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Family Aplysinellidae Bergquist, 1980

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Aplysinellidae Bergquist (Demospongiae, Verongida) are characterised by having a dendritic fibrous skeleton in which both bark and pith elements are present, either component can be significantly reduced. Fibres can be augmented by free fibrous spicules. Three valid genera widely distributed in the Indo-Pacific.
Keywords: Porifera; Demospongiae; Verongida; Aplysinellidae; *Aplysinella*; *Porphyria*; *Suberea*.

DEFINITION, DIAGNOSIS, SCOPE

Synonymy

Aplysinellidae Bergquist, 1980b.

Definition

Verongida with dendritic skeleton made up of fibres with both bark and pith elements represented, both components can vary in the relative proportion of the fibre section that they constitute Some species exhibit a different surface to interior pigmentation in life which remains discernable in alcohol, this is unusual within the Verongida. Free fibrous spicules augment the fibre skeleton in one genus (*Aplysinella*). Fibre mass in relation to soft tissue volume varies from strongly fibrous (*Porphyria*), to predominance of collagenous matrix (*Suberea*). Choanocyte chambers are diplodal, small and spherical.

Scope

Three genera are recognised, their distribution is Red Sea, Indo-Pacific, Australian tropical and warm temperate regions. Several species now grouped within *Aplysina* and *Pseudoceratina* need to be transferred to aplysinellid genera, mainly to *Suberea.* No comprehensive revision has been undertaken at this time. Nine species are currently described in the family.

History and biology

Aplysinellidae was established by Bergquist (1980b) to accommodate Verongida which had a dendritic skeleton and huge variability in the ratio of bark to pith in the fibrous skeleton, fibrous spicules were also present in the type genus *Aplysinella*.

Remarks

When the family Aplysinellidae was established the taxon included, either as good genera or as synonyms, forms in which no bark elements were present in the fibres (i.e., *Pseudoceratina* Carter, *Psammaplysilla* Keller, *Druinella* Lendenfeld, *Korotnewia* Polejaeff), as well as forms with both bark and pith fibrous components. Wiedenmayer (1989) reported the rediscovery of *Druinella rotunda* Lendenfeld, the type and only species placed initially within Lendenfeld's family Druinellidae (now Pseudoceratinidae). He claimed, correctly on the published information at the time, that the Aplysinellidae in toto constituted a junior synonym of the Druinellidae. He recognised *Druinella*, with *Psammaplysilla* as a synonym, as a genus distinct from *Pseudoceratina*. Further genera were added to the Aplysinellidae by Bergquist (1995), who did not use the name Druinellidae. Aware of the diversity of species being discovered, but remaining undescribed that fall within this group, and of the consistency of fibre morphology within two distinct groups of verongids with overall dendritic skeletons, Bergquist had decided to separate the Aplysinellidae and Druinellidae, the former to contain *Aplysinella, Suberea* and *Porphyria*, and the Druinellidae to contain *Pseudoceratina* (with synonyms *Druinella* and *Psammaplysilla*) and *Korotnewia*. Comment on *Aiolochroia,* stated earlier to be a synonym of *Pseudoceratina* (Bergquist 1980b) is made elsewhere in this work. Publication of this new arrangement is in process at the time of writing,

Previous reviews

Bergquist, 1980b; Wiedenmayer, 1989; Bergquist, 1995.

KEY TO GENERA

(1) Fibre skeleton includes free fibrous spicules ..... ***Aplysinella***
Fibrous spicules absent 2
(2) Fibre skeleton strongly represented, bark dominant in fibres ..... ***Porphyria***
Fibre skeleton sparse, pith dominant in fibres ..... ***Suberea***

APLYSINELLA BERGQUIST, 1980

Synonymy

Aplysinella Bergquist, 1980b.

Type species

Aplysinella strongylata Bergquist, 1980b: 496 (by original designation).

Definition

Aplysinellidae with differential pigmentation in life between surface and interior, fibres of characteristic construction having both bark and pith components, the latter being dominant, and fibre skeleton augmented by strongylote fibrous spicules. The spicules are composed only of bark and have a clear axial canal.

Previous reviews

Bergquist, 1980b; Wiedenmayer, 1987; Bergquist, 1995.

Description of type species

Aplysinella strongylata Bergquist (Fig. 1).

Synonymy. *Aplysinella strongylata* Bergquist 1980b: 496.

Material examined. Holotype: BMNH SE1231. Paratype: BMNH SECG.

