

## Family Stylocordylidae Topsent, 1892

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Stylocordylidae Topsent (Demospongiae, Hadromerida) is a monotypical family with characteristic club-shaped habit. They are considered closely related to Suberitidae from which they differ in the possession of long centrotylote megascleres building the stalk and forming the central core of the main body. The single genus *Stylocordyla* occurs in deeper water in all three oceans.

**Keywords:** Porifera; Demospongiae; Hadromerida; Stylocordylidae; *Stylocordyla*.

### DEFINITION, DIAGNOSIS, SCOPE

#### Synonymy

Stylocordylidae Topsent, 1892: 58.

#### Definition

Hadromerida with stipitate habit, and centrotylote oxeas or strongyles in radial arrangement; usually also with smaller partly tangential oxeas or stylotes at the surface.

#### Diagnosis

Deep-water sponges with thin stalk and globular-oval 'body', which is flattened at the top. Skeleton of the main body radially arranged. Megascleres include centrotylote oxeas, with strongylote, or occasionally stylote modifications; in addition many species have smaller oxeas or styles at the surface, partly arranged in a tangential layer both on the main body and lining the stalk. Reproduction is viviparous, with the added peculiarity that larvae are kept in the body until they have developed into young adults (Bergquist, 1972). Distribution is cosmopolitan, with a predominance of records from cold water.

#### Scope

Four nominal genera, only one of which is considered valid.

#### Taxonomic history

The family was erected by Topsent (1892: 58) for *Stylocordyla* with the simple definition 'Aciculida without microscleres', because he considered the centrotylote oxeas related to those of *Dorypleres* and other triaene-less Astrophorida. However, he noted the parallel with Suberitidae in his order Clavulida (now Hadromerida).

The genus *Tethycordyla* de Laubenfels, 1934 was assigned to this family by Lévi (1973), who also considered Podospongiidae de Laubenfels, 1936 a junior synonym of Stylocordylidae. However, *Tethycordyla* possesses asters and is obviously closely related to *Tethya*. It is a member of Tethyidae (see chapter on Tethyidae). *Podospongia* and Podospongiidae have streptaster-like microscleres (spinose microrhabds, or spinorhabds) superficially resembling acanthodiscorhabds, or 'chessman' spicules of the

latrunculiids, and they are also obviously unrelated to Stylocordylidae. Podospongiidae shows superficial similarities to Suberitidae, particularly with the stipitate genus *Rhizaxinella* Keller, 1881, but is clearly a poecilosclerid with suspected affinities to Mycalina families (see chapter on Podospongiidae). Both Vosmaer (1887: 331) and Ridley & Dendy (1887: 222) assigned *Stylocordyla* to Suberitidae. However, from this family *Stylocordyla* differs in the absence of tylostyles and the possession of tangential arrangement of small oxeas. With *Aptos* Vosmaer, 1887 it shares the possession of oxeote spicules and peripheral smaller megascleres intermingled with the radiating megascleres, however the megascleres of *Aptos* are strongyloxeas without any centrotylote swellings, and it has no tangential spicules. Hooper & Wiedenmayer (1994: 402) suggested the family is *incertae sedis* and possibly belongs in Ancorinidae having lost their triaenes. In view of the centrotylote spicules and axial orientation of the skeleton, this is considered unlikely.

#### Previous reviews

Burton (1934c), Bergquist (1972), Hooper & Wiedenmayer (1994).

