

# SPONGES OBTAINED FROM KII-SHIRAHAMA AND ITS VICINITY<sup>1)</sup>

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*With Text-figures 1-6 and Plates I-II*

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There are only a few reports on the sponge-fauna of the Kii-Strait and its adjacent waters. In 1884, Polejaeff reported one species, *Cacospongia collectrix* Schulze, from Awajishima which was obtained by H.M.S. "Challenger". Subsequently, Ridley and Dendy (1887) and Sollas (1888) reported one species respectively, namely, *Myxilla rosacea* var. *japonica* Ridley and Dendy and *Myriastra subtilis* Sollas, both using specimens obtained by the Challenger Expedition from Kobe. The writer recorded 20 species (belonging to 4 families, 5 genera) of Calcarea from the shore of the Kii-Strait in 1934, and 17 species (belonging to 10 families, 13 genera) of Demospongiae from the coast of Tokushima Prefecture which were deposited in the Tokushima Museum in 1970. Thus the sponges reported from these sea areas amount to 40 species in total, but the survey of the sponge-fauna is not satisfactory. Many species are expected from the deeper waters off shore and the shallow waters along the western parts of the Kii-Peninsula or Shikoku Island.

Through the courtesies of Prof. Huzio Utinomi and Dr. Saburo Nishimura, I had the opportunity to study the collections of the Seto Marine Biological Station. The collection includes 14 species of the Demospongiae; two of which are new to science. All of the specimens at hand may be obtained from moderately shallow water, although the majority of them are without depth records.

Before going further, I would like to express my hearty thanks to Prof. Huzio Utinomi and to Dr. Saburo Nishimura for their kindness in allowing me to examine their collection. Thanks are also due to Dr. Motoyoshi Yokote of the Freshwater Fisheries Research Laboratory for his kind assistance with respect to this study.

The following is the identified species dealt with in the present paper.

## Systematic List of Species

Demospongiae

Order Haplosclerina

Family Haliclونidae

- 1) *Siphonochalina truncata* Lindgren
- 2) *Haliclona nishimurai*, n. sp.

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1) Contributions from the Seto Marine Biological Laboratory, No. 640.

## Family Desmacionidae

- 3)
- Strongylacidon obtusispiculifera*
- (Dendy)

## Family Callyspongiidae

- 4) *Callyspongia confoederata* (Ridley)  
 5) *Callyspongia elegans* (Thiele)  
 6) *Callyspongia ramosa* (Gray)  
 7) *Callyspongia rectangularis* (Ridley and Dendy)  
 8) *Callyspongia robusta* (Ridley)  
 9) *Callyspongia waguensis* Tanita  
 10) *Ceraochalina differentiata* Dendy

## Order Halichondrina

## Family Axinellidae

- 11)
- Ceratopsis ramosa*
- Thiele

## Order Poecilosclerina

## Family Adociidae

- 12)
- Strongylophora corticata*
- Wilson

## Family Microcionidae

- 13) *Clathria frondifera* (Bowerbank)  
 14) *Clathria shirahama*, n. sp.

**Description of the Species**1) *Siphonochalina truncata* Lindgren

*Siphonochalina truncata*, Lindgren (1897) p. 481; (1898) p. 296, Pl. 18, figs. 6, 7a-b, Pl. 19, figs. 8a-h; Tanita (1961) p. 132, Pl. 3, figs. 1, 2, text-fig. 1; (1961) p. 339, Pl. 1, fig. 2; (1970) p. 89, Pl. 1, fig. 4; (1970) p. 100.

This species is represented in the collection by two specimens which were obtained by Dr. Nishimura. One specimen was picked up from the shore; it was thrown up by a typhoon in 1965 and the other was obtained by a shrimp-net from the depth of about 10 m off Setozaki in Kanayama Bay in December, 1969. Each specimen consists of a number of digitate, roughly cylindrical branches, 7~14 mm in diameter, with a flabellate lower portion. The larger one is 140 mm in length. The color in life is pale purplish gray, but in dry state or preserved in alcohol it is yellowish brown.

