

Family Ietrochotidae Dendy, 1922

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Ietrochotidae Dendy (Demospongiae, Poecilosclerida) is revived in Myxillina with the distinguishing feature being possession of birotula microscleres. Resemblance of birotulas to polydentate chelae of some Myxillidae make it likely that birotulas are derived from anchorate chelae by proliferation of the alae. This is supported by the occurrence of true anchorate isochelae in a few members of the family. From these facts a close relationship between Myxillidae and Ietrochotidae may be concluded. The shape, skeletal architecture and further spicule complement in this family is quite diverse, paralleling that of the larger families of Myxillina. Six genera are considered valid.

Keywords: Porifera; Demospongiae; Poecilosclerida; Myxillina; Ietrochotidae; *Amphiastrella*; *Hymetrochota*; *Ietroata*; *Ietrochopsamma*; *Ietrochota*; *Rotuloplocamia*.

DEFINITION, DIAGNOSIS, SCOPE

Synonymy

Ietrochoteae Dendy, 1922b: 96.

Definition

Myxillina with birotula microscleres.

Diagnosis

Encrusting, massive, fistular, ramose or flabellate sponges; ectosomal skeleton variously consisting of perpendicular or tangentially arranged tornotes or absent; many genera demonstrate a lack of differentiation of megascleres. Choanosomal skeleton reticulate or hymedesmioid. Choanosomal megascleres styles, strongyles, or tylotes, smooth or acanthose. Microscleres birotulas, occasionally also anchorate isochelae and sigmas.

Scope

Eleven nominal genera, six of which are considered valid: *Amphiastrella*, *Hymetrochota*, *Ietroata*, *Ietrochopsamma*, *Ietrochota* and *Rotuloplocamia*

KEY TO GENERA

- | | |
|---|-----------------------|
| (1) No megascleres; the skeleton is a reticulation of sand grains | <i>Ietrochopsamma</i> |
| At least one category of megascleres | 2 |
| (2) Fistular growth form with parchment-like surface made up of intercrossing strongylote or tylote spicules. Choanosomal skeleton vestigial | <i>Amphiastrella</i> |
| Choanosomal skeleton elaborate, reticulated, plocamiid or hymedesmioid | 3 |
| (3) Acanthose megascleres present | 4 |
| Acanthose megascleres absent | 6 |
| (4) Among the acanthose megascleres there are acanthose strongyles and tylotes; skeleton arrangement is plocamiid ... | <i>Rotuloplocamia</i> |
| No acanthostrongyles or -tylotes; skeleton hymedesmioid or reticulate | 5 |
| (5) Thin encrustations. Skeleton hymedesmioid (i.e., with acanthostyles erect on the substrate, points outwards, with shorter acanthostyles in groups at the base | <i>Hymetrochota</i> |
| Massive or lamellar. Skeleton reticulate, no smaller echinating acanthostyles | <i>Ietroata</i> |
| (6) Rectangular reticulation of polyspicular tracts; differentiation in shorter/fatter and longer/thinner spicules which may be either styles or strongyles or both, but these are not functionally localized | <i>Ietrochota</i> |
| Reticulation of single spicules or paucispicular tracts; differentiation into ectosomal tornotes and choanosomal styles | <i>Ietroata</i> |

History and biology

Dendy's section Ietrochoteae so far has been largely ignored by later authors. Genera united by the possession of the peculiar birotulas were assigned to a variety of families (e.g., Desmacididae (*Ietrochota*), Coelosphaeridae (*Amphiastrella*), Myxillidae (*Ietrochota*, *Ietroata*), Hymedesmiidae (*Hymetrochota*), and Microcionidae (*Rotuloplocamia*)). The formal recognition of this group at the family level is made here for the first time. The family is represented in most areas of the world in shallow as well as deeper waters.

Taxonomic remarks

The previous assignments of genera cited above, here considered members of Ietrochotidae, were based usually on features of skeletal architecture. In other families employed here, skeletal architecture is quite diverse, and the possession of the unique birotulas is considered to be a stronger and clearer indication of shared history than broadly similar skeletal features, which are probably strongly related to shape and size of the sponge, and indirectly to habitat and ecology.

