

THE POLYCHAETE *MAGELONA ALLENI* N.SP.
AND A RE-ASSESSMENT OF *MAGELONA*
CINCTA EHLERS

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(Text-figs. 1-3)

Three species of the polychaete genus *Magelona* are known from the neighbourhood of Plymouth. One is the widely distributed *M. papillicornis* F. Müller, described first from the coast of Brazil (Müller, 1858) and subsequently frequently recorded for northern European coasts and the Mediterranean. Near Plymouth this species occurs in clean sand in the lower tidal region and offshore, as in Whitsand Bay. Of the other two species, one from clean sand near low water at Mill Bay, Salcombe, awaits description. The third has been known for many years but until now has not been recognized as an undescribed species. It was formerly abundant in the Rame Mud (a deposit of black sandy mud); thus Mare (1942, p. 542, as *M. cincta* Ehlers—a provisional identification by me) on 12 July 1939 found 120 per m², associated with large numbers of other polychaetes, lamellibranchs, etc. The locality was close to Ford's station No. 93 (Ford, 1923, chart facing p. 167, and p. 218 where the position is given as Rame Head, E. $\frac{1}{2}$ N. Tregantle, N. $\frac{1}{2}$ E.). At this station on 20 February 1923 Ford had four specimens (recorded as *M. papillicornis*) from $\frac{1}{5}$ m². On 11 August 1922 at station No. 53 close by (Rame Head, E., $1\frac{1}{2}$ miles) he obtained thirteen specimens of the same species from $\frac{3}{10}$ m², the substratum being black mud. Ford records *papillicornis* from other offshore mud or muddy-sand stations over a fairly wide area inside and outside Plymouth Sound, but in less abundance. It is certain that some of these records, especially those detailed above, are of the species taken by Mare and provisionally identified as *cincta*. In 1939 Ford showed me his collections from the Rame Mud and the *Magelona* worms in them were banded with red pigment as is *cincta*, a character which serves to separate them from *papillicornis* which has no such pigmentation. Much more recently Holme (1953) has had this red-banded species in smaller numbers at several stations some miles south of the Sound and to the eastward of the Eddystone, in sandy and muddy sand grounds, sometimes with *papillicornis* whose range the red-banded species overlaps. During the first part of 1958 many attempts have been made to find a locality where these worms can again be obtained in large numbers. Unfortunately the Rame Mud locality is a dumping ground for rubbish and seems to have changed in character of recent years. Search in

the area has yielded only two short anterior portions one of which, narcotized in 7% magnesium chloride in tap water and fixed in hot Bouin's Fluid before preservation in alcohol, forms the basis of the drawings in Fig. 1 C-E. This specimen shows very little contraction from life. The remainder of the material used in the following description of the species was fixed in 1939, either by Mare (formalin) or by myself (alcohol after narcotization).

Magelona alleni n.sp.

Adult specimens in a moderate state of expansion about 40 mm long by 1 to 1.5 mm wide anteriorly (but see p. 625) tapering gradually to the anus; a constriction at the ninth setiger. First nine setigers bristle-bearing, the following setigers with hooded hooks only. Total number of setigers about 70. Prostomium (Fig. 1, C) eyeless, spatulate, wider than long especially in contraction (Fig. 1, A) and with two elongate low dorsal ridges broadened posteriorly, on either side low raised areas. The anterior border of the prostomium is almost straight transversely, short and without horns. The proboscis when everted is globular, ridged. On each side of the mouth, ventral to the postero-lateral corners of the prostomium, there arises a long tentacle,* transversely wrinkled and bearing for much of its length distally a large number of densely crowded papillae, elongate and slightly capitate. When a tentacle has been broken off the postero-lateral border of the prostomium bends inwards ventrally, so reducing the apparent width of the prostomium viewed dorsally (Fig. 1, C, right side). First eight setigers with relatively strong dorsal and ventral winged bristles (Fig. 1, H) springing in bundles of often eight to sixteen bristles from the bases of pointed lamellae (Fig. 1, C, D and F). Some bristles are double-winged; in many, as in the one drawn, the narrow secondary wing is absent. The dorsal lamellae are flattened antero-posteriorly, the ventral lamellae dorso-ventrally, the planes of flattening thus being at right angles to one another. These first eight pairs of parapodia are situated at the anterior borders of the segments. The ninth parapodia and bristles are similar in structure but are smaller and shorter and the segment bearing them is very short with ill-defined limits: it is also much narrower than those in front and behind, producing a marked constriction of the body at this region (Fig. 1, D, E). The reduction in girth of this ninth setiger is largely responsible for the displacement of the noto- and neuropodia, especially the latter, towards the mid-dorsal and mid-ventral lines respectively.

