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New Australian Hexactinellida (Porifera) with a revision of *Euplectella aspergillum**

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Abstract

In this study we found 28 species, 6 new to science, from 17 genera and 11 families. Four families: Aphrocallistidae, Rossellidae, Monorhaphididae and Euretidae have not been reported from the Australian seas before. Revision of the famous 'Venus-flower basket' *Euplectella aspergillum* has accompanied this investigation, which led to designation of the following subspecies defined by specific features and various geographical distributions: *E. aspergillum regalis* (formerly *E. regalis* Schulze), *E. aspergillum australicum*, nov. ssp., *E. aspergillum indonesicum*, nov. ssp. and *E. aspergillum aspergillum.*

Key words: Porifera, Hexactinellida, Australia, new species, deep-sea sponges

Introduction

The Hexactinellida of the seas around Australia are highly diverse. However, they are poorly investigated. At comparably shallow depths, between 300 and 1200 m, we find representatives of many hexactinellids. Previous publications were mainly based on '*Challenger*' expedition collections (Schulze 1887) and on a series of stations in the Great Australian Bight, S Australia (Reiswig 1992). A review of the present knowledge of all Australian sponges (including Hexactinellida) was published by Hooper and Wiedenmayer (1994). As for Hexactinellida, it contains data of the previous publications. Here we describe hexactinellid sponges from the new collections sampled mainly off the Australian West Coast and compare them with material from other museums.

Material and Methods

During several Australian marine expeditions, which took place between 1983 and 1987, the large collections of Hexactinellida were sampled. The sponges were kept in 70 % Ethanol and deposited in various organisations listed below. The sponges were examined, and subsamples taken for spicule preparations from defined body areas: dermal, atrial, choanosomal and peduncle. The method used for spicule preparations was developed by K. R. Tabachnick and is described in Janussen et al. (2004). Spicule preparations were examined by transmission light microscopy and by scanning electron microscopy; drawings and measurements of spicules

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were made by camera lucida. Additional specimens from other then Australian locations, which were studied for comparison, were loaned by other museums.

The studied material is deposited at following institutions: BMNH—The Natural History Museum, London; HM—Humbold Museum, Berlin; IORAS—Institute of Oceanology of the Russian Academy of Sciences, Moscow; MNHN—Muséum national d'Histoire naturelle, Paris; NTM—Northern Territory Museum of Arts and Sciences, Darwin; WAM—Western Australian Museum, Perth; QM—Queensland Museum, South Brisbane; ZMA—Zoological Museum, Amsterdam.

Unfortunately, the Hexactinellida from the Cidaris-I expedition, which are permanently stored in the MNHN, could not yet be definitely inventoried, because some formalities of this collection still need to be settled; therefore they are kept in the MNHN with temporary numbers (which will be maintained for future identification).

Taxonomy

Hexactinellida Schmidt, 1870
Amphidiscophora Schulze, 1899
Amphidiscosida Schrammen, 1924
Monorhaphididae Ijima, 1927
Monorhaphis Schulze 1904; (cited before in Chun, 1900)
***Monorhaphis chuni* Schulze, 1904**

Synonymy and diagnosis. As given in Tabachnick (2002a).

Material. MNHN(fr766)—Cidaris I, RV *Franklin*, sta. 4-1, 18°11.52'S 147°52.12'E, depth 998–1012 m. MNHN(fr867.1; fr868)—Cidaris I, RV *Franklin*, sta. 8-1, 18°7.82'S 148°15.39'E, depth 1115–1119 m. MNHN(fr872)—Cidaris I, RV *Franklin*, sta. 28-1, 17°18.21'S 147°19.76'E, 1400–1414 m. MNHN(p15)—Cidaris I, RV *Franklin*, sta. 33-1, 16°58.76'S 147°11.40'E, depth 1545–1564 m.

Description. All the investigated fragments contain many allochthonic spicules, while autochthonic spicules are similar in their parameters to the ones described for this species by Tabachnick and Lévi (2000).

Pheronematidae Gray, 1870
Pheronema Leidy, 1868
***Pheronema pilosum* Levi, 1964**

*Synonymy and diagnosis.*As given in Tabachnick and Lévi (2000).

Material. MNHN(p1085; p1086)—Cidaris I, RV *Franklin*, sta. 15-4, 17°45.99'S 148°39.09'E, depth 958–964 m. MNHN(p9; p10)—Cidaris I, RV *Franklin*, sta. 25-1, 17°18.73'S 147°37.20'E, depth 1128–1178 m.

Description. Body: One specimen MNHN(p1085) is a complete specimen with basalia and prostalia oscularia up to 35 mm long, it is 90 mm long, 55 mm in diameter with walls about 5 mm in thickness, another specimen from same station is a fragment. Another specimen MNHN(p9) is 60 mm long, 55 mm in diameter with walls about 5 mm in thickness, the fragment MNHN(p10) most probably belongs to the same sponge representing its basalia.

Remarks. There are no differences in the spicule content and their dimensions in the new specimens from specimens described previously (Lévi 1964; Tabachnick and Lévi 2000). All these specimens contain few microscleres with oxyoidal rays as is common for most specimens of this species.

*Semperell*a Gray, 1868

***Semperella schulzei* (Semper, 1868)**

Synonymy and diagnosis. As given in Tabachnick and Menshenina, 2002a

Material. NTM Z 0002577; NTM Z 0002580—Sta. NWS-0043, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°18'S 119°4'E, depth 426 m. NTM Z 0002585—Sta. NWS-0046, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°51'S 118°30'E, depth 410 m. NTM Z 0002592—Sta. NWS-0050, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°28'S 118°53'E, depth 405 m. WAM Z 561—RV *Soela*, sta. SO 2/82/37, NNW of Port Headland, 18°20'–19'S 118°0–1'E, depth 320 m. WAM Z 588 (two specimens)—RV *Soela*, sta. SO 2/82/38, NNW of Port Headland, 18°22'–23'S 117°56'–54'E, depth 309–316 m. WAM Z 598 (4 specimens)—RV *Soela*, sta. SO 2/82/44, NNW of Port Headland, 18°54'–55'S 117°2'–0'E, depth 306–300 m.

Remarks. There are no differences in the body form, spicule content and the size of these specimens from that of the specimens described in the latest revisions (Tabachnick and Lévi 2000, Tabachnick and Menshenina 2002a).

Hyalonematidae Gray, 1857

Hyalonema

Hyalonema (Hyalonema)

***Hyalonema (Hyalonema) proximum* Schulze, 1904 (Fig. 1; Tab. 1, 2A–C)**

Synonymy. Hyalonema proximum Schulze, 1904: 64; *Hyalonema intermedium* Ijima, 1927: 55.

Material. *Types*: HM 4354—RV *Siboga*, sta. 185; HM 3684—RV *Siboga*, sta. 198; HM (no number)—ibid. Other materials: WAM Z 12491—sta. 1031103, N-W Cape, 21°39.18'S 113°51.44'E, depth 610–649 m. NTM Z 0001154—RV *Soela*, sta. NWS-0005, W of port Headland, Northwestern shelf, 18°42'S 117°18'E, depth 360 m. NTM Z 0002570; NTM Z 0002571 (2 specimens); NTM Z 0002573 (3 specimens)—sta. NWS-0042, off Rowley Shoals, Northwest Shelf, 17°24'S 118°52'E, depth 445 m. NTM Z 0002578—sta. NWS-0043, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°18'S 119°4'E, depth 426 m. NTM Z 0002588—sta. NWS-0049, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°39'S 118°38'E, depth 410 m. NTM Z 0002594(a) -sta. NWS-0052, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°28'S 118°53'E, depth 405 m. WAM Z 260—RV *Soela*, sta. SO 2/82/19, 140 miles NW of Port Headland, 18°35'S 117°0'–116°59'E, depth 588–592 m. WAM Z 665—RV *Soela*, sta. SO 2/82/21, 154 miles NW of Port Headland, 18°45'S 116°26.50'–22.50'E, depth 720–724 m. WAM 116-82—RV *Soela*, sta. SO 2/82/25, 147 miles NW of Port Headland, 18°32'–31'S 116°49.40'–51'E, depth 658–660 m. WAM Z 570—RV *Soela*, sta. SO 2/82/27, 155 miles NW of Port Headland, 18°41'S 116°29.50'–31'E, depth 696–704 m. WAM Z 589—RV *Soela*, sta. SO 2/82/30, 140 miles NW of Port Headland, 18°38'S 116°52'–54'E, depth 594–600 m. WAM Z 575—RV *Soela*, sta. SO 2/82/31, 135 miles NW of Port Headland, 18°41'S 116°56'–58'E, depth 500 m. WAM Z 261—RV *Soela*, sta. SO 2/82/32, 120 miles N of Cape Lambert, 18°36'S 117°8'–10'E, depth 500–504 m. WAM Z 559 (2 specimens)—RV *Soela*, sta. SO 2/82/37, 124 miles NNW of Port Headland, 18°20'–19' S 118°0'–1'E, depth 320 m. WAM Z 56136-82 (6 specimens)—RV *Soela*, sta. SO 4/82/8 C, N of Port Headland, 18°43'S 117°12'E, depth 368 m. WAM Z 65 (2 specimens)—RV *Soela*, sta. SO 4A/82/08 D, 14 miles N of Port Headland, 17°58'S 118°25'E, depth 376 m. WAM Z 251—RV *Courageous*, sta. 003, SW of Imperious Reef, Rowley Shoals, 18°1'S 118°13'E, depth 450–452 m. WAM Z 252—sta. 005, SW of Imperious Reef, Rowley Shoals, 18°8'S 118°13'E, depth 350–394 m. WAM 98-91—1982, Slope of NW Shelf (W Australia).

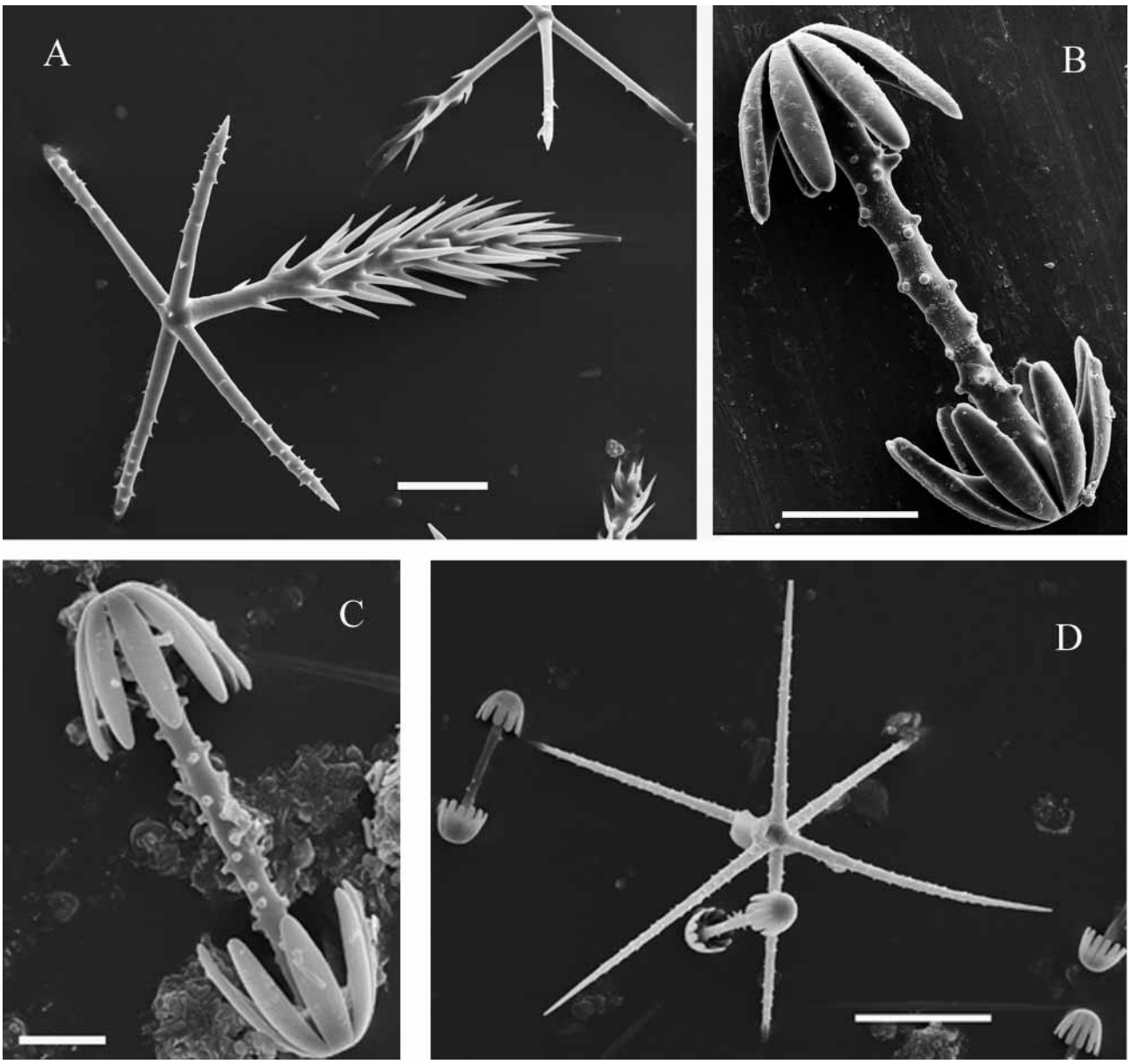

FIGURE 1. *Hyalonema* (*Hyalonema*) *proximum*. A, dermal pinule, NTM Z 0002594, scale 30 µm. B, macramphidisc, NTM Z 0002573, scale 100 µm. C, mesamphidisc, NTM Z 0002594, scale 10µm. D, hexactin with micramphidiscs, NTM Z 0002594, scale 30µm.

Description. Body: About a half of all specimens are the upper parts of sponge bodies, the others are fragments. Complete specimens with their entire stalks preserved are absent. The body is 80–200 mm high and 25–100 mm in diameter. The construction of the atrial sieve-plate typical of the subgenus (open meshes are assembled in groups separated by imperforate tracts) varies from forms with hardly resolvable imperforate tracts to well recognizable ones. Specimen NTM Z 0002594 (a) has four nearly equal sectors of open meshes which alternate with imperforate tracts.

Spicules: The dimensions of spicules are given in Tables 1, 2A–C, some of their specific features are discussed below. Choanosomal spicules are diactins 0.8–12/0.01–0.4 mm, stout or with a widening in the middle and ambuncinates 0.35–1.8/0.002–0.019 mm with four rudimental tubercles in the middle when the spicules are fine or with a widening in the middle, often it is possible to find tauactins, stauractins, pentactins and hexactins with spiny rays, like those of the ambuncinates. Hypodermalia are pentactins with tangential rays

0.3–1/0.02–0.07 mm, the proximal ray is about 1.5 times longer. The pinular rays of dermal pentactins are 0.071–0.765 mm long, tangential rays are 0.02–0.061 mm; their diameter is 0.006–0.008 mm. The pinular rays of atrial pentactins are 0.082–0.74 mm long, tangential rays are 0.02–0.056 mm; their diameter is 0.006–0.009 mm. The canalar pentactins (or undeveloped dermal and atrial spicules) have all rays spiny and equal in shape, unpaired rays 0.036–0.153 mm long, tangential rays 0.026–0.112 mm, their diameter is about 0.002 mm.

Microscleres: Total length of macramphidiscs is 0.306–0.5 mm, the umbel length 0.061–0.143 mm, the umbel diameter 0.031–0.184 mm; their shafts are tuberculated. Occasionally, in some specimens it is possible to find 'small' macramphidiscs and mesamphidiscs. Total length of small macramphidiscs is 0.077–0.255 mm, the umbel length 0.026–0.087 mm, the umbel diameter 0.02–0.107 mm; their shafts are tuberculated. Total length of mesamphidiscs is 0.023–0.046 mm, the umbel length 0.011–0.095 mm, the umbel diameter 0.008–0.015 mm; their shafts are spiny or tuberculated. Total length of micramphidiscs is 0.011–0.027 mm, the umbel length 0.003–0.013 mm, the umbel diameter 0.003–0.008 mm; their shafts are slightly spiny or tuberculated.

TABLE 1: Measurements of spicule types of *Hyalonema* (*Hyalonema*) *proximum*, Schulze, 1904.

	HM 4354					HM (be342)					HM 3684				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm.? pentact. pinul. ray	15	.311	.215	.474	.078	15	.193	.107	.296	.048	15	.360	.229	.555	.103
L. derm.? Pentact. tangent. ray	15	.036	.026	.052	.008	15	.029	.022	.037	.004	15	.045	.033	.059	.008
L. atr. pentact. pinul. ray						15	.212	.130	.315	.042					
L. atr. pentact. tangent. ray						15	.037	.019	.048	.008					
L. spiny pentact. unpaired ray	15	.107	.052	.170	.031	15	.098	.074	.122	.019	15	.094	.063	.118	.018
L. spiny pentact. tangent. ray	15	.060	.044	.074	.009	15	.066	.041	.104	.018	15	.066	.044	.089	.011
L. large macroamphidisc	15	.357	.281	.407	.034	15	.285	.252	.318	.020	15	.354	.303	.389	.022
l umbel, large macramphidisc	15	.092	.074	.111	.010	15	.083	.074	.093	.007	15	.086	.074	.118	.010
d umbel, large macramphidisc	15	.140	.130	.159	.010	15	.099	.085	.111	.007	15	.143	.122	.152	.007
L micramphidisc	15	.014	.011	.022	.002	15	.013	.011	.018	.002	15	.015	.010	.022	.003
l umbel, micramphidisc	15	.004	.003	.007	.001	15	.004	.003	.007	.001	15	.005	.003	.007	.001
d umbel, micramphidisc	15	.004	.003	.006	.001	15	.004	.003	.005	.001	15	.005			.001

Remarks. After our re-examination of types of *H. proximum* in HM, the newly-observed specimens are here referred to as *H. proximum* Schulze, 1904; however, their original description is incomplete. Unfortunately the type specimens are in such poor condition that it is impossible to differentiate dermal and atrial layers, but the most important measurements are the following: pinular ray of dermal-atrial pentactins is 0.107–0.555 mm long, tangentials are 0.019–0.048 mm; macramphidiscs are 0.252–0.407 mm long with umbel 0.074–0.118 mm long and 0.085–0.159 mm in diameter; micramphidiscs are 0.01–0.022 mm long with umbel 0.003–0.007 mm long and 0.003–0.007 mm in diameter; hypodermal pentactins and diactins are of common shape and size; ambuncinates are 0.5–2/0.004–0.015 mm, sometimes in the form of stauractin or pentactin (see Tab. 1). As may now be seen, the newly found Australian specimens are intermediate between *H. proximum* Schulze, 1904 (off Sumatra) and *H. intermedium* Ijima, 1927 (off Kei Island), moreover new measurements from *H. proximum* show a notable overlap of spicule dimensions with *H. intermedium* (dermal pinular ray 0.4–0.7 mm; macramphidisc 0.43–0.485 mm long (Ijima 1927). Thus such features as rare ambuncinate derivatives in the form of stauractins etc., presence of rare mesamphidiscs and likely choanosomal macro-

hexactins do not seem to be significant in this species. The status of *H. intermedium* is not specific but might still prove to be subspecific (in this case Australian specimens might yet be considered as one more new subspecies of *H. proximum* as well as *H. keyanum* (Ijima 1927)) or all of them are complete synonyms of *H. proximum*. This taxonomic problem may be solved only after finding and comparison of new specimens from the type locations of *H. proximum* and the former *H. intermedium*. Thus *Hyalonema (Hyalonema)* comprises two species: *H. (Hyalonema) sieboldi* Gray, 1835 distributed off Japan, and *H. (Hyalonema) proximum* Schulze, 1904 widely distributed in the Indo-West-Pacific. *H. (Hyalonema) sieboldi* (see Tabachnick and Menshenina, 2002a) differs by: smaller size of ambuncinates (0.3–0.7 mm long), smaller size of pinular ray of atrial spicules (0.06–0.4 mm long) and smaller size of macramphidiscs (0.15–0.4 mm long).

TABLE 2A, B: Some measurements of spicules of new australian sponges reffered to *Hyalonema* (*Hyalonema*) *proximum*, Schulze, 1904.

Table 2A	WAM92-91 (fr807)					WAM 118-82 (fr799)					WAM 113-82 (fr814)				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm.? pentact. pinul. ray	15	.293	.128	.525	.104	15	.236	.082	.423	.129	15	.190	.092	.342	.058
L. derm.? Pentact. tangent. ray	15	.029	.015	.051	.009	15	.033	.026	.051	.007	15	.037	.026	.056	.007
L. atr. pentact. pinul. ray	4	.300	.199	.469	.120	15	.302	.194	.418	.070	15	.224	.082	.423	.090
L. atr. pentact. tangent. ray	4	.030	.020	.046	.011	15	.029	.026	.036	.004	15	.040	.031	.046	.004
L. spiny pentact. unpaired ray	15	.085	.061	.133	.022	15	.088	.051	.133	.024	15	.121	.097	.153	.019
L. spiny pentact. tangent. ray	15	.052	.031	.077	.015	15	.053	.046	.071	.007	15	.062	.046	.082	.011
L. large macroamphidisc	15	.419	.332	.464	.037	15	.433	.347	.500	.039	5	.390	.332	.434	.045
l umbel, large macramphidisc	15	.106	.071	.122	.012	15	.103	.082	.117	.009	5	.111	.087	.138	.023
d umbel, large macramphidisc	15	.135	.112	.153	.012	15	.140	.112	.163	.013	5	.111	.031	.148	.047
L. small macramphidisc	1	.077	.077	.077		1	.255	.255	.255						
l umbel, small macramphidisc	1	.026	.026	.026		1	.077	.077	.077						
d umbel, small macramphidisc	1	.020	.020	.020		1	.092	.092	.092						
L. mesamphidisc	1	.036	.036	.036											
l umbel, mesamphidisc	1	.017	.017	.017											
d umbel, mesamphidisc	1	.015	.015	.015											
L micramphidisc	15	.015	.013	.019	.002	15	.014	.011	.017	.002	15	.017	.013	.027	.004
l umbel, micramphidisc	15	.005	.004	.006	.001	15	.004	.003	.006	.001	15	.006	.004	.013	.002
d umbel, micramphidisc	15	.005	.003	.006	.001	15	.004	.003	.006	.001	15	.005	.004	.008	.001

Table 2B	WAM 136-82 (fr855)					NTM Z 0001154					WAM 12491				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	17	.464	.306	.765	.141	15	.465	.306	.571	.074	15	.355	.071	.612	.156
L. derm. pentact. tangent. ray	17	.035	.020	.056	.010	15	.035	.026	.041	.004	15	.035	.020	.054	.008
L. atr. pentact. pinul. ray	15	.356	.163	.469	.075	15	.368	.173	.683	.137	15	.361	.153	.510	.106

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Table 2B	WAM 136-82 (fr855)					NTM Z 0001154					WAM 12491				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. atr. pentact. tangent. ray	15	.027	.020	.036	.005	15	.037	.026	.056	.008	15	.033	.020	.041	.006
L. spiny pentact. unpaired ray	15	.075	.051	.107	.020	15	.072	.036	.102	.018	15	.117	.077	.148	.021
L. spiny pentact. tangent. ray	15	.045	.026	.082	.017	15	.052	.031	.087	.015	15	.065	.041	.112	.019
L. large macroamphidisc	15	.393	.321	.454	.036	15	.370	.306	.413	.029	15	.390	.311	.428	.034
l umbel, large macramphidisc	15	.106	.061	.143	.020	15	.087	.071	.097	.009	15	.086	.066	.112	.014
d umbel, large macramphidisc	15	.140	.107	.163	.017	15	.153	.133	.184	.016	15	.154	.107	.184	.021
L. small macramphidisc	1	.224	.224	.224		1	.240	.240	.240						
l umbel, small macramphidisc	1	.087	.087	.087		1	.056	.056	.056						
d umbel, small macramphidisc	1	.107	.107	.107		1	.097	.097	.097						
L. mesamphidisc	1	.046	.046	.046		1	.034	.034	.034						
l umbel, mesamphidisc	1	.095	.095	.095		1	.017	.017	.017						
d umbel, mesamphidisc	1	.011	.011	.011		1	.015	.015	.015						
L micramphidisc	15	.015	.011	.025	.003	15	.014	.012	.016	.001	15	.015	.012	.017	.002
l umbel, micramphidisc	15	.005	.004	.011	.002	15	.005	.004	.006	.001	15	.005	.003	.006	.001
d umbel, micramphidisc	15	.005	.004	.008	.001	15	.004	.004	.005	.000	15	.004	.003	.005	.001

Table 2C	WAM 136-82 (fr845)														
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	25	.513	.255	.765	.180										
L. derm. pentact. tangent. ray	25	.039	.020	.061	.013										
L. atr. pentact. pinul. ray	25	.335	.087	.740	.163										
L. atr. pentact. tangent. ray	25	.031	.026	.051	.007										
L. spiny pentact. unpaired ray															
L. spiny pentact. tangent. ray															
L. large macroamphidisc	25	.417	.311	.500	.047										
l umbel, large macramphidisc	25	.113	.087	.133	.011										
d umbel, large macramphidisc	25	.128	.107	.148	.011										
L. small macramphidisc															
l umbel, small macramphidisc															
d umbel, small macramphidisc															
L. mesamphidisc	2	.024	.023	.025	.001										
l umbel, mesamphidisc	2	.011	.011	.011	0										
d umbel, mesamphidisc	2	.009	.008	.009	.001										
L micramphidisc	25	.015	.011	.019	.002										
l umbel, micramphidisc	25	.005	.003	.006	.001										
d umbel, micramphidisc	25	.005	.004	.006	.001										

***Hyalonema (Hyalonema?) soelae* sp. nov. (Fig. 2, Tab. 3)**

Etymology. The species name refers to the RV *Soela*, from which the holotype was collected.

Material. *Holotype*: WAM 108-82—RV *Soela*, SO 2/82/38, 18º22'–23'S 117º56'–54'E, depth 316–309 m.

Description. Body: The holotype is conical without an atrial cavity, but with a well-recognizable sieve-plate with meshes regularly distributed. Total length of the sponge body is 100 mm, the upper part is oval 40x50 mm, basalia are broken. The sieve-plate net shows meshes of 1–2 mm diameter, the spaces between the meshes are very narrow, about 0.3 mm.

Spicules: Choanosomal spicules are diactins and ambuncinates. The diactins 0.4–10/0.01–0.25 mm have a widening in the middle, the biggest ones are stout. Ambuncinates measure 0.3–1.37/0.002–0.01 mm; they have a widening in the middle or four rudimental tubercles. Hypodermalia are pentactins with unpaired rays 0.3–0.7 mm long, tangential rays 0.24–0.62 mm long, their diameter is 0.019–0.038 mm. Specific hypoatrialia as pentactins are mostly absent. Dermalia are pinular pentactins with pinular ray fine, gradually tapering towards the end. The pinular ray of dermal pentactins is 0.255–0.581 mm long, tangential rays are 0.02–0.046 mm long, the rays are 0.005–0.011 mm in diameter, the outer ends of tangential rays are rough and conically pointed. Atrialia are pinular pentactins with pinular rays similar to those of the dermal spicules. The pinular rays of atrial pentactins 0.099–0.449 mm long, tangential rays 0.023-0.046 mm long, the rays are 0.005–0.008 mm in diameter, the tangential rays are rough, conically pointed. Some probable canalaria are found: Pinular pentactins, rarely hexactins with pinular rays 0.061–0.133 mm, rough tangential rays 0.02–0.082 mm, their diameter is about 0.005 mm.

TABLE 3: Measurements of spicule types of *Hyalonema* (*Hyalonema*?) *soelae* sp. nov.

	n	avg	min	max	std
L. derm. pentact. pinul. ray	25	.410	.255	.581	.087
L. derm. pentact. tangent. ray	25	.031	.020	.046	.007
L. atr. pentact. pinul. ray	25	.263	.158	.449	.065
L. atr. pentact. tangent. ray	25	.030	.023	.046	.005
L. canalar? pentact. pinul. ray	25	.096	.061	.133	.022
L. canalar? pentact. tangent. ray	25	.055	.020	.082	.015
L. macroamphidisc	25	.452	.357	.520	.042
l umbel, macramphidisc	25	.115	.087	.148	.014
d umbel, macramphidisc	25	.144	.117	.158	.009
L. mesamphidisc	1	.032	.032	.032	
l umbel, mesamphidisc	1	.016	.016	.016	
d umbel, mesamphidisc	1	.012	.012	.012	
L micramphidisc	25	.013	.011	.021	.002
l umbel, micramphidisc	25	.004	.003	.007	.001
d umbel, micramphidisc	25	.005	.003	.006	.001

Microscleres are two types of amphidiscs: Macramphidiscs and micramphidiscs. Total length of macramphidiscs is 0.357–0.52 mm, the umbel length 0.087–0.148 mm, the umbel diameter 0.117–0.158 mm; their shafts are densely tuberculated, sometimes it is possible to find a staurodisc of similar dimensions. The only mesamphidisc found in this specimen may be of allochthonic origin. Total length of mesamphidisc is 0.032

mm, the umbel length 0.016, the umbel diameter 0.012 mm. Total length of micramphidiscs is 0.011–0.021 mm, the umbel length 0.003–0.007 mm, the umbel diameter 0.003–0.06 mm; their shafts have a widening in the middle. Microhexactins or micropentactins seems to be absent in this species.

