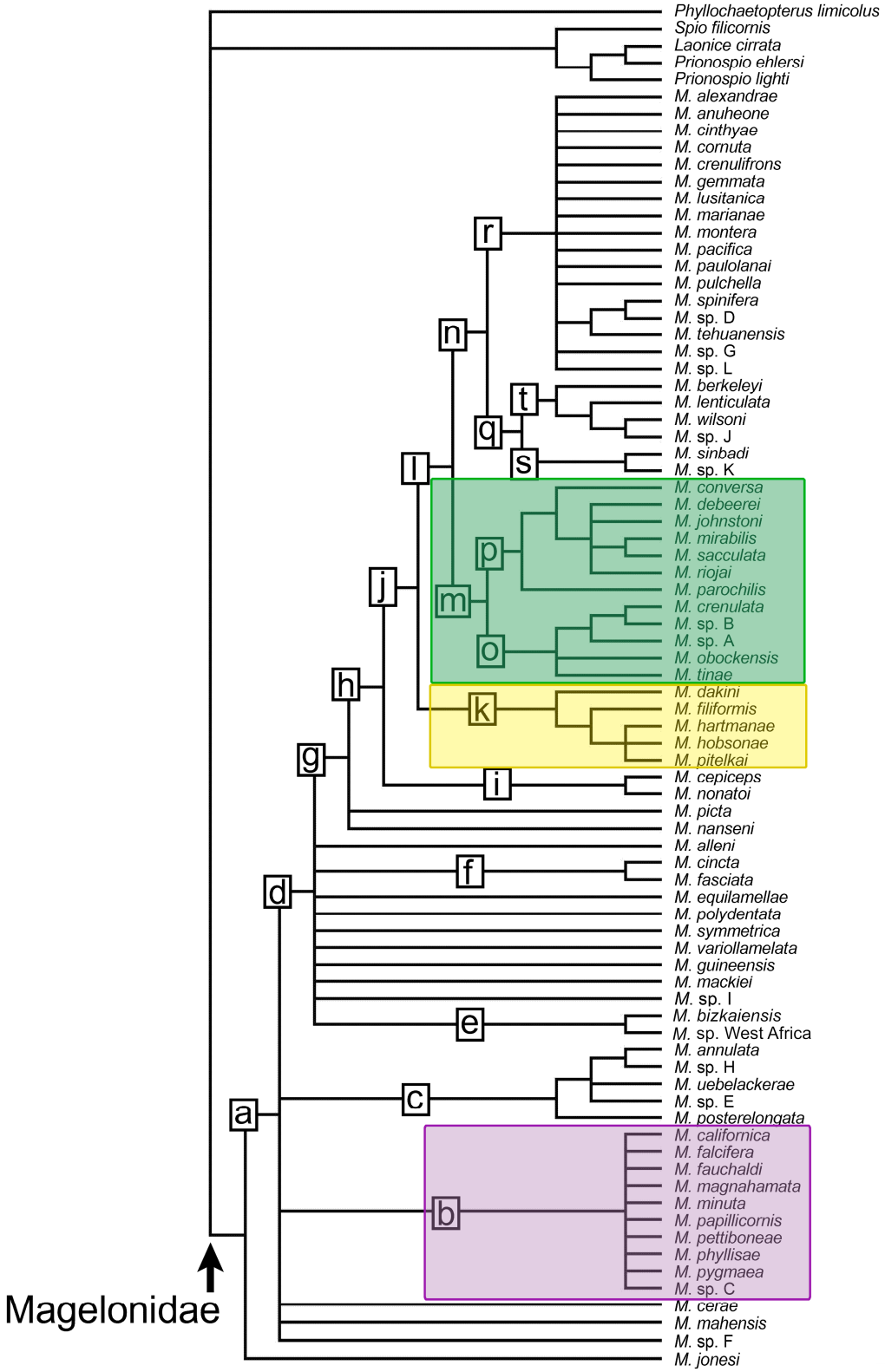


Figure 6. Phylogenetic results from Mortimer et al. [45] highlighting clade b containing the type species of *Magelona*, *Magelona papillicornis* F. Müller, 1858, and clade m containing the type species of *Maea*, *Maea mirabilis* Johnston, 1865. (N.B. the analysis excluded *M. sachalinensis* and *M. pectinata* which warranted redescriptions, and *M. brachypalpata* which was described after the analysis was published). Additionally highlighting clade k of the same analysis (adapted from Mortimer et al. [45]).

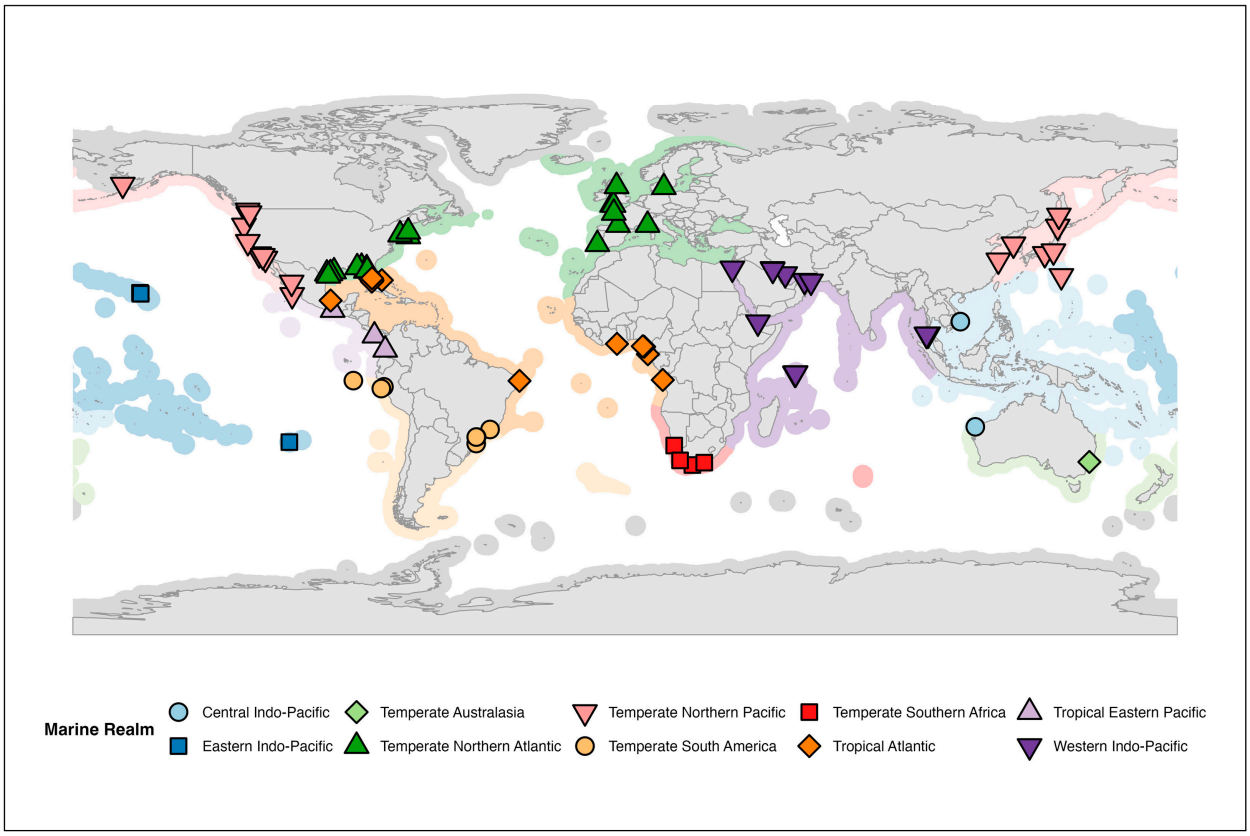
Table 4. Morphological differences between the type species of *Magelona*, *Magelona papillicornis* F. Müller, 1858, and the type species of *Maea*, *Maea mirabilis* Johnston, 1865.

Morphological Character	*Magelona papillicornis* F. Müller, 1858	*Maea mirabilis* Johnston, 1865
Size	Minute, slender species	Moderate species, fairly robust
Prostomial shape	Prostomial width similar to length, anterior prostomial margin straight. One pair of dorsal muscular ridges, no distinct prostomial markings either side of ridges	Longer than wide, rounded with smooth rounded anterior prostomial margin. Two pairs of distinct dorsal muscular ridges. Obvious prostomial markings either side of ridges
Thoracic lamellae	Notopodia similar to neuropodia and similar across entire thorax. Lamellae postchaetal	Notopodia larger than neuropodia. Notopodial lamellae postchaetal to subchaetal; neuropodial lamellae prechaetal to postchaetal in position. Chaetigers 1–8 similar, chaetiger 9 different
Thoracic chaetae	Simple capillary chaetae from chaetigers 1–9	Capillary chaetae from chaetigers 1–8, those of chaetiger 9 mucronate
Abdominal pouches	Absent	Present
Group	**Group 2, Diminutive group**	**Group 1, *Maea* Johnston, 1865**

Worldwide Identification Key to the Magelonidae

To address ongoing taxonomic challenges within the Magelonidae, this work presents the first comprehensive global identification key since that of Jones [55]. The key encompasses all formally described magelonid species, as well as the undescribed taxa documented by Uebelacker & Jones [22]. It is provided in two complementary formats: (1) a dichotomous key organised according to the marine realms of Spalding et al. [64], and (2) a pictorial key. For the latter key, all species have been divided into one of nine putative groups, based on a set of morphological characters: (1) overall body size; (2) prostomial morphology, including the presence or absence of prostomial horns; (3) lamellar morphology of chaetigers 1–8; (4) lamellar morphology of chaetiger 9; (5) morphology of abdominal lamellae; (6) chaetal types; and (7) the presence or absence of abdominal lateral pouches. Both identification keys follow the terminology and standardised morphological characters implemented by Mortimer [7] and Mortimer et al. [45].

To support the identification keys, type locality data for all known species, including sediment type and depth data, are provided in Table A1 (Appendix A) and shown in Figure 7. The type localities can be additionally viewed online, via the interactive map (https://katemortimer.shinyapps.io/MagelonidaeTypeLocalities/, created on 16 November 2025, accessed on 1 February 2026) (searchable by species, marine realm or morphological group). Note that only data from the original species descriptions has been incorporated to minimise the risk of data spread from erroneous identifications. However, links to GBIF records are included on the interactive map as well as comments on potentially incorrect records. The maps reveal numerous regions requiring taxonomic reassessment, which have a high likelihood of the presence of undescribed magelonid species. Users are advised to report specimens that do not conform to any currently recognised species to appropriate taxonomic specialists, thereby facilitating necessary revisions. Additionally, the identification keys clearly indicate all species that warrant formal redescription.



Central Indo−Pacific
Magelona crenulifrons
Magelona jonesi
Magelona lenticulata

Eastern Indo−Pacific
Magelona alexandrae
Magelona anuheone
Magelona cinthyae
Magelona paulolanai

Temperate Australasia
Magelona dakini

Temperate Northern Atlantic
Maea brachypalpata
Maea johnstoni
Maea mirabilis
Maea sp.
Magelona alleni
Magelona americana
Magelona bizkaiensis
Magelona equilamellae
Magelona filiformis
Magelona lusitanica
Magelona minuta
Magelona pettiboneae
Magelona rosea
Magelona sp.
Magelona uebelackerae
Magelona wilsoni

Temperate Northern Pacific
Maea parochilis
Maea sacculata
Maea sachalinensis
Magelona agoensis
Magelona alata
Magelona alba
Magelona armatis
Magelona berkeleyi
Magelona boninensis
Magelona californica
Magelona cerae
Magelona hartmanae
Magelona hobsonae
Magelona japonica
Magelona koreana
Magelona longicornis
Magelona marianae
Magelona pitelkai
Magelona spinifera

Temperate South Africa
Maea debeerei
Magelona capensis
Magelona cincta
Magelona ekapa

Temperate South America
Maea crenulata
Magelona annulata
Magelona borowskii
Magelona nonatoi
Magelona papillicornis
Magelona phyllisae
Magelona posterelongata
Magelona variolamellata

Tropical Atlantic
Maea riojai
Magelona capax
Magelona fasciata
Magelona guineensis
Magelona mackiei
Magelona nanseni
Magelona picta
Magelona polydentata
Magelona sp.

Tropical Eastern Pacifi
Magelona magnahamata
Magelona pacifica
Magelona tehuanensis

Western Indo−Pacific
Maea conversa
Maea obockensis
Maea pectinata
Maea tinae
Magelona cepiceps
Magelona cornuta
Magelona falcifera
Magelona fauchaldi
Magelona gemmata
Magelona heteropoda
Magelona kamala
Magelona mahensis
Magelona methae
Magelona mickminni
Magelona montera
Magelona noppi
Magelona petersenae
Magelona pulchella
Magelona pygmaea
Magelona sinbadi
Magelona symmetrica

Figure 7. Marine realms utilised in the dichotomous and pictorial identification keys herein (modified from Spalding et al. [64]) and including type localities for all described magelonid species and those of Uebelacker & Jones [22]. Data for each species are included in Table A1 and can be additionally found on the interactive map. Map created in R (R Core Team, 2024) using the packages sf, ggplot2 and rnaturalearth. Country boundaries were obtained from Natural Earth (public domain; https://www.naturalearthdata.com, accessed on 1 February 2026), (See https://katemortimer.shinyapps.io/MagelonidaeTypeLocalities/, created on 16 November 2025, accessed on 1 February 2026).

Users are suggested to consult both identification keys to cross-reference and validate preliminary species determinations. In accordance with standard taxonomic practice, detailed sources—such as original species descriptions and subsequent redescriptions—should be reviewed to confirm the accuracy of identifications. The species authorities and full references for each species are given for all species included in the key. The interactive map incorporates direct links to key taxonomic publications, including original species descriptions and subsequent redescriptions. Given the documented evidence for the distribution of some species overlapping several marine realms (e.g., *Magelona alleni* spanning Temperate Northern and Tropical Atlantic), users are advised to consult adjacent realms within the dichotomous key. Nonetheless, current evidence suggests that the majority of magelonid species exhibit geographically restricted distributions (first author pers. comm.).

Key to adult specimens of known Magelonidae species by marine realms of Spalding et al. [64]) (type localities/confirmed locations given in brackets; full descriptions of characters can be found in Mortimer et al. [45]), and images of example morphological characters are included in Figures 1 and 2 herein.

Temperate Northern Pacific

1. Prostomium with distinct prostomial horns (N.B. damage to the prostomia may cause "rudimentary horns" to look more prominent) —2
   Prostomium without prostomial horns, or with "rudimentary" horns/squared anterior margin —10
2. Deep purple/brown pigment band between chaetigers 5 and 8 (N.B. pigment band can fade after preservation)
   —*Magelona japonica* Okuda, 1937 (Korean Archipelago, Japan)
   No distinct band of pigment observed on thoracic chaetigers (N.B. pigment may be present along the body) —3
3. Abdominal parapodia sub-equal, those of the neuropodia being somewhat smaller than those of the notopodia (~1/3 of the size) —*Magelona koreana* Okuda, 1937 (Korean Archipelago, in need of redescription, see note below about pigmentation)
   Abdominal parapodia approximately equal. No distinct pigmentation along body. —4
4. Thoracic notopodial lamellae slender —5
   Thoracic notopodial lamellae foliaceous —6
5. Prostomium length greater than width with triangular anterior margin, abdominal hooded hooks tridentate
   —*Magelona alba* Taylor, Mortimer & Jimi, 2022 (Japan)
   Prostomium length similar to width, distinct prostomial horns with a squared anterior margin, abdominal hooks bidentate
   —*Magelona cerae* Hartman & Reish, 1950 [86] (NW coast of USA, in need of redescription)
6. Upper margins of notopodial thoracic lamellae distinctly crenulate
   —*Magelona marianae* Hernández-Alcántara & Solís-Weiss, 2000 (Pacific coast of Mexico)
   Upper margins of notopodial thoracic lamellae appearing smooth, or with light crenulations only —7

7. Hooded hooks of the abdominal region bidentate —8
   Hooded hooks of the abdominal region tridentate —9
8. Large spines present on abdominal chaetigers, no dorsal superior lobe present on the notopodia of chaetiger nine, neuropodial postchaetal lamellae of the same chaetiger of similar size to the ventral neuropodial lobe
   —*Magelona spinifera* (Hernández-Alcántara & Solís-Weiss, 2000) (Gulf of California, Mexico/Gulf of Mexico (?))
   No large spines on abdominal chaetigers. Notopodia and neuropodia of chaetiger nine similar with large triangular postchaetal lamellae, and a small dorsal superior or small ventral neuropodial lobe respectively
   —*Magelona longicornis* Johnson, 1901 [87] (Puget Sound, Pacific coast of USA)
9. Prostomium longer than wide with distinct prostomial horns, separated from the distal prostomial margin. Slender species
   —*Magelona boninensis* Taylor, Mortimer & Jimi, 2022 (Japan)
   Prostomium wider than long, prostomial horns not entirely separated from the distal prostomial margin. Stout species
   —*Magelona berkeleyi* Jones, 1971 (Puget Sound, Pacific coast of USA)
10. Prostomium rounded without prostomial horns, chaetae of chaetiger nine mucronate (i.e., subdistally expanded, see example in Figure 2K), and paired anteriorly open lateral abdominal pouches (Σ) present in anterior abdomen —11
    Prostomium with rudimentary horns/squared anterior margin, mucronate chaetae absent on chaetiger nine, and paired anteriorly open lateral abdominal pouches (Σ) absent in anterior abdomen —13
11. Distinct superior dorsal lobes present on chaetigers 1–8
    —*Maea parochilis* (Zhou & Mortimer, 2013) (China, Korea)
    Superior dorsal lobes absent, or minute on chaetigers 1–4 —12
12. Hooded hooks of the abdominal region bidentate
    —*Maea sachalinensis* (Buzhinskaja, 1985) (Sakhalin Island, in need of redescription)
    Hooded hooks of the abdominal region tridentate
    —*Maea sacculata* (Hartman, 1961) (California, USA)
13. Thoracic notopodia with superior dorsal lobes present —14
    Thoracic notopodia without superior dorsal lobes —17
14. Prostomium longer than wide —16
    Prostomium wider than long —15
15. Thoracic lamellae slender, superior dorsal lobes absent on chaetiger nine
    —*Magelona hobsonae* Jones, 1978 (Puget Sound, Pacific coast of USA)
    Thoracic lamellae foliaceous, small superior dorsal lobes present on chaetiger nine
    —*Magelona armatis* Taylor, Mortimer & Jimi, 2022 (Japan)
16. Thoracic neuropodial lamellae of a similar size throughout the thorax; triangular postchaetal expansion of the neuropodia present from chaetiger seven
    —*Magelona pitelkai* Hartman, 1944 (California, Pacific coast of USA)
    Thoracic neuropodial lamellae reducing in mid thorax before increasing towards posterior thorax; no distinct triangular postchaetal expansions of the thoracic neuropodia
    —*Magelona hartmanae* Jones, 1978 (California, Pacific coast of USA)

17. Slender worm with bidentate abdominal hooded hooks
—*Magelona californica* Hartman, 1944 (California, Pacific coast of USA, in need of redescription)
Stout, wide species with polydentate abdominal hooded hooks
—*Magelona agoensis* Kitamori, 1967 (Ago Bay, Japan, in need of redescription)

Remarks: *Magelona koreana* was originally described as carrying no marked pigmentation such as that observed for *Magelona japonica*. The former species requires redescription; however, the type material is presumed lost. Specimens collected recently from the region carried brown pigment across the body (Ha-Eun Lee pers. comm.) which obscures the pigmentation band in the posterior thorax (similar to that in Figure 1H). *Magelona cerae* is currently being redescribed by the first author. *Maea sachalinensis* is a species in need of redescription, and a species which until recently has not been reported outside of the original description. The location of the type material is unknown, but a recent report of the species off western Korea has been made [73]. *Magelona agoensis* needs redescribing; however, the type material is presumed lost.

