

# *EUNICE MANIHINE* SP. NOV. (POLYCHAETA: EUNICIDAE), A MEMBER OF THE FLAVUS- BIDENTATE GROUP FROM THE WESTERN EQUATORIAL INDIAN OCEAN

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## SYNOPSIS

A new species of the genus *Eunice* Cuvier, 1817, is described from 421 m depth in the western equatorial Indian Ocean. The characteristic features are: yellow, bidentate acicular setae, up to 4 per parapodium; up to 6 acicula per parapodium; branchiae, with few filaments, present from setiger 8 to 43; smooth occipital tentacles, the median reaching to setiger 24.

## INTRODUCTION

THE few surveys of polychaetes carried out in the western equatorial Indian Ocean have been restricted to intertidal and shallow-water habitats, rarely exceeding 50 m depth (Crossland, 1904), and little is known of the fauna of the rough bottoms at greater depths. During the Royal Society Indian Ocean Deep Slope Fishing Expedition (January/February, 1969), vertical bottom lines were fished from the FRV *Manihine* around the islands and banks in this region of the Indian Ocean (Forster *et al.*, 1970). One of these lines foul-hooked a piece of coral debris at 421 m, in which was a eunicid worm; further examination showed this to be an undescribed species of *Eunice*.

The genus *Eunice* Cuvier, 1817, consists of a large number of valid species (approximately 140) for which the common specific characters and their variations are discussed in a recent review (Fauchald, 1970). Briefly, these are the form and colour of the acicular setae (subacicular hooks), the distribution and form of the branchiae, and the length and form of the occipital tentacles. Combinations of these and, frequently, other characters serve to distinguish the species, only rarely is one of these major characters alone sufficient. Major divisions, based on the form and colour of the acicular setae, were suggested by Hartman (1944), resulting in four groups of those species for which the relevant details were known. This system has been expanded to include a greater number of valid species, and, based on the distribution of the branchiae, five subdivisions have been proposed for each of seven groups (Fauchald, 1970).