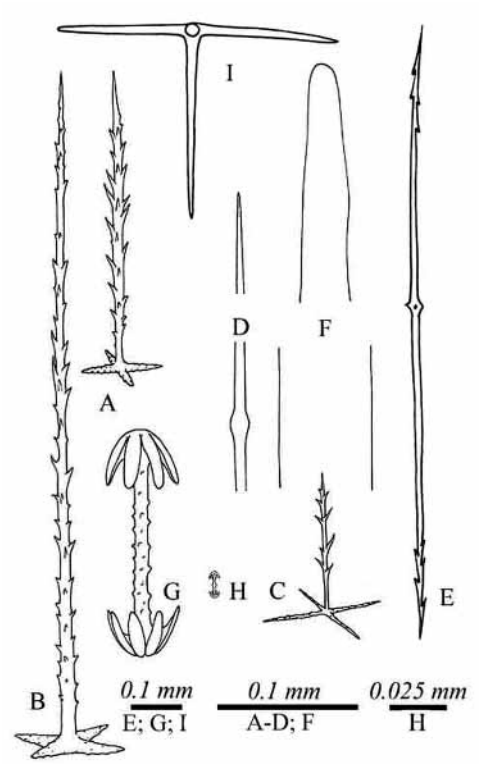

FIGURE 2. *Hyalonema (Hyalonema?) soelae*, sp. nov., spicules. A, dermal pinular pentactin. B, atrial pinular pentactin. C, canalar pinular pentactin. D, choanosomal diactin. E, ambuncinate. F, large choanosomal diactin. G, macramphidisc. H, micramphidisc. I, hypodermal pentacin. A-I, holotype.

Remarks. The species is referred to as *H.* (*Hyalonema*) in spite of a different construction of the sieve-plate. According to previous *Hyalonema* subgenera diagnoses in Ijima (1927) and Tabachnick and Menshenina (2002a), *H. soelae* should be referred to *H.* (*Coscinonema*), since when erected (Ijima 1927) *H.* (*Coscinonema*) was considered to have ambuncinates (diagnosis and key to subgenera). As is clear now, no species in Ijima's scope of the subgenus (including the type species) has ambuncinates. The only species with ambuncinates, *H. (Coscinonema) polycoelum* Levi and Levi, 1989, was transferred to *H. (Pteronema)* due to its long spines in the pinular ray as well as some other characters (Tabachnick and Menshenina 2002). Thus '*Coscinonema'* is a subgenus without ambuncinates. Species '*soelae'* is referred to *Hyalonema (Hyalonema*) with some hesitations in order not to erect another new subgenus. The most notable difference of the new species from other representatives of the subgenus is the absence of a specific atrial sieve-plate, where areas with meshes are interrupted by imperforate tracts. The diagnosis of *Hyalonema (Hyalonema)* should be widened according to this specific feature of the new species.

Hyalonema. (Corynonema) Ijima, 1927
***Hyalonema. (Corynonema*?) *intersubgenerica* sp. nov.** (Fig. 3, 4; Tab. 4)

Etymology. The name is given because of the diagnostic features of this species, which are in some respects intermediate between the subgenera *Corynonema* and *Cyliconema.*

Material. *Holotype*: MNHN(p1) Cidaris I, RV *Franklin*, sta. 27-2, 17°19.76'S 147°28.05'E, depth 1310–1357 m.

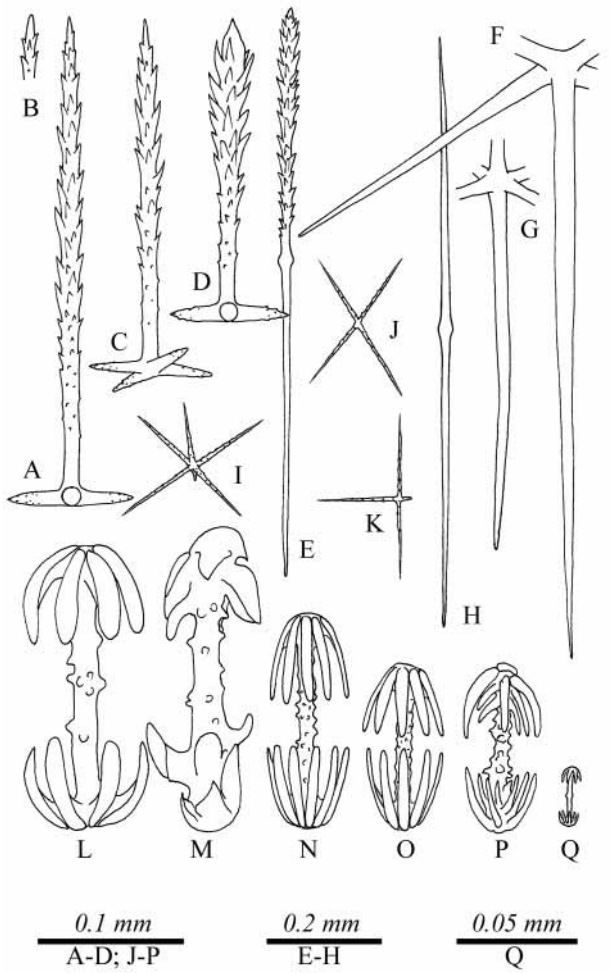

FIGURE 3. *Hyalonema* (*Corynonema*) *intermedia*, sp. nov., spicules. A, dermal pinular pentactin. B, outer end of dermal pinular pentactin. C-D, atrial pinular pentactin. E, atrial pinular diactin. F, hypodermal pentactin. G, choanosomal hexactin. H, choanosomal diactin. I, micropentactin. J, microstauractin. K, microtauactin. L-M, macramphidiscs. N-P, mesamphidiscs. Q, micramphidisc. A-L; N-Q, holotype. M, MNHN(p2).

Paratypes: MNHN(p2)—same as the holotype. MNHN(p27)—Cidaris I, RV *Franklin*, sta. 24-2, 17°19.58'S 147°47.61'E, depth 1187–1200 m. Other materials: MHNH(p541.1, p541.2)—Cidaris I, RV *Franklin*, sta. 31-1, 17°12.15'S 147°10.80'E, depth 1489–1491 m.

Description. Body: The holotype is conical with a slightly depressed atrial cavity and well-defined sieve-plate. Total length of this sponge is 90 mm, the upper part is oval 30x80 mm, basalia are remnants 150 mm long. Paratypes are similar to the holotype; they are 43–80 mm in length 25–60 mm in diameter. The sieve-plates are nets with meshes 1–3 mm.

Spicules: Choanosomal spicules are diactins and hexactins. The diactins 0.5–1.5/0.006–0.023 mm have a widening in the middle or occasionally 4 rudimental tubercles. Rays of hexactins are 0.18–0.65/0.015–0.03 mm. Hypodermalia are pentactins with tangential rays 0.14–0.6 mm long, proximal ray is 0.27–0.8 mm long, their diameters are 0.011–0.04 mm. Specific hypoatrial pentactins are likely to be absent. Dermalia are pinular pentactins with pinular ray spindle-like in overall shape, the rachis is stout. The pinular ray of dermal pentactins is 0.179–0.51 mm long, tangential rays are 0.02–0.082 mm long, the rays are about 0.01 mm in diameter, outer ends of tangential rays are rough or they have small spines and conically pointed outer ends. Atrialia are pinular pentactins and diactins. The pinular ray of atrial pentactins is 0.143–0.357 mm long, tangential rays are 0.031–0.071 mm long, all rays are about 0.01 mm in diameter but some spicules have pinular rays with a

thickness up to 0.014 mm in the upper parts, the shape of such rays is clavate and they have a remarkable apical cone. The atrial pinular diactins have widenings or 4 rudimental tubercles in the middle. The pinular ray is spindle-like in shape or slightly clavate, length of the pinular ray is 0.153–0.561 mm, the proximal ray is 0.219–0.918 mm long, diameter of these rays is about 0.013 mm.

TABLE 4: Some measurements of spicules of *H.* (*Corynonema*?) *intersubgenerica* sp. nov.

	p1					p27				
	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	17	.303	.179	.485	.074	15	.386	.270	.510	.068
L. derm. pentact. tangent. ray	17	.041	.020	.082	.014	15	.041	.031	.051	.005
L. atr. pentact. pinul. ray	15	.221	.143	.270	.031	15	.286	.199	.357	.043
L. atr. pentact. tangent. ray	15	.039	.031	.051	.007	15	.052	.041	.071	.011
L. atr. diactin pinul. ray	15	.404	.153	.510	.109	15	.441	.235	.561	.078
L. atr. diactin proximal ray	15	.615	.301	.918	.198	15	.442	.219	.765	.170
L. macroamphidisc	16	.263	.174	.311	.037	10	.219	.189	.291	.029
l umbel macramphidisc	16	.072	.061	.092	.007	10	.049	.036	.071	.010
d umbel macramphidisc	16	.106	.061	.128	.018	10	.073	.041	.102	.017
L mesamphidisc	20	.104	.048	.151	.039	20	.114	.065	.148	.022
l umbel, mesamphidisc	20	.041	.015	.074	.021	20	.041	.017	.056	.010
d umbel, mesamphidisc	20	.037	.015	.061	.017	20	.041	.015	.056	.011
L. microamphidisc	16	.022	.019	.034	.004	18	.026	.015	.050	.011
l umbel, microamphidisc	16	.006	.005	.012	.002	18	.008	.004	.017	.004
d umbel, microamphidisc	16	.007	.005	.013	.002	18	.009	.005	.019	.004
L. ray, oxyoidal spicule	16	.055	.041	.071	.010	15	.056	.046	.092	.011

Microscleres are represented by three types of amphidiscs and a range of oxyoidal spicules. Total length of macramphidiscs is 0.174–0.311 mm, the umbel length 0.036–0.092 mm, the umbel diameter 0.041–0.102 mm; their shafts are notably tuberculated. Total length of mesamphidiscs is 0.048–0.151 mm, the umbel length 0.015–0.074 mm, umbel diameter 0.015–0.061 mm; their shafts are numerously spined or tuberculated, some mesamphidiscs are oval in shape – their umbels nearly meet at the equator. Abnormal macramphidiscs and mesamphidiscs with irregular umbels may be present. Total length of micramphidiscs is 0.015–0.034 mm, the umbel length 0.004–0.017 mm, the umbel diameter 0.005–0.019 mm; their shafts have a widening or several spines in the middle. The oxyoidal microscleres are pentactins, stauractins, paratetractins and tauactins with rough rays 0.036–0.092 mm long.

Remarks. The species *'intersubgenerica'* is here attributed to the subgenus *Corynonema* with some hesitation. According to the construction of dermal pentactins it should be classified as *Hyalonema* (*Cyliconema*), but representatives of the latter have no sieve-plates. Another feature peculiar to this species is the presence of atrial pentactins with clavate pinular ray and apical cone, which should be present as dermal spicules in *Hyalonema* (*Corynonema*), while the atrial pentactins in this subgenus have previously been known to be similar in shape to the dermal pentactins in this new species. The diagnosis of the subgenus *Corynonema* should be accomplished by mentioning that its dermal and/or only atrial spicules may be the thickest at a distance from the base. One specific character unknown in formerly described representatives of both subgenera *Corynonema* and *Cyliconema* is the predominance of other than hexactin types of oxyoidal microscleres (from pentactins to tauactins).

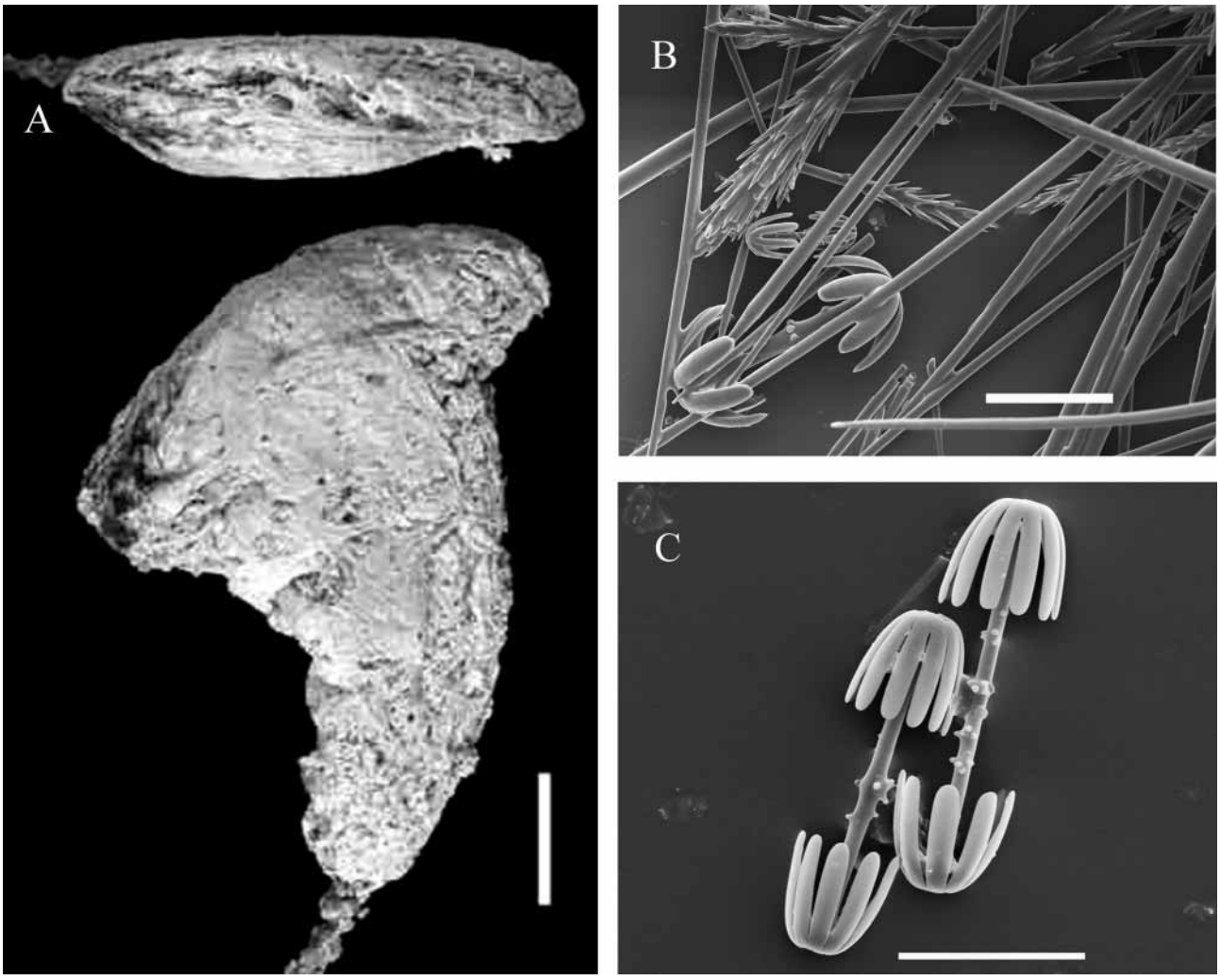

FIGURE 4. *H. (Corynonema). intersubgenerica,* sp. nov., holotype. A, body view from the side and from above, scale 20mm. B, dermal pinules, macramphidisc and mesamphidics, scale 100 µm.C, two mesamphidiscs, scale 30 µm.

H. (Cyliconema) Ijima, 1927
***Hyalonema (Cyliconema) apertum maehrenthali* Schulze, 1895 (Fig. 5)**

Material. Types: BMNH 1896.09.12.003: HM 5502—RV *Investigator*, sta. 3147, off Andamans. Other material: WAM Z 258—RV *Soela*, sta. SO 4A/82/O8 D, 17°58'S 118°25'E, depth 376 m. WAM 101-82—RV *Soela*, sta. SO 2/82/42, 18°44'S 117°20'–19'E, depth 326–360 m. WAM Z 272—RV *Soela*, sta. SO 2/82/37, 18°20'–19'S 118°0'–1'E, depth 320 m. MNHN HCl 436—CALSUB, 'Cyana', sta. 4, off Loyalty Islands, 20°35.40'S 167°12.00'E, depth 2380–2697 m.

Description. Body: The sponges are cup-like with thick walls. The body of the holotype is 100 mm long, 40x70 mm in diameter in the upper part, the atrial cavity is 50 mm deep, the walls 10–15 mm in thickness, the apical cone does not protrude far beyond the upper surface, sieve-plate is absent. The body parameters of the newly found specimens are similar to the holotype, 60 and 90 mm long, 20–60 mm in maximal diameter with well-developed atrial cavity in one specimen (WAM Z 272). WAM 101-82 shows body 40 mm long with wall 10 mm in thickness and slightly depressed atrial cavity; the tuft of basalia broken at the lower part is 350 mm long in this specimen. The HCl436 specimen, the description of which was erroneously missing in Tabachnick and Lévi (2000), is a broken sponge without the upper part of the body.

Spicules: The newly performed measurements are given in the Table 5 for comparison with those of other specimens of this subspecies given in Table 6. Abnormal amphidiscs (hexadiscs comparable to the mesamphi-

discs and micramphidiscs with umbels different in shape) may be found.

Remarks. In spicule measurements the specimens of this subspecies are very similar except for the length of macramphidiscs; specimens off W Australia are more similar to the 'Indonesian' ones (Ijima, 1927) in being generally larger and specimens off the Loyalty Islands are more similar to the types.

TABLE 5: *Hyalonema* (*Cyliconema*) *apertum maehrenthali* Schulze, 1895 off W. Australia. [MS S.12].

	WAM 79-91					WAM 101-82					WAM 123-82				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	15	.136	.056	.250	.065	17	.157	.071	.306	.076	15	.213	.061	.536	.145
L. derm. pentact. tangent. ray	15	.017	.010	.020	.003	18	.024	.015	.041	.007	15	.022	.013	.046	.009
L. atr. pentact. pinul. ray	15	.145	.056	.250	.060	15	.196	.112	.286	.058	15	.168	.077	.383	.074
L. atr. pentact. tangent. ray	15	.020	.015	.031	.004	15	.024	.015	.028	.004	15	.020	.015	.031	.004
L. macroamphidisc	17	.338	.102	.418	.088	15	.367	.321	.408	.027	15	.385	.326	.459	.036
l umbel, macramphidisc	17	.075	.046	.092	.011	15	.070	.061	.082	.008	15	.082	.066	.097	.009
d umbel, macramphidisc	17	.116	.061	.143	.022	15	.119	.107	.133	.008	15	.120	.102	.133	.009
L. mesamphidisc	16	.083	.038	.163	.045	17	.065	.031	.107	.026	19	.097	.041	.173	.043
l umbel, mesamphidisc	16	.028	.011	.066	.016	17	.020	.009	.031	.007	19	.028	.015	.051	.010
d umbel, mesamphidisc	16	.023	.009	.046	.012	17	.019	.010	.033	.008	19	.025	.010	.046	.009
L micramphidisc	15	.016	.013	.027	.004	15	.017	.012	.036	.007	15	.016	.011	.023	.003
l umbel, micramphidisc	15	.005	.004	.011	.002	14	.006	.004	.013	.003	15	.005	.004	.008	.001
d umbel, micramphidisc	15	.005	.004	.009	.001	15	.006	.004	.009	.002	15	.005	.004	.008	.001
L microhexactin ray	15	.030	.023	.041	.005	15	.032	.023	.051	.007	15	.031	.020	.46	.006

TABLE 6: Comparative measurements of *Hyalonema* (*Cyliconema*) *apertum maehernthali* Schulze, 1895 from different locations [MS S. 13].

	Andamans types original		Indonesia Ijima,1927		W Australia Loyality MNHN HCl 436			
	min	max	min	max	min	max	min	max
L derm. pentatc. pinul. ray	.185	.414	.175	.440	.056	.536	.340	.480
L derm. pentact. tangent. ray	.030	.063	.026	.050	.010	.046	.030	.050
L atr. pentact. pinul. ray	.118	.222	.100	.500	.056	.383		
L.atr. pentact. tangent. ray	.024	.044	.030	.038	.015	.031		
L macramphidisc	.111	.241	.220	.460	.102	.459	.140	.280
l umbel, macramphidisc	.037	.056	.060	.130	.046	.097	.025	.110
d umbel, macramphidisc	.041	.089	.076	.154	.061	.143	.060	.100
L mesamphidisc	.031	.038	.042	.150	.038	.173	.045	.113
l umbel, mesamphidisc	.011	.014	.015	.026	.009	.066	.018	.048
d umbel, mesamphidisc	.009	.014	.006	.043	.009	.046	.018	.045
L. micramphidisc	.012	.016	.012	.023	.011	.036	.015	.033
l umbel, micramphidisc	.004	.005			.004	.011	.005	.009
d umbel, micramphidisc	.004	.005	.006	.010	.004	.009	.006	.010
L. microhexactin ray	.030	.059	.020	.070	.020	.046	.043	.095

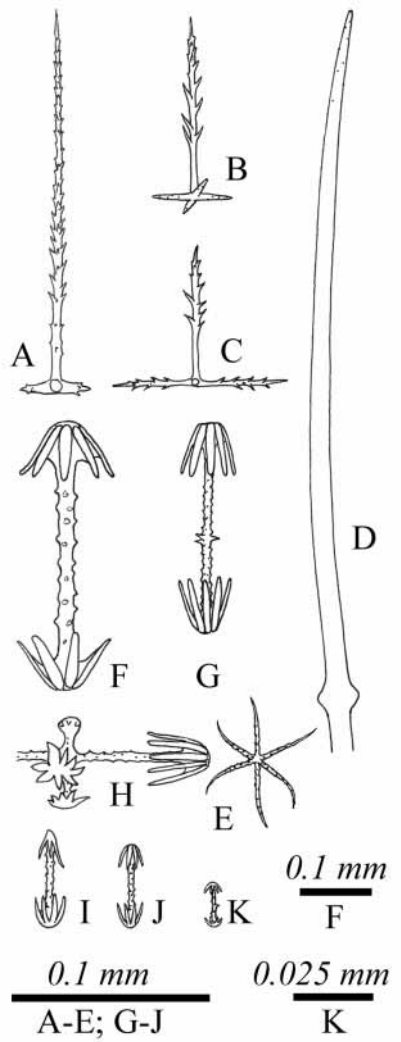

FIGURE 5. *Hyalonema. (Cyliconema) apertum maehrenthali* Schulze, 1895, spicules. A, dermal pinular pentactin. B, atrial pinular pentactin. C, canalar pinular pentactin. D, choanosoaml diactin. E, microhexactin. F, macramphidisc. G-J, mesamphidiscs. K, micramphidisc. A-K, WAM Z 272.

***Hyalonema. (Cyliconema) lanceolata* sp. nov.** (Fig. 6, 7; Tab. 7, 9)

Etymology. The name refers to the characteristic lanceolate teeth of the macramphidiscs in this species.

Material. *Holotype*: WAM Z 12488—sta. 1031103, NW Cape, 21°39.18'S 113°51.44'E, depth 610–649 m.

Paratypes: WAM Z 560; WAM Z 565; WAM Z 571; WAM Z 572; WAM Z 13103—sta. 4, NW Cape, 21°28.80'–28.20'S 113°57.93'–58.05'E, depth 570 m. WAM Z 560; WAM Z 562; WAM Z 565—Survey II, NW Cape, 21°48.72'S 113°98.88'E, depth 550 m. WAM Z 12489—sta. 1031201, NW Cape, 21°25.44'S 113°47.73'E, depth 850 m. WAM Z 12490—sta. 1031102, NW Cape, 21°30.35'S 113°56.14'E, depth 650 m. NTM Z 0002574 (2 specimens)—NWS-0042, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°24'S 118°52'E, depth 445 m. NTM Z 0002583 (3 specimens)—NWS-0045, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 18°0'S 118°16'E, depth 430 m. NTM Z 0002589 (2 specimens)—NWS-0049, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°39'S 118°38'E, depth 410 m. NTM Z 0002595—NWS-0053, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°24'S 118°52'E, depth

445 m. WAM Z 259—RV *Soela*, sta. SO 2/82/19, 140 miles NW of Port Headland, 18º35'S 117º0'–116°59'E, depth 588–592 m. WAM Z 554—RV *Soela*, sta. SO 2/82/20, 152 miles NW of Port Headland 18º45'S 116º31'–29'E, depth 584–590 m. WAM Z 654—RV *Soela*, sta. SO 2/82/21, 154 miles NW of Port Headland, 18º45'S 116º26.50'–22.50'E, depth 720–724 m. WAM Z 579 (2 specimens)—RV *Soela*, sta. SO 2/82/28, 145 miles NW of Port Headland, 18º41'S 116º44'–45'E, depth 594–596 m. WAM Z 644 (3 specimens)—RV *Soela*, sta. SO 2/82/29, 149 miles NW of Port Headland, 18º43'S 116º35'–33'E, depth 610–612 m. WAM Z 573 (3 specimens)—RV *Soela*, sta. SO 2/82/31, 135 miles NW of Port Headland, 18º41'S 116º56'–58'E, depth 500 m. WAM Z 649 (2 specimens)—RV *Soela*, sta. SO 2/82/32, 120 miles N of Cape Lambert, 18º36'S 117º8'–10'E, depth 500–504 m. WAM Z 577—RV *Soela*, sta. SO 2/82/33, 123 miles N of Cape Lambert, 18º32'S 117º21'–19'E, depth 496–504 m. WAM Z 595 (3 specimens)—RV *Soela*, sta. SO 2/82/34 B, 20 miles W of W Clarke Reef, 17º15'S 119º1'E, depth 444–450 m. WAM Z 595—RV *Soela*, sta. SO 2/82/43, 126 miles NW of Port Headland, 18º40'S 117º13'–11'E, depth 396–398 m. WAM Z 263 (3 specimens)—RV *Soela*, sta. SO 2/82/46, 145 miles NW of Port Headland, 18º41'S 116º45'–47'E, depth 506–508 m. WAM Z 563 (2 specimens)—RV *Soela*, sta. SO 4/82/8 C, N of Port Headland, 18º43'S 117º12'E, depth 368 m. WAM (p1360)—RV *Soela*, sta. 105-82, 20 miles W of W Clarke Reef, 17º15'S 119º1'–3'E. WAM Z 579—N of Montbello Island, 19º1'–15'S 115º53'E, depth 300–500 m.

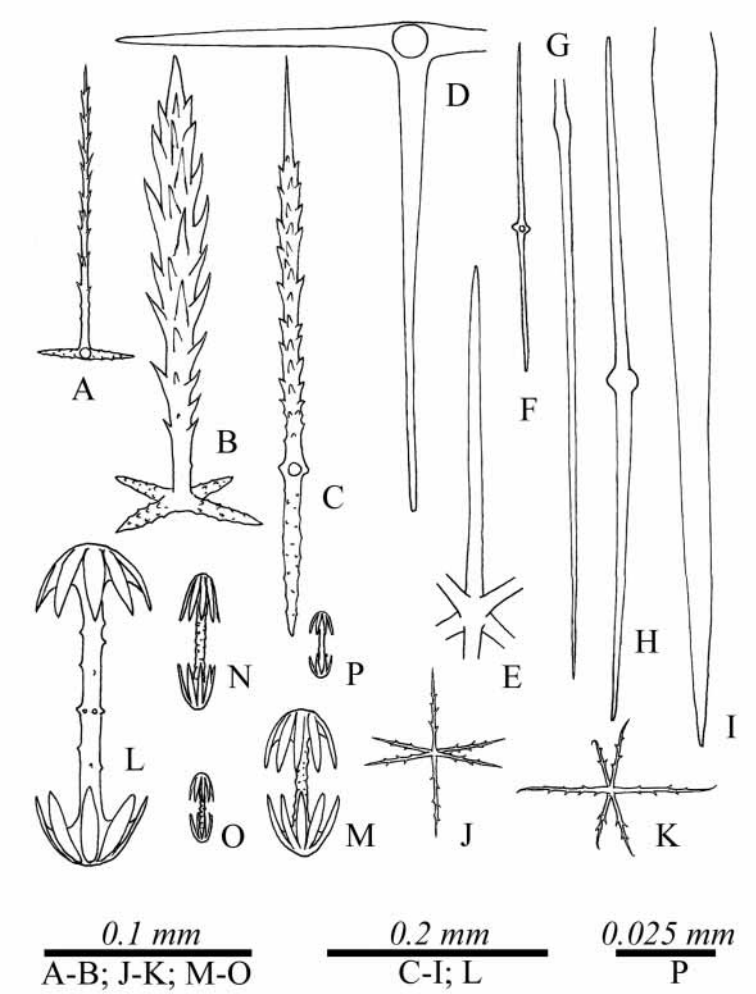

FIGURE 6. *Hyalonema (Cyliconema) lanceolata*, sp.nov., spicules. A, dermal pinular pentactin. B, atrial pinular pentactin. C, pinular diactin. D, hypodermal pentactin. E, choanosomal hexactin. F-I, choanosomal diactins. J-K, microhexactins. L-M, macramphidiscs. N-O, mesamphidiscs. P, micramphidisc. A-L; N; P, holotype. M, NTM Z 0002583. O, NTM Z 0002574.

