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Report on the Sponges Obtained from the Adjacent Waters of the Sado Island, Japan Sea

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Articles on the sopnge-fauna of the Japan Sea are very scanty. The late Prof. SANJI HOZAWA reported in 1940 five species of Calcarea from around the Noto Peninsula, Ishikawa Prefecture and the writer reported on the Demosponges collected from the shallow water along the same Peninsula in 1963. To date, only five species of sponges, all of Calcarea, have been described from Sado Island and its adjacent waters, as shown in Table 1. Therefore, this is the first record of the Demospongiae from the adjacent waters of the same area.

Table 1. Species of sponges described from around the Sado Island to date

Species	Localities	Authors
Leucosolenia soyo HOZAWA	off Sado, 168 *m*	HOZAWA (1933)
L. laxa KIRK	Aikawa	TANITA (1943)
L. stipitata DENDY	〃	〃 〃
Sycon okadai HOZAWA	Ryotsu & Aikawa	〃 〃
Leucandra abratsbo HOZAWA	Aikawa	〃 〃

The sponges dealt with in this paper consist of two collections. One of which was collected by the members of the Japan Sea Regional Fisheries Research Laboratory during several investigating navigations of 1955 from the northern sea area of Sado Island. The specimens were obtained by means of a trawl-net from the depths of 200～500 meters on the bank, commonly called Hyotan-se, except for one which was collected from the shore of Funakawa in Akita Prefecture. The collecting regions are shown in Figure 1.

The other collection was made by Dr. HISAAKI IWASAWA of the Niigata University from along the shore of the Sado Marine Biological Station in 1956 and '57.

These collections include 22 species belonging to 17 genera, among which eight species are new to science. All of the specimens are deposited in the Museum of the Japan Sea Regional Fisheries Research Laboratory. The following is the list of the species dealt with in the present paper.

Systematic List of Species

Class Calcarea
  Order Homocoela
    Family Homocoelidae
      1) *Leucosolenia laxa* KIRK
  Order Heterocoela

Family Heteropiidae

2) *Grantessa intusarticulata* (CARTER)

Class Demospongiae

Order Haplosclerina

Family Haliclonidae

3) *Haliclona permollis* (BOWERBANK)

4) *Haliclona clathrata* (DENDY)

Family Callyspongiidae

5) *Callyspongia elegans* (THIELE)

6) *Ceraochalina differentiata* DENDY

Order Poecilosclerina

Family Adociidae

7) *Petrosia ushitsuensis* TANITA

8) *Kallypilidion negro*, n. sp.

Family Ophlitaspongiidae

9) *Ophlitaspongia noto* TANITA

10) *Esperiopsis plumosa*, n. sp.

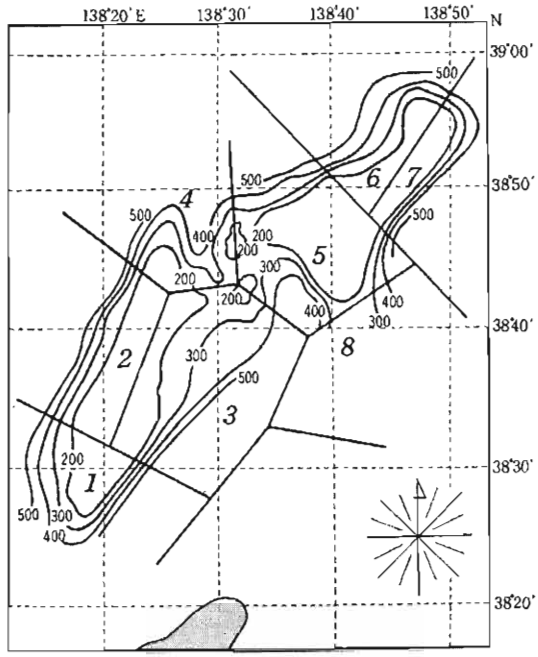

Fig. 1. Map showing the depth and the collecting regions off Sado Island.

Order Halichondrina

Family Halichondriidae

11) *Dactylella hilgendorfi* THIELE

12) *Halichondria disparilis* LAMBE

Orber Hadromerina

Family Choanitidae

13) *Spirastrella insignis* THIELE

Order Tetractinellida

Family Tetillidae

14) *Tetilla ovata* (THIELE)

15) *Tetilla ginzan*, n. sp.

