

Order Chondrosida Boury-Esnault & Lopès, 1985. Family Chondrillidae Gray, 1872

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Chondrosida Boury-Esnault & Lopès (Demospongiae) contains only a single family Chondrillidae Gray, including junior synonym Chondrosiidae Schulze, with seven nominal genera of which four are valid: *Chondrosia*, *Chondrilla*, *Thymosia* and *Thymosiopsis*. Chondrillidae was previously considered close to both the order Hadromerida and other tetractinellid orders, such as Astrophorida, warranting recognition in a new order as there was no argument in favour of one solution over the other. This order was subsequently supported by recent molecular data confirming its monophyly although there are still no clear phylogenetic hypotheses on relationships with the other orders of Demospongiae. Chondrosids are oviparous, encrusting to massive with a marked cortex enriched with fibrillar collagen, inhalant apertures localised in special structures and a skeleton (when present) composed of siliceous spicules or spongin fibres. Chondrosid species are widely distributed mainly in shallow waters, exceptionally up to 750 m depth. They are often present in semi-obscure conditions, on vertical walls, at the entrance of submarine caves, or below rocks.

Keywords: Porifera; Demospongiae; Chondrosida; Chondrillidae; *Chondrosia*; *Chondrilla*; *Thymosia*; *Thymosiopsis*.

DEFINITION, DIAGNOSIS, SCOPE

Synonymy

Order: Chondrosides Lévi, 1956. Chondrosiina Wiedenmayer, 1977b. Chondrosida Boury-Esnault & Lopès, 1985: 172. Family: [Gummineae] Schmidt, 1862 (*nomen oblitum*). [Gumminidae] Schmidt, 1862 (*nomen oblitum*). Chondrillidae Gray, 1872a. Chondrosidae Schulze, 1877. Chondrissinae Lendenfeld, 1885: 14. Chondrosiidae Wiedenmayer, 1977b.

Diagnosis of the order and family

Demospongiae, encrusting to massive, with a marked cortex enriched with fibrillar collagen, with inhalant apertures localised in pore-sieves or cribriporal chones and a skeleton often absent, composed when present of nodular spongin fibres or aster micro-scleres only (never megascleres). Collagen always very abundant. Oviparous.

Type genus

Chondrilla Schmidt, 1862 (by original designation).

Scope

Single family with over seven generic names of which only four are now considered valid and most appropriately referred here. Approximately 50 species have been published worldwide mostly belonging to the genera *Chondrosia* Nardo, 1847b (10 valid species) and *Chondrilla* Schmidt, 1862 (24 valid species). Although some of the nominal chondrosid species are now known to be junior synonyms, others which are allegedly cosmopolitan (*Chondrosia reniformis* Nardo, 1847b and *Chondrilla nucula* Schmidt, 1862) are certainly complex of species (Klautau *et al.*, 1999; Lazoski *et al.*, 2001). The genera *Thymosia* Topsent, 1895 and *Thymosiopsis* Vacelet & Perez, 1998 contain two species.

History and biology

The concept of Chondrosida is relatively recent and the order was erected in 1985 by Boury-Esnault & Lopès for the unique family Chondrillidae. Chondrosida includes oviparous species with a well developed cortex reinforced by fascicles of fibrils of collagen, with numerous spherulous cells, relatively small choanocyte chambers and a mesohyl with very abundant symbiotic bacteria. Skeleton may be absent or present but is always reduced and made of either siliceous microscleres of the aster type or irregular and nodular spongin fibres. Megascleres are always absent. The inhalant apertures are always localised in pore-sieves or cribriporal chones.

There is some debate on the correct name for this family. Gray (1872a) erected Chondrillidae for *Chondrilla* and *Corticium* Schmidt, 1862, and Schulze (1877) subsequently erected Chondrosiidae to include these two genera plus *Chondrosia*. *Corticium* was later transferred to Homoscleromorpha. Although these two family names have been used together in recent literature (e.g., Wiedenmayer, 1977b), most authors used Chondrosiidae in the sense of Topsent (1895), including three genera *Chondrosia*, *Chondrilla* and *Thymosia*, whereas Hooper & Wiedenmayer (1994) emended this name to Chondrillidae based on the rule of priority. Similarly, although Chondrillidae is a junior synonym of Gummineae Schmidt, 1862, the prevailing usage of Chondrillidae must be maintained (ICZN, Art. 23.9) based on 'reversal of precedence'. Gummineae has not been used subsequent to 1899 whereas Chondrillidae has been used as a valid name by at least 10 authors, in at least 25 works in the immediately preceding 50 years (Colin & Arneson, 1995; Desqueyroux-Faúndez & van Soest, 1997; Erhardt & Moosleiner, 1995; Fromont, 1999a; Hechtel, 1965, 1969, 1976; Hooper, 1994, 1997; Hooper & Wiedenmayer, 1994; de Laubenfels, 1950a, 1954; Lazoski *et al.*, 2001; Lehnert & van Soest, 1998, 1999b; Pattanayak, 1999; Pulitzer-Finali, 1993; Reitner, 1991; Thomas, 1973, 1979; Vacelet *et al.*, 2000; Vacelet & Perez, 1998; Wiedenmayer, 1977b, 1989, 1994). The seniority of Chondrillidae over Chondrosiidae has no bearing on the choice of the ordinal name Chondrosida (ICZN Art. 40).

