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Family Diapleuridae Ijima, 1927

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Diapleuridae Ijima (Hexactinellida, Lychniscosida) consists of a single genus, *Scleroplegma* Schmidt, with two species. Restudy of most known specimens of Schmidt's *Scleroplegma lanterna* (=preoccupied *Auloplegma lanterna*) confirms that it is congeneric with Ijima's type genus *Diapleura*. *Diapleura* thus becomes a junior synonym of *Scleroplegma*, but Ijima's family name, Diapleuridae, is maintained following ICZN rules. The family is distinguished from the other living lychniscosidan family, Aulocystidae, by basic construction – interpretable either as a thick-walled cup with schizorhyses or as a radial set of branching and anastomosing tubules sharing fused walls. Lychnisc dictyonalia of Diapleuridae are not arranged in rectangular array or in ranks as in Aulocystidae. Loose spiculation of *Scleroplegma*, first described here, is similar to that of Aulocystidae. The two species are tropical in distribution, *S. lanterna* restricted to the West Indies, and *S. maasi* restricted to Indonesia. Depth range is 204–585 m, excluding a questionable record of 1383 m.
Keywords: Porifera; Hexactinellida; Lychniscosida; Diapleuridae; *Scleroplegma*.

DEFINITION, DIAGNOSIS, SCOPE

Synonymy

Diapleuridae Ijima, 1927: 314. Aulocystidae (in part); de Laubenfels, 1936a: 187 (type genus *Scleroplegma* Schmidt, 1880b: 56 (Fig. 1)).

Definition

Lychniscosida with body in form of thick-wall cup, cone or cylinder, the walls of which can be viewed either as a continuous framework channelized by schizorhyses (negative space view) or as a radial set of branching and anastomosing tubules sharing fused walls (constructional component view); lychnisc-dictyonalia are arranged irregularly, not in rectangular array or ranks.

Diagnosis

Monogeneric (see genus definition).

Remarks

The family was erected by Ijima (1927) for a new lychniscid, *Diapleura maasi*, differing in basic framework organization from *Neoaulocystis* (then *Aulocystis*). The body was not constructed of obvious tubular elements, and lacked the rectangular arrangement of lychnisc nodes. The family was transferred to subfamily status within Aulocystidae by de Laubenfels (1936a) but has been treated by later workers in Ijima's original sense, as a distinct family (Hartman, 1982; Pisera, 1997). Although the type genus, *Diapleura*, is here transferred to a junior synonym of *Scleroplegma* Schmidt, Ijima's original family name is retained following ICZN rules (Anon, 1999).

Scope

Monogeneric. Family distribution is that of the sole genus.

SCLEROPLEGMA SCHMIDT, 1880

Synonymy

[*Auloplegma*] Schmidt, 1879: pl. III, fig. 17 (preocc.). *Scleroplegma* Schmidt, 1880b: 56. *Diapleura* Ijima, 1927: 314.