This species may be considered to be common on the Pacific side of Japan.

Known Distribution:—Coast of Vietnam. In Japan—Mie-Wagu; Kurushima Strait; Sagami Bay; coast of Tokushima Prefecture.

2) *Haliclona nishimurai*, n. sp.

(Pl. I, fig. 1; Text-fig. 1)

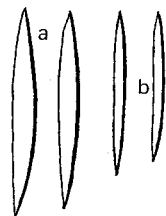
This new species is represented by a single specimen in the collection obtained

by Dr. Nishimura from Kanayama Bay using a shrimp-net in December 9, 1969.

The sponge (Pl. I, fig. 1) consists of a mass of slender, thin-walled tubes, branching and anastomosing sparingly and in a very irregular fashion. The branches vary from about 1.5 to 5 mm in diameter and terminate bluntly. No main stem can be distinguished. Vents circular or elliptical in shape with the diameter of about 1 mm, arranged sparsely in longitudinal series. Surface minutely rough and porous-looking. The color in life, it is orange, but in preserved state it is pale brown and the texture is resilient.

The main skeleton is a rectangularly meshed network of stout multispicular fibers, the meshes becoming irregularly polygonal in the deeper parts. The primary fibres are about  $45\ \mu$  in diameter, and run longitudinally in the interior of the sponge. Near the dermal portion, they are connected by secondary fibres and at the surface they terminate in tufts which project to a greater or lesser extent. Along the fibre, slender spicules are scattered interstitially. There is no dermal skeleton except the sparsely projecting brushes of spicules.

Spicules (Text-fig. 1):—Stout oxeas(a) straight, sharply pointed, measuring  $135\sim 150\times 8\sim 10\ \mu$ . Interstitial oxeas(b) slender, nearly straight, slightly shorter than the former, measuring  $115\sim 130\times 5\sim 6\ \mu$ .



Text-fig. 1. Spicules of *Haliclona nishimurai*, n. sp.  
a. stout oxeas  $\times 220$ ; b. interstitial oxeas  $\times 220$ .

Locality:—Kanayama Bay, Kii Shirahama.

Remarks:—The present specimen is referable to the genus *Haliclona* by its skeletal arrangement. This species is easily distinguished from other members of the genus by its characteristic external feature and by having two sizes of oxeas.

### 3) *Strongylacidon obtusispiculifera* (DENDY)

(Pl. I, fig. 2; Text-fig. 2)

*Chalina obtusispiculifera*, Dendy (1905) p. 150, pl. 10, fig. 9.

*Strongylacidon obtusispiculifera*, Tanita (1968) p. 42, Pl. 1, fig. 2, text-fig. 2.

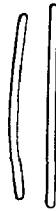
This species is represented by six specimens and two fragments, which were collected by Dr. Nishimura from the shore of the Seto Marine Biological Station. All of them more or less washed out.

The specimens are elongated, some slender and cylindrical while others are

flattened. They vary from 22 mm to 56 mm in height. The surface of the sponge is nearly uniform. The color in dry state is pale yellowish brown and the texture is soft and compressible.

The skeleton consists of well developed, pale colored horny fibres cored by strongyles. The main fibres run parallel to the body axis, branch as they go and curve outwards from the surface and contain many spicules multiserially. The secondary fibres connect the main ones to form an irregular network and contain a fewer number of spicules. The dermal skeleton is a close, tri- or rectangularly meshed reticulation of horny fibres cored by uniserially arranged spicules.

Spicules (Text-fig. 2):—Strongyles only; broadly rounded at each end, nearly straight, measuring  $80\sim 90 \times 2.5\sim 3.5 \mu$ .



Text-fig. 2. Spicules of *Strongylacidon obtusispiculifera* (Dendy).  
Strongyles  $\times 290$ .

Known Distribution:—Ceylon. In Japan—Ariake Sea.

Remarks:—This species was first described by Dendy from Ceylon and subsequently the writer reported it from the Ariake Sea. This is, therefore, the second report from Japan.