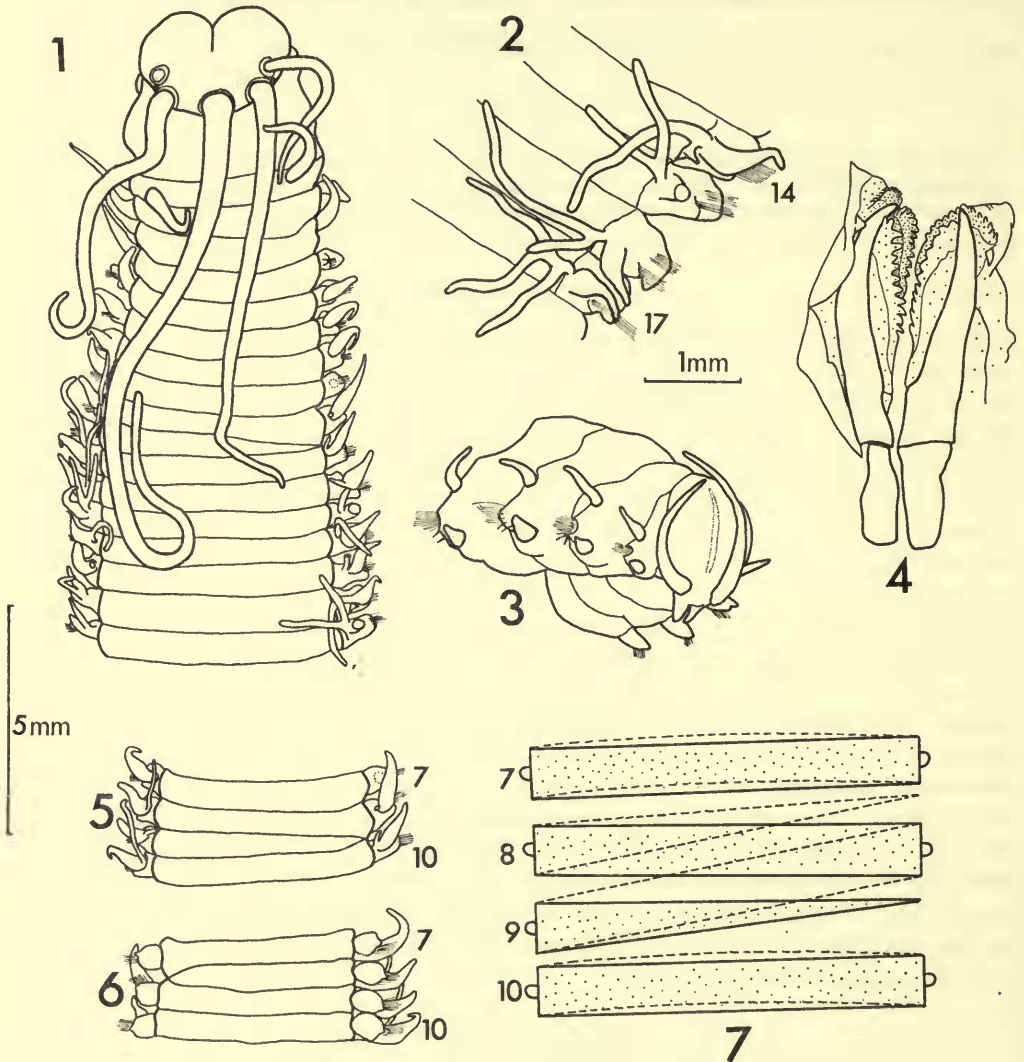
## DESCRIPTION

The single specimen of *Eunice manihine* sp. nov. consists of 127 setigers and is approximately 75 mm long (9 mm from the tip of the palps to the posterior edge of the tenth setiger on the dorsal side, following Fauchald, 1970) and 5 mm wide. The

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specimen is cylindrical in the anterior region, and becomes flattened towards the posterior.

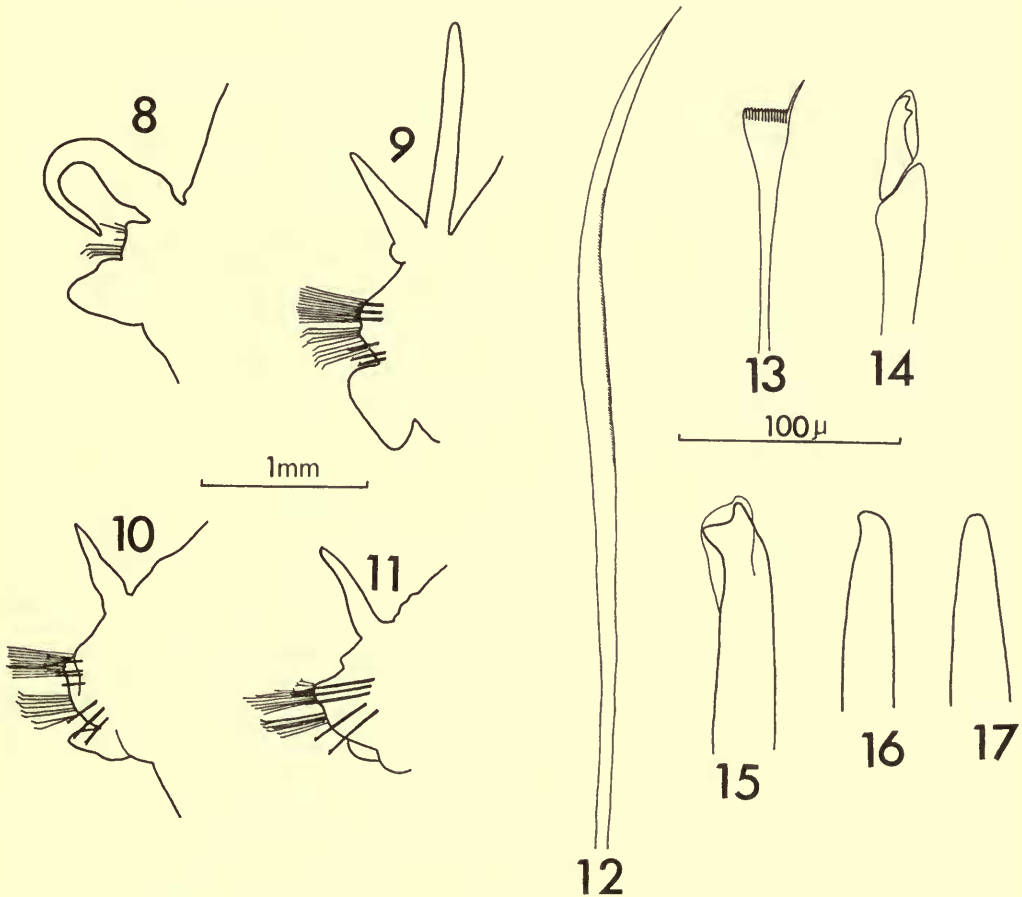
The anterior margin of the prostomium is distinctly notched between the palps (Fig. 1). The length of the prostomium is slightly greater than half the breadth. The prostomium bears a pair of eyes posterior to the gap between the bases of the



FIGS 1-7. *Eunice manihine*. 1. Anterior end, dorsal view (left outer occipital tentacle missing). 2. Setigers 14-17 right side, dorsal view. 3. Posterior end, left lateral and slightly ventral view. 4. Maxillary plates, dorsal view. 5. Setigers 7-10, dorsal view. 6. Setigers 7-10, ventral view. 7. Setigers 7-10, diagrammatic representation, dorsal side firm lines.

inner and outer occipital tentacles (Fig. 1). Five smooth and very long, slender tentacles are present; the unpaired median tentacle reaching back to setiger 24, the inner lateral tentacles reaching setiger 12 and the outer laterals setiger 3. The first peristomial segment is two thirds the length of the prostomium; the second peristomial segment is half the length of the first and the same length as the first setiger. The peristomial cirri are smooth and reach just beyond the posterior border of the prostomium.