Tropical Eastern Pacific

1. Prostomium with distinct prostomial horns —2
Prostomium without prostomial horns; abdominal hooded hooks in three abruptly different sizes including a single large, recurved hook per ramus
—*Magelona magnahamata* Aguado & San Martín, 2004 [88] (Panamá)
2. Anterior prostomial margin crenulate; abdominal hooded hooks tridentate
—*Magelona tehuanensis* Hernández-Alcántara & Solís-Weiss, 2000 (Pacific coast of Mexico)
Anterior prostomial margin smooth; abdominal hooded hooks bidentate
—*Magelona pacifica* Monro, 1933 [89] (Gorgona Island, off Colombia)

Temperate South America

1. Thorax of eight chaetigers
—*Magelona borowskii* (Fiege, Knebelsberger & Meißner, 2023) (Peru Basin, Southeast Pacific Ocean; Central Pacific)
Thorax of nine chaetigers —2
2. Prostomium with distinct prostomial horns —3
Prostomium without prostomial horns, or possessing a squared anterior margin ("rudimentary horns") —4
3. Abdomen with sub-equal lamellae, those of the notopodia larger than the neuropodia (~double the size)
—*Magelona posterelongata* Bolívar & Lana, 1986 (Southern Brazil)
Lamellae of the abdomen roughly equal in size between the two rami
—*Magelona annulata* Hartmann-Schröder, 1962 [90] (Peru, N.B. the species is currently being redescribed and is likely to result in the synonymisation of *Magelona phyllisae* Jones, 1963 with this species, first author pers. comm.).
4. Paired anteriorly open lateral pouches in the anterior abdomen, specialised chaetae of chaetiger nine present, thoracic notopodial lamellae bi-lobed
—*Maea crenulata* (Bolívar & Lana, 1986) (Southern Brazil)
No lateral pouches present in the anterior abdomen, chaetae of chaetiger nine similar to those of preceding chaetigers, thoracic notopodial lamellae not bi-lobed —5

5. Thoracic notopodia with superior dorsal lobes
—*Magelona nonatoi* Bolívar & Lana, 1986 (Southern Brazil)
Thoracic notopodia without superior dorsal lobes —6
6. Small slender species, prostomial anterior margin may be straight but not formed into rudimentary horns, abdominal hooded hooks bidentate. No thoracic pigment band
—*Magelona papillicornis* F. Müller, 1858 (Southern Brazil)
Large, stout species with rudimentary prostomial horns, tridentate abdominal hooded hooks. Distinct reddish pigment band between chaetigers 5–8 (N.B. may fade with preservation), sediment tube may be present
—*Magelona variolamellata* Bolívar & Lana, 1986 (Southern Brazil)

Tropical Atlantic—adapted from [2]

1. Thoracic superior dorsal lobes absent/minute —2
Thoracic superior dorsal lobes present —3
2. Prostomial anterior margin straight; however, horns absent. Ventral neuropodial lamellae of anterior thorax scoop-shaped. Distinct stripy pigmentation along length of animal (N.B. this may fade over time), abdominal hooded hooks bidentate
—*Magelona fasciata* Mortimer, Kongsrud & Willassen, 2021 (Mauritania to Angola, West Africa)
Rudimentary prostomial horns present. Ventral neuropodial lamellae of anterior thorax pointed. Pigmentation, if present, limited to posterior thorax (chaetigers 5–9), abdominal hooded hooks polydentate
—*Magelona polydentata* Jones, 1963 (Bahamas)
3. Chaetae of chaetiger nine mucronate (i.e., subdistally expanded, see example in Figure 2K), paired lateral anteriorly open pouches present in anterior abdomen
—*Maea riojai* (Jones, 1963) (Gulf of Mexico)
Chaetae of chaetiger nine similar to those of preceding chaetigers, paired lateral pouches of the anterior abdomen absent —4
4. Thoracic superior dorsal lobes short, thoracic notopodial lamellae slender —5
Thoracic superior dorsal lobes long, thoracic notopodial lamellae more foliaceous —7
5. Abdominal hooded hooks tridentate
—*Magelona guineensis* Mortimer, Kongsrud & Willassen, 2021 (Gulf of Guinea, West Africa)
Abdominal hooded hooks bidentate —6
6. Pigmentation in posterior thorax present
—*Magelona mackiei* Mortimer, Kongsrud & Willassen, 2021 (Gulf of Guinea, West Africa)
Pigmentation of the posterior thorax absent
—*Magelona capax* Hartman, 1965 (Suriname, Northern Brazil, in need of redescription)

7. Foliaceous abdominal lateral lamellae heavily pigmented (N.B. may fade over time), with slight basal constriction only. Thoracic notopodial lamellae foliaceous, neuropodial lamellae of a similar length along the thorax (only marginally shorter towards posterior thorax). Abdominal lamellae with distinct postchaetal expansion behind chaetal rows, triangular
—*Magelona picta* Mortimer, Kongsrud & Willassen, 2021 (Angola, West Africa)
Spatulate abdominal lateral lamellae without pigmentation, distinct basal constriction present. Thoracic notopodial lamellae slender foliaceous, marked reduction in the length of neuropodial lamellae along the thorax. Abdominal lamellae without postchaetal expansion behind chaetal rows
—*Magelona nanseni* Mortimer, Kongsrud & Willassen, 2021 (Liberia to Nigeria, West Africa)

Remarks: Mortimer et al. [2] marked the beginning of a series of studies focused on magelonids along the West African coastline. Preliminary research has identified more than 20 magelonid species inhabiting the region between Morocco to Angola. Several species previously recorded off the coast of West Africa require verification, including *Magelona capensis* Day, 1961 [91] (and by extension *Magelona ekapa* Mortimer & Clarke, 2024), *Magelona wilsoni* Glémarec, 1967 [92], *Magelona rosea* Moore, 1907 [93], and *Magelona pacifica* Monro, 1933. The latter two are considered unlikely due to the significant geographic distance from their respective type localities. *Magelona rosea* needs redescribing; however, given its morphological similarity to *Magelona capensis* originally described from South Africa, it is plausible that historic West African records of the former species may relate to the latter species. It has been concluded that several other previously recorded species in the region: *Magelona cincta*, *Magelona cornuta* Wesenberg-Lund, 1949 [94] and *Magelona papillicornis* do not occur off West Africa [2,76,95]. However, several European species are known to occur in the region: *Magelona alleni*, *Magelona filiformis*, *Magelona johnstoni* and *Magelona minuta* [2,95]. The forthcoming taxonomic papers by Mortimer, Kongsrud and Willassen will complete the taxonomic revision of West Africa.

Temperate Northern Atlantic

1. Thorax of eight chaetigers—*Magelona bizkaiensis* (Aguirrezabalaga, Ceberio & Fiege, 2001) (Bay of Biscay)
Thorax of nine chaetigers —2
2. Chaetae of chaetiger nine mucronate (i.e., subdistally expanded, see example in Figure 2K) —3
Chaetae of chaetiger nine similar to those of preceding chaetigers —5
3. Thoracic superior dorsal lobes present (N.B. either on chaetigers 1–8, or 4–8). Paired lateral anteriorly open pouches of the anterior abdomen present —4
Thoracic superior dorsal lobes absent. Paired lateral pouches of the anterior abdomen absent
—*Maea mirabilis* Johnston, 1865 (UK, Europe)
4. Upper edges of thoracic notopodial lamellae crenulate, superior dorsal lobes from chaetigers 4(3)–8
—*Maea johnstoni* (Fiege, Licher & Mackie, 2000) (UK, Europe)
Upper edges of thoracic notopodial lamellae smooth, superior dorsal lobes from chaetigers 1–8
—*Maea brachypalpata* (Mortimer, Blake & Harrendence, 2021) (NE USA)

5. Prostomial horns absent (N.B. anterior prostomial margin may be squared and straight forming "rudimentary horns") —6
   Distinct prostomial horns present —11
6. Distinct pigment band in posterior thorax (N.B. may fade with time after preservation) —7
   Pigmentation of the posterior thorax absent —8
7. Abdominal lateral lamellae sub-equal, much larger in the notopodia than the neuropodia (~4 times the size)
   —*Magelona alleni* Wilson, 1958 (UK, Norway to Gulf of Guinea)
   Abdominal lateral lamellae of roughly equal size in both rami
   —*Magelona equilamellae* Harmelin, 1964 (Mediterranean species, see [13,65]).
8. Superior dorsal lobes present on thorax
   —*Magelona filiformis* Wilson, 1959 [96] (UK, Europe)
   Superior dorsal lobes absent on thorax —9
9. Broad species, prostomium rounded laterally with distinct prostomial markings either side of prostomial ridges. Small ventral cirri underneath chaetal bundle of the neuropodia of ninth chaetiger in addition to postchaetal lamella
   —*Magelona rosea* Moore, 1907 (NE USA, in need of redescription)
   Small species, prostomium with a straight anterior margin, no obvious prostomial markings either side of prostomial ridges. No ventral cirri in the neuropodia of chaetiger nine —10
10. Thoracic postchaetal lamellae broad triangular
    —*Magelona pettiboneae* Jones, 1963 (Gulf of Mexico)
    Thoracic postchaetal lamellae slender triangular, elongate
    —*Magelona minuta* Eliason, 1962 (Sweden, Europe)
11. Thoracic superior dorsal lobes absent —12
    Thoracic superior dorsal lobes present —13
12. Abdominal hooded hooks predominantly bidentate, with large, recurved spines present from approximately chaetiger 36
    —*Magelona uebelackerae* (Hernández-Alcántara & Solís-Weiss, 2000) (Gulf of Mexico)
    Abdominal hooded hooks tridentate, no additional large, recurved spines present
    —*Magelona americana* Hartman, 1965 (NE USA, needs redescription)
13. Stout species, width reaching over 1 mm. Prostomium wider than long. Superior dorsal lobes of the thoracic region foliaceous. Postchaetal lamellae of chaetiger nine elongate; similar in both rami
    —*Magelona wilsoni* Glémarec, 1967 (France)
    Moderate species, approximately 0.5 mm wide. Prostomium longer than wide. Superior dorsal lobes of the thoracic region slender cirriform. Lamellae of chaetiger nine varying between rami; that of the neuropodia shorter and triangular, not elongate
    —*Magelona lusitanica* Mortimer, Gil & Fiege, 2011 (Portugal)

Remarks: Several undescribed species are likely to be present in European waters. Gill [97] noted a species resembling *Magelona minuta* in the Gulf of Cádiz, and ongoing research by the first author and colleagues [98] is focused on a potential undescribed mucronate species. Taylor & Mortimer [61,62,99] provide an illustrated guide to magelonid taxonomic terminology, and the identification of European shovel head worms.

Temperate South Africa—from [14]

1. Chaetiger nine with mucronate chaetae (i.e., subdistally expanded, see example in Figure 2K); prostomium longer than wide without prostomial horns; anteriorly open pouches present in anterior abdomen. Abdominal hooded hooks unidirectional
—*Maea debeerei* (Clarke, Paterson, Florence & Gibbons, 2010) (Namibia, South Africa)
Chaetiger nine without mucronate chaetae, no lateral pouches present in anterior abdomen. Abdominal hooks in two facing groups in each ramus (*vis-à-vis*) —2
2. Superior dorsal lobes absent on thoracic chaetigers —3
Superior dorsal lobes present on chaetigers 1–8/9 —4
3. Neuropodia of chaetigers 1–3 distally expanded, scoop-shaped. Prostomium roughly as long as wide. In posterior thorax, notopodial and neuropodial lamellae of a particular chaetiger similar in size. Red pigment band present between chaetigers 4–9 (band may fade after preservation)
—*Magelona cincta* Ehlers, 1908 (South Africa)
Neuropodia of chaetigers 1–3 spatulate, not distally expanded. Prostomium wider than long, lateral edges undulating. Neuropodial lamellae of posterior thorax larger than notopodial lamellae (particularly those of chaetiger eight). Pigmentation present between chaetigers 5–9
—*Magelona* cf. *cincta* of Mortimer & Clarke [14] (Mozambique)
4. Stout body; prostomium longer than wide with distinct prostomial markings either side of ridges. Notopodial thoracic lamellae foliaceous with foliaceous superior dorsal lobes. Thoracic neuropodial lamellae pocket-like, chaetae emerging from top edge
—*Magelona capensis* Day, 1961 (South Africa; historic records need verification, see [14])
Slender body; prostomium roughly as wide as long, with weak prostomial markings either side of ridges. Notopodial thoracic lamellae and superior dorsal lobes slender. Neuropodial thoracic lamellae slender triangular
—*Magelona ekapa* Mortimer & Clarke, 2024 (South Africa)

Western Indo-Pacific

1. Prostomial horns present —2
Prostomial horns absent (N.B. anterior prostomial margin may be squared and straight forming "rudimentary horns", but never forming distinct horns) —8
2. Thoracic superior dorsal lobes absent
—*Magelona petersenae* Nateewathana & Hylleberg, 1991 (Thailand)
Thoracic superior dorsal lobes present —3
3. Prostomial horns separated from prostomial anterior margin for two thirds of length (shape resembling a matador's hat). Upper margins of notopodial lamellae of chaetigers 1–8 crenulate
—*Magelona montera* Mortimer, Cassà, Martin & Gil, 2012 (Red Sea Coast of Israel)
Prostomial horns distinct but not greatly separated from prostomial anterior margin. Upper margins of thoracic notopodial lamellae smooth —4
4. Thoracic superior dorsal lobes foliaceus
—*Magelona methae* Nateewathana & Hylleberg, 1991 (Thailand)
Thoracic superior dorsal lobes cirriform —5