#### 4) *Callyspongia confoederata* (RIDLEY)

*Tuba confoederata*, Ridley (1884) p. 400.

*Siphonella laxa*, Lendenfeld (1887) p. 803, Pl. 24, fig. 55.

*Siphonella confoederata*, Lendenfeld (1887) p. 803, Pl. 25, fig. 60.

*Siphonella typica*, Lendenfeld (1887) p. 804, Pl. 24, fig. 54, Pl. 27, figs. 2, 19.

*Siphonella elastica*, Lendenfeld (1887) p. 805.

*Siphonella paucispina*, Lendenfeld (1887) p. 805.

*Siphonella axialis*, Lendenfeld (1887) p. 805, Pl. 24, fig. 53.

*Siphonella tuberculata*, Lendenfeld (1887) p. 808.

*Siphonella extensa* var. *dura*, Lendenfeld (1887) p. 806.

*Spinossella confoederata*, Topsent (1879) p. 479, Pl. 19, fig. 20.

*Callyspongia confoederata*, Burton (1934) p. 541; Tanita (1961) p. 133, Pl. 3, fig. 3, text-fig. 2; (1967) p. 113; (1969) p. 72; (1970) p. 101, Pl. 1, fig. 3; Bergquist (1969) p. 65.

This common species is represented by eleven specimens in the collection. Six of them were obtained by Prof. Utinomi and the remaining five by Dr. Nishimura from the shore of the Seto Marine Biological Station. Each specimen is erect, tubular with numerous small blunt outgrowths. The texture is elastic and tough. The color in dry state is pale yellowish brown.

The specimens vary from 65 mm to 180 mm in length and from 20 mm to 45 mm in diameter and are penetrated by a wide, vertical oscular tube.

Known Distribution:—Australia; Malay Area; Penguin Channel; in Vietnam. In Japan—Mie Wagu; Tajima-Moroyose; Sado-Aikawa; coast of Tokushima Prefecture.

#### 5) *Callyspongia elegans* (THIELE)

*Spinosella elegans*, Thiele (1899) p. 23, Pl. 3, fig. 2, Pl. 5, fig. 19.

*Callyspongia elegans*, Tanita (1965) p. 46, Pl. 1, fig. 2; Kim, Rho, and Lin (1968) p. 38, Pl. 1, fig. 2, text-fig. 2.

The three specimens in the collection are referable to the named species. They were collected by Dr. Nishimura from the shore of the Seto Marine Biological Station. They were washed up on the beach by a typhoon in 1965.

The specimens conform in general appearance and skeletal characteristics to the illustration of *Spinosella elegans* (Thiele, 1899) which was relegated to *Callyspongia* by the writer (1965).

All of them are tubular, but strongly laterally compressed and their upper parts much expanded so as to become funnel-shaped. The color in dry state is pale yellowish brown and the texture is firm but compressible.

Known Distribution:—Celebes; Korea Strait. In Japan—Sado-Aikawa.

#### 6) *Callyspongia ramosa* (GRAY)

(Pl. I, fig. 3)

*Spongia ramosa*, Gray (1843) p. 295.

*Chalina oculata* var. *novae-zealandiae*, Dendy (1924) p. 326.

*Cladochalina dendyi*, Burton (1929) p. 421.

*Callyspongia ramosa*, Burton (1934) p. 17, Pl. 2, fig. 3; Bergquist (1961) p. 36; (1961) p. 173, fig. 3;

Tanita (1961) p. 341, Pl. 2, fig. 5; Kim, Rho and Sim (1968) p. 39, Pl. 1, fig. 3, text-fig. 4.

This species is represented by a single specimen in the collection obtained by Prof. Utinomi. It is of erect habit and has several branches. Oscula nearly round, measuring 1~2 mm in diameter, scattered chiefly on one side of the sponge. The sponge measures 145 mm in height and 70 mm in breadth. The color in dry state is gray and the texture fibrous and compressible.