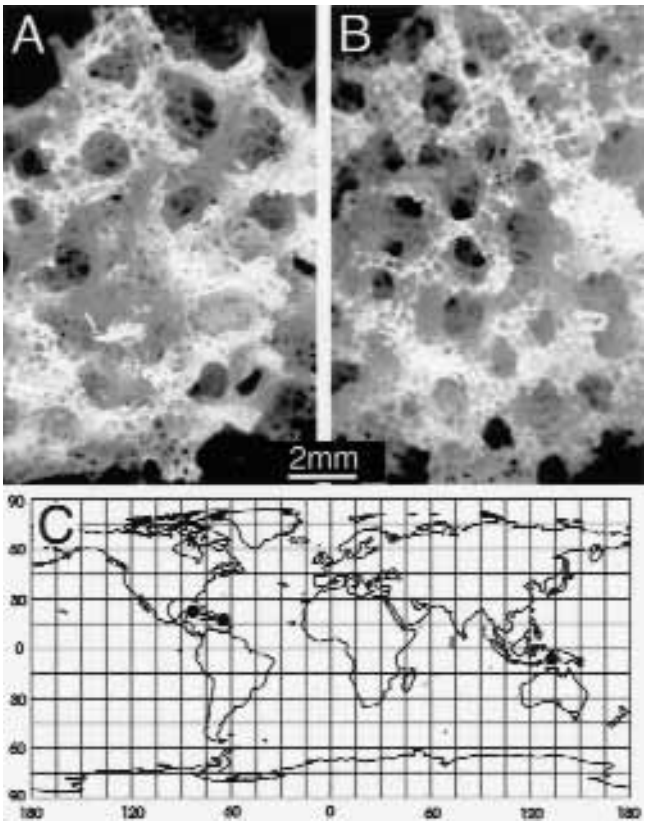

Fig. 1. Diapleuridae. A, lateral body surface of *Scleroplegma lanterna* lectotype, MCZ 6459. B, lateral body surface of *Diapleura maasi* lectotype, ZMA 3445 (here designated). C, distribution of Diapleuridae and *Scleroplegma*.

Type species

Auloplegma lanterna Schmidt, 1879: pl. III, fig. 17 (by subsequent designation; de Laubenfels, 1936a: 187).

Definition

Small, Recent calyciform or cylindric Lychniscosida with spacious axial atrial cavity; main body wall interpretable either as a unitary structure channelized by radially oriented cylindrical schizorhyses or as a system of intimately fused, short, branching and anastomosing tubules with primary radial orientation; body apertures consist of large terminal osculum and smaller lateral apertures of channels or tubules, distributed either irregularly or with slight indication of longitudinal alignment; septa of channelized wall or tubule walls 1–3 dictyonalia thick with dictyonalia within or between successive framework layers arranged without detectable pattern – not aligned rectangularly; external body surface jagged due to non-alignment of dictyonalia of septa/tubule margins.

Diagnosis

Dictyonal beams ornamented with short, spined, transverse ridges; dictyonal meshes rounded; dictyonal spurs unthickened – essentially roughened original lychnisc rays; dermalia and atrialia pentactins; choanosomal megascleres as hexactins; prostalia as large pentactins, usually broken distally; microscleres include discohexasters and onychexasters; flexible or rigid outer cover layers are unknown, but at least two forms of fused networks of loose spicules occur.

Remarks

Schmidt's (1879) first publication on this genus was a single figure of a dictyonal node labelled *Auloplegma lanterna*, which is accepted by some workers (Desqueyroux-Faundez & Stone, 1992) as adequate fixation of the type species of *Auloplegma*, and its successor *Scleroplegma*. Since *Auloplegma* Schmidt was preoccupied by *Auloplegma* Haeckel, 1870d, a calcareous sponge, Schmidt (1880b) replaced the earlier name with *Scleroplegma*. Schmidt (1880b) provided few useful characters and figures for the four species assigned to the genus but Schulze (1886, 1887a) was able to redescribe the second of Schmidt's species, the non-lychniscid *Scleroplegma conica*, since he (Schulze) happened to have access to part of its original holotype. The genus, *Scleroplegma*, thus became more widely, but mistakenly, known from that redescription, and was generally assigned to Maeandrospongidae. Schmidt's first species, *S. lanterna*, remained unrecognizable and unplaceable (Schulze, 1899). Ijima (1927) finally moved *S. conica* to *Myliusia*, leaving the status of the genus *Scleroplegma* still unresolved. De Laubenfels (1936a), in absence of any earlier statement, declared *S. lanterna* type species. *Scleroplegma*, defined by *S. lanterna*, has thus remained essentially unknown until redescription of original types below. It is understandable why Ijima (1927) failed to assign his *D. maasi* to *Scleroplegma* – he had no basis for such assignment since no body figure of *S. lanterna* had ever been published, and he had no loose spicule evidence from his fully macerated *D. maasi* specimens to connect with Schmidt's original mention of discohexasters in *S. lanterna*. Restudy here of types of both species confirm there are very minor differences between the two forms – *S. lanterna* (relative to *D. maasi*) has larger canals/tubules of mean diameter 2.2 mm (vs. 1.4 mm, see comparison figure), it has coarser frame with mean node-node spacing of 424 μm (vs. 361 μm), and mean beam thickness is greater, 83 μm (vs. 65 μm). In absence of any serious contradictory evidence, *Diapleura* Ijima is here transferred to status of junior synonym of *Scleroplegma* Schmidt. While *S. conica* has been convincingly repositioned to *Myliusia*, the remaining two species of Schmidt's (1880b) original set, *S. herculeum* and *S. seriatum*, still require restudy and reassignment. They are not lychniscid and are not acceptable as members of *Scleroplegma*. *Scleroplegma* occurs in two tropical regions: the West Indies and Indonesia, at depths of 204–585 m, excepting the questionable record of 1383 m for a specimen (BMNH 1939.2.10.39) boxed with conflicting labels.