5. Anterior prostomial margin crenulate
—*Magelona cornuta* Wesenberg-Lund, 1949 (Iran)
Anterior prostomial margin smooth —6
6. Thoracic notopodial lamellae lanceolate
—*Magelona pulchella* Mohammad, 1970 (Kuwait)
Thoracic notopodial lamellae foliaceous —7
7. Notopodial lamellae of the ninth chaetiger subtriangular with swollen bud-like tips. Postchaetal neuropodial lamellae of the same chaetiger distinctly pointed, with long and slender prechaetal lobes
—*Magelona gemmata* Mortimer & Mackie, 2003 (Seychelles)
Notopodia of the ninth chaetiger with digitiform lateral processes in addition to triangular postchaetal lamellae. Neuropodia of the same chaetiger with broad postchaetal, and short thick prechaetal lobes
—*Magelona sinbadi* Mortimer, Cassà, Martin & Gil, 2012 (Iran)
8. Chaetae of ninth chaetiger mucronate (i.e., subdistally expanded, see example in Figure 2K), paired lateral anteriorly open pouches present at the start of the abdomen —9
Chaetae of the ninth chaetiger similar to those of preceding chaetigers, not otherwise modified. No paired lateral pouches present at the start of the abdomen —12
9. Upper margins of thoracic notopodial lamellae smooth. Superior dorsal lobes absent in anterior thorax
—*Maea conversa* (Mortimer & Mackie, 2003) (Seychelles)
Pectinate, crenulate or bi-lobed thoracic notopodial lamellae present. Superior dorsal lobes present from chaetigers 1–8. —10
10. Upper margins of thoracic notopodial lamellae distinctly pectinate with a comb-like appearance, particularly those of the anterior thorax
—*Maea pectinata* (Nateewathana & Hylleberg, 1991) (Thailand)
Upper margins of thoracic notopodial lamellae lightly crenulated; becoming bi-lobed. —11
11. Thoracic notopodial lamellae rounded oblong, bi-lobed on chaetigers seven and eight. No superior dorsal lobes on chaetiger nine.
—*Maea tinae* (Nateewathana & Hylleberg, 1991) (Thailand)
Thoracic notopodial lamellae foliaceous, bi-lobed from mid to posterior thorax. Small superior dorsal lobes present on chaetiger nine
—*Maea obockensis* (Gravier, 1905) (Red Sea)
12. Thoracic superior dorsal lobes present. —13
Thoracic superior dorsal lobes absent. —15
13. Rounded prostomium, with slender foliaceous thoracic notopodial lamellae. Thoracic notopodial lamellae considerably larger than neuropodial. Superior dorsal lobes present on chaetiger nine
—*Magelona cepiceps* Mortimer & Mackie, 2006 (Seychelles)
Truncate prostomium with slender cirriform thoracic notopodial lamellae. Thoracic notopodia and neuropodia of an approximately equal size particularly in anterior thorax. Superior dorsal lobes absent on chaetiger nine —14

14. Neuropodia of chaetigers eight and nine with elongate postchaetal lamellae at the top of the chaetal bundle, alongside smaller prechaetal process towards the base of the chaetal bundle
—*Magelona noppi* Nateewathana & Hylleberg, 1991 (Thailand)
Postchaetal neuropodial lamellae of chaetigers eight and nine low, alongside elongate ventral process
—*Magelona kamala* Nateewathana & Hylleberg, 1991 (Thailand)
15. Enlarged abdominal hooded hooks present.
—*Magelona falcifera* Mortimer & Mackie, 2003 (Seychelles)
Abdominal chaetae of approximately same size, no enlarged abdominal hooded hooks. —16
16. Abdominal hooded hooks polydentate
—*Magelona fauchaldi* Shakouri, Mortimer & Dehani, 2017 (Iran)
Abdominal hooded hooks either bidentate or tridentate. —17
17. Thoracic neuropodial lamellae reducing to mid thorax and then increasing towards chaetiger nine. Abdominal hooded hooks bidentate
—*Magelona mahensis* Mortimer & Mackie, 2006 (Seychelles)
Thoracic neuropodial lamellae do not reduce in size along thorax to any great extent. Abdominal hooded hooks tridentate. —18
18. Small, slender species approximately 0.2 mm wide. Palps long and slender with two rows of papillae.
—*Magelona pygmaea* Nateewathana & Hylleberg, 1991 (Thailand, Seychelles)
Large, stout species, reaching over 1 mm in width. Palps heavily papillated. —19
19. Prostomial anterior margin straight and squared forming "rudimentary horns"
—*Magelona mickminni* Nateewathana & Hylleberg, 1991 (Thailand)
Prostomium without "rudimentary horns", anterior margin maybe medially indented
—*Magelona symmetrica* Mortimer & Mackie, 2006 (Seychelles)

Central Indo-Pacific

1. Prostomium with distinct prostomial horns, anterior margin crenulate. Thoracic superior dorsal lobes present —2
Prostomial horns absent (N.B. prostomium may be medially indented, but not crenulated), thoracic superior dorsal lobes absent
—*Magelona jonesi* Hartmann-Schröder, 1980 (Western Australia, currently being redescribed by first author)
2. Stout species, reaching approximately 1 mm in width. Prostomium wider than long. Foliaceous superior dorsal lobes from chaetigers 1–8, small superior dorsal lobes on chaetiger nine. Abdominal hooded hooks tridentate
—*Magelona lenticulata* Gallardo, 1968 (Vietnam)
Moderately slender species, reaching approximately 0.4 mm in width. Prostomium marginally longer than wide. Slender superior dorsal lobes on chaetigers 1–8, absent on chaetiger nine. Abdominal hooded hooks bidentate.
—*Magelona crenulifrons* Gallardo, 1968 (Vietnam)

Eastern Indo-Pacific

1. Prostomium with distinct prostomial horns —2
   Prostomial horns rudimentary
   —*Magelona paulolanai* Magalhães, Bailey-Brock & Watling, 2018 (Hawaii)
2. Upper notopodial lamellar margins from chaetigers 1–8 crenulate. Edges of abdominal parapodial lamellae crenulate
   —*Magelona alexandrae* Magalhães, Bailey-Brock & Watling, 2018 (Hawaii)
   Upper notopodial lamellar margins of thoracic chaetigers smooth. Edges of abdominal parapodial lamellae smooth. —3
3. Prostomium much longer than wide, with distinct prostomial horns separated at either end from the prostomial margin. Palps thick and heavily papillated, with up to eight rows of papillae. No eye spots. Thoracic notopodial lamellae elongate
   —*Magelona anuheone* Magalhães, Bailey-Brock & Watling, 2018 (Easter Island, Chile)
   Prostomium only marginally longer than wide; obvious prostomial horns but connected to anterior prostomial margin for majority of length. Palps slender, with up to four rows of papillae. Small black eye spots at base of prostomium in majority of specimens. Thoracic notopodial lamellae foliaceous
   —*Magelona cinthyae* Magalhães, Bailey-Brock & Watling, 2018 (Hawaii)

Temperate Australasia

Moderate species, with a squared anterior margin formed into "rudimentary horns"; prostomium longer than wide. Thoracic notopodia larger than neuropodia from chaetigers 1–8, but of a similar size on chaetiger nine. Thoracic superior dorsal lobes absent

—*Magelona dakini* Jones, 1978 (New South Wales, Australia)

Remarks: The area is in need of an urgent revision, and there are likely to be many more undescribed magelonid species present.

Uebelacker & Jones's magelonids of the Gulf of Mexico—Updated from [22], see Figures 8 and 9.

1. Prostomial horns absent. —2
   Prostomial horns present, either rudimentary (squared anterior margin), or distinct. —4
2. Chaetae of ninth chaetiger mucronate (i.e., subdistally expanded, see example in Figure 2K). Paired lateral anteriorly open pouches in anterior abdomen present; superior dorsal lobes present on chaetigers 1–8. Abdominal hooded hooks of approximately similar size. —3
   Chaetae of ninth chaetiger similar to those of preceding chaetigers. Lateral pouches absent in anterior abdomen; superior dorsal lobes absent on thoracic chaetigers. Abdominal hooded hooks of three abruptly different size.
   —*Magelona* sp. C (see below)
3. Abdominal hooded hooks bidentate. Postchaetal lamellae of chaetiger nine smooth. —*Maea* sp. A
   Abdominal hooded hooks tridentate. Postchaetal lamellae of chaetiger nine fimbriated (possessing a fringed margin, see Figure 8)
   —*Maea* sp. B
4. Anterior abdominal hooded hooks predominately unidentate or bidentate (odd sporadic tridentate hook may be present) —5
   Anterior abdominal hooded hooks tridentate or polydentate —9

5. Anterior abdominal parapodia with enlarged bidentate hooks or enlarged acicular spines —6
   Anterior abdominal parapodia predominately bidentate hooded hooks. Enlarged chaetae if present, recurved. —7
6. Larger abdominal chaetae unidentate ("acicular spines"); superior dorsal lobes present from chaetigers 1–8 only. Notopodial lamellae foliaceous in anterior thorax —*Magelona* sp. D (see below)
   Larger abdominal hooded hooks bidentate; superior dorsal lobes present from chaetigers 1–9. Thoracic notopodial lamellae slender —*Magelona* sp. E (see below)
7. Prostomial horns rudimentary; anterior abdominal parapodia without postchaetal expansion behind chaetal rows —*Magelona* sp. F
   Distinct prostomial horns present; anterior abdominal parapodia with postchaetal expansion behind chaetal rows —8
8. Parapodia of chaetigers 1–8 with superior dorsal lobes. No enlarged recurved spines present —*Magelona* sp. G
   Parapodia of chaetigers 1–8 without superior dorsal lobes. Enlarged recurved spines in mid abdomen
   —*Magelona uebelackerae* (Hernández-Alcántara & Solís-Weiss, 2000) (*Magelona* sp. H, see below)
9. Chaetiger six with oblique slits dorsolaterally; parapodia of chaetigers 1–8 without superior dorsal lobes —*Magelona* sp. I
   Chaetiger six without oblique slits; parapodia of chaetigers 1–8 with superior dorsal lobes —10
10. Parapodia in both rami of chaetiger nine similar with superior dorsal lobes in the notopodia and prechaetal lobes in the neuropodia, in addition to the postchaetal lamellae. Anterior abdominal parapodia without postchaetal expansion behind chaetal rows —*Magelona* sp. J
    Parapodia in both rami of chaetiger nine differing in shape and size, without superior dorsal lobes; anterior abdominal parapodia with postchaetal expansion behind chaetal rows —11
11. Prostomium longer than wide with smooth anterior margin —*Magelona* sp. K
    Prostomium approximately as wide as long, anterior margin crenulate —*Magelona* sp. L

Remarks: Specimens of *Magelona* sp. C were viewed during the description of *Magelona magnahamata* Aguado & San Martín, 2004, with the authors stating that they coincide widely. Variations were noted by the authors between the Atlantic and Pacific material in the nature of the apical tooth and robust nature of the of enlarged hooks, and overall body size. Given the varying locations of the material described, the current authors have kept *Magelona* sp. C in this key at this time. *Magelona* sp. D was described as *Meredithia spinifera* Hernández-Alcántara & Solís-Weiss, 2000, whilst *Magelona* sp. H was described as *Meredithia uebelackerae* Hernández-Alcántara & Solís-Weiss, 2000. *Meredithia* was later synonymised with *Magelona* by Mortimer & Mackie [44]. Given the location of the specimens of *Magelona* sp. D ranging from the Gulf of California to the Gulf of Mexico, the current authors have currently kept this species within the key. *Magelona* sp. E is only known from one specimen, which may be juvenile.

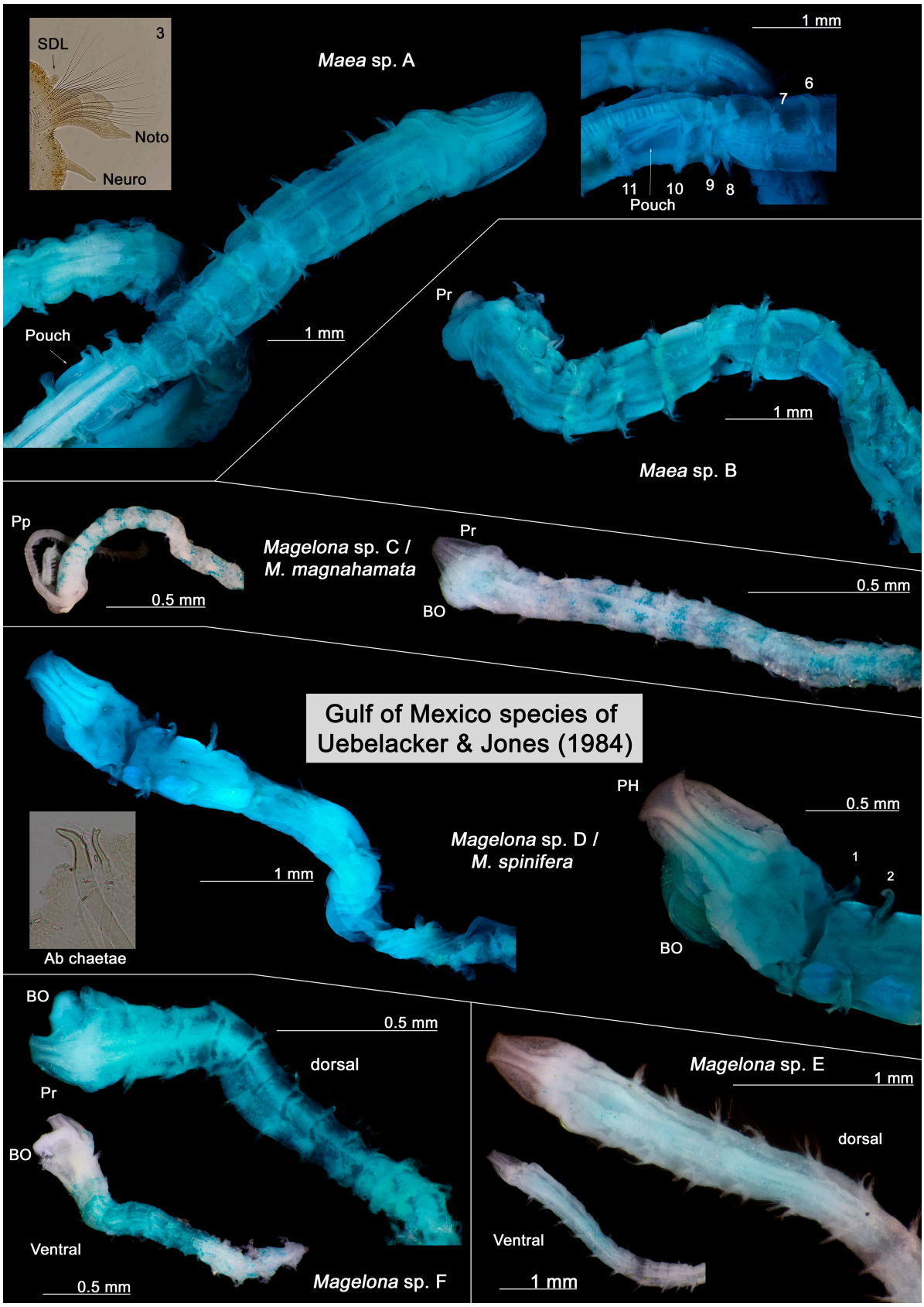


Figure 8. *Maea* spp. A–B and *Magelona* spp. C–F of Uebelacker & Jones [22].

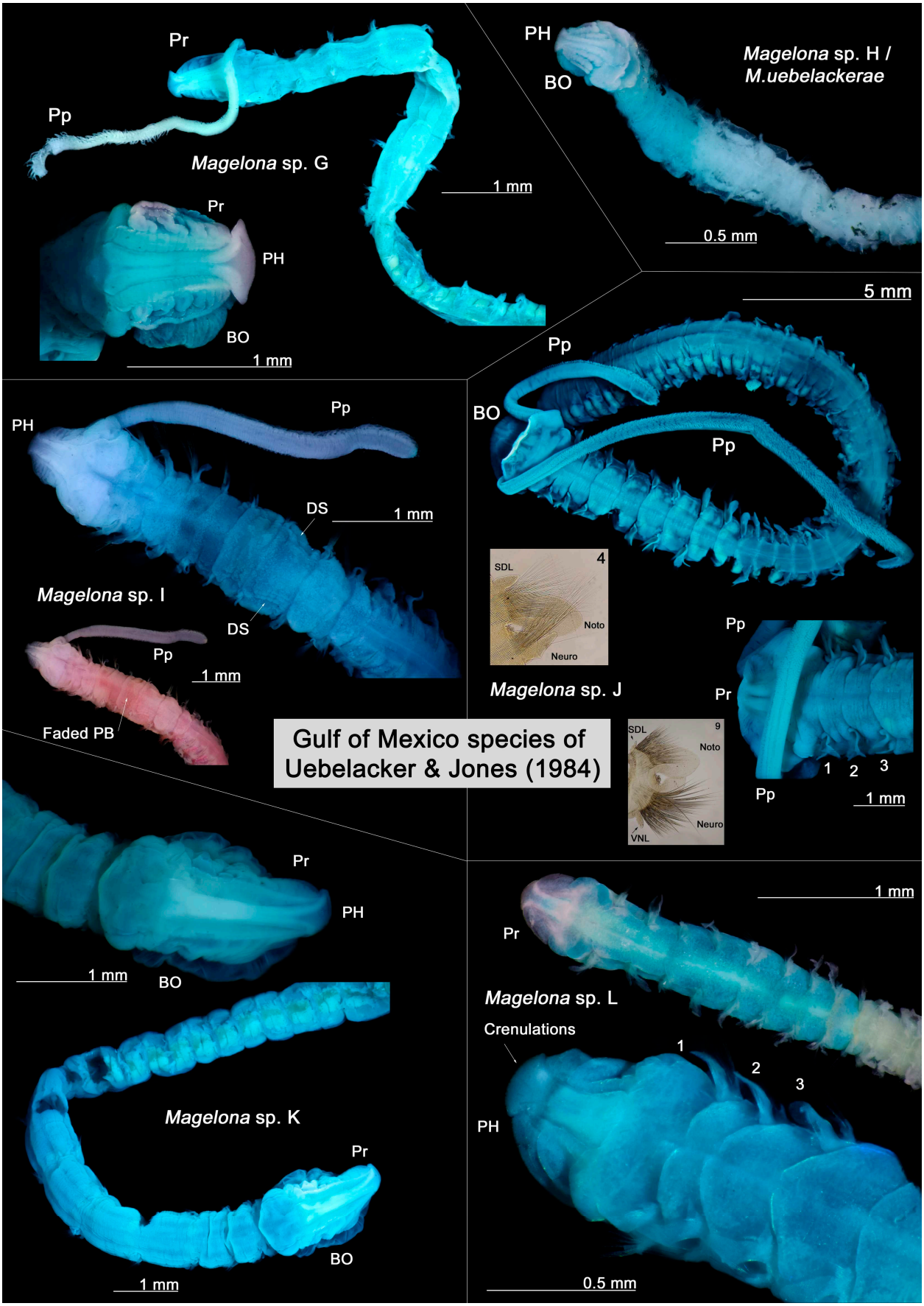


Figure 9. *Magelona* spp. G–L of Uebelacker & Jones [22].

