Systema Porifera: A Guide to the Classification of Sponges, Edited by John N.A. Hooper and Rob W.M. Van Soest

Family Tedaniidae Ridley & Dendy, 1886

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Tedaniidae Ridley & Dendy (Demospongiae, Poecilosclerida) is characterized by the possession of onychaetes, thin finely acanthose monactinal microscleres. Three genera are recognized based on the shape and differentiation of megascleres. One genus, *Tedania*, is subdivided in three subgenera, based on the morphology of ectosomal tornotes and size of choanosomal megascleres. The use of the nominal genus *Tedanione* is abandoned.
Keywords: Porifera; Demospongiae; Poecilosclerida; Myxillina; Tedaniidae; *Hemitedania*; *Strongylamma*; *Tedania (Tedania)*; *Tedania (Tedaniopsis)*; *Tedania (Trachytedania)*.

DEFINITION, DIAGNOSIS, SCOPE

Synonymy

Tedaniina Ridley & Dendy, 1886: 335. Tedaniae Burton, 1932b: 345.

Definition

Myxillina with onychaetes, without chelae or sigmas.

Diagnosis

Encrusting, massive or digitate poecilosclerid sponges. Choanosomal skeleton predominantly plumo-reticulate or plumose, composed of tracts of smooth or spined monactinal megascleres, or smooth diactinal megascleres, enclosed within light or moderate spongin fibres, or with no visible fibres and spicules merely cemented together at their nodes. Occasionally fibres contain sand particles partly replacing spicules. Ectosomal spicules (tornotes) diactinal, tylotes or strongyles, with smooth or spined bases, lying tangential, paratangential or erect on the surface, although usually not in bundles. Microscleres onychaetes; chelae or sigmas absent.

Scope

Nine nominal genera. Genera and subgenera considered valid are *Hemitedania, Strongylamma, Tedania (Tedania), Tedania (Tedaniopsis), Tedania (Trachytedania)*.

History and biology

Ridley & Dendy (1887) erected the family (as a subfamily) for only two genera, viz., *Tedania* and *Trachytedania*. Tedaniinae was considered related to and united with sigma-bearing Haplosclerida (their subfamilies Gelliinae and Phloeodictyiinae) and lipochelate Poecilosclerida (Desmacellinae and Hamacanthinae) within a larger family Heterorhaphidae. Myxillinae was classed further away in the chela-bearing family Desmacidonidae. Since that time various authors assigned a wide variety of genera to tedaniids. Topsent (1928c) recognized a subfamily Tedaniinae (with content closely similar to what is used here) within a wider concept of Myxillidae. De Laubenfels (1936a) retained separate families Tedaniidae and Myxillidae, but compared with Topsent's classification mixed their contents on the basis of smooth vs. spined choanosomal megascleres, thus including genera like *Lissodendoryx* and *Acarnus* within Tedaniidae. Lévi (1973), Wiedenmayer (1977b) and Van Soest (1984b) did not distinguish between subfamilies and employed a broad assemblage named variously Myxillidae (including both *Tedania* and *Myxilla*) or Tedaniidae (*ibidem*). Finally, Bergquist & Fromont (1988) restricted the use of Tedaniidae to sponges possessing onychaetes, and Desqueyroux-Faúndez & Van Soest (1996) followed this. Tedaniids are soft slimy sponges with irregular shape. They are found in many different habitats, predominantly favouring sedimented environments: e.g., mangroves and stones among sand and mud, from shallow to deep waters. Reproduction is viviparous. Mature larvae have a bare posterior pole and are 300–600 μm diameter (Wapstra & Van Soest, 1987).

Taxonomic remarks

Tedaniidae is well delimited by the possession of unique onychaete microscleres. Their position within the Poecilosclerida, and its suborder Myxillina, is less well established due to reduced spiculation. Despite the lack of the major poecilosclerid synapomorphy (chelae), the family can nevertheless be assigned to this order on the basis of its possession of tornotes, a feature shared with two Poecilosclerida suborders. The lack of tridentate chelae and sigmas is shared with Microcionina (which have palmate chelae), whereas the lack of toxas is shared with Myxillina. Diversity of tornote shapes and apical ornamentations are more often found in Myxillina families than in Microcionina families. Similarly, the loose plumoreticulate structure of most tedaniids is more often observed in Myxillina. For these (perhaps) inconclusive reasons Tedaniidae is assigned to Myxillina rather than to Microcionina.

Previous reviews

Bergquist & Fromont (1988), Desqueyroux-Faúndez & Van Soest (1996).

KEY TO GENERA

(1) Megascleres are oxeas or strongyles of one type only 2
Megascleres are differentiated in ectosomal (diactinal) and choanosomal spicules (usually monactinal, but in any case differently shaped from those of the ectosome) ..... ***Tedania***
(2) Megascleres oxeas ..... ***Hemitedania***
Megascleres thin strongyles ..... ***Strongylamma***

HEMITEDANIA HALLMANN, 1914

Synonymy

Hemitedania Hallmann, 1914: 431.

Type species

Amorphina anonyma Carter, 1886b: 49 (by original designation).

Definition

Tedaniidae with exclusively oxea megascleres.

Diagnosis

Massive; ectosomal skeleton reticulate but without any specialised spicules; choanosomal skeleton composed of plumoreticulate fibres cored by smooth choanosomal oxeas, occasionally with an arenaceous skeleton; oxeas sharply pointed, of a single category; microscleres one or more size categories of onychaetes. Distribution. New South Wales and Victoria, two species.

