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Family Dendoricellidae Hentschel, 1923

Rob W.M. Van Soest

Zoological Museum, University of Amsterdam, P.O. Box 94766, 1090 GT Amsterdam, Netherlands. (soest@science.uva.nl)

Dendoricellidae Hentschel (Demospongiae, Poecilosclerida) is revived in an emended form wihin the suborder Myxillina for species having only oxeas as megascleres and arcuate isochelae as microscleres, in addition to which sigmas may be present. The family resembles the Myxillina family Desmacididae, but differs in possessing arcuate chelae and having spicules arranged in a plumose fashion, as opposed to anchorate chelae and reticulate skeletons in Desmacididae. It is similar to the Myxillina family Phellodermidae, but that has exclusively styles. There is also resemblance to the Mycalina family Isodictyidae, but these have palmate chelae. Three valid genera are recognized in the family, viz., *Dendoricella, Fibulia* and *Pyloderma*.
Keywords: Porifera; Demospongiae; Poecilosclerida; Myxillina; Dendoricellidae; *Dendoricella*; *Fibulia*; *Pyloderma*.

DEFINITION, DIAGNOSIS, SCOPE

Synonymy

Dendoricellidae Hentschel, 1923.

Definition

Myxillina with megascleres exclusively oxeas not differentiated morphologically into ectosomal and choanosomal forms. The skeletal architecture is plumose. Microscleres arcuate chelas. Sigmas may be present.

Diagnosis

Shape usually elaborate, massive with fistules or long projections, branching or flabellate. Spicules sharp-pointed oxeas, sometimes differentiated into distinct smaller ectosomal and larger choanosomal sizes. Arrangement of megascleres plumose, occasionally almost plumoreticulate; in the case of fistular growth forms there is a parchment like tangential ectosomal skeleton and a scanty choanosomal skeleton. Microscleres scattered arcuate isochelae, sometimes modified to resemble peculiarly round sigmoids, occasionally entirely absent. In the latter case membership of this family is based on circumstantial similarities in megasclere shape and arrangement.

Scope

Six nominal genera, three of which are considered valid: *Dendoricella, Fibulia* and *Pyloderma*.

History and biology

The name of the family was previously employed for a different set of genera by Hentschel (1923). The former family Desmacididae or Desmacidonidae was loosely employed for poecilosclerid sponges having exclusively oxeas as megascleres. As outlined in the chapter on the suborder Myxillina, and also again in the remarks on the family Desmacididae, microsclere shape and distribution does not match the possession of exclusively oxeas as megascleres and accordingly it is proposed to spread the former desmacidid genera over four families which are not otherwise considered closely related (Desmacididae *s.s.*, Dendoricellidae, and Phellodermidae, all in the suborder Myxillina, and Isodictyidae in the suborder Mycalina). The present family is emended from Hentschel's concept (1923: 406) to accommodate Myxillina with the combined possession of exclusively oxeas as megascleres and arcuate chelae as microscleres. These properties, with the addition of plumose instead of reticulate arrangement of the megascleres, distinguish this small group of genera from the equally small group of Desmacididae. Isodictyidae are reticulate and possess palmate isochelae. Members of the family Dendoricellidae occur predominantly in cold or temperate waters, frequently at greater depths.

Previous reviews

Lundbeck (1905: 126), Hentschel (1923: 406).

