

## from southern Namibia

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A new species of Magelonidae, *Magelona debeerei* sp. nov., is described and illustrated from grab-samples collected at < 100 m off the southwest coast of Africa. *Magelona debeerei* sp. nov. has previously been identified from the region as *M. papillicornis* (Müller, 1858) by Day (1955, 1961, 1967) but differs from *M. papillicornis sensu stricto* by possessing dorsal medial lobes on chaetigers 4–8 and lateral pouches ( $\Sigma$  configuration) between chaetigers 10 and 11. Three species of *Magelona* have now been recorded from southern Africa (*M. capensis* Day, 1961, *M. cincta* Ehlers, 1908 and *M. debeerei* sp. nov.), and a key to *Magelona* from this region is provided.

**Key words:** Polychaeta, Magelonidae, *Magelona*, southern African waters.

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### INTRODUCTION

The Magelonidae is a comparatively small family of polychaetes comprising at least 70 known species (Mortimer & Mackie 2009) in three genera, *Magelona* Müller, 1858, *Meredithia* Hernández-Alcántara & Solis-Weiss, 2000 and *Octomagelona* Aguirrezabalaga *et al.* 2001. *Meredithia* is distinguished from all the other magelonid genera in that it possesses large hooded curved spines in some of the abdominal chaetigers (Hernández-Alcántara & Solis-Weiss 2000), *Octomagelona* is characterized by having eight instead of nine thoracic chaetigers (Aguirrezabalaga *et al.* 2001).

*Magelona* species are burrowers (Rouse 2001), typically found in intertidal muds and sands and at depths of less than 100 m (Jones 1963, 1971, 1978), though they have been reported from deeper oceanic waters (Hartman 1971). Diagnostic characters for these species have been discussed in

detail by Jones (1963, 1977, 1978), Fiege *et al.* (2000), Rouse (2001) and Aguado & Martin (2003). Three species, *M. papillicornis* Müller, 1858, *M. cincta* Ehlers, 1908 (see Mortimer & Mackie 2009) and *M. capensis* Day, 1961, have previously been reported from southern Africa (Day 1955, 1961, 1967).

During the 1950s and 1960s, extensive exploration and description of the polychaete fauna of southern Africa were undertaken by the University of Cape Town under the leadership of Professor John Day (Day 1955, 1961, 1967). This work culminated in the monographic treatment, *The Polychaeta of Southern Africa* (Day 1967). However, since then, remarkably little work on this fauna has been reported. Continuing exploitation of mineral resources, particularly the extraction of diamonds along the southern Namibian coast, has revealed a number of species, which cannot be characterized using Day's monograph. In this paper we

report on a new species, *Magelona debeerei* sp. nov., recovered from sampling undertaken on behalf of De Beers Marine (Pty) Ltd, that includes the specimens referred to *M. papillicornis* by Day (1967). Three species of *Magelona* have now been recorded from southern Africa: *M. capensis*, *M. cincta* and *M. debeerei* sp. nov.

### MATERIALS AND METHODS

Material examined in this study includes specimens collected during a benthic grab-sampling survey conducted by De Beers Marine (Pty) Ltd along the southern coast of Namibia from Oranjemund to Lüderitz in 2002 and museum specimens from the collections of the Iziko South African Museum and the Natural History Museum, London (NHM). Freshly collected specimens were fixed in 10% seawater formalin and later preserved in 70% ethanol. Specimens were examined using both stereo and compound microscopy with images captured using a Leica DM5000 photosystem. Specimens were prepared for SEM using the methods outlined in Simon (2009). Scanning by SEM was later performed at the NHM's EMMA unit. All material collected by De Beers and examined during this study is deposited in the Iziko South African Museum (SAM) and the Natural History Museum, London.

### SYSTEMATICS

**MAGELONIDAE** Cunningham & Ramage, 1888.

*Magelona* F. Müller, 1858; emended Fiege *et al.* (2000).

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

*Magelona debeerei* sp. nov.

Figures 1, 2

*Magelona papillicornis*: Day 1955: 416; 1961: 494; 1967: 495.