Chondrillidae has been tossed back and forth within the demosponge ordinal classification, sometimes even by the same author, considered close to Hadromerida (e.g., Topsent, 1925c; Bergquist, 1978; Hooper, 1997), and Tetractinellida (e.g., Topsent, 1995; Lévi, 1973), prompting Boury-Esnault & Lopès (1985) to erect the order Chondrosida for the family, citing that there is no argument to favour one solution or the other. Recent molecular analyses have confirmed that Chondrosida is a monophyletic clade distinct from Hadromerida and Tetractinellida, although analyses failed to find clear phylogenetic relationships with other orders of Demospongiae (Chombard, 1998).

The most important debate concerns the placement of *Thymosia*, a genus with a spongin fibre skeleton. It has, in turn, been considered as Chondrosiidae (Topsent, 1895), Spongiidae (de Laubenfels, 1936a), Verongiinae (de Laubenfels, 1948), Dysideidae (Borojevic *et al.*, 1968) and finally again Chondrosiidae (Hiscock *et al.*, 1984; Boury-Esnault & Lopès, 1985; Rosell, 1988).

Recently Vacelet & Perez (1998) described a new genus without a skeleton from the Western Mediterranean Sea, *Thymosiopsis*, also included in this family. A second species of this genus was discovered recently and molecular analysis of both species, and of *Thymosia guernei*, confirmed that they are closely related and both genera made a monophyletic clade with *Chondrosia reniformis* (Vacelet *et al.*, 2000).

Chondrosid sponges are widely distributed mainly in shallow waters, exceptionally up to 750 m depth. They are often present in semi-obscure conditions, on vertical walls, at the entrance of submarine caves, or below rocks. One species, *Thymosiopsis cuticulatus*, is typical of obscure caves. *Chondrosia* and *Chondrilla*

have a worldwide distribution, and have been recorded from the NE Atlantic and Mediterranean (Topsent, 1895; Pulitzer-Finali, 1983), West Atlantic and Caribbean (Wiedenmayer, 1977b; de Laubenfels, 1936a; Pulitzer-Finali, 1986), South Atlantic (Boury-Esnault, 1973) and Indo-Pacific and Australia (Hooper & Wiedenmayer, 1994). *Thymosia* has been recorded in the NE Atlantic and in SW Pacific (N. Zealand) whereas *Thymosiopsis* has to be considered for the moment as an endemic of the NW Mediterranean.

Although the monophyly of the family is supported on molecular grounds (Chombard, 1998; Vacelet *et al.*, 2000), it is less evident with morphological characters. The synapomorphies between *Chondrosia* and *Chondrilla* are cribriporal chones, thick cortex with dense fascicles of collagen, disjunction between both cellular and collagen elements and a granulo-fibrillar matrix (Vacelet & Donadey, 1987). The synapomorphies between *Thymosia* and *Thymosiopsis* are presence of pore-sieves and an ectosome constituting a weakly developed cortex with fibrillar collagen. The probable homology between pore-sieves and cribriporal chones has yet to be confirmed, as does the homology on the structure of the cortex. Relationships between the four genera also remain to be confirmed. The generic classification of the Chondrillidae centres around the presence/absence of a skeleton and if present the type of the skeleton, i.e., spongin fibre versus siliceous spicules.

Previous reviews

Schulze, 1877: 1–38; Topsent, 1895: 512; Wilson, 1925: 353; Boury-Esnault & Lopès, 1985: 172; Hooper & Wiedenmayer, 1994: 122.

