Additions to the Sponge Fauna of the Hawaiian Islands

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Introduction

Fifteen species of sponges from the Hawaiian Islands are considered below; of these two have been recorded previously by de Laubenfels, but were either incompletely described or incorrectly named; three are new species and the remainder are recorded for the first time from the Hawaiian area.

Sponges recorded for the first time from Hawaii are essentially Indo-Pacific species although for two species, *Tedania macrodactyla* and *Diplastrella spiniglobata*, the distribution data are very poor. Four species have an almost cosmopolitan distribution, *Aplysilla rosea*, *Aplysilla sulfurea*, *Ciocalypta penicillus* and *Spirastrella coccinea* and one species, *Halichondria melanadocia*, is West Indian and Tropical East Coast North American in distribution.

Associated with *Halichondria melanadocia* in the fouling community on the floating dock at Coconut Island are three other species with a similar distribution —*Tedania ignis*, *Mycale cecilia* and *Zygomycale parishii*. Of these sponges only *Tedania ignis* is common elsewhere in Hawaii.

It appears likely that this group of species has been transported artificially to Hawaii and that species which readily establish in fouling communities have been favored.

Most previous work relating specifically to the sponge fauna of Hawaii has been contributed by de Laubenfels (1950, 1951, 1954a, 1957) and in the course of preparing a key to the common shallow water sponges of the area many of de Laubenfels' holotypes were re-examined. Three cases of synonymy involving common species have been discovered and incorporated in the key, (Bergquist, in press). These are formally noted below:

Neoadocia mokuoloe de Laubenfels is a synonym of *Toxadocia violacea* de Laubenfels.

Kaneohea poni de Laubenfels is a synonym of *Toxadocia violacea* de Laubenfels.

Mycale manuakea de Laubenfels is a synonym of *Mycale cecilia* de Laubenfels.

Color notations given in the text refer to Munsell (1940).

Means are quoted in brackets after the spicule dimensions and are based on ten measurements for each spicule type.

Acknowledgements

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SYSTEMATIC DESCRIPTIONS AND DISCUSSION

(Species included are listed in systematic order)

Order *Dictyoceratida* Minchin
- Family *Spongiidae* Gray
  - Genus *Psammaplysilla* Keller
    - *Psammaplysilla purpurea* (Carter)
- Family *Dysideidae* Gray
  - Genus *Dysidea* Johnston
    - *Dysidea herbacea* (Keller)

Order *Dendroceratida* Minchin
- Family *Aplysillidae* Vosmaer
  - Genus *Aplysilla* Schulze
    - *Aplysilla rosea* (Barrois)
    - *Aplysilla violacea* Lendenfeld
    - *Aplysilla sulfurea* Schulze

Order *Poecilosclerida* Topsent
- Family *Tedaniidae* Ridley and Dendy
  - Genus *Tedania* Gray
    - *Tedania macrodactyla* (Lamarck)
- Family *Microcionidae* Hentschel
  - Genus *Clathria* Schmidt
    - *Clathria procera* (Ridley)

Order *Halichondrida* Topsent
- Family *Halichondriidae* Gray
  - Genus *Halichondria* Fleming
    - *Halichondria melanadocia* de Laubenfels
    - *Halichondria coerulea* nov. sp.
  - Genus *Ciocalypta* Bowerbank
    - *Ciocalypta penicillus* Bowerbank

Order *Axinellida* Bergquist
- Family *Raspailiidae* Hentschel
  - Genus *Eurypon* Gray
    - *Eurypon nigra* nov. sp.

Order *Hadromerida* Topsent
- Family *Suberitidae* Schmidt
  - Genus *Terpios* Duchassaing and Michelotti
    - *Terpios granulosa* nov. sp.
- Family *Spirastrellidae* Hentschel
  - Genus *Spirastrella* Schmidt
    - *Spirastrella vagabunda* Ridley
    - *Spirastrella coccinea* (Duchassaing and Michelotti)
  - Genus *Dipastrella* Topsent
    - *Diplastrella spiniglobata* (Carter)

Order Dictyoceratida Minchin
Family Spongiidae Gray

Genus PSAMMAPLYSILLA Keller

Psammaplysilla purpurea (Carter)

Aplysina purpurea Carter, 1880, p. 36.
Hexadella pleochromata de Laubenfels, 1950, p. 10.
Psammaplysilla purpurea, Bergquist, 1965, p. 135, fig. 6, a, b, c, d.

Remarks: This sponge was recorded by de Laubenfels (1950) from Kaneohe Bay as *Hexadella pleochromata*. De Laubenfels' holotype (U.S.N.M. 22748) was examined and found to be a specimen of *Psammaplysilla purpurea* (Bergquist, 1965).

