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Family Calcifibrospongiidae Hartman, 1979

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Calcifibrospongiidae Hartman (Demospongiae, Haplosclerida) combines a stromatoporoid grade of coralline skeleton with a uni- or paucispicular skeleton of thin siliceous strongyles. Since the coralline skeleton of 'sclerosponges' is demonstrated to be polyphyletic, the family is classified on the basis of its spicule skeleton. The strongyles in a light reticulation reveals the family as a haplosclerid, positioned in the suborder Petrosina. There is one monotypical Recent genus, *Calcifibrospongia* Hartman, 1979, possibly related to some fossil coralline sponges.
Keywords: Porifera; Demospongiae; Haplosclerida; Petrosina; Calcifibrospongiidae; *Calcifibrospongia*.

DEFINITION, DIAGNOSIS, SCOPE

Synonymy

Calcifibrospongiidae Hartman, 1979: 468.

Definition

Petrosina with stromatoporoid calcareous basal skeleton and a reticulation of siliceous strongyles.

Diagnosis

Semiglobular or flattened aragonitic masses covered by a thin veneer of organic tissue. Surface with evenly scattered depressed oscules. Siliceous skeleton a reticulation of thin strongyles. No ectosomal specialization. Aragonitic basal skeleton consists of a meshwork of tubes, pillars and lamellae that intergrade peripherally with the spicular skeleton. The canal system penetrates the aragonitic meshwork to a varying degree depending on episodes of growth.

Scope

A single genus and species is recorded.

Taxonomic history

Hartman (1979) referred this 'sclerosponge' to his class Sclerospongiae, order Stromatoporoidea, in a separate family Calcifibrospongiidae. Although some morphological similarities were noted with mesozoic stromatoporoids, no close relative appeared to exist among those fossils. Van Soest (1984a: 214) in a discussion of the polyphyletic nature of 'sclerosponges' suggested *Calcifibrospongia* could be a member of Haplosclerida: Chalinidae (as Haliclonidae). Hartman & Willenz (1990) conceded that Calcifibrospongiidae show convincing similarities to various representatives of Haplosclerida. This was also the conclusion of Reitner (1992: 261), although he pointed out that both a chalinid and a petrosid affinity were possible. In view of the fact that the aragonitic basal skeleton is unique in Haplosclerida, and also because affinity with either Chalinidae or Petrosiidae is not firmly established, it is proposed here to maintain *Calcifibrospongia* as a family of its own. The strongyles in isodictyal reticulation without clear primary and interconnecting tracts are indicative of the suborder Petrosina.

Previous reviews

Hartman, 1979; Hartman & Willenz, 1990; Reitner, 1992.

CALCIFIBROSPONGIA HARTMAN, 1979

Synonymy

Calcifibrospongia Hartman, 1979: 468.

Type species

Calcifibrospongia actinostromarioides Hartman, 1979: 468 (by monotypy).

Definition and diagnosis

See above definition of family.

Description of type species

Calcifibrospongia actinostromarioides Hartman, 1979 (Fig. 1A–C).

Synonymy. *Calcifibrospongia actinostromarioides* Hartman, 1979: 468, figs 1–13; Hartman & Willenz, 1990: 231, fig. 4; Reitner, 1992: 261, pls 49–51; Willenz, 1993: 279.

Material examined. Holotype (not seen): YPM 9114 – Acklin Island, Bahamas. Paratypes (not seen): BMNH and USNM. Other material. ZMA POR. 6157 – Andros Island, Bahamas, coll. J. Reitner.

Description (from Hartman, 1979). Mushroom-shaped (smaller specimens), dome-shaped to flattened with a broad base of attachment. Size up to $30 \times 30 \times 10$ cm. Surface smooth when alive, provided with many evenly distributed rounded slightly depressed oscules, with faint trace of astrorhizae. Color brownish tan or tannish orange alive. Soft parts – apart from the pinacoderm – entirely incorporated in the basal calcareous skeleton. The inhalant