Type material

Holotype: SAM A21534, Beverly Hill, southern coast of Namibia between Lüderitz and Oranjemund, 28°16'S, 16°01'E, sandy to muddy sediments, 37 m, 13 July 2002, coll. De Beers Marine (Pty) Ltd, det. D.T. Clarke. Paratypes: SAM A21535 (10 specimens), Beverly Hill, southern coast of Namibia between Lüderitz and Oranjemund, 28°16'S, 16°01'E, sandy to muddy sediments, 37 m, 13 July 2002, coll. De Beers Marine (Pty) Ltd, det. D.T. Clarke; NHM. 2010.121 and NHM. 2010.122, Beverly Hill, southern coast of Namibia between Lüderitz and Oranjemund, 28°16'S, 16°01'E, sandy to muddy sediments, 37 m, 13 July 2002, coll. De Beers Marine (Pty) Ltd, det. D.T. Clarke.

Other material examined

*Magelona debeerei* sp. nov. identified as *M. papillicornis* by John Day: SAM A21536 (17 specimens), FBY 1♀, False Bay, South Africa, 34°21'S, 18°39'E, 25 January 1967, coll. University of Cape Town, det: D.T. Clarke; SAM A21537 (1 specimen, degraded), SWD 1F Namibia, 28°35'S, 16°15'E, 10 June 1962, coll. University of Cape Town, det: D.T. Clarke; SAM A21538 (2 incomplete, fragmented specimens), SB 226E, Saldanha Bay, 32°02'S, 18°14'E, 3 May 1960, coll. University of Cape Town, det: D.T. Clarke; SAM A20570 (1 speci-

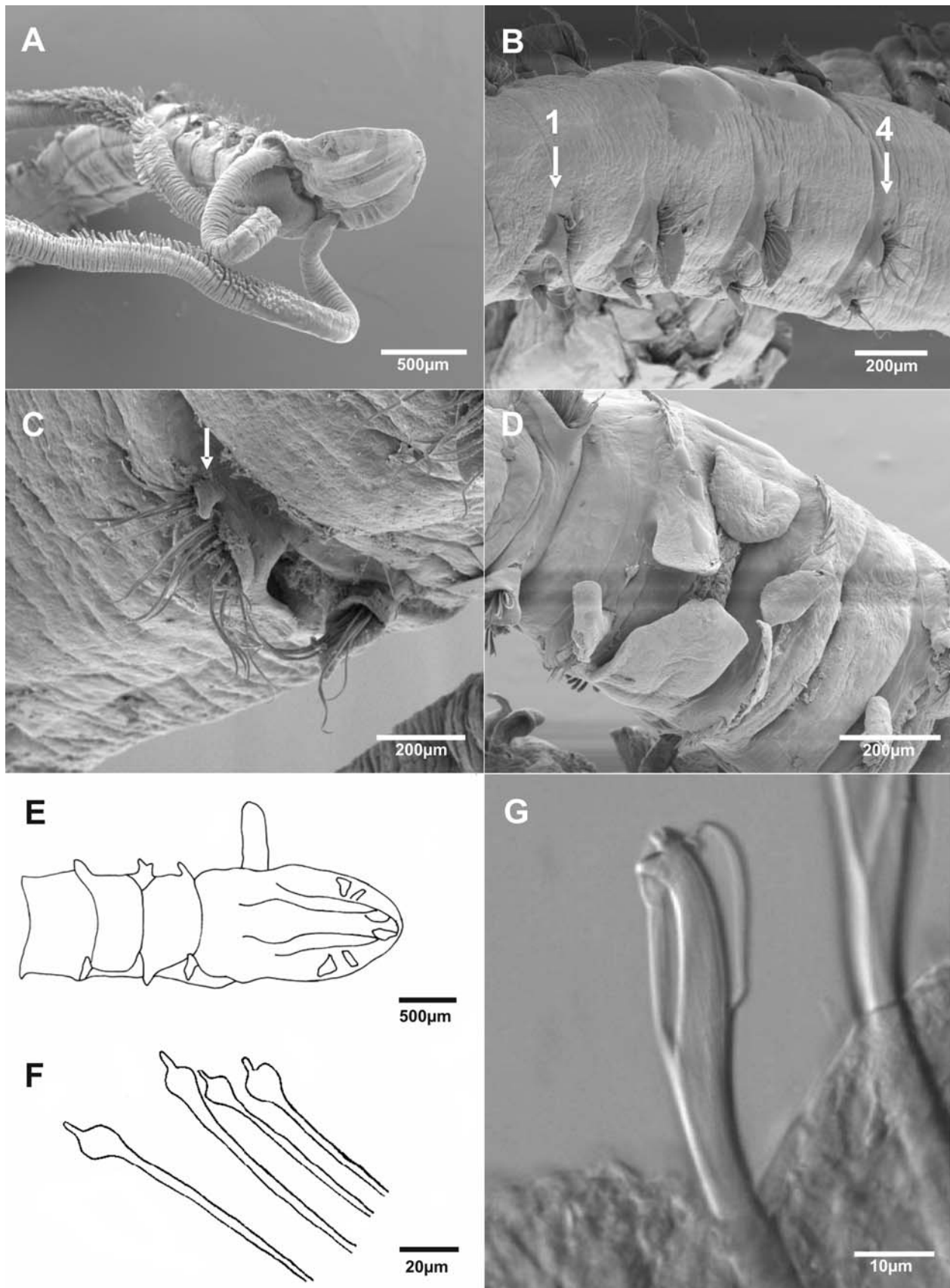
men), KNY 186T, Knysna Estuary, 34°02'S, 23°03'E, 13 July 1950, coll. University of Cape Town, det: D.T. Clarke; *Magelona papillicornis*, BMNH.1950.9.1.2, St 10, 5 fathoms (9 m) Manahine Expedition (1 specimen) *Magelona mirabilis* Johnston, 1865, BMNH.1999.2400 Neotype St. Andrews, Scotland, W.C. McIntosh; *Magelona cincta* Ehlers, 1908: SAM A20569 (2 specimens), IN 80E, Inhaca Island, Mozambique, 26°00'S, 35°55'E, 12 July 1952, coll. University of Cape Town, det: J.H. Day; *Magelona capensis*, SA collection BMNH.1961.9.516/ 535, St. WCD, 70J, det: J.H. Day, (7 specimens).