Description. Body: The holotype is represented by the upper part of the conical body, 30–50 mm long and 20 mm in diameter fixed to a short broken stalk (3 mm in diameter). This specimen has a long 25 mm apical cone (3 mm in diameter) which protrudes far beyond the atrial surface; the atrial cavity is slightly depressed and four large depressions penetrate deeply into the sponge body; walls between the deep depressions form four septa; the walls of the sponge are 5–8 mm in thickness. No uniformity in the body shape of this species is observed. The specimen WAM Z 263 has an elevated atrial cavity (thus no atrial depression, canals and septa); its body is 50 mm long and ovoid in section 25x30 mm in maximum. The specimen WAM (p1360) is composed of four fused units each with several separate canals and septa and it is impossible to decide whether this is a single abnormal unit or a fusion of four initially independent specimens. Most other paratypes are conical in shape with atrial depression, sometimes with an apical cone and rarely with canals and septa. The body is 40–110 mm in length and 15–100 mm in diameter; the walls are 5–10 mm in thickness.

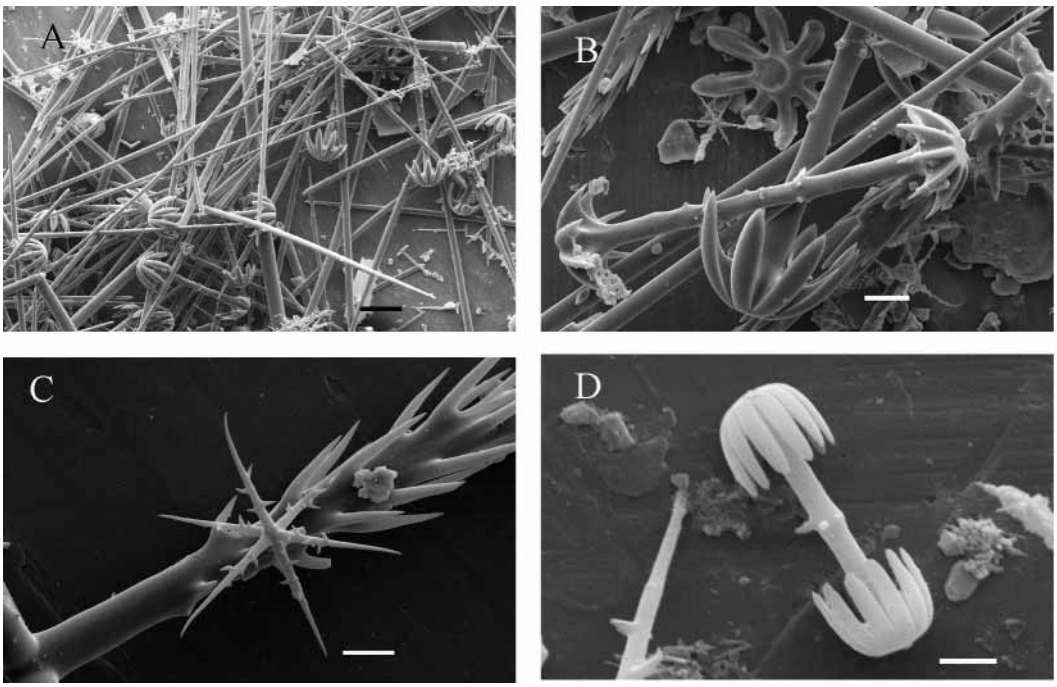

FIGURE 7. *Hyalonema Cyliconema lanceolata*, sp. nov., NTM Z 0002583. A, overview of atrial spicules, scale 100 µm. B, close-up of macramphidiscs, scale 30 µm. C, microhexaster on dermal pinule, scale 10 µm. D, micramphidisc, scale 3 µm.

Spicules: Choanosomal spicules are diactins and rarely hexactins. The diactins are 0.315–3.5/0.006–0.09 mm long; usually they have a widening in the middle or rarely four rudiment tubercles. The hexactins have rays 0.17–0.46/0.01–0.011 mm. Hypodermalia and hypoatrialia are pentactins, the former are notably larger then the latter. Hypodermal pentactins have tangential rays 0.2–0.6 mm long, the ray directed inside the body is 0.3–0.8 mm, diameter of these rays is 0.014–0.038 mm. Hypoatrial pentactins have tangential rays 0.15–0.27 mm long, the ray directed inside the body is 0.12–0.27 mm, diameter of these rays is 0.008–0.021 mm. In some specimens these spicules reach great sizes: hypodermal pentactins have rays up to 1.98/0.11 mm, hypoatrial pentactins up to 0.9/0.08 mm. Dermalia are pinular pentactins (rarely hexactins), they have short spines, the pinular ray is thickest at the base and finely tapering towards its outer end, other rays are short, spiny or rough, with conically pointed outer ends. The pinular ray in dermal pentactins is 0.059–0.285 mm long, tangential rays are 0.015–0.056 mm long, diameter of rays is 0.003–0.004 mm. Atrialia are pinular pentactins and rarely pinular diactins. The pinular ray of the diactins has short spines, it is conical in overall shape, 0.4–0.5 mm long, the ray directed inside the body is 0.15–0.4 mm long, diameter of this diactin is 0.015–0.022 mm; four rudimental tubercles or a widening is situated in the middle. Atrial pentactins have a pinular ray with relatively long spines, spindle-like in shape (thickest in the middle) with upper end conically

pointed, the tangential rays are spiny, conically pointed. The pinular ray in atrial pentactins is 0.044–0.37/0.016 mm, tangential rays are 0.019–0.059/0.007 mm.

Microscleres: Amphidiscs occur in three types. Macramphidiscs have tuberculated shafts; their total length is 0.144–0.433 mm, the length of the umbel is 0.026–0.104 mm, the umbel diameter is 0.044–0.133 mm. Mesamphidiscs have rough or densely tuberculated shafts; their total length is 0.026–0.111 mm, the length of the umbel is 0.009–0.052 mm, the umbel diameter is 0.007–0.052 mm. Total length of micramphidiscs is 0.011–0.03 mm, the length of the umbel is 0.004–0.011 mm, the umbel diameter is 0.004–0.011 mm. Microhexactins have spiny rays 0.022–0.048 mm long with straight or curved outer ends.

TABLE 7: Some measurements of spicules of *Hyalonema (Cyliconema) lanceolata*, sp.nov.

Table 7 A	WAM 12488					WAM 107-82 (fr826)					WAM 1272-82				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	15	.157	.085	.285	.053	15	.129	.074	.185	.034	16	.119	.059	.204	.040
L. derm. Pentact. tangent. ray	15	.026	.015	.044	.009	15	.031	.022	.056	.008	16	.022	.019	.028	.003
L. atr. pentact. pinul. ray	15	.203	.115	.289	.051	15	.092	.044	.167	.034	16	.146	.104	.215	.030
L. atr. pentact. tangent. ray	15	.040	.030	.059	.008	15	.026	.019	.037	.006	16	.024	.019	.030	.004
L. macroamphidisc	16	.270	.218	.322	.030	15	.263	.215	.333	.032	8	.321	.266	.363	.029
l umbel, macramphidisc	16	.060	.048	.074	.007	15	.061	.048	.074	.007	8	.065	.056	.074	.006
d umbel, macramphidisc	16	.091	.063	.118	.020	15	.086	.074	.115	.013	8	.106	.096	.118	.009
L. mesamphidisc	15	.057	.033	.104	.020	8	.045	.033	.056	.007					
l umbel, mesamphidisc	15	.021	.015	.037	.007	8	.019	.015	.022	.003					
d umbel, mesamphidisc	15	.015	.011	.026	.005	8	.014	.011	.019	.003					
L micramphidisc	15	.014	.012	.016	.001	15	.018	.014	.022	.002	15	.014	.011	.016	.002
l umbel, micramphidisc	15	.004	.004	.005	.001	15	.006	.004	.007	.001	15	.005	.004	.005	.001
d umbel, micramphidisc	15	.005	.004	.006	.001	15	.006	.005	.007	.001	15	.005	.004	.006	.001
L microhexactin ray	15	.039	.026	.048	.006	15	.039	.022	.048	.007	15	.039	.033	.044	.004

Table 7 B	NTM Z 0002574 (JH2574#1)					NTM Z 0002583 (JH2583#1)					WAM 13490				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	15	.124	.093	.148	.017	15	.127	.096	.155	.020	15	.171	.133	.241	.033
L. derm. Pentact. tangent. ray	15	.020	.015	.033	.005	15	.022	.015	.041	.007	15	.024	.015	.037	.005
L. atr. pentact. pinul. ray	16	.208	.111	.352	.079	17	.236	.093	.370	.075	15	.244	.133	.363	.063
L. atr. pentact. tangent. ray	16	.033	.022	.048	.008	17	.034	.022	.059	.009	15	.034	.022	.044	.008
L. macroamphidisc	15	.308	.281	.352	.024	15	.305	.259	.363	.035	15	.268	.170	.307	.041
l umbel, macramphidisc	15	.068	.059	.078	.006	15	.067	.048	.085	.011	15	.060	.026	.074	.013
d umbel, macramphidisc	15	.097	.089	.118	.008	15	.105	.085	.130	.011	15	.096	.048	.126	.026
L. mesamphidisc	15	.043	.030	.081	.014	15	.046	.037	.059	.006	18	.040	.030	.056	.008
l umbel, mesamphidisc	15	.018	.011	.030	.006	15	.020	.019	.030	.003	18	.015	.009	.019	.003
d umbel, mesamphidisc	15	.013	.009	.022	.004	15	.017	.012	.022	.003	18	.011	.007	.019	.003
L micramphidisc	15	.019	.011	.030	.006	16	.016	.011	.026	.004	13	.017	.012	.020	.002
l umbel, micramphidisc	15	.006	.004	.011	.002	16	.006	.004	.011	.002	13	.005	.004	.006	.001
d umbel, micramphidisc	15	.006	.005	.009	.001	16	.006	.004	.011	.002	13	.005	.004	.007	.001
L microhexactin ray	15	.032	.022	.041	.005	15	.031	.022	.037	.005	16	.033	.022	.041	.006

Remarks. Among numerous species of *Hyalonema. (Cyliconema)* only three species known before now have atrial spicules different from dermal ones in shape: *Hyalonema. (Cyliconema) masoni* Schulze, 1894 (Indian Ocean); *Hyalonema. (Cyliconema) infundibulum* Topsent, 1896 (Atlantic Ocean; a species described many times, but poorly) and *Hyalonema. (Cyliconema) hozawai* Okada, 1932 (Pacific Ocean). The atrial spicules in the first species have pinular rays with relatively long spines, clavate in shape with an apical cone, the other species have pinular rays also with relatively long spines, and spindle-like in shape with conically pointed gradually tapering outer end, as in the new species from off Australia. There are many similarities between the shape of most spicules between *Hyalonema. (Cyliconema) hozawai* and *Hyalonema. (Cyliconema) lanceolata sp. nov.*, but the latter exhibits two characteristic features: 1) macramphidiscs with lanceolate teeth (they are oval in the former species), and 2) microhexactins which have straight rays which are curved at outer ends in the Australian new species; they are entirely straight in the first species. Besides, most spicule measurements vary notably between these species. These are sufficient reasons to consider the Australian specimens as a new species of *Hyalonema. (Cyliconema).*

***Hyalonema. (Cyliconema) clavapinulata* sp. nov.** (Fig. 8, 9; Tab. 8)

Etymology. The name refers to the spindle-like or clavate shape of the pinular ray of the pinular pentactin atrialia of this species.

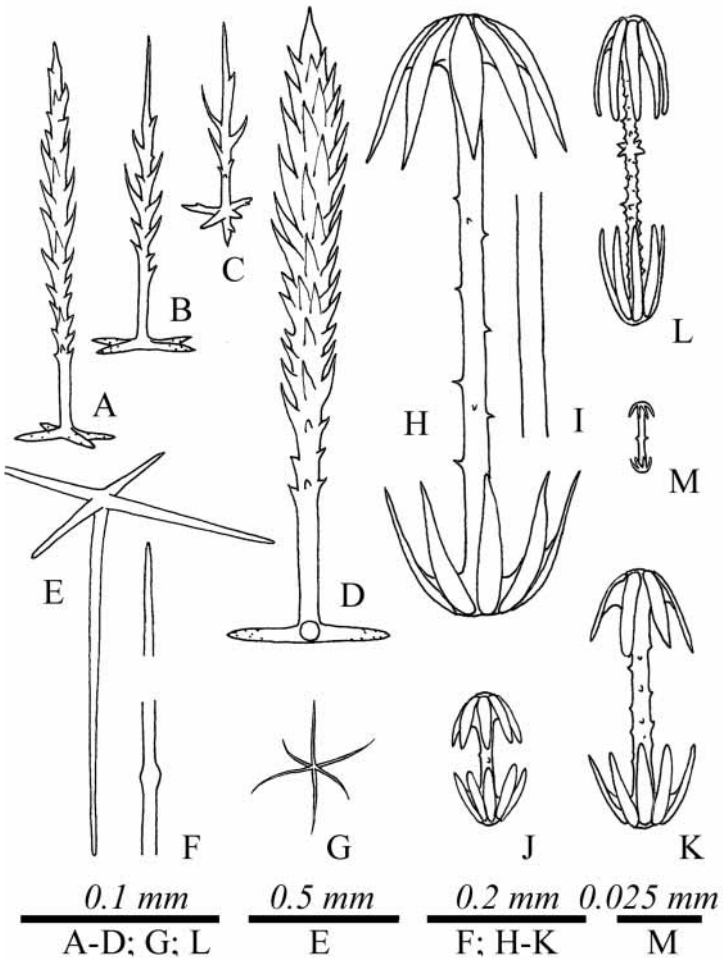

FIGURE 8. *Hyalonema. (Cyliconema) clavapinulata* sp. nov, spicules, holotype. A-C, dermal pinular pentactin. D, atrial pinular pentactin. E, hypoatrial pentactin. F, choanosomal diactin. G, microhexactin. H, large macramphidisc. I, shaft of large macramphidisc. J-K, small macramphidiscs. L, mesamphidisc. M, micramphidisc.

Material. *Holotype*: WAM 106-82—RV *Soela*, sta. SO 2/82/34 B, 20 miles W of W Clarke Reef, 17°15'S 119°1'E, depth 444–450 m.

Paratypes: NTM Z 0002571—sta. NWS-0042, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°24'S 118°52'E, depth 445 m. NTM Z 0002579—sta. NWS-0043, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°18'S 119°4'E, depth 426 m. NTM Z 0002585—sta. NWS-0048, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°52'S 118°28'E, depth 415 m.

Description. Body: The holotype is represented by the upper part of the body which is cup-shaped, 130 mm high, oval in the upper part 40x80 mm, with low atrial cavity 40 mm deep and walls 10 mm in thickness. The paratype NTM Z 0002579 is similar in shape to the holotype, the upper part of its body is 140 mm high, oval in the upper part 80x90 mm, with atrial cavity 50 mm deep and a short (5 mm long) apical cone; its atrial surface is folded with rare openings, 1–2 mm in diameter. The paratype NTM Z 0002585 is also cup-shaped; its upper part of the body is 110 mm high, 110 mm in diameter with very shallow atrial cavity and 4 large septa inside the atrial cavity.

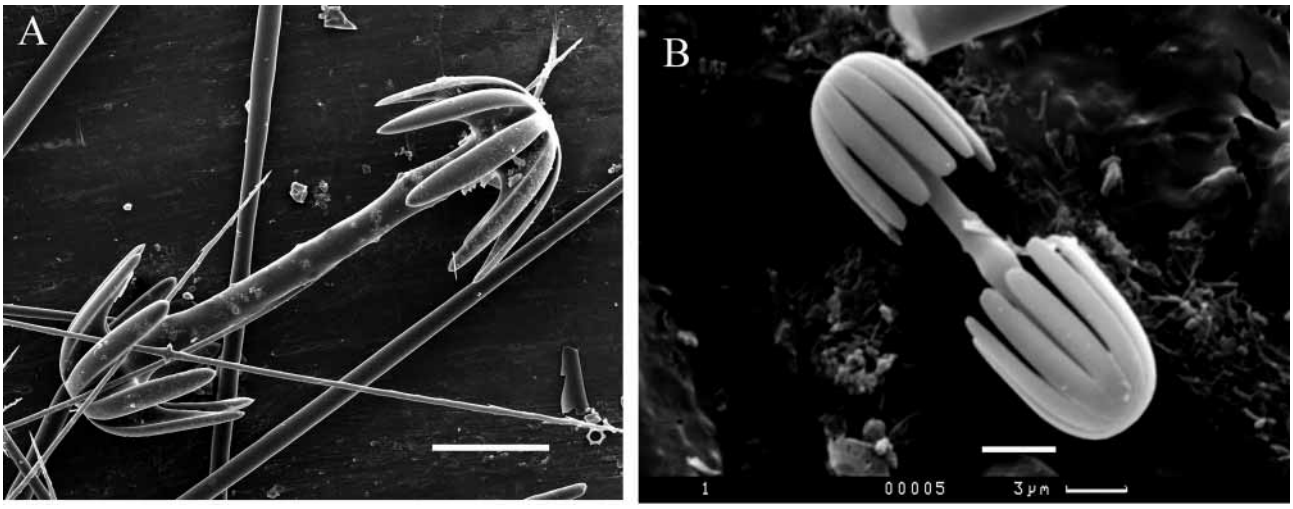

FIGURE 9. Hyalonema. (Cyliconema) clavapinulata, sp. nov., holotype. A, macramphidisc, scale 100 µm. B, micramphidisc, scale 3 µm.

Spicules: Choanosomal spicules are diactins 0.5–1.7/0.006–0.011 mm, stout or with a widening in the middle. Hypodermalia are pentactins with tangential rays 0.16–0.38 mm long, the ray directed inside the body is 0.36–0.61 mm, the diameter of these rays is 0.011–0.03 mm. Specific hypoatrialia seem to be absent. Dermalia are pinular pentactins (rarely hexactins), they have short spines, the pinular ray is thickest at base and finely tapering at its outer end, other rays are short spiny or rough with conically pointed outer ends. The pinular ray in dermal pentactins is 0.066–0.383/0.007 mm, tangential rays are 0.02–0.036/0.003-0.004 mm. Atrialia are pinular pentactins in which the pinular ray has relatively long spines, it is spindle-like or clavate in shape (thickest in the distal part) with upper end conically pointed; the tangential rays are short spiny, conically pointed. The pinular ray in atrial pentactins is 0.128–0.439 mm long, 0.004 mm in diameter at the base and 0.007 mm in diameter in the thickest part; tangential rays are 0.015–0.041/0.004 mm.

Microscleres: Amphidiscs are represented by three types. Macramphidiscs usually have spiny, rarely smooth shafts and they are mostly large: their total length is 0.163–0.816 mm, the length of the umbel is 0.051–0.179 mm, the umbel diameter is 0.082–0.245 mm. One specimen, NTM Z 0002585, is unusual because it has comparably small macramphidiscs with tuberculated shafts which are situated close to the atrial surface; their total length is 0.163–0.332 mm, the length of the umbel is 0.066–0.107 mm, the umbel diameter is 0.087–0.153 mm. Mesamphidiscs are rare in the holotype, but common in the paratype NTM Z 0002579, and usual in the paratype NTM Z 0002585; they have shafts with numerous spines; their total length is 0.041–

0.291 mm, the length of the umbel is 0.018–0.097 mm, the umbel diameter is 0.014–0.107 mm. Total length of micramphidiscs with several spines in the middle is 0.014–0.042 mm, the length of the umbel is 0.004–0.013 mm, the umbel diameter is 0.005–0.012 mm. Microhexactins have smooth rays 0.02–0.046 mm long with straight or curved outer ends.

TABLE 8: Some measurements of spicules of *Hyalonema* (*Cyliconema*) *clavapinulata* sp. nov.

	WAM 106-82					NTM Z 0002585					NTM Z 0002579				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	15	.172	.082	.214	.036	18	.198	.066	.383	.065	15	.173	.133	.204	.022
L. derm. Pentact. tangent. ray	15	.026	.020	.031	.003	18	.026	.020	.036	.004	15	.025	.020	.031	.003
L. atr. pentact. pinul. ray	15	.253	.133	.332	.055	15	.292	.179	.439	.083	15	.242	.128	.316	.047
L. atr. pentact. tangent. ray	15	.026	.020	.031	.003	15	.031	.020	.041	.005	15	.028	.015	.036	.005
L. macroamphidisc	15	.539	.286	.765	.175	18	.572	.163	.750	.188	18	.539	.214	.816	.194
l umbel, macramphidisc	15	.134	.061	.179	.034	18	.141	.066	.173	.026	18	.117	.051	.163	.031
d umbel, macramphidisc	15	.162	.097	.219	.035	18	.190	.087	.245	.036	18	.166	.082	.230	.045
L. mesamphidisc	1	.041	.041	.041		15	.132	.056	.250	.056	6	.156	.077	.291	.097
l umbel, mesamphidisc	1	.018	.018	.018		15	.054	.020	.097	.024	6	.052	.028	.087	.027
d umbel, mesamphidisc	1	.015	.015	.015		15	.046	.017	.107	.027	6	.035	.020	.077	.021
L micramphidisc	15	.019	.017	.023	.002	15	.018	.014	.021	.002	15	.019	.015	.042	.007
l umbel, micramphidisc	15	.005	.004	.006	.001	15	.005	.004	.008	.001	15	.005	.004	.013	.002
d umbel, micramphidisc	15	.006	.005	.008	.001	15	.006	.005	.007	.001	15	.006	.005	.012	.002
L microhexactin ray	16	.031	.026	.046	.007	15	.030	.020	.041	.007	15	.027	.020	.036	.004

TABLE 9: Some measurements of spicules of species of *Hyalonema* (*Cyliconema*) with different shape of atrial pinular ray: H. masoni: BMNH 1907.08.01.003; HM 5507; Hm 5510; HM 3680 (‚Investigator‘, sta. 117); H. hozawai (from Okada, 1932) and newly described species *H.* (*Cyliconema*) *lanceolata* and *H.* (*Cyliconema*) *clavapinulata.*

	H. (*C.*) *masoni*		*H .*(*C.*) *hozawai*		*H.* (*C.*) *lanceolata*		*H.* (C.) *clavapinulata*	
	min	max	min	max	min	max	min	max
L derm. pentatc. pinul. ray	.044	.244	.240	.280	.059	.285	.066	.383
L derm. pentact. tangent. ray	.024	.041	.035	.050	.015	.056	.020	.036
L atr. pentact. pinul. ray	.133	.178	.200	.200	.044	.370	.128	.439
L.atr. pentact. tangent. ray	.015	.026	.080	.110	.019	.059	.015	.041
L macramphidisc	.096	.414	.200	.320	.144	.433	.163	.816
l umbel, macramphidisc	.037	.093	.070	.125	.026	.104	.051	.179
d umbel, macramphidisc	.019	.115	.104	.120	.044	.133	.082	.245
L mesamphidisc	.030	.144	.060	.145	.026	.111	.041	.291
l umbel, mesamphidisc	.011	.048	.024	.048	.009	.052	.018	.097
d umbel, mesamphidisc	.008	.041	.040	.040	.007	.052	.014	.107
L. micramphidisc	.012	.027	.016	.020	.011	.030	.014	.042
l umbel, micramphidisc	.004	.010			.004	.011	.004	.013
d umbel, micramphidisc	.003	.009			.004	.011	.005	.012
L. microhexactin ray	.020	.050	.060	.080	.022	.048	:020	:046

Remarks. The external shape of the pinular ray in the atrial pentactins of this new species is most similar to that of *Hyalonema. (Cyliconema) masoni*. Specific features of the four new specimens of *Hyalonema. (Cyliconema) clavapinulata* sp. nov. are spindle-like or clavate atrial pentactins and extremely large sizes of macramphidiscs, dermal and atrial pentactins (see Tab. 8, 9).

Hyalonema. (Cyliconema) ***timorense*** **Ijima, 1927** (Fig. 10; Tab. 10)

Material. MNHN(fr867.2)—Cidaris I, RV *Franklin*, sta. 8-1, 18º7.82'S 148º15.39'E, depth 1115–1119 m. MNHN(fr727)—Cidaris I, RV *Franklin*, sta. 15-3, 17º45.49'S 148º37.52'E, depth 945 m. MNHN(p1087)—Cidaris I, RV *Franklin*, sta. 15-4, 17º45.99'S 148º39.09'E, depth 958–964 m.

Description. Body: All specimens present here are fragments.

Spicules: No significant differences were observed between spicules, their shape and measurements. Small macramphidiscs (large mesamphidiscs according to Ijima, 1927) may have a widening in the middle of the shaft in the newly observed fragments.

Remarks. The holotype was described from a single small specimen and we have nothing to add to its external shape of the body. Very little variation in the spicule measurements was found, the only notable one is the ray length of microhexactins; they are notably larger in the holotype than in our specimens.

TABLE 10: Some measurements of spicules of species of *Hyalonema* (*Cyliconema*) *timorense* Ijima, 1927.

	from Ijima, 1927		n. sp. fr 727					n.sp. p 1087				
	min	max	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	.230	.360	11	.198	.112	.357	.077	14	.217	.087	.270	.048
L. derm. pentact. tangent. ray	.060	.080	14	.047	.031	.066	.009	14	.040	.020	.077	.014
L. atr. pentact. pinul. ray			15	.224	.153	.321	.051	12	.231	.168	.306	.046
L. atr. pentact. tangent. ray			15	.045	.033	.066	.009	15	.047	.026	.066	.012
L. large macroamphidisc	.495	.715	15	.743	.653	.857	.051	14	.649	.571	.734	.048
l umbel, large macramphidisc	.120	.165	15	.128	.107	.153	.011	14	.125	.117	.143	.006
d umbel, large macramphidisc	.160	.200	15	.190	.158	.214	.015	14	.170	.112	.204	.026
L. small macroamphidisc	.110	.143	9	.146	.107	.224	.037	13	.188	.112	.316	.069
l umbel, small macramphidisc			9	.065	.051	.082	.009	13	.078	.051	.117	.019
d umbel, small macramphidisc	.075	.090	9	.061	.046	.082	.012	13	.078	.056	.107	.014
L. mesamphidisc	.050	.050	16	.078	.061	.122	.019	15	.089	.056	.158	.025
l umbel, mesamphidisc			16	.027	.020	.061	.010	15	.029	.015	.048	.008
d umbel, mesamphidisc	.015	.015	16	.023	.017	.056	.009	15	.025	.015	.036	.005
L micramphidisc	.015	.020	15	.022	.017	.025	.002	15	.023	.019	.027	.002
l umbel, micramphidisc			15	.007	.005	.008	.001	15	.007	.005	.008	.001
d umbel, micramphidisc			15	.008	.006	.009	.001	15	.008	.007	.009	.001
L microhexactin ray	.075	.120	15	.055	.044	.071	.077	15	.064	.042	.080	.010

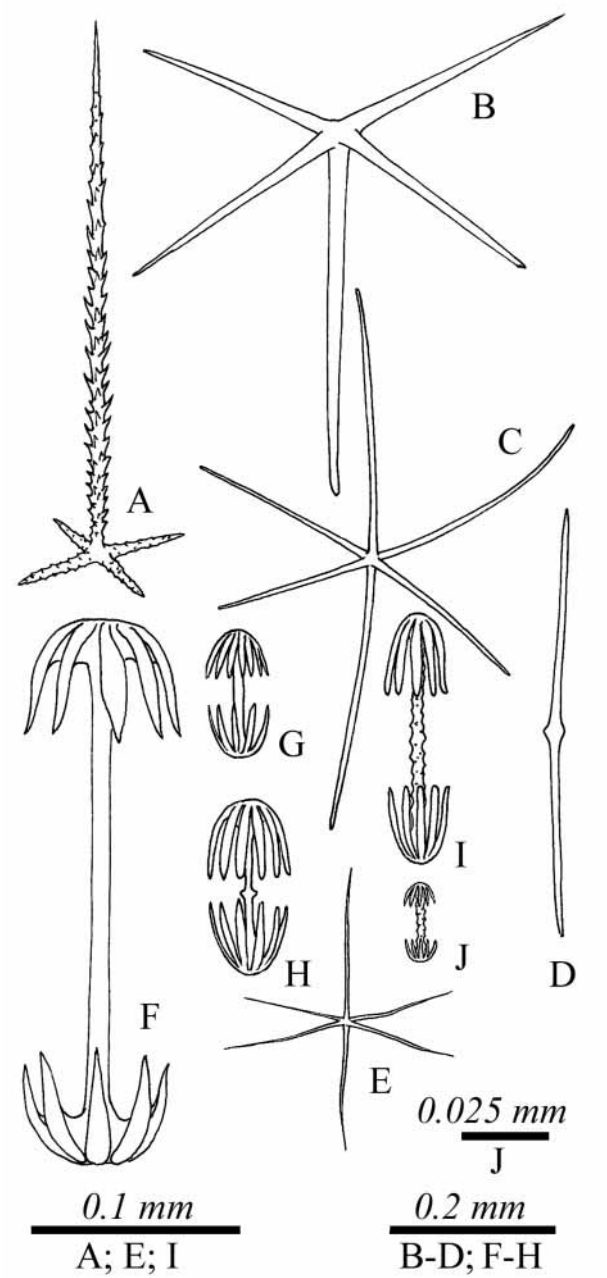

FIGURE 10. Spicules of *Hyalonema. (Cyliconema) timorense* Ijima, 1927, MNHN(p1087). A, pinular pentactin. B, hypodermal pentactin. C, choanosomal hexactin. D, choanosomal diactin. E, microhexactin. F, large macramphidisc. G-H, small macramphidiscs. I, mesamphidisc. J, micramphidisc.