KEY TO GENERA

- | | |
|--|---------------------|
| (1) Chondrosida with skeleton | 2 |
| Chondrosida without skeleton | 3 |
| (2) Chondrosida with siliceous skeleton | <i>Chondrilla</i> |
| Chondrosida with spongin skeleton | <i>Thymosia</i> |
| (3) Chondrosida with a well developed cortex | <i>Chondrosia</i> |
| Chondrosida with a thin cortex and a cuticle | <i>Thymosiopsis</i> |

CHONDROSIA NARDO, 1847

Synonymy

Chondrosia Nardo, 1847b: 267; Schmidt, 1862: 40; *Gummina* Schmidt, 1862: 37; Schmidt, 1864; Topsent, 1895: 568; Topsent, 1929c.

Type species

Chondrosia reniformis Nardo, 1847b (by monotypy).

Diagnosis

Chondrillidae without skeleton and with a well developed cortex made of thick fascicles of collagen and with numerous spherulous cells.

Remarks

Gummina gliricauda Schmidt, 1862 (type species of *Gummina*) was synonymised by Schmidt himself with *Chondrosia reniformis* (Schmidt, 1864). *Cellulophana pileata* Schmidt, 1862, type species

of the genus *Cellulophana* Schmidt, 1862, which was also assigned to Gumminae is a colonial ascidian (Schulze, 1877: 35). *Chondrosia tuberculata* Schmidt, 1868: 24, was synonymised by Schulze, 1877: 31, to *Oscarella (Halisarca) lobularis* and is considered a valid species of *Oscarella* by Boury-Esnault *et al.* (1992b).

Among the species described nine seem to be valid. However the genus probably has many more species because several, such as *Chondrosia reniformis*, *C. plebeja* Schmidt, 1868, *C. collectrix* Lendenfeld, 1888 are allegedly cosmopolitan and whereas they most likely represent a complex of species, as demonstrated for *C. reniformis* (Lazoski *et al.*, 2001). There are also many nomenclatural problems which have to be resolved through re-examination of type specimens, if they are still available, one being *Cellulophana collectrix* Schmidt, 1862, the type specimen of which is lost. However the type specimens need to be sufficiently well preserved to make histological slides, the only way to discriminate the species. Dry specimens are useless.

Distribution

Cosmopolitan, tropical, subtropical and temperate zones, mostly in the littoral zone above 50 m depth. *Chondrosia plebeja* was dredged once at 760 m depth.

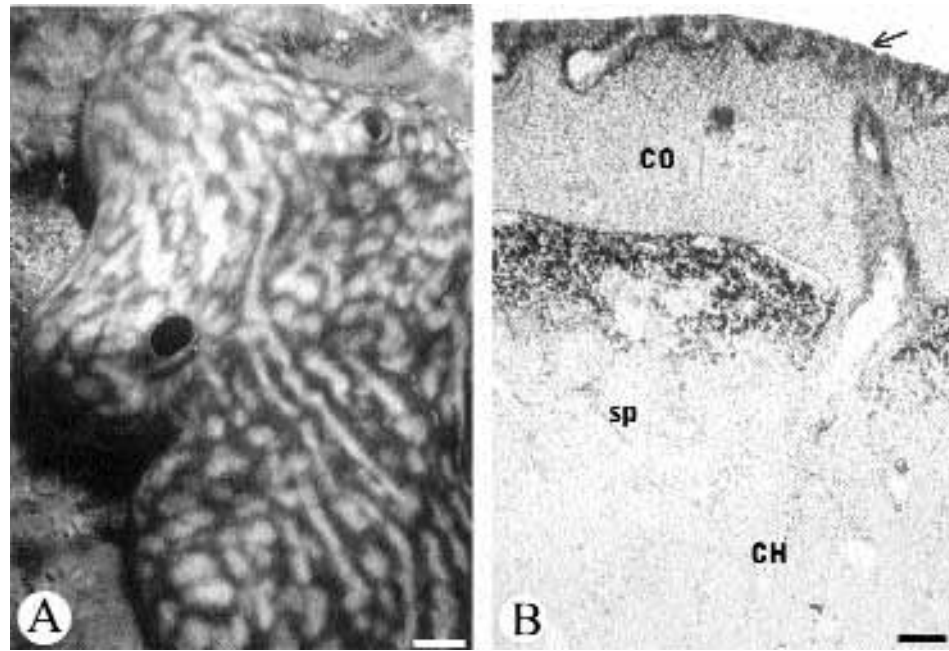


Fig. 1. *Chondrosia*. A, in situ photograph of a Mediterranean specimen of *Chondrosia reniformis* (J. Vacelet) (scale 0.5 cm). B, microphotograph of histological slide from the Lendenfeld collection BMNH 96.11.5.109 (abbreviations: CO, cortex; CH, choanosome; sp, foreign spicule; arrow, cribriporal chone) (scale 400 µm).

Description of type species

Chondrosia reniformis Nardo, 1847b (Fig. 1).