Diagnosis

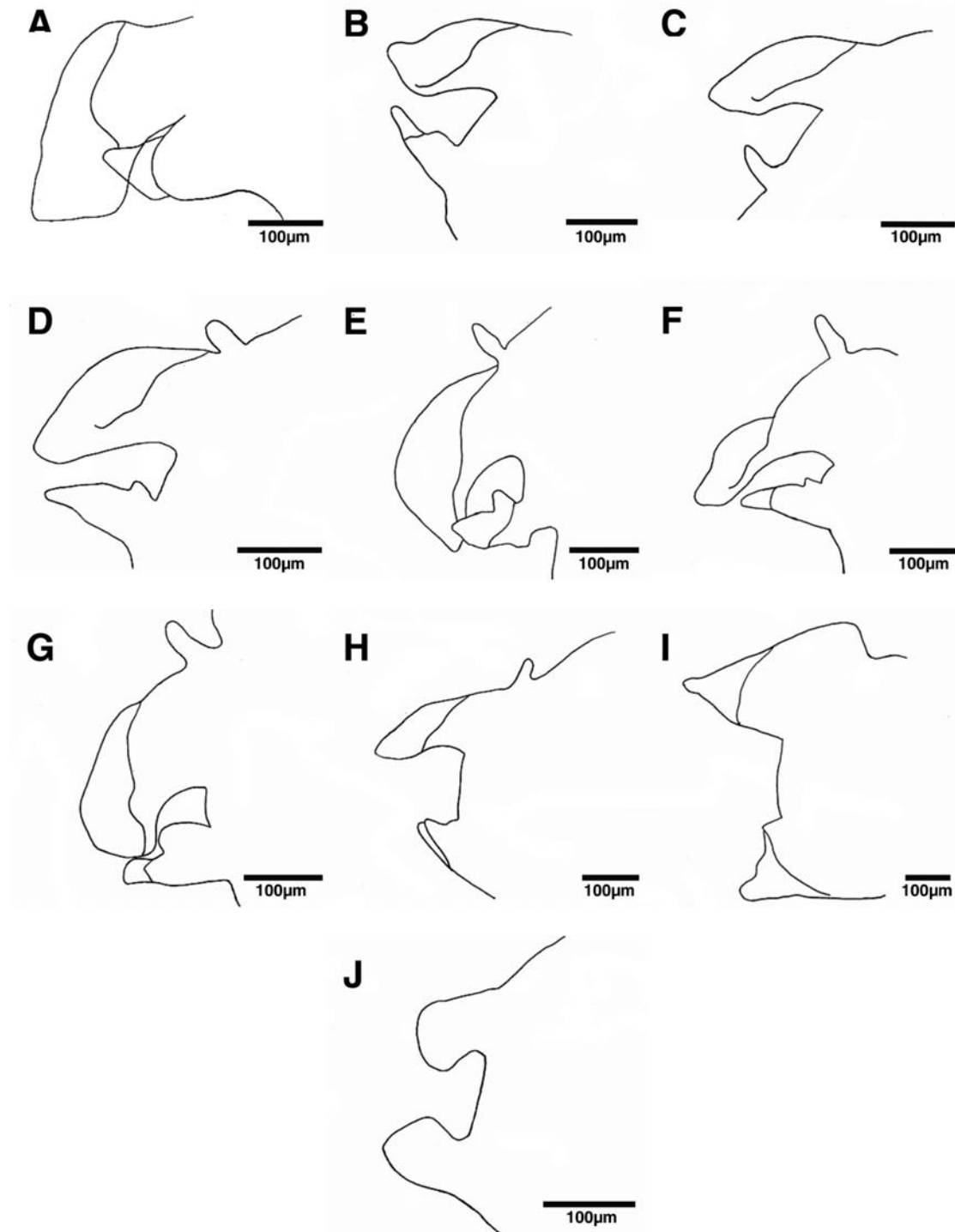
Prostomium longer than wide, rounded, without prostomial horns. Notopodia of chaetigers 1–8 with elongate leaf-like post-chaetal lamellae with smooth upper edges. Low, rounded pre-chaetal lamellae. Dorsal medial lobes present from chaetigers 4–8. Neuropodial lamellae of chaetigers 1–8 smaller than those of notopodia. Chaetiger 9 with mucronate chaetae. Abdominal hooded hooks tridentate. Lateral pouches ( $\Sigma$  configuration) present between chaetigers 10 and 11, and between 14 and 15.