Family Halinidae

16) *Pachastrella tenuilaminaris* (SOLLAS)

Famly Geodiidae

17) *Geodinella hyotania*, n. sp.

Family Epipolasidae

18) *Jaspis sadoensis*, n. sp.

Family Ancorinidae

19) *Stelletta gigantea*, n. sp.

20) *Stelletta misakiensis* LEBWOHL

21) *Stelletta ovalae*, n. sp.

22) *Stelletta splendens*, n. sp.

Before going further, I express my hearty thanks to the members of the Japan

Sea Regional Fisheries Research Laboratory and to Dr. H. IWASAWA for their kindness in allowing me to examine their collections.

Descriptions of the Species

1. *Leucosolenia laxa* KIRK

Leucosolenia laxa, KIRK (1895) p. 208, Pl. 4, fig. 1 ; DENDY and ROW (1913) p. 722 ; HOZAWA (1928) p. 220, Pl. 1, figs. 4, 5 ; (1940) p. 35 ; TANITA (1941) p. 2, Pl. 1, fig. 1 ; p. 265 ; (1942) p. 23 ; p. 83 ; (1943) p. 383, Pl. 13, fig. 20 ; (1964) p. 17.

The collection contains two specimens of this species. They were obtained from the shore of Aikawa by Dr. IWASAWA. Each of them shows a massive colony of branching Ascon-tubes ; the larger one attains 23 *mm* in height and 14 *mm* in breadth and is light brown in alcohol.

Locality : — Aikawa, Sado Island.

Previously known distribution : — New Zealand; Japan.

Remarks : — This species was previously obtained by the author from the same locality. This is one of the species which is widely distributed in the Japanese waters, although it was first described based on a specimen collected from New Zealand by KIRK in 1895.

2. *Grantessa intusarticulata* (CARTER)

Hypograntia intusarticulata, CARTER (1885—1886) p. 45.
Hypograntia mediarticulata, CARTER (1885—1886) p. 46.
Grantessa intusarticulata, DENDY (1892) p. 108 ; (1893) p. 181 ; p. 201, Pl. 13, fig. 18 ; DENDY and ROW (1913) p. 753 ; HOZAWA (1916) p. 14, Pl. 1, fig. 4, Pl. 2, fig. 13, text-fig. 3 ; (1929) p. 318, (1933) p. 7 ; (1940) p. 37 ; BRØNDSTED (1926) p. 308 ; ROW and HOZAWA (1931) p. 775 ; TANITA (1942) p. 36, Pl. 2, fig. 10 ; (1943) p. 415.
Grantia intusarticulata, BREITFUSS (1897) p. 219.

Only a single specimen is in the collection and it is assigned to this species. It was collected from the shore of Aikawa. It is a tubular individual, measuring 11 *mm* in height and 3 *mm* in diameter. The specimen in alcohol is light yellow.

With respect to the anatomical structure and spiculation, the present specimen is identical with the description of this species given previous writers.

Locality : — Aikawa, Sado Island.

Previously known distribution : — Near Port Phillip Heads ; Watson's Bay ; Port Jackson ; Island Bay, N. Z. ; Geraldton District, S. W. Australia ; Japan (Misaki ; Kamakura ; Shimoda ; Sunosaki ; Wagu ; Noto-Wajima).

Remarks : — This species seems to have universal distribution.

3. *Haliclona permollis* (BOWERBANK)

Isodictya permollis, BOWERBANK (1866) p. 278 ; (1874) p. 123, Pl. 48, figs. 9, 10.
Reniera tubifera, GEORGE and WILSON (1921) p. 145.

Haliclona permollis, DE LAUBENFELS (1936) p. 444 ; (1939) p. 1 ; (1942) p. 263 ; (1949) p. 11 ; TANITA (1958) p. 130, Pl. 1, figs. 3, 4, text-fig. 2 ; (1961) p. 338.

Two small fragments are in the collection. They were obtained from the shore of Aikawa and are assigned to this well known species. The larger specimen measures 17 *mm* by 12 *mm* in horizontal dimensions. The colour in preserved state is dull brown and the consistency is soft.

Locality : — Aikawa, Sado Island.

Previously known distribution : — Cosmopolitan.