Description of type species

Scleroplegma lanterna (Schmidt) (Fig. 2).

Synonymy. *Auloplegma lanterna* Schmidt, 1879: pl. III, fig. 17; *Scleroplegma lanterna* Schmidt, 1880b: 56, pl. V, fig. 6.

Material examined. Lectotype (here designated): MCZ 6459 – Havana, Cuba. Paralectotypes (here designated): MCZ 6456 & 6457 – Havana, Cuba. **Other material.** MCZ 6344, BMNH 1939.2.10.22 – Havana, Cuba. MCZ 6721u (part) – St. Croix. MCZ 8067, USNM 23435 (part), ZMUB 80, CAS IZ-067725 (labeled *Cystispongia superstes*) – West Indies.

Description (measurements from lectotype). Body as an irregular cylinder or cone, 29 mm tall by 19 mm diameter, tapering basally to a small disc attached to hard substrate; spacious atrial cavity open above by 7 mm diameter terminal or subterminal osculum; texture brittle and fragile; body structure interpretable in two ways: (1) as thick-walled sponge with entire wall, from atrial to lateral surfaces, penetrated by system of large schizorhysial channels, or (2) as body wall constructed of system of small-calibre, branching and anastomosing tubules, with lateral tubule walls closely fused, intercanal spaces indistinguishable; lateral surfaces raggedly irregular, composed of septa between channels or tubule walls ending in circular to groove apertures with irregularly projecting margins; lateral apertures 1.2–*2.2*–3.4 mm diameter; septa between channels or tubule walls 1–*2*–3 lychnisc nodes thick so most nodes surficial; framework of septa or tubule walls is an irregular network of lychnisc dictyonalia without detectable rectangular arrangement; node-node spacing 262–*424*–615 μm; node diameter 166–*240*–326 μm; beams and nodal buttresses ornamented with short transverse ridges bearing 2–12 fine conical spines; beam diameter 52–*83*–118 μm; fine silica nets of two forms occur between outer dictyonalia – 3-dimensional, crude-meshed net of fused, curved rays of hexactin and pentactin rays with few synapticulae, and 2-dimensional, mm-size flakes of large pentactins and very small hexactins as basal components of a fine-meshed network of synapticulae; such lacy networks not known to form a cover layer; dictyonal spurs extremely thin, essentially roughened but unthickened rays of surficial lychnisc dictyonalia, including those of channels or tubules; dermalia and atrialia as finely-rough pentactins with rounded or bullet-like ray tips, tangential rays 122–*269*–541 by 4–*7*–10 μm (rarely to 800+ μm long), proximal rays 175–*324*–748 by 4–*6*–9 μm; finely-rough choanosomal (?) hexactins with rays 161–*232*–339 by 5–7 μm; large, finely-rough siliceous rods to 5.7 mm long by 21–73 μm thick project through framework meshes, interpreted as proximal rays of large pentactins with broken-off (lost) distal heads; robust, spherical discohexasters 95–*117*–136 μm