The parapodia of the tenth and all succeeding setigers are situated near the middle of the segment to which they belong. They bear only hooded hooks, each with one main tooth surmounted by two smaller teeth (Fig. 1, I-K). There are about twelve hooks in two facing groups in each noto- and neuropodium (Fig. 1, G), except posteriorly where the numbers are less. The rows of hooks reach to within short distances of the mid-dorsal and mid-ventral lines. Between the dorsal and ventral rows of hooks of each parapodium there is a large leaf-like dorsal lamella and a much smaller ventral lamella, both lamellae flattened antero-posteriorly. Ventrally and medianly to the ventral rows of hooks there is a very small protuberance, or rudimentary ventral cirrus. Except for the incompletely developed parapodia at the extreme posterior end all the parapodia from the tenth onwards are closely similar. The body ends in a clearly defined pygidium with the anus between two short stumpy cirri (Fig. 1, B).

On both dorsal and ventral surfaces of the body there are in the anterior region a pair of longitudinal grooves. At the region of the ninth setiger these grooves merge

* Other writers variously term these organs tentacles, palps, etc. My own choice of term should not be considered an expression of opinion about their homology.

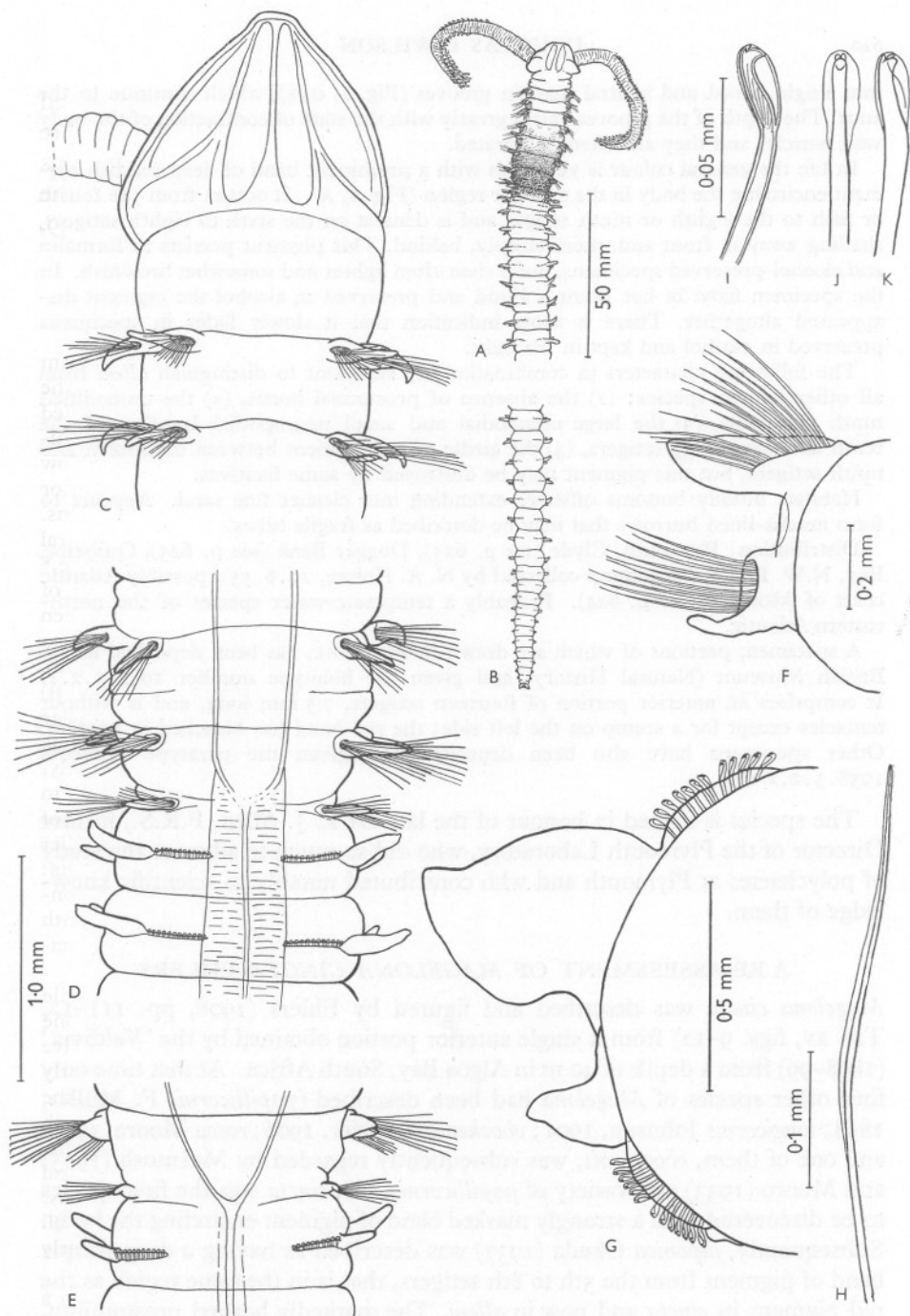


Fig. 1. *Magelona alleni* n.sp. A, dorsal view of the anterior portion of a partially contracted specimen showing band of reddish pigment. B, dorsal view of the posterior portion of another specimen. C, dorsal view of the head and first two setigers of a third specimen fixed with little or no contraction. D, dorsal view of the 7th-11th setigers of the same specimen. E, ventral view of the 8th-10th setigers of the same specimen. F, view from in front of 5th parapodium from a fourth specimen. G, 31st parapodium of the fourth specimen. H, winged bristle. I, hooded hook in side view. J, another hook in front view. K, a third hook in oblique front view.

into single dorsal and ventral median grooves (Fig. 1, D, E), which continue to the anus. The depth of the grooves varies greatly with the state of contraction of the body wall muscles and they are often obliterated.