4. *Haliclona clathrata* (DENDY)
(Pl. I, fig. 1)

Reniera clathrata, DENDY (1895) p. 237 ; BRØNDSTED (1923) p. 125 ; (1924) p. 453.
Haliclona clathrata, BURTON (1934) p. 532 ; BERGQUIST (1961) p. 35.

One ierrgularly lumpnshaped and several fragmental specimens in the collection were identified with this species.

The maissve specimen (Pl. I, fig. 1) is 20 × 15 × 15 *mm* in dimensions ; surface minutely hispid and the oscula, 1 ~ 3 *mm* in diameter without raised rim. The texture is soft but slightly elastic and the colour is pale brown or yellowish white.

The skeleton is very regular, shows an isodicty alreticu lationwith spicules that are cemented to each other at their ends only by minute amounts of spongin. Ectosome absent as in other members of the genus.

Spicules : — One type only. Oxeas of typically Renieroid structure ; slightly curved, tapering to the sharp-pointed end, 75 ~ 100*μ* long and about 5*μ* thick.

Locality : — Aikawa, Sado Island.

Previously known distribution : — South Australia ; New Zealand ; Malay Area ; Low Isles ; Luana Creek.

Remarks : — This is the first record of this species from Japan.

5. *Callyspongia elegans* (THIELE)
(Pl. I, fig. 2)

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

The two specimens in the collection are referable to this species. One is an imperfect specimen, as the lower half of the body was torn off. The larger and nearly perfect specimen (Pl. I, fig. 2) is composed of two tubular bodies which are laterally compressed and united side by side. The tubes are not of the same diameter all the way up, but are much expanded so as to become funnel-shaped.

The larger orifice measures about 95 *mm* × 43 *mm* in width and the thickness of the wall of the tube in average is about 5 *mm*. The total height of the entire specimen is 200 *mm* and the greatest breadth is nearly 135 *mm*.

The outer surface of the sponge is oculeated by blunt, spinous processes. The margin of the orifice is extremely thin and delicately weined in a dendritic manner. The colour of the specimen is pale brownish yellow in dry state and the texture is firm but elastic.

The main skeleton is a close-meshed reticulation of horny fibers, composed as usual, of primary fibers running vertically to the surface, and secondary fibers

crossing them at right angles. The fibers contain small, slender spicules. On the outer surface of the tube, there is a well-developed dermal skeleton of a polygonally meshed reticulation of horny fibers.

The spicules are small, slender oxeas, straight or slightly curved, measuring 80 ~ 95 × 2 ~ 4μ.

Locality : —Aikawa, Sado Island.

Previously known distribution : —Celebes.

6. *Ceraochalina differentiata* DENDY
(Pl. I, fig. 3)

Ceraochalina differentiata, DENDY (1921) p. 34, Pl. 3, fig. 7, Pl. 12, fig. 11 ; TANITA (1964) p. 17.

Four specimens are in the collection. They are assigned to this species. One of them was collected from the shore of Funakawa in Akita Prefecture and is preserved in formalin, and the three others in dry state are from Aikawa in Sado Island.

The largest specimen which is from Funakawa (Pl. I, fig. 3), is composed of short, sub-cylindrical branches ; attached on the side to a root of sea weed. It measures 77 mm in maximum breadth and 32 mm in height, while the diameter of the branches averages about 15 mm.

Several large, more or less circular openings are scattered irregularly over the surface, they must be regarded as the oscula ; these average about 3 mm in diameter. The dermal membrane is thin and transparent, so that the numerous small subdermal cavities of varying sizes can be seen superficially through the membrane. The colour in formalin is light brown and the texture is rather soft and resilient.

The skeleton is composed of a reticulation of horny fibers cored with oxeote spicules. The oxeas small, rather slender, measure 75 ~ 80 × 4 ~ 5μ.

Localities :— Funakawa, Akita Prefecture ; Aikawa, Sado Island.

Previously known distribution : — Amirante : Noto-Peninsula.

7. *Petrosia ushitsuensis* TANITA
(Pl. I, fig. 4)

Petrosia ushitsuensis, TANITA (1963) p. 122, Pl. 4, fig. 1, text-fig. 1.

This species is represented in the collection by a single specimen. It was obtained by Dr. IWASAWA from the coast of Aikawa in Sado Island and is preserved in formalin.

