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Family Desmacididae Schmidt, 1870

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Desmacididae Schmidt (Demospongiae, Poecilosclerida) are Myxillina characterized by the possession of anchorate chelae in combination with a reticulate skeleton of exclusively oxeas. By this definition the family contents are here newly restricted to the type genus *Desmacidon* and its closest relative *Desmapsamma*. All other genera previously assigned by various authors to this family are referred to other families: Myxillina with exclusively oxeas and arcuate isochelae are united in the family Dendoricellidae, whereas Myxillina with exclusively strongyles and arcuate chelae are assigned to Chondropsidae, and Myxillina with exclusively styles and arcuate chelae are assigned to Phellodermidae. Poecilosclerid sponges with exclusively diactinal spicules and palmate chelae are referred to the Mycalina family Isodictyidae.
Keywords: Porifera; Demospongiae; Poecilosclerida; Myxillina; Desmacididae; *Desmacidon*; *Desmapsamma*.

DEFINITION, DIAGNOSIS, SCOPE

Synonymy

Desmacidinae Schmidt, 1870: 52 (in part) (emended to Desmacididae; Wiedenmayer, 1977b: 79). Desmacidonidae Gray, 1872a: 449 (in part). Desmacidontidae de Laubenfels, 1955b: E37 (in part).

Definition

Myxillina with exclusively oxeote megascleres; no morphological differentiation in ectosomal and choanosomal megascleres; anchorate or unguiferate tridentate chelae and sigmas.

Diagnosis

Encrusting, massive, lobate, fan-shaped or branching sponges. The ectosomal skeleton consists of perpendicular bundles or bouquets of megascleres and numerous microscleres. The bouquets of megascleres may also be at the end of longer subectosomal spicule bundles traversing larger subdermal lacunae. Choanosomal skeleton reticulated, either an isodictyal network making small meshes one spicule in length and width, or forming a coarser mesh in an anisotropic reticulation of thick spicule tracts. Desmacididae occur in temperate and tropical shallow-water habitats.

Scope

Two genera are included, both of which are considered valid: *Desmacidon, Desmapsamma*.

History and biology

The taxonomic history of Desmacididae is complicated and full of erroneous assumptions and decisions, as was explained at length by Hajdu *et al*. (1994a). This was the reason for these authors to make a case for abandoning this name. However, since it is one of the oldest names in sponge systematics, and since the priority rule also applies to family names, it is not possible to maneuver it into synonymy. It is here newly proposed to restrict the use of the family name to *Desmacidon* and its immediate relative *Desmapsamma*, despite the similarity (microscleres) of *Desmacidon* to *Myxilla* in the family Myxillidae. Justification is found in the apparent suppression of choanosomal megascleres in favour of the ectosomal tornotes, which are smooth oxeotes. Several species are fouling organisms, and they may incorporate considerable amounts of sand. Reproduction is viviparous where known (*Desmapsamma*).

Taxonomic remarks

The possession of only tornote-derived spicules is shared with genera such as *Fibulia, Amphiastrella*, several Coelosphaeridae and most Chondropsidae. From these, members of Desmacididae differ in having a reticulate skeleton and anchorate chelae. Sponges with only styles as megascleres and arcuate chelae are united in the new family Phellodermidae.

Previous reviews. Hajdu *et al*., 1994a; Desqueyroux-Faúndez & Van Soest, 1996.

KEY TO GENERA

(1) Skeletal architecture isotropic or irregular, making meshes one spicule in diameter, no distinct spicule tracts; sand is normally incorporated in the ectosomal and choanosomal skeleton ..... ***Desmapsamma***
Skeletal architecture plumoreticulate, consisting of thick spicule bundles making large meshes; no sand ..... ***Desmacidon***