Kaneohe Bay is still the only Hawaiian locality for this sponge, but it is relatively common there in sheltered localities at depths of 1-3 fathoms.

The sulphur yellow color sometimes overlain by dull green, conulose surface and the marked color change to deep brown or maroon after death enable easy recognition of the species.

A full description with illustration is given by Bergquist (1965).

Previous Distribution: Gulf of Manaar, Ceylon, S. W. Australia, Red Sea, Celebes, Gt. Barrier Reef, East Indies, Caroline Is., Marshall Is., Palau Is., Hawaii, Darwin, Fiji.

Family Dysideidae Gray

Genus DYSIDEA Johnston

Dysidea herbacea (Keller)

Restricted Synonymy:
Spongelia herbacea Keller, 1889, p. 336, pl- 20, fig. 1.
Dysidea herbacea, Bergquist, 1965, p. 140, fig. 7, a, b, c.

Remarks: This well characterized and widespread Indo-Pacific species is recorded for the first time from the Hawaiian Islands where it has been found on Maui at depths of 2-4 fathoms. The colonies are small but the typical habit with vertical lamellae, intersecting in complex fashion is developed.

Among Hawaiian sponges the color of this sponge is quite characteristic, externally blue to slate gray, internally green as a result of the presence of symbiotic blue-green algae.

Full description and illustrations are given by Bergquist (1965).

Previous Distribution: Red Sea, Indian Ocean, Abrohlos, S. W. Australia, Great Barrier Reef, Darwin, Marshall Is., Palau Is.

Order Dendroceratida Minchin

Family Aplysillidae Vosmaer

Genus APLYSILLA Schulze

Aplysilla rosea (Barrois)

Restricted synonymy:
Verongia rosea Barrois, 1876, p. 57.
Alysilla rosea Schulze, 1878, p. 416, pl. XXIII, figs. 16, 17.
Aplysilla rosea, Lendenfeld, 1889, p. 708, pl. XLIV, fig. 4.
Aplysilla rosea, Burton, 1930, p. 510, pl. I, fig. 3.
Aplysilla rosea, Burton, 1934, p. 595.

Remarks: This sponge is distinguished in the Hawaiian islands by its per-

sistently encrusting habit, markedly conulose surface and rose pink color (pR 6/10). It is widespread, usually on the undersurfaces of rocks and coral boulders. In the course of this survey it was found at Kaimolino, Bay, Punaluu, Diamond Head, Nanakuli and Kewalo on Oahu and at Watanabe Reef on Maui.

In Australian and New Zealand waters this species attains considerable size and thickness; the Hawaiian specimens were never more than 1.0 mm thick and 3.0 square cm in area.

On present distribution data, *Aplysilla rosea* appears to be a cosmopolitan species, with a huge depth range, intertidal to 300 fms. There is almost certainly more than one species involved in this complex but the fragile nature of these sponges makes it difficult to work from preserved material without extensive field notes. Thus, many of the literature descriptions are almost useless for purposes of detailed comparison. It may be that the persistant encrusting habit and small overall size of this sponge in Hawaii indicate that this is a colder water species existing at sub-optimal conditions or, alternatively, that this is a different species. No histological differences can be found to separate the Australasian and Hawaiian specimens, but without seasonal observations from Hawaii it is impossible to know whether the latter specimens ever attain greater size and thickness.

Previous Distribution: Mediterranean, Australia, Atlantic coast of Europe.

Aplysilla violacea Lendenfeld

Aplysilla violacea Lendenfeld, 1883, p. 237, pl. 10, pl. 11, pl. 12.
Aplysilla violacea, Lendenfeld, 1883, p. 26.
Aplysilla violacea, Lendenfeld, 1889, p. 704, pl. 46, fig. 13-15.
Aplysilla violacea, de Laubenfels, 1948, p. 165.

Remarks: This sponge can be distinguished in the Hawaiian area by its dark purple color (pR 2/4), persistently encrusting habit and conulose surface. Specimens were recorded from Oahu only, at Diamond Head and Kewalo on the under-surfaces of stones.

Although literature records of this sponge are all Australian, it is common throughout New Zealand as well and extends to Fiji. In Australian waters, vertical lamellae are sometimes produced from the encrusting base. This has not been observed in either New Zealand or Hawaiian specimens.

Lendenfeld (1889) gives a good description of the species, particularly of the surface patterning which is distinctive and the distribution of pigment which is very dense toward the surface and tends to obscure histological detail.

De Laubenfels' (1948) emphasis of a color difference between surface and interior is quite misleading. *Aplysilla violacea* is never yellow or orange internally. The only color difference is a slight gray to white cast at the surface as a result of thickening of the dermal membrane between adjacent pores, and this is sometimes not detectable.