KEY TO GENERA

(1) Oxeas differentiated in smaller ectosomal and larger choanosomal size categories 2
Only a single size category of oxeas ..... ***Fibulia***
(2) Shape bladder-like with hollow fistular projections ..... ***Pyloderma***
Shape lobate or fan-shaped, not fistular ..... ***Dendoricella***

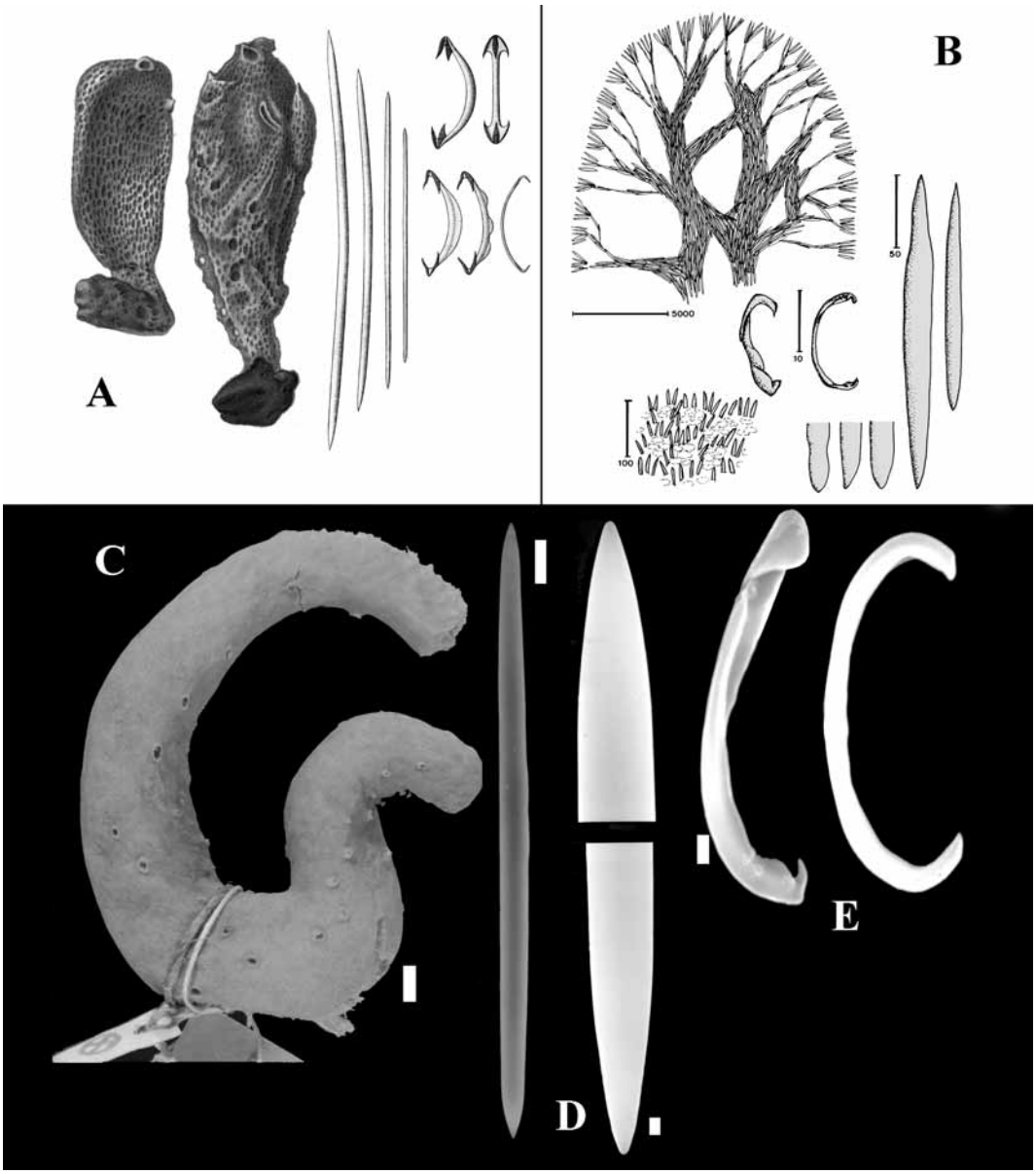

Fig. 1. A, *Dendoricella rhopalum* Lundbeck (1905), drawing of shape and spicules reproduced from his pl. IV figs 4–5, pl. XIV fig. 1 (scales see text). B–E, *Fibulia carnosa* Carter (1886). B, drawing of skeleton and spicules made from a slide of the holotype. C, holotype (scale 1 cm). D–E, SEM photos of spicules made from the type (scale 1 μm).