Remarks

Hallmann (1914) based his description of *Hemitedania anonyma* on 'some twenty specimens' from Port Jackson and neighbouring localities, and furthermore on a specimen from Port Phillip Bay and a slide preparation presented to the Australian Museum by Dendy. It is likely that Hallmann did not examine the original Carter specimens. The BMNH collection holds one alcohol specimen (BMNH 1886.12.15.119) and two dry specimens (BMNH 1886.12.15.390, 466), all labeled 'Amorphina anonyma, Bracebridge Wilson Collection, Port Phillip Heads'. The specimens 390 and 466 appeared to have switched labels (inspected March 1999) and moreover are not conspecific, one (466) appeared to be a *Xestospongia*, lacking the onychaetes. The other (390) conforms to the description of Carter. It seemed the best course to select the alcohol material as the type, although Carter's description is probably based more on the dry material. The BMNH collection also holds several further specimens and slides labeled "*Rhaphisia anonyma*" from the same area described by Dendy (1895). These are not type specimens and have not all been re-examined for the present study. Van Soest (1984b) included in this genus species with thin strongyles answering to *Strongylamma* based on the shared possession of eccentric tyles on the onychaetes (emphasized by Hallmann in his definition of the genus *Hemitedania*). This feature is of much wider occurrence in the family and in view of the asymmetric nature of onychaetes is thought to be without value at the genus level. Desqueyroux-Faúndez & Van Soest (1996) erroneously considered the type species to be one of the 'sand sponges' (i.e., sponges which have replaced part or whole of their skeletal spicule tracts by sand tracts), but this was based on examination of one of Dendy's subsequently named specimens, not on Carter's original specimens. The type specimens do not contain any appreciable build-up of sand tracts and it is dubious whether such specimens belong to *H. anonyma* at all. Desqueyroux-Faúndez & Van Soest (1996) suggested that the genus *Tedaniopsamma* Burton, 1934a may be synonymous with *Hemitedania*. However, after examination of the type of *Tedaniopsamma* (*Hircinia*) *flabellopalmata* (Carter, 1885b) it is clear that this lacks the onychaetes and consequently is referred to Chondropsidae.

Previous reviews

Hallmann (1914), Hooper & Wiedenmayer (1994), Desqueyroux-Faúndez & Van Soest (1996).

Description of type species

Hemitedania anonyma (Carter, 1886b) (Fig. 1A–E).

Synonymy. *Amorphina anonyma* Carter, 1886b: 49; *Rhaphisia anonyma*; Dendy, 1895: 256; *Hemitedania anonyma*; Hallmann, 1914: 431, pl. 18 fig. 4, pl. 19 figs. 1–5, pl. 24 figs. 3–5, text-fig. 20; Hooper & Wiedenmayer, 1994: 414. *Reniera pandaea* Lendenfeld, 1888: 79; *Rhaphisia pandaea*; Whitelegge, 1902: 281. *Halichondria rubra* Lendenfeld, 1888: 81. *Halichondria rubra digitata* Lendenfeld, 1888: 81; *Rhaphisia rubr*a; Whitelegge, 1901: 77.

Material examined. Lectotype (designated herein): BMNH 1886.12.15.119 – preserved in alcohol, Port Phillip Heads, Bracebridge Wilson collection (slide of the holotype labeled: Dendy, coll. 1954.2.12.291 (Fig. 1A)). Paralectotype: BMNH 1886.12.15.390 – dry specimen, same data as the lectotype (Fig. 1B).

Description. Massive, lobate (Fig. 1A–B) to thickly ramose, laterally compressed. Size up to $20 \times 10 \times 10$ cm. Surface smooth. Numerous oscules on the upper parts and at the apex of lobes and branches. Colour possibly orange (based on remarks made by Dendy); in alcohol it is yellow-brown; in the dry state it is beige. Skeleton (Fig. 1E) of the ectosome formed by the brushed endings of the choanosomal tracts, with spicules fanning out and partly becoming tangential. Choanosomal skeleton plumoreticulate, with emphasis on main ascending tracts, which are 30–70 μm in diameter, made up of 4–20 spicules in cross section. Interconnecting tracts irregularly branching off from the main tracts at right angles, thinner and with less coring spicules. Spongin binding the spicules. Between the tracts there are many loose single megascleres and microscleres. Spicules (Fig. 1B–E), oxeas, 242–(257.3)–318 × 4–8 μm (Carter gives a size of 317×10.5 μm); onychaetes in two size categories, 155–188 and 60–65 μm. Distribution and ecology.