Spicules are oxea only, nearly straight or very slightly curved, sharply pointed at both ends, measuring 130~150 × 9.5~12.5 μ.

Known Distribution:—New Zealand; Australia; Victoria Land; Falkland Islands; Korea Strait. In Japan—Kurushima Strait.

#### 7) *Callyspongia rectangularis* (RIDLEY and DENDY)

(Pl. I, fig. 4)

*Chalina rectangularis*, Ridley and Dendy (1886) p. 331; (1887) p. 27, Pl. 5, fig. 3, Pl. 46, fig. 6.

The single specimen in the collection is referable to this species. It was collected by Dr. Nishimura from the shore of the Seto Marine Biological Station. The sponge is encrusting, being attached to the substratum, with uneven surface and irregularly rectangular in shape with an outgrowth. It measures  $50 \times 50$  mm and 5~10 mm thick. Oscula numerous, nearly round, measuring 1~2 mm in diameter, scattered singly on the upper side of the sponge. Surface minutely reticulate. The color in dry state is pale yellowish brown and the texture elastic and fibrous.

The dermal skeleton is a close, tri- or rectangularly meshed network of horny fibres cored by uni- or biserially arranged spicules; the fibres are about  $25 \mu$  in diameter. The main skeleton is a rectangularly or irregularly meshed network of pale colored horny fibre. The fibre varies greatly in diameter and contains a large number of oxeas arranged almost parallel with the long axis of the fibre.

Known Distribution:—Philippines.

### 8) *Callyspongia robusta* (RIDLEY)

(Pl. I, fig. 5; Text-fig. 3)

*Toxochalina robusta*, Ridley (1884) p. 403, Pl. 39, G. Pl. 41, n, n'; Ridley and Dendy (1887) p. 50; Dendy (1905) p. 139; Bröndsted (1934) p. 17, figs. 14, 15.

*Toxochalina robusta* var. *ridleyi*, Dendy (1905) p. 140, Pl. 9, fig. 2.

*Toxochalina chalmeri*, Bröndsted (1927) p. 5, fig. 4.

*Callyspongia robusta*, Bergquist (1961) p. 171, fig. 2.

The single specimen in the collection is assigned to this species. It was obtained by Dr. Nishimura from Okinoshima in Tanabe Bay from 8 m depth by a shrimp-net in November 8, 1969.

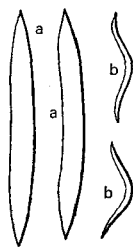
The sponge is irregular in shape, massive with stout but five short branches, which are erect from the base and connect side by side with one another. At the top of each branch opens a circular or elliptical osculum, but smaller oscula, 1~2 mm in diameter, are scattered on the side of the body. The surface is sub-glabrous, but uneven as a whole. The specimen is 132 mm high, 104 mm broad, and 57 mm thick. The color in life is dark yellowish brown, in alcohol it is light brown and the texture is resilient and tough.

The main skeleton is a reticulation of horny fibres cored with spicules. The primary fibres are very stout, run at right angles to the surface and are united by short secondaries to form rectangular meshes. The secondary fibres are more slender, contain a few spicules arranged uniserially. The dermal skeleton consists of a close-meshed reticulation of rather slender, unispicular horny fibres.

Spicules (Text-fig. 3):—Oxeas (a) short, slightly curved, gradually becoming sharp-pointed at each end, measuring  $100 \sim 115 \times 7 \sim 8 \mu$ . Toxas (b) slender, more or less curved at the middle, very slightly recurved at the apices, size  $20 \sim 60 \mu$ .

This is the first record of this species from Japan.

Known Distribution:—Australia; New Zealand; Ceylon Sea; Amirante; Natal coast; off Bahia.



Text-fig. 3. Spicules of *Callyspongia robusta* (Ridley).  
a. oxeas  $\times 290$ ; b. toxas  $\times 290$ .

### 9) *Callyspongia waguensis* TANITA

*Callyspongia waguensis*, Tanita (1961) p. 134, Pl. 3, figs. 4, 5, text-fig. 3; (1970) p. 89, Pl. 1, fig. 5, Pl. 2, fig. 6.

