

## ON A NEW SPECIES OF *SIBOGLINUM* (POGONOPHORA), FOUND ON BOTH SIDES OF THE NORTH ATLANTIC

By EVE C. SOUTHWARD

The Laboratory, Citadel Hill, Plymouth

(Text-fig. 1)

*Siboglinum* is the most widespread of pogonophoran genera (for references see Southward, 1963). The new species described in this paper is interesting because it is common in comparatively shallow water and because it is one of the two species so far found on both east and west sides of the North Atlantic (Wigley, 1963). Off the coast of the British Isles the most favourable habitat known is muddy sand in depths between 100 and 175 m, where there may be 50 to 200 animals per m<sup>2</sup> (N. A. Holme, personal communication; McIntyre, 1963). The animals are small and form only a minor part of the biomass. Off the west coast of Ireland *Siboglinum* is found in a community consisting mainly of *Ophiura affinis*, small polychaetes, small lamellibranchs, small spatangoids and a few *Astrorhiza limicola*; the specimens collected by McIntyre in the North Minch were associated with a rather similar community, with more *Astrorhiza*.

A few specimens of the new species of *Siboglinum* have been found in deeper water, where they were associated with other pogonophores (*S. atlanticum*, *S. inerme* and *Diplobranchia capillaris* on the European side of the Atlantic and *Siboglinum ekmani* on the American side). A closely related species, *S. caulleryi* Ivanov, 1957, has a similar depth distribution in the North Pacific, and the two species have much in common besides depth distribution and habitat (see p. 517).

I am very grateful to Mr N. A. Holme for the first specimens collected off the west of Ireland. Mr A. D. McIntyre (Scottish Home Department Marine Laboratory) kindly sent me some of his specimens and Dr R. L. Wigley (U.S. Fish and Wildlife Service, Woods Hole Biological Laboratory) allowed me to examine some from the west Atlantic. Prof. A. V. Ivanov (Leningrad) has given me some examples of *S. caulleryi* from the Pacific, which have enabled me to make a detailed comparison of the two species.

**Siboglinum holmei** sp.nov.

*Siboglinum* sp., A. J. Southward, 1958; E. C. Southward, 1963; McIntyre, 1963; Wigley, 1963; *Siboglinum caulleryi*, Brunet & Carlisle, 1958, non *S. caulleryi* Ivanov, 1957.

Material: about 50 specimens, both sexes, and many empty tubes, from the following localities:

(1a) Off Dingle Bay, S.W. Ireland, 51° 54' N., 11° 00' W.; 4 stations in depths 143–174 m; 16 specimens; 23–25. vii. 56.

(1b) Same area; 3 stations in depths 145–150 m; 21 specimens; 23. vi. 60.

(2) 51° 57½' N., 10° 58' W.; 143 m; 2 empty tubes, 23. vi. 60.

(3) 51° 20' N., 10° 37' W.; 155 m; 1 empty tube; 27. vi. 60.

(4) 47° 50' N., 7° 57' W.; 550–820 m; 2 specimens; 16. v. 58.

(5) 47° 50' N., 8° 08' W.; 1200–1300 m; 1 empty tube; 16. v. 58.

(6) North Minch, West Scotland, 58° 24' to 58° 33½' N., 5° 55' W.; 4 stations in depths 100–114 m; 25 specimens; 1. viii. 60.

(7) East of Philadelphia, U.S.A., 39° 56' N., 71° 00' W.; 366 m; 2 specimens; 18. vi. 62.

(8) 39° 59' N., 71° 00' W.; 567 m; 3 specimens; 18. vi. 62.

Holotype: female from locality 1a, B.M. No. 1963. 5. 2. 1.

*European specimens**Description*

The tubes are light brown, greenish grey or colourless, with thin walls. They are up to 14 cm long and 0.17–0.27 mm in diameter (usually about 0.22 mm). Both ends of the tube are colourless, limp-walled and ringless, but in most cases the middle part is ringed (Fig. 1A). The rings, which are smooth, greenish-brown and rather variable in length, are separated by colourless, wrinkled interspaces. Often there are some sand grains sticking to the outside of the tube.

The animal can be seen through the tube wall, but the tube is fairly easily removed by tearing apart lengthwise (unlike some other species). The animal is up to 70 mm long with a tentacle up to 15 mm long. The maximum diameter of the body is between 0.15 and 0.25 mm (usually about 0.19 mm) and the diameter of the tentacle is about one-third of this. The tentacle has one semi-double row of pinnules (Fig. 1E) about equal to the tentacle diameter. The fore-part of the body (Fig. 1D) is 1.2–1.7 mm long (about 8 to 10 × the diameter), with a pointed cephalic lobe, and a post-tentacular groove on the ventral side only. The bridle lies only a short way behind the tentacle base, and is preceded by a deep mid-ventral furrow (Fig. 1D). The presence of small transverse grooves between this and the tentacle base depends on the state of contraction, but two other transverse grooves are always present. The first of these is shallow on the ventral side but deepens as it passes around the

sides of the body and then curves backward to meet the dorsal points of the bridle (Fig. 1B, D). A second transverse groove helps to demarcate a pair of ventral lobes (Fig. 1D) which are especially characteristic of this species. The bridle keels are colourless and lie on narrow ridges; they meet but do not fuse on the ventral side, and are well separated dorsally (Fig. 1B). Behind the bridle is a pair of white glandular patches of epidermis (stippled in Fig. 1B, D).