Previous Distribution: Australia.

Aplysilla sulfurea Schulze

Restricted Synonymy:
Aplysilla sulfurea Schulze, 1878, p. 405, pl. 23, fig. 15, 18, 20-27, pl. 24, fig. 28a-30.

Aplysilla sulfurea, Lendenfeld, 1889, p. 707.
Aplysilla sulfurea, de Laubenfels, 1948, p. 163.
Aplysilla sulfurea, de Laubenfels, 1954b, p. 47, fig. 26.

Remarks: This species is widespread under boulders at low tide on the island of Oahu. It is distinguished by its encrusting habit, conulose surface and bright yellow to yellow-green color.

Previous Distribution: Mediterranean, Australia, Britain, Antarctic, Red Sea, New Zealand, North America, Ponape, Majuro Atoll.

Order Poecilosclerida Topsent
Family Tedaniidae Ridley and Dendy
Genus *Tedania* Gray

Tedania macrodactyla (Lamarck)

(Plate I, Fig. 1)

Spongia macrodactyla Lamarck, 1814, p. 458.
Tedania macrodactyla, Topsent, 1933, p. 13, pl. I, fig. 1.

Occurrence: Floating pier and stone pier, Coconut Is. Oahu.

Description: A massive sponge with long branched projections which are reduced sharply in diameter at each bifurcation. The total height of the colony is 30–40 cm; thickness of the base up to 6.0 cm; diameter of the ultimate branches, 0.3–0.5 cm.

Color: In life, dull orange (Y-R 6/4 to Y-R 6/6) throughout except for a slight white cast at the surface.

Texture: Soft, easily compressible.

Surface: The surface is grooved by prominent, meandering subdermal channels into which the dermal membrane collapses when the sponge is removed from the water. Apart from the grooves, the surface is smooth.

Skeleton: The skeleton is a rough isodictyal reticulation of styles, through which short tracts of styles, up to 120 μ in diameter, run at intervals. The subdermal region is reinforced by tufts of tylotes and onychaetes are strewn throughout the sponge. Spongin B is present throughout the sponge, at the angles of the reticulum and binding the spicule tracts.

Spicules: *Megascleres*: (a) *Styles*, straight or anteriorally curved spicules, entirely unspined; 160–192×3.0–7.0 μ (172×5.0 μ).

(b) *Tylotes*, straight relatively slender spicules often slightly spined at both ends: 160–204×2.5–4.0 μ (187×3.0 μ).

Microscleres: *Onychaetes*, straight, spined over the entire length. 102–134×up to 2.0 μ.

Discussion: *Tedania macrodactyla* as re-described by Topsent (1933) differs from the above described Hawaiian specimens in two features; it has a greater quantity of spongin in the skeleton and the spicules are slightly smaller.

In view of the striking similarity in habit, general architecture and details of spicule morphology the Hawaiian specimens are referred to this species with confidence.

Previous Distribution: East Indies.

Family Microcionidae Hentschel
Genus CLATHRIA Schmidt
Clatharia procera (Ridley)
(Fig. 3)

Restricted Synonymy:
Rhaphidophlus procerus Ridley, 1884, p. 451, pl. XXXIX, fig. K, pl. XLII, fig. 0-0″.
Echinonema gracilis, Ridley, 1884, p. 617, pl. LIV, fig. 1, 1′.
Clathria procera, Dendy, 1921, p. 64, pl. 2, fig. 6, 7.
Tenacia procera, Burton, 1934, p. 559.

