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SPHAERODORIDAE (ANNELIDA: POLYCHAETA) FROM THE BIOSHELF PROJECT, ANDAMAN SEA, THAILAND

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ABSTRACT

Polychaetes of the family Sphaerodoridae from the BIOSHELF Project in the Andaman Sea, Thailand are described. The material comprises a total of seven specimens representing five species in three genera. As the material is scarce three species of *Sphaerodoropsis* are described but not identified to species. *Clavodorum andamanense* n. sp. and *Ephesiella phuketensis* n. sp. are described.

INTRODUCTION

The family Sphaerodoridae is well defined and is placed in the taxon Phyllodocida (Rouse and Fauchald 1997). It currently comprises 85 species in 10 genera. A majority of the species are found in shelf depths but a considerable number are only found in bathyal and abyssal depths (Borowski 1994). Most sphaerodorids were described during the last 30 years; only 20 species were described until 1970. When Fauchald (1974) reviewed the group most species were described from deep waters where they were found to be frequent. In shelf depths they tend to have been overlooked (Fauchald 1977) due to their general small body size but are found in greater numbers in samples from deeper waters as these are treated more thoroughly. Most of the recently described species are from shelf-depths (Borowski 1994). Care should therefore be taken in the choice of gear and mesh sizes of sieves to get representative samples of sphaerodorids from each sampled station. Recent samples from the Greenland Sea proved this approach to be successful (pers. obs.).

Sphaerodorids are described from all over the world, but the Indian Ocean and the Far East seem to be underrepresented. Two species from Vietnam (*Ephesiella gallardi* Fauchald, 1974 and *Sphaerodorum vietnamense* Fauchald, 1974), one from Indonesia (*Sphaerodoropsis malayana* (Augener, 1933)) and one from East India (*Clavodorum bengalorum* Fauchald, 1974) are the only species described from areas close to the investigation undertaken by the BIOSHELF Project.

The material available for this study consisted of seven specimens representing five species in three genera. Unfortunately there is only one specimen for each species, with two exceptions. Two new species are named. The three other species belong to the species-rich and heterogeneous genus *Sphaerodoropsis*, and are described but not named as the present material consists of too few specimens to allow a verified identification.

A list of species described in the Sphaerodoridae is presented at the author's Internet pages (www.ntnu.no/~vmzotbak/polychaeta/sphaerodoridae/).

MATERIAL AND METHODS

The material of Sphaerodoridae treated in this investigation was found at seven different stations (Table 1). For a map of the area sampled and a complete list of stations see Aungtonya and Eibye-Jacobsen (2002).

Specimens were studied in a stereo microscope and a compound microscope, drawings were made with the aid of a camera lucida. Each specimen was studied with the aid of staining with Shirlastain

Table 1 Station data for the stations where specimens of Sphaerodoridae were sampled. BC = box corer; OS = Ockelmann sledge. Latitudes are N, longitudes are E, and depths are in m.

Station	Gear	Date	Latitude	Longitude	Depth	Sediment
A-2	OS	18 Apr 1996	9°32′	97°50′	66	sandy mud
C-1	OS	20 Apr 1996	9°01′	98°03′	39	muddy sand
C-2	OS	20 Apr 1996	9°00′	97°53′	64	muddy sand
K-3	OS	5 May 1996	6°59′	98°42′	82	sandy mud
L-1	BC	6 May 1996	6°45′	99°21′	38	sandy mud with shell frag.
RN-1	?	8 May 1996	7°30′	98°22′	63–64	sandy mud
PB-7	BC	22 Apr 1997	7°45′	98°41′	29	sand with shell fragments

A (Petersen 1998). This gives the specimen a red/brown temporary colour. In general, microtubercles, papillae and antennae stain darker than the body surface. In addition there is an extensive contrast of the body surface and prominent macrotubercles. These staining patterns are of great advantage in studying sphaerodorids.

All the material is deposited at Phuket Marine Biological Centre (PMBC).

TAXONOMY

Clavodorum Hartman and Fauchald, 1971

Clavodorum Hartman and Fauchald, 1971: 63.

Type species: *Clavodorum atlanticum* Hartman and Fauchald, 1971: 63–64, pl. 32, figs. a–d.