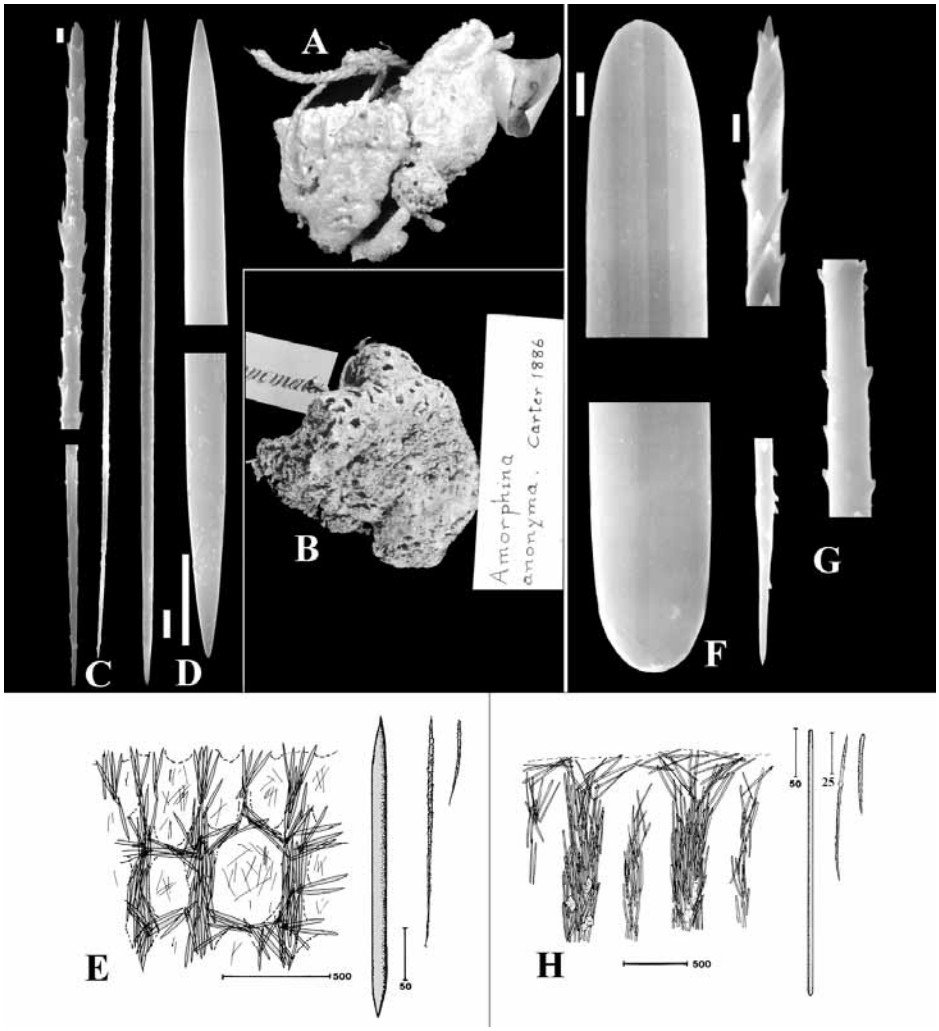

Fig. 1. A–E, *Hemitedania anonyma* (Carter, 1886b as *Amorphina*), type material. A, lectotype (wet, scale 1 cm), B, paralectotype (dry, scale 1 cm). C, SEM photo of onychaete (right, scale 10 μm) and detail (scale 1 μm). D, SEM photo of oxea (right, scale 10 μm) and detail (scale 1 μm). E, drawing of skeleton and spicules made from a slide of the holotype. F–H, *Strongylamma carteri* (Dendy, 1895 as *Chondropsis*). F, SEM photo of strongyle. G, SEM photo of onychaete (scales 1 μm), both made from topotypical specimen. H, drawing of skeleton and spicules made from a slide of the type.

SE Australia, Port Phillip Heads, Port Jackson, Port Stephens, Green Point, Shark Reef, Bass Strait, 7–57 m.

Remarks. In addition to the type species a further SE Australian species may exist, *H. ramosa* (Whitelegge, 1906: 463, as *Rhaphisia*). Hallmann (1917c), who assigned Whitelegge's material provisionally to *Hemitedania*, thought it would need a genus of its own, but judging from Hallmann's redescription the spicule characters (oxeas and onychaetes) perfectly fit with *Hemitedania*. For type specimen information on the various Lendenfeld synonyms see Hooper & Wiedenmayer (1994: 414).

STRONGYLAMMA HALLMANN, 1917

Synonymy

Strongylamma Hallmann, 1917c: 643. *Tedanione sensu* Dendy, 1922b: 100 (not Wilson, 1894: 338). *Hemitedania sensu* Van Soest, 1984b: 52 (not Hallmann, 1914: 431).

Type species

Chondropsis carteri Dendy, 1895: 256 (by original designation).

Definition

Tedaniidae with smooth strongyles as the only megascleres forming a loosely plumose skeleton.

Diagnosis

Encrusting, cryptic, or more massive growth forms. Skeleton of smooth strongyles as the only megascleres forming a loosely plumose skeleton. In one species the spicule bundles are reinforced by sand grains. No ectosomal specialization. Little spongin. Microscleres onychaetes in single or 2 size classes, with or without distinct tyles. Distribution. Victoria, Tropical W Atlantic, W Africa, and Indian Ocean. Three species.

Remarks

Emphasis is placed on the lack of differentiation of the megascleres and feebly-developed spicule bundles. *Hemitedania* also has only a single category of megasclere, but these are oxeas. Moreover, the type species and a second species assigned to *Hemitedania* are elaborate sponges with reticulate skeletons, unlike the thin crusts of *Strongylamma. Tedanione sensu* Dendy, 1922b is a clear synonym, but the type of *Tedanione* (i.e., *T. foetida* Wilson, 1894) is a *Halichondria* (cf. below).

Previous review

Desqueyroux-Faúndez & Van Soest (1996 as *Tedanione*).

Description of type species

Strongylamma carteri (Dendy, 1895) (Fig. 1F–H).

Synonymy. *Chondropsis carteri* Dendy, 1895: 256; *Strongylamma carteri*; Hallmann, 1917c: 643.

Material examined. Holotype (not seen): NMVG2322. Fragment of holotype: BMNH 1902.10.18.166 – slide made from holotype, Port Phillip Heads, South Australia. Other material. BMNH 1933.8.1.1 – specimen and slide, from Port Phillip Heads.

Description. Small, massive, rounded, constricted below and somewhat flattened above. Oscules small and grouped on the upper part. Surface smooth but uneven. Consistency compressible. Colour (alcohol) pale yellowish grey. Skeleton (Fig. 1H) of the ectosome with tangential megascleres and microscleres strewn in confusion. Choanosomal skeleton of wispy loose tracts of strongyles containing also some sand grains. The tracts have a width of ca. 200 μm and are arranged at distances of 100–400 μm. Spicules, strongyles, straight and thin (Fig. 1F–H): 165–(253.5)–303 × 2.5–(2.9)–3.5 μm. Microscleres, two size categories of onychaetes (Fig. 1G–H), tyles not visibly developed: 84–90.8–99 and 42–47.6–54 μm. Distribution. Victoria.