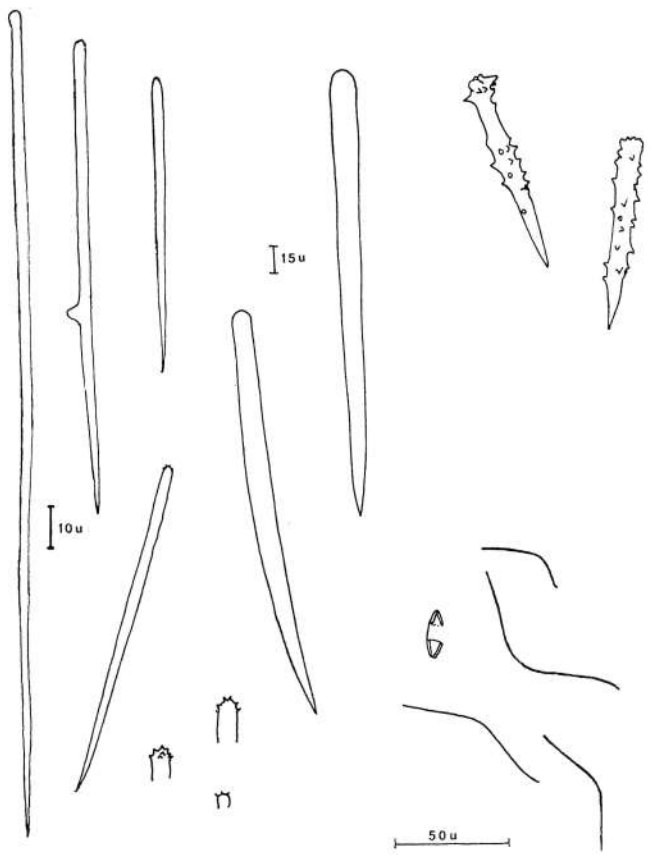

Fig. 3. *Clathria procera* (Ridley). At left: accessory styles. Center: structural styles. Upper right: acanthostyles. Lower right: toxas and an isochela.

Remarks: This widespread Indo-Pacific sponge is known, in the Hawaiian islands, only from Kanoehe Bay, Oahu.

The diagnostic field characteristics are the finger-like form stiff texture, brick red color (yR 4/10), and smooth surface.

The Hawaiian specimens are not notably different from previously described specimens, having a reticulate skeleton of spongin fibre, cored by smooth styles

and echinated by acanthostyles, which is replaced at the surface by a dense layer of smaller dermal styles arranged in tufts.

Spicule dimensions are as follows:

Structural styles, 240-360×12-16 μ (315×13.0 μ)
Accessory styles, 120-160×4.0-6.0 μ (138×4.8 μ)
Acanthostyles, 50-105×5.0-6.0 μ (80×5.7 μ)
Toxas 25.0-50.0 μ (40.0 μ)
Isochelae (palmate) 16.0-18.0 μ (16.5 μ)

Previous Distribution: Indian Ocean, Australia (north), Great Barrier Reef.

Order Halichondrida Topsent
Family Halichondriidae Gray
Genus HALICHONDRIA Fleming

Halichondria melanadocia de Laubenfels

Halichondria melanadocia de Laubenfels, 1936, p. 133.
Halichondria melanadocia, Wells, Wells and Gray, 1960, p. 225.
Halichondria melanadocia, Hechtel, 1965, p. 52, pl. V, fig. 2.

Remarks: The type description (de Laubenfels, 1936) of this sponge is very sketchy; however, the original specimens were re-examined by Hechtel (1965) and it is on the basis of his observations that this identification of the Hawaiian specimens rests.

The surface of the sponge is minutely conulose, the oscules usually elevated on low cones are 4.0 to 6.0 mm in diameter; the sponge is extremely soft and easily torn. Among Hawaiian sponges the color is distinctive; the ectosome is deep gray to black, the endosome dull yellow (Y-R-Y 5/6 to Y-R-Y 6/6).

The skeleton is typical of *Halichondria* in lacking order and consisting entirely of oxeas. The dermal skeleton contains multispicular tracts as noted by Hechtel. Spicule dimensions are as follows:

Oxeas: 200-512×2.0-13.0 μ (403×9.0 μ)

Halichondria melanadocia was found only on the floating pier at Coconut Island in what appears to be a typical fouling community.

Previous Distribution: West Indies; Florida, North Carolina.

Halichondria coerulea nov. sp.

(Plate I, Fig. 2; Fig. 4)

Holotype: Dominion Museum, N. Z. Por. 33.

Occurrence: Coconut Is., (Kaneohe Bay, Oahu) on Floating dock and stone pier. Abundant.

Description: A massive, spreading sponge with numerous oscular projections; colonies ranging from 8.0-50.0 cm in length, 5.0-18.0 cm in height. Oscular projections rise from 3.0-7.0 cm above the sponge surface and oscules are 0.8-1.5 cm in diameter. The sponge is found only on fouling surfaces, and is inhabited by large numbers of polychaetes and ophiuroids.

Color: In life, a pale blue throughout (G 8/2 to BG 8/2); in alcohol, white.

Texture: Fragile but crisp, not compressible without breaking the surface.

Surface: The surface is smooth, with the thin dermal membrane stretched over extensive sub-dermal cavities.

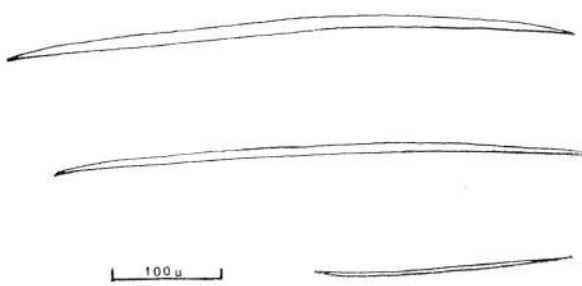

Fig. 4. *Halichondria coerulea* n. sp. Oxeas.