Description. A pedunculate sponge, knobbed or lamellate, 6.5 cm high, stalk 0.5–0.7 cm diameter, terminal knob 2.9 cm. across (Fig. 1A). Colour deep maroon–red to flesh pink externally, beige internally, texture rubbery, compressible. Surface conulose, oscules apical, surrounded by a contractile membrane. Skeleton composed of dendritic fibres, sparse in relation to the soft tissue except in the stalk, supplementary fibre spicules are abundant throughout. Fibres 400–550 μm diameter, pith 300–480 μm diameter. Spicules are irregular nubbins of spongin, always strongylote and lacking pith, 200–800 μm long, 20–100 μm thick, always with a clear axial canal (Fig. 1B–C). Ectosome strongly collagenous, 400–500 μm deep, endosome dense, collagenous. Choanocyte chambers spherical, 15–20 μm in diameter.

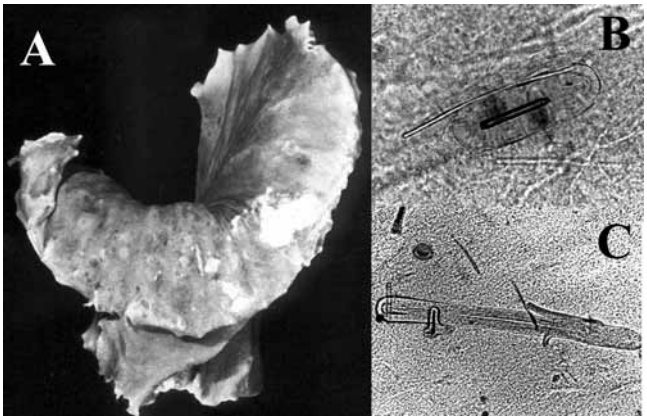

Fig. 1. *Aplysinella strongylata*. A, paratype. B–C, light micrograph of spongin spicules.

Remarks. The development of free fibre spicules in *Aplysinella* is an example of development of a secondary skeleton in a sponge with weak fibre development. This is a similar case to that of *Darwinella*, but *Igernella*, which also has fibrous spicules, has a well developed fibre skeleton thus no general inference can be drawn.

Distribution

Sele Strait, Irian Jaya, Indonesia.

PORPHYRIA BERGQUIST, 1995

Synonymy

Porphyria Bergquist, 1995.

Type species

Porphyria flintae Bergquist, 1995: 38 (by original designation).

Definition

Aplysinellidae with the typical dendritic skeleton with fibres having short, often flexuous branches and reduced pith component. Fibres are abundant. The sponge is in the form of a goblet and is a rich purple colour externally.

Previous reviews

Bergquist (1995).

Description of type species

Porphyria flintae Bergquist (Fig. 2).

Synonymy. *Porphyria flintae* Bergquist, 1995: 38

Material examined. Holotype: QMG304700 (ORSTOM R193). Paratypes: ORSTOM R340, R246.

Description. Stalked goblet-shaped sponge with distinct oscular and poral faces, 7 cm high, 7 cm across, stalk 0.5 cm thick

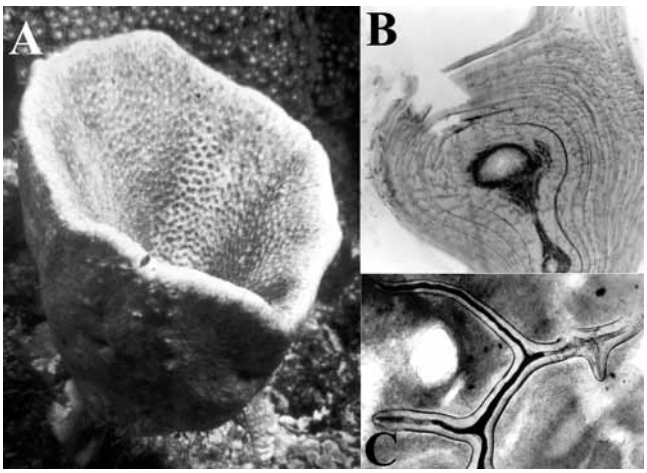

Fig. 2. *Porphyria flintae*. A, holotype *in situ*, 35 m depth (photo Pierre Laboute). B, photomicrograph of fibre in cross section. C, photomicrograph showing fibre structure and pattern.

(Fig. 2A). Specimens up to 20 cm high have been recorded. Colour pale to deep purple externally, cream/beige internally, in spirit purple black. Texture rubbery, firm, but compressible. Interior surface smooth, exterior roughened by low conules. Skeleton is made up of slender dendritic fibres ramifying from a centre basal stalk, fibres are of even dimension, 60–80 μm thick, tapering to points, 15 μm diameter near the surface, branch fibres short, 30–350 μm long, flexuous, often pointed. Pith occupies up to one quarter of the fibre thickness, bark very dense, tightly laminated (Fig. 2B–C). Ectosome a well marked region, 110–140 μm deep, choanosome evenly collagen-reinforced, choanocyte chambers diplodal, spherical, 15–30 μm diameter.