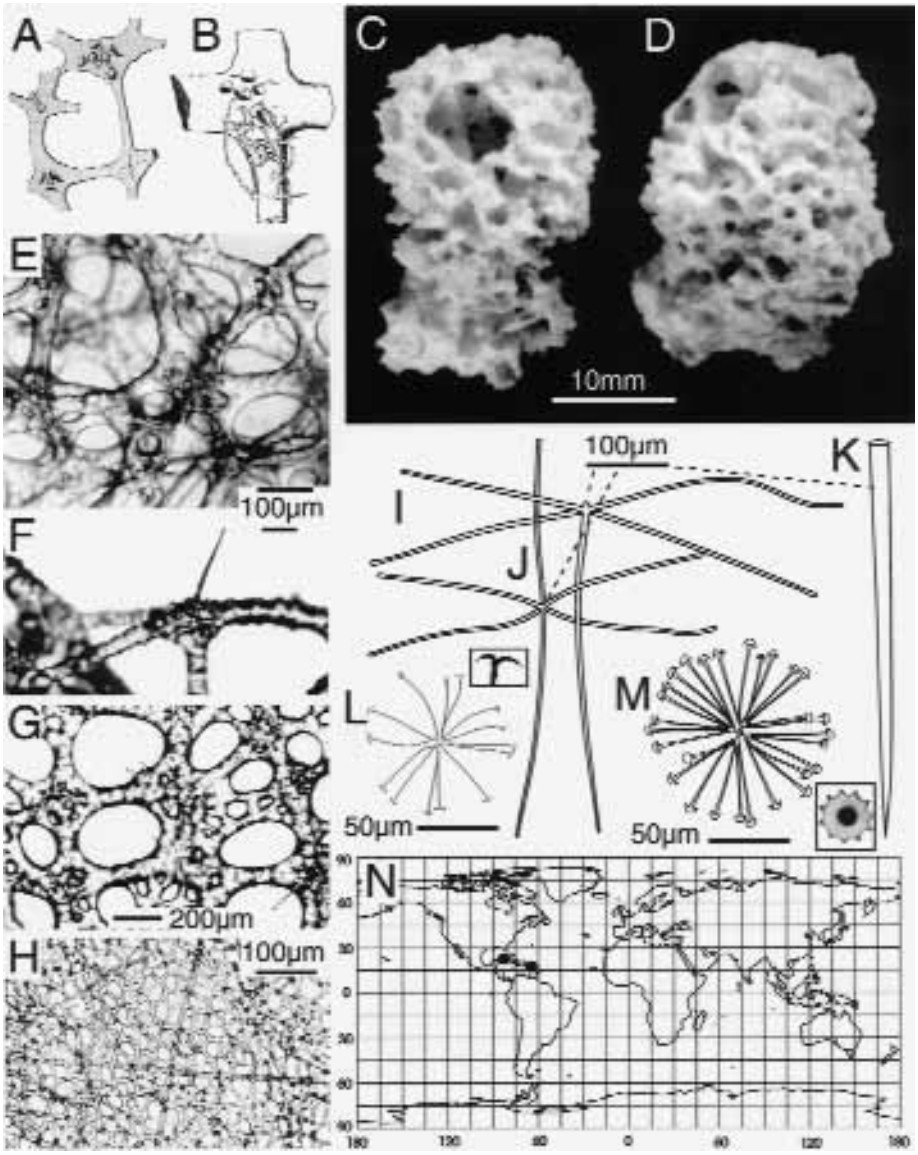

Fig. 2. *Scleroplegma lanterna*. A–B, Schmidt's original figures of (A) *Auloplegma lanterna* (1879, pl. III, fig. 17) and (B) *Scleroplegma lanterna* (1880b, pl. V, fig. 6). C–D, the lectotype MCZ 6459 in front and side views. E, typical irregular arrangement of lychnisc dictyonalia in septa/wall framework (surface view) of lectotype. F, filiform dictyonal spur (lectotype). G, septa/wall one dictyonal layer in thickness (paralectotype MCZ 6456). H, portion of surface lace scale (paralectotype MCZ 6456). I, dermal pentactin. J, choanosomal hexactin. K, portion of prostal pentactin proximal ray. L, onychexaster with magnified ray tip (box). M, spherical discohexaster with magnified ray tip (box). N, distribution of *S. lanterna*.

diameter with short primary rays bearing 4–6 terminals ending in 10–12-toothed discs; thin onychexasters with short primary rays bearing 2–3 terminals ending in 1–2–3 recurved claws, most commonly with two claws not in a single plane with terminal ray; lacking uncinate, sceptrule and graphiocome; known only from the West Indies (Cuba and St. Croix), from depths of 399–585 m, excluding questionable 1383 m record.

Remarks. Schmidt (1879, 1880b) provided only two figures of lychnisc nodes with his original description of *Auloplegma/Scleroplegma lanterna*, along with brief mention of body form and discohexasters as microscleres. The species has remained indeterminate until the redescription of type specimens provided here. Several specimens listed above under other material might be part of the original type series, but they do not satisfy criteria of having precise collection location, collection dated before 1880, and label hand-written by Schmidt. The six slides as ZMB 7042 reported by Desqueyroux-Faundez & Stone, 1992, were unavailable for review.