Description

All specimens incomplete. Length of first 10 chaetigers 8.5 mm, width of first chaetiger 1.2 mm (holotype only). Prostomium 2.5 times as long as wide, anterior margin rounded, prostomial horns absent (Fig. 1A, E). Palps with four rows of papillae, and reaching to chaetiger 20. Notopodial lateral lamellae of chaetigers 1–8 with smaller pre-chaetal lamellae and larger, elongate, leaf-like, post-chaetal lamellae, margins smooth throughout (Fig. 2A–H). Neuropodial lateral lamellae of chaetigers 1–8 digitiform, cone-shaped with a smooth margin throughout (Fig. 2A–H). Dorsal medial digitiform lobes present from chaetigers 4–8 (Figs 1B, C, 2A–C). Ventral neuropodial lobes in anterior chaetigers small triangular or auricular, laterally pointed. Chaetiger 9 with notopodial lamellae consisting of low pre-chaetal and subtriangular laterally-pointed post-chaetal lamellae (Fig. 2I). Neuropodial lamellae on chaetiger 9 similar, same size as in notopodia, but with pointed post-chaetal lobes. Dorsal medial lobe and ventral neuropodial lobe absent on chaetiger 9. Abdominal lateral lamellae in both rami broad, leaf-like, with smooth margin throughout, similarly-sized and arched ventrally and dorsally, in the noto- and neuropodia, respectively (Fig. 2J). Dorsal and ventral medial lobes absent. Chaetigers 1–8 with fascicles of winged capillaries in both rami; capillaries in lateralmost position of noto- and neuropodial fascicles, originating from trough between pre- and post-chaetal lamellae in both rami. Winged capillaries of chaetiger 9 smaller than those of preceding chaetigers. Chaetiger 9 with mucronate chaetae (Fig. 1F). Abdominal hooded hooks from chaetiger 10; hooks similarly-sized with two small teeth above the main fang; hood, oval in shape attached to the large tooth and to just below the crown (Fig. 1G). Hooded hooks occur in both rami, orientated in the same direction (eight per ramus). Lateral pouches absent in chaetigers 1–9 (Fig. 1B, for chaetigers 1–4). Lateral pouches with  $\Sigma$  configuration (anteriorly open pouches, often convoluted, bounded dorsally and ventrally



**Fig. 1.** *Magelona debeerei* sp. nov., sectioned specimen: **A**, anterior, ventral view; **B**, thoracic chaetigers 1–4, left to right, lateral-dorsal view; **C**, chaetiger 4, lateral-dorsal view; **D**, lateral pouch ( $\Sigma$  configuration) between chaetigers 10 and 11, lateral view; **E**, anterior, dorsal view; **F**, mucronate chaetae from chaetiger 9, lateral view; **G**, tridentate abdominal hooded hook, lateral view.



