

Family Samidae Sollas, 1888

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Samidae Sollas (Demospongiae, ? Spirophorida) is an enigmatic monotypical family of excavating sponges. The affinities of the genus *Samus* Gray are obscure, but the possession of sigmaspire microscleres is considered evidence for membership of the order Spirophorida. The typical family of Spirophorida, Tetillidae Sollas, differs considerably in habit and additional spiculation. Although several species have been described in the genus *Samus*, only one species name remains recognized in the genus, the others having been transferred to other genera of different families. The single species *Samus anonymus* Gray is reported to be almost cosmopolitan (Brazil, Caribbean, Indian Ocean, Mediterranean, Australia), but is probably a complex of closely related species. It forms insignificant excavations in corals and coralline algae and was long thought to be a facultative dweller of empty holes excavated by clionids.

Keywords: Porifera; Demospongiae; Spirophorida; Samidae; *Samus*.

DEFINITION, DIAGNOSIS, SCOPE

Synonymy

Samidae Sollas, 1888: 244.

Definition

Spirophorida (?) with amphitrichotriaenes, without long-shafted triaenes or oxeas.

Diagnosis

Small sized excavating sponges with scanty skeletons consisting of confusedly arranged small amphitriaenes and sigmaspires. No further spicule types.

Scope

A single genus, *Samus*, is recognized. Its only valid species has been reported from many parts of the world.

History

Bowerbank (1864: pl. II figs 41–42) figured the megascleres of an unknown sponge from Bahia. Gray (1867a: 526) subsequently named this *Samus anonyma*, assigning it to his family Clioniadae. He indicated relationship with *Axos cliftoni* and *Cliona* species (as *Vioa* and *Euryphylle*), but gave little comment or descriptions. We may conclude however, that Gray tended to regard the amphitriaenes as microscleres (the true microscleres were not known to him then). Carter (1879b) gave a full description of *S. anonyma* based on material from Australia, and discussed the affinities. He concluded that *Samus* was not related to either *Axos* or *Cliona*, but appeared to belong to a group of excavating sponges like *Dotona* and *Alectona*, later to be united in the family Thoosidae. Sollas (1888: 244) described the original material from Bahia and erected a separate family Samidae in his suborder Sigmatophora (=Spirophorida) based on the amphitriaenes. This fundamental difference – alliance with either Thoosidae in Hadromerida or a separate family in Spirophorida – remains a

controversy until the present. Major authors like Topsent (1928c: 28), Lévi (1973: 599) and Wiedenmayer (1994: 29) considered the combination of excavating habit, smallness of the amphitriaenes and their resemblance to amphiasters of *Thoosa* and *Alectona*, for example, compelling evidence for membership of Hadromerida, whereas many contemporary taxonomists attach more weight to the presence of the sigmaspires as a synapomorphy with Tetillidae. De Laubenfels (1936a: 180) assigned *Samus* to Homosclerophorida near *Corticium*, but that has found few followers. In the present volume we choose for inclusion of Samidae in Spirophorida, based on the sigmaspires, which are shared with Tetillidae, and based on the argument that the excavation habit is not exclusive to Hadromerida. We realize that there is an inconsistency in this emphasis on shared possession of sigmaspires, because the family Scleritodermidae is assigned to ‘Lithistida’ in spite of its possession of sigmaspires. However, because at this moment in time, redistribution of the polyphyletic ‘Lithistida’ over the various orders and families of Demospongiae cannot be confidently executed, we prefer to keep ‘lithistids’, including Scleritodermidae, as a sponge group defined pragmatically on the presence of an articulated desma skeleton.

Previous reviews

Sollas (1888); Lendenfeld (1903); Hooper & Wiedenmayer (1994, as member of Tetillidae).

SAMUS GRAY, 1867

Synonymy

Samus Gray, 1867a: 526.

Definition

See definition of family.

Diagnosis

See diagnosis of family.