DENDORICELLA LUNDBECK, 1905

Synonymy

Dendoricella Lundbeck, 1905: 127.

Type species

Dendoricella rhopalum Lundbeck, 1905: 127 (by subsequent designation; de Laubenfels, 1936a: 53).

Definition

Dendoricellidae with size differentiation in megascleres: smaller ectosomal oxeas, and larger choanosomal oxeas forming dendritic tracts; microscleres are arcuate isochelae of normal shape, and sometimes sigmas (absent in the type species).

Diagnosis

Flabellate or club-shaped sponges with irregular surface. Smaller oxeas concentrated at the surface in bouquets. Choanosomal skeleton dendritic-plumose, consisting of bundles of spicules larger than those of the surface. Not clearly reticulated although spicule tracts may be connected. Microscleres arcuate isochelae and sigmas (may be absent).

Description of type species

Dendoricella rhopalum Lundbeck, 1905 (Fig. 1A).

Synonymy. *Dendoricella rhopalum* Lundbeck, 1905: 127, pl. IV figs 4–5, pl. XIV fig. 1.

Material examined. None.

Description (from Lundbeck, 1905). This is a club-shaped to stalked-flabellate species (Fig. 1A). Live colouration unknown. Skeleton a plumose-dendritic system of bundles of oxeas. These are apparently divisible in oxea-like tornotes of the surface smaller than the choanosomal oxeas, but morphologically they are similar. Spicules, ectosomal oxeas, 340–429 × 7–11 μm, choanosomal oxeas, 680–980 × 14–22 μm. Microscleres normal-shaped arcuate isochelae and thin growth forms resembling sigmas, 34–43 μm. Distribution and ecology. Denmark Strait, between Iceland and Greenland, deep water, 2000–3000 m.

Remarks. The genus is close to *Pyloderma*, differing primarily in the non-fistular habit and punctate surface characters, whereas *Pyloderma* has a parchment-like surface skeleton and bears fistules. Several of the species assigned to *Dendoricella* by Lundbeck (1905: 127) are no longer considered related (*Crella schmidti* and *Damiria cavernosa* belong to *Lissodendoryx*), but other species of Lundbeck's list appear to be good members of *Dendoricella*, viz., *Desmacidon abyssi* Topsent (1904b: 204) and *Dendoricella obesichela* Lundbeck (1905: 130). The latter has sigmas in addition to the arcuate chelae. Several other *Dendoricella* may hide under the genus name *Isodictya*, a genus with palmate chelae and reticulate skeleton.

FIBULIA CARTER, 1886

Synonymy

Fibulia Carter, 1886: 51. *Plumocolumella* Burton, 1929a: 424. *Xytopsaga* de Laubenfels, 1936a: 54.

Type species

Fibulia carnosa Carter, 1886: 51 (by monotypy).

Definition

Desmacididae with a plumose or confused skeleton of multispicular tracts; microscleres arcuate or reduced isochelae.

Diagnosis

Massive; ectosomal skeleton regularly reticulate composed of the same spicules as in the choanosomal skeleton, and with brushes of spicules protruding through the surface; choanosomal skeleton plumose or thoroughly confused, with curved or sinuous primary spongin fibres interconnected frequently by smaller secondary fibres, both cored by bundles of small thin oxeas or oxeotes ascending to surface and producing plumose dermal brushes, no echinating spicules; microscleres are arcuate or irregularly unguiferate isochelae and sigmas. Half a dozen species.

Description of type species

Fibulia carnosa Carter, 1886 (Fig. 1B–E).

Synonymy. *Fibulia carnosa* Carter, 1886: 51; *Plumocolumella carnosa*; Burton, 1929a: 424.