Diagnosis: Sphaerodorids with stalked macrotubercles and a long, slender median antenna. The tubercles form six or eight rows on the dorsum; smaller tubercles, similarly stalked, may form irregular rows on the venter. Parapodia have large ventral cirri and usually distinct prechaetal lobes. Postchaetal lobes are present. Nephridiophores are present on all chaetigers except the first and last three or four. All chaetae composite (Hartman and Fauchald 1971).

Remarks: The length of the median antennae is the single character separating the two genera with stalked macrotubercles, *Clavodorum* and *Sphaerodoridium*. In *Clavodorum* the median antenna is longer or as long as the lateral antennae, and in *Sphaerodoridium* it is shorter than the lateral ones. It has been questioned whether this character alone is enough to keep these genera separate (Hartmann-Schröder and Rosenfeldt 1990). Other characters used to describe species in these genera have been found in species in both genera (Borowski 1994). Based on these facts it is beyond doubt that the 15 species with stalked macrotubercles (9 species in *Clavodorum* and 6 in *Sphaerodoridium*) should be revised.

Characters that should be taken into consideration for a distinction between the two genera should include the number and distribution of the dorsal stalked macrotubercles, the number, distribution and feature of the ventral tubercles and/or papillae, and the morphology of the parapodia.

Clavodorum andamanense n. sp.

Fig. 1A–E

Material examined: BIOSHELF st. PB-7/BC (holotype, PMBC 18540).

Description: The single specimen is complete, measuring 0.8 mm in length for 13 chaetigers. The body has its greatest width between chaetigers 5 and 7. Up to ten rows of stalked macrotubercles (Fig. 1B) in mid-body segments, five in the first chaetiger. Two eyes are present. Antennae partly retracted, seen from the ventral side; lateral and median antennae seem to be equal in length. Tubercles on the ventral side in a triangular pattern

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with one larger tubercle placed at the base of the parapodia and two smaller ones placed in a more mid-body position (Fig. 1A). Ventral tubercles are stalked like the dorsal ones, although smaller in size (Fig. 1D). Parapodia long with two large papillae, parapodial lobe and ventral cirrus equal in length; a short and slightly pointed postchaetal lobe is present (Fig. 1C). Compound chaetae with long straight blades, 3-5 chaetae in each parapodium (Fig. 1E).

Remarks: As the antennae are drawn towards the ventral side and are partly retracted, it is difficult to judge whether the median antenna actually is as long as the lateral antennae. As a consequence it is difficult to judge whether this species should be placed in *Sphaerodoridium* or in *Clavodorum*, as the length of the median antennae is the only character separating the two genera. The present species is placed in *Clavodorum* due to the presence of stalked ventral tubercles. A majority of the species in this genus has stalked ventral tubercles while no species in *Sphaerodoridium* does, with a possible exception for *S. japonicum* Ozolinsh, 1987.

C. andamanense n. sp. is distinct from all other species with stalked macrotubercles as it has up to ten rows of dorsal macrotubercles. Whether the triangular pattern of the ventral tubercles is a consistent character for this species remains to be seen.

Etymology: The specific name refers to the Andaman Sea from which this species was collected.

Ephesiella Chamberlin, 1919

Ephesiella Chamberlin 1919: 182.

Type species: *Sphaerodorum abyssorum* Hansen, 1878: 9, pl. VI, figs. 9–12.

Diagnosis: Two rows of macro- and two rows of microtubercles on the dorsum; the sessile macrotubercles with terminal papillae. Anterior end with a median and one or two pairs of lateral