Remarks. Dendy's description does not mention onychaetes, but merely 'long hair-like rhaphides', but Hallmann (1917c: 643) discovered that these were onychaetes when he re-examined the type of Dendy. Under SEM these are clear and unequivocal. This genus is known under the aliases *Tedanione* and *Hemitedania*. Type material of *Hemitedania baki* (ZMA POR. 4766–4768; Curaçao, encrusting on corals, 20–35 m), which answers in all aspects to *Strongylamma*, was compared to Wilson's (1894) description of *Tedanione foetida* from the Bahamas; no original Wilson material has been unearthed so far. Since *Tedanione sensu* Dendy, 1922b is clearly congeneric with *H. baki* it seemed a fair assumption that the latter could be a junior synonym of Wilson's species as they are both from the same broad locality. However, not only are *Tedanione foetida* and *H. baki* clearly different in morphology and spicule size, it has also become clear that *Tedanione* is an unlikely tedaniid. The description and figures of Wilson allow the conclusion that the only spicules likely to be proper to the sponge are oxeas 350 μm long and 'microscleres (oxeas) of varying length', and also that the larvae are uniformly ciliated. Tylotes were also mentioned, but only 'very few' were observed. The description fits perfectly with sponges of the genus *Halichondria* and not with tedaniids on two important counts: *Halichondria* species often have a smaller and a larger category of oxeas whereas tedaniids have differentiated spicules including onychaetes, and *Halichondria* larvae are typically ciliated all-over, whereas tedaniid larvae have a bare posterior pole. At least two species from the general area appear likely candidates as junior synonyms, *H. poa* de Laubenfels (1947) and *H. corrugata* Díaz *et al*. (1993). Until Wilson's material has been traced, it is not possible to draw a firm conclusion about this synonymy. West African waters harbour specimens of *Strongylamma baki* indistinguishable from those of the Caribbean (cf. Van Soest, 1993a, as *Tedanione*), so it is assumed to be the same species. In addition to *S. carteri* and *S. baki* a further species belonging to this genus is the Western Indian Ocean *S. wilsoni* Dendy (1922b: 101, as *Tedanione*). *Tedanione connectens* Brøndsted, 1924 (see also Bergquist & Fromont, 1988) and *T. obscurata* de Laubenfels, 1930 do not conform to the present definition of the genus *Strongylamma* and are referred to *Tedania (Tedania)*.

TEDANIA GRAY, 1867

Synonymy

Tedania Gray, 1867a: 520. *Trachytedania* Ridley, 1881: 122. *Tedaniopsis* Dendy, 1924: 367. *Paratedania* Burton, 1929a: 411. *Xytopsihis* de Laubenfels, 1936a: 54. *Oxytedania* Sarà, 1978: 61.

Type species

Reniera digitata Schmidt, 1862: 73 (by original designation) (=junior synonym of *Halichondria anhelans* Lieberkühn, 1859: 521).

Definition

Tedaniidae with differentiated ectosomal and choanosomal megascleres.

Diagnosis

Massive to lobate; ectosomal skeleton composed of tylotes or tornotes with microspined bases forming tangential or paratangential surface tracts; choanosomal skeleton composed of styles with smooth or microspined bases, producing reticulate, plumo-reticulate, plumose or dendritic architecture; microscleres onychaetes. Distribution cosmopolitan. Approximately 65 species.

Previous reviews

Bergquist & Fromont (1988), Desqueyroux-Faúndez & Van Soest (1996).

Remarks

Three subgenera have been recognized by Desqueyroux-Faúndez & Van Soest (1996): *Tedania s.s*. with basically the spicule complement and arrangement of *T. anhelans*, including microspined ectosomal tylotes and small choanosomal styles <350 μm; *Trachytedania* Ridley, 1881: 122 (type species *T. spinata* Ridley, 1881) with mucronate ectosomal tornotes, and main spicules in the same size range as *Tedania s.s*.; and *Tedaniopsis* Dendy, 1924: 366 (type species *T. turbinata* Dendy, 1924) with variably shaped ectosomal tornotes, and styles (occasionally stylote or oxeote modifications) larger than 350 μm.

Key to subgenera of *Tedania*

(1) Ectosomal megasclere microspined tylotes ..... ***Tedania (Tedania)***
Ectosomal megascleres mucronate tornotes or smooth tylotes 2
(2) Choanosomal megascleres >350 μm ..... ***Tedania (Tedaniopsis)***
Choanosomal megascleres <350 μm ..... ***Tedania (Trachytedania)***

SUBGENUS *TEDANIA* GRAY, 1867

Synonymy

Tedania Gray, 1867a: 520. *Xytopsihis* de Laubenfels, 1936a: 54.

Type species

Reniera digitata Schmidt, 1862: 73 (by original designation) (=junior synonym of *Halichondria anhelans* Lieberkühn, 1859: 521).

Diagnosis

Smooth, relatively small styles, occasionally strongylote styles as structural megascleres and microspined tylotes as ectosomal megascleres. Distribution: predominantly in tropical and warm-temperate waters of all three ocean systems.

Description of type species

Tedania (Tedania) anhelans (Lieberkühn, 1859) (Fig. 2A–F).

Synonymy. ? *Spongia anhelans* Vio in Olivi, 1792: ix–xxxi (fide Schmidt, 1862); *Halichondria anhelans* Lieberkühn, 1859: 521, pl. XI fig. 6; *Myxilla anhelans*; Schmidt, 1862: 72; *Tedania anhelans*: Lévi, 1952: 48; Lévi, 1959: 130, fig. 21; Boury-Esnault, 1971b: 312; Sarà, 1972: 80; Pulitzer-Finali, 1978: 57; Solórzano & Babio, 1979: 55, fig. 11; Pulitzer-Finali, 1983: 561; Van Soest, 1987b: 13, figs 1–4. *Reniera digitata* Schmidt, 1862: 73, pl. VII fig. 11; Desqueyroux-Faúndez & Stone, 1992: 16, figs 175–177; *Tedania digitata*; Gray, 1867a: 520; Topsent, 1920a: 16; Babic, 1922: 245; Topsent, 1932b: 4; Topsent, 1936: 23. *Reniera nigrescens* Schmidt, 1862: 74; Desqueyroux-Faúndez & Stone, 1992: 17, figs. 195–196. *Reniera muggiana* Schmidt, 1868: 28; Desqueyroux-Faúndez & Stone, 1992: 17, fig. 193. *Tedania chevreuxi* Topsent, 1891b: 13, pl. II figs 1–2. *Tedania suctoria, sensu* Arndt, 1941: 12 (not Schmidt, 1875).