Material examined. Holotype: BMNH 1886.12.15.71; slide BMNH 1902.10.18.36 – labeled as "*Desmacidon carnosa*", South Australia.

Description. Cylindrical, thickly ramose or massively digitate sponges with slippery smooth surface (Fig. 1C). Size up to 15 cm long. Scattered oscules on slightly raised papillae. Consistency solid, fleshy. Colour dark red (beige in alcohol). Skeleton (Fig. 1B) at the surface consists of evenly distributed brushes of oxeas surrounding the pores. Interiorly there is an axial, massively developed system of spicule columns, up to 1 mm in diameter, branching off and thinning out to spicule tracts of less than 20 μm diameter towards the surface, where they fan out to form the ectosomal brushes. The fibre system is dendritic-plumose, with few anastomoses. Spicules (Fig. 1B, D–E), oxeas of variable size and endings, tending to be smaller at the surface but there are no clearly different size categories, 155–245 × 10–15 μm; microscleres peculiarly reduced, sigmiform chelae (Fig. 1E), occasionally with unequal endings, 8–15 μm. Distribution and ecology. South Australia, shallow water, 9–33 m.

Remarks. The nomenclatorial confusion over this genus was resolved by Hechtel (1965) and Hartman (1967). In summary, the confusion stems from the fact that Burton (1929a: 424) assumed that *Fibulia* was a misprint for Carter's (1882b) genus *Fibularia*, established for *Fibularia massa*. Later (1936: 142), Burton admitted that the evidence for that assumption was lacking and thus that *Fibulia* should be reinstated with *Plumocolumella* as objective (or homotypic) synonym, both having the same species as the type. Remarkably, he ignored this decision a few years later and used *Plumocolumella* again (Burton, 1938: 11). De Laubenfels (1936a: 51) independently assumed that *Fibulia* was intended as a replacement name for *Fibularia* Carter (1882b), since that was preoccupied by the echinoid genus *Fibularia* Lamarck (1815), a fact established by Vosmaer (1887). De Laubenfels (1936a) unfortunately assumed *Fibulia* to have *massa* as the type, despite the fact that Carter (1886) did not give any indication that he was aware of the preoccupation or that he intended his name as a replacement. Since *carnosa* is the only species mentioned when *Fibulia* was used for the first time, it is firmly established as the type species. *Fibulia* is similar to *Desmacidon* in having the oxeote tornotes as structural megascleres arranged in a system of spicule tracts. The genera differ in the shape of the isochelae (anchorate in *Desmacidon*) and skeletal architecture (reticulate in *Desmacidon*). The two are here considered only distantly related.

De Laubenfels (1936a: 54) erected the genus *Xytopsaga* for type species *Plumocolumella myxilloides* Burton (1929a: 288) (by original designation). The holotype BMNH 1928.2.15.321, and an additional specimen BMNH 1928.2.15.788 and one slide BMNH 1928.2.15.788a, from the Falkland Islands, 81–267 m, were examined. This is an erect arborescent sponge, with flattened anastomosing branches, with smooth surface, but showing numerous scattered circular depressions. The skeleton of this species is similar to that of *Fibulia carnosa*, with oxeas 248–333 × 5–8 μm, arranged in irregular wispy bundles ending in surface brushes. It differs from *F. carnosa* in having normal arcuate isochelae, 26–33 μm, instead of reduced chelae. In view of the great similarity in structure and further spiculation, the chelae of *Fibulia* are here considered highly deformed arcuate isochelae. A further species to be allocated is *Fibulia anchorata* (Carter, 1881b: 382, pl. XVIII fig. 3, as *Axos*). The holotype and two paratype specimens together labeled as BMNH 1871.5.12.34, the former from South Australia, the latter from South Africa, were examined. This species has oxeas