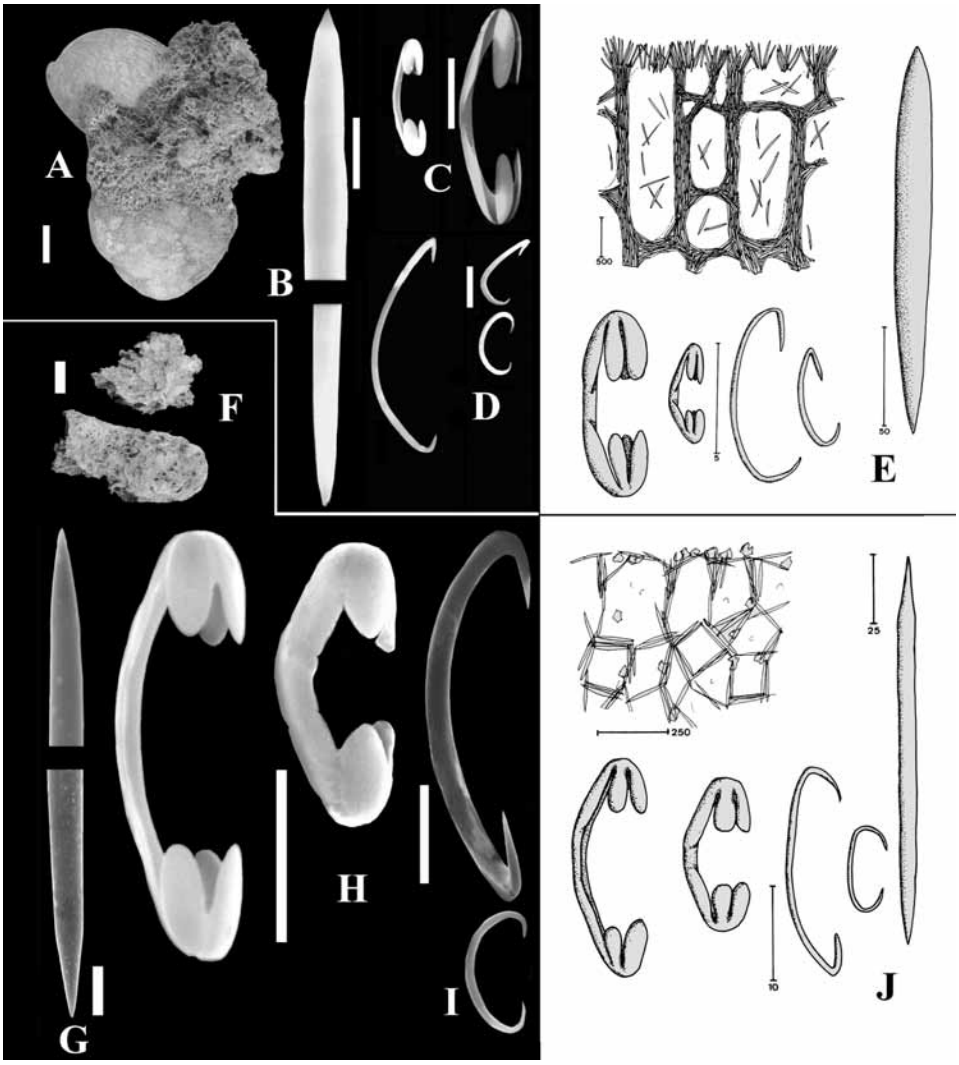

Fig. 1. A–E, *Desmacidon fruticosum* (Montagu, 1818 as *Spongia*). A, habit of lectotype encrusting a barnacle (scale 1 cm). B–D, SEM photo of spicules made from the lectotype (scale 10 μm). E, drawing of skeleton and spicules made from a slide of a specimen from Roscoff. F–J, *Desmapsamma anchorata* (Carter, 1882a as *Fibularia*). F, holotype fragments (scale 1 cm). G–I, SEM photos of spicules made from the holotype (scale 10 μm). J, drawing of skeleton and spicules made from a slide of a specimen from Curaçao.

DESMACIDON BOWERBANK, 1861

Synonymy

Desmacidon Bowerbank, 1861: 372.

Type species

Spongia fruticosa Montagu, 1818: 112 (by original designation).

Definition

Desmacididae with an anisotropic reticulation of spongin enforced spicule tracts and anchorate isochelae.

Diagnosis

Erect growth forms; ectosomal skeleton composed of smooth oxeote spicules arranged in bouquets; choanosomal skeleton composed of smooth diactinal megascleres forming an isodictyal reticulation; microscleres are spatuliferous anchorate isochelae and sigmas. Probably not more than half a dozen species, recorded mostly from temperate and subtropical waters.

Previous reviews

Ridley & Dendy (1887: 103); Bergquist & Fromont (1988: 37); Desqueyroux-Faúndez & Van Soest (1996: 45).

Description of type species

Desmacidon fruticosum (Montagu, 1818) (Fig. 1A–E).

Synonymy. *Spongia fruticosa* Montagu, 1818: 112; *Halichondria fruticosa*; Johnston, 1842: 103, pl. XIV fig. 1; *Desmacidon fruticosum*; Bowerbank, 1861: 372; Bowerbank, 1866: 345; Bowerbank, 1874b: 155, pl. LXI figs 1–7; Ackers *et al*., 1992: 119, fig. 42.

Material examined. Lectotype: BMNH 1930.7.3.410. Other material. ZMA POR. 286 – Atlantic coast of France, Roscoff, 18–25 m, coll. G.J. Kleeton. ZMA POR. 2435 – Mediterranean, Banyuls, coll. J.H. Stock.

Description (mostly derived from Ackers et al., 1992). Massive-lobose (Fig. 1A); substantial growths often with massive tubular processes. Up to 22 cm high. The processes are simple or coalescent, often fusing at the bases and so resembling malformed, band-like structures. Sometimes the thicker branches have a longitudinal groove in one side. Surface bristly. Oscules are usually small, scattered and numerous. Consistency firm, compressible. Exudes large amounts of slime when removed from the water. No smell. Colour yellow to orange. Skeleton (Fig. 1E) of the ectosome consists of bouquets of tornotes, possibly slightly shorter than those of the choanosomal tracts. Choanosomal skeleton is an irregular reticulation of thick multispicular tracts of tornotes, about 100 μm in diameter, forming meshes of 800 × 500 μm. Many loose individual spicules. Spicules (Fig. 1B–E), tornotes, with oxeote or mucronate ends, 184–236 × 5–8 μm; spatuliferous anchorate chelae of two sizes, 15–20 and 32–49 μm, and sigmas of two sizes, 15–20 and 50–63 μm. Distribution and ecology. British Isles; France; Spain, Mediterranean, on mud, sand, gravel, rock, or broken shell. Recent records are from 30 m or greater depths.