Skeleton: The endosomal skeleton is confused in the deeper regions of the sponge, but nearer the surface between the large sub-dermal cavities there is a tendency toward formation of short ascending spicule tracts. The dermal skeleton is irregular and the spicules are not aggregated, all meshes are unispicular. There is no obvious spongin B.

Flagellate chambers: These are spherical, 20–30 μ in diameter, to oval, $20\times40\ \mu$, maximum dimensions.

Spicules: *Megascleres*; *Oxeas*—Two size categories are distinguishable but these are not strictly localized in the sponge. The smaller spicules are proportionately more abundant in the sub-dermal region.

(a) *Large Oxeas*, slightly curved spicules tapering abruptly at each end. Some stylote forms occur. $380\text{–}600\times6\text{–}12\ \mu$ ($520\times9.5\ \mu$).

(b) *Small Oxeas*, much thinner spicules and evenly tapering along their entire length. $240\text{–}384\times20\text{–}2.5\ \mu$ ($304\times2.3\ \mu$).

Remarks: This species is not easily comparable to any others in the genus *Halichondria*. The spicule size and differentiation, lack of a definitive arrangement of the dermal skeleton in conjunction with the distinctive habit and color distinguish it from other described species.

Genus CIOCALYPTA Bowerbank

Ciocalypta penicillus Bowerbank

Restricted Synonymy:

Ciocalypta penicillus Bowerbank, 1864, p. 180, pl. XXX, fig. 360, 361.

Ciocalypta penicillus, Burton, 1959, p. 264.

Ciocalypta penicillus, Wells, Wells and Gray, 1960, p. 226, fig. 49.

Remarks: This seemingly cosmopolitan species is found in the Hawaiian Islands only on offshore sandy substrates. (Sta. 159 Pele.) The habit of the sponge is typical, a buried massive base from which tapering fluted fistules arise. An excellent illustration of the species is given by Wells (1960).

Previous Distribution: Cosmopolitan in temperate, subantarctic and subtropical waters.

Order Axinellida Bergquist

Tetractinomorpha which have an axially condensed or plumoreticulate skeleton usually rich in spongin B. The megascleres are monaxons, oxeas, styles or strongyles in all combinations, the spicules are frequently curved or contort.

Microscleres are often absent but a variety of forms can occur. Raphides and microxeas are the commonest, asterose and sigmoid types are found in the Astraxinellidae and Sigmaxinellidae respectively.

A stiff axial region, clearly distinct from a softer extra-axial region is the typical body form although variations towards massive form are found. The surface of axinellid sponges can be smooth but is usually hispid with projecting spicules. The colour of the living sponge is characteristically dark brown, orange or yellow.

In the few cases where reproductive processes have been recorded, the sponges are oviparous.

Axinellida are close in many morphological features to such groups of Ceractinomorpha as the Clathriidae. Several families are difficult to place between the Poecilosclerida and the Axinellida; for example the Raspailiidae and the Sigmaxinellidae. In grouping these families with the Axinellida, considerable importance has been attached to reproductive characteristics.

Family Raspailiidae Hentschel
Genus EURYPON Gray
Eurypon nigra nov. sp.

Eurypon distincta, de Laubenfels, 1957, p. 239, fig. 5.

Holotype: Dominion Museum N. Z. Por. 34.

Occurrence: On coral debris, 3-6 fathoms in Kaneohe Bay, Oahu.

Description: The sponge is an exceedingly thin crust, covering an area of approximately 2.0 square cm.

Color: Dark blue, almost black (B-GB 2/2). This color is unchanged in alcohol.

Surface: The surface is granular and distinctly hispid with the projecting ends of tylostyles which extend up to 1000 μ above the sponge surface.

Skeleton: The skeleton is composed of a sparse, basal palisade of acanthotylostyles, erect upon the substrate. Interspersed with these are tufts of two to eight large tylostyles. These spicules are arranged obliquely and generally extend beyond the sponge surface. Shorter tylostyles are abundant and dispersed without order. Some very fine tylostyles are present and appear to be developmental stages of both short and long spicules.

Spicules: *Megascleres*: (a) *Long tylostyles*—These spicules are always curved basally and have a pronounced, often assymetric or polytylote head. 1200-2400$\times$6.0-12.0 μ (2040$\times$9.5 μ).

(b) *Short tylostyles*—These spicules are identical in diameter and morphology to the larger forms and are noted as a separate category because of their different arrangement in the sponge and because their great abundance would produce an artificially low mean length for the tylostyles were both groups considered together. 170-800$\times$6.0-12.0 μ (350$\times$9.5 λ).

(c) *Acanthotylostyles*—Straight or slightly curved spicules, entirely spined but frequently having more prominent head spines. 70-165$\times$6.0-9.0 μ (96$\times$7.5 μ).