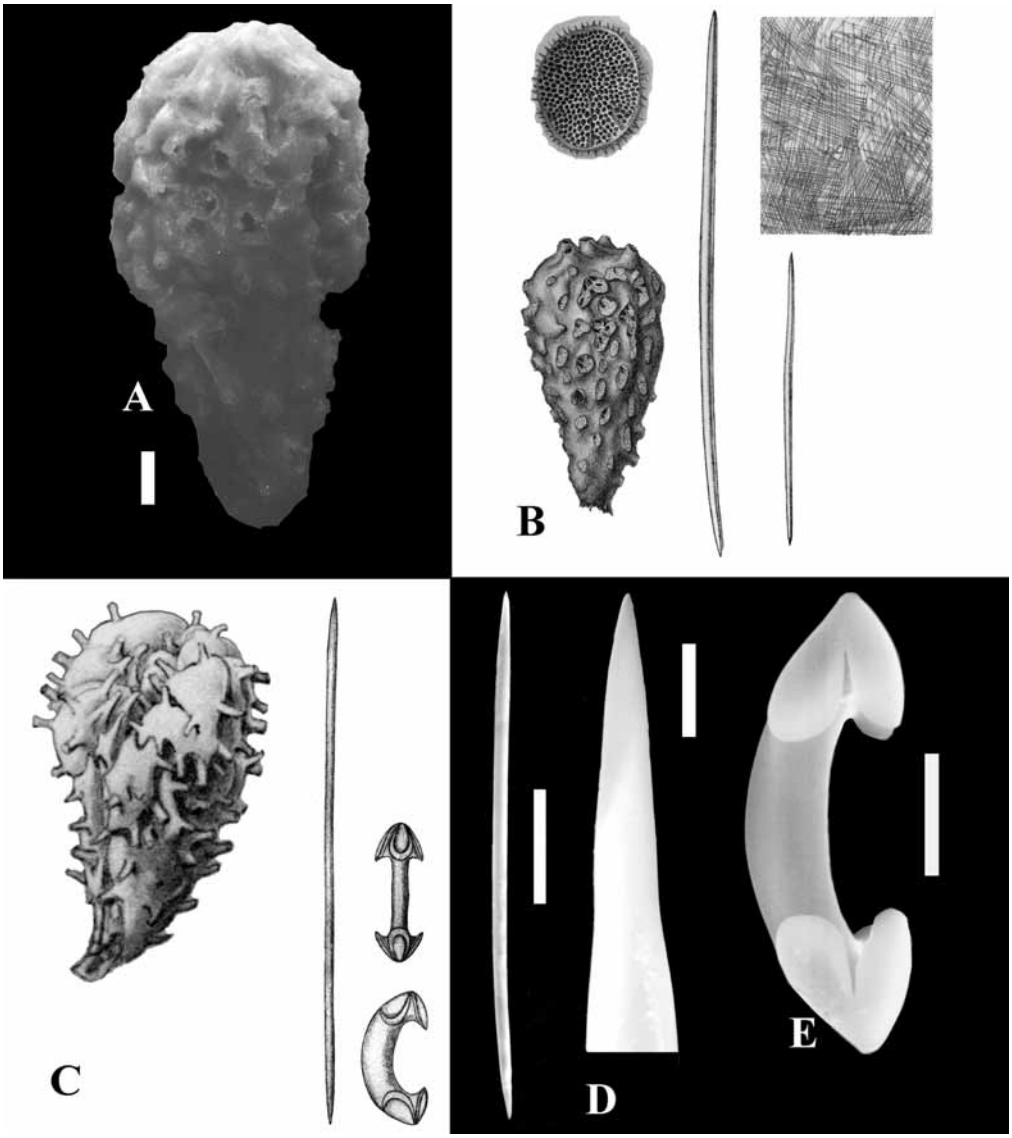

Fig. 2. *Pyloderma* spp. A–B, *Pyloderma latruncul*ioides (Ridley & Dendy, 1887 as *Halichondria*). A, photo of lectotype (scale 1 cm). B, drawings of habit, detail of papilla, ectosomal skeleton and spicules reproduced from Ridley & Dendy (1887, pl. I fig.5, pl. II fig. 1, pl. XLVI fig. 5) (scales see text). C–E, *Pyloderma demonstrans* Dendy (1924). C, drawings of habit and spicules reproduced from Dendy (1924, pl. IX fig. 4, pl. XV figs 22–23) (scales see text). D–E, SEM photos of spicules made from the type (scale D left, 100 μm; D right and E, 10 μm).