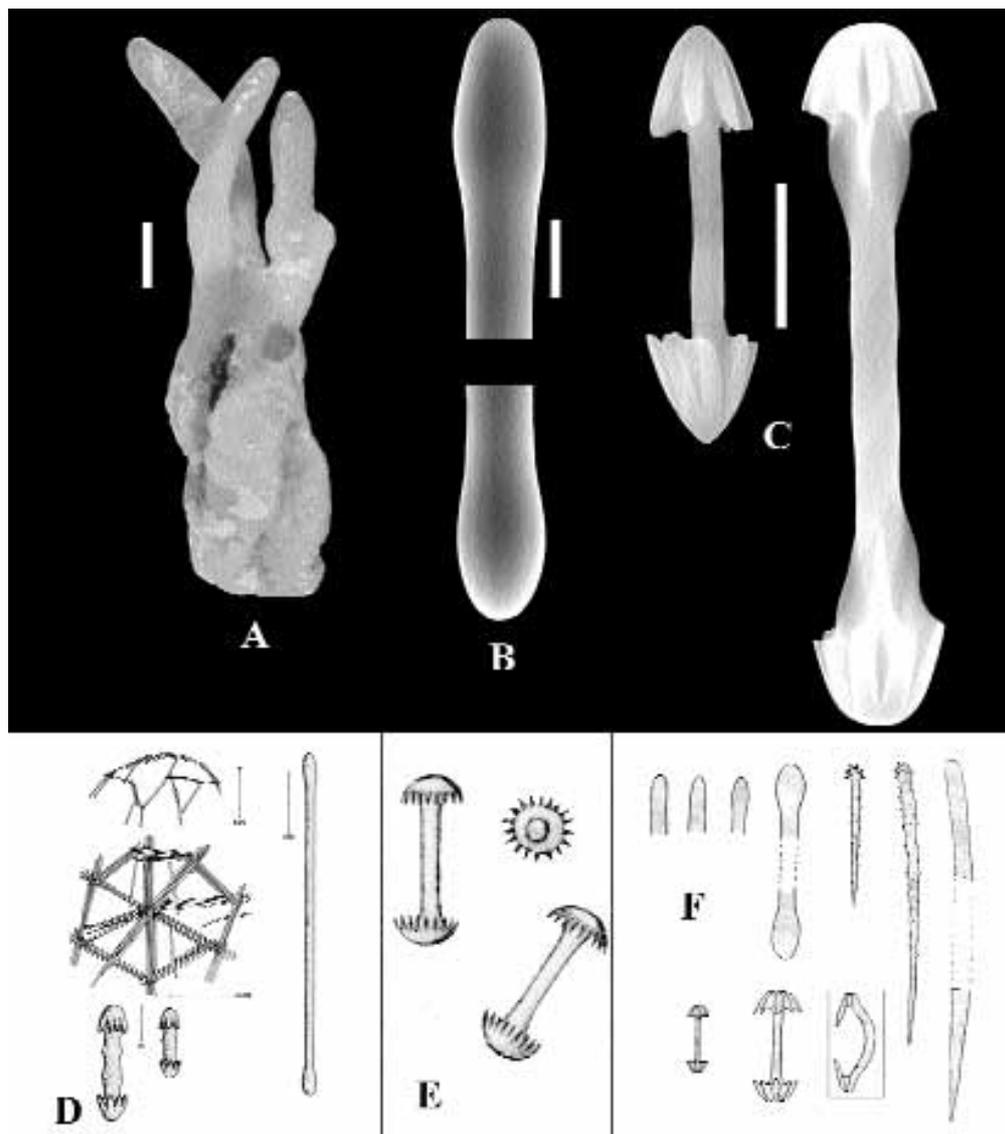


Fig. 1. A–D, *Amphiestrella birotulifera* (Carter, 1886c as *Phloeodictyum*). A, holotype (scale 1 cm). B–C, SEM photos of spicules made from the holotype (scales 10 μ m). D, drawing of skeleton and spicules made from a slide of the holotype. E, *Hymetrochota rotula* Topsent (1904b), drawing of birotulas reproduced from Topsent's plate XIV fig. 6 (size see text). F, *Hymetrochota topsenti* (Burton, 1930 as *Hymenotrocha*), drawing of spicules reproduced from Burton's fig. 4 (encadred chela assumed to be foreign, sizes not recorded).

AMPHIASTRELLA DENDY, 1896

Synonymy

Amphiestrella Dendy, 1896: 27.

Type species

Phloeodictyon birotuliferum Carter, 1886c: 447 (by original designation).

Definition

Iotrochotidae with fistulose hollow shape and tylotes as megascleres.

Diagnosis

Massive, erect, fistulose growth form; choanosomal skeleton consists of diactinal megascleres which are strongyles or tylotes forming an irregular mesh; ectosomal megascleres same as in choanosome, arranged tangential to surface forming a compact dermal layer; microscleres are birotulas and in one species sigmas. Two species, apparently restricted to South Australia and New Zealand.

Previous review

Bergquist & Fromont (1988).

Description of type species

Amphiestrella birotulifera (Carter, 1886c) (Fig. 1A–D).

Synonymy. *Phloeodictyon birotuliferum* Carter, 1886c: 447, pl. X figs 1–5; *Amphiastrella birotulifera*; Dendy, 1896: 27.

Material examined. Syntypes: BMNH 1887.7.11.12 – Westernport Bay, Victoria, Bracebridge Wilson Collection, and 2 slides, BMNH 1887.7.11.12a, and unregistered.

Description. Hollow mass (Fig. 1A) with branching fistules on top and rooting processes at the base (the latter observation is from Dendy, 1896, from an additional specimen). Length of fistular tubes ca. 9 cm, diameter 0.5 cm. Some of the branches of the fistules are open-ended and presumably function as oscules. Surface smooth. Consistency parchment-like, firm. Colour brownish in alcohol. Skeleton (Fig. 1D) of the ectosome a tangential reticulation of spongin enforced spicule tracts, 3–5 spicules in cross section, making rather neat triangular meshes. Choanosomal skeleton virtually absent: a few thin spicule lines traverse the wide internal space, branching infrequently and irregularly. Tylotes are the only megascleres. Spicules (Fig. 1B–D), tylotes, straight, robust, with clearly developed, elongate tyles, smooth, 400–700 × 7–20 μm (Carter mentions a second thinner category with less developed tyles, but it seems they are part of a continuous series); birotulas with relatively thick shaft often constricted in the middle, which may bear an occasional spine, variable in length, probably divisible in two size categories, 17–35 and 51–56 μm; there are a few sigmas of about 40 μm in the slide (also recorded by Dendy), but these are probably foreign. Distribution. Victoria.

