

A partial review of the European Magelonidae (Annelida: Polychaeta): *Magelona mirabilis* redefined and *M. johnstoni* sp. nov. distinguished

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The identification of magelonids with mucronate chaetae on chaetiger 9 has long been confused. Until 1977 all corresponding European specimens were erroneously referred to *Magelona papillicornis*; a Brazilian species. Since then, but without any detailed study, the name *M. mirabilis* (originally given to a species from Scotland) has been widely employed. However, in recent years, it has become clear that two morphologically similar species coexist in European waters. *Magelona mirabilis* is redescribed and a neotype designated, and *M. johnstoni* sp. nov. is formally distinguished. Following re-examination of the other five species present in the region, a dichotomous key and a synoptic table of characters is provided for all seven European species.

INTRODUCTION

The Magelonidae is a relatively small family comprising the single genus *Magelona* F. Müller, 1858 with currently about 55 species described worldwide. They are common in sand and mud substrates of intertidal and continental shelf areas, though they also occur in abyssal depths to at least 5000 m (Hartman, 1971). Most species are assumed to live in poorly supported burrows (Fauchald & Jumars, 1979); a tube was reported for *Magelona variolamellata* Bolívar & Lana, 1986, while *Magelona alleni* Wilson, 1958 has a parchment-like tube (A.S.Y.M., personal observations). The body is long, slender and divided into an anterior (thoracic) and posterior (abdominal) region by a constriction at chaetiger 9. Magelonids are easily recognized by the presence of two long ventrolateral and papillated palps in combination with a flattened, shovel-shaped prostomium showing longitudinal muscle bands providing high mobility in all directions.

The main diagnostic characters for the distinction of *Magelona* spp. are: (1) presence/absence of prostomial horns; (2) length/width relation of the prostomium; (3) morphology of thoracic lateral lamellae; (4) presence/absence of specialized chaetae on chaetiger 9; (5) structure and arrangement of abdominal hooded hooks; (6) presence/absence of medial lobes; and (7) presence/absence of lateral pouches in anterior abdominal segments. Detailed accounts of the morphology, taxonomic history and biology of the Magelonidae are given in Fauchald & Jumars (1979); Uebelacker & Jones (1984); Blake (1996); and Fauchald & Rouse (1997).

For European waters (i.e. north-east Atlantic including North Sea, Baltic Sea, Irish Sea and Mediterranean Sea) the following species are described: *Magelona mirabilis* (Johnston, 1865); *M. alleni* Wilson, 1958; *M. filiformis* Wilson, 1959; *M. minuta* Eliason, 1962; *M. equilamellae*

Harmelin, 1964; and *M. wilsoni* Glémarec, 1966. From the Baltic Sea (Kiel Bay) only *M. mirabilis* has been recorded (Hartmann-Schröder, 1996). *Magelona equilamellae* is only known from the Mediterranean Sea.

Several additional species, originally described elsewhere, have been recorded from the region. *Magelona cincta* Ehlers, 1908 (South Africa), reported from Plymouth (Mare, 1942; Marine Biological Association, 1957) and west Scotland (Clark, 1952; Clark & Milne, 1955), was referred to *M. alleni* by Wilson (1958). *Magelona rosea* Moore, 1907 (Atlantic, USA), reported from west Ireland (Southern, 1914) and off west Sweden (Eliason, 1920), was later (Eliason, 1962) referred to *M. minuta*. *Magelona rosea* has also been recorded off east Scotland (McIntyre, 1958; Laverack & Blackler, 1974) and the Irish Sea (Bruce et al., 1963); the former were referred by Wilson (1959) to a dwarf variety of *M. filiformis*.

Another species, *M. papillicornis* Müller, 1858 (Brazil), has been widely reported from the North Sea (Hartmann-Schröder, 1971), Baltic Sea (Bick & Gosseck, 1985), Mediterranean Sea, UK and France (Fauvel, 1927; Marine Biological Association, 1957; Bruce et al., 1963; Cabioch et al., 1968). It has long been recognized as one of the most abundant faunal elements in the southern North Sea benthos (e.g. Davis, 1923; Stripp, 1969; Racher & Gerlach, 1978; Ziegelmeier, 1978; Salzwedel et al., 1985; Holtmann et al., 1998).

Moore (1907) and Day (1961) both doubted the presence of this Brazilian species in European waters, but this view was only confirmed by Jones (1977) following his redescription of *M. papillicornis* from topotype material. The European '*M. papillicornis*' was clearly a different species, for which Jones provisionally suggested the name *M. mirabilis* (Johnston, 1865). Unfortunately, "this purposeful taxonomic compromise" (Jones, 1977) was never resolved; his further investigations (into the early

1980s) remained unpublished as, from 1979 to his death in 1996 (Gardiner, 1997), he concentrated his scientific studies on the Vestimentifera (=polychaete family Siboglinidae; see Rouse & Fauchald, 1997). Several authors (e.g. Dauvin & Gentil, 1980; Garwood, 1982; Bhaud & Cazaux, 1987; Fiege & Ben-Eliahu, 1994; Böggermann, 1998) subsequently used the name *M. mirabilis* for European magelonids possessing special chaetae on chaetiger 9, which are in fact absent in the true *M. papillicornis*.