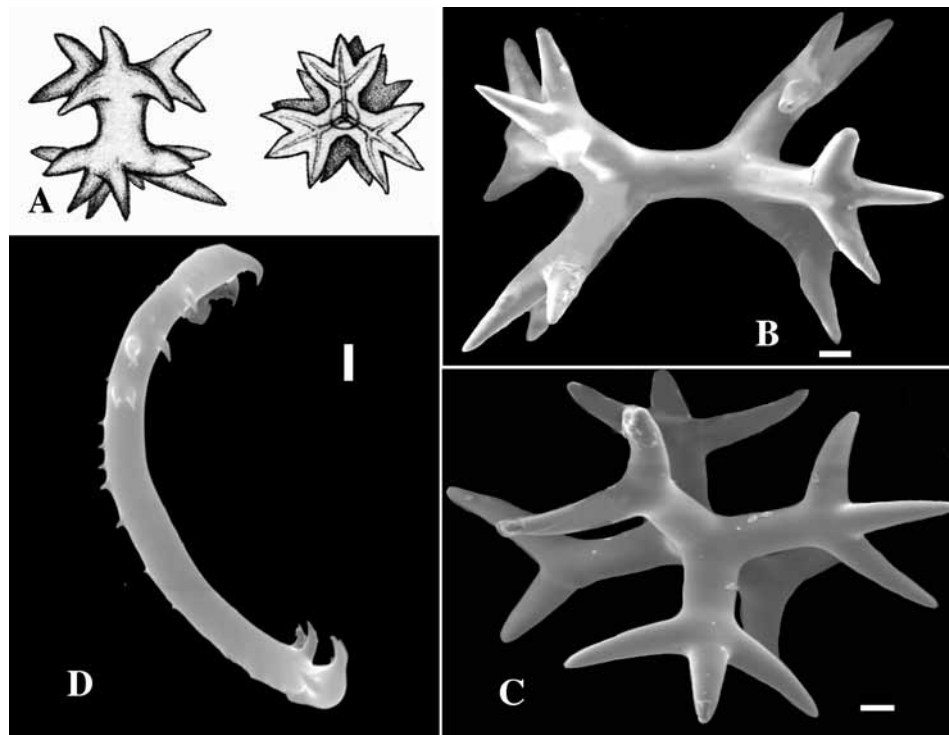


Fig. 1. *Samus anonymus* Gray, 1867a. A, Bowerbank's (1864) drawings of the spicules of an unnamed sponge (copied from his plate II figs. 41–42) (scale see text). B–D, SEM images of spicules of a Curaçao specimen, made by Ms Elly Beglinger (ZMA). B, lateral view of amphitriaene (scale 10 μm). C, amphitriaene from the head (scale 10 μm). D, sigmaspire (scale 1 μm).

Description of type species

Samus anonymus Gray, 1867a: 526 (Fig. 1).

Synonymy. Unnamed sponge of Bowerbank, 1864: 234, pl. II figs. 41–42. *Samus anonyma* Gray, 1867a: 526; Carter, 1879b: 350, pl. XXIX figs 1–4; *Samus anonymus*; Carter, 1880b: 59.

Material examined. Holotype (not seen): BMNH 1877.5.21.221 (slide) – Bahia (see remarks below). Other material. ZMA 13348, 14063, 14069 – reef cavities Curaçao, coll. S. Wiegman, E. Wierenga and I. Wunsch.

Description. Excavating sponge making tiny holes and corridors in limestone of corals and coralline algae. Colour variously recorded as yellowish, purple or blueish, but that may have been influenced by other boring sponges which are invariably present in samples containing this species. The blue colour especially may be derived from e.g., *Cliona schmidti*. The surface character and presence of papillae or similar extralithic parts of the sponge remain unknown, as the species so far is detected only in preserved samples, collected mostly because of the presence of more obvious excavating sponges. Skeleton a ? confused arrangement of megascleres, with numerous microscleres. Megascleres (Fig. 1A–C) short-shafted amphipro- or amphiplagiotriaenes, basically symmetrical amphitrichotriaenes. However, frequently cladi are only dichotomous, and then symmetry is usually lacking. An often smaller variation is distinctly asymmetrical in having only three undivided cladi at one end of the shaft and three trichotomously divided cladi at the other end. Such spicules may appear to be calthrop-like, but they are basically the same amphitriaene-type as the fully developed larger ones, and only Sollas proposed to distinguish them as a distinct spicule type (normal amphitriaenes and 'heteropolar' amphitriaenes). Rhabs

may vary from 20–80 μm in length by up to 38 μm in thickness, total length of amphitriaene including cladi may be 150 μm ; cladome may be up to 160 μm , with protocladi and deuterocladi each about 15–75 μm in length. Microscleres (Fig. 1D) sigmaspires with relatively few and long spines, 10–14 μm . Distribution and ecology. Reported from NE Brazil, 'Australia', Sri Lanka, Singapore, Florida, Palau Islands, West Africa, Mediterranean, Colombia, Curaçao, from shallow depths, excavating limestone substrates, often in caves.

Remarks. Ms Clare Valentine kindly provided the following information on the type material. The type, a dry specimen, is supposed to be in BMNH but a recent search did not turn it up. However, there is a slide (registered as BMNH 1877.5.21.221) with Bowerbank number Bk. 221 on it and the locality Bahia. It also reads "type". In the BMNH register the entry reads: "Sponge spicules – illustration Fig. 42 Vol. I. Mon. Brit. Spongidae". This is evidently the material upon which Gray founded the species. Hooper & Wiedenmayer (1994: 433) erroneously indicated another specimen in BMNH from Australia as the holotype. This is the material mentioned in Carter's (1879b: 350) subsequent record of the species, in which he described a hitherto undescribed Bowerbank specimen (bearing Carter's number 699) from Australia.

In addition to the type material from Bahia and the Australian material of Carter (1879b), the species is reported from Sri Lanka (Carter, 1880b), Singapore (Sollas, 1902), Florida (de Laubenfels, 1936a), Palau Islands (de Laubenfels, 1954), West Africa (Lévi, 1959), Seychelles (Thomas, 1973), the Mediterranean (Pulitzer-Finali, 1983), Colombia (Wintermann-Kilian & Kilian, 1984), and Curaçao (this volume). The various records from all over the world are suspect from a genetic point of view. It is likely that widely

separated populations comprise different species, but the absence of spicular differentiation precludes definite conclusions in this respect. All reported spicule sizes and forms are similar. Of the further species assigned to *Samus* by Carter (1880b) not one appears to share the characters of *Samus anonymus*. These are *S. simplex* (= *Stoeba*, Pachastrellidae), *S. parasiticus* (= *Triptolemma*,

Pachastrellidae) and *S. complicatus* (= *Rhachella*, Theonellidae). Diaz & Van Soest (1994) suggested the latter to be a true *Samus*, but the isolated spicule upon which the genus *Rhachella* was founded is not an amphitriaene, but a cladocalthrop, i.e., a calthrop with proliferated cladi such as is found in some theonellid 'lithistids'.