Synonymy. *Chondrosia reniformis* Nardo, 1847b: 267; Schmidt, 1862: 40; *Gummina ecaudata* Schmidt, 1862: 38; *Gummina gliricauda* Schmidt, 1862: 38; Schulze, 1877: 13; Topsent, 1895: 568; Topsent, 1925c.

Material examined. Holotype: Unknown – North Adriatic Sea. Neotype: MNHN DNBE 2000; BMNH: 96.11.5.112 (slides) – coll. February in Trieste, Lendenfeld Adriatic sponges; BMNH: 96.11.5.109 (radial serial section, thick) – Trieste, Collection Rao; BMNH: 33.3.1.45 – Napoli. Other material. Personal collection – specimens from Western Mediterranean (Provence Coast). *Gummina ecaudata* Schmidt – evidently from Schmidt species, Adriatic. Slides from BMNH (labelled *Chondrosia reniformis*) – doubtful or evidently misinterpretations: BMNH 158.12.29.127 – Hebrew University collection, Eylath Red Sea; BMNH 1954.2.23.37 – Herdman's Ceylon sponges; BMNH 1936.11.2b.8a – Reef bay, Pt Elizabeth South Africa, 5.7.36, Presd. Prof. JA Stephenson; BMNH 32.4.5.16a – Dry Tortugas, Dendy collection; BMNH 1939.5.8.56 – off Tampa Bay, USA, Belgian Museum Coll. 'Mercator'.

Description. Specimens are generally lobate and can reach 30 cm in greatest dimension and 3 cm thick. The colour in life is from black on parts exposed to the light to white on parts unexposed to light. The consistency in life is cartilaginous, firm, and tough. The surface is smooth, shiny (Fig. 1A) (features taken from living Mediterranean specimens). The upper cortex is composed of two layers: one superficial layer with numerous spherulous cells, one internal layer with few spherulous cells. The basal cortex shows a lower density of spherulous cells and the external zone is devoid of any spherulous cells. Spherulous cells are abundant also around canals. The density of the spherulous cells in the choanosome is similar to that of the internal layer of the upper cortex. The spherulous cells contain about 20 spherules of about 3 µm in diameter. Cortex is also characterised by a net of large fascicles of collagen fibrils. Foreign

spicules are present in the choanosome and in the internal layer of the cortex. The border cortex/choanosome is underlined by a line of spherulous cells (Fig. 1B). Choanocyte chambers ovoid to spherical are about 40 µm in diameter with a small aphodus at the apopyle of the chamber. Extracellular symbiotic bacteria and bacteriocytes are present in the mesohyl (anatomical description taken from neotype and other slides made by Lendenfeld in 1896 from Adriatic specimens).

Reproduction. The type species is oviparous (Scalera-Liaci *et al.*, 1971). Oogenesis occurs from May to August and spermatogenesis from July to August. The emission of the spermatozooids and oocytes occurs between the first quarter and the full moon of August (Lévi & Lévi, 1976). The oocytes remain trapped in follicular cells near the basis of the sponge. The fecundation is external. The larva is a blastula. During embryogenesis, there is a transmission of bacteria and spherulous cells from the mother-sponge to the larva (Lévi & Lévi, 1976).

Remarks and distribution. We consider that only populations of *Chondrosia reniformis* from the Mediterranean and the nearest Atlantic (Coasts of Spain, Portugal and Morocco) (Lazoski *et al.*, 2001) belong to this species. Specimens from localities outside the Mediterranean vary principally in the localisation and abundance of foreign materials and spherulous cells and are certainly different species (Lazoski *et al.*, 2001).

CHONDRILLA SCHMIDT, 1862

Synonymy

Chondrilla Schmidt, 1862: 38. *Magog* Sollas, 1888: 442 (for *Chondrilla sacciformis* Carter, 1879b: 299); de Laubenfels, 1936a: 182; Topsent, 1895: 512; Topsent, 1918: 601. *Chondrillastra* Topsent, 1918: 603 (for *C. australiensis* Carter, 1873b); de Laubenfels, 1936a: 182.