***Hyalonema. (Cyliconema) keiense* Ijima, 1927** (Fig. 11; Tab. 11).

Material. NTM Z 0002594—sta. NWS-0052, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°28'S 118°53'E, depth 405 m. WAM 136-82—RV *Soela*, sta. SO 4/82/8 C, N of Port Headland, 18°43'S 117°12'E, depth 368 m.

Description. Body: The specimen NTM Z 0002594 is a complete upper part of the body, cup-like, 70 mm high and oval in the upper part of the body 60x100 mm; the atrial cavity is slightly depressed. The sieve-plate is similar to that of *Hyalonema* (*Hyalonema*); open meshes are assembled in groups separated by imperforate tracts). The other specimen is a fragment.

Spicules: The most important measurements are given in the Tab. 11. Choanosomal hexactins were found neither in our material nor in the holotype (Ijima, 1927 wrote that their presence is uncertain). Unlike the holotype, many atrial pinular diactins were found in both new specimens; the pinular ray is conically pointed with few short spines. Some macramphidiscs in the specimen WAM 136-82 have sparsely spiny shafts. Unlike the holotype, small macramphidiscs were not observed in the investigated specimens.

Remarks. The primary description was made from a single representative, a poor fragment, likely from the dermal surface. Unlike the new Australian specimens, pinular diactins located among atrial spicules are entirely absent in the holotype. All the other spicules are very similar in size and shape, the only exception being the small macramphidiscs; amphidiscs of such size are entirely absent in both of the new specimens (see Tab. 11). Neither of these differences seems to be significant enough to consider the new specimens to be a new species nor to distinguish them as a new subspecies.

TABLE 11: Some measurements of spicules of species of *Hyalonema* (*Cyliconema*) *keiense* Ijima, 1927.

	from Ijima, 1927		n. sp. WAM 136-82					n.sp. NTM Z 0002594				
	min	max	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	.130	.300						16	.253	.138	.332	.054
L. derm. pentact. tangent. ray	.038	.050						16	.026	.020	.031	.004
L. atr. pentact. pinul. ray			15	.196	.158	.245	.026	15	.196	.143	.296	.038
L. atr. pentact. tangent. ray			15	.024	.015	.031	.005	15	.022	.018	.031	.003
L. atr. diactin pinul. ray			15	.248	.173	.347	.041	15	.317	.230	.403	.058
L. atr. diactin ray directeced inside body			15	.175	.102	.281	.051	15	.215	.138	.281	.042
L. large macroamphidisc	.440	.695	15	.506	.230	.663	.162	15	.632	.184	.928	.203
l umbel, large macramphidisc	.120	.165	15	.127	.077	.163	.028	15	.134	.066	.168	.036
d umbel, large macramphidisc	.143	.210	15	.164	,092	.204	.038	15	.168	.071	.209	.047
L. small macroamphidisc	.286	.365										
l umbel, small macramphidisc	.085	.110										
d umbel, small macramphidisc	.112	.135										
L. mesamphidisc	.040	.187	16	.085	.046	.163	.030	15	.092	.046	.168	.036
l umbel, mesamphidisc		.040	16	.031	.015	.066	.013	15	.034	.015	.061	.014
d umbel, mesamphidisc			16	.028	.015	.061	.012	15	.030	.013	.056	.013
L micramphidisc	.020	.020	15	.020	.015	.025	.003	15	.018	.016	.021	.002
l umbel, micramphidisc			15	.006	.004	.008	.001	15	.006	.005	.008	.001
d umbel, micramphidisc			15	.007	.005	.008	.001	15	.006	.005	.007	.001
L microhexactin ray	.033	.043	15	.032	.027	.042	.004	15	.028	.023	.034	.003

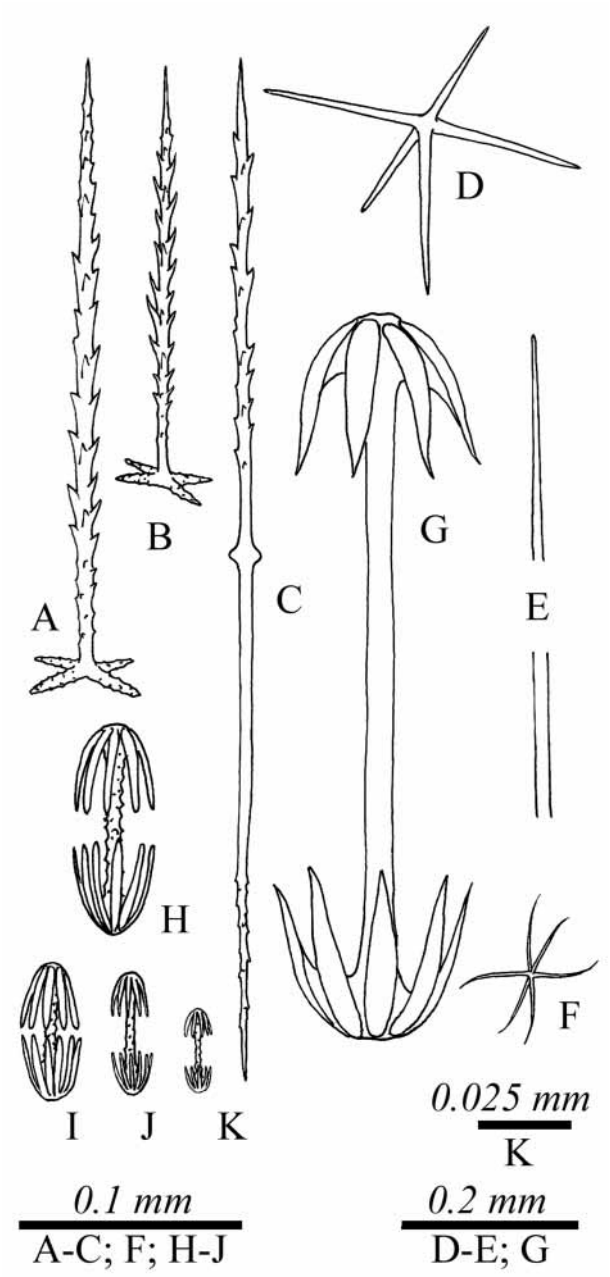

FIGURE 11. Spicules of *Hyalonema. (Cyliconema) keiense* Ijima, 1927, WAM 136-82. A, dermal pinular pentactin. B, atrial pinular pentactin. C, atrial pinular diactin. D, hypodermal pentactin. E, choanosomal diactin. F, microhexactin. G, macramphidisc. H-J, mesamphidisc. K, micramphidisc.

H. (*Oonema*) Lendenfeld, 1915

***Hyalonema*. (*Oonema?*) *microstauractina* Tabachnick and Levi, 2000** (Fig. 12, 13; Tab. 12)

Material. MNHN(p1088; fr865)—Cidaris I, RV *Franklin*, sta. 24-2, 17°19.58'S 147°47.61'E, depth 1187–1200 m. MNHN(p8)—Cidaris I, RV *Franklin*, sta. 3-1, 18°8.22'S 147°33.97'E, depth 1044–1067 m.

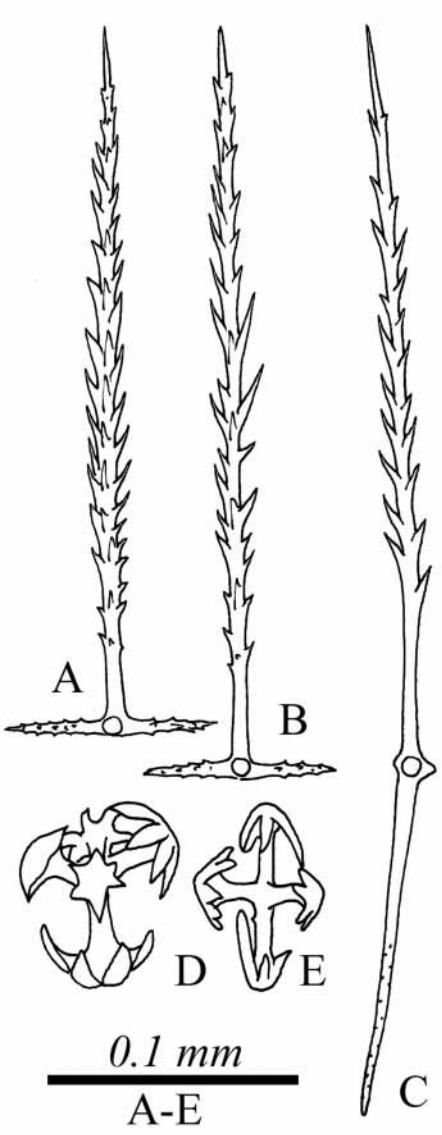

FIGURE 12. Spicules of *Hyalonema. (Oonema?) microstauractina* Tabachnick & Lévi, 2000, MNHN(p1088). A, dermal pinular pentactin. B, atrial pinular pentactin. C, pinular diactin. D-E, abnormal macramphidiscs.

Description. Body: The most complete specimen (p1088) has a conical body 45 mm high and oval in the upper part of the body 20x40 mm, other specimen are fragments.

Spicules: The measurements of spicules are given in Tab. 12, their specific features are discussed below. Macramphidiscs are regular but abnormal forms with 4 teeth and with several umbels were found in MNHN(fr865).

Remarks. These specimens are very similar to *H. (Oonema?) microstauractina* described from relatively close to Australian regions, off New Caledonia, Wallis and Futuna Islands. The complete absence of spicules with spindle-like pinular ray and apical cone is not an outstanding feature because the construction of the pinular ray in dermal spicules varies in the type series: All pinular rays are conical without an apical cone as it is in the newly found Australian as well as in the type series: MNHN HCL 430; 434; 435. The abnormal amphidiscs in the form of staurodiscs and hexadiscs found sometimes in the 'Australian' specimens should be considered as an intraspecific variation, as known for other species of *Hyalonema*.

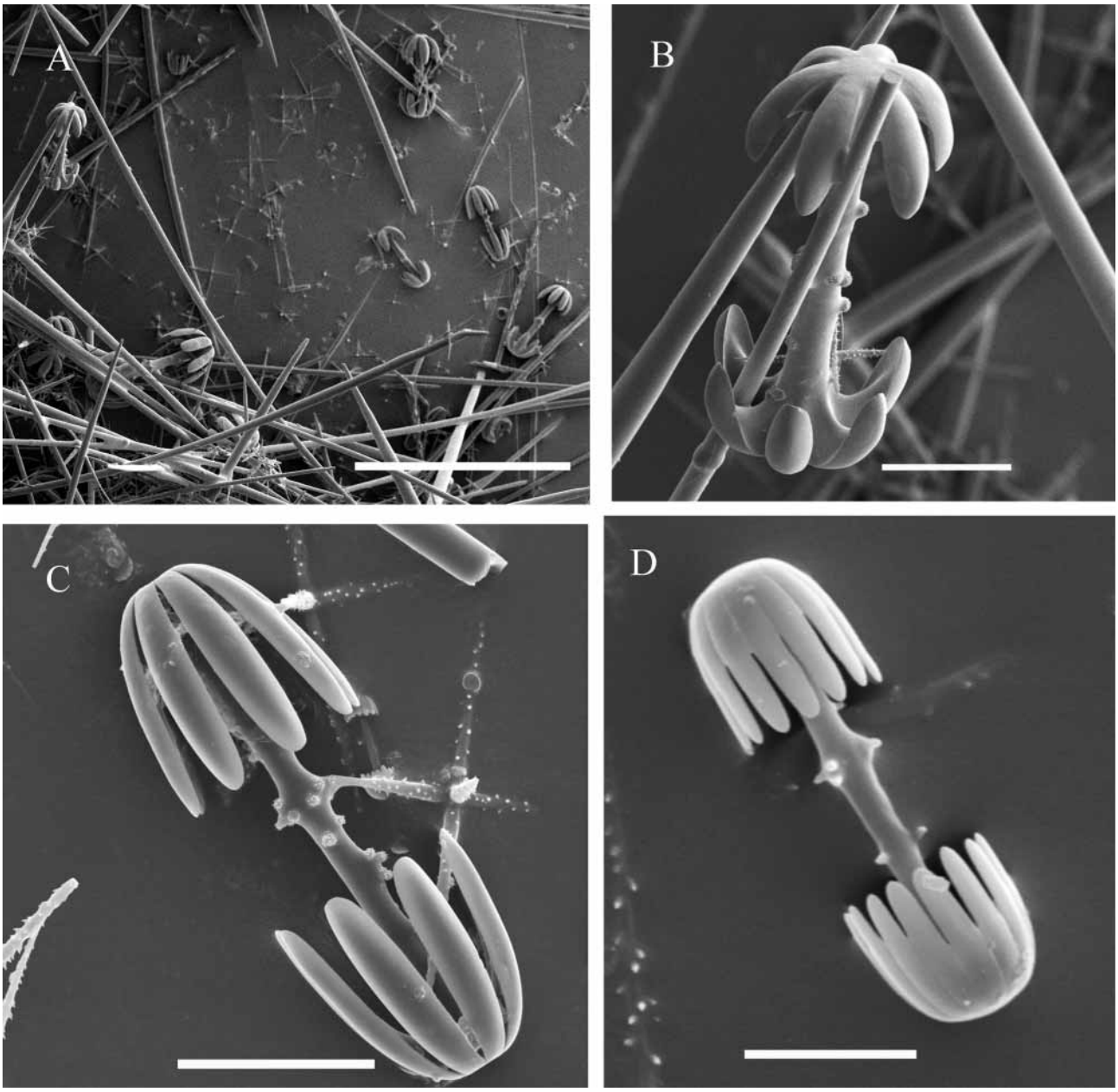

FIGURE 13. *Hyalonema. (Oonema?) microstauractina* Tabachnick & Lévi, 2000, A-D, MNHN(fr865). A, overview of spicules, scale 300 µm. B, macramphidisc, scale 30 µm. C, mesamphidisc, scale 30 µm. D, micramphidisc, scale 10 µm.

TABLE 12: Some measurements of spicules of *Hyalonema* (*Oonema*?) *microstauractina* Tabachnick & Levi, 2000.

	(p1088)					(p8)					(p865)				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	25	.320	.120	.485	.093						15	.287	.204	.587	.100
L. derm. pentact. tangent. ray	25	.039	.020	.061	.008						15	.044	.031	.061	.010
L. atr. pentact. pinul. ray	25	.206	.128	.270	.042						15	.191	.097	.230	.038
L. atr. pentact. tangent. ray	25	.034	.020	.051	.006						15	.036	.026	.043	.005
L. atr. diactin pinul. ray	5	.447	.316	.765	.183						3	.286	.255	.332	.040
L. atr. diactin proximal ray	5	.257	.214	.357	.060						3	.162	.117	.240	.068
L. macroamphidisc	25	.119	.063	.174	.021	15	.118	.092	.141	.012	15	.133	.059	.235	.044
l umbel, macramphidisc	25	.033	.021	.057	.006	15	.041	.032	.050	.005	15	.045	.023	.113	.021
d umbel, macramphidisc	25	.047	.029	.067	.007	15	.048	.040	.055	.004	15	.056	.032	.084	.013
L. mesamphidisc	25	.067	.032	.143	.028	15	.052	.029	.105	.022	17	.051	.029	.101	.018
l umbel, mesamphidisc	25	.028	.014	.063	.013	15	.022	.013	.050	.011	17	.019	.011	.038	.008
d umbel, mesamphidisc	25	.024	.013	.059	.011	15	.016	.008	.042	.010	17	.017	.009	.040	.009
L micramphidisc	25	.019	.016	.025	.002	16	.019	.015	.023	.002	15	.018	.011	.023	.003
l umbel, micramphidisc	25	.005	.004	.007	.001	16	.007	.005	.011	.001	15	.005	.002	.007	.001
d umbel, micramphidisc	25	.006	.005	.007	.001	16	.007	.005	.008	.001	15	.006	.003	.007	.001
L microhexactin ray	25	.090	.020	.133	.037	15	.080	.005	.128	.035	15	.082	.005	.138	.042

Chalaronema Ijima, 1927

***Chalaronema sibogae* Ijima, 1927 (Fig. 14; Tab. 13A, B)**

Material. *Type*: ZMA—fragment of the type, 'Siboga', sta. 251. Other materials: WAM 108-82—RV *Soela*, sta. SO 2/82/38, 122 miles NNW of Port Headland, 18°22'–23'S 117°56'–54'E, depth 309–316 m. WAM 101-82—RV *Soela*, sta. SO 2/82/42 119 miles NW of Port Headland, 18°44'S 117°20'–19'E, depth 326–360 m. WAM Z 602 (3 specimens)—RV *Soela*, sta. SO 2/82/44 124 miles NW of Port Headland, 18°54'–55'S 117°2-0'E, depth 300–306 m. WAM Z 603—RV *Soela*, sta. SO 2/82/45, 133 miles NW of Port Headland, 18°49'–48'S 116°50'–52'S, depth 400–406 m.

Description. Body: The new specimens show an oval body form with a sieve-plate, but without an atrial cavity. The length of the body is 40–80 mm, the diameter 20–50 mm. Some of the specimens have upper fragments of the tufts (150–400 mm long and 3–4 mm in diameter) of anchorate spicules. It is very difficult to recognize if these tufts are twisted or not, but in comparison with the original description of this sponge the tufts are thinner and more compact.

Spicules: The measurements are given in the Tab 13A, B. Most of the spicules are in the size range of what is known from the original description. But one sponge WAM 101-82 has a few mesamphidiscs with spiny shafts (absent in other specimens) and a notable amount of rare micropentactins and additionally common microhexactins similar in shape to the microstauractins (with harpoon-like rays), but their rays are generally shorter, 0.043–0.112 mm.

Remarks. It is very difficult to make a decision if the genus *Chalaronema* should be kept or synonymized with *Hyalonema* (*Pteronema*), because these sponges often have no basal tufts preserved, or they are so destroyed that it is impossible to decide whether or not the root tuft is twisted. Moreover, it is unknown if the

types were damaged in a way that the tuft has become untwisted, or whether this really is very important for taxonomic purposes. Nevertheless, the genus *Chalaronema* is kept for the time being and our new specimens are tentatively referred to it.

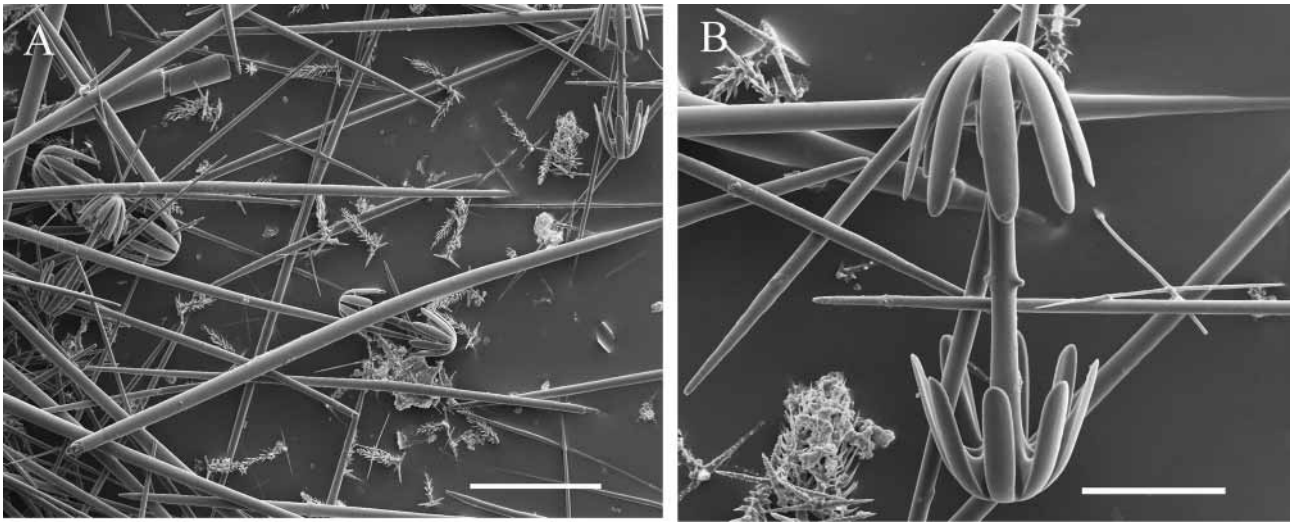

FIGURE 14. *Chalaronema sibogae* Ijima, 1927, WAM Z 602. A, overview of spicules, scale 300 µm. B, macramphidisc, scale 100 µm.

TABLE 13A, B: Some measurements of spicules of *Chalaronema sibogae* Ijima, 1927.

Table 13 A	Types (Ijima, 1927 and original data)					new Australian materials									
	2 specimens					fr795					fr797				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray			.110	.150		15	.122	.087	.204	.030	15	.087	.041	.102	.014
L. derm. pentact. tangent. ray			.040	.068		15	.045	.031	.056	.007	15	.044	.031	.056	.008
L. atr. pentact. pinul. ray				.080		16	.218	.122	.321	.063	15	.214	.107	.306	.067
L. atr. pentact. tangent. ray				.075		16	.040	.031	.056	.007	15	.044	.036	.056	.007
L. macroamphidisc		.272	.190	.357		16	.319	.265	.388	.040	15	.297	.209	.383	.051
l umbel, macramphidisc		.089	.030	.114		16	.110	.077	.143	.022	15	.092	.056	.112	.018
d umbel, macramphidisc		.103	.049	.137		16	.129	.087	.163	.026	15	.110	.066	.143	.023
L. mesamphidisc															
l umbel, mesamphidisc															
d umbel, mesamphidisc															
L micramphidisc		.016	.013	.024		15	.015	.011	.017	.002	15	.015	0.13	.021	.002
l umbel, micramphidisc		.005	.004	.009		15	.005	.004	.006	.001	15	.005	.004	.006	.001
d umbel, micramphidisc		.005	.004	.007		15	.005	.004	.006	.001	15	.005	.004	.006	.001
L microstauractine ray			.060	.198		15	.106	.077	.153	.020	15	.123	.087	.179	.028

Table 13 B	new Australian materials									
	fr802.2					fr823				
	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. pinul. ray	15	.096	.071	.117	.011	25	.113	.092	.128	.010
L. derm. pentact. tangent. ray	15	.047	.036	.056	.006	25	.042	.023	.051	.007
L. atr. pentact. pinul. ray	15	.233	.112	.510	.118	25	.239	.097	.357	.071
L. atr. pentact. tangent. ray	15	.045	.023	.061	.009	25	.045	.033	.056	.007
L. macroamphidisc	15	.339	.235	.439	.049	25	.293	.219	.383	.037
l umbel, macramphidisc	15	.092	.061	.122	.019	25	.092	.061	.133	.015
d umbel, macramphidisc	15	.108	.077	.143	.020	25	.113	.079	.143	.018
L. mesamphidisc						9	.093	.046	.138	.027
l umbel, mesamphidisc						9	.028	.015	.036	.006
d umbel, mesamphidisc						9	.025	.012	.038	.007
L micramphidisc	15	.017	.013	.022	.003	25	.018	.014	.038	.005
l umbel, micramphidisc	15	.005	.004	.007	.001	25	.006	.004	.014	.002
d umbel, micramphidisc	15	.005	.004	.006	.001	25	.006	.004	.012	.001
L microstauractine ray	15	.113	.071	.153	.023	25	.114	.010	.163	.031

Lophophysema Schulze, 1900

***Lophophysema inflatum* Schulze, 1900**

Material. WAM Z 13101; WAM Z 574; WAM Z 576; WAM Z 13102—sta. 4, NW Cape, 21°28.80'–28.20'S 113°57.93'–58.05'E, depth 570 m. NTM Z 0002572—sta. NWS-0042, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°24'S 118°52'E, depth 445 m. NTM Z 0002589; NTM Z 0002591—sta. NWS-0049, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°39'S 118°38'E, 410 m. WAM Z 12492—sta. 1031103, NW Cape (W Australia), 21°39.18'S 113°51.44'E, depth 610–649 m.

Description and remarks. The identified specimens and fragments definitely belong to this species; their spicule composition and forms are equal to the variability of the species described by Tabachnick and Lévi (1999).

***Lophophysema australicum* Tabachnick and Levi, 1999**

Material. MNHN(p41)—Cidaris I, RV *Franklin*, sta. 11-4, 18°10.06'S 148°32.44'E, depth 1121–1123 m. MNHN(p513)—Cidaris I, RV *Franklin*, sta. 12-1, 18°2.50'S 148°36.19'E, depth 1039–1065 m.

Description and remarks. There are no differences between these fragments and the specimens described earlier (Tabachnick and Lévi, 1999) in their body features, spicule content or dimensions.

Hexasterophora Schulze, 1899

Hexactinosida Scrammen, 1903

Farreidae Gray, 1872
Farrea Bowerbank, 1862
Farrea occa Bowerbank, 1862

Synynomy. As given in Reiswig (2002).

***Farrea occa ouwensi* Ijima, 1927 (Fig. 15, 16; Tab. 14)**

Material. *Types*: ZMA POR; POR 5101 – RV *Siboga*, sta 119. ZMA POR (two specimens) – RV *Siboga*, sta 122. ZMA POR; POR 3427 – RV *Siboga*, sta 124. ZMA POR– RV *Siboga*, sta 226. ZMA POR 5098 – RV *Siboga*, sta 252.

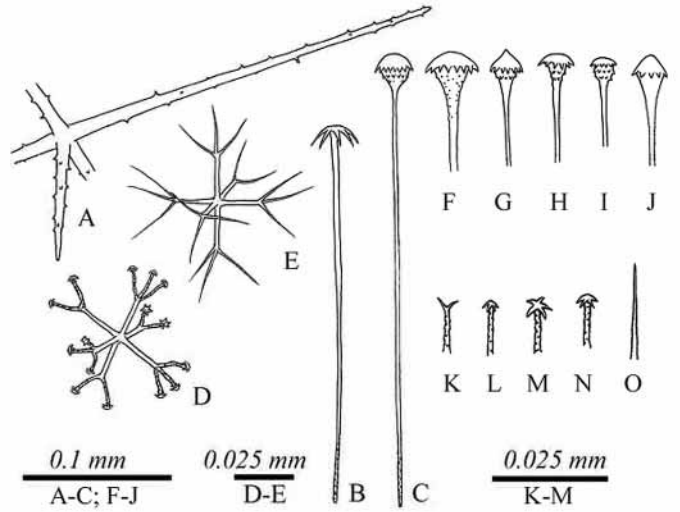

FIGURE 15. *Farrea occa ouwensi* Ijima, 1927, spicules. A, dermal or atrial pentactin. B, anchorate clavule. C; F-J, pileate clavule. D, discohexaster. E, oxyhexaster. K-O, outer ends of microsclers: K, onychoidal; L-N, discoidal; O, oxyoidal. A-C, MNHN (fr875). F-O, types: F-L, ZMA POR?, sta. 124; M-O, ZMA POR?, sta. 119.

New specimens: MNHN(fr875) (two specimens)—Cidaris I, RV *Franklin*, sta. 15-3, 17°45.49'S 148°37.52'E, depth 945 m.

Description. Body: Both new specimens are small and tubular (probably juveniles). The bigger one is a 26 mm long tube, 3.5 mm in diameter in the lower part and 5 mm in diameter in the upper part, with basidictyonal remnants about 5 mm in diameter. The small specimen is 15 mm long, 2.5 mm in diameter in the lower part and 5 mm in diameter in the upper part.

Framework: Dictyonal skeleton; typical farreoid skeleton, which consists 2–3 dictional layers. Skeletal beams are smooth or rarely rough 0.04–0.1 mm in diameter, distances between the spicules' centers are 0.2–0.5 mm, the free meshes are rectangular or rarely triangular, 0.1–0.4 mm. The free rays, which protrude inside and outside the body wall, are short, 0.08–0.1/0.02 mm, usually rough with rounded outer ends. Some small hexactins are fixed to the dictyonal skeleton by one of their rays; these hexactins have rays of 0.01–0.03/0.002–0.003 mm. In one of the type specimens, ZMA POR 5098, the beams are spined.

Loose spicules: The variability of the loose spicules may be observed in Tab 14. It is worth noting that pentactins with spines outwardly directed seems to predominate among dermal pentactins, while the pentactins with rough rays are usually atrial spicules. The form of the heads of pileate clavules varies in the speciemens of the type series.