**Fig. 2.** *Magelona debeerei* sp. nov., sectioned specimen, anterior view of right parapodia from: **A**, chaetiger 1; **B**, chaetiger 2; **C**, chaetiger 3; **D**, chaetiger 4; **E**, chaetiger 5; **F**, chaetiger 6; **G**, chaetiger 7; **H**, chaetiger 8, **I**, chaetiger 9, **J**, chaetiger 28 (chaetae omitted for clarity).

by large cuticular flaps, after Mortimer & Mackie 2006) found between chaetigers 10 and 11 (Fig. 1D) and then again between chaetigers 14 and 15. Some paratypes with lateral pouches ( $\Sigma$  configuration) between chaetigers 13 and 14, on left side only. C configuration (posteriorly open pouches, ventral part sometimes folded over flattening pouch against body after Mortimer & Mackie 2006) pouches not observed in any material, but this may be due to the fact that all specimens were incomplete. Pygidial region unknown.

*Colour.* In alcohol, specimens are usually cream-white, with dark reddish-brown patches on the lateral surfaces of some chaetigers posterior to chaetiger 10. No staining pattern observed with methyl blue.

#### Distribution

This species has now been recorded at Lüderitz, Namibia and False Bay, Knysna and Zwartkops Estuaries, South Africa.

**Habitat**

Occurs in muddy and sandy sediments, from intertidal to 100 m depth.

**Etymology**

Named for De Beers Marine (Pty) Ltd, who provided the biological material and funding support for the study.

**Remarks**

*Magelona papillicornis* was previously described from southern Africa by Day (1955, 1961, 1967). Day (1955) compared his southern African specimens with those from Europe noting that those specimens of this species collected from the Knysna and Zwartkops estuaries, were consistent with *M. papillicornis* specimens from Plymouth. Subsequently, Jones (1977) reassigned all European specimens, erroneously reported as *M. papillicornis* to either *M. mirabilis* (Johnston, 1865) (see Fiege *et al.* 2000) or *M. johnstoni* (Fiege, Licher & Mackie, 2000). This reassignment cast doubt on Day's identifications. His descriptions indicate that the southern African specimens had dorsal medial lobes present on chaetigers 1–8 and specialized chaetae on chaetiger 9, both of which are absent in *M. papillicornis sensu stricto*.

Our re-examination of Day's specimens has revealed some disagreement with his original descriptions. These include the configuration of the dorsal medial lobes (that we only observed on chaetigers 4–8), the presence of lateral pouches on several chaetigers after chaetiger 25 (seen by Day, but not observed here), and the absence of lateral pouches between chaetigers 10 and 11 ( $\Sigma$  configuration pouches observed here). Therefore, all Day's records of *M. papillicornis* from southern Africa are now believed to be *M. debeerei* sp. nov.

The presence of mucronate chaetae on chaetiger 9, the absence of prostomial horns and the presence of tridentate abdominal hooks aligns *M. debeerei* sp. nov. with 11 other *Magelona* species: *M. obockensis* Gravier, 1905; *M. pitelkai* Hartman, 1944; *M. sacculata* Hartman, 1961; *M. riojai* Jones, 1963; *M. heteropoda* Mohammad, 1973; *Magelona* sp. B. Uebelacker & Jones, 1984; *M. crenulata* Bolivar & Lana, 1986; *M. pectinata* Nateewathana & Hylleberg, 1991; *M. tinae*, Nateewathana & Hylleberg, 1991; *M. johnstoni* Fiege *et al.* 2000 and *M. mirabilis* Johnston, 1965.