Material examined. Lectotype (designation herein): LMJG 15344 – labeled 'Reniera digitata, Venedig' (Venice), alcohol preserved specimen (cf. Desqueyroux-Faúndez & Stone, 1992 pl. XXIX fig. 175). Paralectotype: LMJG 15335 – same locality (cf. Desqueyroux-Faúndez & Stone, 1992 pl. XXIX fig. 176). Other material. ZMA POR. 4863 – Chateau du Taureau, Baie de Morlaix, Bretagne, France.

Description. Massive-ramose (Fig. 2D–E), with irregular branches and flattened fistule-like projections issuing from a thick base. Size up to 10 cm in lateral expansion and elevation. Surface irregular, corrugated. Oscules of ca. 5 mm diameter on the main body as well as on the branches and at the end tubular elevations. Consistency soft, compressible, easily damaged. Colour variably brownish, orange-green, reddish brown and 'blue'. Skeleton of the ectosome consists of bundles of tylotes, partly tangential, partly perpendicular or in surface brushes; individual tylotes are strewn throughout the peripheral regions. Choanosomal multispicular reticulation of styles, spongin indistinct, with many loose spicules. Spicules, ectosomal tylotes (Fig. 2A) with finely spined apices, 140–302 × 2–7 μm; styles (Fig. 2B) smooth, slightly curved: 173–280 × 5–12 μm; onychaetes (Fig. 2C), finely rugose, without a distinctly swollen asymmetrical tyle, in a single but variable size category: 40–220 × 0.5–2 μm (Lieberkühn pictured 2 styles of 240–270 × 7–12 μm and an onychaete of 180 μm). Distribution and ecology. Western and Eastern Mediterranean, NE Atlantic from Bretagne down to Senegal, Azores; shallow-water, on rocks and stones, littoral to 100 m.

Remarks. Lieberkühn (1859) described and figured only styles and onychaetes (Fig. 2F), but Schmidt (1862: 72) found tylotes in Lieberkühn's material. It is remarkable that on the next page, when describing *Reniera digitata*, Schmidt did not refer at all to his description on the previous page of *Myxilla anhelans* for which he described exactly the same spicules. The species has been reported from all over the world, and it is clear that closely similar populations exist over the whole Tethyan region. Recent insights in biogeography and ecology favour the recognition of a series of allopatric (sibling) species (e.g., the Caribbean representatives are known under the name *T. ignis* (Duchassaing & Michelotti, 1864 as *Thalysias*), cf. Fig. 2G), rather than a single cosmopolitan species (cf. Van Soest, 1987b).

The genus *Xytopsihis* de Laubenfels, 1936a was erected for type species *Halichondria aspera* Bowerbank, 1875b: 287) from the Straits of Malacca (by original designation). Bowerbank's description is misleading in giving the spicule combination of tylotes, oxeas, styles, 2 size categories of chelae, sigmas. Not surprisingly, Hofman & Van Soest (1992: 87) misinterpreted the nature of the type specimen. These authors referred it to the genus *Lissodendoryx* (as *L. aspera*), and this was made the senior synonym of a number of species variously known as *Crella schmidti* Ridley (1884a: 432), *Zetekispongia zonea* de Laubenfels (1936b: 446) and *Damiriana hawaiiana* de Laubenfels (1950b: 14). The type specimen and two microscopic slides are kept in the BMNH London, unregistered. It is an irregularly lobate sponge of 8 × 6 × 3 cm, with an irregularly pitted surface. Attached at its undersurface there is a smaller cushion-shaped sponge, size 3 × 2 × 0.5 cm, with a smooth surface. The larger sponge is a *Tedania*, probably matching the description of *T. dirhaphis* Hentschel (1912) which would then become a junior synonym of *T. aspera*. It has microspined tylotes of 224–(247.4)–276 × 4–(4.3)–5 μm, thick smooth styles of 253–(279.1)–302 × 11–(13.5)–15 μm, and two size categories of onychaetes, viz., 221–(303.6)–352 × 2.5–5.5 μm and 50–144 × <0.5 μm (cf. Fig. 2H). No chelae or sigmas were found in this specimen. However, the smaller sponge is a *Lissodendoryx*, identified as *L. ternatensis* (Thiele, 1903a) using Hofman & Van Soest's key to the *Lissodendoryx* of the Indo-Malayan Archipelago (it has tylotes of ca. 180 × 4 μm, styles of ca. 180–200 × 6 μm, two categories of arcuate isochelae, ca. 25 and 15 μm, and two categories of sigmas, 35 and 18 μm). Since the *Tedania* makes up the bulk of the material of *Halichondria aspera* and was obviously the material intended for it by Bowerbank, we are forced to accept that *Tedania aspera* is the type of *Xytopsihis* and this genus is an obvious junior synonym of