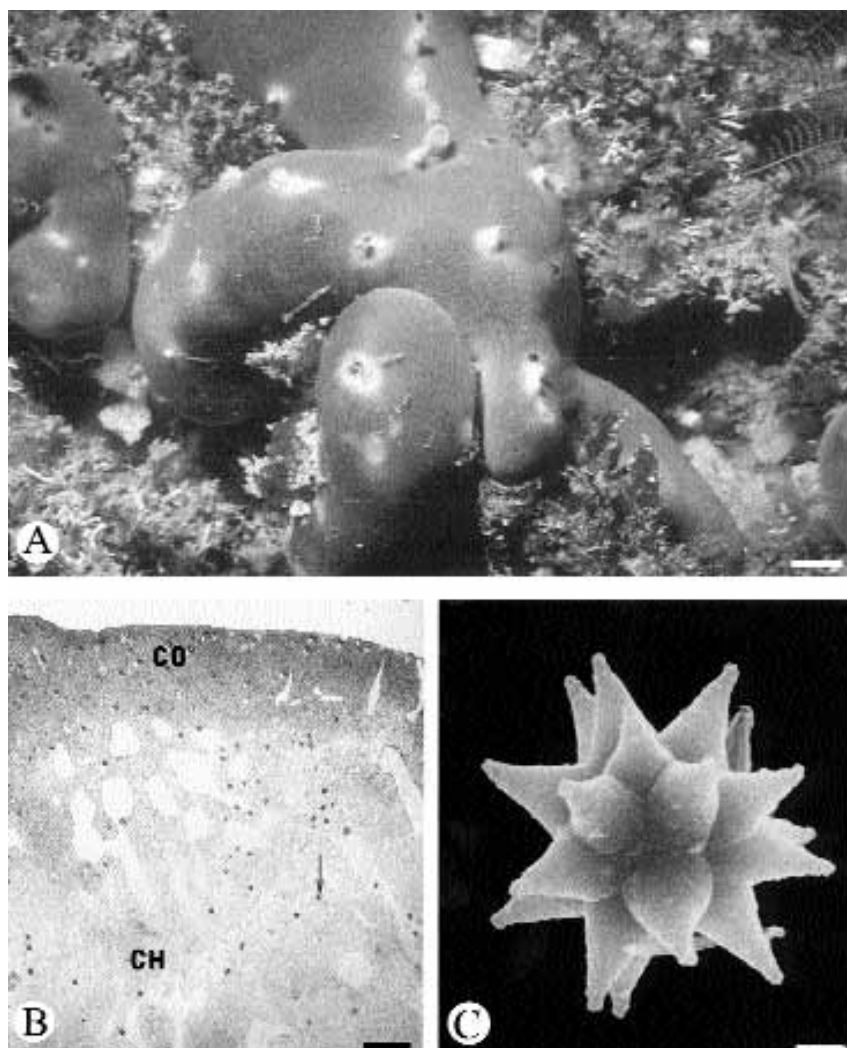


Fig. 2. *Chondrilla*. A, in situ photograph of a living specimen of *Chondrilla nucula* from the Provence coast (western Mediterranean) (J. Vacelet) (scale 1 cm). B, microphotograph of a slide from the Lendenfeld collection BMNH 96.11.5.108 (abbreviations: CO, cortex; CH, choanosome) (scale 500 μ m). C, SEM micrograph of a spheraster of the type specimen (courtesy of R. Desqueyroux-Faúndez) (scale 7 μ m).

Type species

Chondrilla nucula Schmidt, 1862 (subsequent designation by de Laubenfels, 1936a).

Diagnosis

Chondrillidae with a skeleton only composed of siliceous spicules of the aster type localized mainly in the cortex and around the canals.

Remarks

Among the 26 nominal *Chondrilla* species described about 20 seem to be valid. However, the genus probably has many more species because one (*Chondrilla nucula*) is considered as cosmopolitan (Klautau *et al.*, 1999), and others have a very large distribution in the Indo-Pacific region like *Chondrilla australiensis*. A complete revision is necessary with examination of type specimens which are well preserved and of living populations.

Distribution

Cosmopolitan, tropical, subtropical and temperate zones, mostly in the littoral zone above 50 m depth.

Description of type species

Chondrilla nucula Schmidt, 1862 (Fig. 2).

Synonymy. *Chondrilla nucula* Schmidt, 1862: 38; Schulze, 1877: 24; Topsent, 1918: 601.

Material examined. Holotype: LMJG 15018 – Quarnero, North Adriatic, Mediterranean Sea. Paratype: LMJG 15687 (with handwritten labels by Lendenfeld; Desqueyroux-Faúndez & Stone, 1992). Other material. Personal collection: Western Mediterranean Sea (Ligurian and Provence coast). BMNH 96.11.5.108 (slide) – Lesina, Adriatic, coll. of Lendenfeld. BMNH 1938.5.26.109 – Acca, Palestine, coll. of Dr K. Reich. Slides from BMNH (labelled *Chondrilla nucula*) – doubtful or evidently misinterpretations. BMNH 23.10.1.257 – Dendy, 1924 collection, 15 m, R.N.VIII, 'Terra Nova' sponges; BMNH 24.5.1.115 – Port Philip Heads,

RN 490, Victorian sponges, J.B. Wilson coll; BMNH 1938.4.26.15 – Richardson Cove, Bermuda, 74.13.16, collected by Dr J.F.Cr. Wheeler; BMNH 1954.2.12.258 – Dendy collection, South coast of Australia.