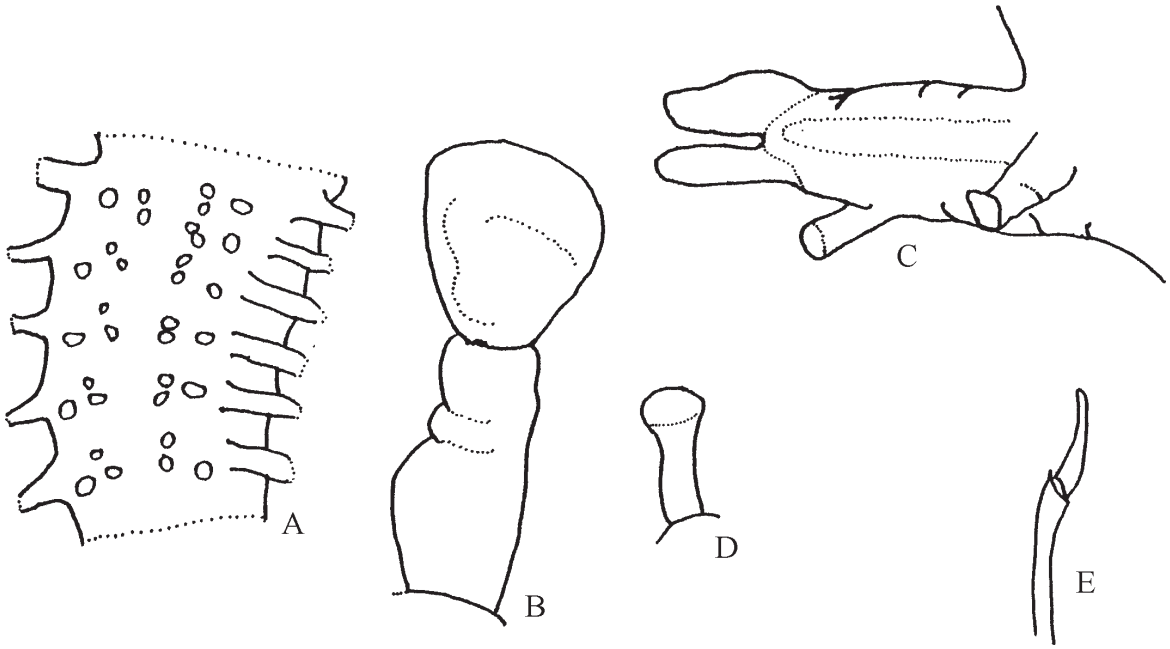

Figure 1 *Clavodorum andamanense* n. sp.: A. Ventral side between chaetigers six and ten, with ventral tubercles in a triangular pattern. B. Dorsal macrotubercle. C. Parapodium, anterior view. D. Ventral tubercle. E. Compound chaeta.

antennae. A large recurved hook present in the first chaetiger in most species; all other chaetae composite (Fauchald 1974).

Remarks: There are currently 13 species known in this genus. Mòllica (1994) presented a key to the species in *Ephesiella* but left out two species, *E. bipapillata* Kudenov, 1987 and *E. muehlenhardtae* Hartmann-Schröder, 1988.

Ephesiella phuketensis n. sp.
Fig. 2A–E

Material examined: BIOSHELF st. L-1/BC (1 paratype, PMBC 18541); st. RN-1/OS (holotype, PMBC 18542).

Description: Holotype complete, measuring 7 mm in length for 77 chaetigers. Two rows of macrotubercles with terminal papilla. Macrotubercles wrinkled (especially evident in holotype). Two rows of microtubercles (Fig. 2D), situated at the base of the macrotubercles but not fused to them. One or two small papillae on most macrotubercles in addition to the large terminal one (Fig. 2C). Segmental papillae scattered on the dorsal and ventral surface. Two pairs of lateral antennae, the superior pair slightly longer than the inferior, one shorter median antenna. Parapodia short with digitiform ventral cirri, parapodial lobe as long as ventral cirrus, four digitiform papillae (Fig. 2B). Compound chaetae with shaft broadened at the top, slightly curved blade (Fig. 2E). Hooks in the first chaetiger present, two hooks visible on the left-hand side in paratype (Fig. 2A).

Remarks: The two specimens are very differently preserved. In the holotype the anterior end is contracted but papillae on both dorsal and ventral surfaces are clearly visible. The paratype is not well preserved and has a loose epidermis; it is complete, measuring 8 mm in length. As a consequence it is difficult to see the outline of the macrotubercles on some parts of the paratype. Despite the different appearance of the two specimens there is no doubt that they belong to the same species. The fact that both have one to two small additional papillae on the macrotubercles and that the chaetae, dorsal and ventral papillae, and the configuration of parapodia are similar confirm this.

Due to the preservation the paratype is more or less transparent revealing two simple hooks in the first left chaetiger. Only one could be observed on the right side. In most specimens from species with simple hooks only their tip and distal part are seen extending from the body surface, as most of the hook lies interiorly. The transparency of the specimen in question was the only reason why two hooks were observed. There are three species in *Ephesiella* were no hooks are described (*E. gallardi* Fauchald, 1974; *E. australis* Hartmann-Schröder, 1982; *E. cantonei* Mòllica, 1994); an internal position of the hooks might be an explanation as to why they were not observed.