Remarks. A second species of this genus is *A. kirkpatricki* Dendy (1924: 371) from New Zealand, differing primarily in the size of the birotulas which are in a single small size category of 17–34 μm (see Bergquist & Fromont (1988: 50) for a subsequent record of that species). These authors considered *Xytopsene* de Laubenfels (1936a) a junior synonym of *Amphiastrella*, but this was based on the statement of de Laubenfels that *Cornulum novaezealandiae* Brøndsted (1924b: 473, fig. 26) should be assigned to *Xytopsene*. Brøndsted's species is a junior synonym of *Amphiastrella kirkpatricki* Dendy (1924). However, the type species of *Xytopsene* is not Brøndsted's species, but *Suberites fistulatus* Carter (1880b: 53, pl. V fig. 22), a clear *Damiria*, making *Xytopsene* a junior synonym of that genus and not of the present one.

Lévi & Lévi (1983b: 966) assigned *Amphiastrella* to their family Cornulidae (subsequently named Iophonidae for priority reasons, cf. Van Soest *et al.*, 1994, but now called Acarnidae, again for priority reasons), while Bergquist & Fromont (1988) maintained it in the family Coelosphaeridae. Neither assignment is here followed because of the possession of the peculiar birotulas shared with the other members of this family. The fistular shape and skeletal organization, although common in the families Coelosphaeridae and Acarnidae, is found in many unrelated sponges. It is considered a functional adaptation to life in sedimented environments.

HYMETROCHOTA TOPSENT, 1904

Synonymy

Hymetrochota Topsent, 1904b: 168. *Hymenotrocha* Burton, 1930c: 506.

Type species

Hymetrochota rotula Topsent, 1904b: 168 (by original designation).

Definition

Iotrochotidae with hymedesmioid arrangement of megascleres, including echinating acanthostyles erect on the substrate.

Diagnosis

Encrusting sponges with hispid surface. Skeleton hymedesmioid. Ectosomal tornotes smooth. Choanosomal spicules are spined styles; auxiliary acanthostyles echinate the substrate. Microscleres are birotulas. Two species, apparently restricted to North Atlantic deep water.

Previous review

Topsent (1904b).

Description of type species

Hymetrochota rotula Topsent, 1904b (Fig. 1E).

Synonymy. *Hymetrochota rotula* Topsent, 1904b: 168, pl. XIV fig. 6.

Material examined. Holotype (not seen): MOM. Fragment of holotype: MNHN D.T. 999 (slide) – labeled 'PA 1897, 152', Azores, Princesse Alice Cruise 1897, 200 m depth.

Description. A thin hispid crust epibiotic on a fistule of *Oceanapia*. Brownish in alcohol. Skeleton. Hymedesmioid, i.e., large acanthostyles stand erect on the substrate surrounded by small acanthostyles. Tornotes scattered singly or occasionally in bundles near the surface. Microscleres abundant in all parts of the sponge. Spicules, tornotes smooth, style-like, with unequally swollen mucronate ends, frequently polytylote, 350–380 × 3 μm; choanosomal acanthostyles, slightly curved, heavily spined with truncate spines on the head, less densely and more finely spined along the shaft, 800–1000 × 10–15 μm; echinating acanthostyles straight, entirely spined, 80–180 μm. Microscleres birotulas (Fig. 1E) with 20, relatively short, teeth, 20–23 μm, umbrella 7 μm (growth stages with reduced teeth and prominent falces). Distribution and ecology. Azores, collected at 200 m.

Remarks. The distinction of this genus from the closely related *Iotroata* rests on the combination of a hymedesmioid skeleton (as opposed to a reticulate one in *Iotroata*), and echinating acanthostyles (absent in *Iotroata*). Both characters are not considered of phylogenetic significance if occurring singly, but in combination they are provisionally considered to unite a monophyletic group. A second species, *H. topsenti* (Burton, 1930c: 506, text-fig. 4) from Stavanger (Norway) is here assigned to *Hymetrochota*. Burton described it under the name *Hymenotrocha*, without indicating that he intended it to be a new genus and in his comments indicated there were 'other species of the genus'. Our assignment of Burton's material to *Hymetrochota* is conditional on the correctness of our assumption that his description includes a mixture of spicules of a *Hymetrochota* and a *Hymedesmia*, tylotes, strongyles, smooth styles, two categories of acanthostyles, arcuate chelae and two sizes of birotulas. His figure is here reproduced (Fig. 1F). No material of this species was found in the BMNH London (although Burton mentions the reg. no. 1910.1.1.2626), so the assignment to *Hymetrochota* remains tentative.

IOTROATA DE LAUBENFELS, 1936**Synonymy**

Iotroata de Laubenfels, 1936a: 87. *Iotaota* de Laubenfels, 1936a: 95. *Sigmarotula* Bergquist & Fromont, 1988: 94.

Type species

Iotrochota acanthostylifera Stephens, 1916: 236 (by original designation).

Definition

Iotrochotidae with an isotropic skeleton; microscleres may include anchorate isochelae.