A single specimen of this species is contained in the collection obtained by Prof. Utinomi. The sponge is erect, composed of a large vase-like body, which is supported on four distinct, short, stout stalks attached on another massive sponge (*Jaspis* sp.). The main body consists of a deep hollow cup; the inhalant and exhalant surfaces of the body are sharply differentiated from one another. The latter is nearly smooth, while the former is uneven and has numerous small outgrowths. Oscula are small round openings, 1~2 mm diameter, scattered at about equal distances from one another on the inner surface of the sponge. Pores small, scattered very abundantly on both sides of the body. The sponge measures 19.5 cm in height, diameter of the cup 18.2 $\times$ 13.0 cm, depth of the cup 11.4 cm. The color in the dry state is pale yellowish brown and the texture fibrous, tough, and compressible.

The skeleton and spicules of the specimen is nearly identical with that of the type specimen of this species which described by the writer, and there is no need to add any further description.

Known Distribution:—Mie-Wagu; Sagami Bay.

### 10) *Ceraochalina differentiata* DENDY

*Ceraochalina differentiata*, Dendy (1921) p. 43, Pl. 3, fig. 7, Pl. 12, fig. 11; Tanita (1964) p. 17; (1965) p. 47, Pl. 1, fig. 3; (1969) p. 73; Kim, Rho and Sim (1968) p. 39, Pl. 1, fig. 4, text-fig. 5.

This species is represented by three fragmental specimens in the collection obtained by Dr. Nishimura from the shore of the Seto Marine Biological Station in 1965. The sponge is irregular, clathrous, with a slight tendency to become lobose or digitate. The surface is smooth and even glabrous. The color in dry state is light yellowish brown and the texture soft and compressible.

The dermal skeleton is a polygonally meshed network of fibres containing a very large portion of spongin and 1~2 rows of spicules. The main skeleton is very strongly developed, an irregular or rectangularly meshed network of stout, horny

fibres, containing usually several rows of small spicules arranged almost always parallel with the long axis of the fibres.

Known Distribution:—Amirante: Korea Strait. In Japan—Noto Peninsula; Sado-Aikawa; Funaoka; Nezugasaki in Yamagata Prefecture.

### 11) *Ceratopsis ramosa* THIELE

(Pl. II, fig. 6)

*Ceratopsis ramosa*, Thiele (1898) p. 58, Pl. 4, fig. 7, Pl. 8, fig. 45.

This species is represented by a single specimen in the collection obtained by Prof. Utinomi. The sponge is erect, dichotomously branched, branches more or less expanded and compressed. The total height is 98 mm, the breadth 70 mm, and the thickness is only 5 mm.

The surface of the sponge is not smooth, minutely hispid and has a slightly woolly appearance. There are no recognizable vents and pores. The color in dry state is pale brown and the texture flexible and elastic.

The skeleton is composed of smooth styles which build up a fest axial skeleton, from which the same kind of spicules radiate toward the surface. Among the axial skeleton, slender, vermiculous strongyles and microxeas are scattered sparsely. Near the distal portion of the radiating styles, numerous microxeas are gathered thickly as if forming a thin dermal skeleton.

Known Distribution:—Japan (Sagami Bay?)

Remarks:—This species was first described by Thiele using the specimens of Hilgendorf's collection from Japan, but the original localities were not certain. Judging from the paper of Thiele dealing with the Japanese sponges, the original locality of this species is judged to be Sagami Bay.

### 12) *Strongylophora corticata* WILSON

(Pl. II, fig. 7; Text-fig. 4)

*Strongylophora corticata*, Wilson (1925) p. 392, Pl. 40, fig. 7, Pl. 48, figs. 2, 7; Tanita (1970) p. 89, Pl. 2, fig. 7, text-fig. 1.