E. phuketensis n. sp. is different from all other species in the genus by having one or two additional small papillae on the macrotubercles. It resembles *E. macrocirris* Hartman and Fauchald, 1971 and *E. gallardi* by the numerous parapodial papillae, but it differs from the former in not having as prominent ventral cirri, and from the latter by having the larger papillae more distally positioned. *E. phuketensis* n. sp. also resembles *E. gallardi* in the similarly scattered dorsal and ventral papillae.

Etymology: *Ephesiella phuketensis* is named after the Phuket Marine Biological Center, which ran the BIOSHELF Project.

***Sphaerodoropsis* Hartman and Fauchald, 1971**

Sphaerodoropsis Hartman and Fauchald, 1971: 69.

Type species: *Sphaerodorum sphaerulifer* Moore, 1909: 336.

Diagnosis: Four or more rows of dorsal macrotubercles without terminal papillae. Anterior end with a median and two or three pairs of lateral antennae. Chaetae composite (Fauchald 1974).

Remarks: A compilation of data from the literature of the species assigned to *Sphaerodoropsis* (Borowski 1994) revealed that the genus

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Figure 2 *Ephesiella phuketensis* n. sp.: A. Anterior end, ventral view showing two simple hooks in the first left chaetiger (paratype). B. Parapodium (holotype). C. Dorsal macrotubercle with terminal and a small additional papilla. D. Dorsal microtubercle. E. Compound chaeta.

is a heterogeneous group in need of revision. Borowski divided the species into four groups based on their morphological characters, mainly the number and arrangement of the dorsal macrotubercles. There are 43 species currently described in this genus.

Sphaerodoropsis sp. A

Material examined: BIOSHELF st. K-3/OS (1, PMBC 18543).

Description: The single specimen is 3 mm long, complete, with 25 chaetigers. Four rows of sessile macrotubercles. Body surface densely covered with papillae of various sizes on the ventral and dorsal sides. Two pairs of long slender lateral antennae, one shorter median antenna. Parapodia with long ventral cirri and numerous papillae of various sizes, numerous chaetae (up to 20) in each parapodium. Compound chaetae with long blades.

Remarks: This species belongs to Group 1 (sensu Borowski 1994). Most species in Group 1 have numerous papillae on both the ventral surface and parapodia. A long ventral cirrus and a digitate prechaetal lobe seem also to be present in most species in this group, in addition to the characters presented by Borowski (1994).

Additional specimens are necessary to give a more complete description of the present material.

Sphaerodoropsis sp. B

Fig. 3A–B

Material examined: BIOSHELF st. C-2/BC (1, PMBC 18544).

Description: Four rows of sessile macrotubercles. Papillae evenly distributed on the dorsal and ventral surface. Parapodia short and fleshy, short oval postchaetal lobe with chaetae in a transverse row, a large papilla at the superior edge at the base of the parapodial lobe and a small papilla on the lower part of parapodium. Parapodial lobe and ventral cirrus equally long (Fig. 3A). Compound chaetae (Fig. 3B). Specimen measuring 2.5 mm in length for 17 chaetigers.

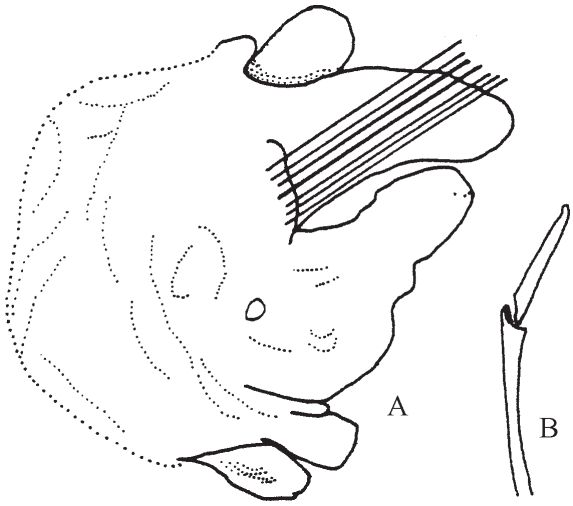

Figure 3 *Sphaerodoropsis* sp. B: A. Mid-body parapodium with typical transverse row of chaetae. B. Compound chaeta.

Remarks: This species also clearly belongs to Group 1 (sensu Borowski 1994) with its four rows of macrotubercles. The present specimen most closely resembles *S. exmouthensis* Hartmann-Schröder, 1981 with respect to its parapodia and chaetae. A strictly transverse row of chaetae seems to be unique, separating it from the other species in Group 1.