Diagnosis

Encrusting, massive or flabellate; ectosomal skeleton composed of smooth ectosomal tylotes with mucronate or spined ends, mostly standing erect, sometimes paratangentially, in bundles on the surface; choanosomal skeleton composed of smooth or slightly acanthose styles, sometimes oxeote or absent, forming an isotropic reticulation; fibres are poor but there may be abundant collagen; microscleres are birotulas, anchorate (unguiferous) isochelae and sigmas. About 10–11 species, occurring in northern and southern oceans, but so far not recorded in the tropics.

Previous review

Van Soest (1987b).

Description of type species

Iotroata acanthostylifera (Stephens, 1916) (Fig. 2A).

Synonymy. *Iotrochota acanthostylifera* Stephens, 1916: 236; Stephens, 1920: 29, pl. II fig. 5; *Iotroata acanthostylifera*; de Laubenfels, 1936a: 87.

Material examined. Holotype (slide): BMNH 1953.11.1.89 – from W coast of Ireland.

Description (from Stephens, 1916). Massive encrustation on deep-water corals, up to 2 cm thick. No further data. Skeleton. Choanosomal skeleton is an irregular reticulation of acanthostyles. Ectosomal skeleton consists of tangential bundles of tornotes, which may form longer fibres. Spicules (Fig. 2A), ectosomal tylotes, ends often unequal, one being more elongate, 300–330 × 5 µm; choanosomal acanthostyles, straight or slightly curved, with the head very slightly swollen and thickly spined; a few small spines are scattered along the shaft, 320–350 × 8 µm. Microscleres are polydentate unguiferate chelae with 8–10 teeth at either end, 45–50 µm and birotulas with 15 teeth, about 15 µm. Distribution and ecology. W coast of Ireland, encrusting hard substrates at 450–1300 m.

Remarks. The genus is peculiar because the type species and several other forms (e.g., *Iotroata somovi* (Koltun, 1964b as *Iotrochota*) combine the possession of birotulas with unguiferate-anchorate chelae, thus providing evidence of the likely origin of birotulas from anchorate chelae. The genus is closely related to *Hymetrochota* with which it shares presence and shape of tornotes and spined styles. It differs in having an isotropic reticulation.

De Laubenfels (1936a), after having erected *Iotroata* on p. 87 for thinly encrusting species combining the presence of birotulas and anchorate chelae, some pages further on (p. 95) proposed a further new genus *Iotaota* for species with a reticulate skeleton, tylotes as ectosomal megascleres and birotulas and unguiferate chelae as microsclere. The type was indicated (by original designation) to be *Halichondria abyssii* Carter (1874a); in this genus he included several species already assigned to *Iotroata*, including its type *I. acanthostylifera*, apparently having forgotten his actions on p. 87. It is clear that the two 'genera' are synonyms. The name *Iotroata* was chosen in preference over *Iotaota* because of page priority. The holotype of *Halichondria abyssii* Carter (1874a: 245), BMNH 1890.4.10.4 with slide BMNH 1910.1.1.1393, was examined (Fig. 2B–G). The skeleton consists of smooth oxeas (Fig. 2B, E) and styles (Fig. 2D) for structural megascleres, but is otherwise similar to *acanthostylifera* in having ectosomal tylotes (Fig. 2B) of ca. 250 µm, polydentate chelae of ca. 65 µm (Fig. 2F) and birotulas (Fig. 2G) of ca. 17 µm. Carter reported toxas, but these are here assumed to be contamination because the type slide examined here did not contain them. Likewise, Lundbeck (1905: 195) re-examined the type and did not find them. The genus *Iotroata* has been largely ignored so far, with the exception of a record by Van Soest (1987b: 18) of *Iotroata spinosa* (Lundbeck, 1905: 195), ZMA POR. 4708. This species differs from *I. acanthostylifera* in being thickly flabelliform and in the absence of true chelae, instead of which it has two size categories (33 and 18 µm) of birotulas (Fig. 2H). The choanosomal styles are entirely spined and measure 450–500 × 12–15 µm; they are arranged in a loose reticulation. Further species of *Iotroata* appear to be *I. affinis* (Lundbeck, 1905: 194), *I. oxeata* (Lundbeck, 1905: 186), *I. polydentata* (Lundbeck, 1905: 192), *I. rotulancora* (Lundbeck, 1905: 191, with junior synonym *I. dubia* Lundbeck, 1905: 189), *I. varidens* (Lundbeck, 1905: 185), and *I. somovi* (Koltun, 1964b: 52), all described originally as *Iotrochota*.

The genus *Sigmarotula* Bergquist & Fromont, 1988 was erected (by monotypy) for type species *S. lamellata* Bergquist & Fromont (1988: 94, pl. 44 figs D–F, pl. 45 figs A–D). This was excellently described by these authors; it is an orange-red, lamellate sponge, with ectosomal tylotes of 210–225 × 4–5 µm, choanosomal smooth styles of 360–425 × 7.5–20 µm, birotulas of 12–16.5 µm and sigmas of 36–50 µm. Bergquist & Fromont state that their new genus is quite distinct from other birotula-possessing genera, but it is clearly closely related and synonymous with *Iotroata* because the only difference with several *Iotroata* species, such as *I. polydentata*, is the possession of sigmas. In other Myxillina genera (*Amphiastrella*, *Myxilla*, *Phorbas*) the presence or absence of sigmas is not considered to unite monophyletic groups (the presence of sigmas is considered an ancestral Myxillina character).