Remarks: De Laubenfels (1957) recorded a species *Eurypon distincta* (Thiele)

from dredgings around Oahu. His description of the sponge was brief, but spicule dimensions and morphology compare well with those quoted above and both sponges have a deep blue color.

De Laubenfels was in considerable doubt over the identity of his Hawaiian specimen with Thiele's species from the East Indes. There is very little substance in Thiele's description of *Hymeraphia distincta* except for the fact that the acanthostyles are abundant and divisible into three categories. This is not true of either de Laubenfels' specimen or the specimen described above and for this reason the Hawaiian specimens are treated as a distinct species.

Within the genus *Eurypon*, *nigra* is distinctive for its coloration and the abundance of short, squat tylostyles.

Order Hadromerida Topsent
Family Suberitidae Schmidt
Genus TERPIOS Duchassaing and Michelotti

Terpios granulosa nov. sp.
(Fig. 5)

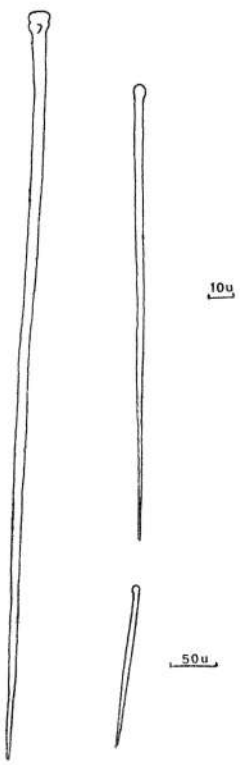

Fig. 5. *Terpios granulosa* n. sp. Tylostyles.

Holotype: Dominion Museum, New Zealand, Por. 35.

Occurrence: Under low tidal rocks and on coral down to 3 fathoms at most localities collected on Oahu. (Kaneohe Bay, Kewalo, Diamond Head, Punaluu, Nanakuli.) Also collected at Lautoka (Fiji). Common in all localities.

Description: A thin encrusting sponge, from 0.8–1.0 mm thick, growing on coral or rock surfaces.

Color; In life, dark blue throughout, (B 3/4 to B 2/2); in alcohol, slightly lighter blue, (bP-B 3-8).

Texture: Crisp and granular.

Surface: The surface is generally uneven following the contours of the substrate, but the sponge itself is velvety, macroscopically granular and microscopically hispid.

Skeleton: The skeleton is made up of short tracts of tylostyles running in oblique fashion from the base to the surface where they terminate in small tufts. Considerable numbers of spicules are dispersed between the tracts and lie parallel to the surface.

Spicules: *Megascleres*; *Tylostyles*—Straight spicules, with terminally flattened heads. Most examples show traces of the quadrilobate condition typical of the genus *Terpios* but this is mostly discernable in the smaller spicules. 192-352×1.8-6.0 μ (260×4.0 μ).

Remarks: This species is distinctive in the genus *Terpios* for the dense, uniform blue coloration and persistently encrusting habit. It can be compared with *Terpios viridis* Keller from Suakin, another encrusting form, which, however has deep green coloration and substantially smaller spicules

than *Terpios granulosa*. There is no possibility of confusing *Terpios granulosa* with another species also common on Oahu, *Terpios zeteki*. The latter species always exhibits a color contrast between ectosome and endosome; the endosome always being yellow. In this respect *T. zeteki* can be likened to *T. aploos* de Laubenfels from Guam and Ebon Atoll.

Family Spirastrellidae Hentschel
Genus SPIRASTRELLA Schmidt

Spirastrella vagabunda Ridley

Restricted Synonymy:
Spirastrella vagabunda Ridley, 1884, p. 468.
Spirastrella vagabunda, Bergquist, 1965, p. 184.

Remarks: A single, quite typical specimen of this species was collected in 3 fathoms on sandy bottom in Kaneohe Bay. The body of the sponge is buried in the sand and stout oscular projections protrude up to 5–6 cm. above the surface.

Previous Distribution: Widespread Indo-Pacific.

Spirastrella coccinea (Durchassaing and Michelotti)

Restricted Synonymy:
Thalysias coccinea Durchassaing and Michelotti, 1864, p. 84.
Spirastrella keaukaha, de Laubenfels, 1951, p. 264, fig. 13.
Spirastrella coccinea, Hechtel, 1965, p. 54.

Remarks: This species is very common on both Oahu and Maui and has two very distinct forms associated with two distinct habitats.