### STYLOCORDYLA THOMSON, 1873

#### Synonymy

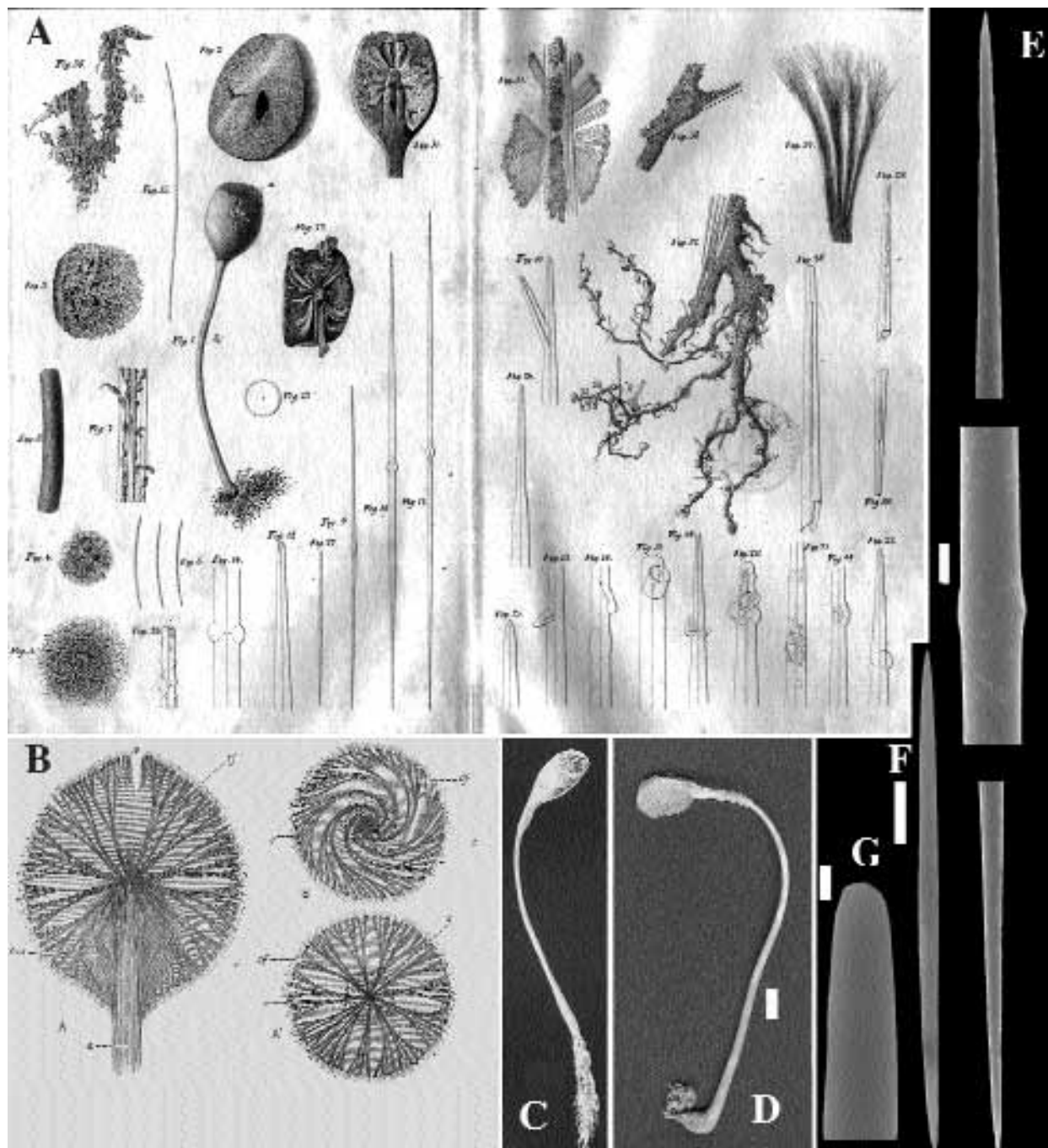
*Stylocordyla* Thomson, 1873: 113. *Stylorhiza* Schmidt, 1880: 79 (Not Haeckel, 1880: 612). *Oxycordyla* Topsent, 1904b: 135. ? *Microcordyla* Zirpolo, 1927: 290.

#### Type species

*Hyalonema boreale* Loven, 1868: 105 (by original designation).

#### Definition

As for the family. Stalked Stylocordylidae with centrotylote megascleres arranged polyserially in the stalk and in an axial-radial fashion in the main-body. At the surface and scattered in the body are smaller oxeas and/or styles. About 12 nominal species and 'varieties' have been described from all over the world oceans from depths between 13 and 3000 m.



**Fig. 1.** *Stylocordyla borealis* (Loven, 1868). A, reproduction of Loven's (1868) plate I, with drawings of habit, cross section and spicules of the type specimens (sizes see text). B, schematic cross sections of the main body, reproduced from Ridley & Dendy's (1887) text-fig. 9. C, Schmidt's drawing of *Styrorhiza stipitata* considered a junior synonym (size see text). D–G, specimen ZMA POR. 2224 from the Arctic Ocean. D, photo of habit (scale 1 cm). E, SEM photo of middle sized centrotylote megasclere from the choanosomal region (scale 10  $\mu\text{m}$ ). F, small oxea from the ectosomal region (scale 10  $\mu\text{m}$ ). G, styloid end of a small oxeote from the ectosomal region (scale 1  $\mu\text{m}$ ).