In life the general colour is yellowish with a prominent band of deep reddish pigment encircling the body in the anterior region (Fig. 1, A). It occurs from the fourth or fifth to the eighth or ninth setiger and is densest on the sixth to eighth setigers, shading away in front and, more steeply, behind. This pigment persists in formalin and alcohol-preserved specimens, but is then often lighter and somewhat brownish. In the specimen fixed in hot Bouin's Fluid and preserved in alcohol the pigment disappeared altogether. There is some indication that it slowly fades in specimens preserved in alcohol and kept in the light.

The following characters in combination are sufficient to distinguish *alleni* from all other known species: (1) the absence of prostomial horns, (2) the unmodified ninth parapodia, (3) the large notopodial and small neuropodial lamellae of the tenth and succeeding setigers, (4) the girdle of red pigment between the fourth and ninth setigers, but this pigment may be destroyed by some fixatives.

Habitat: muddy bottoms offshore extending into cleaner fine sand. Appears to form mucus-lined burrows that may be described as fragile tubes.

Distribution: Plymouth, Clyde (see p. 625), Dogger Bank (see p. 625), Quiberon Bay, N.W. France (specimens collected by N. A. Holme, 19.6.55), possibly Atlantic coast of Morocco (see p. 624). Probably a temperate-water species of the north-eastern Atlantic.

A specimen, portions of which are drawn in Fig. 1C-E, has been deposited in the British Museum (Natural History) and given the holotype number 1958.5.2.1. It comprises an anterior portion of fourteen setigers, 7.5 mm long, and is without tentacles except for a stump on the left side; the red band has bleached in fixation. Other specimens have also been deposited and given the paratype numbers 1958.5.2.2/10.

The species is named in honour of the late Dr E. J. Allen, F.R.S., former Director of the Plymouth Laboratory, who did so much to advance the study of polychaetes at Plymouth and who contributed notably to scientific knowledge of them.