Pictorial Worldwide Identification Key to the Magelonidae

All species have been assigned to one of nine putative morphological groups, based on diagnostic traits including body size, morphology of the prostomium and parapodial lamellae, chaetal type, and the presence or absence of lateral abdominal pouches. Each group is accompanied by a figure plate, a general diagnosis, a list of species, and the marine realm in which each species was originally described.

Group 1 *Maea* Johnston, 1865 (Mucronate species)—see Figures 5 and 10

- **Body size**—moderate to large, approximately 0.5–1 mm in width.
- **Prostomium**—longer than wide, rounded anterior margin without prostomial horns. Two pairs of dorsal longitudinal muscular ridges (outer and inner pair), with obvious markings on either side of ridges.
- **Palps**—approximately 4–10 rows of papillae proximally (N.B. details not recorded for all species).
- **Chaetigers 1–8**—chaetigers similar, notopodial lamellae generally larger than neuropodial lamellae. Notopodial lamellae in a postchaetal to subchaetal position, the upper edges of which may be smooth, crenulate, pectinate or bi-lobed. Superior dorsal lobes may be absent (*Maea mirabilis*) or present. If present, they may occur on chaetigers 1–8 or may be absent in the anterior thorax (e.g., present on chaetigers (3)4–8). Neuropodial lamellae generally slender in a ventral position. Two species (*Maea crenulata* and *Maea* sp. B) possess both ventral and postchaetal neuropodial lamellae. In three species (*Maea mirabilis*, *Maea conversa* and *Maea* sp. A) the neuropodial lamellae are in a prechaetal position. The neuropodial lamellae of chaetiger 8 may be additionally postchaetally expanded.
- **Chaetiger 9**—differs to preceding chaetigers. Postchaetal lamellae of both rami low as opposed to elongate, adjoined to low prechaetal lamellae (cuff-like). Edges of lamellae may be smooth or crenulate. No superior dorsal lobes present, but small ventral lobes may be present in the neuropodia.
- **Abdominal chaetigers**—abdominal lamellae generally spatulate with a slight basal constriction, triangular processes (DML and VML of Jones [55]) may be present or absent. Lamellae with or without a postchaetal expansion behind chaetal rows.
- **Chaetae**—chaetae of chaetigers 1–8 simple capillaries, those of chaetiger 9 mucronate (distally expanded). Abdominal hooded hooks all of a similar size; bi- or tridentate, and either unidirectional or *vis-à-vis*.
- **Abdominal pouches**—all species carry lateral abdominal pouches, and in all but one species (*Maea mirabilis*) they possess both anteriorly (Σ-shaped, generally paired occurring in the anterior abdomen, consisting of a dorsal and ventral flap with a convoluted membrane in between) and posteriorly open pouches (C-shaped, generally unpaired, alternating from one side of the body to the other and on alternate chaetigers).
- See Table 1 of Mortimer et al. [28] for a review of characters.

***Maea* species (Group 1):**

SDL absent, anteriorly open pouches absent (posteriorly open pouches only)

Maea mirabilis Johnston, 1865—Temperate Northern Atlantic

SDL absent in anterior thorax, both anteriorly and posteriorly open pouches present

Maea conversa (Mortimer & Mackie, 2003)—Western Indo-Pacific
Maea debeerei (Clarke, Paterson, Florence & Gibbons, 2010)—Temperate South Africa
Maea johnstoni (Fiege, Licher & Mackie, 2000)—Temperate Northern Atlantic
Maea sacculata (Hartman, 1961)—Temperate Northern Pacific

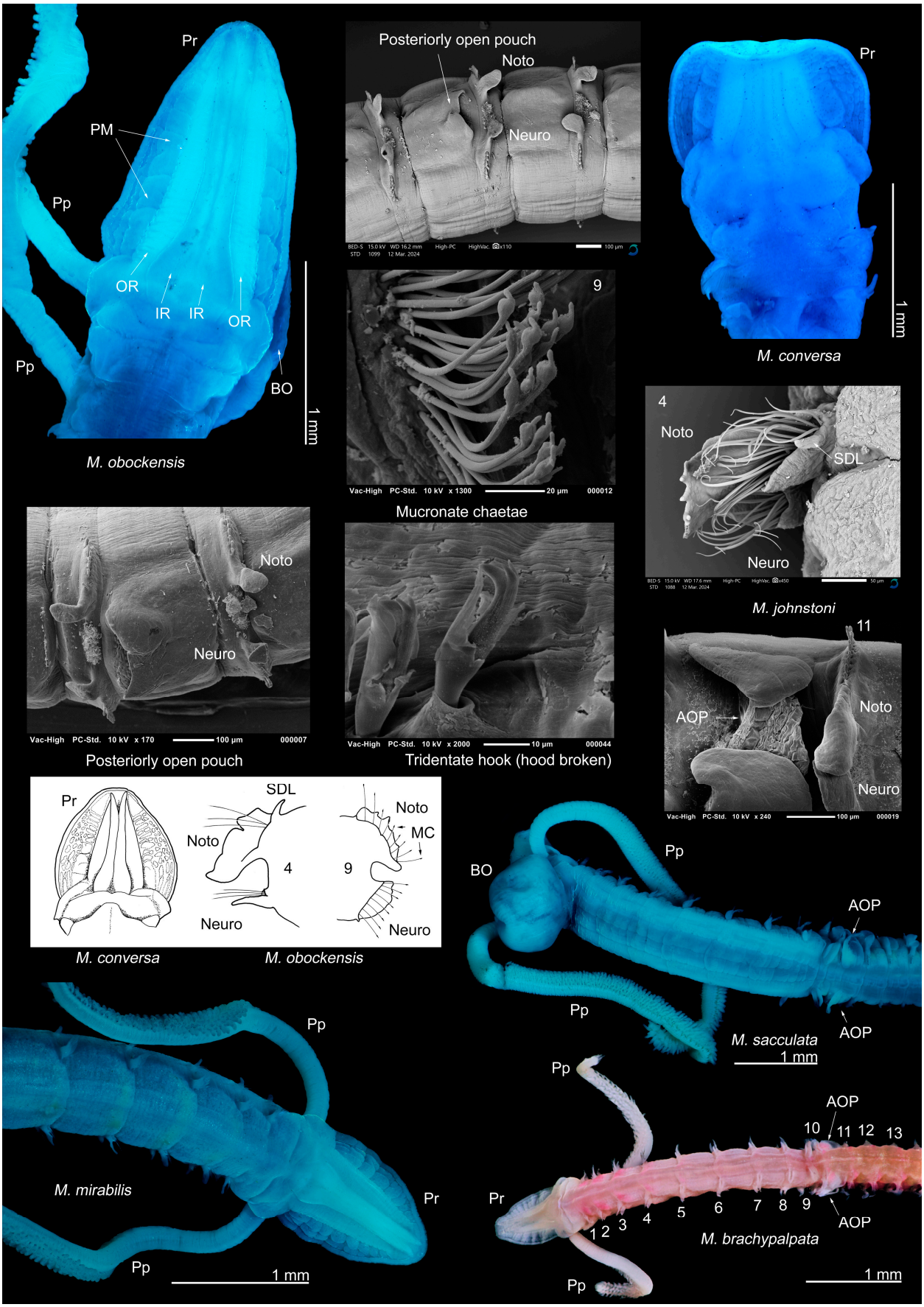


Figure 10. *Maea* Johnston, 1865, group 1.

SDL present on chaetigers 1–8, both anteriorly and posteriorly open pouches present

Maea sp. A of Uebelacker & Jones (1984)—Gulf of Mexico (see Figure 8)
Maea sp. B Uebelacker & Jones (1984)—Gulf of Mexico (see Figure 8)
Maea brachypalpata (Mortimer, Blake & Harrendence, 2021)—Temperate Northern Atlantic
Maea crenulata (Bolívar & Lana, 1986)—Temperate South America
Maea obockensis (Gravier, 1905)—Western Indo-Pacific
Maea parochilis (Zhou & Mortimer, 2013)—Temperate Northern Pacific
Maea pectinata (Nateewathana & Hylleberg, 1991)—Western Indo-Pacific
Maea riojai (Jones, 1963)—Tropical Atlantic
Maea sachalinensis (Buzhinskaja, 1985) (the presence of SDL in the anterior thorax needs verification, and the species needs redescription)
Maea tinae (Nateewathana & Hylleberg, 1991)—Western Indo-Pacific

Group 2 (Diminutive species)—see Figure 11

- **Body size**—minute, approximately 0.2–0.3 mm in width, slender, thread-like.
- **Prostomium**—similar width to length, straight anterior margin. One pair of dorsal longitudinal muscular ridges, no obvious markings either side of ridges.
- **Palps**—slender with approximately 2–6 rows of papillae.
- **Chaetigers 1–9**—all similar. Noto- and neuropodial lamellae small, postchaetal and of similar size and shape in each ramus and across the thorax. Superior dorsal lobes absent. Edges of thoracic lamellae smooth.
- **Abdominal chaetigers**—abdominal lamellae leaf-shaped (foliaceous) with a slight basal constriction. Triangular processes (DML and VML) generally present, although not observed in a couple of species (difficult to detect due to small body size). No postchaetal expansion of lamellae behind chaetal rows.
- **Chaetae**—similar across thorax, no specialised chaetae of the 9th chaetiger. Abdominal hooded hooks predominately bidentate, although one species (*Magelona pygmaea*) possesses tridentate hooks. Enlarged hooks may be present or absent. Hooks in two groups *vis-à-vis*.
- **Abdominal pouches**—absent.

Species of Group 2:

Magelona sp. C of Uebelacker & Jones [22]—Gulf of Mexico (see Figure 8)
Magelona californica Hartman, 1944—Temperate Northern Pacific (needs redescribing)
Magelona falcifera Mortimer & Mackie, 2003—Western Indo-Pacific
Magelona fauchaldi Shakouri, Mortimer & Dehani, 2017—Western Indo-Pacific
Magelona magnahamata Aguado & San Martín, 2004—Tropical Eastern Pacific
Magelona minuta Eliason, 1962—Temperate Northern Atlantic
Magelona pettiboneae Jones, 1963—Temperate Northern Atlantic
Magelona papillicornis F. Müller, 1858—Temperate South America
Magelona pygmaea Nateewathana & Hylleberg, 1991—Western Indo-Pacific

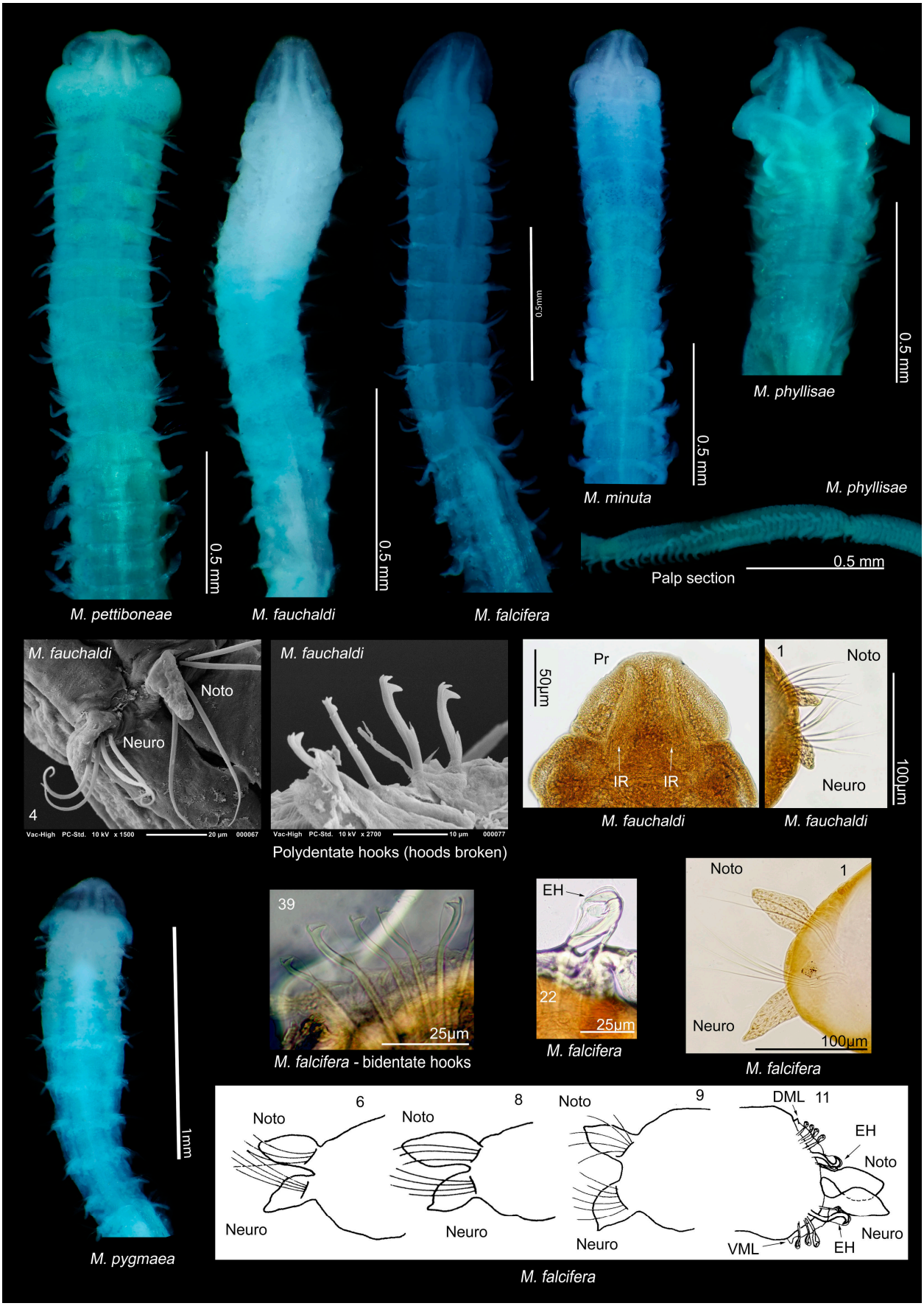


Figure 11. Diminutive species of magelonids in putative group 2.

Group 3 (Horned species)—see Figure 12

- **Body size**—moderate, approximately 0.4–1 mm in width.
- **Prostomium**—length similar to width, or longer than wide, with distinct prostomial horns. Anterior prostomial margin (often triangular in shape) may be smooth or crenulate. Eye spots at the base of the prostomium may be present (*Magelona cinthyae*) but generally absent. Two pairs of dorsal longitudinal muscular ridges present with prostomial markings either side.
- **Palps**—generally long and slender with approximately 4–6 rows of papillae proximally.
- **Chaetigers 1–8**—all similar; foliaceous postchaetal notopodial lamellae, upper edges of which may be smooth, or crenulate. Superior dorsal lobes present from chaetigers 1–8, generally slender, but may be more foliaceous (*Magelona spinifera*, *Magelona* sp. L). Neuropodial lamellae slender digitiform in a ventral position underneath chaetal bundle. Neuropodia of chaetiger 8 with additional postchaetal lamellae (generally triangular in shape), which may also be present on chaetiger 7 (N.B. a slight postchaetal expansion may be present across the thorax).
- **Chaetiger 9**—lamellae generally shorter than preceding chaetigers. Notopodia differing from preceding chaetigers, more slender and lateral in position without superior dorsal lobes. Neuropodia similar to that of chaetiger 8, with short slender ventral lamellae of similar size to triangular postchaetal lamellae.
- **Abdominal chaetigers**—spatulate lamellae, basal constricted, edges may be smooth or crenulated. Triangular processes (DML and VML) present. Triangular postchaetal expansion present behind chaetal rows in anterior abdomen.
- **Chaetae**—chaetae similar across thorax, mucronate chaetae of the 9th chaetiger absent. Abdominal hooded hooks bi- or tridentate in two groups *vis-à-vis*, enlarged spines may be present (*Magelona spinifera*) or absent.
- **Abdominal pouches**—posteriorly open pouches from mid abdomen. Pouches may be paired occurring on consecutive chaetigers, or unpaired alternating from one side of the body to the other, and on alternate segments (both types may be present). Pouches simple C-shaped pocket-like structures, which may or may not be medially split. (N.B. pouches have not been observed in several species originally described from incomplete specimens, needs verification).