### Description of type species

*Stylocordyla borealis* (Loven, 1868) (Fig. 1A–F).

**Synonymy.** *Hyalonema boreale* Loven, 1868: 105, pl. 2; *Stylocordyla borealis*; Thomson, 1873: 113; Topsent, 1896c: 286, pl. VIII, figs 11–15; *Stylocordyla borealis* var. *typica* Burton, 1934c: 13 (with further synonyms). *Polymastia stipitata* Carter, 1876: 393.

**Material examined.** Type material (not examined) is stated to be in the Stockholm Museum, consisting of two specimens, the specimen illustrated by Loven, 1868 from 360 m off the N coast of Norway (Finmarken), is here designated as lectotype, and a second specimen from the coast of Norway collected by G. von Yhlen is the paralectotype. Other material. ZMA 2224 – 'Varna' Exped. 1883, Arctic Ocean, (det. E. Arnesen). No further data.

**Description.** Club-shaped on long thin stalk, provided with a proliferated root system. The lectotype is 5.2 cm long, with a body of 1.3 cm and a stalk of 3.9 cm. The oval body is somewhat flattened at the top and has an optically smooth surface. A single oscule is apparent, to the side of the body near the flattened top. Skeleton of the stalk made up of a tight mass of aligned larger megascleres, somewhat spirally arranged. The stalk penetrates macroscopically far into the main body and from it radiating bundles of larger megascleres fan out towards the surface. Small spicules form a palisade at the surface in between the radiating bundles of megascleres. Small spicules also form a dense tangential crust. Spicules, oxeas, often with rounded or strongly lute endings, often centrotylote, in three size categories,  $790\text{--}2930 \times 10\text{--}47 \mu\text{m}$ ,  $400\text{--}1140 \times 11\text{--}13 \mu\text{m}$ , and  $340\text{--}450 \times 4\text{--}4.5 \mu\text{m}$ . Ectosomal microxeas,  $70\text{--}100 \times 1.5\text{--}2 \text{m}$ . Distribution and ecology. North Atlantic, deep water.

**Remarks.** Judging from the records of the type species its distribution is bipolar and includes large sections of the North and South Atlantic and Pacific Oceans. Hooper & Wiedenmayer (1994) considered Southern Ocean 'varieties' described by several authors (var. *globosa* Ridley & Dendy, 1887: 224; var. *acuata* Kirkpatrick, 1908c: 22; var. *irregularis* Hentschel, 1914: 55) conspecific with the nominal populations from the North Atlantic, but this is here left undecided in view of the apparent discontinuous distribution. *Stylorhiza* Schmidt, 1880: 79 was erected for type species *Polymastia stipitata* Carter, 1876: 393 (by original designation). This is here considered a junior synonym of *S. borealis*, although it is uncertain whether Schmidt's Gulf of Mexico material was

conspecific with the North Atlantic material of Carter. The genus name *Stylorhiza* was also used for a cnidarian by Haeckel (1880). *Oxycordyla* Topsent, 1904b: 135 was erected for *O. pellita* Topsent, 1904b: 135 (by monotypy), and subsequently it was synonymized with *Stylocordyla* by Bergquist (1972: 128). The type (in MOM, not reexamined) has the shape and structure of *Stylocordyla*, but was distinguished by the absence of small monactinal or diactinal surface spicules. The only spicules noted by Topsent were long thin oxeas of  $1500\text{--}2500 \times 23 \mu\text{m}$ . It is proposed here to follow Bergquist's opinion and assign this species to *Stylocordyla*. The genus *Microcordyla* Zirpolo (1927: 290, fig. unnumbered) was erected (by monotypy) for *Microcordyla asteriae* Zirpolo, 1927. The description and very crude drawing of the habit are inadequate for definite classification. The stalked specimen of only 7 mm length apparently was attached to one of the arms of an asteroid of the genus *Asterias*, with three peculiar-shaped uncinata attachment organs. The vague reference to oxeas, the description of the cup-shaped oscule with a circle of spine-like 'spicules', and the apparent 'muscular' nature of the attachment organs all contribute to the impression that this is not a stylocordylid sponge, but for a firm conclusion the type material, presumably lodged in the collections of the Stazione Zoologica at Naples, will have to be studied.

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