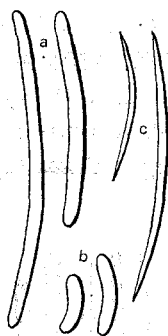
Three specimens and several fragments of this species are in the collection obtained by Prof. Utinomi. All of the specimens are flattened, massive, and the largest (Pl. II, fig. 7) is 82 × 60 × 26 mm in dimensions.

The surface of the sponge is uneven, with large undulated folds, bearing on both surfaces numerous small processes, each with a single round osculum at the summit. Oscula very conspicuous, small round openings, 1~2 mm in diameter. Some parts of the dermal membrane macerated. The color in dry state is brown and the texture firm and compact, rather brittle.

Skeleton of the surface consists of a reticulation of dense spiculo-fibres which



run tangentially. Along the spiculo-fibres, microxeas are arranged vertically in the dermal membrane. The skeleton of the interior consists mainly of strongyles which are partly collected in the spiculo-fibres and tracts, forming a dense reticulation with other spicules intermingled, and scattered oxeas. The dense cortical layers of the skeletal reticulum consists of strongyles and oxeas.



Text-fig. 4. Spicules of *Strongylophora corticata* Wilson.  
a. strongyles  $\times 100$ ; b. smaller strongyles  $\times 160$ ; c. oxeas  $\times 100$ .

Spicules (Text-fig. 4):—Strongyles (a) smooth, slightly curved, with rounded ends,  $180\sim 320 \times 10\sim 13 \mu$ . Smaller strongyles (b) are common, relatively very stout forms, measure  $40\sim 70 \times 7.5\sim 8 \mu$ . Oxeas (c) smooth, slightly curved, with sharp points, mainly found in the dermal skeleton, measure  $140\sim 280 \times 4\sim 5 \mu$ . Microxeas exclusively found in the dermal membrane, slightly curved,  $30\sim 70 \times 2\sim 4 \mu$ .

Known Distribution:—Philippines. In Japan—Sagami Bay.

### 13) *Clathria frondifera* (BOWERBANK)

(Pl. II, fig. 8; Text-fig. 5)

*Halichondria frondifera*, Bowerbank (1875) p. 288.

*Clathria frondifera*, Ridley (1884) p. 448, Pl. 42, fig. i, Pl. 53, fig. j; Ridley and Dendy (1887) p. 149;

Topsent (1893) p. 21; Lindgren (1897) p. 480; (1898) p. 309; Dendy (1905) p. 170.

*Clathria coralitincta*, Dendy (1889) p. 85, Pl. 4, fig. 8; (1916) p. 128; (1921) p. 65.

*Tenacia frondifera*, Burton and Rao (1932) p. 337; Burton (1934) p. 559.

*Thalysias frondifera*, Laubenfels (1954) p. 138, text-fig. 88.

This very variable and widely distributed species is represented by five specimens in the collection, one of which was obtained by Prof. Utinomi and the remaining four by Dr. Nishimura from the shore of the Seto Marine Biological Station.

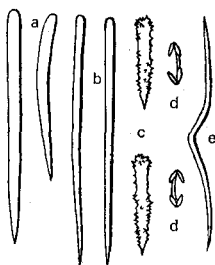
The species is very variable in external form; massive (Pl. II, fig. 8), clathrous, irregularly ramose, or erect and tree-like. The spiculation, however, varies little except so far as the dimensions of the spicules are concerned.

The surface is not smooth, meandrine or irregularly tuberculate. The oscula are elliptical in form and scattered on the side of the body or located at the terminal

parts of branches. The color in dry state is yellow or pale brown and the texture stiff.

The skeleton is composed of an irregularly isodictyal network of spongin fibres cored by several lines of smooth styles and echinated by acanthostyles. At the dermal portion, slender styles add vertically to the surface and project outwardly. Microscleres, isochelas and toxas, scattered interstitially.