Description. The type specimen is small about 0.9 cm in length and 0.6 cm in width and has a rounded shape. A paratype of unknown locality is lobate and about 4.5 cm/1 cm. The colour in life of Mediterranean specimens is brown to brown violet and the general shape is rounded to lobate (Fig. 2A). The consistency is cartilaginous, firm, and tough. The surface is smooth. In the Lendenfeld's slides of Adriatic specimens, the cortex is about 175–280 µm thick with a cuticle of about 5 µm (Fig. 2B). It is composed of two layers; the upper one is a dense sheet of spherulous cells and spherasters, whereas the internal one is made of scattered spherulous cells and spherasters. The choanocyte chambers are ovoid, aphodal and have a diameter of about 40–50 µm. In the choanosome the spherulous cells and the spherasters are scattered in the mesohyl. Around the canals the spherasters are organized in an unispicular layer. Extracellular symbiotic cyanobacteria are present in the upper layer of the cortex and symbiotic bacteria and bacteriocytes are present in the mesohyl. Spicules. The spicules are spherasters. Average diameter varied along the year from 20–27 µm (Bavestrello *et al.*, 1993). The number of rays varied between 20–25 in the holotype. The extremities of the rays are most often rugose or slightly spinose (Fig. 2C).

Reproduction. The species is oviparous as are all species of the order. Oogenesis and spermatogenesis occurs mostly during August although oogenesis may last from July to October. The oocyte is surrounded by follicular cells (Scalera-Liaci *et al.*, 1971; Gaino, 1980). The release of the gametes, the embryogenesis and the larva have never been observed.

Remarks and distribution. The morphology and the size of the spherasters can vary between populations of the same species and seem not to be a good character to discriminate between the species of *Chondrilla* (Bavestrello *et al.*, 1993; Klautau *et al.*, 1999). However their distribution and abundance in the cortex and the choanosome, as well as the distribution and abundance of the spherulous cells, seem to be better discriminant characters. As these characters have been used rarely a precise redescription of all the species is necessary.

We consider *Chondrilla nucula* to comprise only the populations from Mediterranean and the nearest Atlantic (Coasts of Spain, Portugal and Morocco) (Klautau *et al.*, 1999).

THYMOSIA TOPSENT, 1895

Synonymy

Thymosia Topsent, 1895: 574; de Laubenfels, 1948: 103; Bergquist, 1980b: 499; Boury-Esnault & Lopès, 1985: 172; Rosell, 1988: 353.

Type species

Thymosia guernei Topsent, 1895 (by monotypy)

Diagnosis

Chondrillidae with skeleton composed of nodular spongin fibres.

Remarks

The nodular spongin fibres present in the type species were misinterpreted by Bergquist (1980b) who suggested that they may have been a foreign hydroid skeleton, whereas they are so abundant in well preserved specimens that it is impossible to miss them. Although the genus is currently monotypic, the only species described, *Thymosia guernei*, is distributed over a large area of the NE Atlantic. Originally described by Topsent (1895) from the south coast of French Brittany, the species has been redescribed in detail from diverse populations throughout the NE Atlantic (Boury-Esnault & Lopès, 1985; Rosell, 1988).

Distribution

Northeast Atlantic from Lundy (Great Britain) to Lagos (South Portugal) and Azores (Portugal) – 51°11'–37°N, 4°40'–28°39'W – in caves and overhanging walls. Depth: 0–36 m. Apparently absent from the Mediterranean. Recently a new species have been found at the entrance of a cave in New Zealand (Bergquist, pers. comm.).

Description of type species

Thymosia guernei Topsent, 1895 (Fig. 3).

Synonymy. *Thymosia guernei* Topsent, 1895: 574; Hiscock *et al.*, 1984: 20; Boury-Esnault & Lopès, 1985: 172; Rosell, 1988: 353.

Material examined. Holotype: MNHN DT 1895 – Concarneau, south coast of French Brittany, North East Atlantic, Topsent collection (dry). Other material. Personal collection: alcohol fixed specimens from Lagos Portugal, 37°N, 8°50'W; Sagres, Portinho da Arrabida, and Azores (Ilha de Faial and Ilha de São Miguel: 38°31'N, 28°37'W to 37°45'N, 25°30'W); and Lundy, 51°11'N, 4°40'W, Great Britain.