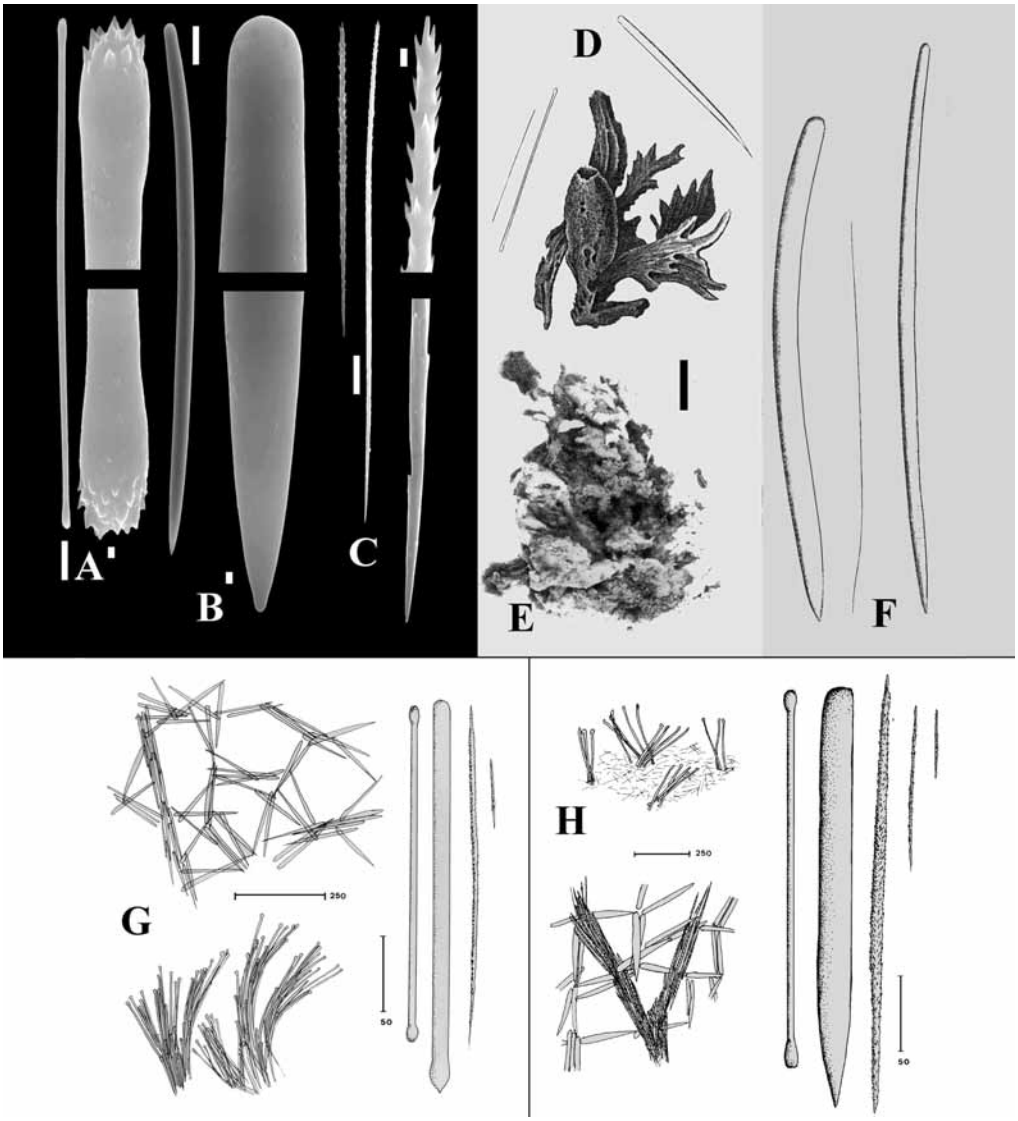

Fig. 2. A–F, *Tedania (Tedania) anhelans* (Lieberkühn, 1859 as *Halichondria*). A–C, spicules of a type specimen of the type of *Tedania*, i.e., *Reniera digitata* Schmidt (1862), considered a junior synonym of *T. anhelans*. A, microspined tylote (left, scale 10 μm) with detail, (scale 1 μm). B, style (left, scale 10 μm) with detail (scale 1 μm). C, onychaetes (left, scale 10 μm) with detail (scale 1 μm). D, Schmidt's drawing of *Reniera digitata*. E, photo of the lectotype of *Reniera digitata* from Desqueyroux-Faúndez & Stone, 1992 (scale 1 cm). F, Lieberkühn's (1869) drawing of the spicules of *Halichondria anhelans* (sizes see text). G, *Tedania (Tedania) ignis* (Duchassaing & Michelotti, 1864 as *Thalysias*), drawing of the skeleton and spicules (reproduced from Van Soest, 1984b). H, *Tedania (Tedania) aspera* (Bowerbank, 1875b as *Halichondria*), type of *Xytopsihis* de Laubenfels (1936a), drawing of skeleton and spicules made from the type.

Tedania (Tedania). Hofman & Van Soest's (1992) use of the species name for *Lissodendoryx* material with oxeas as the structural megascleres is thus incorrect. The name of that species now becomes *Lissodendoryx (Waldoschmittia) schmidti* (Ridley, 1884a).

SUBGENUS *TEDANIOPSIS* DENDY, 1924

Synonymy

Tedaniopsis Dendy, 1924: 367. *Paratedania* Burton, 1929a: 441.

Type species

Tedaniopsis turbinata Dendy, 1924: 367 (by monotypy).

Diagnosis

Relatively long (>350 μm), thick, smooth styles, occasionally modified to anisostrongyles, anisotylotes or anisoxeas as structural megascleres, ectosomal megascleres are mucronate or tylostrongylote tornotes occasionally with one or more vestigial spines. Distribution. Predominantly known from the southern oceans.

Description of type species

Tedania (Tedaniopsis) turbinata (Dendy, 1924) (Fig. 3A–D).

Synonymy. *Tedaniopsis turbinata* Dendy, 1924: 367, pl. XI figs 2–3, pl. XIV figs 31–35.

Material examined. Holotype: BMNH 1923.10.1.148 – Three King Islands, New Zealand.