Microscleres: The microscleres are discohexasters, oxyhexasters and rarely onychohexasters and their hemihexasterouse forms. Ijima (1927) described two the latter types as tylohexasters. Oxyhexasters were not

found in one type species from sta. 122.

Remarks. The subspecies looks to be very polymorphic even in the type series. The original description of Ijima (1927) is not satisfactory and we supplement it here by new data given above, the spicule measures are defined more precisely in Tab. 14. The new material perfectly goes within the type series variation.

TABLE 14: Spicule measurements of *Farrea occa ouwensi.*

	Type		**Type**					**Type**				
	From Ijima,1927		**Siboga Sta. 119**					**Siboga Sta. 124**				
	Min	Max	n	avg	min	max	std	n	avg	min	max	std
L spiny (dermal?) pentactin tangential ray	0,200	0,300	17	0,180	0,130	0,229	0,30	20	0,224	0,159	0,289	0,037
L spiny (dermal?) pentactin unpaired ray			11	0,178	0,096	0,270	0,053	10	0,212	0,111	0,322	0,060
L rough (atrial?) pentactin tangential ray		0,350	2	0,141	0,111	0,170	0,042	25	0,198	0,137	0,244	0,029
L rough (atrial?) pentactin unpaired ray			1	0,130	0,130	0,130		17	0,183	0,078	0,285	0,056
L pileate clavule	0,270	0,310	13	0,195	0,159	0,259	0,033	4	0,280	0,248	0,348	0,046
L length of disc of pileate clavule			13	0,009	0,006	0,015	0,003	7	0,012	0,008	0,015	0,002
D width of disc of pileate clavule	0,030	0,035	13	0,017	0,012	0,022	0,002	7	0,024	0,019	0,031	0,004
L anchorate clavule	present		3	0,210	0,178	0,241	0,031	12	0,277	0,222	0,322	0,025
L anchor of anchorate clavule			5	0,017	0,011	0,022	0,004	11	0,012	0,009	0,015	0,002
D anchor of anchorate clavule			5	0,028	0,017	0,037	0,008	11	0,024	0,019	0,030	0,003
D oxyhexaster	rare		25	0,078	0,054	0,122	0,015	25	0,084	0,058	0,108	0,011
d oxyhexaster			25	0,038	0,022	0,068	0,011	25	0,038	0,022	0,061	0,010
D onychohexaster			1	0,076	0,076	0,076		1	0,065	0,065	0,065	
d onychohexaster			1	0,036	0,036	0,036		1	0,025	0,025	0,025	
D discohexaster	0,055	0,107	25	0,065	0,047	0,090	0,012	25	0,068	0,050	0,086	0,010
d discohexaster			25	0,038	0,025	0,065	0,011	25	0,034	0,018	0,058	0,010

TABLE 14, continued:

Type					**Type**									
ZMA 5098; Siboga Sta. 251					**Siboga Sta. 122**					**MNHN (fr875)**				
n	*avg*	*min*	*max*	*std*	*n*	*avg*	*min*	*max*	*std*	*n*	*avg*	*min*	*max*	*std*
					21	0,316	0,229	0,418	0,058	17	0,206	0,117	0,275	0,039
					11	0,304	0,170	0,426	0,088	8	0,120	0,071	0,224	0,048
25	0,125	0,111	0,204	0,026	24	0,256	0,130	0,318	0,048					
18	0,128	0,074	0,226	0,042	14	0,271	0,178	0,426	0,063					
16	0,187	0,163	0,215	0,013	19	0,245	0,000	0,333	0,112	5	0,309	0,281	0,350	0,033
16	0,,10	0,007	0,012	0,001	19	0,012	0,007	0,015	0,002					
16	0,018	0,012	0,019	0,002	19	0,026	0,022	0,034	0,003	5	0,023	0,017	0,026	0,004
					11	0,262	0,233	0,285	0,017	17	0,228	0,209	0,256	0,015
					11	0,015	0,011	0,019	0,002	17	0,013	0,010	0,020	0,003
					11	0,026	0,020	0,033	0,004	16	0,025	0,015	0,031	0,005
16	0,078	0,054	0,101	0,010						17	0,074	0,063	0,084	0,006
16	0,037	0,022	0,050	0,009						17	0,037	0,027	0,042	0,005
					1	0,076	0,076	0,076						
					1	0,050	0,050	0,050						
11	0,058	0,047	0,068	0,007	25	0,075	0,050	0,112	0,012	17	0,063	0,042	0,076	0,008
11	0,031	0,022	0,040	0,006	25	0,050	0,025	0,094	0,015	17	0,041	0,025	0,050	0,006

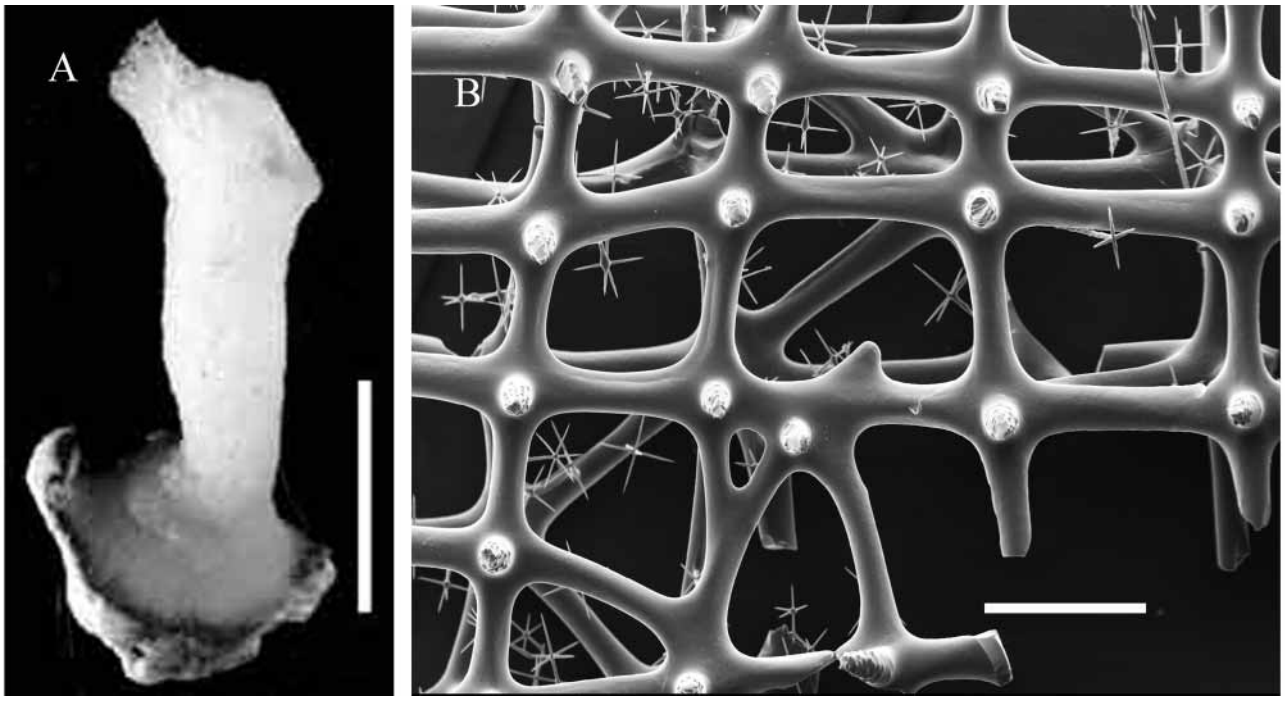

FIGURE 16. *Farrea occa ouwensi* Ijima, 1927. A, body, view from the side, scale 10 mm. B, dictyonal framework, scale 300 µm. A-B, MNHN (fr875).

Farrea occa mammillata Ijima, 1927 (Tab. 15)

Material. WAM Z 258—RV *Soela*, sta. SO 1/84/82, NNW of Cape Leveque, 13º7.20'S 123º15.70'E, depth 400 m. WAM (p4135)—RV *Soela*, sta. ?, NNW Cape Leveque, 13°7'S 123º15'E, depth 400 m.

Description. Body: Fragments of dichotomously branching tubes about 22 mm in diameter; the specimens WAM Z 258 are two fragments 70x50x60 mm and 50x30x40 mm; the other specimen is a small lamella-like fragment. The thickness of the wall is about 1.5–3 mm.

Spicules: There are no significant differences of spicule forms compared to the primary description by Ijima (1927). The differences in the spicule dimensions seen in Tab.15 are not significant and require no special discussion.

TABLE 15: Some measurements of spicules of *Farrea occa mammillata* Ijima, 1927

	Type from Ijima, 1927					p4135					p761				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. tangent. ray			.185	.250		15	.165	.092	.230	.034	15	.174	.128	.219	.022
L derm. pentact. proximal ray						15	.271	.194	.347	.044	15	.265	.163	.377	.056
L. atr. pentact. tangent. ray						15	.186	.128	.214	.025	15	.213	.168	.281	.030
L. atr. pentact. distal ray						15	.228	.143	.306	.045	15	.216	.112	.281	.046
L pileate clavule			.196	.220		12	.220	.179	.245	.022	3	.221	.179	.255	.039
D disc of pileate clavule			.016	.025		10	.013	.010	.015	.002	3	.014	.010	.015	.003
L disc of pileate clavule						10	.019	.016	.020	.002	3	.016	.014	.016	.001
L anchorate clavule			.196	.220		10	.224	.184	.265	.030	15	.219	.173	.326	.040
D anchor, anchorate clavule		.026				10	.027	.018	.036	.005	15	.027	.018	.041	.006
L anchor, anchorate clavule		.015				10	.021	.010	.031	.005	15	.019	.013	.028	.004
L cusped or cusped clavate clavule			.216	.258		15	.293	.245	.357	.031	15	.338	.311	.388	.021
D oxyhexaster			.075	.107		15	.088	.071	.101	.008	15	.091	.076	.113	.010
d oxyhexaster			.044	.080		15	.046	.034	.059	.006	15	.047	.029	.059	.009

Euretidae Zittel, 1877
Genus: *Eurete* Semper, 1868
***Eurete schmidti schmidti* Schulze, 1886** (Fig. 17; Tab. 16)

Material. RV *Soela*, sta. SO 1/84/055, NNW of Lacepede Archipelago, 15º57.20'–59'S 120º46.20'–44.60'E, 296–298 m.

Description. Body: A plexiform sponge 100x60x40 mm composed of tubes 5–6 mm in diameter with walls 0.8–1 mm thick.

Spicules: The dictyonal skeleton shows a shape and dimensions agreeing with the description of *E. schmidti schmidti* by Ijima (1927). Dermalia and atrialia are pentactins (rarely hexactins) with rough rays about 0.004 mm in diameter with rounded or clavate outer ends. The scopules have clavate, rarely spindle-like, rough 2–3 (rarely 1 or 4) tines, the end directed inside the body is rough and rounded. Uncinates are several mm long and about 0.015 mm in diameter.

Microscleres: The microscleres are oxyhexasters with 2, sometimes 3 secondary rays and hemioxyhexasters.

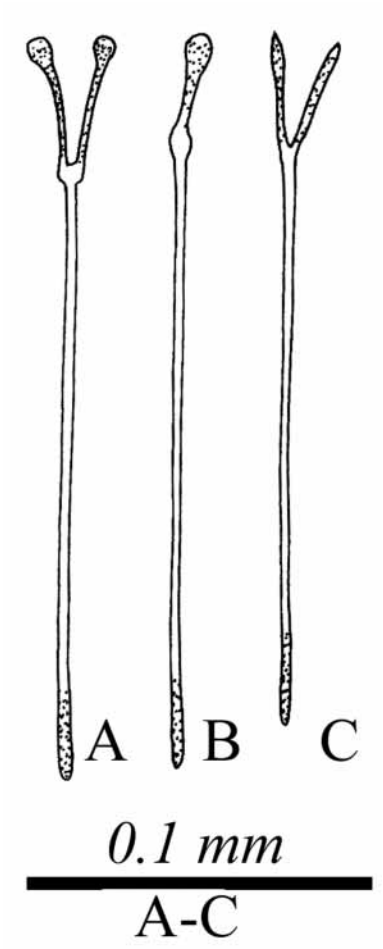

FIGURE 17. *Eurete schmidti* Schulze, 1886, spicules, WAM Z 265. A-C, scopules.

Remarks. The sponge is attributed to *E. schmidti schmidti* (known off the Philippines and off Japan) based on the loose spicule form and measurements. The scopules in *E. schmidti schmidti* are 0.25–0.385 and up to 0.6 mm long, their 2–4 tines are 0.031–0.042 mm long (Ijima 1927). Two other subspecies, *E. schmidti treubi* and *E. schmidti kampeni*, both described by Ijima (1927) off the Indonesian Archipelago, have short scopules

with different tines. It is impossible to make the comparison of the external body shape which is also important for the subspecies identification (Ijima 1927), because it is not clear whether the Australian specimen is complete or a broken fragment (the latter case is most common among such rigid, but fragile, sponges).

TABLE 16: Some measurements of spicules of *Eurete schmidti* Schulze, 1886.

	n	avg	min	max	std
L. derm. or atr. pentact. tangent. ray	15	.172	.122	.281	.049
L derm. or atr. pentact. ray directed inside body	15	.120	.036	.168	.040
L clavate scopule	19	.253	.163	.510	.104
L tine of clavate scopule	19	.034	.026	.056	.008
D hexaster	15	.054	.042	.063	.008
d hexaster	15	.009	.004	.013	.002

Pararete Ijima, 1927

***Pararete semperi* (Schulze, 1886)** (Fig. 18, 19; Tab. 17)

Material. WAM Z 265—RV *Soela*, sta. SO 1/84/055, NNW of Lacepede Archipelago, 15º57.20‘–59’S 120º46.20‘–44.60’E, 296–298 m. WAM Z 584—NW Caplenque, 224 m. WAM Z 583—RV *Soela*, sta. SO 1/84/085, NW of Cape Leveque, 14º52.20’–53.70’S 121º41.70’–39.90’E, 220–224 m. WAM Z 555—RV *Soela*, sta. SO 1/84/87, NW of Cape Leveque, 15º11.1’–12.90’S 121º26.90’–25.70’E, 258–260 m.

Description. Body: Sponges are plexiform, up to 40x30x30 mm, composed of tubes 6–10 mm in diameter with walls about 0.8 mm in thickness and no channelization.

Framework: The beams of the dictyonal skeleton are 0.023–0.038 mm with a rough surface. The meshes are 0.08–0.3 mm; they are rectangular at the dermal side and sometimes triangular at the atrial side. The nodes, usually at the dermal side and rarely at the atrial side, are inflated 0.09–0.11 mm in diameter. As usual for dictyonal skeletons of Euretidae, some small hexactins are fixed to the beams; their rough rays with conically pointed outer ends are about 0.046/0.006 mm.

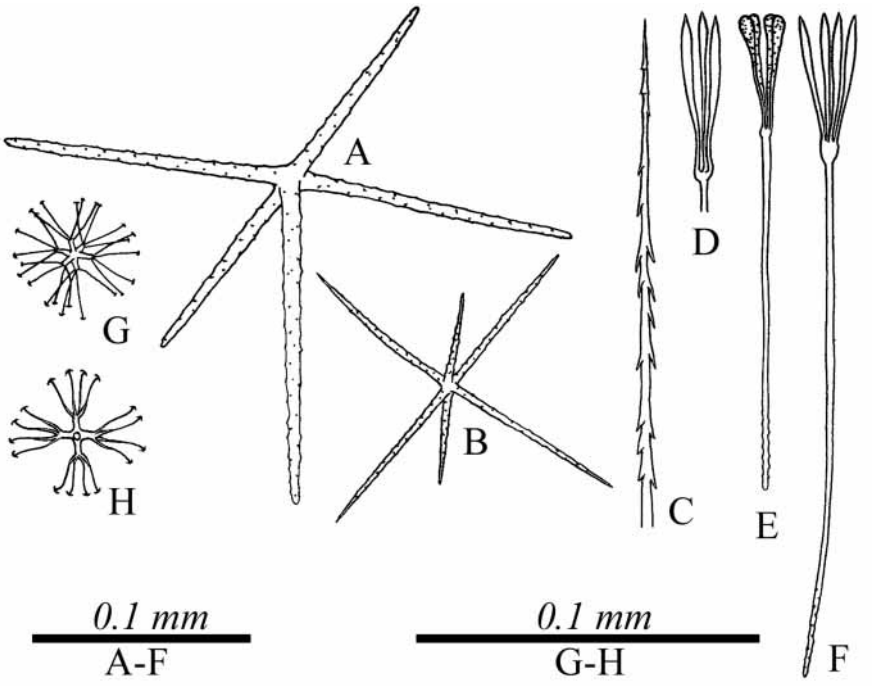

FIGURE 18. *Pararete semperi* (Schulze, 1886), WAM Z 265. A, dermal or atrial pentactin. B, choanosomal hexactin. C, uncinate. D; F, scopules with lanceolate tines. E, scopule with clavate tines. G, spherical discohexaster. H, stellate discohexaster.

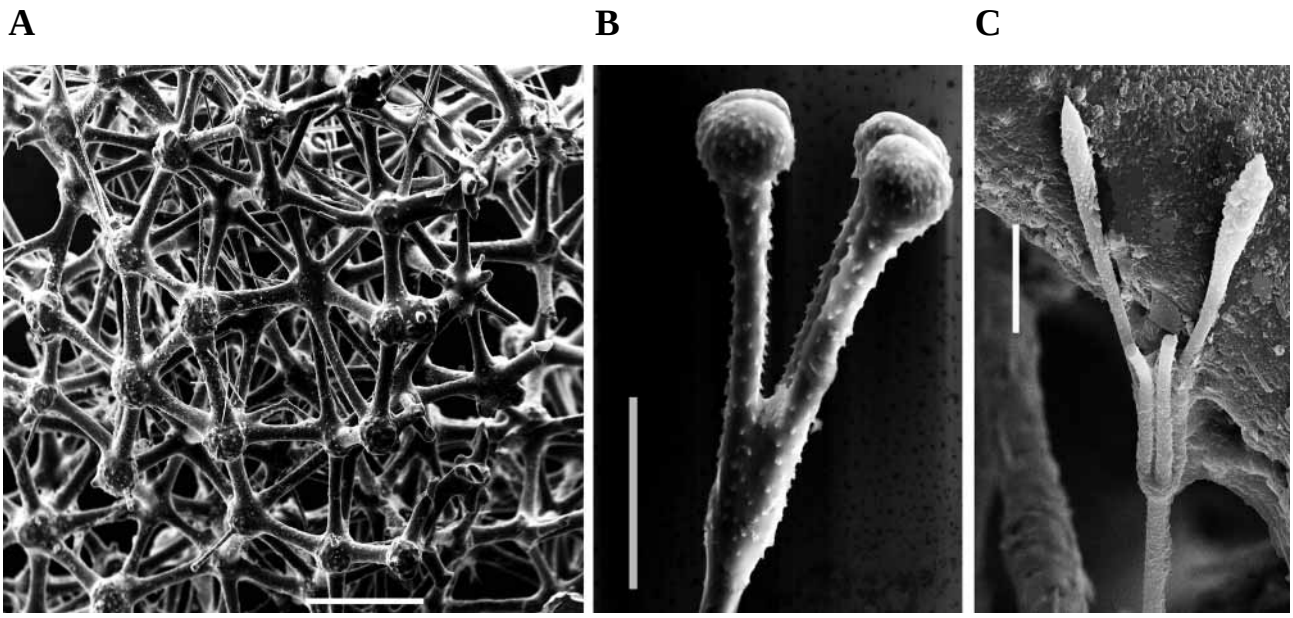

FIGURE 19. *Pararete semperi* (Schulze, 1886), WAM Z 265. A, dictyonal skeleton, scale 300 µm. B, scopule with clavate tines, scale 30 mm. C, scopule with lanceolate tines and single terminal spines, scale 10 µm.

Loose spicules: Dermalia and atrialia are pentactins with rough rays and rounded outer ends. Dermal and atrial pentactins do not differ significantly: The tangential rays of dermal pentactins are 0.092–0.286 mm, the proximal ray is 0.066–0.255 mm; tangential rays of atrial pentactins are 0.077–0.214 mm, the proximal ray is 0.02–0.173 mm; their rays are about 0.006 mm in diameter. Hexactins, normally uncommon for *Pararete*, are common among the loose choanosomal spicules. They have rough rays 0.02–0.03/0.015 mm with conically pointed outer ends. The dermal scopules have smooth tines, lanceolate in shape with a small, single, terminal spine on each of them; these scopules are 0.209–0.536/0.002 mm, their 3–4 (sometimes 2 or 5) tines are 0.015–0.061 mm long. The atrial scopules 0.102–0.291/0.002 mm have 4 (rarely 2–6) clavate rough tines, 0.02–0.051 mm long. Uncinates are 0.15–0.7/0.002–0.005 mm.

Microscleres: Exclusively spherical or stellate discohexasters with 4 (rarely 2–6), sigmoidal, secondary rays. They are 0.029–0.042 mm in diameter with the primary rosette 0.006–0.015 mm in diameter.

Remarks. Measurements of most spicules do not differ strongly in these two specimens (Tab. 17). The free choanosomal hexactins commonly found in *E. semperi* are unusual for the genus.

TABLE 17: Some measurements of spicules of *Pararete semperi.*

	Pararete semperi semperi Ijima, 1927					*Pararete semperi*									
						fr762.1					fr763				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. tangent. ray			.150	.230		21	.164	.092	.286	.040	15	.153	.117	.194	.022
L derm. pentact. proximal ray			.150	.230		18	.097	.066	.138	.023	15	.110	.077	.158	.022
L. atr. pentact. tangent. ray			.150	.230		25	.156	.097	.194	.027	15	.173	.102	.214	.029
L. atr. pentact. distal ray			.150	.230		25	.102	.061	.173	.027	15	.038	.020	.046	.007
L lanceolate scopule			.330	.440		25	.438	.245	.536	.065					
l lanceolate scopule			.039	.060		25	.050	.026	.061	.008					
L clavule scopule			.216	.275		4	.212	.204	.224	.009	15	.173	.102	.214	.029
l clavule scopule			.045	.054		4	.047	.046	.051	.003	15	.038	.020	.046	.007
D discohexaster			.035	.043		9	.038	.034	.042	.003	15	.035	.029	.042	.003
d discohexaster						9	.009	.006	.013	.002	15	.009	.006	.015	.002

TABLE 17, continued:

	Pararete semperi									
	fr764					fr757				
	n	avg	min	max	std	n	avg	min	max	std
L. derm. pentact. tangent. ray	16	.154	.107	.194	.025	15	.158	.128	.245	.031
L derm. pentact. proximal ray	16	.122	.066	.184	.035	15	.124	.066	.255	.043
L. atr. pentact. tangent. ray	15	.131	.077	.163	.024	15	.149	.112	.194	.025
L. atr. pentact. distal ray	15	.103	.071	.133	.018	15	.108	.077	.138	.022
L lanceolate scopule	4	.328	.270	.377	.044	1	.209	.209	.209	
l lanceolate scopule	4	.043	.036	.056	.009	1	.015	.015	.015	
L clavule scopule	15	.219	.153	.255	.026	15	.238	.199	.291	.024
l clavule scopule	15	.038	.031	.046	.005	15	.039	.031	.046	.005
D discohexaster	14	.035	.029	.042	.003	2	.035	.034	.036	.001
d discohexaster	14	.009	.008	.013	.001	2	.009	.008	.009	.001

Aphrocallistidae Gray, 1867
Genus: *Aphrocallistes* Gray, 1858
***Aphrocallistes beatrix beatrix* Gray, 1858**

Material. WAM Z 247—RV *Soela*, sta. SO 1/84/051, NNW of Lacepede Archipelago, 15º42.60'S 120º37.30'–34.60'E, depth 500–504 m. WAM Z 242—RV *Soela*, sta. SO 1/84/58, NW Beagle Bay, 15º12.80'–10.40'S 121º5.90'–9.20'E, depth 404–410 m. WAM Z 254—RV *Soela*, sta. SO 2/84/057, NW Beagle Bay, 15º13.50'–15'S 121º8.90'–6.50'E, depth 352 m. WAM Z 255—RV *Soela*, sta. SO 1/84/065, NW of Cape Leveque, 14º49'–50.80'S 121º36.10'–35.60'E, depth 300-302 m. WAM Z 244—RV *Soela*, sta. ?, NW of Bathurst Island, 14º21.50'–22.30'S 122º2.40'–1'E, depth 348–350 m. WAM Z 257—RV *Soela*, sta. SO 1/84/73, NW of Collier, 14º10.90'–12.10'S 122º35.10'–32.10'E, depth 348–350 m. WAM Z 256—RV *Soela*, sta. SO 1/84/91, W of Lacepede Archipelago, 16º55.80'–17º1.80'S 119º53.90'–51.30'E, depth 426 m. WAM Z 245—RV *Soela*, sta. SO 1/84/117, W of Lacepede Archipelago, 16º57'–52'S 119º48'–51'E, depth 450–452 m. WAM Z 248—RV *Soela*, sta. ?, W of Lacepede Archipelago, 16º54'–59'S 119º52'–47'E, depth 440 m. WAM Z 557—RV *Soela*, sta. SO 2/82/34 B, 20 miles W of W Clarke Reef, 17º15'S 119º1'E, depth 444–450 m. WAM Z 274—RV *Soela*, sta. SO 2/82/34 B, 20 miles W of W Clarke Reef, 17º15'S 119º1'E, depth 444–450 m.

Description and remarks. There are no significant differences in spicule content and dimensions of these fragments compared with those of the specimens described earlier from adjacent locations of the Indonesian Archipelago (Ijima 1927) and from the Indian Ocean (Schulze 1895, 1900, 1904). This species is very polymorphous (Ijima 1927) and investigated material off Australia displays some variability as well: Microscleres with onychoidal outer ends are usually absent, but some specimens have them in considerable numbers. The scopules usually have 4 tines but some specimens have 3–6 tines. All the specimens have large numbers of dermal pentactins with rudimental distal ray beside pinular hexactins.

Lychniscosida Scrammen, 1903
Aulocystidae Sollas, 1887
Genus: *Neoaulocystis* Zhuravleva, 1962

Neoaulocystis zitteli zitteli (Marshall and Meyer, 1877)

Material. WAM Z 273—RV *Soela*, sta. SO 2/82/14, NNW of Port Headland, 18º31'–9'S 118º9'-8'E, depth 200–201 m.

Description. Body: The sponge is a plexiform globe 90x50x50 mm, constructed of tubes 10–15 mm in diameter.

Spicules: The lophodiscohexasters, about 0.092 mm in diameter with primary rosette 0.046 mm in diameter, are very rare in this specimen.

Remarks. Features characteristic for *N. zitteli zitteli* according to Ijima (1927) are present in the investigated specimen; the only difference is that the lophodiscohexasters are a little smaller than described by Ijima (over 0.1 mm in diameter). Nevertheless they are more similar to *N. zitteli zitteli* than to *N. zitteli sibogae* (where they are less than 0.057 mm in diameter).

Lyssacinosida Zittel, 1877
Euplectellidae Gray, 1867
Euplectellinae Gray, 1867
Euplectella Owen, 1841
Euplectella paratetractina **sp. nov.** (Fig. 20–23; Tab. 18)

Etymology. The name was given according to the outstanding abundance of paratetractins within the choanosomal spicules, which is unique to this species.

Material. *Holotype*—WAM Z 262—RV *Soela*, sta. SO 2/82/49, 105 miles NW of Port Headland, 19º6'–5'S 117º17'–19'E, depth 156 m.

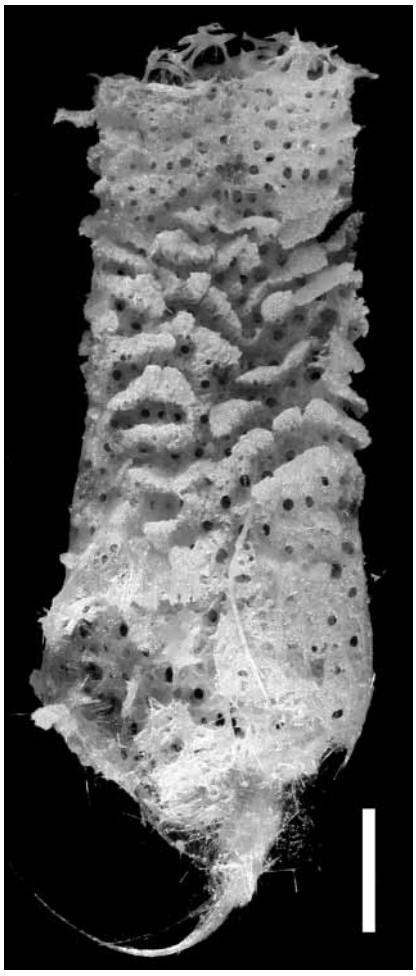

FIGURE 20. *Euplectella paratetractina*, sp. n., holotype, scale 20 mm.