Mackie (in Oliver et al., 1986 and Howson et al., 1987) suggested (confirmed by M.L. Jones, personal communication, 1983) that there were actually two coexistent and morphologically similar species confused under the name *M. mirabilis*. The main distinguishing features between the two were included in a dichotomous key to the European Magelonidae made available at a polychaete taxonomy workshop held, under the auspices of the Estuarine and Coastal Sciences Association, in south-west Wales in April 1990. Later, the distinctions between *Magelona* sp. A and *Magelona* sp. B (for it was unclear which was actually *M. mirabilis*) were published in Mackie & Garwood (1995). The species were respectively distinguished by either a fimbriate or smooth upper margin to the notopodial lamellae of chaetigers 1–8, presence or absence of dorsal cirri in posterior thoracic chaetigers, and the presence or absence of lateral pouches between chaetigers 10 and 11. These results have been confirmed in the present study and leave most of the previous records of *M. mirabilis* doubtful as to the correctness of their designation.

Unfortunately, the type material of the species originally described (Johnston, 1865; ten years after his death) as *Maea mirabilis* was lost, and the accompanying illustration (cited 'plate XXII') was never published. We have been unable to locate the missing plate at either the Natural History Museum in London, or the Berwick-upon-Tweed Borough Museum and Art Gallery (initially established to house the Johnston Collection). Further, Johnston's description did not readily facilitate identification with either *Magelona* sp. A or *Magelona* sp. B *sensu* Mackie; both agreed in the salient features. However, detailed examination of material collected by McIntosh at St Andrews, Scotland, and comparison with Johnston's original description showed that patches of dark pigment were present between parapodia along the sides of the abdomen in a number of specimens. This pigmentation was subsequently noted by the two senior authors as a feature of Mackie's sp. B, indicating that it was *M. mirabilis* and that his *Magelona* sp. A was the undescribed species.

To settle the confusion about the proper identification of the European species of Magelonidae, we present a detailed redescription of *M. mirabilis* and describe *M. johnstoni* sp. nov. The morphological characteristics of all seven European magelonid species are compiled in a synoptic table and an identification key is provided.

MATERIALS AND METHODS

The specimens

The specimens used in this paper were obtained from the collections of the following institutions: The Natural History Museum, London (BMNH), Laboratoire Arago

Banyuls (LAB), Los Angeles County Museum—Allan Hancock Foundation, Los Angeles (LACM-AHF), Muséum National d'Histoire Naturelle, Paris (MNHN), Natural History Museum Göteborg (NHMG), National Museum of Wales, Cardiff (NMW), United States National Museum of Natural History, Smithsonian Institution, Washington (USNM), Phuket Marine Biological Center, Thailand (PMBC), Senckenberg Museum Frankfurt (SMF).

Full locality and sampling details for German Bight (FK 'Senckenberg' cruise DEB 1987) and Irish Sea (BIOMOR 1989 & 1991) specimens are detailed in Fiege & Ben-Eliahu (1994) and Mackie et al. (1995) respectively. The sampling equipment used in the former has been abbreviated in the text as BC (box corer), VV (van Veen grab) and BT (beam trawl). Stations from the ongoing 'South West Irish Sea Survey', an Ireland–Wales project sponsored under the European Union INTERREG programme, are prefixed SWISS.

Specimens of all seven European species are detailed in the main text under their respective species names. The condition of the specimens has been given as: c, complete specimen, c-p, complete specimen, pygidium missing; pr, complete specimen, posterior regenerated; af, anterior fragment; pf, posterior fragment; and f, fragments. Where possible, the sex of reproductive specimens was also noted.

Material of several additional species from other regions was used for comparative purposes as follows:

Magelona longicornis Johnson, 1901. Canada, Vancouver Island, Barkley Sound, off Voss Point, 69 m, fine sandy silt, 29 specimens (4 c, 1 pr, 24 af, 6 f, 3 pf), coll. A.S.Y. Mackie & A. Woodham 14 August 1989 (NMW.Z. 1989.115.1–2).

Magelona obockensis Gravier, 1905. Gulf of Aden/Gulf of Tadjourah, Obock, in *Balanoglossus* sand with *Cymodoce*, syntypes (MNHN A 172).

Magelona pectinata Natecwathana & Hylleberg, 1991. Thailand, west coast of Phuket, Kamala Bay (stn 8), 10 m, holotype, coll. 23 December 1981 (PMBC 3165).

Magelona pitelkai Hartman, 1944. USA, California, Marin County, Tomales Bay (Pitelka Station A-128), two specimens, coll. F.A. Pitelka, May–June 1941, det. O. Hartman (SMF 8866).

Magelona sacculata Hartman, 1961. USA, South California, off Point Hueneme Light (Velero IV stn 4843–57), 88 m, six specimens, coll. 6 February 1957, det. O. Hartman (SMF 8868). Canada, Vancouver Island, Barkley Sound, outside sill of Trevor Channel, 27 m, medium fine sand, two specimens (af), coll. A.S.Y. Mackie & A. Woodham 14 August 1989 (NMW.Z.1989.115.3).

Terminology

Parapodial lamellae

In his description of *Maea mirabilis*, Johnston (1865) simply referred to the projecting parapodial structures of the thorax as vesicular lobes at the base of the chaetae. This was presumably because the prechaetal and postchaetal parts encompassed the thoracic chaetae to some extent. The lobes of chaetiger 9 were described as larger, but those of the abdomen were considered absent or present 'only in minor form'. McIntosh (1878, 1911) used