IOTROCHOTA RIDLEY 1884**Synonymy**

Iotrochota Ridley, 1884a. *Hiattrochota* de Laubenfels, 1950b: 20. *Iotrochostyla* de Laubenfels, 1954: 150.

Type species

Halichondria birotulata Higgin, 1877: 296 (by subsequent designation; de Laubenfels, 1936a: 48).

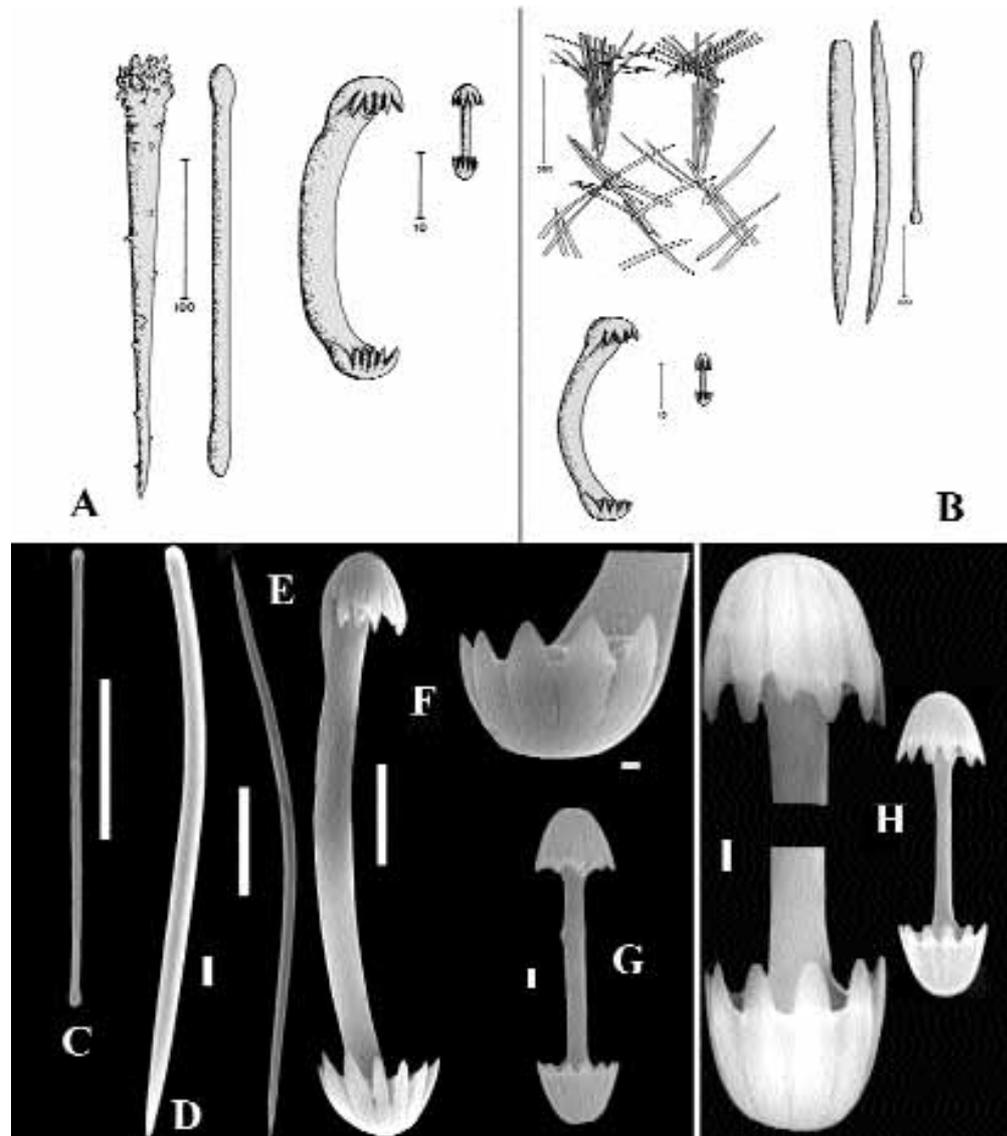


Fig. 2. *Iotroata* spp. A, *Iotroata acanthostylifera* (Stephens, 1916 as *Iotrochota*), drawing of skeleton and spicules made from a slide of the holotype. B–G, *Iotroata abyssii* (Carter, 1874a as *Iotrochota*), type of *Iotroata*. B, drawing of skeleton and spicules made from a slide of the holotype. C–G, SEM photos of spicules made from the holotype (scales: C–E, 100 μ m; F, 10 μ m; G, 1 μ m). H, *Iotroata spinosa* (Lundbeck, 1905 as *Iotrochota*), SEM photos of two size categories of birotulas (scale 1 μ m) made from a ZMA specimen.

Definition

Iotrochotidae with smooth megascleres normally differentiated in two categories, longer and thinner monactinal (styles) or diactinal spicules (usually strongyles) and shorter and thicker styles or diactinal spicules, which do not have distinct localization in ectosomal and choanosomal regions.