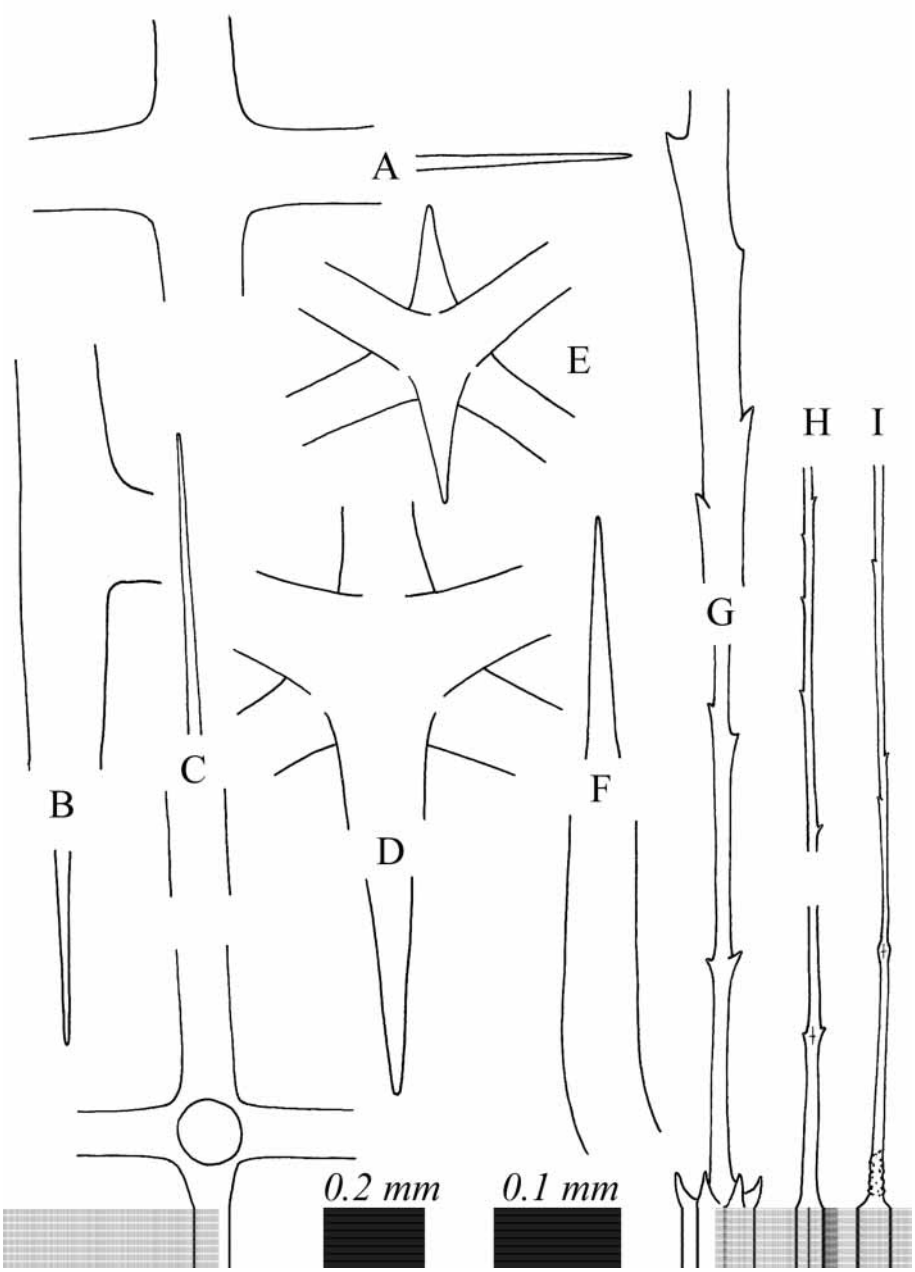

FIGURE 21. *Euplectella paratetractina*, sp.n., spicules. A, large choanosomal stauractin. B, large choanosomal tauactin. C, large pentactin with rudiment of proximal ray. D, large choanosomal hexactin. E, large choanosomal stauractin with rudiments of distal and proximal rays. F, large choanosomal diactin. G-I, anchorate spicules. A, G-I, holotype. C; E, WAM Z 646. D, WAM Z 548. B, F, WAM Z 648.

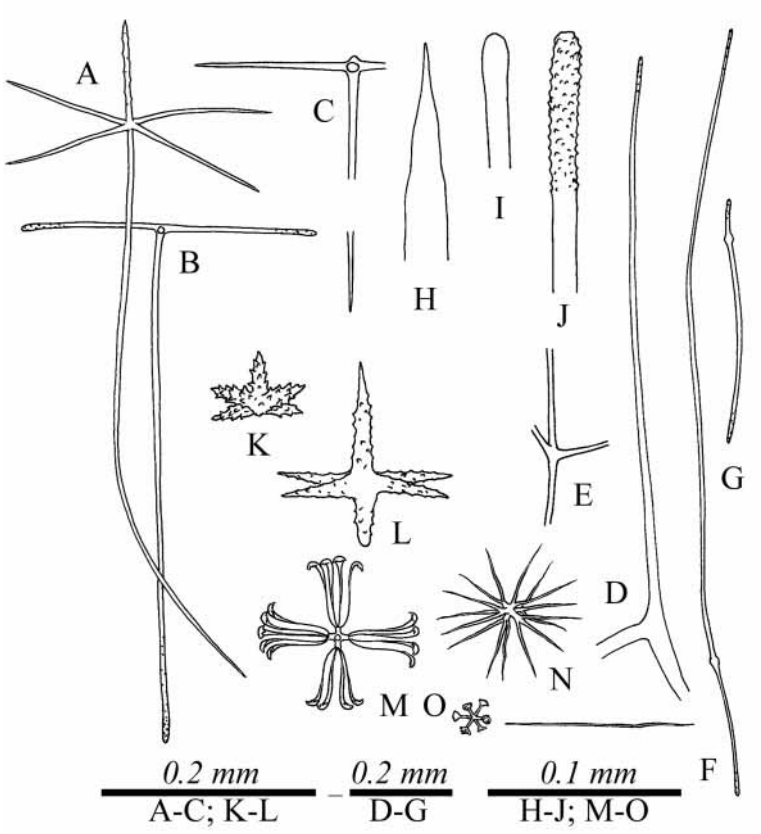

FIGURE 22. *Euplectella paratetractina*, sp.n., spicules, holotype. A, dermal hexactin. B-C, atrial pentactins. D, choanosomal tauactin. E, choanosomal paratetractin. F-G, choanosomal diactin. H-J, outer ends of choanosomal spicules. K-L, spicules of the sieve-plate (hexactins and pentactins). M, floricome. N, oxyhexaster. O, graphiocome.

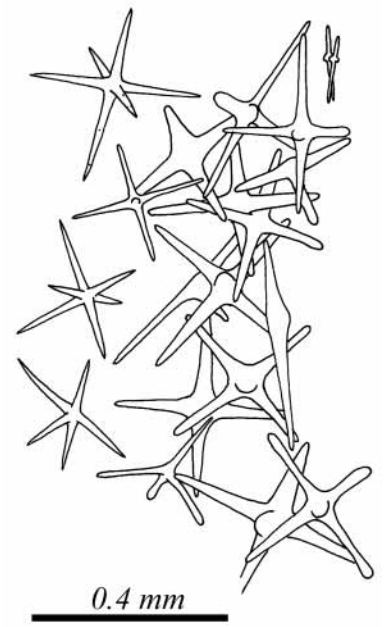

FIGURE 23. *Euplectella paratetractina*, sp. n., oscularia, holotype.

Paratypes: WAM Z 648 (2 specimens)—RV *Soela*, sta. 29. N of Karratha, 18º44'S 116º59'E, depth 404–406 m. WAM Z 548 (3 specimens)—RV *Soela*, sta. SO 2/82/21, 154 miles NW of Port Headland, 18º45'S 116º26.50'–22.50'E, depth 720–724 m. WAM Z 604—RV *Soela*, sta. SO 1/84/051 NNW of Lacepede Archipelago, 15º42.60'S 120º37.30'–34.60'E, depth 500–504 m. WAM Z 547—RV *Soela*, sta. SO 1/84/81 NW of York Sound, 12º54.40'–50.60'S 123º0.20'E, depth 452–462 m. WAM Z 646—RV *Soela*, sta. SO 2/82/35 18.5 miles W of Imperieuse Reef Rowley Shoals, 17º34'–31'S 118º38'–40'E, depth 492–520 m. WAM Z 593—RV *Soela*, sta. SO 2/82/42 119 miles NW of Port Headland, 18º44'S 117º20'–19'E, depth 326–360 m. WAM Z 549—RV *Soela*, sta. SO 2/82/47 113 miles NW of Port Headland, 19º4'–5'S 117º6'–5'E, depth 200–202 m.

Description. Body: The body shape is typical for the genus: tubular with numerous lateral oscula, colander-like sieve-plate and a tuft of basalia. The parietal ledges have various degrees of expression in different specimens, from low (as in *E. regalis* or young specimens of *E. imperialis*) to prominent, circular and oblique (as in *E. aspergillum*). The lateral oscula are oval (1–1.8x2.5 mm), thay are not regularly situated; some of them are enclosed by ridges so the oscula are situated partly in rows with an alternating position and partly in regular horizontal and vertical rows. The holotype is a tube 110 mm long and 40 mm in diameter; basalia are about 40 mm long. The parietal ledges are prominent, up to 8 mm in width, and especially the last circular ridge, the cuff, situated in the vicinity of the main osculum (covered by the colander-like sieve-plate) is well expressed. The numerous paratypes are tubes 55–300 mm long, 12–60 mm in diameter or usually oval in section with corresponding measures; they are often broken so only their upper parts are present. One specimen (WAM Z 547) is a fragment of the wall.

Spicules: Principalia (large choanosomal spicules) are stauractins with rays 3–15 mm long and some other rare spicules: hexactins, hexactins with a reduced proximal ray, hexactins with two reduced rays (proximal and distal), tauactins and diactins. Hexactins are very rare; they have short rays 1–2 mm long. The hexactins with two reduced rays have tangential rays 2–9 mm and reduced rays 0.2–0.5 mm long. The diactins are 2–2.5 mm long, and tauactins are of similar size. The hexactins with a reduced proximal ray have a smooth distal ray (in other species of *Euplectella*, which have spicules of this type, it is rough or tuberculated) 3–30 mm long with tangential rays 3–11 mm, the reduced ray is 0.1–0.3 mm long. These spicules have conically pointed outer ends; the diameter of their rays is 0.08–0.23 mm. Other choanosomal spicules are mostly tauactins and paratetractins, rarely diactins. These spicules have rays 0.2–4.5/0.009–0.04 mm with rounded rough, sometimes-smooth, outer ends. Comitalia (diactins) which are associated with the principalia, usually with the long distal ray of pentactins and hexactins, seem to be absent in this species.

Basalia are anchorate, rarely clavate spicules with spiny shafts 0.003–0.04 mm in diameter. The anchorate spicules have 6, rarely 4 teeth; their discs are 0.05–0.07 mm in diameter and 0.05–0.11 mm long. The 4-toothed and clavate spicules have shafts of the smallest diameter; their spicule center is situated some distance (about 0.15 mm) from the anchorate or clavate head (this may also be observed in 6-toothed anchorate spicules); the clavate spicules have spherical outer ends about 0.03 mm in diameter and are slightly rough in the upper parts.

Spicules of the sieve-plate are large diactins and tauactins, as well as small hexactins and pentactins. The diactins are 0.46–8/0.008–0.13 mm; they are usually curved; the small ones have a widening in the middle or four rudimentary tubercles; their outer ends are rounded or conically pointed, smooth or rough. Tauactins are less common than diactins; their unpaired ray is smaller than the two others. Hexactins and pentactins have rays 0.04–0.2/0.008–0.023 mm, spiny with conically pointed or rarely rounded outer ends. The spicules do not undergo notable fusion, however this process differs between specimens: considerable fusion was observed in the sieve-plate of the holotype and in some of the spicules in the basal part of the body, whereas the fusions in other specimens are very limited.

Dermalia are hexactins with a rough distal ray, the other rays are smooth, conically pointed. The distal ray of dermal hexactins is 0.041–0.189 mm long, tangential rays are 0.061–0.23 mm, the proximal ray is 0.144–

1.071 mm, their diameter is 0.004–0.015 mm. Atrialia are pentactins with rounded rough or sometimes conically pointed, smooth outer ends, the proximal ray is entirely absent or may be represented by a tuberculated rudiment. The tangential rays of atrial pentactins are 0.015–0.23 mm, the distal ray 0.245–0.969 mm long, diameter is 0.004–0.008 mm.

Spicules situated in the vicinity of lateral oscula (oscularia) are mainly pentactins (28 %) and stauractins (28 %), some paratetractins (15 %), triactins (15 %) and diactins (11 %), and hexactins are rare (3%) (this spicule counting was done for the holotype, n=74). These spicules have smooth rays, 0.026–0.3 mm (avg=0.133; std=0.072; n=25) long and 0.007–0.05 mm in diameter, their outer ends are usually rounded. Often these spicules have tuberculated rudiments of reduced rays with variable lengths, which makes attribution of such spicules to any class very difficult. At some distance from the lateral oscula similar regular hexactins and some pentactins are found, which have rays conically pointed, smooth or slightly rough in the holotype and paratype WAM Z 549, but which are notably spiny in other specimens. Their rays are 0.056–0.49/0.01-0.02 mm.

Microscleres are floricomes, oxyhexasters, graphiocomes and sigmatocomes in some specimens. The floricomes are 0.074–0.113 mm in diameter with the primary rosette 0.007–0.021 mm in diameter. The oxyhexasters with 2–4 secondary rays are 0.055–0.097 mm in diameter with the primary rosette 0.007–0.017 mm in diameter. The sigmatocomes (probably young floricomes) are numerous in the paratype fr792, but they were not found in the holotype, they are 0.04–0.063 mm in diameter with the primary rosette 0.011–0.019 mm in diameter. The graphiocomes are present in various specimens in variable amounts (they are sometimes numerous, but not everywhere), the size of these fragile spicules, mostly destroyed in preparations, can be reconstructed as 0.24–0.385 mm in total diameter; their primary rosette is 0.013–0.023 mm in diameter.

TABLE 18: Some measurements of spicules of *Euplectella paratetractina*, sp.n.

	fr 781					fr792					fr791				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. hexact. distal ray	15	.088	.041	.117	.023	17	.150	.051	.189	.036	13	.114	.093	.137	.015
L derm. hexact. tangent. ray	19	.134	.061	.230	.042	17	.156	.082	.214	.037	23	.137	.096	.189	.025
L. atr. hexact. proximal. ray	19	.630	.296	1.071	.219	15	.411	.245	.740	.130	20	.410	.144	1.021	.185
L. atr. pentact. tangent. ray	3	.020	.015	.023	.004	25	.166	.107	.230	.033	3	.152	.115	.174	.032
L atr. pentact. distal ray	3	.374	.265	.490	.112	25	.504	.245	.969	.186	3	.516	.407	.585	.095
D floricome	15	.082	.076	.084	.003	25	.102	.092	.113	.005	25	.082	.074	.089	.005
d floricome	15	.051	.013	.019	.002	25	.017	.013	.021	.003	25	.013	.007	.019	.003
D sigmatocome						10	.046	.040	.063	.007					
d sigmatocome						12	.014	.011	.019	.002					
D oxyhexaster	15	.070	.059	.080	.006	25	.080	.055	.097	.010	25	.072	.059	.081	.005
d oxyhexaster	15	.013	.011	.017	.002	25	.012	.008	.017	.002	25	.012	.007	.015	.003
D graphiocome	1	.240	.240	.240		1	.300	.300	.300		1	.385	.385	.385	
d graphiocome	4	.017	.013	.019	.003	8	.020	.017	.023	.002	1	.015	.015	.015	

Remarks. The new species *E. paratetractina* is defined on the basis of a specific combination of 'principalia' (large choanosomal spicules) which are represented by numerous stauractins, hexactins, including hexactins with one or two (proximal and distal) reduced rays, tauactins and diactins. The extraordinary variability of large principal spicules building the choanosomal skeleton is characteristic of the genus *Euplectella*. These spicules are represented by stauractins in *E. marshalli* Ijima, 1895, *E. oweni* Herklots and Marshall, 1868, *E.*

curvistelata Ijima, 1901, *E. simplex* Schulze, 1895, *E. imperialis* Ijima, 1894, *E. regalis* Schulze, 1900, *E. aspergillum* Owen, 1841, *E. timorensis* Ijima, 1927, *E. nobilis* Schulze, 1904 and *E. gibbsae* Tabachnick and Collins, 2008. Mainly hexactins with a reduced proximal ray and additional stauractins are found in *E. aspera* Schulze, 1895, *E. crassistellata* Schulze, 1886 and *E. plumosum* Tabachnick and Levi, 2004. Pentactins and, sometimes in some species, hexactins are present in *E. jovis* Schmidt, 1880, *E. nodosa* Schulze, 1886, *E. suberea* Thomson, 1876 and *E. cucumer* Owen, 1857. In *E. paratetractina* sp. nov., the most numerous choanosomal spicules are tauactins and paratetractins, whereas in other species of the genus, paratetractins, if reported at all, are rare spicules, e.g. in *E. oweni*, *E. marshalli*, and probably in *E. curvistellata*. The microsclere composition and proportions of thick-rayed spicules (mainly pentactins) situated in the vicinity of the lateral oscula are similar to those of *E. aspergillum*, *E. timorensis* and *E. regalis*. The fusion of spicules is not prominent – only a few of the large choanosomal spicules show traces of secondary silica deposition.

Basal spicules with their spicule centre situated not in the anchorate head were described before from one genus *Holascella* Lendenfeld, 1915, whose definition was based on this feature only. Later it was synonymized with *Holascus* (Tabachnick 2002b); the finding of the same feature in a related genus, *Euplectella*, provides further support for this action.

It is very difficult to compare oscularia with the small hexactins and pentactins situated some distance from them. Thus it is uncertain if these two types are a special category, or if they should be regarded as belonging to the general category of dermal-atrial spicules. It seems that this situation is unique for *Euplectella*, and needs to be re-examined in most species of the genus.

***Euplectella aspergillum* Owen, 1841** (Fig. 24; Tab. 19)

Synonymy. E. aspergillum Owen, 1841: 3 (together with many other publications). *E. aspergillum aspergillum* Owen, 1841. Not *E. aspergillum* (Schulze, 1904: 17 and recitation in Burton, 1959: 154) – these W Indian specimens of *Euplectella* are likely to be *E. aspera* Schulze, 1895. *E. regalis* Schulze, 1900: 24; Schulze, 1902: 61 (not *E. regalis* (Reiswig, 1992: 31). Not *E. aspergillum* specimen IORAS 5/2/1324 in Tabachnick, 2002b: 1391.

Material. Off the Philippines: *Holotype*: BMNH 1988.06.29.002. Other specimens examined: BMNH 1887.10.20.007-9; 1887.10.20.010-12 (3 specimens)—RV *Challenger*, sta. 209, off Cebu, 183 m. BMNH 1921.11.30.004—coll. by J. Murray (likely off the Philippines). ZMA por 2694. MNHN (p4275)—Musorstom 1, sta. 4, 14º1.80'–1.20'N 120º17.20'–19'E, depth 182–194 m. MNHN (p1108; p1109; p1110; p1111; p1112)—Musorstom 2, sta. 41, 166, 13º15.30'–16.90'N 122º45.90'–46.60'E, depth 166–172 m. MNHN (p1655)—Musorstom 2, sta. 1?, CP, 14º0.30'–0.40'N 120º19.30'–17.60'E, depth 188–198 m. MNHN (p4266; p4267; p4268; p4269)—Musorstom 2, sta, 41, CP, 13º15.30'–16.90'N 122º45.90'–46.60'E, depth 166–172 m. MNHN (p4274; p4278)—Musorstom 2, sta. 64, 14º1.50'–0.10'N 120º18.90'–18.20'E, depth 191–195 m. MNHN (p1156)—Musorstom 3, sta. 111, 14º0.10'–0.50'N 120º17.50'–19.40'E, depth 193–205 m. MNHN (p1157)—Musorstom 3, sta. 101, 14º0.15'–0.55'N 120º19.25'–18.20'E, depth 194–196 m. MNHN (p1173; p1174; p1175; p1176; p1177)—Musorstom 3, sta. 92, 14º3'–3.30'N 120º11.50'–12.30'E, depth 224 m. HM 3611; 3990; 5432; 5623 (5 specimens)—RV *Challenger*, sta. 209, off Cebu, 183 m. HM ?—RV *Challenger*?, sta. 22?, off Cebu. HM 5430—RV *Challenger*. HM ?—location unknown. USNM 21332 (13 specimens) identified as *E. imperialis* by Wilson—RV *Albatross*, sta. 5117, 21.01.1908, 13º52.22'N 120º46.22'E, depth 216 m.

Off Japan: HM 5429, identified as *Euplectella aspergillum* (det. by unknown specialist), re-identified here as *E. oweni*.

W of the Indian Ocean: The following specimens identified and described as *E. aspergillum* by Schulze

(1904) are not representatives of *E. aspergillum*, they are probably *E. aspera* Schulze, 1900: HM 3612—RV *Valdivia*, sta. 243, 6°39'1"S 39°30'8"E, depth 400 m. HM 4337 (2 specimens); 5431; 5778 (2 specimens)—RV *Valdivia*, sta. 245, 5°27'9"S 39°18'8"E, depth 463 m.

Description. As given in Tabachnick (2002b).

TABLE 19: Some measurements of spicules of *E. aspergillum* Owen, 1841. [MS S. 46]

	BMNH1988.06.29.002					MNHN(p1175)					MNHN(p4274)				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. distal ray	13	.147	.081	.185	.030	6	.123	.076	.167	.036	5	.140	.099	.167	.032
L derm.. tangent. ray	20	.126	.100	.155	.018	6	.185	.137	.251	.049	8	.176	.114	.319	.070
L. derm. proximal ray	15	.389	.204	.548	.096	7	.616	.471	.768	.134	8	.523	.160	.844	.286
L. atr. tangent. ray	5	.145	.118	.92	.031	15	.151	.068	.342	.085	12	.138	.084	.190	.033
L atr. proximal ray	4	.402	.222	.648	.178	8	.476	.296	.684	.122	12	.567	.213	.988	.227
L ray spicules, lateral oscula	9	.296	.190	.570	.143	25	.230	.076	.494	.100	25	.297	.152	.517	.090
D floricome	1	.067	.067	.067		15	.070	.058	.076	.005	15	.061	.054	.076	.006
d floricome	1	.007	.007	.007		15	.011	.011	.014	.001	15	.012	.007	.014	.002
D oxyhexaster	2	.070	.067	.074	.005	3	.070	.065	.079	.008	4	.067	.065	.072	.004
d oxyhexaster	2	.007	.007	.007	0	3	.011	.011	.011	0	4	.011	.007	.014	.003
D graphiocome															
d graphiocome						2	.013	.011	.014	.003					

TABLE 19, continued:

	BMNH1921.11.30.004					BMNH1887.10.20.007-9					BMNH1887.10.20.010-12				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L. derm. distal ray	10	.157	.106	.213	.032	9	.135	.091	.160	.024	4	.108	.068	.152	.042
L derm.. tangent. ray	14	.150	.122	.213	.027	12	.155	.076	.198	.034	3	.134	.114	.152	.019
L. derm. proximal ray	12	.622	.372	.737	.117	13	.653	.342	.851	.191	1	.509	.509	.509	
L. atr. tangent. ray	5	.154	.129	.167	.015	11	.142	.106	.190	.032	14	.145	.099	.198	.029
L atr. proximal ray	5	.634	.418	.912	.204	9	.578	.395	.714	.113	8	.347	.190	.722	.177
L ray spicules, lateral oscula	25	.292	.091	.570	.115	14	.266	.152	.365	.064	25	.262	.076	.547	.129
D floricome	15	.074	.068	.083	.004	8	.073	.065	.083	.006	9	.078	.072	.083	.004
d floricome	15	.014	.011	.016	.002	8	.011	.009	.013	.002	9	.012	.009	.014	.002
D oxyhexaster	15	.064	.058	.079	.006	15	.058	.043	.072	.008	9	.060	.050	.068	.006
d oxyhexaster	15	.010	.007	.013	.002	15	.010	.007	.013	.002	9	.008	.007	.011	.002
D graphiocome															
d graphiocome						2	.013	.011	.014	.003					

TABLE 19, continued:

	BMNH1987.10.20.010-12 (b280)				
	n	avg	min	max	std
L. derm. distal ray	7	.136	.106	.175	.025
L derm.. tangent. ray	6	.144	.114	.167	.022
L. derm. proximal ray	6	.555	.410	.874	.174
L. atr. tangent. ray	11	.149	.114	.205	.026
L atr. proximal ray	8	.417	.228	.669	.173
L ray spicules, lateral oscula	25	.260	.099	.517	.122
D floricome	10	.081	.072	.090	.005
d floricome	10	.014	.011	.016	.002
D oxyhexaster	15	.068	.054	.079	.008
d oxyhexaster	15	.010	.007	.013	.002
D graphiocome					
d graphiocome					

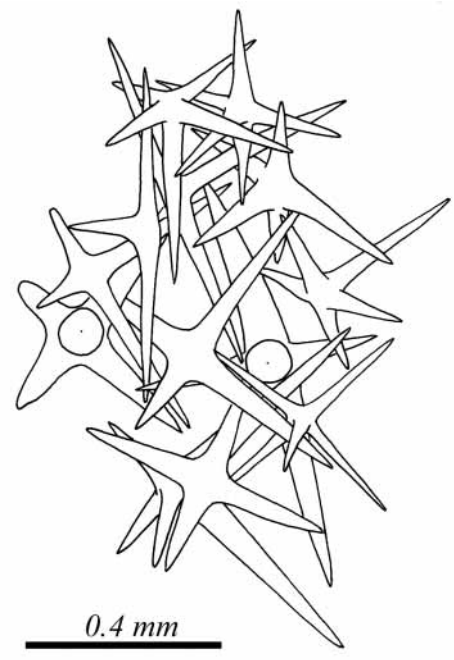

FIGURE 24. *E. aspergillum aspergillum* Owen, 1841, oscularia, HM 5430.

Remarks. E. aspergillum is one of the most famous hexactinellid species, at the same time it is very hard to identify properly due to its poor initial description and the relatively poor condition of the holotype stored in the BMNH (it has very few loose spicules). The first attempt to obtain a better description was made by Claus (1868), later by Schulze (1887), who both worked on the materials collected close to the type location; the latest approach was by Tabachnick (2002b). Description of several closely related species (having principalia of stauractins and notable fusion of the choanosomal skeleton) was done by Ijima (*Euplectella imperialis* Ijima, 1901, *E. timorensis* Ijima, 1927), and Schulze (1900) raised many questions concerning the problem of the similarity and possibly close relationship between *E. regalis* Schulze, 1900 and *E. aspergillum*. Here we

formally join the two species. Dimensions of the most important spicules of *E. aspergillum aspergillum* and *E. aspergillum regalis* are given in Tables 19 and 20 repsectively. Further important measurements of the proportion of oscularia variable from hexactins to monactins, usually thick-rayed (0.02–0.10 mm in diameter), are given in Tab. 21. An interesting discovery was made in one specimen (p1157) of an anchorate spicule with spicule centre situated at some distance from the anchor, as in *E. paratetractina.* (described above) and in several species of *Holascus* earlier referred to the genus *Holascella* (Lendenfeld, 1915).

***Euplectella aspergillum regalis* Schulze, 1900** (Fig. 25; Tab. 20)

Synonymy. E. regalis Schulze, 1900: 24; Schulze, 1902: 61; not *E. regalis* Reiswig, 1992: 31.

Material. *Holotype*: fragments of *E. regalis* Schulze, 1900 BMNH 1908.09.24.012; 1907.08.01.010; HM 3616; HM 5453—RV *Investigator*, off Andamans Islands, 13º27'N 93º14'30"E, depth 741 m.

Description. In agreement with the original description given for *E. regalis* by Schulze (1900).

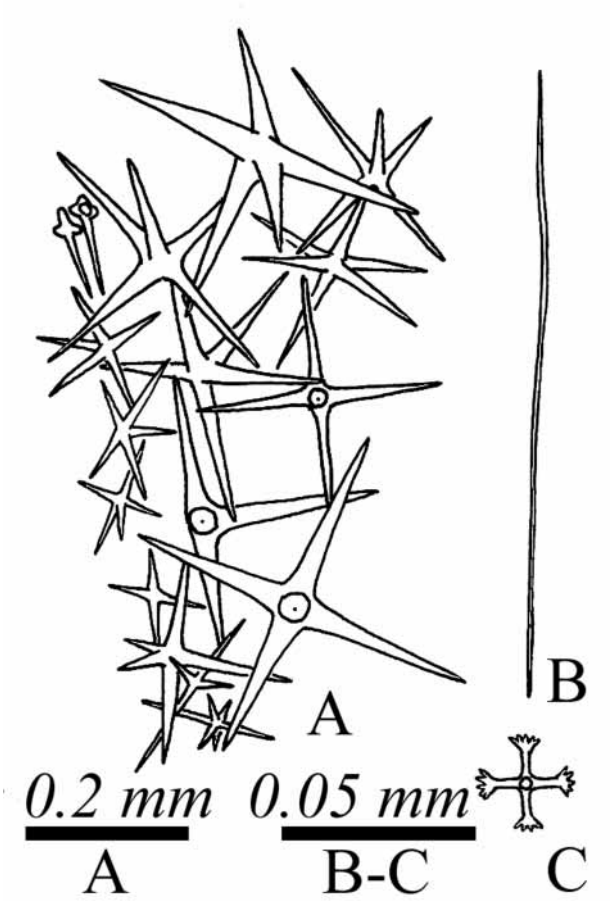

FIGURE 25. *E. aspergillum regalis* Schulze, 1900, spicules, HM 3616. A, oscularia. B, rhaphid of graphiocome and primary rosette of graphiocome.