The sponge (Pl. I, fig. 4) is an irregular, somewhat flattened mass, measuring 55 mm in breadth, 36 mm in maximum height and 17 mm in thickness. Several small circular oscula are seen on the upper surface. The colour in formalin is pale brown and the consistency is hard and stony.

As the species has been fully described by the writer, no further details are necessary with regard to the structure or to the spiculations.

Locality : — Aikawa, Sado Island.

Previously known distribution : — Noto Peninsula.

Remarks : — This is the second record of this species from the Japan Sea.

8. *Kallypilidion negro* n. sp.
(Pl. I, fig. 5, text-fig. 2)

Two specimens of this species are in the collection from the VIII Region off Sado Island. They were obtained in September and December, 1955, by a trawl-net.

The smaller but perfect specimen (Pl. I, fig. 5) which is designated as the type of this species, is cup-shaped or temple bell-shaped, and is attached to a calcareous living tube of Polychaeta by a short stalk. It measures 37 *mm* in height and 29 *mm* in maximum diameter. The external surface of the sponge is not smooth, but irregularly undulated and covered with numerous small pores. The interior of the cup is covered with exhalant openings of about 1 *mm* in diameter. The wall of the body is only 4 *mm* thick. The colour in formalin is blackish brown and the texture is soft but elastic and compressible.

Fig. 2.
Oxeas of *Kallypilidion negro*, n. sp ; × 100.

The ectosome consists of a tangential isodictyal reticulation, which is the characteristic of the Adociidae. The main skeleton consists of a more or less confused reticulation of oxea lying in the choanosome with little or no order. The ends of the spicules are cemented by a small qnantity of spongin.

The larger specimen was broken off into several pices.

Spicules (Text-fig. 2) : — Only one sort. Oxeas slightly curved, not sharply pointed at each end, measuring 230 ~ 280 × 11 ~ 17μ.

Locality : — Off Sado Island.

9. *Ophlitaspongia noto* TANITA

Ophlitaspongia noto, TANITA (1963) p. 124, Pl. 4, fig. 3, text-fig. 3 ; (1964) p. 17, Pl. 1, fig. 4.

There are two specimens in the collection which are undoubtedly referable to this species. Each of them encrusting in shape with a thickness of 3 ~ 6 *mm*. The oscula sattered on the upper side of the sponge are on raised processes, several radiating grooves are placed around each osculum. The texture is sligtly firm and brittle. The colour in dry state is dirty brown.

The skeleton is composed of smooth styles, slender styles and numerous toxas.

Locality : — Aikawa, Sado Island.

Previously known distribution : — Noto Peninsula.

10. *Esperiopsis plumosa*, n. sp.
(Pl. II, fig. 6, text-fig. 3)

This new species is represented by five specimens in the collection ; they are variable in size and shape. Two of them were obtained from the IV Region and the remaining three came from the VIII Region off Sado Island.

The largest specimen (Pl. II, fig 6) which is designated as the type of this

species is erect, plumose, showing a fibrous appearance. There are several large vents, scattered over the lateral sides of the sponge, and varying in diameter up to about 5 *mm*. The surface of the sponge is hirsute with projecting spiculo-fibers. The dermal membrane appears to have been almost entirely rubbed off. Texture is soft but elastic and the colour in the preserved state in formalin is dirty white.

The skeleton consists of fairly well developed main fibers; these latter are rather thick, containing 5～7 spicules side by side, running parallel towards the surface. These fibers are connected with one another by secondary ones at nearly right angles, so that a regular network of rectangular meshes is built. The secondary fibers are only bundles of spicules lying between the primary ones, of only one spicule's length. Spongin only very slightly developed. Microscleres are scattered mainly along the main fibers.

Spicules (Text-fig. 3) : — Megascleres are of one kind : Styles (*a*) straight or slightly curved, thickness rather constant for a greater part, tapering evenly to a sharp point, measuring 670～720 × 22.5～25μ. Microscleres also of one kind, isochelas (*b*) small, palmate, 33～38μ long.

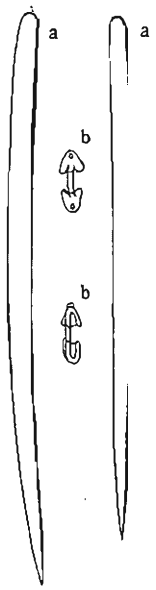

Fig. 3.
Spicules of *Esperipsis plumosa*, n. sp. *a*, styles × 75 ; *b*, isochelas × 160.