Diagnosis

Encrusting, massive, digitate or bushy growth forms, often black colouration with a purple stained mucus; ectosomal skeleton thick, difficult to detach, composed of single spicules or poorly defined short tracts of spicules; choanosomal skeleton a regular reticulation of multispicular tracts; spongin maybe well-developed and is usually darkly pigmented; megascleres are smooth

choanosomal styles, or oxeas, or only strongyles inside fibres (all about the same size, without definite localization of strongyles in the ectosomal skeleton); microscleres are birotulas. About 10–15 species, predominantly recorded from tropical waters, but at least one species is from the Arctic.

Previous reviews

Ridley (1884a: 433), Wiedenmayer (1977b: 138), Van Soest (1984b: 38).

Description of type species

Iotrochota birotulata (Higgin, 1877) (Fig. 3A–D).

Synonymy. *Hyrtios musciformis* Duchassaing & Michelotti, 1864: 75, pl. 14 fig. 3; Van Soest, 1984b: 38 (senior synonym proposed for suppression by Wiedenmayer, 1977b: table 48).

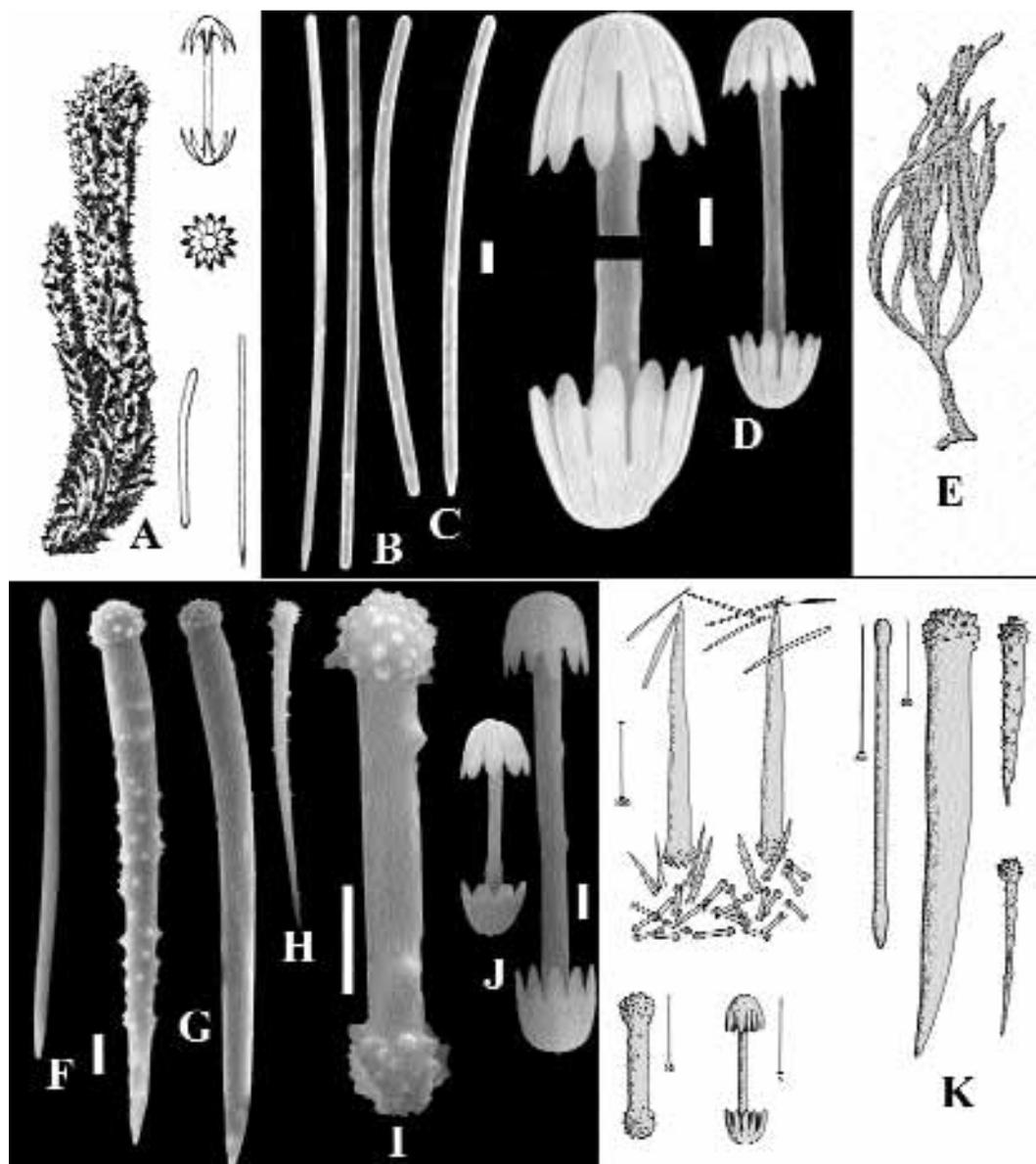


Fig. 3. A–D, *Ietrochota birotulata* (Higgin, 1877 as *Halichondria*). A, drawing of habit and spicules copied from Higgin, 1877 (sizes see text). B–D, SEM photos of spicules made from the lectotype (scales: B–C, 10 μm ; D, 1 μm). E, *Ietrochopsamma arbuscula* (Whitelegge, 1906 as *Ietrochota*), habit, copied from Whitelegge (1906) (size see text). F–K, *Rotuloplocamia octoradiata* Lévi (1952). F–J, SEM photos of the spicules made from a ZMA specimen (scale 10 μm ; except E, 1 μm). K, drawing of skeleton and spicules made from the holotype.