Spicules (Text-fig. 5):—Styles (a) smooth, straight or slightly curved, sharply pointed at one end, measuring  $180\sim 230 \times 9\sim 13 \mu$ . Slender styles (b) mainly dermal, straight,  $220\sim 260 \times 5\sim 8 \mu$ . Acanthostyles (c) short, straight, with numerous spines at head and pointed end, measuring  $45\sim 60 \times 6\sim 10 \mu$  including spines. Isochelas (d) palmate,  $12\sim 16 \mu$  long. Toxas (e) very slender, sharp pointed both ends, measuring  $120\sim 160 \mu$  long.



Text-fig. 5. Spicules of *Clathria frondifera* (Bowerbank).

a. styles  $\times 100$ ; b. slender styles  $\times 100$ ; c. acanthostyles  $\times 160$ ; d. isochelas  $\times 430$ ; e. toxas  $\times 430$ .

Known Distribution:—Ceylon; Amirante; Red Sea; Malacca Strait; East Australia; Seychelleri ?; Providence.

#### 14) *Clathria shirahama*, n. sp.

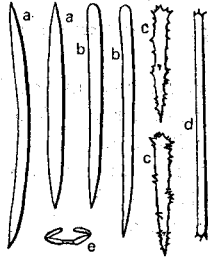
(Pl. II, fig. 9; Text-fig. 6)

There are two specimens of this new species in the collection, both were obtained by Prof. Utinomi. The larger one (Pl. II, fig. 9) which the writer designated as the type consists of much flattened, expanded, divided lobes and attached to a small stone by its basal part. Thickness of the lobes is about 10 mm. The margins of the lobes are more or less notched and slightly undulating. It measures 165 mm high, 137 mm broad, and 100 mm thick.

The surface of the sponge is very uneven, minutely reticulate and faintly hispid. To the naked eye the two surfaces of the lobes appear similar. Oscula are small and scattered over the surface. Pores not apparent. The color in dry state is pale brown and the texture hard but somewhat compressible.

The skeleton is composed of a more or less regular network of primary horny fibres containing serially arranged oxeads and styles, running perpendicularly to the surface and connected at intervals by feeble secondary fibres, which usually contain

only several spicules. The fibres are echinated by acanthostyles set at right angles. Microscleres present in fibres or scattered between meshes. In the dermal portion there are numerous strongyles, scattered tangentially.



Text-fig. 6. Spicules of *Clathria shirahama*, n. sp.

a. oxeas  $\times 160$ ; b. styles  $\times 160$ ; c. acanthostyles  $\times 160$ ; d. strongyles  $\times 160$ ; e. isochelas  $\times 430$ .

Spicules (Text-fig. 6):—Oxeas (a) straight or very slightly curved, sharply pointed at both ends, measuring  $120\sim 160 \times 5\sim 8 \mu$ . Styles (b) smooth, nearly straight, measuring  $110\sim 150 \times 6\sim 9 \mu$ . Acanthostyles (c) echinate the fibres, straight, measuring  $70\sim 80 \times 7.5\sim 11 \mu$ . Strongyles (d) slender, straight, microspined at both ends, mainly in dermal portion, measuring  $180\sim 190 \times 4\sim 6 \mu$ . Isochelas (e) palmate,  $12\sim 14 \mu$  long.

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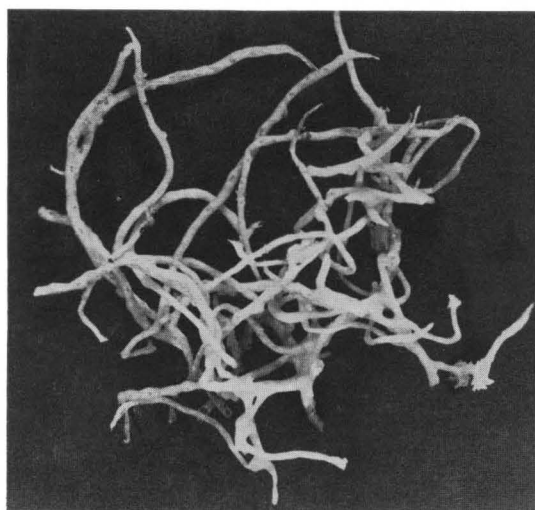
EXPLANATION OF THE PLATES