The metasoma is separated from the mesosoma by a very shallow groove and its lateral rows of metameric papillae flank a mid-ventral furrow. Each papilla contains one pear-shaped gland. Between the openings of the glands and the dorsal ciliated band there are bands of whitish glandular epidermis similar to the patches behind the bridle. The whole pre-annular region of the metasoma is 10–20 mm long, consisting of a metameric region up to 4.6 mm long, with 50–70 pairs of papillae; followed by a long section with small scattered papillae, a short region with two to eight large ventral papillae and a dorsal ciliated band (Fig. 1F); behind this comes a region with a few small papillae and then two to four more large papillae just before the girdles. The two girdles (Fig. 1G) lie close together and consist of one or two irregular rows of platelets. The anterior girdle is divided dorsally and ventrally, while the posterior is divided only ventrally. They are followed by one large papilla. The girdle platelets are about  $15\mu$  long and have numerous small teeth, which are arranged in a small anterior and a larger posterior group. The post-annular part of the metasoma is 30–50 mm long and bears small dorsal groups of glands (Fig. 1I), each opposed by two or three small papillae tipped with cuticular bars.

In mature specimens the largest oocytes are about  $400\mu$  long and the spermatophores are between  $140$  and  $170\mu$  long, with the non-filamentar end slightly bifid and the basal part of the filament fringed with very fine 'setules' (Fig. 1H). Embryos have been found in tubes collected in June, July and August. They were in batches of four to twelve per tube and all members of a batch were at about the same stage of development. The most advanced stage seen has a rudimentary tentacle and is about  $900\mu$  long. Living embryos and adults are whitish and transparent, with red blood in the adults.

#### *American specimens*

These were received after the above description was drawn up. They differ from the European specimens in a few details: the fore-part varies from 1.2 to 2.0 mm in length; the bridle keels are yellow, and the ventral lobes in front of the bridle are smaller; the non-filamentar end of the spermatophore is more obviously bifid.

*Siboglinum holmei* is named after Mr N. A. Holme, who collected the first specimens.

*S. holmei* is apparently closely related to *S. caulleryi* Ivanov, the tubes being practically identical, except that those of *S. caulleryi* are slightly larger. The

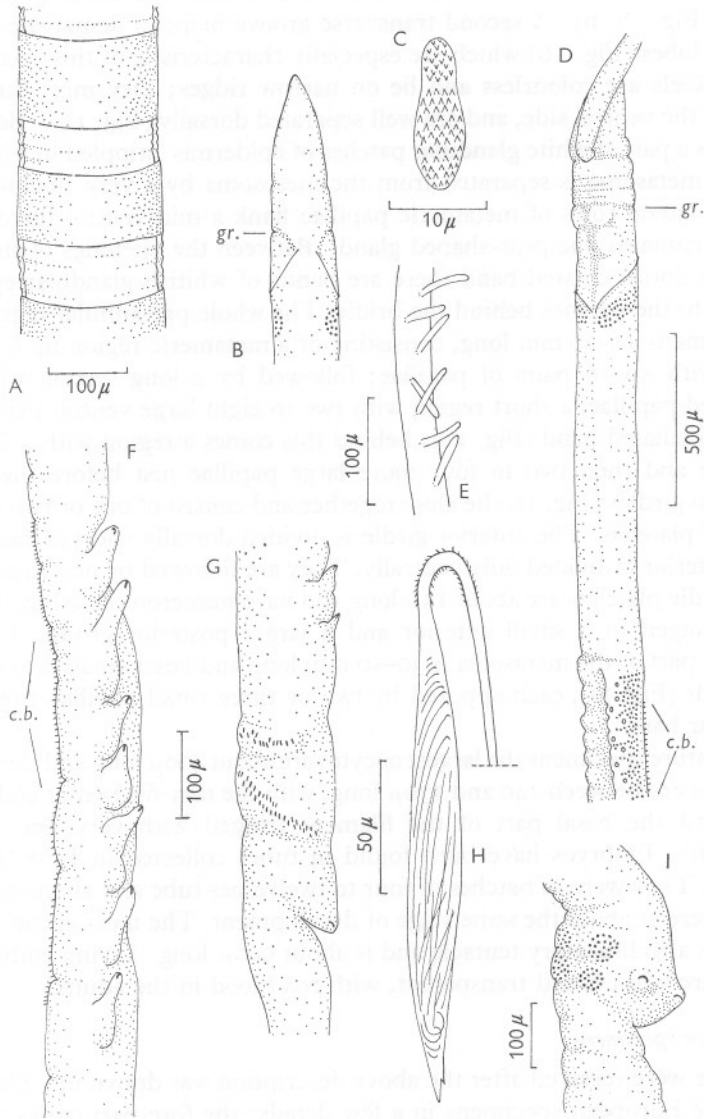


Fig. 1. *Siboglinum holmei* sp. nov. A, ringed part of tube; B, anterior end, dorsal view; C, toothed platelet; D, fore-part, ventral view; E, part of tentacle; F, zone of metasoma with large papillae; G, girdle region; H, spermatophore; I, part of post-annular metasoma with glandular shield and papillae. (c.b., ciliated band; gr., main transverse groove; heavy stipple indicates whitish glands.)

following differences have been found between the animals. In *S. caulleryi* there are no distinct white glands on mesosoma or metasoma. It has a more muscular fore-part, with the bridle about half-way along. The main transverse furrow in front of the bridle is also oblique but it does not stop at the dorsal points of the bridle but is continuous across the dorsal side; the points of the bridle are closer together than in *S. holmei*. The sides of the mid-ventral furrow are practically undivided and there are no ventral lobes. The ventral points of the bridle keels fuse together completely. The rest of the body is much the same in both species.

These similarities in form and habitat suggest that the evolution of distinct species in the Atlantic and Pacific may have occurred comparatively recently.

#### SUMMARY

A description is given of *Siboglinum holmei* sp.nov., a shallow-water Atlantic species. It is compared with *S. caulleryi*, a related species from the Pacific.

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