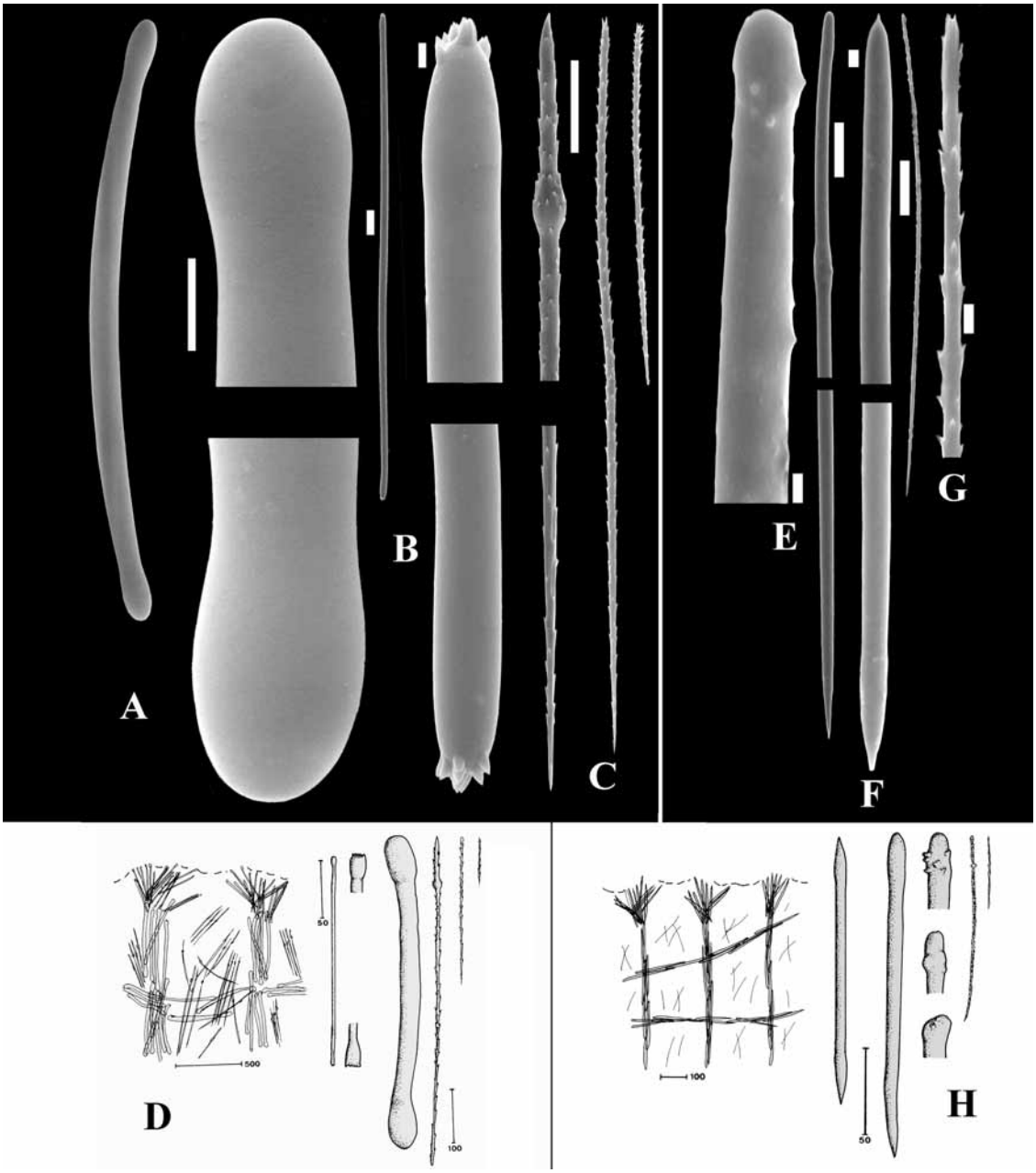

Fig. 3. A–D, *Tedania (Tedaniopsis) turbinata* (Dendy, 1924). A–C, SEM photos of spicules from the holotype (scales 10 μm; except B right, 1 μm). D, drawings of skeleton and spicules made from a slide of the holotype. E–H, *Tedania (Trachytedania) spinata* Ridley (1881). E–G, SEM photos of spicules from the holotype (scales 10 μm; except D left, E and F right. 1 μm). H, drawings of skeleton and spicules made from a slide of the holotype.

Description. Large stipitate sponge forming a thick-walled shallow cup, up to 20 cm high, 14 cm wide. Surface smooth, grooved on the sides. Oscules scattered over inner surface. Colour in alcohol pale yellowish greyish. Skeleton (Fig. 3D) of the surface consists of brushes of tornotes, forming a fringe around each of the oscules. Choanosomal skeleton an irregular reticulation of spicule tracts. Spicules, ectosomal tylotornotes (Fig. 3B, D), inequiended, mostly provided with two or three spines at one end: 340 × 6 μm; choanosomal strongylotylotes (Fig. 3A, D), large and thick, with oval heads: 500 × 25 μm; onychaetes (Fig. 3C–D), finely spined, in two categories, the larger with a clear asymmetrical tyle: 600 × 4 μm and 180 × 2 μm. Distribution and ecology. New Zealand; dredged up from 180 m.

Remarks. *Tedaniopsis* was erected because of the replacement of choanosomal styles by strongylotylotes. However, no similar species with comparable spiculation has been described and thus the generic status is questionable. Nevertheless, the large sizes of the spicules and the irregular skeletal architecture unite the present species with several others, and accordingly Desqueyroux-Faúndez & Van Soest (1996) proposed to recognize a distinct subgenus for them. Species assigned to this subgenus are: *Tedania massa* Ridley & Dendy, 1886 (with junior synonyms *T. actiniformis* Ridley & Dendy, 1886 and *Tedania tantula* (Kirkpartick, 1907a, as *Oceanapia*) (Antarctica, Magellan province); *Tedania charcoti* Topsent, 1917 (Antarctica, Magellan province, SE Pacific); *Tedania infundibuliformis* Ridley & Dendy, 1886 (SE Pacific);

Tedania tenuicapitata Ridley, 1881 (Magellan province, SE Pacific); *Tedania oxeata* Topsent, 1907 (Antarctica); *Tedania vanhoeffeni* Hentschel, 1914 (Antarctica); and *Tedania phacellina* Topsent, 1928c (deep water North Atlantic).

The genus *Paratedania* Burton, 1929a, with type species *Oceanapia tantula* Kirkpatrick, 1907a (by monotypy) (which is probably a junior synonym of *Tedania massa* Ridley & Dendy, 1886) was erected because of a densely packed layer of tangential megascleres, as opposed to the bouquet-type arrangement of all other Tedaniidae. *Oceanapia tantula* (persistently named *tarantula* by Burton, 1929a, 1932b), of which the type specimen BMNH 1908.2.5.198 was examined, is a lobate to erect sponge with smooth anisostrongyles as structural megascleres and tylotornotes with an occasional mucron at one of the apices. The tangential arrangement at the surface, however, was probably entirely induced by the periostracum of mollusc shells on which the specimens were found to be attached, and thus must be considered artifactual. Burton (1932b) withdrew this genus himself, and suggested that the type was a junior synonym of *Tedania massa*. Examination of type material of both revealed some differences in the shape of tornote endings (hastate in *T. massa*), but in view of the variability of this character, conspecificity of both is certainly possible. Both are also similar to *Tedania turbinata*, and accordingly *Paratedania* is considered a junior synonym of the subgenus *Tedaniopsis*.