Description. Plate-like in shape with a maximum dimensions of about 2 cm × 10 cm. The surface is conulose with cone-shape projections of about 0.5 mm high raised up by the termination of the fibres. The colour in life is light grey to cream. The pore sieves are located in some depressions and are about 5 mm in diameter. The oscules are at the top of cone-shaped projections and are 2 mm in diameter. At the basis a layer of foreign detritus is most often present (taken from dry holotype). The cortex of about half a millimetre thick is composed of two layers of collagen. From outside to inside are present the exopinacocyte layer composed of T-shaped cells, a layer of dense collagen up to 50 µm thick, a second layer of collagen up to 450 µm filled up by numerous spherulous cells. The spongin fibres stop at the level of the first layer and slightly raise the surface. The choanosome is composed of spherical to ovoid choanocyte chambers of about 30 µm in diameter. A central cell is most often visible at the apopyle of the chambers. In the mesohyl different cell types are present (lophocytes, glycocytes, archaeocytes) and two types of spherulous cells. Type 1 has a diameter up to 13 µm and is filled by 3 to 5 spherules of about 3 µm in diameter. They are particularly numerous in the layer 2 of the cortex. Type 2 are cells of about 16 µm in diameter and filled with 20 small spherules. They are less abundant than type 1. The skeleton is composed of fibrillar collagen which give the particular texture of the cortex and by dendritic heavily nodular fibres. The choanosome is densely packed by the fibres which are perpendicular to the surface with a diameter varying from 100 µm at the basis to 40 µm at the top.

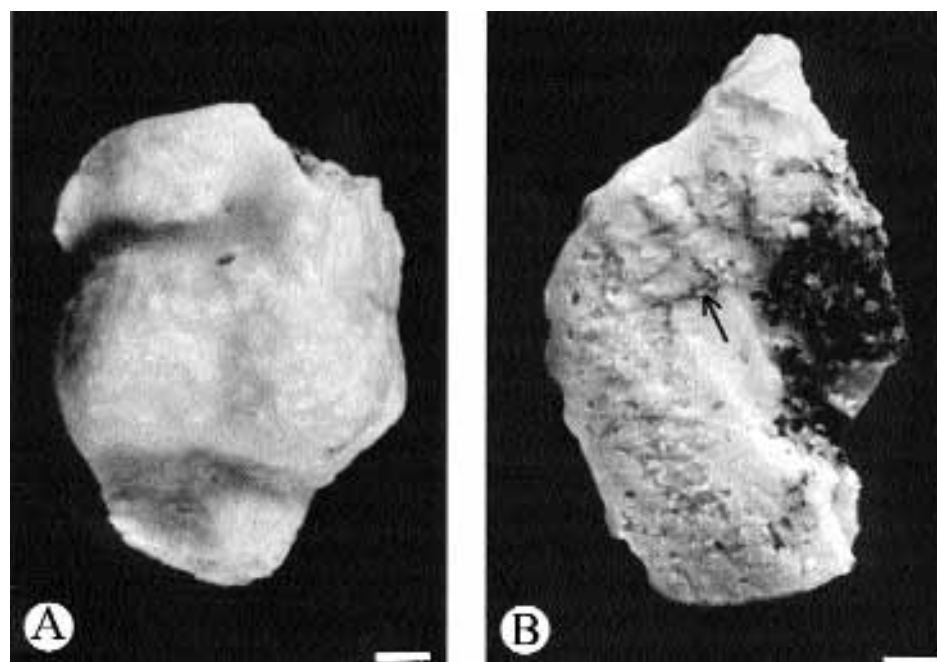


Fig. 3. *Thymosia*. A, specimen of *Thymosia guernei* from the south coast of Portugal (Portinho da Arrabida) (scale 35 mm). B, transverse section of *Thymosia guernei* where spongin fibres (arrow) are visible (scale 35 mm).

The bark is laminar and the pith is granular. The fibres are dendritic, although some anastomoses are present. They are easily breakable (anatomical details taken from MNHN Azores specimen).

Remarks and distribution. The nodular fibres have been interpreted as a hydroid skeleton (Bergquist, 1980b) whereas in living specimens these fibres are clearly native to the species and cannot be confused with a hydroid skeleton (Topsent, 1895; Boury-Esnault et Lopès, 1985; Rosell, 1988). Found mostly on wave exposed coasts on vertical to overhanging walls and entrance of caves from 6–20 m depth.