approximately 300 × 12 μm and unguiferate chelae, 15–20 μm. Hooper & Wiedenmayer (1994: 303) list an additional four species from South Australia.

PYLODERMA KIRKPATRICK, 1907

Synonymy

Pyloderma Kirkpatrick, 1907a. *Manawa* Bergquist & Fromont, 1988: 52.

Type species

*Halichondria latruncul*ioides Ridley & Dendy, 1886: 326 (by subsequent designation; de Laubenfels, 1936a: 72).

Definition

Dendoricellidae with fistular shape.

Diagnosis

Fistular, smaller and larger oxeas of same shape. Type species lacks chelae, but a second species, with similar shape, identical oxeas, shape and size, has arcuate chelae. At least 2 species.

Description of type species

*Pyloderma latruncul*ioides (Ridley & Dendy, 1886) (Fig. 2A–B).

Synonymy. *Halichondria latruncul*ioides Ridley & Dendy, 1886: 326; Ridley & Dendy, 1887: 6, pl. I fig. 5, pl. II fig. 1,

pl. XLVI fig. 5; Van Soest *et al*., 1990: 49, fig. 82; *Pyloderma latrunculioides*; Kirkpatrick, 1908c: 51; Dendy, 1924: 370; *Inflatella latrunculioides*; Hentschel, 1914: 83.

Material examined. Lectotype (here figured in Fig. 2A), and paralectotype: BMNH 1887.5.2.197 – "Challenger" collection, Argentina; including two slides, and a further slide (BMNH 1891.10.3.4).

Description. Erect-lobose, pear-shaped (Fig. 2A), with uneven, parchment-like surface (Fig. 2B). There are two specimens in the BMNH jar and the specimen chosen as the lectotype is the one pictured by Ridley & Dendy. Oscule and pore areas elevated, rounded or elongated. Consistency soft, spongy. Colour light grey (alcohol). Skeleton a dense ectosomal crust of felted, intercrossing oxeas, largely independent of the choanosome, which shows irregular tracts and loose oxeas. Spicules, oxeas only, interpreted as tornotes, sharply pointed, often inequiended, 700–1250 × 22–31 μm. Distribution and ecology. Off the coast of Argentina, deep water, 1100 m.

Remarks. Van Soest *et al*. (1990) assigned this genus to the family Halichondriidae, but the close similarity with chela-bearing *Pyloderma demonstrans* Dendy (1924: 370) now renders this assignment untenable. The genus *Manawa* was erected by Bergquist & Fromont (1988: 52) for type species *Pyloderma demonstrans* Dendy (1924: 370) (by original designation). The type specimen, BMNH 1923.10.1.152 from the 'Terra Nova' Expedition, stat. 96, North Cape, New Zealand, was re-examined. This is a spherical sponge (Fig. 2C) with fistulose inhalant and exhalant surface papillae; the ectosomal skeleton is a compact tangential crust of oxeas; choanosomal skeleton consists of coarse irregular, poorly defined tracts of oxeas, also dispersed throughout the choanosome; microscleres are arcuate isochelae. Oxeas (Fig. 2C–D) measure about 500 × 12 μm, chelae (Fig. 2E) 28 μm. We concur with Dendy (1924), that the presence of chelae is the only significant difference with *P. latrunculioides* and this is judged to be of specific value only.