

POGONOPHORA FROM SOUTH AFRICA

By

EVE C. SOUTHWARD

The Laboratory, Citadel Hill, Plymouth, U.K.

(With 3 figures in the text)

INTRODUCTION

The Pogonophora, a group of tubicolous marine animals related to the Hemichordata, have aroused much interest in recent years. A curious feature of the group is the total absence of an internal digestive system, a condition which is unique among non-parasitic Metazoa. The Class name Pogonophora was suggested in 1937 by Johansson who chose the name to describe the beard-like appearance of the tentacles of the only species known to him then (*Lamellisabella zachsi* Uschakov). A new Phylum, Brachiata, was erected for the group by Ivanov (1955*b*), who had already (1951) assigned to the Pogonophora a peculiar animal described much earlier by Caullery (1914, 1944) and described several new genera and species himself (Ivanov, 1949, 1952).

Our knowledge of the distribution of these animals is still very incomplete. They seem to be restricted to soft sediments in deep, or at least cold, water. Ivanov's specimens have come, so far, from the north-west Pacific and Arctic Oceans. Others have been collected in the East Indies and in the east Pacific off the coast of Central America (Caullery, 1944; Kirkegaard, 1956*a* & *b*; Menzies, Ewing, Worzel & Clarke, 1959). The first species was recorded from Europe in 1956 (Jägersten) and more have been found since (Southward & Southward, 1958; Brattström, 1959; Southward, 1959).

A collection of pogonophore tubes made by the R.S. *Africana II*, off the west coast of South Africa, is of great interest as the first record from the south Atlantic and the most southerly record so far.

The deep-trawling was done by courtesy of the Director, Division of Fisheries, Cape Town. The tubes were sent to me by Dr. F. H. Talbot of the South African Museum, to whom I am very grateful for the opportunity to examine the specimens. The tubes seem to belong to three species, but only one tube was occupied by an animal. This one animal, though incomplete, shows enough of the important taxonomic features to allow it to be used as the type specimen of a new species.

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Family POLYBRACHIIDAE Ivanov 1952

Heptabrachia talboti n. sp.

Material: One occupied tube (holotype) and 7 empty fragments; position: 33° 26' S., 16° 33' E.; depth: 2,268 m.; date of collection: 26.8.59; S.A.M. No. A 19704.

Three empty fragments of tube; position: 33° 50' S., 17° 21' E.; depth: 1,097 m.; date of collection: 25.8.59; S.A.M. No. A 19702.

Two empty fragments of tube; position: 33° 50' S., 16° 30' E.; depth: 2,750–2,890 m.; date of collection: 27.8.59; S.A.M. No. A 193.

Description: The tubes are brown and stiff anteriorly, white and soft posteriorly. Their diameter is a little greater at the anterior end. The tube of the holotype is 0.46 mm. in diameter at the anterior end and 0.41 mm. posteriorly, while the variation among the empty tubes is from 0.34 to 0.56 mm. The longest tube is not complete and is 13 cm. long. The anterior part of the tube is marked with wide brown rings, separated by narrower yellow rings (fig. 1, A), but towards the middle part of the tube the brown rings become narrower and less distinct (fig. 1, B) and finally disappear. The posterior part of the tube is whitish and its rather thick walls are encircled by slightly wrinkled marks about 1 cm. apart. One short fragment of tube with stiff, transparent, yellow walls may be the extreme anterior end of one of the tubes of this species, although other species of *Heptabrachia* have the anterior end of the tube colourless, with thin, limp walls (Ivanov, 1957).

The animal has lost the distal parts of the tentacles and much of the posterior part of the body. Although parts of the specimen are crushed the following details can be seen. At the anterior end about 15 tentacles were attached to the cephalic lobe of the protosoma, or first segment (fig. 2, A, B), and about half of these tentacles were lying along the mesosoma (an unusual position which may have been produced during fixation). These backward-pointing tentacles had to be removed to expose the mesosoma (fig. 2, A) and this procedure slightly damaged the anterior part of the specimen, so that it is difficult to decide how the bases of the tentacles were arranged. In this specimen it is not possible to see any pinnules on the tentacles, but many pognophores have them and they may be found in other specimens.

The protosoma is separated from the mesosoma by a circular groove, behind and over which the anterior mesosoma is drawn out into a collar-like flap (fig. 2, A, C). On the tentacular side* the collar is divided by a deep groove which extends back, with a flap on each side, as far as the bridle. This bridle is a ridge of thickened cuticle which encircles the mesosoma except for a small gap on the tentacular side (fig. 2, A, C). Behind the bridle the mesosoma is smooth. Together the protosoma and mesosoma are 1.52 mm. long and the

* The tentacular side of the animal is ventral according to Ivanov (1955a), dorsal according to Jägersten (1956).

greatest width of either is 0.32 mm. The third, last, and longest segment of the body is the metasoma, which in this specimen is 12 mm. long and certainly not complete. The first part (1.7 mm.) is very much contracted and twisted, and the closely packed papillae on the tentacular side (fig. 2, A) are probably normally arranged in two rows separated by a longitudinal groove, as they are in many other pogonophores. The paired arrangement of the papillae on this part of the body in other pogonophores has earned it the name of the 'metameric' region. In the present specimen each papilla is crowned with an