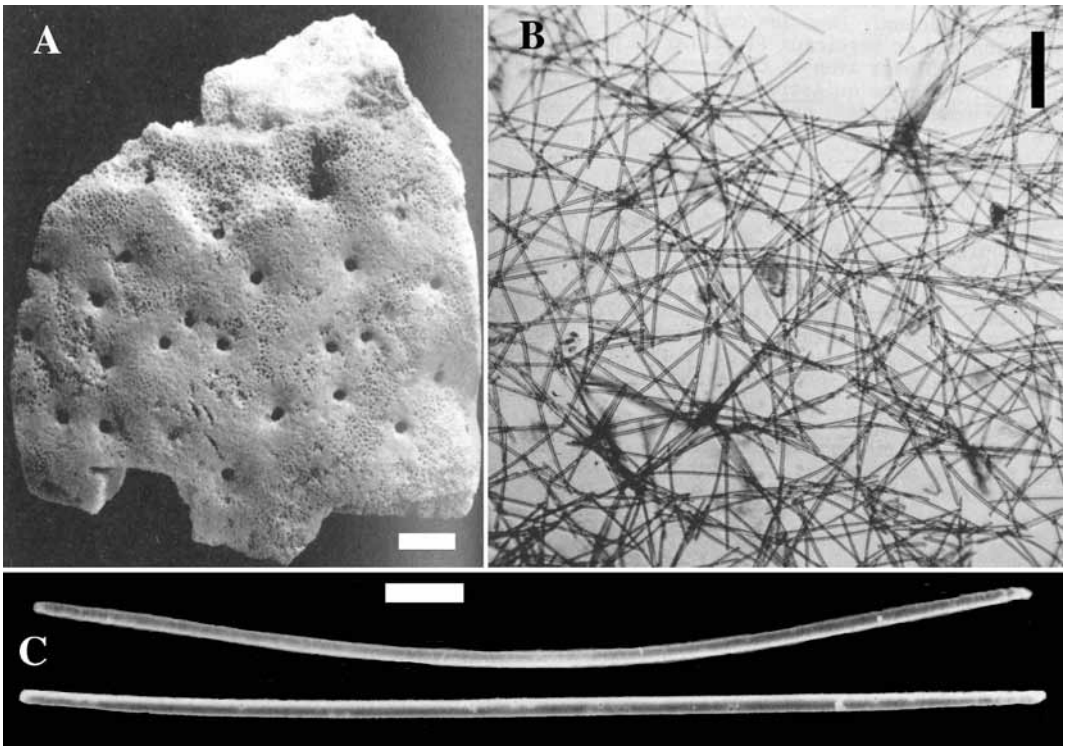

Fig. 1. A–C, *Calcifibrospongia actinostromarioides* Hartman, 1979 (all figures reproduced from Hartman, 1979, figs 1, 2 and 7). A, holotype YPM 9114 (scale 1 cm). B, spicular skeleton (scale 100 μm). C, strongyles (scale 10 μm).

canals lead into the system of cavities of the calcareous skeleton, and likewise the exhalant canals run through the calcareous mass over considerable distance to end in vestibulae immediately underneath the pinacoderm. The ectosomal region is supported for a small distance by free siliceous spicules arranged in a uni- or paucispicular isodictyal reticulation. In the subectosomal region the spicule tracts, which are aligned in a collagenous matrix become the focal points for calcification and further down into the sponge the spicules become entirely enclosed in calcium carbonate. Siliceous skeletal meshes and calcareous cavities match closely in size, the smaller meshes varying from 55–175 μm in diameter, many larger represent various canals and tubes. Choanocyte chambers, about 20 μm diameter, and mesohyl tissues are found to a variable depth within the calcareous basal mass. They are rich in symbiont prokaryotes. In larger specimens a layer of 1.5–3 cm thick is 'alive', underneath which there are 'dead' layers of similar thickness to mark off periods of death and regeneration. Spicules are thin strongyles, 130–210 × 3–6 μm. Distribution. Bahamas, in shaded deep reef habitats.

Remarks

This sponge may be a living representative of a larger now extinct group of haplosclerid 'sclerosponges' (see review in Reitner, 1992). However, in most cases the basal skeleton or the microstructure of the fossils differ from those of *Calcifibrospongia*. Some fossils have similar basal skeletons but certain traces of spicules are lacking. So far this genus is monotypic.