Remarks. It seems that *E. regalis* from the Indian Ocean (not the specimens of *E. regalis* off S Australia described by Reiswig 1992) should be considered a subspecies of *E. aspergillum* (their similarity was reported before by Ijima 1901). During a re-examination of the holotype of *E. regalis*, graphiocomes were found as rhaphides (sometimes numerous) and primary rosettes. According to the picture by Schulze (1900), *E. regalis* has ridges as in *E. aspergillum*, but not knobs, flaps etc. as in *E. imperialis*. However, the ridges of *E. regalis*

are low and not as prominent as in *E. aspergillum*. Furthermore, *E. regalis* differs from *E. aspergillum* by generally larger sizes of microscleres: The floricomes are 0.089–0.118 mm and the oxyhexasters are 0.074–0.104 mm in diameter in *E. regalis*, while in *E. aspergillum* the corresponding dimensions are 0.054–0.09 mm and 0.043–0.079 mm, respectively. The spicule dimensions, recently made of the single known doubtless representative – the holotype, of *E. regalis* are given in Table 20. The proportions of the oscularia are as follows: hexactins – 2 %, pentactins – 94 %, stauractins, paratetractins, triactins and diactins – 1 % (n=214). Their rays are 0.004–0.03 mm in diameter. These proportions are largely equal to the wide range of corresponding spicules measured for *E. aspergillum aspergillum* (Tab. 21).

TABLE 20: Some measurements of spicules of *E. aspergillum regalis* Schulze, 1900.

	n	avg	min	max	std
L derm. hexact. distal ray	15	.042	.017	.082	.019
L derm. hexact. tangent. ray	16	.056	.032	.083	.015
L derm. hexact. proximal ray	11	.237	.075	.0375	.086
L atr. pentact. tangent. ray	17	.056	.030	.080	.014
L atr. pentact. distal ray	17	.123	.058	.225	.049
L ray spicules, lateral oscula	50	.117	.038	.198	.046
D floricome	25	.100	.089	.118	.008
d floricome	25	.014	.007	.019	.002
D sigmatocome	1	.080	.080	.080	
d sigmatocome	1	.016	.016	.016	
D oxyhexaster	25	.092	.074	.104	.009
d oxyhexaster	25	.008	.006	.015	.002
D graphiocome	2	.414	.385	.444	.042
d graphiocome	3	.020	.016	.023	.004

TABLE 21: Proportion (in % here and below approximate to an integer) of the spicules (thick-rayed) wich are situated in the vicinity of lateral oscula in *E. aspergillum aspergillum* Owen, 1841.

	MNHN p4267	MNHN p4274	MNHN p4269	MNHN p4268	MNHN p1112	MNHN p1109	MNHN p4622	MNHN p1108	BMNH 1921.11.30.004	BMNH 1887.10.20..007-9
Hexactines	3	2	4	2	1	7	5	3	2	0
Pentactines	96	96	94	92	90	87	87	85	84	83
Tetractines	2	2	2	5	8	5	7	10	10	13
Stauractines (Tetractines)	1	0	1	1	0	1	2	2	2	0
Parateractines (Tetractines)	1	2	1	4	8	4	5	8	8	13
Triactines	0	0	0	0	1	1	1	1	4	4
Diactines	0	0	0	1	0	0	0	0	0	0
Monoactines	0	0	0	0	0	0	0	0	0	0
(n)	120	50	101	217	114	134	102	176	51	23

TABLE 21, continued:

	MNHN p1110	BMNH 1887.10.20.010-12(b279)	MNHN p1156	MNHN P1111	MNHN p4275	MNHN p1177	MNHN p1157	BMNH 1887.10.20.010-12(b281)	HM 3990	BMNH 1888.06.29.002
Hexactines	0	8	3	3	9	7	0	20	0	0
Pentactines	82	78	78	77	75	70	68	67	67	63
Tetractines	9	13	16	14	9	13	18	9	17	13
Stauractines (Tetractines)	4	5	10	1	0	3	5	6	0	0
Parateractines (Tetractines)	4	8	6	13	9	10	12	3	17	13
Triactines	7	1	3	4	6	10	11	3	6	25
Diactines	2	0	0	3	1	0	4	1	11	0
Monoactines	0	0	0	0	0	0	0	0	0	0
(n)	94	125	63	117	107	30	114	70	36	8

TABLE 21, continued:

	BMNH 1887.10.20.010-12(b280)	MNHN p1655	HM 5432	MNHN P1176	MNHN p1175	HM 5623 (be53)	HM 5623 (be54)	HM 5623 (be55)	MNHN p1174	HM 5430	HM (be24)	HM 5623 (be56)	HM 5623 (be57)
Hexactines	4	12	2	8	3	5	4	13	29	0	0	0	0
Pentactines	59	59	58	58	55	53	52	44	40	38	30	25	20
Tetractines	23	24	19	25	28	26	28	28	19	45	30	60	42
Stauractines (Tetractines)	9	12	2	25	6	11	8	7	12	7	7	16	9
Parateractines (Tetractines)	14	12	18	0	22	16	20	21	7	38	30	44	33
Triactines	9	0	14	8	9	9	7	10	10	17	19	14	18
Diactines	4	6	7	0	5	7	8	6	3	0	15	2	18
Monoactines	0	0	0	0	0	0	0	0	0	0	0	0	2
(n)	74	17	57	12	65	57	71	72	101	29	27	57	45

***E. aspergillum indonesicum* ssp. nov.** (Fig. 26; Tab. 22)

Synonymy. E. aspergillum Owen (in part) in Tabachnick, 2002b: 1391.

Etymology. Subspecies name refers to the region where the holotype was found.

Material. *Holotype*: IORAS 5/2/1324—Indonesian Archipelago, RV *Vityaz*—50, sta. 6482, 4°31’2” –30’8”N 112°55’7” –56’3”E, depth 85–88 m.

Description. Body: The single specimen has the typical body form for *E. aspergillum*. The length is 190 mm, its diameter about 40 mm, the sieve-plate is oval 38x48 mm, anchorate basalia protrude about 60 mm, the walls are about 2.5 mm thick. Lateral ridges both circular and oblique are not very prominent, they are 2–3 mm high and rather short (usually 30–40 mm long), the last ridge situated close to the sieve-plate, often known as the cuff, is higher 4–5 mm. The lateral oscula are 0.8–1.5 mm in diameter, they are situated partly in regular rows and partly in alternating position, the sieve-plate shows colander structure with meshes triangular and rectangular 1–3.5 mm. This specimen was already figured in Tabachnick (2002b: Fig. 1 A, B).

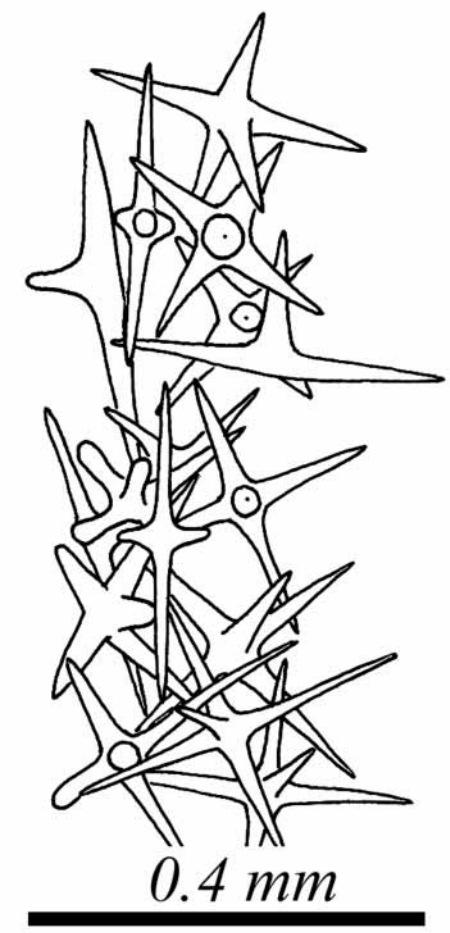

FIGURE 26. *E. aspergillum indonesicum*, ssp.n., oscularia, holotype.

Spicules: The spicules are very similar to *E. aspergillum aspergillum* and their important measurements are given in the Tab. 22. The proportions of the oscularia are following: hexactins – 3 %, pentactins – 69 %, stauractins – 7 %, paratetractins – 4 %, triactins and diactins – 9 % (n=112) (their rays are 0.014–0.034 mm in diameter).

Remarks. The new subspecies is very similar to *E. aspergillum aspergillum* in sizes and shapes of most spicules. The proportion of microscleres which are located in the vicinity of the lateral oscula is also similar between these two sponges: pentactins predominate in *E. aspergillum indonesicum* (69 %); these are also common for *E. aspergillum aspergillum* where their proportion varies between 20 and 96 % (usually closer to the latter). The only difference between the two subspecies is the ray length of oscularia, which measure 0.061–0.19/0.008–0.023 mm; length average is 0.124 mm. In *E. aspergillum aspergillum* the corresponding spicule rays are 0.076–0.684 mm long (their average length varies in different specimens between 0.23–0.349 mm, which is significantly longer than that of *E. aspergillum indonesicum*). In any investigated specimen of *E. aspergillum aspergillum* the maximal length of oscularia is much longer then 0.19 mm in length (maximal length of that in the new subspecies). Since these spicules (oscularia) are becoming important for the recognition of the subspecies of *E. aspergillum,* as it is stated in this publication, we suppose that such difference in the ray length variation is also important and may be considered as a character of lower then species level too.

TABLE 22: Some measurements of spicules of *E. aspergillum indonesicum*, ssp.n.

	n	avg	min	max	std
L. derm. distal ray	15	.128	.076	.167	.023
L derm.. tangent. ray	19	.148	.091	.532	.095
L. derm. proximal ray	17	.584	.266	1.026	.219
L. atr. tangent. ray	25	.119	.084	.243	.038
L atr. proximal ray	21	.366	.114	.699	.208
L ray spicules, lateral oscula	25	.124	.061	.190	.035
D floricome	15	.078	.065	.086	.006
d floricome	15	.011	.008	.014	.002
D oxyhexaster	15	.058	.043	.068	.008
d oxyhexaster	15	.009	.005	.013	.002
D graphiocome	2	.182	.173	.191	.013
d graphiocome					

***Euplectella aspergillum australicum* ssp. nov.** (Fig. 27; Tab. 23, 24)

Etymology. Subspecies name reflects the region of type locality.

Material. *Holotype*: WAM Z 545—RV *Soela*, sta. SO 2/82/44, 124 miles NW of Port Headland 18°54'–55'S 117°2'–0'E, depth 300–306 m.

Paratypes: WAM Z 546 (4 specimens)—together with the holotype. WAM Z 551 (3 specimens)—RV *Soela*, sta. SO 4/82/08 C, N of Port Headland, 18°43'S 117°12'E, depth 368 m. WAM Z 643—RV *Soela*, sta. SO 2/82/18, 56 miles of Imperieuse Reef, 18°8'–9'S 118°6'–4.60'E, depth 404 m. WAM Z 552—RV *Soela*, sta. SO 2/82/37, 124 miles NNW of Port Headland, 18°26'–19'S 118°0'–1'E. WAM Z 592—RV *Soela*, sta. SO 2/82/42, 119 miles NW of Port Headland, 18°44'S 117°20'–19'E, depth 326–360 m. WAM Z 653—sta. 008, SW of Imperieuse Reef Rowley Shoals, 17°42'S 118°38'E. WAM Z 553—SW of Imperieuse Reef Rowley Shoals, 17°37'S 118°46'E. WAM 72-91—RV *Courageous*, sta. 013, NE of Mermaid Reef, Rowley Shoals, 16°49'S 119°59'E. NTM Z 0001154 (2 specimens)—RV *Soela*, sta. NWS-0005, W off port Headland, Northweste Shelf, 18°42'S 117°18'E, depth 360 m. NTM Z 0002568—sta. NWS-0040, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°23'S 118°57'E, depth 430 m. NTM Z 0002575 (2 specimens)—sta. NWS-0042, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17°24'S 118°52'E, depth 445 m.

Other materials (*Euplectella aff. aspergillum australicum*): WAM Z 569—RV *Soela*, SO 1/84/067, NW of Bathurst Island, 14°21.50–22.30'S 122°2.40–1'E, depth 348–350 m. NTM Z 0002586—location unknown.

Description. Body: The body shape is similar to that of *E. aspergillum aspergillum*, parietal ledges are found in both spiral and circular arrangements. The holotype is 150 mm in length, oval in section 23x27 mm, the tuft of basalia is about 50 mm in length. The other complete sponge is WAM Z 546, it is 110 mm in length, 23 mm in diameter with basalia up to 50 mm in length, the other numerous paratypes are mostly fragments of the upper part of the body, one fragment reaches 260 mm in length, the diameter of these fragments is 22–35 mm. The parietal ledges of these sponges are up to 1–2 mm high, the rigid walls are 2–3 mm in thickness, the lateral osula are 0.5–1.5 mm in diameter, the sieve-plate is colander-like with meshes mostly triangular, 1–2 mm in diameter.

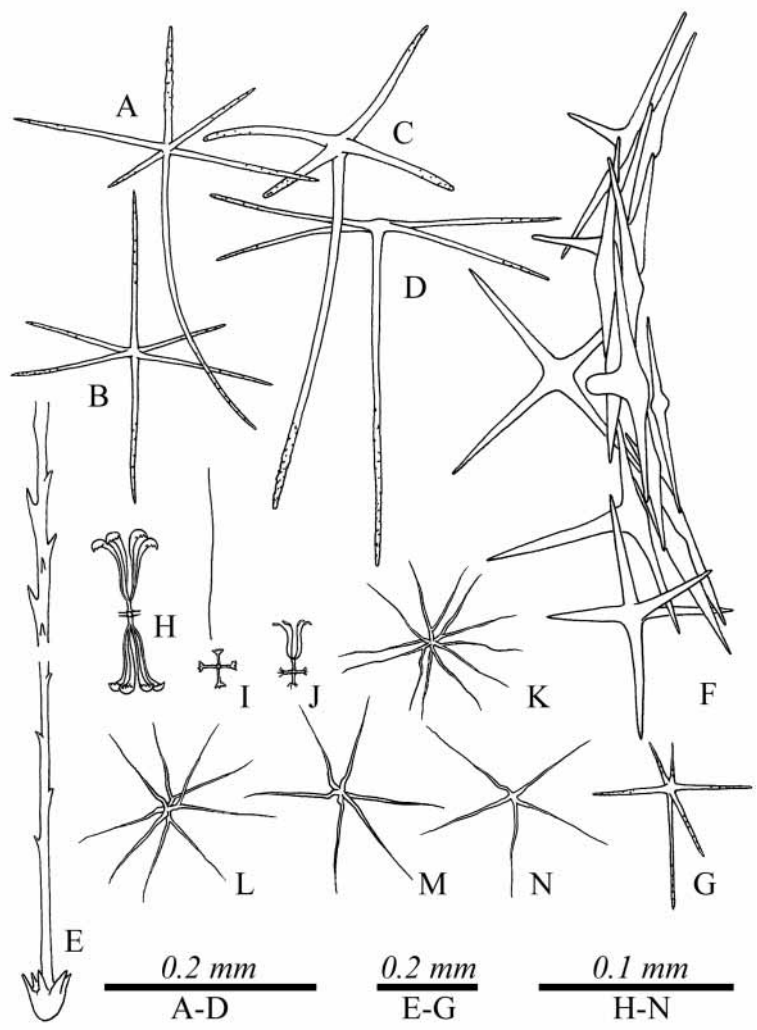

FIGURE 27. *Euplectella aspergillum australicum*, ssp.n., spicules. A-B, dermal hexactin. C-D, choanosomal pentactins. E, anchorate spicule. F, oscularia. G, hexactin of the sieve-plate. H, floricome. I, graphiocome. J, sigmatocome. K, oxyhexaster. L, oxyhemihexaster. M, oxyhexactin. N, oxypentactin. A-E; G-I; K-M, holotype. F, J, N, WAM Z 546.

Spicules: Principalia are stauractins with rays about 12/0.11–0.16 mm. Other choanosomal spicules are tauactins with rays several mm in length and 0.01–0.06 mm in diameter. Basalia are anchors with spiny shafts 0.1–0.13 mm in diameter and 6 teeth. Spicules of the sieve-plate are diactins, some tauactins, small hexactins and pentactins. The diactins are 0.46–several mm long and 0.004–0.05 mm in diameter, they are usually slightly curved and have a widening in the middle, their outer ends are conically pointed or rounded, smooth or rarely rough. The small and rare hexactins and pentactins have conically pointed outer ends, usually rough. All these spicules show notable fusions, which makes their measurements rather difficult. Dermalia are hexactins with distal ray rough, other rays are smooth, conically pointed with rough distal ends. The distal ray of dermal hexactins is 0.066–0.179 mm long, tangential rays are 0.087–0.204 mm, the proximal ray is 0.194–0.944 mm, their diameter is about 0.007 mm. Atrialia are pentactins with rounded and rough outer ends, the tangential rays of atrial pentactins are 0.112–0.27 mm long, the distal ray is 0.306–1.352 mm long; their diameter is about 0.01 mm.

The oscularia are mainly diactins, some triactins, rarely tetractins and other rarely found spicules, ranging from monactins to hexactins. Only one specimen, WAM Z 546, has a larger proportion of the triactins (see Tab. 24), but this may be a result of its poor condition. The rays of these spicules are smooth with conically pointed or sometimes rounded outer ends, they measure 0.076–0.608/0.002–0.046 mm.

Microscleres: floricomes, oxyhexasters, hemioxyhexasters and other oxyoidal abnormal forms, in some specimens oxyhexactins, graphiocomes and sigmatocomes. The floricomes are 0.067–0.092 mm in diameter with the primary rosette 0.008–0.019 mm in diameter. The oxyhexasters, oxyhemihexastrs and abnormal spicules with several primary rays reduced (observed in the specimenWAM Z 546) are 0.065–0.113 mm in diameter with the primary rosette 0.006–0.013 mm in diameter. The sigmatocomes (probably young floricomes) are very rare (WAM Z 545 and WAM Z 546); they are 0.061–0.063 mm in diameter with the primary rosette 0.013–0.014 mm in diameter. Graphiocomes are equally rare and only represented by a few primary rosettes, 0.019–0.021 mm in diameter.

TABLE 23: Some measurements of spicules of *E. aspergillum australicum*, ssp.n.

	fr777					fr773					jh2575#1				
	n	avg	min	max	std	n	avg	min	max	std	n	avg	min	max	std
L derm. hexact. distal ray	14	.108	.082	.143	.017	14	.130	.066	.153	.026	16	.120	.082	.179	.023
L derm. hexact. tangent. ray	14	.149	.112	.179	.017	14	.133	.087	.204	.040	17	.148	.102	.204	.021
L derm. hexact. proximal. ray	12	.537	.194	.867	.196	14	.587	.469	.791	.090	16	.523	.214	.944	.197
L. atr. pentact. tangent. ray	15	.177	.122	.255	.036	15	.174	.112	.219	.033	15	.179	.117	.270	.041
L atr. pentact. distal ray	15	.522	.306	.740	.118	15	.571	.306	.816	.142	15	.717	.342	1.352	.293
L ray of spicules of lateral oscula	17	.214	.015	.319	.088	15	.203	.122	.380	.068	15	.227	.114	.395	.084
D floricome	15	.076	.067	.084	.006	2	.074	.071	.076	.003	13	.081	.067	.092	.007
d floricome	15	.015	.008	.019	.003	2	.012	.011	.013	.001	13	.012	.008	.015	.002
D sigmatocome	1	.063	.063	.063											
d sigmatocome	1	.013	.013	.013											
D oxyhexaster	15	.085	.067	.092	.008	15	.089	.065	.105	.010	18	.091	.067	.113	.013
d oxyhexaster	15	.009	.008	.013	.001	15	.010	.006	.013	.002	18	.010	.008	.013	.002
D graphiocome															
d graphiocome	2	.020	.019	.021	.001										

TABLE 24: Proportions (%) of the spicules wich are situated in the vicinity of lateral oscula in *E. aspergillum australicum*, ssp.n.

	jh2586	fr774	fr772	fr770	jh2568	jh1154#1	fr816	fr769	jh1154#2	fr771	fr777	jh2575#2	fr779	fr776	Fr780
Hexactines	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Pentactines	0	0	2	0	0	4	0	4	8	2	2	10	10	21	4
Tetractines	0	1	2	1	2	5	8	9	3	8	10	17	19	14	19
Stauractines (Tetractines)	0	1	2	1	2	3	5	6	0	2	10	2	11	5	12
Parateractines (Tetractines)	0	1	0	0	0	2	3	3	3	6	0	15	8	9	7
Triactines	2	5	2	9	8	5	8	4	8	9	4	13	19	18	40
Diactines	98	92	91	90	90	85	85	84	83	80	80	60	52	47	37
Monoactines	0	0	2	0	0	0	0	0	0	0	4	0	0	0	0
(n)	99	134	45	70	102	146	40	79	40	100	49	48	62	57	73

Remarks. *E. aspergillum australicum* has several peculiar features in comparison with the typical subspecies: it shows notable skeleton fusions and oscularia are mainly diactins (or diactins and triactins). Oxyhexasters have thin secondary rays (about 0.001 mm in diameter), they are often curved and many specimens have hemioxyhexasters, and sometimes even oxyhexactins are derived from the oxyhexasters.

Placopegma Schulze, 1895

***Placopegma plumicomum* Tabachnick and Levi, 2004** (Tab. 25)

Material. MNHN (p13; fr871)—Cidaris I, RV *Franklin*, sta. 13-1, 17°58.59'S 148°38.40'E, depth 1040–1059 m.

Description. Body: The specimen (or specimens?) is represented by small fragments.

Spicules: Choanosomal spicules are diactins and hexactins. The diactins are several mm in length and 0.006–0.05 mm in diameter with conically pointed outer ends, stout or rarely with a widening in the middle. The rare hexactins have rays about 2/0.05 mm. A unique anchorate spicule shows four short teeth and spiny shaft about 0.04 mm in diameter. Dermal spicules are hexactins with distal ray almost spiny and other rays rough, they are 0.01–0.025 mm in diameter and have conically pointed or rounded outer ends. The atrialia, and probably also a portion of the dermalia, are pentactins with rough rays, their outer ends similar to those of dermal spicules, the diameter of their rays is 0.008 mm.

Microsleres are spherical discohexasters with 4 (rarely 2) secondary rays, plumicomes and a unique hemidiscohexaster (0.084 mm in diameter).

Remarks. The sponge is attributed to *P. plumicomum* described from off New Caledonia (Tabachnick and Lévi 2004) with very large probability. The only notable differences are not significant and are considered to be intraspecific variation: Length of distal ray of dermal hexactins and diameter of plumicomes (Tab. 25); the latter is a result of different lengths of the sigma-like secondary rays, while the primary rosettes are nearly equal.

TABLE 25: Some measurements of spicules of *Placopegma plumicomum* Tabachnick & Levi, 2004.

	Holotype Tabachnick & Levi					MNHN (fr871)				
	n	avg	min	max	std	n	avg	min	max	std
L. derm. hexact.distal ray		.068	.053	.084		43	.159	.097	.306	.040
L derm. pentact. & hexact. tangent. ray		.226	.099	.342		31	.190	.117	.342	.054
L. derm. pentact. & hexact. proximal ray		.463	.175	.836		21	.547	.265	.867	.149
L atr. penctact. tangent. ray		.189	.122	.296		37	.190	.112	.459	.054
L atr. pentact. distal ray		.354	.213	.448		29	.495	.133	.714	.164
D discohexactine		.046	.036	.054		25	.057	.046	.071	.006
d discohexactine		.006	.004	.007		25	.010	.008	.013	.002
D plumiocome		.045	.040	.050		6	.082	.067	.118	.019
d plumicome		.019	.018	.022		6	.024	.021	.025	.002

Corbitellinae Gray, 1872

Corbitella Gray, 1867

***Corbitella cf. elegans* (Marshall, 1875)** (Fig. 28, Tab. 26)

Material. WAM Z 266 (4 specimens)—RV *Soela*, sta. SO 1/84/122, W of Broom, 17°59'–54'S 118°23'–29'E, depth 389–390 m. *Corbitella speciosa*, *holotype*—MNHN – RV *Astrolabe*, off the Molukkas Islands.

Description. Body: At least two sponges are represented by fragments of the walls and the basal parts. The biggest basal part is 110 mm in length and oval in section 120x170 mm, the walls are 2–4 mm in thickness with lateral oscula 2–5 mm in diameter.

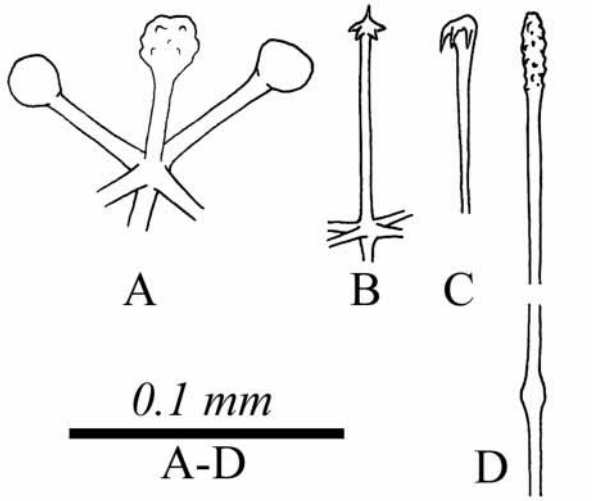

FIGURE 28. *Corbitella c.f. elegans* (Marshall, 1875), spicules, WAM Z 266. A, hexactin with clavate outer ends. B, hexactin with abnormal discoidal outer ends. C, outer end of onychoidal type of hexactin. D, choanosomal diactin.

Spicules: Choanosomal spicules are large diactins, the largest ones fused; they are several mm in length and up to 0.15 mm in diameter. The smaller diactins, 0.7–1.4/0.003-0.015 mm, are loose spicules with clavate rough outer ends and show a widening in the middle. Dermalia are hexactins with rounded, smooth, rarely rough, outer ends and rays 0.005–0.009 mm in diameter. Atrialia are pentactins with rays similar to those of the dermal spicules.

Microscleres are discohexactins, oxyhexactins (usually spiny) and some discohexasters. Some discohexactins show abnormal rays with tyloidal or onychoidal outer ends. Discohexasters have very short principalia.

TABLE 26: Some measurements of spicules of closely related species of *Corbitella*.

	C.speciosa, holotype, Ijima (1903)			*C. speciosa*, holotype, original measurements					*C. elegans*, holotype, Ijima (1903)		*C. elegans* fr783				
	avg	min	max	n	avg	min	max	std			n	avg	min	max	std
L derm. hexact. distal ray				7	.048	.015	.137	.041			4	.102	.061	.138	.032
L derm. hexact. tangent. ray				7	.114	.091	.137	.018			2	.311	.102	.520	.296
L derm. hexact. proximal. ray				7	.335	.243	.464	.067			14	.064	.026	.102	.019
L. atr. hexact. tangent. ray				25	.117	.084	.167	.024			14	.106	.077	.133	.016
L atr. hexact. proximal ray	.100			25	.413	.274	.578	.092			12	.364	.214	.536	.105
D discohexactine				4	.124	.122	.126	.002	.220	.264	15	.140	.092	.168	.020
D discohexaster or hemidiscohexaster		.100	.145	5	.105	.097	.108	.005	.122	.165	15	.131	.097	.153	.015
D discohexaster or hemidiscohexaster	.016			5	.010	.007	.011	.002							
D floricome		.072	.083						.098	.114					
d floricome				1	.018	.018	.018								
D microhexactine		.120	.280	3	.174	.158	.194	.018			15	.118	.061	.153	.023

TABLE 27: Some measurements of spicules of *Regadrella okinoseana* Ijima, 1896.