Remarks. The alleged holotype is of uncertain status as most of Montagu's material is no longer extant, and the label with the specimen is not original; nevertheless it is here considered the lectotype. The microscleres of this species are similar to those of various *Myxilla* species, but lack of spined styles is a good microscopic marker to tell this apart from species of that genus. Other species of *Desmacidon*: the genus name is widely used in the literature, but few of those records seem to correspond to the characters of the type species. They are likely or certainly members of other genera, e.g., *Fibulia, Pyloderma* or *Isodictya*.

DESMAPSAMMA BURTON, 1934

Synonymy

Desmapsamma Burton, 1934a: 547.

Type species

Fibularia anchorata Carter, 1882a: 283 (by original designation).

Definition

Desmacididae with paucispicular isotropic reticulation; sand is normally incorporated in variable quantities.

Diagnosis

Erect, and repent-ramose growth form; ectosomal skeleton tough, arenaceous, with oxeas in bouquets and sand grains forming a narrow-meshed reticulation sometimes completely replacing oxeas; choanosomal skeleton arenaceous, also with smooth oxeas forming a paucispicular isotropic reticulation of short spicule tracts composed of oxeas similar to those of the ectosome; megascleres slender oxeas; microscleres are anchorate isochelae and sigmas. Two species from the tropical Atlantic and Pacific.

Previous reviews

Burton (1934a), Desqueyroux-Faúndez & Van Soest (1996), Van Soest (1998).

Description of type species

Desmapsamma anchorata (Carter, 1882a) (Fig. 1F–J).

Synonymy. *Fibularia anchorata* Carter, 1882a: 283; *Desmapsamma anchorata*: Burton, 1934a: 547 (only West Atlantic specimens); Burton, 1956: 131; Lévi, 1959: 134, pl. 5 fig. 3; Hechtel, 1965: 21, pl. II fig. 4; Hartman, 1967: 20, pl. 7 fig. 1; Van Soest, 1984b: 35, text-fig. 10, pl. II figs 2–5; Van Soest, 1998: 433. *Desmacidon reptans* Ridley & Dendy, 1886: 345; Ridley & Dendy, 1887: 105, pl. XXIII fig. 7. *Desmacidon carterianum* Arndt, 1927: 147.

Material examined. Holotype: BMNH 1939.3.24.12 – Antigua, Carter collection. Other material. Many specimens in ZMA from Curaçao and Cape Verde Islands.

Description. Upright, somewhat ramose masses (Fig. 1F) with oscules on elevations, or sprawling clumps of volcanoe-shaped oscular tubes. Up to 15 cm long or more, up to 15 cm in diameter (largest type fragment 3 cm long, 1 cm diameter). Oscules 1–5 mm in diameter. Consistency compressible, rather soft; slimy. Colour. Variably pale-purplish pink to dirty pink (salmon-colour), or dark brown, depending of the quantity and colour of sand grains available in the environment. Skeleton (Fig. 1J). Ectosomal palisade of bundles of diverging oxeas covered and partly obscured by variable quantities of sand grains; single oxeas may also form an irregular surface reticulation. The cohesiveness of the ectosomal skeleton is influenced strongly by the quantity of foreign material. Choanosomal skeleton. Basically a renieroid, irregularly isotropic skeleton of bundles of oxeas, 3–6 per side, but here and there longer ascending primary tracts are visible. The bundles and tracts may be strengthened and partly replaced by variable quantities of sand grains and broken spicules. Spicules (Fig. 1G–J). Oxeas, slender, sharply pointed, 140–190 × 3–9 μm; anchorate chelae in 2 size categories, the larger with fimbriae along the entire length of the shaft, 15–20 and 8–10 μm; sigmas in 2 size categories, 19–39 and 11–16 μm. Distribution and ecology. Tropical Atlantic, on both African and American coasts, in shallow reef habitats, lagoons, often fouling.

Remarks. Desqueyroux-Faúndez & Van Soest (1996: 45) suggested that the genus is very close to *Desmacidon* and should be recognized only at the subgeneric level. The genus was recently discussed by Van Soest (1998), who erected *D. vervoorti*, with type from Indonesia, for Indo-Pacific records of *D. anchorata*. This differs subtly from the Caribbean *D. anchorata* in colour, surface characteristics, and in a third size category of sigmas. In view of the fact, that at least one other species similar to the type species exists, sharing the isotropic reticulation of the oxeas as well as a variable sand cover, it seems preferable to keep *Desmapsamma* as a separate genus.