*Magelona obockensis*, *M. heteropoda*, *M. sp. B*, *M. crenulata* and *M. tinae* have lateral pouches that first appear between chaetigers 11 and 12, which clearly distinguishes this group of species from *M. debeerei* sp. nov. where lateral pouches first appear between chaetigers 10 and 11. The presence of two groups of abdominal tridentate hooded hooks facing each other (i.e. main fangs *vis-à-vis* in both rami) in *M. sp. B*, *M. crenulata* and *M. tinae*, further distinguishes these species from *M. debeerei*, which has one group of laterally facing abdominal hooded hooks in each ramus. Furthermore *M. crenulata* also differs from *M. debeerei* sp. nov. in the shape of the lateral lamellae of chaetigers 1–9, because it has cirriform pre-chaetal and triangular post-chaetal lamellae on chaetigers 1–8 and triangular crenulated lateral lamellae on chaetiger 9 as opposed to *M. debeerei* sp. nov., which has small pre-chaetal and larger (leaf-like), post-chaetal lamellae on chaetigers 1–8, with the margin of the lamellae smooth throughout. Chaetiger 9 in

*M. debeerei* sp. nov. also has notopodial lamellae consisting of low pre-chaetal and subtriangular laterally pointed post-chaetal lamellae.

*Magelona mirabilis* and *M. pitelkai* have abdominal medial lobes, and basally stalked abdominal lateral lamellae: both these characteristics are absent in *M. debeerei* sp. nov. Furthermore *M. debeerei* sp. nov. possesses dorsal medial lobes from chaetigers 4–8, and abdominal  $\Sigma$  configuration lateral pouches. Whereas *M. mirabilis* lacks dorsal medial lobes on all thoracic chaetigers and has C configuration abdominal lateral pouches, and *M. pitelkai* has dorsal medial lobes on all thoracic chaetigers and is reported to have no lateral pouches.

*Magelona riojai* differs from *M. debeerei* sp. nov. in the nature of the prostomial margin, which is straight in the former and rounded in the latter, and dorsal medial lobes are present throughout the thorax in the former species. *M. pectinata* has longer pre-chaetal than post-chaetal lateral lamellae on the notopodia of chaetiger 8 and a ventral neuropodial lobe on chaetiger 9, whereas *M. debeerei* sp. nov. has smaller pre-chaetal than post-chaetal lateral lamellae on the notopodia of chaetiger 8 and no ventral neuropodial lobe on chaetiger 9. Furthermore, *M. pectinata* further differs in possessing pectinate margins on thoracic notopodial lamellae. *Magelona sacculata* differs in the notopodial post-chaetal lamellae on chaetiger 8 which are more symmetrically subtriangular and in the anterior abdomen lateral lamellae which exhibit shorter basal constrictions than those seen in *M. debeerei* sp. nov. *Magelona sacculata* further differs in possessing medial lobes in the abdomen.

*Magelona debeerei* sp. nov. is closely aligned with *M. johnstoni*, in that both species have lateral pouches ( $\Sigma$  configuration) first appearing between chaetigers 10 and 11 and again between chaetigers 14 and 15. Other similarities between the two species are the presence of dorsal medial lobes from chaetigers 4–8, thoracic ventral neuropodial lobes, mucronate chaetae on chaetiger 9 and a single group of laterally-facing tridentate abdominal hooded hooks in each ramus. However, *M. johnstoni* has crenulated (elk-horn shaped) notopodial lateral lamellae in chaetigers 1–8, abdominal dorsal and ventral medial lobes, lateral pouches (C configuration) in the posterior chaetigers (not observed in *M. debeerei* sp. nov. as the specimens were all incomplete) and slightly-stalked abdominal lamellae in both rami, all of which are absent in *M. debeerei* sp. nov.

### Key to *Magelona* species in southern African waters

Including the new species reported on in this paper and the reassignment of Day's southern African *M. papillicornis*, three *Magelona* species have now been reported for southern Africa. Below we provide a key to the southern African *Magelona* species

1. Chaetiger 9 with specialized chaetae (i.e. mucronate, subdistally expanded), prostomium smoothly oval, non-frontal horns, tridentate hooks  
 ..... *M. debeerei* sp. nov.
- Chaetiger 9 without specialized chaetae. .... 2
2. A red pigment band on chaetigers 5–8 (pigment band

may disappear in alcohol). No dorsal medial lobes present. Anterior thoracic neuropodial lamellae scoop-shaped, particularly those of chaetiger 1. Parapodial lamellae of abdomen ligulate . . . . *M. cincta*

- No red pigment band. Thoracic chaetigers with dorsal medial lobes. Parapodial lamellae of abdomen oval and restricted at the base . . . . . *M. capensis*

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