	(JH) 2581#1					(JH) 2581-a				
	n	avg	min	max	std	n	avg	min	max	std
L derm. hexact. distal ray	22	.082	.020	.168	.046	3	.111	.051	.153	.053
L derm. hexact. tangent. ray	23	.118	.061	.219	.043	3	.165	.077	.214	.077
L derm. hexact. proximal. ray	20	.166	.056	.316	.082	3	.245	.071	.383	.159
L smooth oxyhexactine ray	20	.090	.066	.133	.018	1	.071	.071	.071	
L rough oxyhexactine ray	19	.088	.041	.138	.024	6	.107	.066	.143	.032
D oxystauraster	20	.074	.063	.092	.009	2	.077	.071	.082	.007
d oxystauraster	20	.020	.017	.027	.03	2	.021	.020	.022	.001
D floricome	20	.094	.084	.0113	.008	4	.085	.082	.092	.005
d floricome	20	.016	.013	.019	.002	4	.014	.010	.015	.003
D graphiocome						4	.273	.092	.347	.121
d graphiocome	8	.022	.017	.025	.003	4	.022	.015	.031	.006

Remarks. The genus *Corbitella* comprises 4 species. The investigated fragments are very similar to *C. elegans* (Marshall, 1875) except for the dimensions of discohexactins (diameter of discohexactins in the holotype 0.22–0.264 mm) as reported by Ijima (1903) in his re-description of this species. The diameter of these spicules is more similar to that of *C. speciosa* (Quoy and Gaimard, 1833); diameter of discohexasters and rare discohexactins in this species is 0.1–0.145 mm (Ijima 1903). Unfortunately both species are known from single representatives, which contain only a few loose spicules; both species were found off the Molucca. It is very likely that *C. speciosa* and *C. elegans* are complete synonyms, but it is also possible that the Australian specimens described here should be regarded as a new subspecies of *C. elegans*. In any case the settlement of this question requires analysis of additional material of these two species.

Regadrella Schmidt, 1880

***Regadrella okinoseana* Ijima, 1896** (Tab. 28)

Material. NTM Z 0002581(three specimens)—sta. NWS-0043, off Rowley Shoals, Northwest Shelf, 17°18'S 119°4'E, 426 m.

Description. Body: This species is represented by three fragments; they probably belong to three different specimens. These sponges are at least 250 mm long with walls about 5 mm in thickness. One sponge contains several dense spherical aggregations 4–12 mm in diameter composed of sponge tissue with spicules. Inside each such sphere a specimen of Solenogastres *Genus sp.* (Mollusca) was found.

Spicules: The spicules of these Australian specimens do not differ in shape from other specimens of *R. okinoseana*. Occasionally it is possible to find among the dermal hexactins some diactins with rays very similar to those of the hexactins; the length of these diactins corresponds to axial length of the hexactins.

Remarks. R. okinoseana is widely distributed in the Indo-West Pacific; the last revision was done by Tabachnick and Lévi (2004), and the Australian specimens have very similar spicule dimensions to those of both well-investigated locations (off Japan and off New Caledonia). The only notable differences are the dimensions of dermal pentactins: the distal rays of the 'Australian' specimens are longer than those from off Japan and shorter than those from off New Caledonia; and the other rays of dermal hexactins are smaller in the sponges from off Australia. The microscleres are very similar in their shape and dimensions. Unlike the specimens of *R. okinoseana* described from the Great Australian Bight (off South Australia) (Reiswig 1992), the investigated specimens have very few oxypentasters and no oxyhexasters at all; the rays of dermal hexactins correspond to the smallest ones of those described from off South Australia.

TABLE 28: Some measurements of spicules of *Scyphidium australiensis*, sp.n.

	n	avg	min	max	std
L derm. pentact. tangent. ray	25	.094	.056	.122	.017
L derm. pentact. proximal ray	25	.085	.051	.117	.020
L atr. hexact. proximal ray	16	.155	.051	.316	.078
L. atr. hexact. tangent. ray	16	.148	.041	.347	.080
L atr. hexact. distal ray	16	.193	.056	.332	.095
D macrodiscohexaster	25	.067	.046	.084	.009
d macrodiscohexaster	25	.009	.004	.015	.002
D macrodiscohexactine	10	.068	.050	.097	.014
D microdiscohexaster	4	.043	.034	.055	.099
d microdiscohexaster	4	.007	.006	.008	.001
D oxyhexaster	14	.078	.038	.097	.016
d oxyhexaster	14	.009	.006	.013	.002

Rossellidae Schulze, 1885
Rossellinae Schulze, 1885
Scyphidium Schulze, 1900
***Scyphidium australiensis* sp.nov.** (Fig. 29, 30; Tab. 28)

Etymology. The name refers to the type locality of this species.

Material. *Holotype*: WAM (p14)—RV *Soela*, sta. SO 17-80, 43 °33.10'–33.05'S 179°27.25'–27.08'E, depth unknown

Description. Body: The sponge is represented by a single fragment of the wall, 200x300 mm and about 15 mm in thickness.

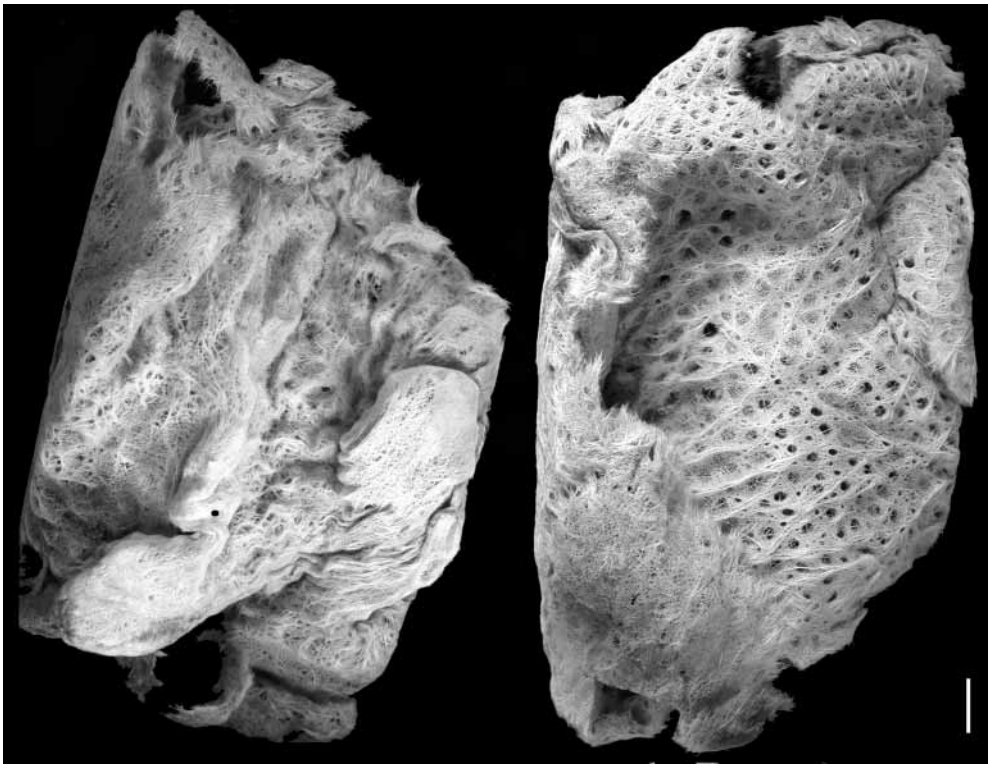

FIGURE 29. *Scyphidium australiensis*, sp. n., external shape, holotype, scale 20 mm.

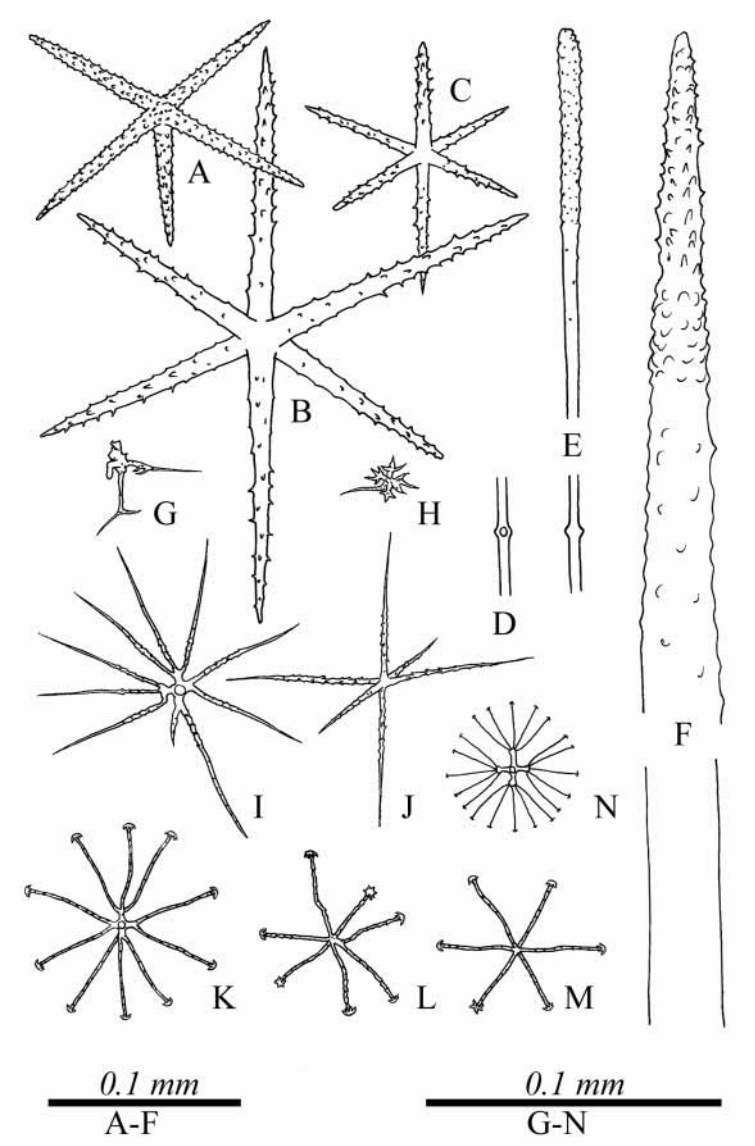

FIGURE 30. *Scyphidium australiensis*, sp.n., spicules, holotype. A, dermal pentactin. B-C, atrial hexactin. D-F, choanosomal diactin. G-H, abnormal oxyoidal microscleres. I, oxyhemihexaster. J, oxyhexactin. K, large discohexaster. L, large hemidiscohexaster. M, large discohexactin. N, small discohexaster.

Spicules: Choanosomal spicules are diactins 0.4–7/0.004–0.017 mm, usually stout and sometimes with a widening or four rudimental tubercles in the middle, their outer ends are rough, conically pointed or rounded. Fragments of large choanosomal hexactins with distally directed rays 0.1–0.22 mm, tangential rays, about 0.3 mm, and long proximal rays were found in very restricted numbers. Dermalia are pentactins with rays covered by short spines and conically pointed outer ends, and have tangential rays 0.056–0.122 mm long and the proximal ray is 0.051–0.117 mm, their diameter is 0.002–0.006 mm. Atrialia are hexactins with rays similar to those of the dermal spicules and of nearly equal length, their proximal ray is 0.051–0.316 mm, tangentials are 0.041–0.347 mm, the distal ray is 0.056–0.332 mm, their diameter is 0.002-0.008 mm.

Microscleres: Microscleres are discoidal (large and small spicules), oxyoidal and abnormal derivatives of large discoidal spicules, and all oxyoidal forms. The large discoidal spicules are spherical discohexasters, hemidiscohexasters, discohexactins. Small discoidal spicules are the microdiscohexasters. Oxyoidal spicules are oxyhexasters, hemioxyhexasters and oxyhexactins. The large discohexasters (with 2–3, rarely 4–5 secondary rays) and large hemihexasters are 0.046–0.084 mm in diameter with a primary rosette 0.004–0.015 mm in

diameter, the large discohexactins are similar in size to hexaster-like forms, but sometimes bigger, 0.050–0.097 mm long. The small discohexasters are rare; they are 0.034–0.055 mm in diameter with a primary rosette 0.006–0.013 mm in diameter. The oxyoidal spicules have 1–3 rough secondary rays, their diameter is 0.038–0.097 mm, the primary rosette in oxyhexasters and oxyhemihexasters is 0.006–0.013 mm in diameter.

TABLE 28: Some measurements of spicules of *Scyphidium australiensis*, sp.n.

	n	avg	min	max	std
L derm. pentact. tangent. ray	25	.094	.056	.122	.017
L derm. pentact. proximal ray	25	.085	.051	.117	.020
L atr. hexact. proximal ray	16	.155	.051	.316	.078
L. atr. hexact. tangent. ray	16	.148	.041	.347	.080
L atr. hexact. distal ray	16	.193	.056	.332	.095
D macrodiscohexaster	25	.067	.046	.084	.009
d macrodiscohexaster	25	.009	.004	.015	.002
D macrodiscohexactine	10	.068	.050	.097	.014
D microdiscohexaster	4	.043	.034	.055	.099
d microdiscohexaster	4	.007	.006	.008	.001
D oxyhexaster	14	.078	.038	.097	.016
d oxyhexaster	14	.009	.006	.013	.002

Remarks. The unique features of this new species of *Scyphidium* are the presence of large discoidal spicules and their abnormal forms, as well as the diameter of large discohexasters and their derivatives , which are too small for the other species of the genus. Only the type species of *S. septentrionale* Schulze, 1900, from off Greenland, has similar size large discohexasters 0.05–0.094 mm in diameter (Tabachnick 2002c). *S. australiensis* is the third species of the genus collected in the Southern Hemisphere. The two other species are *S. chilense* Ijima, 1927 (former *Rossella sp.* (Schulze 1899)) off Chile and *S. hodgsoni* (Kirkpatrick, 1907)—the latter was described as *Holascus hodgsoni* but definitely belongs to *Scyphidium* by having two types of discohexasters – from the Antarctic Ocean (Mount Erebus). Another species of the genus, which was described without hypodermal pentactins, may be *S. tuberculata* (formerly *Aulosaccus tuberculatus* Okada, 1932).

Lanuginellinae Schulze, 1897
Sympagella Schmidt, 1870
***Sympagella multihexastera* sp. nov.** (Fig. 31, 32; Tab 29)

Etymology. The name refers to the multitude of hexaster types characteristic of the spicule composition of this species.

Material. *Holotype*: NTM Z 0002592—Sta. NWS-0050, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17º28’S 118º53’E, depth 405 m.

Paratype: NTM Z 0002594—Sta. NWS-0052, off Rowley Shoals, Northwest Shelf, Scampi trawl Grounds, 17º28’S 118º53’E, depth 405 m.

Description. Body: Both specimens are presented by lamella-like fragments, 5–8 mm in thickness.

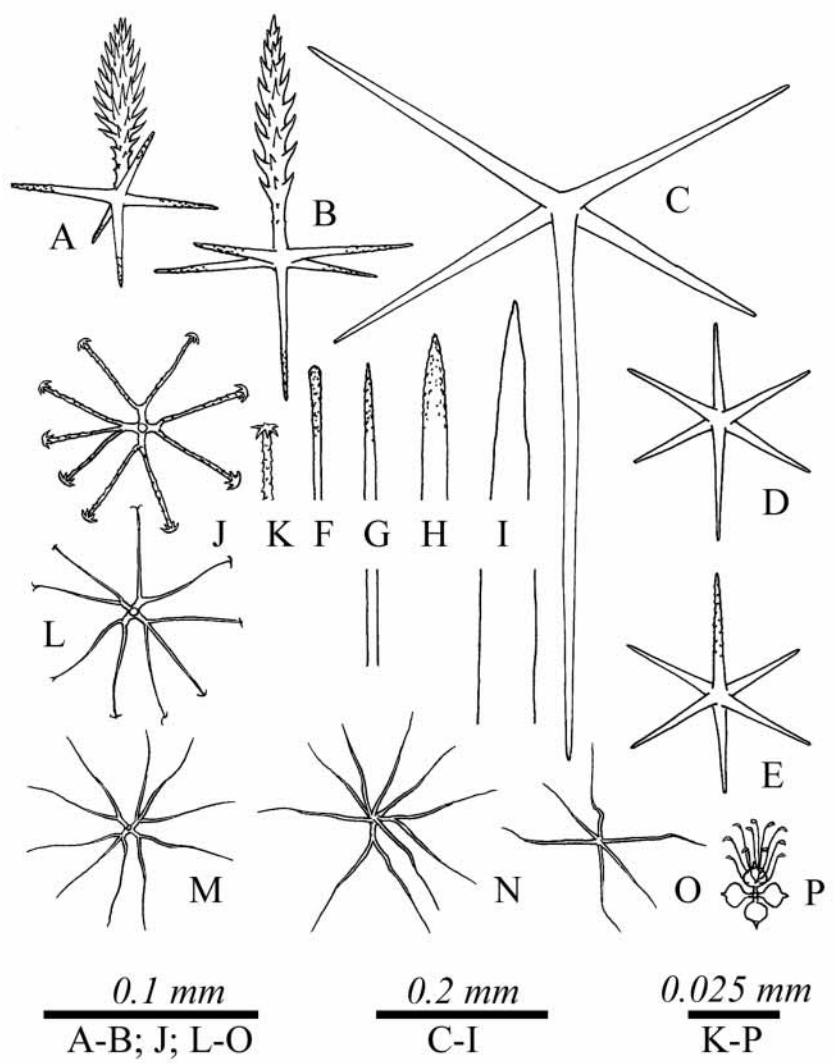

FIGURE 31. *Sympagella multihexastera*, sp. n., spicules, holotype. A, dermal pinular pentactin. B, atrial pinular hexactin. C, hypodermal pentactin. D-E, choanosomal hexactins. F-I, central parts and outer ends of choanosomal diactins. J, discohexaster. K, outer end of discohexaster. L, onychohexaster. M, oxyhexaster. N, oxyhemihexaster. O, oxyhexactin. P, strobiloplumicome.

Spicules: Choanosomal spicules are diactins and hexactins. The diactins have stout shafts, rarely with a widening in the middle and conically pointed or rounded outer ends, smooth or rough, they measure 1.5–2.9/0.01–0.13 mm. The hexactins have conically pointed outer ends, usually smooth, some hexactins have rough rays directed outside the body; the rays of these hexactins are 0.15–0.37/0.01–0.0.026 mm. Hypodermalia and probably hypoatrialia are pentactins with conically pointed, usually smooth outer ends, their tangential rays are 0.25–0.87 mm long, the ray directed inside the body is 0.3–1 mm, the diameter of these rays is 0.014–0.026 mm. Dermalia and atrialia are pinular hexactins with a spindle-like pinular ray, the other rays are conically pointed or rounded, usually rough, sometimes smooth. The pinular ray of dermal hexactins is 0.066–0.143/0.009 mm, tangential rays are 0.041–0.077 mm, the proximal ray is 0.041–0.077 mm, the diameter of these rays is 0.002–0.003 mm. The pinular ray of atrial hexactin is 0.092–0.204 mm long, tangential rays are 0.041–0.071 mm, the proximal ray is 0.051–0.082 mm.

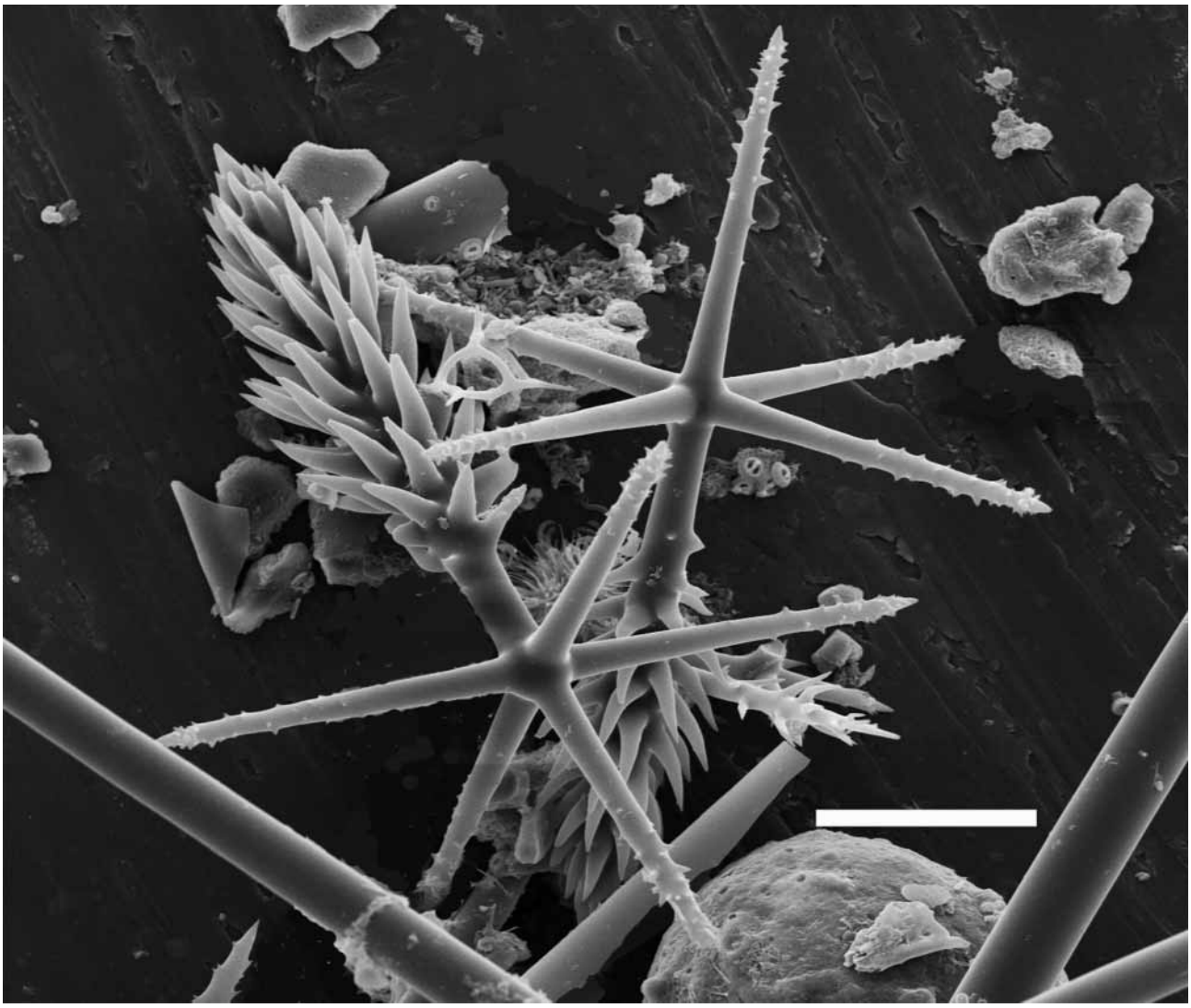

FIGURE 32. *Sympagella multihexastera*, sp.n., holotype. Dermal pinules, scale 30 µm.

Microscleres: Microscleres are discohexasters, rarely onychohexasters, oxyhexasters, rarely oxyhemihexasters, oxyhexactins and strobiloplumicomes. The discohexasters, with 2, rarely 3 rays, are uncommon; they are 0.101–0.105 mm in diameter with a primary rosette 0.008–0.017 mm in diameter. The single onychohexaster found is 0.063 mm in diameter with a primary rosette 0.008 mm in diameter. The microscleres with oxyoidal secondary rays are 0.076–0.113 mm in diameter with a primary rosette 0.008–0.017 mm in diameter. The strobiloplumicomes are 0.029–0.063 mm in diameter with a primary rosette 0.013–0.025 mm in diameter.

Remarks. The new species *'multihexastera'* is erected according to its specific combination of microscleres: discohexasters, onychohexasters, oxyhexasters, oxyhexactins and strobiloplumicomes (the latter are characteristic for all species of the genus). Probably the closest species with most similar microscleres is *S. clavipinula* Tabachnick and Levi, 2004 from off New Caledonia, but this species has no oxyhexactins, dermal pinular rays are clavate in shape and atrial pinular hexactins differ strongly from the dermal ones in shape and length of their pinular rays. Two other species which possess similar dermal and atrial spicules are *S. johnsoni* (Schulze, 1887) (formerly *Aulascus*) from off South Africa and *S. gracile* (Schulze, 1903) (formerly *Calycosoma*) from the Indonesian Archipelago. The difference here is in the microsclere composition: *S. johnsoni* has (besides the characteristic strobiloplumicomes) discohexasters and onychohexasters, *S. gracile* has oxyhexasters and onychohexasters.

Discussion. Intraspecific variability and key to subspecies of *Euplectella aspergillum*. The result of this

revision is the new definition of *E. aspergillum* as *Euplectella* having principalia of stauractins, notable fusion of the choanosomal skeleton, formation of ridges, microscleres as floricomes, oxyhexasters and their derivatives, including abnormal oxyoidal forms. Furthermore, usually also graphiocomes and sometimes sigmatocomes (which are probably young stages of floricomes) occur. The four subspecies are justified by their morphological differences as well as the fact that they inhabit distal geographical locations: *E. aspergillum aspergillum* Owen – off the Philippines; *E. aspergillum regalis* Schulze – Sea of Bengal; *E. aspergillum indonesicum* ssp. nov. – Indonesian Archipelago; *E. aspergillum australicum* ssp. nov. – off W Australia. Two subspecies are known from many specimens: *'aspergillum'* and *'australicum'*, the other two only by single representatives. Their identification is based on the detailed investigation of oscularia (spicules located close to the lateral oscula) and of their microscleres: floricomes and oxyhexasters. No overlaps of important features for their identification was observed, therefore the identification key presented here seems justified. The other species of *Euplectella*, which show principalia of stauractins, require re-examination: It is very likely that *E. oweni* Herklots and Marshal, 1868, *E. marshalli* Ijima, 1895 and *E. curvistellata* Ijima, 1901 should be synonymized; as well as *E. imperialis* Ijima, 1894, *E. timorensis*, Ijima, 1927 and specimens of *E. regalis* from off S Australia (Reiswig 1992).

TABLE 29: Some measurements of spicules of *Sympagella multihexastera*, sp.n.

	n	avg	min	max	std
L derm. hexact. distal ray	25	.102	.066	.143	.017
L derm. hexact. tangent. ray	25	.055	.041	.077	.009
L derm. hexact. proximal. ray	25	.057	.041	.077	.009
L. atr. hexact. proximal ray	25	.130	.092	.204	.028
L atr. hexact. tangent. ray	25	.060	.041	.071	.008
L atr. hexact. distal ray	25	.065	.051	.082	.010
D strobiloplumicome	25	.044	.029	.063	.011
d strobiloplumicome	25	.019	.013	.025	.003
D oxyhexaster & oxyhemihexaster	25	.092	.076	.113	.008
d oxyhexaster & oxyhemihexaster	25	.011	.008	.017	.003
D discohexaster	3	.104	.101	.105	.002
d discohexaster	3	.013	.008	.017	.004
D onychohexaster	1	.063	.063	.063	
d onychohexaster	1	.008	.008	.008	

Key to subspecies of *E. aspergillum*

(1) The spicules located close to the lateral oscula are mostly pentactins (rarely together with stauractins) other spicules are uncommon ..... **(2)**
The spicules located close to the lateral oscula are mostly diactins (rarely together with triactins)..... ..... ***E. aspergillum australicum*** ssp. nov.

(2) The floricomes are greater than 0.9 mm in diameter, the oxyhexasters are greater than 0.075 mm in diameter ..... ***E. aspergillum regalis*** Schulze, 1900
The floricomes are smaller than 0.9 mm in diameter, the oxyhexasters are smaller, 0.08 mm in diameter ..... **(3)**

(3) The spicules located close to the lateral oscula have short rays (smaller than 0.19 mm (average 0.124 mm)) ..... ***E. aspergillum indonesicum*** ssp. nov.
The spicules located close to the lateral oscula have long rays (0.053–0.684 mm long (on average they are greater then 0.143 mm)..... ***E. aspergillum aspergillum*** Owen, 1841

So far, only a few hexactinellid species have been described from Australian waters. However, the diversity of Australian hexactinellids at higher taxonomic level is relatively high: Hooper and Wiedenmayer (1994) recorded 31 Australian hexactinellid species distributed within 19 genera and 9 families. But excluding so-called 'Australian Antarctic Territories' and family Caulophacidae (synonynized with Rossellidae Tabachnick 1999), we have the list of 'true' Australian hexactinellids consisting of about 5 families, 7 genera and only 12 species. For comparison, from the Southern Ocean, which is also considered an area of high sponge diversity (Janussen and Tendal in press), about 60 hexactinellid species from 22 genera and 9 families have been reported (Barthel and Tendal 1994; Janussen et al. 2004 and Janussen and Reiswig in prep.). In this study, we found 28 species (6 new to science) from 17 genera and 11 families. Four families (Aphrocallistidae, Rossellidae, Monorhaphididae and Euretidae) have not been reported from the Australian seas before. Most of investigated stations were made off the W Australian Coast and are stored in WAM. In comparison with the northern (off Indonesia) and western (W Indian Ocean) regions, the W Australian Coast hexactinellids fauna is notably poor. One may suppose that the whole fauna of Australian Hexactinellida is really not so poor and only still largely unknown (especially its N and E parts), and further collections in deep water as well as investigations of unstudied museum collections promise to reveal many new taxa from this area.

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