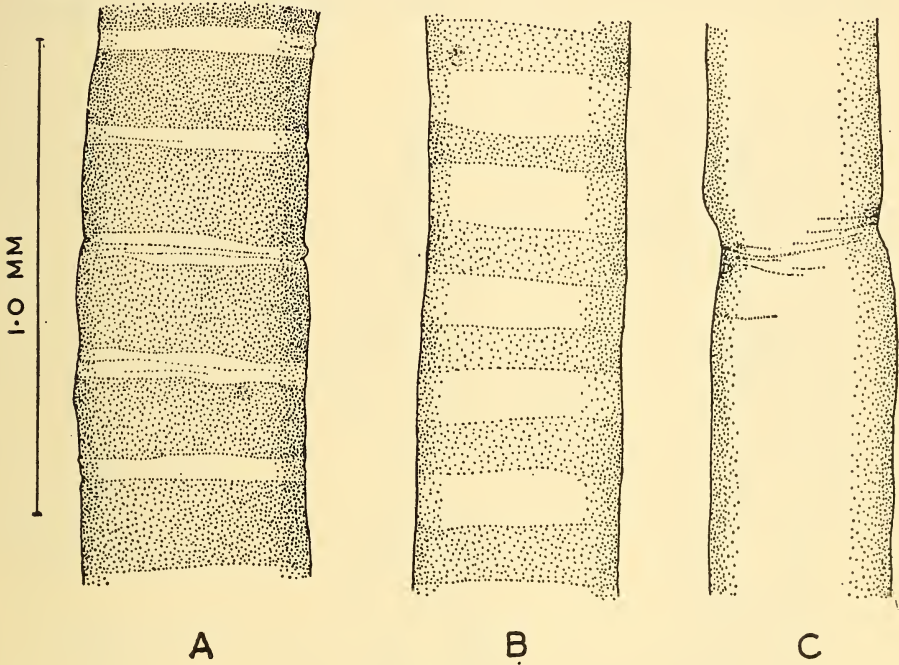


FIG. 1

Tube of *Heptabrachia talboti* n. sp. A, anterior. B, middle. C, posterior.

oval adhesive plate with one thickened border (fig. 2, A, E). Behind the metameric region is a muscular region bearing a few scattered papillae, with adhesive plates (in a mature specimen this is the region which contains the gonads), extending for about 10 mm. and ending with two girdles of small toothed platelets (fig. 2, D). The specimen is broken off at the second girdle and is also damaged at the level of the first, so that the extent and shape of the girdles in the complete animal are not known. Each girdle is made up of several irregular rows of platelets (fig. 2, F, G), of the shape and form found in many other pogonophores. The part of the metasoma behind the girdles (postannular region) is missing; in other species it is often as long as the preannular region.

For a complete description it will be necessary to have a specimen with the metasoma in good condition, in order to discover the true arrangement of the papillae in all parts, and to clarify the arrangement of the girdles. Complete tentacles are needed for measurement of their length and for investigation of their pinnules, if present.

However, with the material available, it is possible to place the species, with reasonable certainty, in the genus *Heptabrachia* Ivanov 1952, and to conclude that it is unlike any of the four species so far known. *H. abyssicola*, *H. gracilis*, *H. beringensis* and *H. subtilis* were all described by Ivanov and he has summarized their characteristics in a table (Ivanov, 1960, p. 214). *H. gracilis* is the closest in