A RE-ASSESSMENT OF *MAGELONA CINCTA* EHLERS

Magelona cincta was described and figured by Ehlers (1908, pp. 111-12, Taf. xv, figs. 9-12) from a single anterior portion obtained by the 'Valdivia' (1898-99) from a depth of 40 m in Algoa Bay, South Africa. At that time only four other species of *Magelona* had been described (*papillicornis* F. Müller, 1858; *longicornis* Johnson, 1901; *obockensis* Gravier, 1906; *rosea* Moore, 1907) and one of them, *obockensis*, was subsequently regarded by McIntosh (1925) and Monro (1933) as a variety of *papillicornis*. *M. cincta* was the first species to be discovered with a strongly marked band of pigment encircling the body. Subsequently, *japonica* Okuda (1937) was described as having a deep purple band of pigment from the 5th to 8th setigers, that is in the same region as the red pigment in *cincta* and now in *alleni*. The markedly horned prostomium, parapodial structure and other features clearly separate *japonica* from *alleni* and from *cincta*. Ehlers's figures, especially the coloured one, bear a strong

resemblance to *alleni*, but his drawings and description are not entirely satisfactory (Wesenberg-Lund, 1949, p. 330, is in agreement) and lack proper figures of the parapodia. I could never satisfy myself that our species was in fact *cincta*; neither could I be quite sure on the basis of Ehlers's work that it was anything more than a variety.

Day (1957) has recorded *M. cincta* from South Africa. He has kindly sent me three of his specimens; one of them a short anterior end of about seventeen setigers from a depth of 15 m in Mossel Bay some 200 miles west of Algoa Bay, the type locality. The other two specimens, each of about forty setigers, came from intertidal sandy mud on Inhaca Island, Delagoa Bay, some 800 miles along the coast north-eastwards of Algoa Bay. These specimens are undoubtedly the same species and I am in agreement with Day's identification

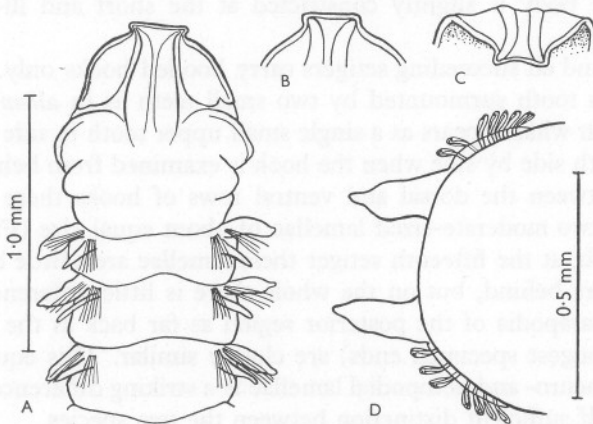


Fig. 2. *Magelona cincta* Ehlers. A, dorsal view of the head and first three setigers of a specimen from Mossel Bay, South Africa. The anterior third of the prostomium is bent upwards a little, giving a slightly foreshortened view of this end. The bristles are more numerous than drawn. B and C, anterior extremities of two specimens from Delagoa Bay, South Africa, both in dorsal view but C has the tip bent over backwards, revealing the ventral surface. D, 39th parapodium.

with *cincta*. They agree closely with Ehlers's description and figures, except that in all three the anterior extremity of the prostomium has at each side of the almost straight front edge much more pronounced corners—almost horns (Fig. 2 A-C)—than Ehlers indicates in his drawings. We are entitled to conclude that Day's specimens are true *cincta* and that they can be used to add to and amend the original description of the species by Ehlers. This will now be done so far as is necessary to define *cincta* more precisely and to distinguish it clearly from *alleni*.

The prostomium of *cincta* is in preserved specimens (Fig. 2A) about as long as broad, terminating anteriorly in a straight edge with pronounced corners, or very short horns. Two medianly placed low ridges extend anteriorly into the corners and are separated by shallow troughs from slightly convex areas

on either side. There are no eyes. One specimen retains one tentacle; it is at least twice as long as that indicated by Ehlers. The tentacle bears long and densely crowded papillae on one face for most of its length; the distal portion is slender, tapering gradually almost to a point and has evidently been fixed in a state of extension.

The anterior setigers all bear winged bristles only, unmodified on the ninth setiger. The bristles are relatively less robust than are those of *alleni*, a feature immediately obvious when similar-sized specimens of the two species are placed side by side. The parapodial lamellae of the first three or four setigers (Fig. 2A) are larger than those of succeeding setigers and they are quite small on the ninth. The neuropodial lamellae are larger than the notopodial. A band of brownish red (in alcohol) pigment encircles the body from the 5th to 8th setigers. The body is slightly constricted at the short and ill-defined 9th setiger.