Remarks. *Porphyria* is distinct from other Aplysinellidae in having abundant branched fibres with reduced pith component, brilliant pigmentation and goblet shape. One sulphur yellow specimen has been recorded among the thirty, otherwise brilliant purple specimens photographed in the field.

Distribution

Known only from New Caledonia.

SUBEREA BERGQUIST, 1995

Synonymy

Suberea Bergquist, 1995.

Type species

Suberea creba Bergquist, 1995 (by original designation).

Definition

Aplysinellidae with coarse irregular dendritic fibres in which bark and pith elements are present but the pith predominates. The bark is strongly laminated and very brittle. Fibres can be very thick and render the texture of the sponge interior very rough to the touch. Dense collagen reinforces the matrix, making the sponges hard, to just compressible. The surface is smooth or conulose and the sponge form massive, sometimes stalked or branching. With the addition of the species referred below, there are eight described species of *Suberea*.

Previous review

Bergquist, 1995.

Description of type species

Suberea creba Bergquist (Fig. 3).

Synonymy. *Suberea creba* Bergquist, 1995: 41.

Material examined. Holotype: QMG304702 (ORSTOM R1280).

Description. A massive, spreading sponge covering an area 10 × 15 cm to a depth of 3–4 cm (Fig. 3A). Colour bright yellow, in spirit purple–black, texture hard, cork-like. Surface smooth, thrown into low mounds conferring a tuberculate appearance.

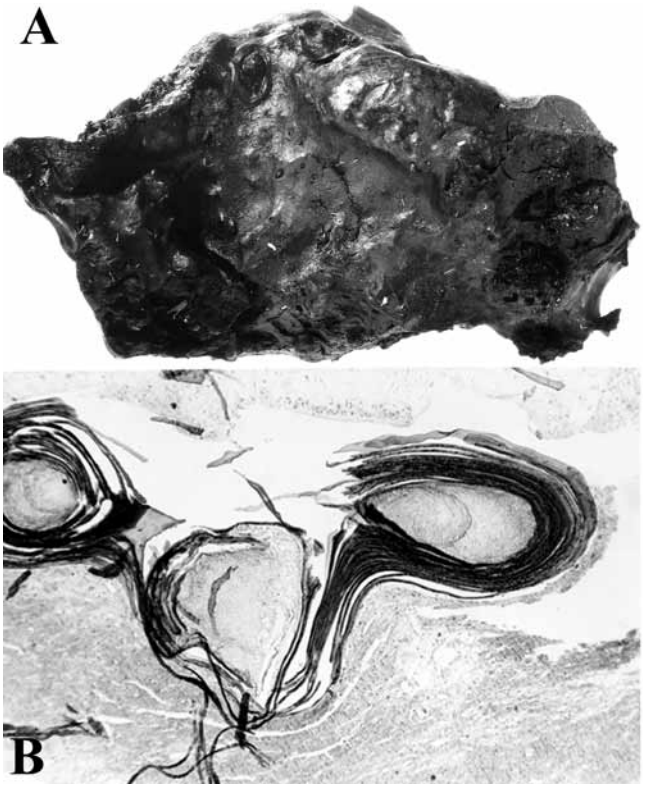

Fig. 3. *Suberea creba*. A, holotype. B, photomicrograph of fibre in cross section.

Skeleton is dendritic, sparse, with fibres usually circular to oval in section having bark and pith, the latter constituting about three quarters of the fibre diameter (Fig. 3B). Fibres 120–150 μm diameter. Ectosome strongly collagenous, 500–600 μm deep, sharply distinct from the choanosome which is evenly collagen-reinforced. Choanocyte chambers 15–20 μm diameter.

Remarks. Recognising the distinctness of the group of species here treated under the genus *Pseudoceratina* Carter, by emphasising fibre structure, and separating them in a family Pseudoceratinidae, has made the genus *Suberea* easy to identify despite external similarities between the two genera.

Distribution

Recorded originally with the description of two species, *creba* and *laboutei* from New Caledonia, the genus *Suberea* includes *Pseudoceratina clavata* Pulitzer-Finali from the Great Barrier Reef, *Aplysina mollis* Row from the Red Sea, *Aplysina ianthelliformis* Lendenfeld from SE Australia, *Aplysina fusca* Carter from SW Australia and *Aplysina pedunculata* Lévi from South Africa. All have been re-examined and confirmed as having the skeletal pattern and fibre structure of *Suberea*. *Aplysina aztecus* from the Pacific coast of Mexico was referred to *Suberea* by Maldonado & Young (1998b) and undescribed collections from Fiji confirm the occurrence of the genus there also. A number of additional species, mainly described in *Aplysina*, require re-examination to confirm the generic assignment. Distribution is widespread Indo-pacific.