THYMOSSIOPSIS VACELET & PEREZ, 1998

Synonymy

Thymosiopsis Vacelet & Perez, 1998: 7; Vacelet *et al.*, 2000: 316.

Type species

Thymosiopsis cuticulatus Vacelet & Perez, 1998 (by original designation).

Diagnosis

Chondrillidae with a general organization similar to that of the genus *Thymosia* having a smooth surface, a marked cortex (40–50 μ m) enriched with fibrillar collagen parallel to the surface, but lacking spongin fibres. A superficial cuticle and pore-sieves may be present. The choanocyte chambers are eurypylous.

Remarks

The genus has been recently described from a dark cave on the coast of the French Mediterranean. A second species was also

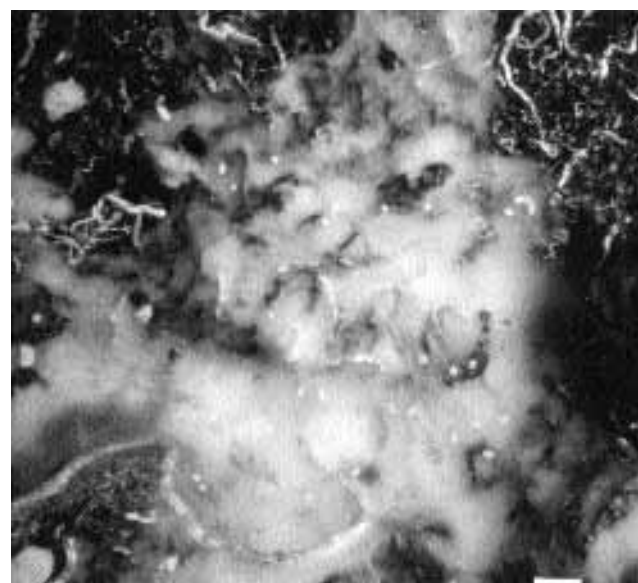


Fig. 4. *Thymosiopsis cuticulatus*. In situ photograph of a specimen from the type locality (J. Vacelet) (scale 1 cm).

discovered recently at the entrance of the same cave (Vacelet *et al.*, 2000). The cortex of *Thymosiopsis* is considerably thinner than that of *Chondrosia*.

Distribution

Known only from caves 3PP, Fauconnière and Plane on the Provence coast of Mediterranean (France).

Description of type species

Thymosiopsis cuticulatus Vacelet & Perez, 1998 (Fig. 4).

Synonymy. *Thymosiopsis cuticulatus* Vacelet & Perez, 1998: 7–13.

Material examined. Holotype: MNHN-D JV.59 – ‘3PP cave’, 1.2 km south-west of La Ciotat, coast of the French Mediterranean, 43°09′47″N, 5°36′01″E, 16–22 m depth, on vertical or overhanging walls, 30–80 m from the cave opening. Paratypes: MNHN D JV 60 – same locality.

Description. Encrusting up to 15–20 cm, and 3–5 mm thick in the centre, thinner on the edges. The colour is white or yellowish white in living specimens (Fig. 4). The surface is smooth, but irregular as the sponge closely follows the irregularities of the substratum. The consistency is quite cartilaginous, although easy to tear. There is neither spicules nor a spongin fibre skeleton. A small amount of foreign material is frequently included in the choanosome. The ectosome is 40–50 µm thick and is lined on the outer surface by a thin, non-cellular cuticle 2 µm thick. The ectosome contains bundles of collagen fibrils parallel to the surface, and two types of cells with inclusions without special localisation. Choanocyte chambers occurs in relatively low density, they are eurypylous and 15–30 µm in diameter. Most of the choanosome

volume is made by cells with inclusions of three types often grouped in clusters. Reproduction has not been observed.

Remarks. This sponge appears to have affinities with *Thymosia*. The two species share the presence of pore-sieves and a weakly collagenous developed cortex. A molecular study using 28S rRNA has shown that *Thymosia* and *Thymosiopsis* made a monophyletic clade (Vacelet *et al.*, 2000). The obvious morphological differences between *Thymosiopsis* and *Chondrosia* are the dimension of the cortex, the abundance of collagen bundles as well as the type of choanocyte chamber and canal system organization, which precludes its allocation to the latter genus.

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I thank the Natural History Museum, London (Clare Valentine), and the Musée de Genève (Ruth Desqueyroux-Faúndez) for having made available slides and type specimens of *Chondrosia reniformis* and *Chondrilla nucula*, Javier Cristobo and Pilar Rios for collection of specimens of *Thymosia* from Portugal, Jean Vacelet and Thierry Perez for slides and type specimens of *Thymosiopsis*.