Species of Group 3:

Prostomium (L = W)
Magelona cinthyae Magalhães, Bailey-Brock & Watling, 2018—Eastern Indo-Pacific
Magelona cornuta Wesenberg-Lund, 1949—Western Indo-Pacific
Magelona crenulifrons Gallardo, 1968—Central Indo-Pacific
Magelona sp. L of Uebelacker & Jones [22]—Gulf of Mexico (see Figure 9)
Magelona lusitanica Mortimer, Gil & Fiege, 2011—Temperate Northern Atlantic
Magelona pulchella Mohammad, 1970—Western Indo-Pacific
Magelona spinifera (Hernández-Alcántara & Solís-Weiss, 2000)—Temperate Northern Pacific (*Magelona* sp. D of Uebelacker & Jones [22]) (see Figure 8)
Magelona tehuanensis Hernández-Alcántara & Solís-Weiss, 2000—Tropical Eastern Pacific
Prostomium (L > W)
Magelona alexandrae Magalhães, Bailey-Brock & Watling, 2018—Eastern Indo-Pacific
Magelona boninensis Taylor, Mortimer & Jimi, 2022—Temperate Northern Pacific
Magelona sp. G of Uebelacker & Jones [22]—Gulf of Mexico (see Figure 9)
Magelona gemmata Mortimer & Mackie, 2003—Western Indo-Pacific
Magelona montera Mortimer, Cassà, Martin & Gil, 2012—Western Indo-Pacific
Magelona pacifica Monro, 1933—Tropical Eastern Pacific

Magelona sinbadi Mortimer, Cassà, Martin & Gil, 2012—Western Indo-Pacific

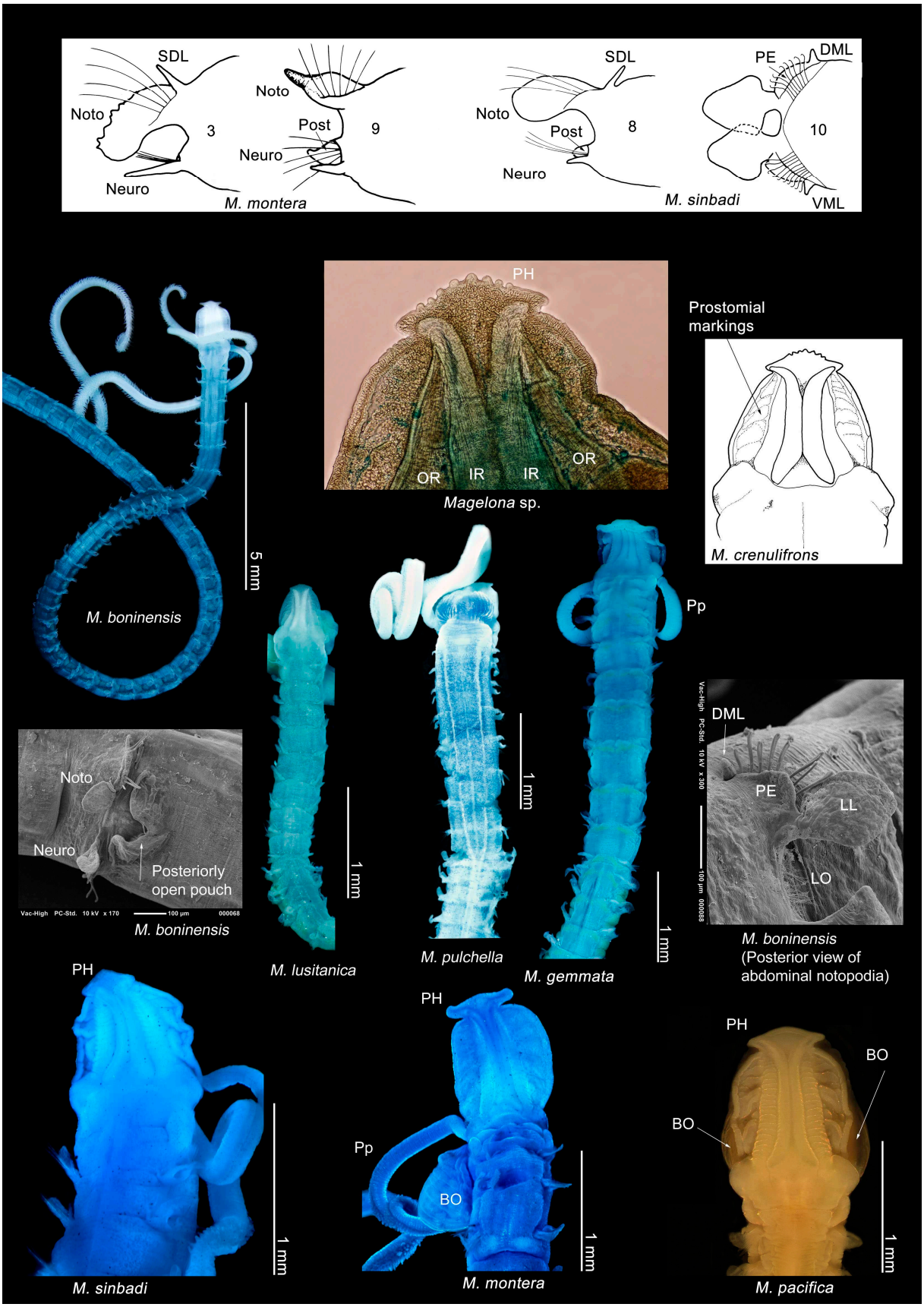


Figure 12. Horned species of magelonids in putative group 3.

Remarks: *Magelona spinifera* needs redescribing, but it fits the above group description well, differing only in the possession of foliaceous superior dorsal lobes. *Magelona paulolanai* Magalhães, Bailey-Brock & Watling, 2018 and *Magelona marianae* Hernández-Alcántara & Solís-Weiss, 2000 share some similarities with this group (see groups 4 and 6 respectively).

Group 4 (Filiform species)—see Figure 13

- **Body size**—slender to moderate, approximately 0.3–0.8 mm in width.
- **Prostomium**—generally longer than wide (or L = W) with a squared anterior margin formed into "rudimentary horns", anterior margin smooth. Two pairs of dorsal longitudinal muscular ridges, outer pair less prominent than inners (often difficult to discern). Light prostomial markings either side of ridges.
- **Palps**—fairly long and slender with approximately 4–8 rows of papillae proximally.
- **Chaetigers 1–8**—chaetigers 1–8 similar. Slender triangular notopodial lamellae postchaetal to subchaetal in position, superior dorsal lobes present. Neuropodial lamellae slender digitiform in a ventral position underneath chaetal bundle.
- **Chaetiger 9**—differs to preceding chaetigers, notopodia without superior dorsal lobes (sporadic ones noted for *Magelona ekapa*). Neuropodia with postchaetal expansions/lamellae towards the upper part of chaetal bundles and ventral/postchaetal lamellae towards the lower part (neuropodia of chaetiger 8 may resemble that of chaetiger nine, e.g., *Magelona noppi*).
- **Abdominal chaetigers**—spatulate lamellae basally constricted, stalked. Abdominal lamellae do not extend postchaetally behind chaetal rows. Triangular processes (DML and VML) present, generally quite long.
- **Chaetae**—chaetae similar across thorax, although those of the 9th chaetiger may be pennoned. Abdominal hooded hooks tridentate, *vis-à-vis*, hook(s) adjacent to lateral lamella smaller than rest, but remaining hooks of a similar size (needs verification for *Magelona paulolanai*).
- **Abdominal pouches**—posteriorly open pouches, if present, occur towards the extreme posterior region, generally alternating from one side of the body to the other, and on alternate chaetigers. Pouches simple, C-shaped, pocket-like structures.

Species of Group 4:

Magelona alba Taylor, Mortimer & Jimi, 2022—Temperate Northern Pacific
Magelona ekapa Mortimer & Clarke, 2024—Temperate South Africa
Magelona filiformis Wilson, 1959—Temperate Northern Atlantic
Magelona hartmanae Jones, 1978—Temperate Northern Pacific
Magelona hobsonae Jones, 1978—Temperate Northern Pacific
Magelona kamala Nateewathana & Hylleberg, 1991– Western Indo-Pacific
Magelona noppi Nateewathana & Hylleberg, 1991—Western Indo-Pacific
Magelona pitelkai Hartman, 1944—Temperate Northern Pacific

Remarks: *Magelona* sp. E of Uebelacker & Jones [22] from the Gulf of Mexico (see Figure 8) fits the above description well; however, differs in the nature of chaetiger nine and in possessing large bidentate hooded hooks. A much-needed redescription of the species may help. However, Uebelacker & Jones [22] concluded the specimen was juvenile. *Magelona cerae* Hartman & Reish, 1950 from the Temperate Northern Pacific is currently being redescribed by the first author. It shares similarities with the species within this group; however, differs in possessing bidentate and not tridentate hooded hooks. *Magelona paulolanai* Magalhães, Bailey-Brock & Watling, 2018 from the Eastern Indo-Pacific fits much of the description above; however, also shares similarities with group 3 (see above).

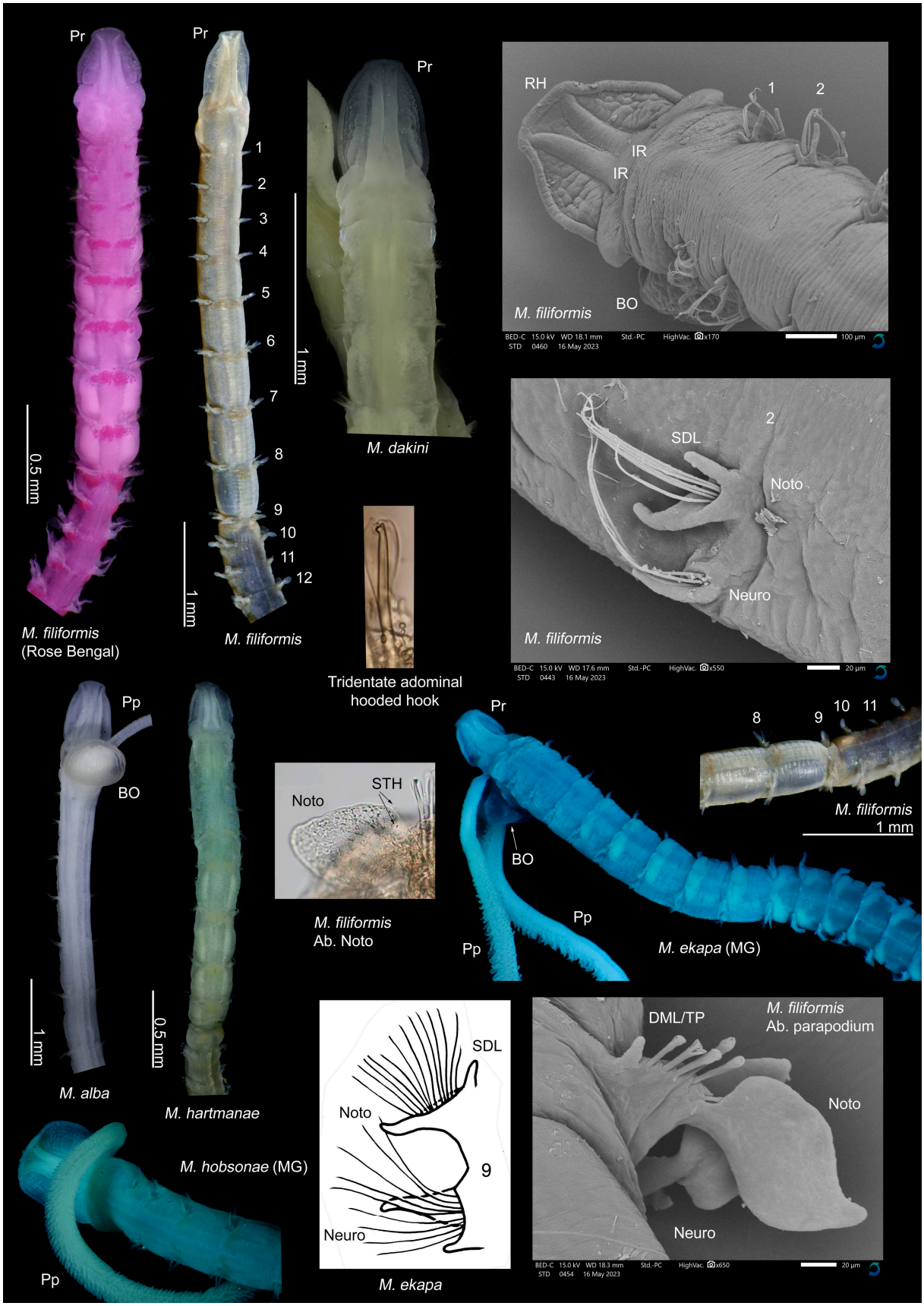


Figure 13. Filiform species of magelonids in putative group 4.

Mortimer & Clarke [14] highlighted clade K of Mortimer et al. [45] (see Figure 6), which included *Magelona filiformis*, *Magelona dakini*, *Magelona hartmanae*, *Magelona hobsonae* and *Magelona pitelkai*; species which possess smooth filiform thoracic lamellae, and straight prostomial anterior margins formed into rudimentary horns. Mortimer & Clarke [14] additionally noted that *Magelona ekapa*, *Magelona kamala*, *Magelona noppi*, *Magelona paulolanai*, *Magelona mahensis* and *Magelona alba* shared similarities with clade K of the above authors, suggesting the need for further investigations of the "*Magelona pitelkai*" group. The aforementioned species, except *Magelona dakini* and *Magelona mahensis,* were placed in group 4 herein by the current authors. The latter two species were placed in group 9 as they lack superior dorsal lobes. The forthcoming analysis from Mortimer, Fitzhugh and Brasil [47] should provide further clarity on this clade and its members. However, it is perhaps of interest to note that Jones [58] suggested a more distant relationship of *Magelona dakini* to *Magelona pitelkai*, *Magelona hobsonae*, and *Magelona hartmanae*.

Group 5 (Stout species)—see Figure 14

- **Body size**—stout, approximately 0.7–1.5 mm in width. Thoracic chaetigers have bulbous, rounded appearance at the lateral margins. Thorax consisting of eight or nine chaetigers.
- **Prostomium**—width similar to or greater than length (basal prostomial margins often wrapping around palp bases, e.g., *Magelona alleni* or *Magelona mickminni*, these edges can become folded outwards increasing appearance of the prostomial width). Anterior margin normally smooth (light crenulations may be present), squared to form "rudimentary horns", or distinct horns. Generally, one pair of prostomial muscular ridges, outer pair if present, less distinct. Prostomial markings either side of ridges generally weak/absent.
- **Palps**—moderate to robust, heavily papillated (~8–16 rows of papillae proximally, although details not known for several species).
- **Chaetigers 1–8**—notopodial lamellae slender triangular, subchaetal to postchaetal in position, superior dorsal lobes absent or present. Neuropodial lamellae slender triangular (may be distally expanded/scoop-shaped, e.g., *Magelona cincta* or *Magelona japonica*), most often ventral in position, but may be postchaetal, especially towards the posterior thorax.
- **Chaetiger 9**—may resemble preceding chaetiger, or lamellae may be entirely postchaetal in both rami. For those species with eight thoracic chaetigers, the 9th chaetiger resembles the subsequent abdominal chaetigers.
- **Abdominal chaetigers**—generally with elongate triangular lamellae, without basal constrictions (slight constriction noted for *Magelona nanseni*, *Magelona picta* and *Magelona petersenae*), no postchaetal expansion behind chaetal rows (except *M. picta*). Lamellae may be equal in size between rami, or significantly larger in the notopodia (e.g., *Magelona alleni* or *Magelona koreana)*. Triangular processes (DML and VML) may be absent or present.
- **Chaetae**—similar across thorax, no specialised chaetae of the 9th chaetiger. Abdominal hooded hooks may be bi-, tri- or polydentate, in two groups *vis-à-vis*.
- **Abdominal pouches**—absent or present. If present, posteriorly open, simple pocket-like pouches from the mid abdomen, alternating from one chaetiger to another, and from one side of the body to the other.
- **Colour**—pigmentation in posterior thorax as a distinct reddish-brown band approximately between chaetigers 5–8 generally present. Pigmentation may be light (e.g., *Magelona symmetrica*) and can fade in preservation fluid. Pigmentation may be more difficult to discern in specimens which carry pigmentation along the whole animal (e.g., *Magelona fasciata* and *Magelona koreana*) (N.B. pigmentation not cur-

rently recorded for *Magelona mickminni*, *Magelona petersenae*, *Magelona bizkaiensis* and *Magelona borowskii*)

➢ **Tube**—several species build multi-layered sediment-covered tubes.