The 10th and all succeeding setigers carry hooded hooks only. Each hook has one main tooth surmounted by two small teeth as in *alleni*. Ehlers did not notice that what appears as a single small upper tooth in side view is seen to be two teeth side by side when the hook is examined from behind or from in front. Between the dorsal and ventral rows of hooks there are in each parapodium two moderate-sized lamellae of about equal size (Fig. 2D). On the 10th to about the fifteenth setiger these lamellae are a little broader than on the setigers behind, but on the whole there is little difference anywhere and all the parapodia of the posterior region as far back as the 40th setiger (where the longest specimen ends) are closely similar. This equality in size between the neuro- and notopodial lamellae is a striking difference from *alleni* and is in itself sufficient distinction between the two species.

The two specimens from Delagoa Bay, each of about forty setigers and incomplete posteriorly, are both about 15 mm long and about 0.7 mm wide. Day informs me that his most westerly specimens, three in number, are from False Bay and were living in green mud at a depth of 43 fathoms.

The type specimen

Since the foregoing was written I have received on loan from the Zoologisches Museum, Berlin, to whose authorities and Dr G. Hartwich in particular I should like to express my gratitude, the type specimen described and figured by Ehlers (1908). It enables me to confirm that Day's specimens are definitely *cincta*. The type specimen is a fragment from a somewhat larger worm than those sent by Day but is very much smaller than full-grown *alleni*. Ehlers's specimen, as he recorded, is about 16 mm long by 1 mm wide and consists of a head and nineteen setigers. The right tentacle is missing; part of the left one is present and is clearly broken short. The specimen shows every indication of having been partially flattened. This has resulted in the extruded proboscis, which in *Magelona* worms normally forms a ventral bulbous

protrusion, being compressed and forced to extend forwards almost to reach the anterior end of the prostomium, as seen in Ehlers's figures (taf. xv, figs. 9, 10a) and in my Fig. 3A drawn with the aid of a camera lucida. The prostomium has been so flattened on top that the dorsal ridges, clearly visible in Day's specimens, can only just be distinguished. Ehlers's artist, when drawing his fig. 10a (but not his fig. 9) misinterpreted the structural relations

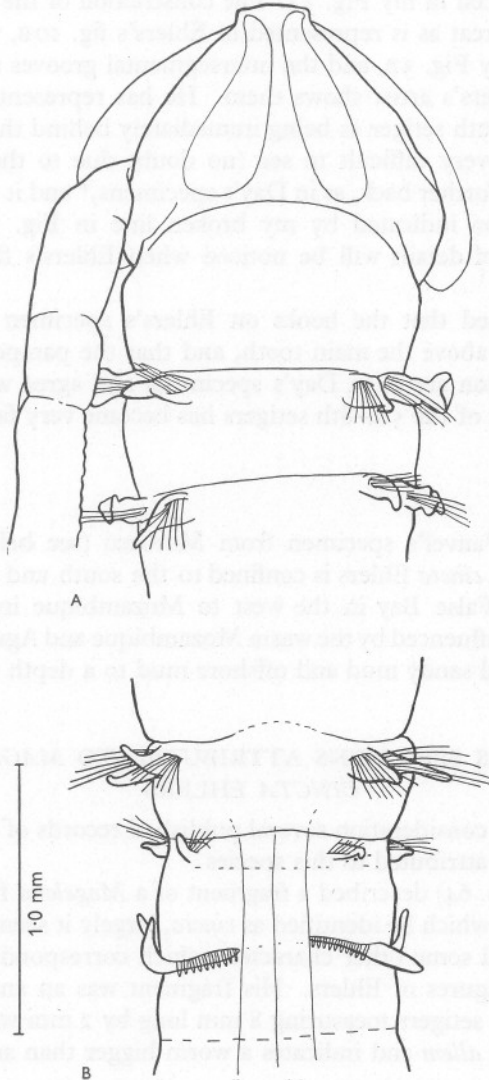


Fig. 3. The type specimen of *Magelona cincta* Ehlers in dorsal view. The bristles are more numerous than drawn. A, head and first two setigers. B, 8th-10th setigers.

between the postero-lateral corners of the extruded proboscis and the overlying prostomium, for he makes the proboscis tissue merge with the lateral walls of the body. The text shows that Ehlers himself was not clear in his own mind concerning the morphology of these parts. The artist has also 'smoothed out' the forwardly projecting anterior tip of the prostomium with its marked corners, which whilst not quite as prominent as in Day's specimens (no doubt due to the flattening) are none the less present, and have been carefully traced in my Fig. 3A. The constriction of the trunk at the 9th setiger is not as great as is represented in Ehlers's fig. 10B, which should be compared with my Fig. 3B, and the intersegmental grooves are by no means as distinct as Ehlers's artist shows them. He has represented the posterior boundary of the 10th setiger as being immediately behind the parapodia, but this boundary is very difficult to see (no doubt due to the flattening). It undoubtedly lies further back, as in Day's specimens,* and it can just be made out in the position indicated by my broken line in Fig. 3B. Some other reinterpretations of details will be noticed when Ehlers's figures and mine are compared.