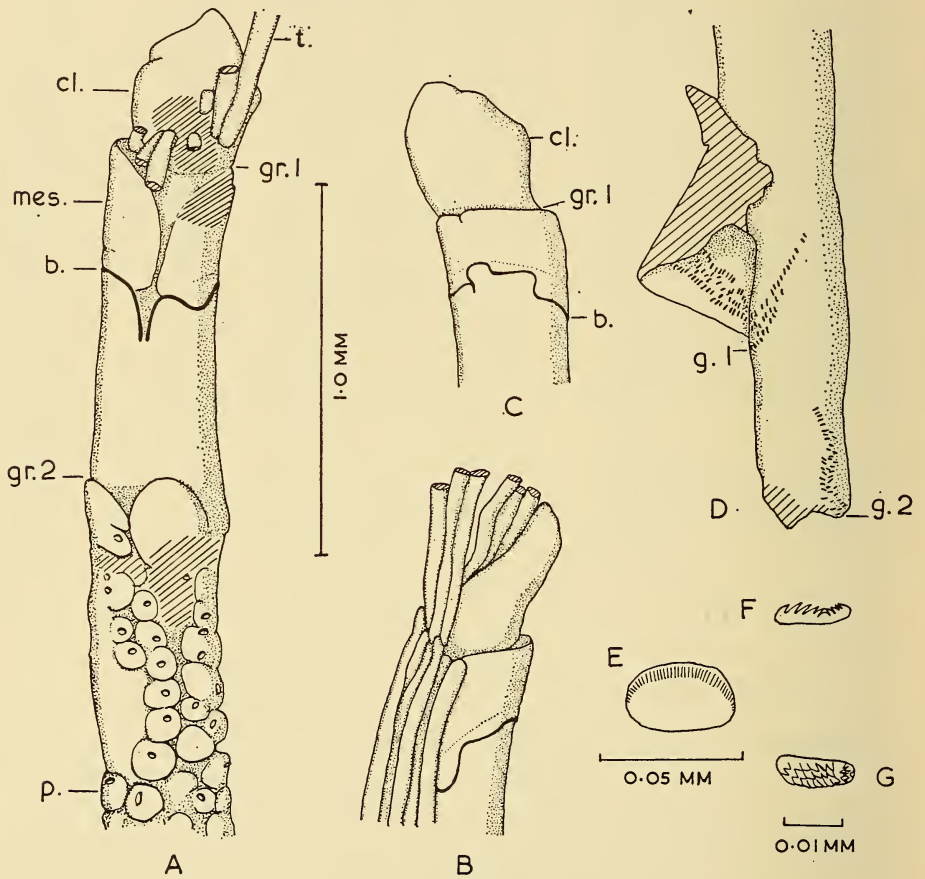


FIG. 2

Heptabrachia talboti n. sp. A, anterior end, tentaculate side, after removal of tentacles. B, anterior end, before removal of tentacles. C, anterior end, non-tentaculate side. D, girdle region of metasoma. E, adhesive plate. F, G, side and surface views of girdle platelet. Diagonal hatching indicates damaged surfaces. Abbreviations: b. bridle, cl. cephalic lobe, g. 1 first girdle, g. 2 second girdle, gr. 1 groove between proto- and mesosoma, gr. 2 groove between meso- and metasoma, mes. mesosoma, p. papilla, t. tentacle.

general appearance to *H. talboti*, but, in addition to differences in size and the number of tentacles, they differ in the size of the adhesive plates which are 15 to 20 μ long in *H. gracilis* and 30 to 40 μ long in *H. talboti*. Examination of more specimens of *H. talboti* might disclose more differences, since all four of Ivanov's species have, on part of the preannular metasoma, an area or row of large papillae set close together, whose arrangement and number varies with the species. In *H. talboti* some large papillae are visible in the correct region but their arrangement cannot be seen clearly. Another useful specific character in this genus is the arrangement of the papillae on the postannular region, which has been lost by the present specimen.

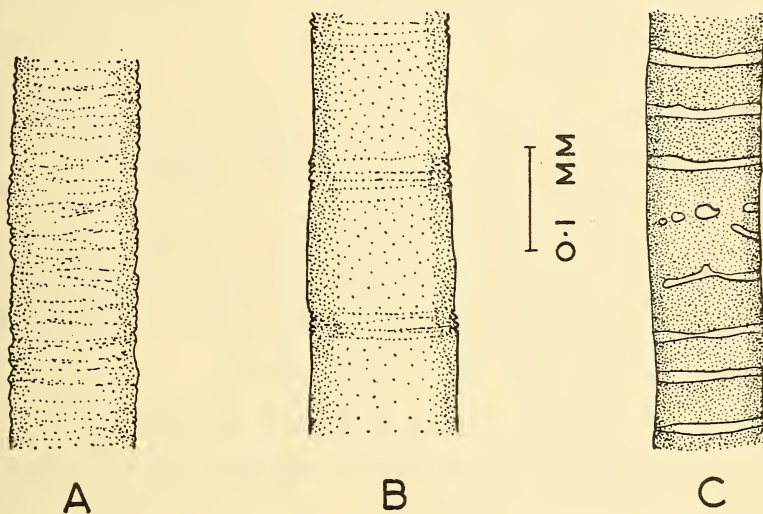


FIG. 3

A & B, two ends of tube type (a). C, tube type (b).

EMPTY TUBES OF UNKNOWN GENERA AND SPECIES

Material: Three tubes; position: 34° 05' S., 16° 58' E.; depth: 2,690 m.; date of collection: 9.12.59; S.A.M. No. A 319.

The tubes are of two types: (a) almost colourless, transparent, with one end slightly wrinkled but not ringed and the other end marked with wide greyish rings (fig. 3, A, B). There are two specimens of this type, one 10 cm. long by 0.195 mm. diameter, the other 2.5 cm. by 0.145 mm. (b) reddish brown in colour, with well-marked brown rings, separated by narrow yellow rings (fig. 3, C). The diameter is 0.12 mm. and the length is 2 cm.

The holotype and other specimens of *Heptabrachia talboti*, and the unidentified pogonophore tubes, are all in the collection of the South African Museum, Cape Town.

SUMMARY

The first member of the Pogonophora to be described from the south Atlantic is *Heptabrachia talboti* n. sp., collected off the west coast of South Africa in depths between 1,097 and 2,890 m. Empty tubes of two other pogonophores are also described.

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