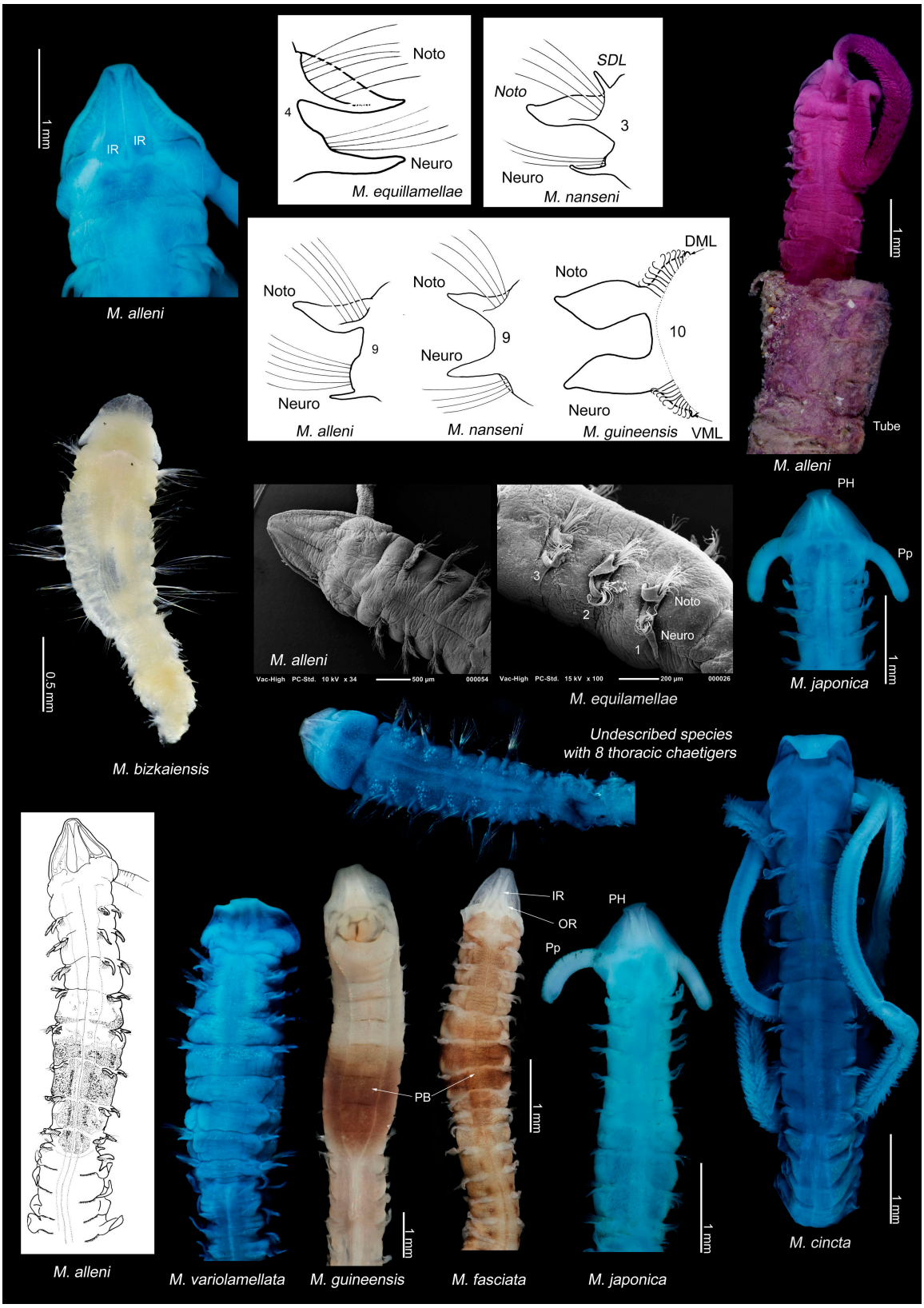


Figure 14. Stout species of magelonids in putative group 5.

Species of Group 5:

Rudimentary horns, SDL absent
Magelona alleni Wilson, 1958—Temperate Northern Atlantic
Magelona cincta Ehlers, 1908—Temperate South Africa
Magelona equilamellae Harmelin, 1964—Temperate Northern Atlantic
Magelona fasciata Mortimer, Kongsrud & Willassen, 2021—Tropical Atlantic
Magelona sp. I of Uebelacker & Jones [22]—Gulf of Mexico (see Figure 9)
Magelona symmetrica Mortimer & Mackie, 2006—Western Indo-Pacific
Magelona variolamellata Bolívar & Lana, 1986—Temperate South America
Rudimentary horns, SDL present
Magelona guineensis Mortimer, Kongsrud & Willassen, 2021—Tropical Atlantic
Magelona mackiei Mortimer, Kongsrud & Willassen, 2021—Tropical Atlantic
Magelona nanseni Mortimer, Kongsrud & Willassen, 2021—Tropical Atlantic
Magelona picta Mortimer, Kongsrud & Willassen, 2021—Tropical Atlantic
Distinct horns, SDL absent
Magelona japonica Okuda, 1937—Temperate Northern Pacific
Magelona koreana Okuda, 1937—Temperate Northern Pacific
Magelona mickminni Nateewathana & Hylleberg, 1991—Western Indo-Pacific
Magelona petersenae Nateewathana & Hylleberg, 1991—Western Indo-Pacific
Magelona polydentata Jones, 1963—Tropical Atlantic
Eight thoracic chaetigers
Magelona borowskii (Fiege, Knebelsberger & Meißner, 2023)—Temperate South America
Magelona bizkaiensis (Aguirrezabalaga, Ceberio & Fiege, 2001)—Temperate Northern Atlantic

Remarks:*Magelona capax* Hartman, 1965 from the Tropical Atlantic needs redescribing; however, fits well with the above description. *Magelona koreana* is in need of redescription.

Group 6 (Stout horned species)—see Figure 15

- **Body size**—large and stout, approximately 1–2 mm in width.
- **Prostomium**—wider than long, with prostomial horns (obvious although may not be separated greatly from anterior prostomial margin). Anterior margin may be smooth or minutely crenulate. Two pairs of prostomial muscular ridges, with some prostomial markings either side of ridges.
- **Palps**—heavily papillated with approximately 8–16 rows of papillae proximally.
- **Chaetigers 1–8**—notopodial lamellae foliaceous in a sub- to postchaetal position with broad superior dorsal lobes. Neuropodial lamellae triangular in a ventral position, often with a postchaetal expansion, which may be triangular, especially towards posterior thorax.
- **Chaetiger 9**—varies to preceding chaetigers, lamellae of notopodia and neuropodia generally symmetrical between the two rami (although note that the notopodia is larger than the neuropodia in *Magelona berkeleyi* and *Magelona cepiceps*). Super dorsal lobes generally present (absent in *Magelona berkeleyi* and *Magelona methae*), and small ventral neuropodial lobes present in addition to postchaetal lamellae.
- **Abdominal chaetigers**—spatulate abdominal lateral lamellae with basal constrictions. Small postchaetal expansion behind chaetal rows may be present in anterior abdomen only, or entirely absent. Triangular processes (DML and VML) present.
- **Chaetae**—similar across thorax, no specialised chaetae of the 9th chaetiger. Abdominal hooded hooks may be bi- or tridentate, in two groups *vis-à-vis* (recorded as unidirectional in *Magelona longicornis*, although this is not believed to be the case (first author, pers. comm.)).

➢ **Abdominal pouches**—unknown, not observed.

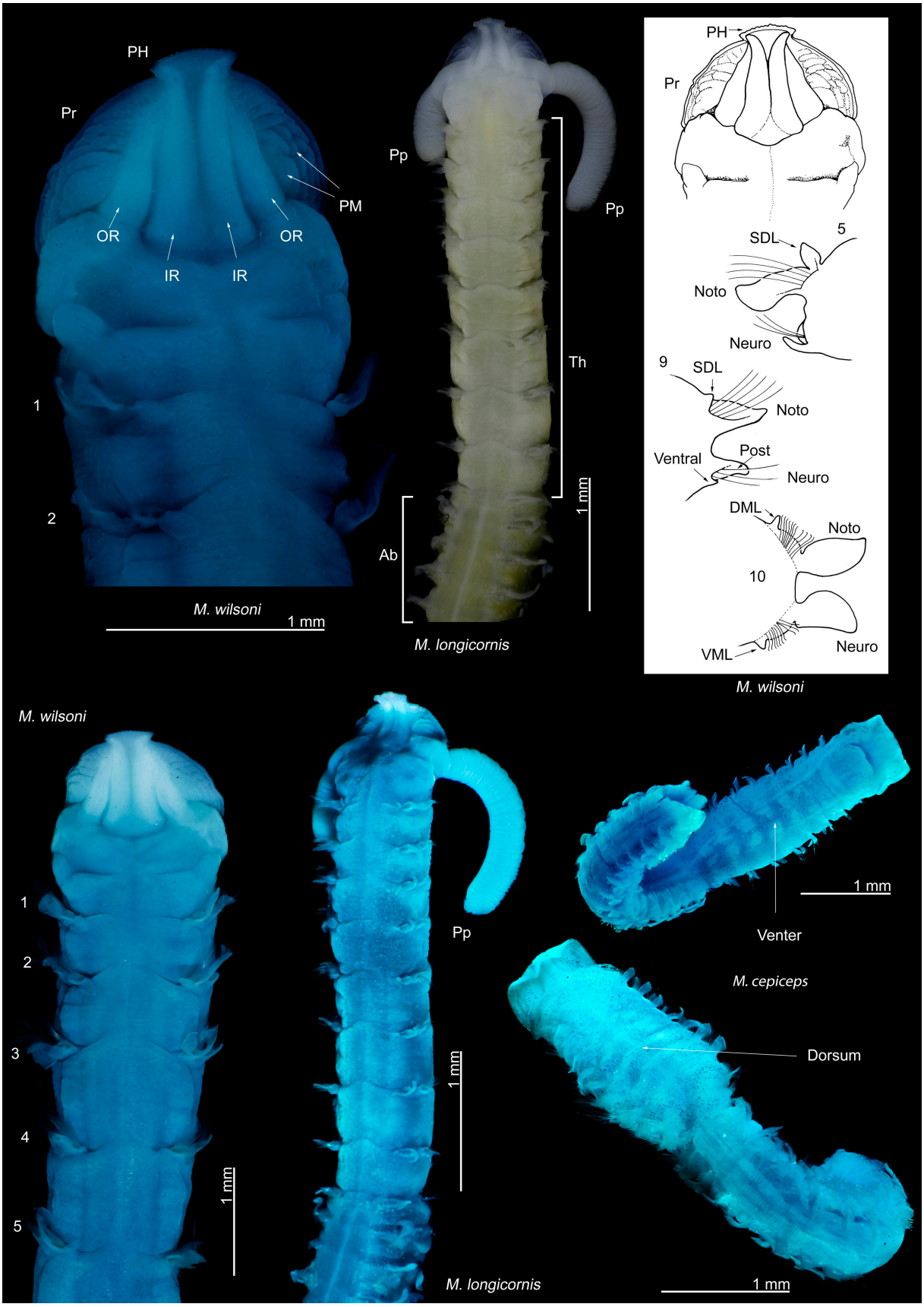


Figure 15. Stout horned species of magelonids in putative group 6.

Species of Group 6:

Magelona berkeleyi Jones, 1971—Temperate Northern Pacific
Magelona cepiceps Mortimer & Mackie, 2006—Western Indo-Pacific
Magelona sp. J of Uebelacker & Jones [22]—Gulf of Mexico (see Figure 9)
Magelona lenticulata Gallardo, 1968—Central Indo-Pacific
Magelona longicornis Johnson, 1901—Temperate Northern Pacific
Magelona marianae Hernández-Alcántara & Solís-Weiss, 2000—Temperate Northern Pacific
Magelona methae Nateewathana & Hylleberg, 1991—Western Indo-Pacific
Magelona nonatoi Bolívar & Lana, 1986—Temperate South America
Magelona wilsoni Glémarec, 1966—Temperate Northern Atlantic

Remarks:*Magelona marianae* needs redescription, and although it does, in general, fit the above criteria; it is slightly thinner and possesses crenulate thoracic notopodial lamellae. It additionally shares some similarities with group 3 (see above).

Group 7 (Long prostomia with distinct horns)—see Figure 16

- **Body size**—moderately sized, approximately 0.8–1 mm in width.
- **Prostomium**—longer than wide with distinct prostomial horns, separated from the anterior prostomial margin somewhat. Anterior margin smooth, triangular. Two pairs of distinct prostomial muscular ridges with obvious prostomial markings either side.
- **Palps**—relatively thick, heavily papillated with ~8 rows of papillae.
- **Chaetigers 1–8**—similar, slender lanceolate to foliaceous notopodial lamellae in a sub- to postchaetal position, with slender superior dorsal lobes. Neuropodial lamellae slender triangular, ventral in position.
- **Chaetiger 9**—varying from preceding chaetigers. Notopodial lamellae shorter than those of chaetigers 1–8 and in a lateral position, without superior dorsal lobes. Neuropodial lamellae similar to preceding chaetigers but shorter.
- **Abdominal chaetigers**—abdominal lateral lamellae spatulate, slight basal constriction. Triangular postchaetal expansion behind chaetal rows. Triangular processes (DML and VML) present.
- **Chaetae**—similar across thorax, no specialised chaetae of the 9th chaetiger. Abdominal hooded hooks tridentate, in two groups *vis-à-vis*.
- **Abdominal pouches**—absent (anteriorly open pouches recorded for *Magelona anuheone* between chaetigers 9 and 10; however, the holotype has been reviewed and they are absent, see Figure 16).
- **Note**—shares many similarities with group 3 (particularly the prostomial shape of species such as *Magelona montera* and *Magelona pacifica;* however, differs in the neuropodia of chaetigers 8 and 9).

Species of Group 7:

Magelona anuheone Magalhães, Bailey-Brock & Watling, 2018—Eastern Indo-Pacific
Magelona sp. K of Uebelacker & Jones [22]—Gulf of Mexico (see Figure 9)

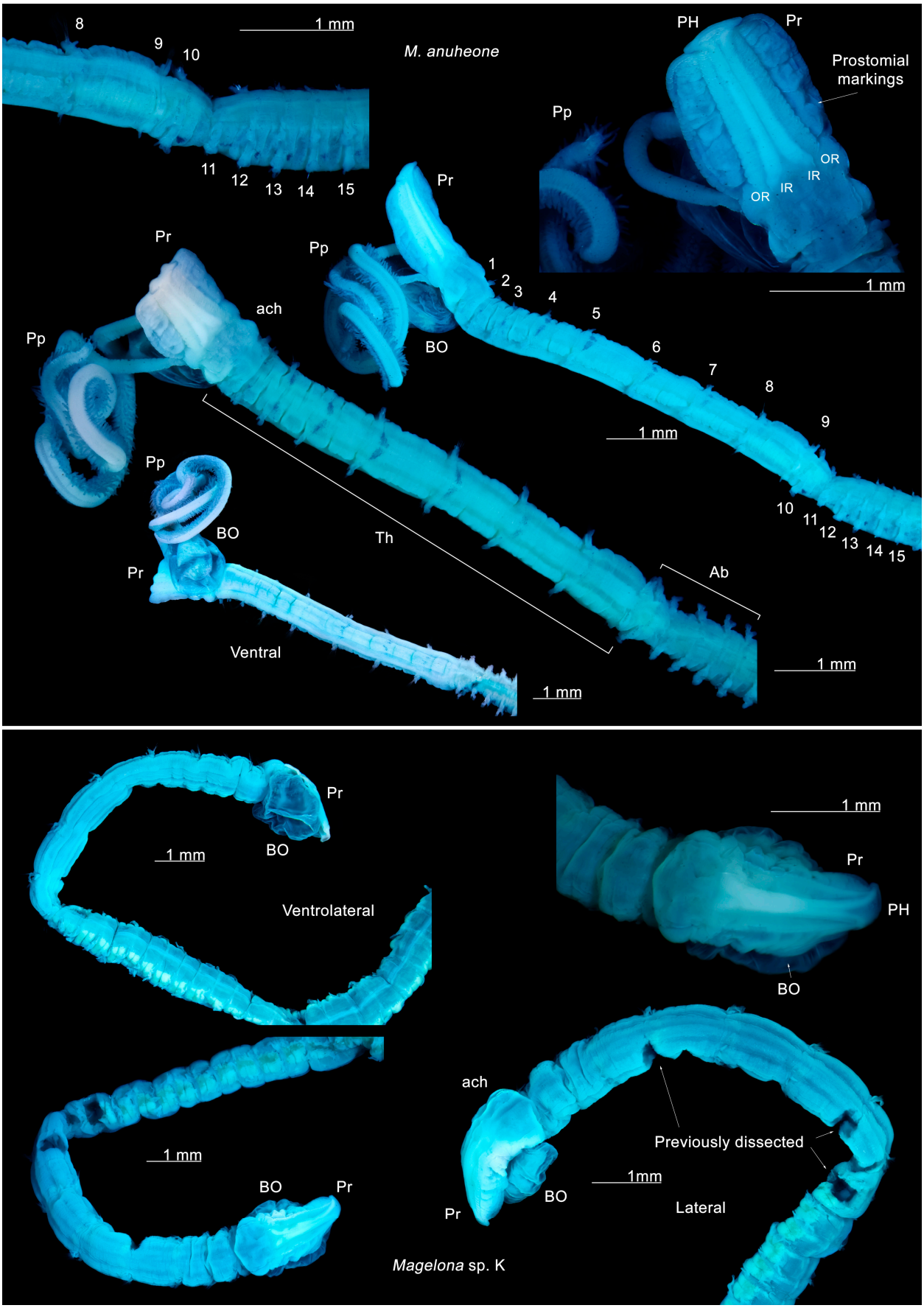


Figure 16. Magelonids in putative group 7 with long prostomia and distinct prostomial horns.

Group 8 (Stout species with rudimentary horns)—see Figure 17

- **Body size**—large, stout, approximately 1–1.5 mm in width. Anterior margins of thoracic chaetigers overlap preceding chaetiger on dorsal surface.
- **Prostomium**—width similar to length, straight anterior margin, which may be formed into "rudimentary horns". Anterior margin may be smooth or medially idented. Basal prostomial margins often wrapping around palp bases. Two pairs of distinct prostomial muscular ridges, with obvious markings either side.
- **Palps**—unknown for two species, thick and heavily papillated for *Magelona rosea.*
- **Chaetigers 1–8**—notopodial postchaetal lamellae foliaceous with superior dorsal lobes. Neuropodia with spatulate to triangular lamellae underneath chaetal bundle, often postchaetally expanded, especially towards posterior thorax. By chaetiger 8 distinct triangular postchaetal lamellae present in addition to ventral lamellae.
- **Chaetiger 9**—notopodial lamellae lower and shorter in comparison to preceding chaetigers, with superior dorsal lobes (unknown for *Magelona rosea*). Neuropodia with triangular postchaetal lamellae and small ventral lamellae underneath chaetae.
- **Abdominal chaetigers**—spatulate abdominal lateral lamellae, basally constricted with slight postchaetal expansion behind chaetal rows in anterior abdomen. Small triangular processes (DML and VML) present.
- **Chaetae**—similar across thorax, no specialised chaetae of the 9th chaetiger. Tridentate abdominal hooded hooks in two groups *vis-à-vis*.
- **Abdominal pouches**—none observed.