PLATE I

- Fig. 1. *Haliclona nishimurai*, n. sp.  $\times 0.4$   
Fig. 2. *Strongylacidon obtusipiculifera* (Dendy)  $\times 0.9$   
Fig. 3. *Callyspongia ramosa* (Gray)  $\times 0.4$   
Fig. 4. *Callyspongia rectangularis* (Ridley and Dendy)  $\times 0.9$   
Fig. 5. *Callyspongia robusta* (Ridley)  $\times 0.7$

PLATE II

- Fig. 6. *Ceratopsis ramosa* Thiele  $\times 0.9$   
Fig. 7. *Strongylophora corticata* Wilson  $\times 1.0$   
Fig. 8. *Clathria frondifera* (Bowerbank)  $\times 0.5$   
Fig. 9. *Clathria shirahama*, n. sp.  $\times 0.5$



1

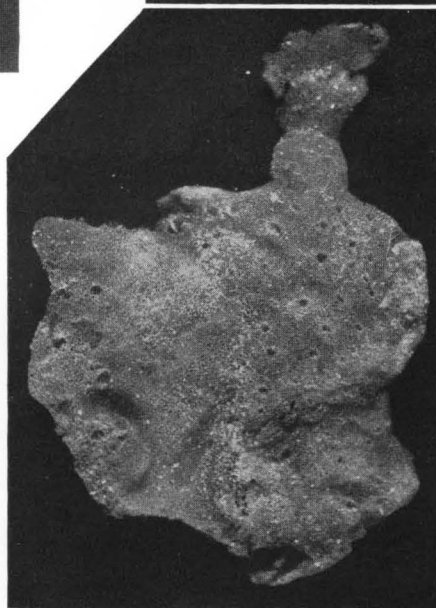


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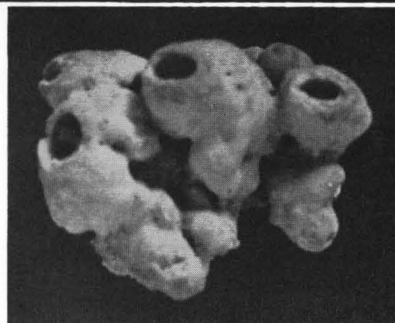
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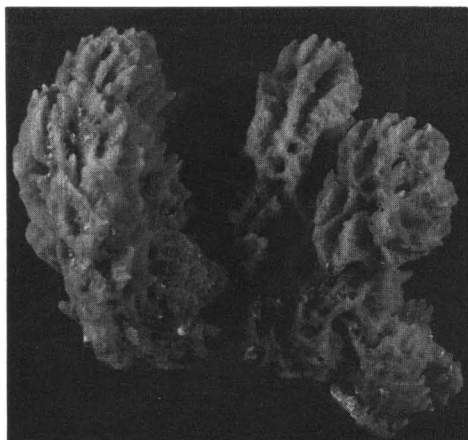


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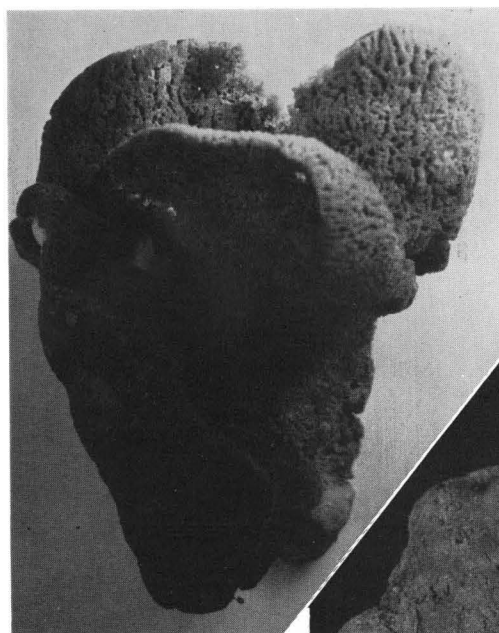




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