Sphaerodoropsis sp. C

Fig. 4A–C

Material examined: BIOSHELF st. A-2/OS (1, PMBC 18545); st. C-1/OS (1, PMBC 18546).

Description: Numerous sessile macrotubercles scattered segmentally and intersegmentally on the dorsal surface. The size of the macrotubercles is variable. No eyes visible. Ventral surface smooth except for one macrotubercle at the base of each parapodium (Fig. 4A). Parapodia elongated, with long and slender ventral cirri, the digitiform parapodial lobe extended, parapodia otherwise smooth (Fig. 4B). All chaetae compound (Fig 4C), with short blades, up to 6–8 chaetae in each parapodium. The specimens measure 3–3.5 mm in length.

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Remarks: In both specimens the anterior end is partly retracted which makes it difficult to detect the number and position of antennae. In one specimen (from st. C-1/OS) it is possible to see one antenna, which is moderately long and slender; this specimen is damaged at the anterior end. It is difficult to see whether the present specimens have two transverse rows of macrotubercles per segment or more than two rows. Most macrotubercles are ruptured and/or flattened; hence it is not easy to count them as well as to judge their position. These features make it difficult to decide whether this taxon should be placed in Group 3 or 4 (sensu Borowski 1994).

The present material most closely resembles *S. bisphaeroserialis* Hartmann-Schröder, 1974 from its long smooth parapodia with a tubercle at the base, as well as the shape of the chaetae. It also resembles *S. fauchaldi* Hartmann-Schröder, 1979 and *S. multipapillata* Hartmann-Schröder, 1974 but is distinct from the former by the lack of two rows of ventral papillae and from the latter by the absence of the inflated chaetae of that species.

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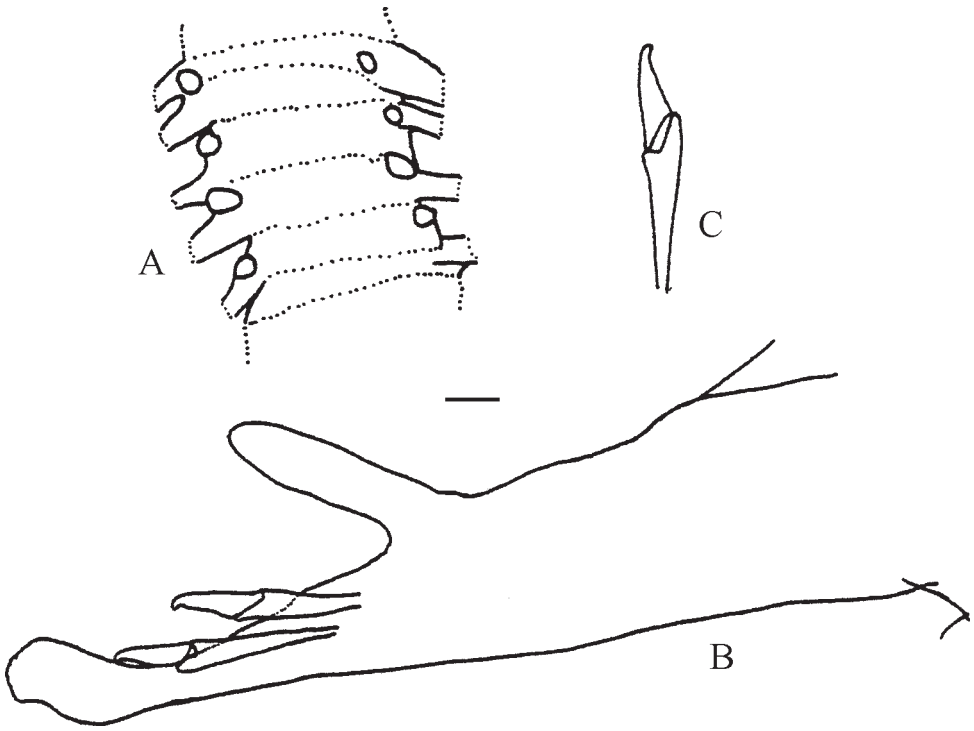

Figure 4 *Sphaerodoropsis* sp. C: A. Part of the ventral side showing ventral tubercles at the base of parapodia (specimen from st. C-1/OS), scale bar 0.1 mm. B. Parapodium (spec. from st. A-2/OS). C. Compound chaeta (spec. from st. A-2/OS).

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