Species of Group 8:

Magelona armatis Taylor, Mortimer & Jimi, 2022—Temperate Northern Pacific
Magelona capensis Day, 1961—Temperate South Africa
Magelona rosea Moore, 1907—Temperate Northern Atlantic (in need of redescription)

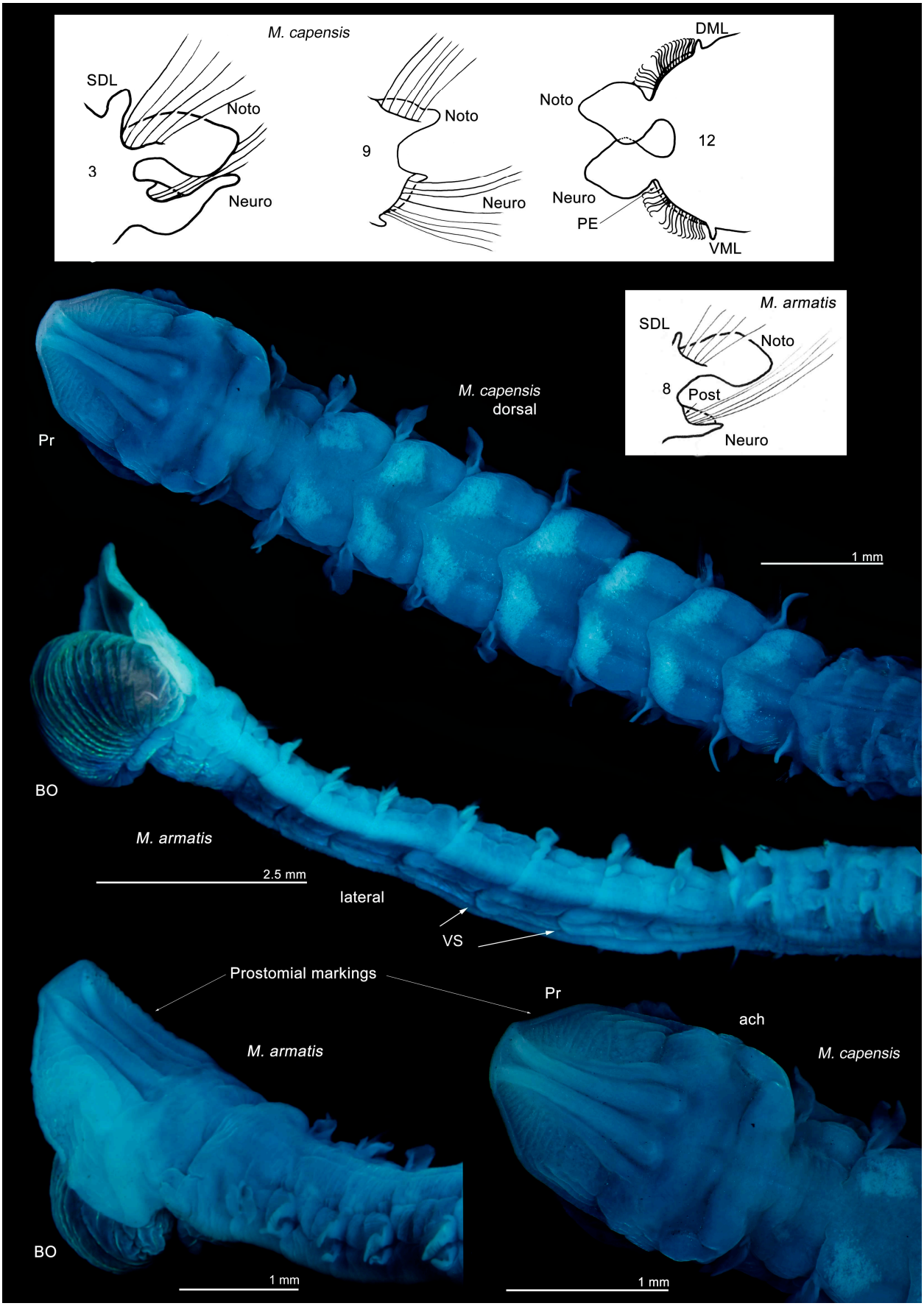


Figure 17. Stout magelonids in putative group 8 with rudimentary prostomial horns.

Group 9 (Moderate species without superior dorsal lobes)—see Figure 18

- **Body size**—moderately slender, approximately 0.3–0.8 mm in width.
- **Prostomium**—width similar to length, or marginally longer than wide. Anterior margin straight and may be formed into "rudimentary horns", or more well-developed horns (*Magelona uebelackerae* and *Magelona posterelongata*), anterior margin may be smooth or minutely crenulate. Two pairs of distinct prostomial muscular ridges with small but distinct markings either side.
- **Palps**—long and fairly slender, 8–12 rows of papillae proximally.
- **Chaetigers 1–8**—notopodial lamellae larger than neuropodial, slender foliaceous and postchaetal without super dorsal lobes. Neuropodial lamellae slender, directly under chaetal bundle.
- **Chaetiger 9**—notopodial and neuropodial lamellae similar in both rami and postchaetal in position (additional ventral lamellae may be absent or present), or lamellae similar to preceding chaetiger.
- **Abdominal chaetigers**—spatulate abdominal lateral lamellae, basally constricted, with or without postchaetal expansion behind chaetal rows. Triangular processes (DML and VML) present or absent.
- **Chaetae**—similar across thorax, no specialised chaetae of the 9th chaetiger. Abdominal hooded hooks bi- or tridentate, in two groups *vis-à-vis*. Enlarged hooded hooks may be present (*Magelona uebelackerae*) or absent.
- **Abdominal pouches**—pouches present or absent. When present, they occur in extreme posterior region and are unpaired, posteriorly open, simple C-shaped pocket-like structures. Pouches alternating from one side of the body to the other and on alternate chaetigers.

Species of Group 9:

Magelona mahensis Mortimer & Mackie, 2006—Western Indo-Pacific

Magelona posterelongata Bolívar & Lana, 1986—Temperate South America

Magelona uebelackerae (Hernández-Alcántara & Solís-Weiss, 2000) (*Magelona* sp. H of Uebelacker & Jones [22])—Temperate Northern Atlantic (see Figure 9)

Magelona sp. F of Uebelacker & Jones [22]—Gulf of Mexico (see Figure 8)

Magelona annulata Hartmann-Schröder, 1962—Temperate South America (currently being redescribed by the first author)

Magelona phyllisae Jones, 1963—Temperate South America—see remarks below

Remarks: *Magelona phyllisae* Jones, 1963 is a likely synonym of *Magelona annulata* (first author pers. comm.), both species of which are currently being redescribed. *Magelona dakini* Jones, 1978 from Temperate Australasia, fits well with the group but does show some variation in terms of chaetiger nine. It additionally shares some similarities with group 4 (see above).

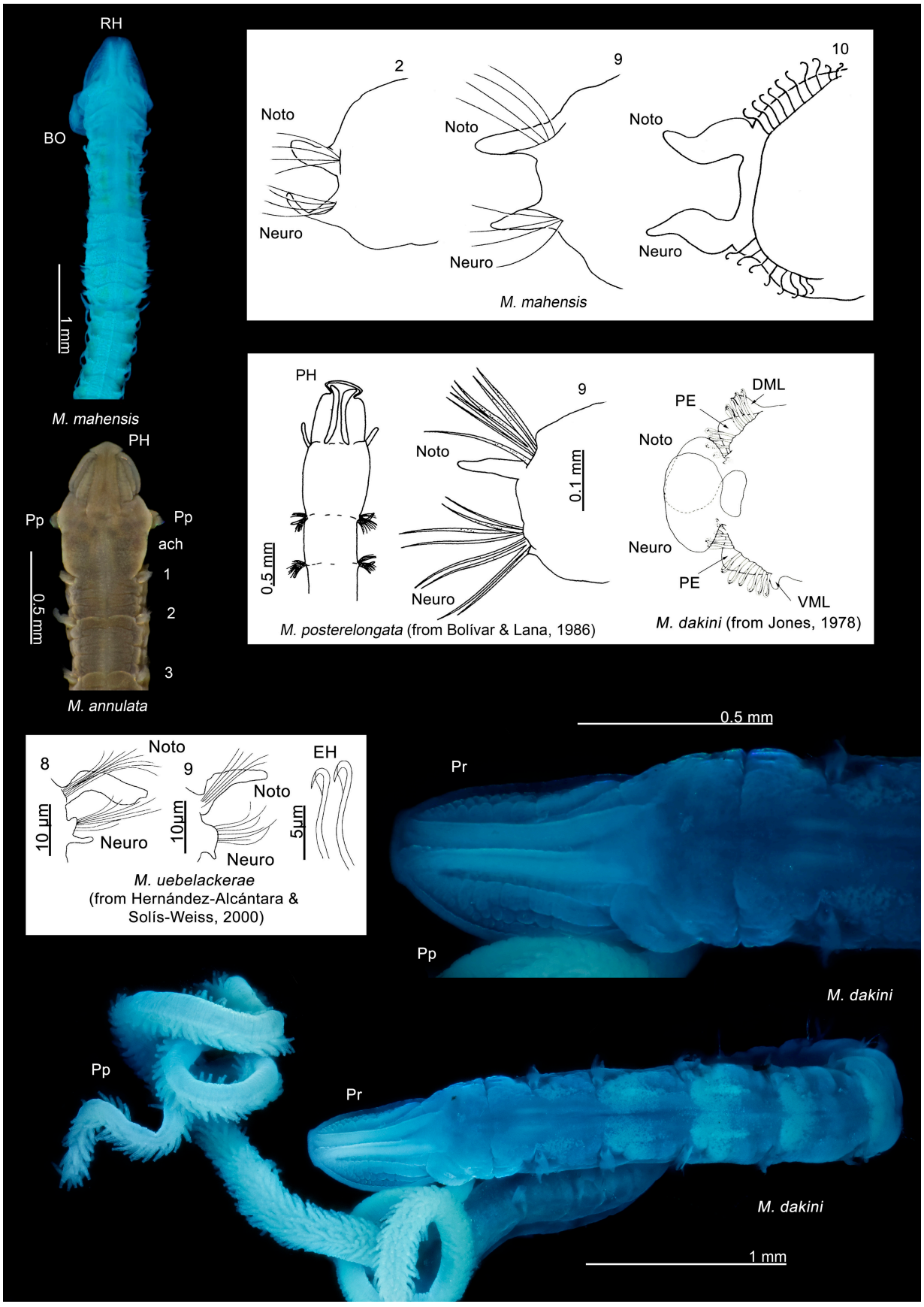


Figure 18. Moderate magelonids in putative group 9 without superior dorsal lobes.

The following species need redescription and cannot be placed into the key at this time:

Magelona americana Hartman, 1965 from the Temperate Northern Atlantic (a large species with distinct prostomial horns and a triangular anterior prostomial margin. It possesses tridentate abdominal hooded hooks).

Magelona jonesi Hartmann-Schröder, 1980 [100] from the Central Indo-Pacific (a stout species possessing a squared anterior prostomial margin, smooth-edged lamellae without superior dorsal lobes, and bidentate abdominal hooded hooks). This species is currently undergoing redescription by the first author.

Magelona agoensis Kitamori, 1967 from the Temperate Northern Pacific (a large species with a squared anterior prostomial margin and polydentate abdominal hooded hooks). Unfortunately, the type material is presumed lost, so collection of fresh material from the type locality is needed.

4. Discussion

This study provides a comprehensive overview of the current taxonomic understanding of the Magelonidae, emphasising both the substantial advancements in species-level knowledge but also the geographic gaps in taxonomic revisions. Despite ongoing taxonomic challenges within the family, the identification keys presented herein offer a practical tool to facilitate more reliable species determinations. The re-establishment of the genus *Maea* Johnston, 1865, in conjunction with an anticipated phylogenetic reassessment [47], is expected to mitigate the issues arising from the historically monotypic framework of the family.

A major impediment to taxonomic resolution remains the uneven geographic coverage of taxonomic research and the lack of systematic revisions across many regions. These challenges are symptomatic of a deepening taxonomic crisis [101–104], with the decline in trained taxonomists and restricted access to the primary literature, which is often locked behind paywalls. Historic identification guides, such as Day [66], remain widely used due to their accessibility, perceived comprehensiveness, and their ease of use in ecological monitoring contexts. However, their continued use has been shown to propagate erroneous identifications [14,67], while more recent, regionally specific taxonomic treatments are frequently underutilised. Although significant strides have been made over the past quarter-century in developing regional guides for Magelonidae, notable gaps persist, underscoring the need for updated and universally accessible resources.

To improve species identification and biodiversity records, it is imperative to consolidate fragmented taxonomic data, prioritise redescriptions of poorly described taxa, and identify potentially undescribed species. Taxonomic resources must be both openly available [105] and comprehensible to a broad user base [106], as demonstrated by Taylor & Mortimer [61,62] in their work on European magelonids. More recently, discussions have also highlighted the necessity of integrating emerging technologies into taxonomy to enhance its relevance and sustainability [107,108]. Tools such as the interactive map (https://katemortimer.shinyapps.io/MagelonidaeTypeLocalities/, created on 11 November 2026, accessed on 1 February 2026) provided in this study may help reduce misidentifications and erroneous biogeographic records, which often result from extrapolating species distributions far beyond their type localities.

However, despite recent taxonomic efforts, platforms such as GBIF [109] continue to host outdated or incorrect records, including those for *Magelona papillicornis*, which have now been referred to multiple species across Europe and South Africa [14,30]. The persistence of such inaccuracies complicates data interpretation and underscores the urgent need for these repositories to synchronise with current taxonomic revisions. At present, the responsibility for identifying and correcting these errors rests largely with the taxonomic experts. Links to the relevant GBIF pages for each species have been added to the interactive map noted here, alongside taxonomic notes from the first author where inaccuracies are likely to persist.

Further taxonomic work is needed particularly in regions such as South America, eastern and western Africa, southern and southeastern Asia, and Oceania, and those species highlighted as needing urgent redescriptions should be the priority.

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Abbreviations

The following abbreviations are used in this manuscript:

ab	Abdomen/abdominal
AC	Amgueddfa Cymru—Museum Wales (NMW.Z)
ach	Achaetous region
AMNH	American Museum of Natural History
AOP	Anteriorly opening pouch (∑ pouch of [5])
BO	Burrowing organ (previously termed proboscis)
DML	Dorsal medial lobe of Jones [58] (triangular processes of Taylor & Mortimer [61,62])
EH	Enlarged hook
IR	Inner ridges (prostomial)
LL	Lateral lamellae
LO	Lateral organ
MC	Mucronate chaetae
MG	Methyl green stained
Neuro	Neuropodia
OR	Outer ridges (prostomial)
PB	Pigment band (of the posterior thorax)
PE	Postchaetal expansion behind chaetal row
PH	Prostomial horns
Post	Postchaetal
PM	Prostomial markings
Pp	Palp
Pr	Prostomium
RH	Rudimentary horns
SDL	Superior Dorsal Lobe
STH	Small tridentate hook
Th	Thorax
VML	Ventral medial lobe of Jones [58] (triangular processes of Taylor & Mortimer [61,62])
VS	Ventral swellings

Appendix A

Table A1. Type locality data for all described species within the Magelonidae divided into the biogeographic marine realms of Spalding et al. [64].