The maxillae are well developed (Fig. 4); maxilla I is falcate; maxilla II has 12 teeth left and 11 teeth right; maxilla III has 12 teeth left; left maxilla IV has 11 teeth and the combined right maxillae III +IV have 13 teeth; each maxilla V has 1 tooth.



FIGS 8-17. *Eunice manihine*. 8-11. Parapodia from right side, anterior view. 8. Setiger 4. 9. Setiger 34. 10. Setiger 60. 11. Setiger 90. 12. Capillary seta from setiger 90. 13. Comb seta from setiger 90. 14. Falcigerous seta from setiger 34. 15. Acicular seta (subacicular hook) from setiger 34. 16. Aciculum from setiger 34. 17. Aciculum from setiger 60.

Branchiae are present only in the anterior third of the specimen: from setiger 8 to setiger 43. The branchiae consist of a single filament anteriorly (Fig. 1) with a maximum of 3 filaments between setigers 17 and 22 (Fig. 2), decreasing posteriorly to a single filament. The filaments are thinner than the dorsal cirri in the branchial region (Fig. 2). The dorsal cirri are smooth, anteriorly with a stout base and elongated tip (Fig. 8), posteriorly digitiform (Figs 3 & 11). The ventral cirri are subulate (Figs 3, 6, 8-11). Two pairs of anal cirri are present (Fig. 3), the dorsal pair long and the ventral pair very short.

In the majority of the parapodia there are, superiorly, between 10-18 long, slightly limbate, capillary setae with weak striations (Fig. 12), and, towards the posterior, 5-9 comb setae with 14-16 teeth, usually with the outer tooth on one side appreciably longer (Fig. 13). Inferiorly, there are 7-9 falcigerous setae, the blades of which are strongly bidentate, with a rounded hood projecting just beyond the tip (Fig. 14). The head of the shaft is slightly enlarged. The acicula are yellow with slightly curved tips (Figs 16 & 17). An average of 3 or 4 are present in each parapodium, with up to 6 in the middle setigers, decreasing to 2 posteriorly. The inferiorly situated acicular setae (subacicular hooks) are first present, singly, from setiger 27/28, with 3-4 per parapodium from setiger 31 throughout the remainder of the setigers. The acicular setae are yellow, bidentate, and hooded (Fig. 15).

#### DISTRIBUTION

*E. manihine* is known from one specimen found in a piece of coral debris foul-hooked on a bottom fishing line from 421 m depth, south of Menai Is, Cosmoledo (10° S, 47° E), in the western equatorial Indian Ocean.

The type specimen (Ref. no. ZB 1971-1) which is preserved in alcohol has been deposited in the British Museum (Natural History).

#### DISCUSSION

No single character is sufficient by itself to distinguish *E. manihine* from other members of the genus; the separation is based on a combination of the following characters: yellow, bidentate, acicular setae; branchiae of few filaments restricted to the anterior third of the body; very long, smooth, occipital tentacles; the form of the maxillary plates; and the large number of acicula per parapodium. The first two characters are common to many species of *Eunice* and are discussed in greater detail below. References in the literature to occipital tentacles reaching to near or beyond setiger 20 are uncommon: *E. antillensis* has been recorded with the median tentacle to setiger 20 (Ehlers, 1887), *E. auriculata* to setiger 18 (Treadwell, 1901), *E. palauensis* to setiger 18 (Okuda, 1937), and *E. tibiana* (Pourtalès, 1863) to setiger 22 (Izuka, 1912). Of these species only *E. antillensis* is a member of the flavus-bidentate group. However, the degree of variation within a species is not known, and to some extent is dependent upon the state of preservation. This also applies to the form of the tentacles, whether they are wrinkled or clearly articulated. The presence of as many as 6 acicula per parapodium is very unusual, contrasting with the more normal number of 1-3 for species of *Eunice*. The number of teeth on the maxillary plate is also greater than is usually found in the genus.

Adoption of the system of subdivision proposed by Hartman (1944) and Fauchald (1970) enables comparisons to be made more easily within this large genus. *E. manihine*, in possessing yellow, bidentate acicular setae, clearly belongs to the flavus-bidentate (A) group of Hartman (1944), and from the distribution of the branchiae (commencing before setiger 10 and not present after setiger 100), to subdivision 1 of Fauchald (1970). As the numbers of setigers may vary in worms of different sizes, it is suggested that the definition of this subdivision should be expanded to place the emphasis on the branchiae being present in the anterior third of the body rather than within a definite number of setigers irrespective of the size of the worm.