This sponge frequently occurs under ledges at low tide level (Diamond Head; Watanabe Reef). In this niche it is a dark red (RY-R 4/10) to dull orange (Y-R 5/10); a thick encrusting sponge (3.0 mm) with no exhalant channels visible through the surface and with a rather corky texture. This is the form described by de Laubenfels as *Spirastrella keaukaha*. The sponge is also common on the undersurfaces of loose coral boulders or encrusting on coral branches, from just below low tide down to 3 fathoms. In these more shaded situations the sponge is always orange (YR 6/10), often with colorless patches, very thin (1.0 mm) and the exhalant channels are always prominent.

The holotype (U.S.N.M. 22777) of *S. keaukaha* de Laubenfels has been reexamined and its identity with other Hawaiian specimens confirmed.

Specimens of both ecological forms have been examined and no differences in spicule complement or morphology or in skeletal arrangement can be found. All specimens conform well to the description of *S. coccinea* given by Hechtel (1965).

Previous Distribution: Tropical Atlantic, North America; Mediterranean; Indo-Pacific; Australia.

Genus DIPLASTRELLA Topsent

Diplastrella spiniglobata (Carter)

(Figs. 6, 7, 8)

Hymeraphia spiniglobata Carter, 1879, p. 301, pl. XXVI, fig. 15, 16.
Kotimea spiniglobata, de Laubenfels, 1936, p. 146.

Occurrence: Encrusting coral heads, 2 fms; Coconut Is., Kaneohe Bay.

Description: An exceedingly thin encrusting sponge, 0.4–0.7 mm deep, covering approximately 2.0 square cm. on a dead coral branch.

Color: In life, deep brick red (yR 4/10), in spirit, white.

Texture: Crisp, rather granular.

Surface: The surface is uneven since the sponge is very variable in thickness. Prominent tufts of tylostyles render the surface hispid, and below these diverging spicules the dermal region appears granular.

Skeleton: The dominant feature of the skeleton is the tufts of stout tylostyles in groups of up to twenty spicules. These stand with heads to the substrate and diverge markedly from a centre. The basal layer is a thick crust of spherasters

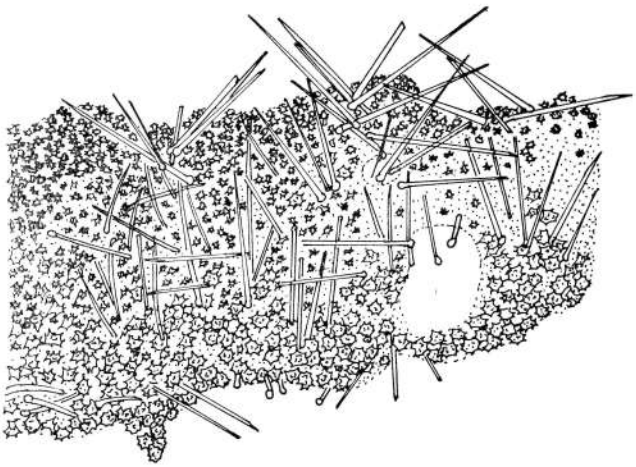

Fig. 6. *Displastrella spiniglobata* (Carter). Diagrammatic vertical section to show skeletal arrangement.

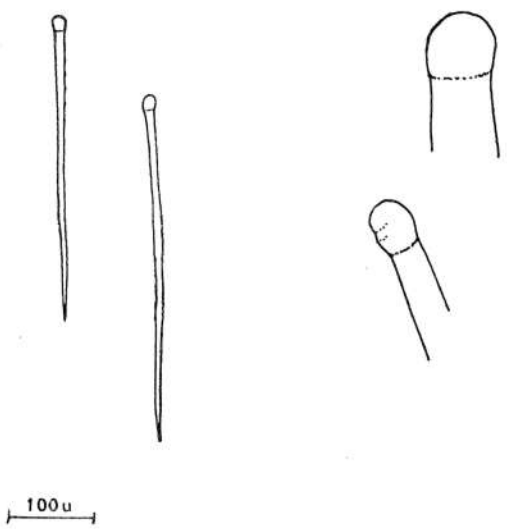

Fig. 7. *Diplastrella spiniglobata* (Carter). Tylostyles.

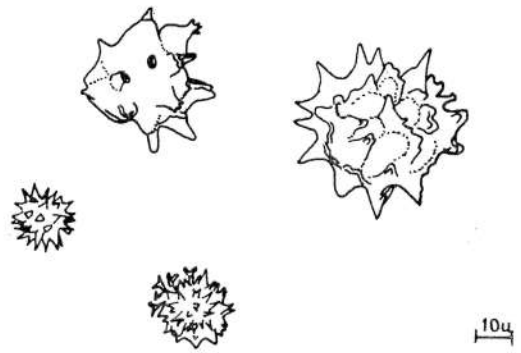

Fig. 8. *Diplastrella spiniglobata* (Carter). Spherasters.

and the dermal layer an equally dense crust of smaller spherasters. Between these two distinct zones of spherasters both microsclere types are abundant.