SUBGENUS *TRACHYTEDANIA* RIDLEY, 1881

Synonymy

Trachytedania Ridley, 1881: 122. *Oxytedania* Sarà, 1978: 61.

Type species

Trachytedania spinata Ridley, 1881: 122 (by monotypy).

Diagnosis

Structural spicules are relatively small styles $<350\,\mu m$, which may show a few spines; ectosomal megascleres are mucronate or oxeote tornotes. Distribution. Predominantly known from the southern oceans, but there are also records from California and from the Arctic.

Description of type species

Tedania (Trachytedania) spinata Ridley, 1881 (Fig. 3E–H).

Synonymy. *Trachytedania spinata* Ridley, 1881: 122, pl. X fig. 10; *Tedania spinata*: Topsent, 1929b: 282, fig. 67; *Tedania (Trachytedania) spinata*: Desqueyroux-Faúndez & Van Soest, 1996: 62, figs 129–134. *Tedania murdochi* Topsent, 1904a: 63; Topsent, 1913b: 629, pl. V fig. 5. *Tedania corticata* Sarà, 1978: 56, figs 34–35. *Tedania laminariae* Sarà, 1978: 54, figs 32–33. *Oxytedania bifaria* Sarà, 1978: 61, figs. 38–39.

Material examined. Holotype: BMNH 1879.12.27.9 – Portland Bay, Chile. Other material. See Desqueyroux-Faúndez & Van Soest (1996: 62).

Description. Massive sponge, size $8–10 \times 3–8$ cm. Surface smooth, covered by a translucent membrane, which is darker than the choanosome. Oscules, 2–3 mm diameter, irregularly scattered. Consistency soft, compressible. Colour of surface dark gray, internally brownish to grayish. Skeleton (Fig. 3H) of the ectosome a dense palisade of tornotes reinforced by the terminal part of styles and abundant onychaetes. Choanosomal skeleton irregular to isotropic reticulation of spicule tracts. Spicules, ectosomal smooth mucronate tornotes (Fig. 3F) abruptly pointed: $120–280 \times 3–6\,\mu m$; choanosomal styles (Fig. 3E) with frequently a few spines on along the upper half: $160–280 \times 3–10\,\mu m$; onychaetes (Fig. 3G) straight, strongly spined, in two size categories: $90–230 \times 2\,\mu m$ and $30–100 \times 0.5\,\mu m$ length. Distribution and ecology. SE Pacific, 39°–50°S; SW Atlantic, 50°–54°S, Falkland Islands; encrusting shells, pebble and sand bottom, 10–69 m.

Remarks. Desqueyroux-Faúndez & Van Soest (1996: 62) reviewed this species extensively. Ridley (1881) emphasized the presence of spines on the heads of part of the styles when describing *T. spinata*. The styles are essentially smooth, but many have a few spines along the shaft. They are not homologous to echinating acanthostyles. The variability and vestigial presence of the spination is paralleled by that of *Lissodendoryx isodictyalis* (Coelosphaeridae). Ridley considered the smooth styles as a separate spicule type, claiming they were also morphologically distinct in having a tapering or mucronate head. Examination of the type as well as redescriptions of topotypical specimens (Topsent, 1929b; Desqueyroux-Faúndez & Van Soest, 1996) did not confirm Ridley's claims. The 'styles' with pointed or mucronate heads are tornotes, which are in the same size range as the styles. The type specimens of *T. murdochi* Topsent, 1904a, *T. corticata* Sarà, 1978 and *T. laminariae* Sarà, 1978 were re-examined and could not be separated from *T. spinata*, on skeletal structure, spicule sizes and form, so their conspecificity is probable. Further species assigned to the subgenus by Desqueyroux-Faúndez & Van Soest (1996) are *Tedania mucosa* Thiele, 1905 (with synonyms *T. excavata* Thiele, 1905, *T. pectinicola* Thiele, 1905 and *T. fuegiensis* Thiele, 1905), *T. patagonica* Ridley & Dendy, 1886, *T. gurjanovae* Koltun, 1958, *T. microrhaphidiophora* Burton, 1935c, and *T. toxicalis* de Laubenfels, 1930.

The genus *Oxytedania* Sarà (1978), with type species *O. bifaria* Sarà, 1978: 61 (by monotypy), was erected for a species with the spicule combination of typical *Tedania* in addition to a reticulate skeleton of oxeas. The type specimen studied by Desqueyroux-Faúndez & Van Soest (1996) did not contain any of the tedaniid spicules described by Sarà. The skeletal architecture was typically that of the haplosclerid family Niphatidae with multispicular tracts of oxeas in a tight reticulation. It is assumed that the genus is based on a contamination of *Tedania spinata* spicules (including styles with a few spines) in a niphatid specimen. Indications for this conclusion are not only Desqueyroux-Faúndez & Van Soest's failure to find any *Tedania*-like spicules, but also the fact that Sarà not only pictured the oxeas as structural megascleres, but also styles of quite dissimilar size and form as a second category of structural megascleres. Two such different structural megasclere categories together in a single sponge are unlikely to occur in a tedaniid. Accordingly this genus is pronounced unrecognizable c.q. a junior synonym of *Tedania (Trachytedania)*. Recent, Cristobo & Urgorri (2001) described a *Trachytedania* species with hymedesmioid skeleton (two size categories of fully spined acanthostyles with heads embedded in a basal spongin plate), which is quite unlike Tedania (*Trachytedania*) spinata in architecture and spiculation. This appears to belong to an undescribed genus of Tedaniidae.