Halichondria birotulata Higgin, 1877: 296, pl. 14 figs 11–15.
Ietrochota birotulata; Ridley, 1884a: 433; Van Soest, 1984b: 38, pl. V, figs 1–2, text-fig. 11. *Hircinia atra* Whitfield, 1901: 49, pl. 5.
 ? *Ietrochota imminuta* Pulitzer-Finali, 1986: 141, figs 62–63.

Material examined. Lectotype: BMNH 1877.3.9.1 – dry specimen from Jamaica. Paralectotype: BMNH 1877.3.9.2 – 2 slides from BMNH collection. Other material. Many specimens from the ZMA collection (see list in Van Soest, 1984b).

Description. Encrusting, massive-lobate, with repent branches, or large branching bushes (Fig. 3A). Surface conulose (sharp conules in dry specimens), but may be smooth for extended areas. Length of branches up to 50 cm or more, diameter 1–5 cm; encrustations may be as thin as 1 mm. Consistency tough and resilient, barely compressible. Colour black, typically mottled with light green patches; occasionally entirely light yellow-green. When

squeezed, it gives off a dark exudate. Many specimens are infested by yellow or orange zoanths. Ectosomal skeleton an organic crust with scattered loose megascleres. Choanosomal skeleton a rectangular reticulation of thick spicule tracts, diameter 35–100 μm , mesh size 100–700 μm . Strongyles and styles are mixed in the tracts. Many loose scattered megascleres. Spicules (Fig. 3A–D) two types of megascleres are present (Fig. 3B–C), occurring both in a continuous range from relatively long and thin to relatively short and fat; strongyles, 140–230 \times 3–5 μm , and styles, 140–240 \times 3–6 μm ; birotulas (Fig. 3A,D), 10–15 μm . Distribution and ecology. Caribbean, reefs down to 90 m, lagoons, mangroves.

Remarks. Localization of styles and strongyles reported by Bergquist (1965) cannot be confirmed. Strongyles (presumably derived from tornotes) and styles (presumably the choanosomal megascleres) are intermingled throughout the sponge. *Hyrtios*

musiformis Duchassaing & Michelotti (1864), type specimen ZMA POR. 1427, redescribed by Van Soest (1984b: 38) is a clear senior synonym of *Halichondria birotulata*, but the proposal by Wiedenmayer (1977b: table 48, footnote f) to suppress this name under ICZN Article 79c in favour of stability is here endorsed. *Iotrochota imminuta* Pulitzer-Finali (1986) was erected for specimens resembling *I. birotulata* in most aspects, but are lacking birotulas and styles. Wiedenmayer (1977b) also discussed such specimens and concluded that they are merely destitute representatives of *I. birotulata*. That is also endorsed here. However, Pulitzer-Finali's material could also belong to chondropsid genera as *Chondropsis* or *Strongylacidon*.

Lundbeck's North Atlantic deep water species described as *Iotrochota* are all referred to *Iotrochota*, due to the fact they have ectosomal tornotes morphologically distinct from megascleres of the choanosome.

The genus *Hiattrochota* de Laubenfels, 1950b was erected for *H. protea* de Laubenfels (1950b: 20, fig. 12) (original designation). The type specimen USNM 22750 was re-examined. It has both styles and strongyles, as well as birotulas and it is entirely unclear why this was considered distinct from *Iotrochota*. Also the widespread *Iotrochota baculifera* Ridley, 1884a (type specimen BMNH 1882.2.23.315 re-examined) was assigned to this genus. Subsequently *H. ditrochota* de Laubenfels (1954: 122), *H. hiatti* de Laubenfels (1954: 125), and *H. mystile* de Laubenfels (1954: 126) were added. The genus allegedly differs from *Iotrochota* proper in having no size distinction between monactinal and diactinal spicules. This is considered of minor importance.

Likewise, *Iotrochostyla* de Laubenfels, 1954 was erected for type species (by original designation) *I. iota* de Laubenfels (1954: 150, fig. 97), and the Alaskan species *Iotrochota magna* Lambe (1894: 120, pl. III fig. 2), based on the lack of diactinal megascleres. This is also considered a minor feature. Both *I. iota* (type specimen USNM 22909) and *I. magna* indeed appear to have a majority of styles as megascleres ($125 \times 4 \mu\text{m}$ in the type, 438×24 and $240\text{--}333 \times 6\text{--}9 \mu\text{m}$ in *I. magna*), but these are clearly differentiated in a longer-thinner and shorter-thicker category. Moreover, the two species differ considerably in appearance and spicule sizes, and appear not at all closely related. If more than one species of *Iotrochota* would be extant with exclusively styles, *Iotrochostyla* may be conveniently recognized as a subgeneric unit.

IOTROCHOPSAMMA DE LAUBENFELS, 1954

Synonymy

Iotrochopsamma de Laubenfels, 1954: 127.

Type species

Iotrochota arbuscula Whitelegge, 1906: 482 (by original designation).

Definition

Iotrochotidae lacking megascleres.

Diagnosis

Ramose; ectosomal skeleton finely reticulate, porous, arenaeous; choanosomal skeleton composed of an open reticulate

network of heavy spongin fibres, with long ascending primary fibres and shorter transverse secondary fibres both cored with sand grains and foreign spicule fragments; megascleres are absent; microscleres are birotulas. A single species from South Australia.