Spicules: *Megascleres*: *Tylostyles*—Stout, straight spicules with clearly marked, globular heads. 320-670×12.0-23.0 μ (478×16.5 μ).

Microscleres: *Spherasters*-of two size categories. Both types have a distinct centrum and short conical spines. The larger spicules which are predominantly basal in position are always spherical; the smaller more superficial spicules are occasionally slightly reniform. This assymetry possibly reflects the homology of these spicules with the diplasters of species such as *Diplastrella bistellata* (Schmidt). *Diplastrella megastellata* Hechtel from Jamaica is an intermediate form where superficial spicules are very variable and difficult to denote as either diplasters or spherasters. Large Spherasters—38.0-56.0 μ (46.0 μ). Small Spherasters—12.0-26.0 μ (17.0 μ).

Discussion: The original description of *Diplastrella spiniglobata* Carter (1879) is brief, but quite adequate, with the supporting figures, to allow positive identifition of the Hawaiian sponge with this species. The locality given by Carter is merely "South Seas" and this can only be improved upon by noting that the substrate was coral and thus the locality is subtropical to tropical Southern hemisphere.

Diplastrella spiniglobata was referred to *Kotimea* by de Laubenfels (1936). The type species of *Kotimea* is *Hymedesmia moorei* Carter from the Gulf of Manaar. This species is not well described; there is only brief mention of the arrangement of the skeleton and no valid observation on the surface characters. I cannot agree with de Laubenfels that this species is closer to *Tethya* than to *Diplastrella*. The only obvious distinction between *Kotimea* and *Diplastrella* is the absence of diplasters in the former. The precise form of these asters is known to vary within wide limits both in individual specimens and between every species thus far assigned to *Diplastrella*. Consequently, this feature is a poor choice for the definition of a genus. De Laubenfels also indicates that *Hymedesmia moorei*, type species of *Kotimea*, has occasional styles among the megascleres. This is not mentioned by Carter and de Laubenfels did not re-examine Carter's type specimen.

It is clear that *Kotimea* de Laubenfels is a synonym of *Diplastrella* Topsent

which must be construed as having small asters of variable form.

De Laubenfels (1954a) described *Kotimea tethya* from a species found in the Honolulu aquarium. This species is not a hadromerid sponge; all the megascleres were styles and the microscleres perfectly typical of *Tethya*. There seems no reason to place this fragmentary sponge elsewhere than in the genus *Tethya*. It obviously is a juvenile form and in all probability will prove unrecognizable.

PreviousDistribution: South Seas, (precise locality not known).

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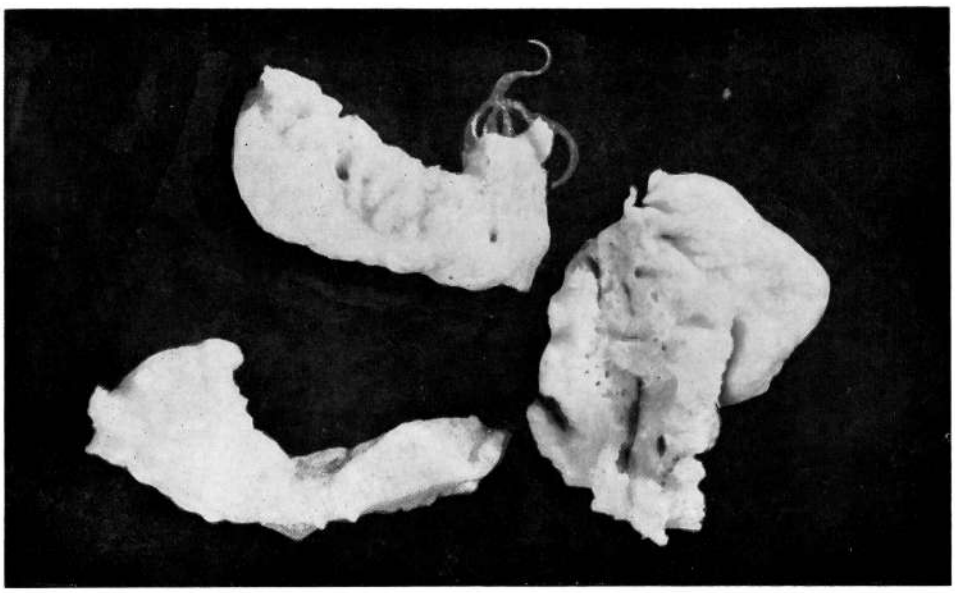

Fig. 1. *Tedania macrodactyla* (Lamarck).

Fig. 2. *Halichondria coerulea* n. sp.

Plate I.