I have confirmed that the hooks on Ehlers's specimen bear two small teeth side by side above the main tooth, and that the parapodial lamellae of the posterior region are as in Day's specimens and agree with my Fig. 2D. The pigmentation of the 5th-8th setigers has become very faint but is still to be seen.

Distribution

If we except Fauvel's specimen from Morocco (see below), the known distribution of *M. cincta* Ehlers is confined to the south and south-east coast of Africa, from False Bay in the west to Mozambique in the north-east, a length of coast influenced by the warm Mozambique and Agulhas Current. It occurs in intertidal sandy mud and offshore mud to a depth of at least 43 fm.

VARIOUS SPECIMENS ATTRIBUTED TO *MAGELONA* *CINCTA* EHLERS

There remain for consideration several published records of *M. cincta* Ehlers and of specimens attributed to this species.

Fauvel (1936, p. 64) described a fragment of a *Magelona* from the Atlantic coast of Morocco which he identified as *cincta*, largely it seems on the basis of the coloration and some other characters which corresponded well with the description and figures of Ehlers. His fragment was an anterior portion of head and thirteen setigers measuring 8 mm long by 2 mm wide, a dimension which fits mature *alleni* and indicates a worm bigger than any known *cincta*.

* In some specimens of *cincta* a transverse groove exists at parapodial level, depending on the state of contraction.

The prostomium was without horns, and 'les pieds portent une grande lamelle dorsale et une plus petite ventrale, et sont dépourvus de cirre'. This description almost perfectly describes the posterior parapodia of *alleni*. Fauvel's specimen may well be *alleni*, it cannot be *cincta*.

Clark & Milne (1955) found below tidal levels off the Island of Cumbrae in the Firth of Clyde some red-banded *Magelona* worms and, following a conversation with me, recorded them as *cincta*. Recently I have had an opportunity of examining several of their specimens and find that they are *alleni*.

From the British Museum (Natural History), through the kind offices of Mr N. Tebble, I have received on loan all their specimens attributed to *Magelona cincta*. They include one specimen (Reg. No. 1955.4.1.96) from the Morrumbene Estuary, Portuguese East Africa, which is indeed *M. cincta* Ehlers. It is of similar dimensions to those from Delagoa Bay (p. 622). A number of specimens (Reg. No. 1954.1.1.85/88) from the Dogger Bank, North Sea, are definitely *alleni*. Some further specimens (Reg. No. 1954.1.1.90/95) from Plymouth (collected originally by Mr N. A. Holme) are also *alleni*. It is interesting that several of these latter, all anterior ends, are fragments of larger worms than any in my own collection. One of them, comprising the head and seventeen setigers measures approx. 13 mm long by 2.5 mm where it is widest at the 6th-7th setigers; it was fixed in a state of contraction.

SUMMARY

A *Magelona*, common at Plymouth and previously provisionally identified as *M. cincta* Ehlers, is described as a new species and given the specific name of *alleni*.

M. cincta Ehlers is partially re-described from South African specimens and from the type specimen.

M. alleni n.sp differs from *M. cincta* Ehlers in several details including the shape of the prostomium and unmistakably in the structure of the parapodia of the posterior region. In *alleni* the notopodial lamellae are very much larger than the neuropodial while in *cincta* they are almost equal in size.

M. alleni occurs in the Firth of Clyde, on the Dogger Bank and in Quiberon Bay, N.W. France. A *Magelona* from the Atlantic coast of Morocco, described in the literature as *cincta*, is not *cincta* and is likely to be *alleni*. A wide distribution in the north-eastern Atlantic is indicated for this new species.

M. cincta Ehlers is known only from the southern and south-eastern coasts of Africa influenced by the warm Mozambique and Agulhas Current.

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