Species	Type Locality	Sediment	Depth (m)
Temperate Northern Pacific			
Magelona agoensis Kitamori, 1967	Ago Bay, Japan	Sandy bottom	5 m
Magelona alba Taylor, Mortimer & Jimi, 2022	Off Toyoihama, Hokkaido (43.2266, 141.0164), Japan	Sandy sediments	4–5 m
Magelona armatis Taylor, Mortimer & Jimi, 2022	Off Miskai, Kanagawa (35.1641, 139.6250), Japan	Sandy sediments	3–5 m
Magelona berkeleyi Jones, 1971	North of Henderson Inlet (47°10′40″ N, 122°48′48″ W), Puget Sound, Washington, USA	Mixed substrate of mud, sand and gravel	32–40 m
Magelona boninensis Taylor, Mortimer & Jimi, 2022	Ougiura beacg, Chichijima Island, Bonin Islands, Japan	Sandy sediments	1–2 m
Magelona californica Hartman, 1944	Mission Bay, California, USA	Not described	Intertidal
Magelona cerae Hartman & Reish, 1950	"Dredged off Coos Bay" (station 1471off Tenmile creek situated between Winchester Bay and Coos Bay), Oregon, USA	Sand	37–73 m (20–40 fms)
Magelona hartmanae Jones, 1978	Velero IV station 4842-57 (34°11′10″ N, 119°15′50″ W, off Port Hueneme/Oxnard, California, USA	Fine olive-green sand	12.7 m
Magelona hobsonae Jones, 1978	Eagle Cove, SW shore of San Juan Island, Puget Sound, Washington (48°27.6′ N, 123°01.8′ W)	Sand	Low intertidal levels of beaches and flats
Magelona japonica Okuda, 1937	Incheon (Jinsen), Korea & Onagawa, Miyagi Prefecture Japan	Soft, muddy sediments	N.D.
Magelona koreana Okuda, 1937	Incheon (Jinsen), Korea. Collected with *M. japonica*	Soft, muddy sediments	N.D.
Magelona longicornis Johnson, 1901	West Seattle, Puget Sound, USA	Not described	N.D. (Intertidal to 197 m Jones [56])
Magelona marianae Hernández-Alcántara & Solís-Weiss, 2000	Punta Mita (20°54′ N, 108°31′ W), Mexico	Fine and medium sands	23.5–46.4
Maea parochilis (Zhou & Mortimer, 2013)	Station ECSFRI100532 (32°10.87′ N, 121°39.58′ E), Yellow Sea, China	Sandy mud	Tidal flats and shallow subtidal waters
Magelona pitelkai Hartman, 1944	Northern end of Tomales Bay, California, USA	Muddy, sandy sediments	Flats at low water line
Maea sacculata (Hartman, 1961)	6 miles SE x E (1248 T) from Long Beach Breakwater Light, Los Angeles County, California (33°40′00″ N, 118°05′08″ W), R/V *Velero* IV Stn 2311-53 San Pedro shelf area, California, USA	Hard-packed grey sand	20–40 m
Maea sachalinensis (Buzhinskaja, 1985)	Sakhalin Island (Russia), Sea of Japan	Sand	30 m
Magelona spinifera (Hernández-Alcántara & Solís-Weiss, 2000)	Stn 4, Santa María Bay (24°57′ N, 108°42′ W), Mexico	Silty sand	75 m

Table A1. *Cont.*

Species	Type Locality	Sediment	Depth (m)
Tropical Eastern Pacific			
Magelona magnahamata Aguado & San Martín, 2004	Granito de Oro, Coiba National Park, Pacific coast of Panamá, (7°35′30″ N, 81°42′30″ W)	Coarse coral sand	Samples taken between 0.5 and 10 m. Type depth not described
Magelona pacifica Monro, 1933	Gorgona Island, off Colombia	Coral rubble?	Low tide
Magelona tehuanensis Hernández-Alcántara & Solís-Weiss, 2000	Western Salina Cruz, (15°57′ N, 95°20′ W), Stn 212,	Mud	70 m
Temperate South America			
Magelona annulata Hartmann-Schröder, 1962	Isla Blanca, Chimbote Bay, Peru	Mud	8 m
Magelona borowskii (Fiege, Knebelsberger & Meißner, 2023)	Peru Basin, SE Pacific Ocean (−7.0742, −88.5735)	Not described	4124–4257 m
Maea crenulata (Bolívar & Lana, 1986)	Access channel to the Port of Paranguá (Canal da Galheta, Buoy 12), Baía de Paraná, Brazil	Fine sand	10 m, shallow
Magelona nonatoi Bolívar & Lana, 1986	Station 190 on the Continental Platform—Ilha Grande, Sepetiba, Rio de Janeiro, Brazil	Fine mud/clayey mud with shells	25 m
Magelona papillicornis F. Müller, 1858	Saco dos Limoes, Santa Catarina Islands (27°36.6′ S, 48°32.2′ W),	Not described	Shallow subtidal (0.0 to −1.0 ft)
Magelona phyllisae Jones, 1963 (N.B. currently being re-described, possibly synonym of *M. annulata*)	Lamont Geological Observatory Station V-15-68 (09°40′ S, 79°28′ W) offshore from Santa, Peru,	Not described	181 m
Magelona posterelongata Bolívar & Lana, 1986	Station D3, Baía de Paraná, Brazil	"lodo com restos vegetais"—slime with plant debris	13 m
Magelona variolamellata Bolívar & Lana, 1986	Station A-2, near the port of Paranagua, Baía de Paraná, Brazil	Sandy-silty sediment	15 m
Tropical Atlantic			
Magelona capax Hartman, 1965	Chain dredge station Ch 35 Dr 12 (07°09′ S, 34°25′30″ W), off João Pessoa, Paraíba, Brazil. Additionally recorded off Suriname (Dutch Guiana)	Not described	770–805 m (additionally recorded from 1500 m)
Magelona fasciata Mortimer, Kongsrud & Willassen, 2021	Stn. 7GH–02, (4.9169 N, 2.6495 W), Ghana	Not described	40 m (type), 19–106 m
Magelona guineensis Mortimer, Kongsrud & Willassen, 2021	Stn 5SP–05 (1.5345 N, 7.4225 E), São Tomé and Príncipe	Not described	38 m (type), 8–92 m
Magelona mackiei Mortimer, Kongsrud & Willassen, 2021	Stn 5N-14 (3.9828° N, 6.2157° E), Nigeria, Gulf of Guinea	Not described	217 m (type), 8–340 m
Magelona nanseni Mortimer, Kongsrud & Willassen, 2021	St. 5N–11 (4.1482 N, 5.7688 E), Nigeria, Gulf of Guinea	Not described	25 m (type), 25–29 m
Magelona picta Mortimer, Kongsrud & Willassen, 2021	St. 7AN–03 (6.8526° S, 12.2831° E) Angola	Not described	50 m
Magelona polydentata Jones, 1963	Bimini Lagoon, Bahamas (*Thalassia* seagrass flats near the Lerner Marine Laboratory Pier)	Not described	Intertidal
Maea riojai (Jones, 1963)	Anton Lizardo, State of Veracruz, Southern Gulf of Mexico, Mexico	Sand substrate	Low intertidal to barely subtidal

Table A1. *Cont.*

Species	Type Locality	Sediment	Depth (m)
Temperate Northern Atlantic			
Magelona alleni Wilson, 1958	Rame Head, Plymouth, England, approximately 50.302° N, 4.244° W	Mud	Estimated 60 m
Magelona americana Hartman, 1965	Slope (S13, Block Canyon) off New England, USA (39°58′24″ N, 70°40′18″ W)	Not described	300 m (type), 200–400 m
Magelona bizkaiensis (Aguirrezabalaga, Ceberio & Fiege, 2001)	Stn KF39, Capbreton Canyon (43°41.88′ N, 02°19.05′ W), Bay of Biscay (offshore France/Spain)	Soft bottom	1020 m (type), 1000–1040 m
Maea brachypalpata (Mortimer, Blake & Harrendence, 2021)	Stn 37-1 (40°33.9938′ N, 73°21.0607′ W), Off Jones Beach, Long Island, NY, USA	Sand	57.9 m (type), 17.3–67.1 m
Magelona equilamellae Harmelin, 1964	Rade de Villefranche (~43.696° N, 7.309° E), 13 m, and Golfe de Marseille, off Anse du Prophète (~43.272° N, 5.359° E), France	Degraded *Posidonia oceanica* meadow covered by a deposit of thin mud, "matte morte" of *Posidonia oceanica*	13–18 m
Magelona filiformis Wilson, 1959	Mill Bay, Salcombe, England	Clean sand	Near low water
Maea johnstoni (Fiege, Licher & Mackie, 2000)	St Andrews, Scotland	Sandy sediments	Intertidal to 88 m, type locality: shore (?)
Magelona lusitanica Mortimer, Gil & Fiege, 2011	SEPLAT 6, Stn 306 (37°26.2′ N, 09°03.1′ W)	Sandy mud, muddy sand and sand	224 m (type), 105–327 m
Magelona minuta Eliason, 1962	Station 068 69 (see map in Eliason (1962)), Öresund, Sweden	Mud with a little sand and shells	16 m (type), 15–18
Maea mirabilis Johnston, 1865	Neotype: St Andrews, Scotland	Sandy sediments	Intertidal (mid to lower shore) to 32 m
Magelona pettiboneae Jones, 1963	Near the mouth of St Andrews Bay (30°00′34″ N, 85°54′12″ W), Florida, USA	Sand	~100 ft (~30 m)
Magelona rosea Moore, 1907	A little shallow bay on the Buzzard's Bay side of Wood's Hole, MA, USA	Sandy	Beach below low water
Magelona uebelackerae (Hernández-Alcántara & Solís-Weiss, 2000)	Stn CC157 (27°49′12″ N, 097°13′08″ W), Gulf of Mexico, TX, USA	Muddy sand (see Uebelacker & Jones (1984), *Magelona* sp. H)	3 m (type), 3–24 m
Magelona wilsoni Glémarec, 1966	3 stations noted for syntype specimens: South of Brittany, 'Grande Vasière (47°38′ N, 3°41′40″W; 47°30′30″ N, 4°1′40″ W; 47°34′ N, 4°24′ W), France	Fine silty sand	60–110 m
Temperate South Africa			
Magelona capensis Day, 1961	Stn SCD 128L (34°37′ S, 21°56′ E) Agulhas Bank, Western Cape, South Africa	Sand	86 m
Magelona cincta Ehlers, 1908	Stn 101 (33°50′ S, 25°48′ E), Algoa Bay, Eastern Cape, South Africa	Among molluscs, bryozoans and echinoderms	40 m
Maea debeerei (Clarke, Paterson, Florence & Gibbons, 2010)	Southern coast of Namibia between Lüderitz and Oranjemund (28°16′ S, 16°01′ E)	Sandy to muddy sediments	37 m (type), from intertidal to 100 m depth
Magelona ekapa Mortimer & Clarke, 2024	Stn WCD 37J (33°06.7′ S, 17°54.8′ E), off Saldanha Bay, Western Cape, South Africa	Sandy mud	68 m

Table A1. *Cont.*

Species	Type Locality	Sediment	Depth (m)
Western Indo-Pacific			
Magelona cepiceps Mortimer & Mackie, 2006	Stn 50 (4°37.71′ S, 55°33.4′ E) NE of Mahé, Seychelles	Medium-coarse coralline sand. known also from silty quartz sand	33 m (type), 33–45 m
Maea conversa (Mortimer & Mackie, 2003)	Stn 2a (4°42.97′ S, 55°32.41′ E) SE of Mahé, Seychelles	Coarse quartz, calcareous sand/gravel	30 m (type), 26–42
Magelona cornuta Wesenberg-Lund, 1949	Stn 100–20 miles E by N of Ras Jagin (25°31′30″ N, 58°29′ E N.B. paper mistakenly says 38°) Gulf of Oman, Iran	Not described	12 m
Magelona falcifera Mortimer & Mackie, 2003	Stn 2a (4°42.97′ S, 55°32.41′ E), SE of Mahé, Seychelles	Coarse quartz, calcareous sand/gravel	30 m (type), 10–56 m
Magelona fauchaldi Shakouri, Mortimer & Dehani, 2017	Shahid Beheshti Docks (25.3129328 N, 60.6037208 E), Chabahar Bay, South-eastern Iran	Very fine sand (type), muddy sand, sandy mud and very fine sand	8 m (type), 1.5–20 m
Magelona gemmata Mortimer & Mackie, 2003	Stn 10a (4°44.05′ S, 55°20.54′ E), West of Mahé, Seychelles	Muddy sand (type), muddy sand to coarse quartz sand	55 m (type), 48–62 m
Magelona kamala Nateewathana & Hylleberg, 1991	Kamala Bay, Phuket Island, Thailand	Fine sand	10 m
Magelona mahensis Mortimer & Mackie, 2006	Stn 48a (4°37.25′ S, 55°32.24′ E), NE of Mahé, Seychelles	Medium coarse coralline sand (type), mud/clay, silty sand, medium coarse sand and coarse sand	22 m (type), 11–48 m
Magelona methae Nateewathana & Hylleberg, 1991	Kamala Bay, Phuket Island, Thailand	Fine sand	10 m
Magelona mickminni Nateewathana & Hylleberg, 1991	Patong Bay, Phuket Island, Thailand	Medium sand	10 m
Magelona montera Mortimer, Cassà, Martin & Gil, 2012	Eilat (~29°33′ N, 34°57′ E), Gulf of Aqaba, Northern Red Sea, Israel	Sand	Intertidal
Magelona noppi Nateewathana & Hylleberg, 1991	Nopparat-Thara Beach, Krabi, Thailand	Muddy sand	Intertidal
Maea obockensis (Gravier, 1905)	Obock, Djibouti, Gulf of Aden, Red Sea	In the sands of *Balanoglossus* with *Cymodoce*	Low tide
Maea pectinata (Nateewathana & Hylleberg, 1991)	Kamala Bay, Phuket Island	Fine sand	10 m
Magelona petersenae Nateewathana & Hylleberg, 1991	Bang Tao Bay, Phuket, Thailand	Fine sand	10 m
Magelona pulchella Mohammad, 1970	Kuwait (29°22′ N, 48°02′ E), Persian Gulf	Sand	Intertidal zone
Magelona pygmaea Nateewathana & Hylleberg, 1991	Kamala Bay, Phuket Island, Thailand	Fine sand	10 m
Magelona sinbadi Mortimer, Cassà, Martin & Gil, 2012	Stn. B4-20A (27°41.908′ N, 52°11.497′ E), Iran, Persian Gulf	Shelly muddy sand	20 m
Magelona symmetrica Mortimer & Mackie, 2006	Stn 1c (4°41.24′ S, 55°32.19′ E), East of Mahé, Seychelles	Fine and medium sand and coral sediment	20 m
Maea tinae (Nateewathana & Hylleberg, 1991)	Bang Tao Bay, Phuket Island, Thailand	Very fine sand	10 m

Table A1. *Cont.*

Species	Type Locality	Sediment	Depth (m)
Central Indo-Pacific			
Magelona crenulifrons Gallardo, 1968	Station 131 (approximately 12.19536, 109.24968 based on map in Naga Report, N.B. the report labels this island as Hòn Lón), off Hòn Tre, Nha Trang, Vietnam	Mud	17 m
Magelona jonesi Hartmann-Schröder, 1980	Exmouth Gulf, approximately 24 km south of the town, Western Australia	Fine sand flats between reef plates	Intertidal?
Magelona lenticulata Gallardo, 1968	Station 277 (approximately 12.1617, 109.28923, based on map in Naga Report) off Hòn Mun, Nha Trang, Vietnam	Muddy sand	34 m
Eastern Indo-Pacific			
Magelona alexandrae Magalhães, Bailey-Brock & Watling, 2018	Oahu, Mamala Bay, Cage, Sta. FWR2 (21°17′22.4″ N, 158°00′36.7″ W), Hawaii	Not described	39.6 m (Holotype), 39–68 m
Magelona anuheone Magalhães, Bailey-Brock & Watling, 2018	Sta. HB3 (27°08′45.60″ S, 109°26′06.00″ W), Hanga Roa, Easter Island (Chile)	Not described	Shallow
Magelona cinthyae Magalhães, Bailey-Brock & Watling, 2018	Sta. HI02-0008, Paukauila Stream (21°34′21.35″ N, 158°5′47.7″ W), Oahu, Hawaii	Not described	N.D. (intertidal?)
Magelona paulolanai Magalhães, Bailey-Brock & Watling, 2018	Sta. B6R5 (21°17′04.7″ N, 157°53′25.3″ W), Sand Island outfall, Mamala Bay, Oahu, Hawaii	Not described	39 m
Temperate Australasia			
Magelona dakini Jones, 1978	Careel Bay (33°37′ S, 151°20′ E), southeast shore of Pittwater, Broken Bay, New South Wales, Australia	Sandy beaches, *Zostera* beds, mangrove mud flats and subtidal sands, silty sands and muds	Intertidal, shallow subtidal
Species of Uebelacker & Jones [22]—Gulf of Mexico			
Maea sp. A (originally described as *Magelona* sp. A)	Scattered occurrences in northeastern Gulf of Mexico	Coarse to fine sand, silty very fine sand, clayey and sandy silt	24–189 m
Maea sp. B (originally described as *Magelona* sp. B)	Common in NE Gulf of Mexico and one record off Texas, USA	Medium to fine sand, silty fine to very fine sand, clayey and sandy silt	15–180 m
Magelona sp. C (see *M. magnahamata*)	Widespread in NE Gulf of Mexico	Coarse to fine-very sand, silty fine to very fine sand, clayey and sandy silt	10–117 m
Magelona sp. D (see *M.spinifera*)		Coarse to fine sand	15–106 m
Magelona sp. E	May be juvenile	Fine sand	90 m
Magelona sp. F	Scattered in NE Gulf of Mexico	Coarse to medium sand, silty very fine sand, clayey sandy silt	20–189 m
Magelona sp. G	Widespread in NE Gulf of Mexico	Medium to very fine sand, silty fine to very fine sand, clayey sandy silt	19–88 m
Magelona sp. H (see *M. uebelackerae*)	Abundant off Louisiana and Texas, USA	Predominately in silts and clays	6–134 m

Table A1. *Cont.*

Species	Type Locality	Sediment	Depth (m)
Species of Uebelacker & Jones [22]—Gulf of Mexico			
Magelona sp. I	Widespread throughout northern Gulf of Mexico	Sands, silts and clays	9–106 m
Magelona sp. J	Few occurrences off Texas and south-western Florida, USA	Medium to fine sand, silty very fine sand, sandy and silty clay	22–180 m
Magelona sp. K	SW Florida, USA	Fine sand, silty fine sand	27–121 m
Magelona sp. L	Common in NW brachy of Mexico	Predominately in silts and clays	10–189 m
Synonymised species			
Magelona alata Reish, 1965			Accepted as *Magelona longicornis* Johnson, 1901
Magelona heteropoda Mohammad, 1973			Accepted as *Magelona obockensis* Gravier, 1905

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