Fourteen species are listed by Fauchald (1970) within this group A1 to which should be added *E. semisegregata* Fauchald, 1970, and from which should be removed *E. benedicti* (Verrill, 1885)—a synonym of *E. pennata* (Müller, 1776) (see Pettibone, 1963)—and *E. norvegica* (Linnaeus, 1767). The latter, in having black bidentate acicular setae, and branchiae present from setiger 3 to within a few setigers of the anus (Pettibone, 1963), should be placed in the fuscus-bidentate (B) group, subdivision 2. All the previously described species in the A1 grouping have the branchiae commencing on setiger 3. Fauchald (1970) has suggested that this is a constant feature within a species, though small variations have been recorded, as for example in *E. pennata* (Pettibone, 1963). Thus, *E. manihine* is the sole member of the flavus-bidentate group in which the branchiae commence before setiger 10, but after setiger 6. Apart from *E. manihine*, only two species—*E. megabranchia* Fauchald, 1970 and *E. validobranchiata* Monro, 1937—in the A1 group have smooth occipital tentacles, the remainder have articulated or moniliform tentacles. *E. megabranchia* (from 894 m depth in the Gulf of California) and *E. validobranchiata* (from 1046 m depth off the South Arabian coast) differ only in the length and shape of the guards of the falcigerous setae and the form of the ventral cirri; the other characters are very similar and for comparison with *E. manihine* may be considered identical. Specimens of these two species of a similar size to the *E. manihine* specimen differ in having branchiae with large numbers of filaments (up to 45) commencing on setiger 3, appreciably shorter occipital tentacles, fewer acicular setae per parapodium and fewer teeth on the maxillary plates.

Of the eunicid polychaetes reported from East Africa (Crossland, 1904), only one species of the flavus-bidentate group was reported—*E. tubifex* Crossland, 1904. This belongs to Fauchald's subdivision 4, in which branchiae are present from after setiger 10 to the posterior.

The type specimen of *E. manihine* shows an abnormality in the segmentation of setigers 8 and 9 (Figs 5 & 6), resulting in a short spiral (Fig. 7) similar to the form Buchanan (1893) found in specimens of *Lumbriconereis impatiens* (= *Lumbrinereis tetraura*). It was not possible to examine the internal anatomy of the single specimen available.

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## REFERENCES

- BUCHANAN, F. 1893. Peculiarities in the segmentation of certain polychaetes. *Q. Jl microsc. Sci.* **34** : 529-544.
- CROSSLAND, C. 1904. The marine fauna of Zanzibar and British East Africa, from collections made by Cyril Crossland in the years 1901 and 1902.—The Polychaeta. Part III. With which is incorporated the account of Stanley Gardiner's collection made in the Maldivé Archipelago in the year 1899. *Proc. zool. Soc. Lond.* **1** : 287-330.
- EHLERS, E. 1887. Report on the annelids of the dredging expedition of the U.S. Coast Survey steamer *Blake*. *Mem. Mus. comp. Zool. Harv.* **15** : 1-335.
- FAUCHALD, K. 1970. Polychaetous annelids of the families Eunicidae, Lumbrineridae, Iphitimidae, Arabellidae, Lysaretidae and Dorvilleidae from Western Mexico. *Allan Hancock Monographs in Marine Biology* **5** : 1-335.
- FORSTER, G. R., BADCOCK, J. R., LONGBOTTOM, M. R., MERRETT, N. R. & THOMSON, K. S. 1970. Results of the Royal Society Indian Ocean Deep Slope Fishing Expedition, 1969. *Proc. R. Soc. B.* **175** : 367-404.
- HARTMAN, O. 1944. Polychaetous annelids. Part 5. Eunicea. *Allan Hancock Pacific Exped.* **10** : 1-238.
- IZUKA, A. 1912. The errantiate Polychaeta of Japan. *J. Coll. Sci. imp. Univ. Tokyo* **30** (2) : 1-262.
- OKUDA, S. 1937. Polychaetous annelids from the Palau Islands and adjacent waters, the South Sea Islands. *Bull. biogeogr. Soc. Japan* **7** : 257-316.
- PETTIBONE, M. H. 1963. Marine polychaete worms of the New England region. I. Families Aphroditidae through Trochochaetidae. *Bull. U.S. natn. Mus.* **227** : 1-356.
- TREADWELL, A. L. 1901. The polychaetous annelids of Porto Rico. *Bull. U.S. Fish Commn* **20** : 181-210.