Previous review

De Laubenfels (1954).

Description of type species

Iotrochopsamma arbuscula (Whitelegge, 1906) (Fig. 3E).

Synonymy. *Iotrochota arbuscula* Whitelegge, 1906: 482, pl. XLIV fig. 18. *Iotrochopsamma arbuscula*; de Laubenfels, 1954: 127.

Material examined. None. Holotype: AM – 'Thetis' Collection, stat. 41, (fide Hooper & Wiedenmayer, 1994).

Description (from Whitelegge, 1906). Dichotomously ramose sponge with a stem of 7.5 cm and dividing branches of up to 24 cm long. Stem and branches are 0.7–3 cm in diameter. Colour grey. Skeleton. Rectangular reticulation of spongin fibres cored by sand grains, no proper megascleres. Fibres 80–150 μm in diameter, meshes 250–500 μm . Spicules exclusively birotulas, 20 μm . Distribution and ecology. New South Wales coast, South Australia, trawled from some depth.

Remarks. The complete absence of megascleres is here considered as sufficient evidence for a separate status of this monotypical genus. If similar specimens or species with sand columns, but including proper megascleres, would be found the genus may be merged with *Iotrochota*, with which it shares the rectangular reticulation. A striking similarity is apparent between myxillid *Psammochela chaliniformis* Carter (1885) and iotrochotid *Iotrochopsamma* in the absence of megascleres and the small polydentate microscleres.

ROTULOPLOCAMIA LÉVI, 1952

Synonymy

Rotuloplocamia Lévi, 1952: 51.

Type species

Rotuloplocamia octoradiata Lévi, 1952: 51 (by monotypy).

Definition

Iotrochotidae with plocamiid skeletal structure, including basal acanthostrongyles and echinating acanthostyles.

Diagnosis

Thin encrustations with basal reticulation of acanthostrongyles on the nodes of which long styles stand erect surrounded by short acanthostyles. Tornotes are anisostrongyles or subtylotes arranged in erect bundles. Microscleres birotulas. A single species from the Eastern Atlantic.

Previous reviews

Desqueyroux-Faúndez & Van Soest (1996).

Description of type species

Rotuloplocamia octoradiata Lévi, 1952 (Fig. 3F–K).

Synonymy. *Rotuloplocamia octoradiata* Lévi, 1952: 51, figs. 15–16; Van Soest, 1993a: 213, table 5. *Plocamiancora* spec. Solórzano *et al.*, 1991: 182, fig. 4.

Material examined. Holotype: MNHN DCI. 1271 – Sénégal. Other material. ZMA 6688 – Mauritania Expedition, stn. 49/5. ZMA 6706 – Mauritania Expedition, stn. 49/18.

Description. Extremely thin, encrusting the undersurface of stones or insides of dead shells, not easily detached; several square cm in lateral expansion. Surface optically smooth, slightly hispid. Consistency firm. Colour yellow-orange or reddish orange. Skeleton (Fig. 3K). acanthostrongyles form a basal, somewhat obscured isotropic reticulation. Upon it large acanthostyles are standing singly and erect, surrounded by groups of shorter acanthostyles. The ectosomal tornotes occur in dense bundles perpendicular and paratangential near the surface forming a more-or-less dense crust. Spicules (Fig. 3F–K). Megascleres ectosomal tornotes in the form of styles or subtylotes (subtylostyles with mucronate pointed end, Fig. 3F, K). smooth, $130\text{--}220 \times 4\text{--}5 \mu\text{m}$; large styles (Fig. 3G, K) with strongly rugose heads and smooth curved shafts, $360\text{--}740 \times 13\text{--}20 \mu\text{m}$; short, echinating acanthostyles (Fig. 3H, K), with heavily rugose heads and lightly spined shafts, $120\text{--}275 \times 9\text{--}16 \mu\text{m}$;

dumbbell-type acanthostrongyles (Fig. 3I, K) with swollen and rugose heads and only a few spines on the shaft, $40\text{--}120 \times 8\text{--}12 \mu\text{m}$. Microscleres birotulas (Fig. 3J, K) with 8 teeth on each umbrella, probably in two size categories, $5\text{--}12 \mu\text{m}$. Distribution and ecology. West Africa, Atlantic coast of Spain, cryptic habitats in shallow water down to 30 m depth.

Remarks. There are a few discrepancies between Lévi's (1952) and the ZMA material on the one hand, and the North Spain material described as *Plocamiancora* spec. by Solórzano *et al.* (1991) in the shape of the tornotes and the size of the large styles. However, the tornotes are variable in shape in the West African specimens, so these differences are considered infraspecific variation. *Rotuloplocamia octoradiata* has the plocamiid skeletal structure considered in the past (Topsent, 1928c; Burton, 1935a) a synapomorphy for a separate and polyphyletic family Plocamiidae. However, the diverse spiculation of the various forms has caused their current assignment to several unrelated Myxillina families, as well as to some Microcionina families. The genus is considered to be valid despite its monotypical status because it differs from other birotule-bearing genera in the possession of dumbbell-type acanthostrongyles forming the isotropic basal skeleton. This type of skeleton is considered ancestral (cf. above) to Myxillina, and also represented in Microcionina families Acarnidae, Microcionidae and Raspailiidae.