Locality : — Off Sado Island.

Remarks : — The plumose, fibrous appearance of this species seems to be very characteristic and very constant, judging from the five specimens examined.

11. *Dactylella hilgendorfi* THIELE
(Pl. II, fig. 7)

Dactylella hilgendorfi, THIELE (1898) p. 56, Pl. 4, fig. 8, Pl. 5, fig. 25, Pl. 8, fig. 41.

Two specimens (Pl. II, fig. 7) in the collection are referable to this species. They were obtained by a trawl-net from the III Region off Sado Island on Aug. 9, 1955.

Each of them is attached to a bivalve by its base and erect slender body. The larger one is nearly straightly erect, has no branch, with nearly equal breadth, strongly laterally compressed, measuring 245 *mm* in height, 8 *mm* in breadth and 4 *mm* in thickness.

Another erect specimen branched into three at the upper half of the body, is 68 *mm* high and 9 *mm* broad. There is an osculum at the end of each branches.

Surface not smooth, rough, slightly hispid. The colour in formalin is light gray and the texture is slightly hard but brittle.

The dermal skeleton is very thin, transparent and is an irregular reticulation of tangentially disposed oxeas. The main skeleton is composed of strongly developed central bundles of spicules, running lengthwise in the body.

Surface, inner structure and spicules are the same in both specimens.

Spicules : — Only of one kind, oxeas. Oxeas straight or nearly so, smooth, sharply pointed at both ends, measuring 1000～1300 × 22～26 μ.

Locality : — Off Sado Island.

Previously known distribution : — Hakodate.

12. *Halichondria disparilis* LAMBE
(Pl. II, fig. 8, text-fig. 4)

Halichondria disparilis, LAMBE (1893) p. 25, Pl. 2, fig. 1; KOLTUN (1959) p. 207.
Topsentia disparilis, BURTON (1935) p. 77.

I identify with this species the single specimen in the collection which was obtained from the waters north of Sado Island. The details of the collecting station are not clear.

The specimen (Pl. II, flg. 8) is elongated massive, measures 105 *mm* in length, 42 *mm* in maximum breadth and 32 *mm* in thickness.

Surface of the sponge is even and smooth. The dermal membrane is an irregular reticulation of tangentially disposed spicules and is very thin, transparent, so that the numerous large subdermal cavities are easily seen. The membrane is macerated at some portions of the sponge and thus the underlying choanosome is naked. The main skeleton is composed of large oxeas with a tendency to form spiculo-fibers. Only little spongin is present. The whole body of the sponge is traversed by numerous canals, some of which are connected with wide subdermal cavities. The texture is firm, slightly compressible and the colour in formalin is dirty white.

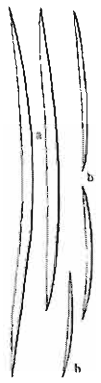

Fig. 4.
Spicules of *Halichondria disparilis* *a*, large oxeas; *b*, small oxeas; All×27.

Spicules (Text-fig. 4) are of two sizes. The large oxeas (*a*) which composed the main skeleton and occur in the dermal membrane, are smooth, slightly curved, gradually and sharply pointed, and measuring 1000 ~ 1700 × 25 ~ 34 μ. The small oxeas (*b*), which are abundant in the dermal membrane, also smooth, slightly curved, sharply pointed, and measuring 250 ~ 400 × 6 ~ 8.5 μ.

Locality : — Off Sado Island.

Previously known distribution : — Vancouver Island ; Sea of Okhotsk ; Sea of Japan (Siberian side).

Remarks : — The present specimen agrees with the description of *H. disparilis* by LAMBE in all respects except for the size of the spicules. Size of the spicules in this specimen is a little larger than the type, but not so large as to establish a new species ; these differences in size of spicules may be variation according to the localities.

13. *Spirastrella insignis* THIELE
(Pl. II, fig. 9)

Spirastrella insignis. THIELE (1898) p. 43, Pl. 2, fig. 5, Pl. 8, fig. 18 ; TANITA (1961) p. 349, Pl. 4, fig. 17, text-fig. 9 ; (1964) p. 18.

There is a single specimen (Pl. II, fig. 9) of this species in the collection. It was obtained by Dr. IWASAWA from the shore of Aikawa. The sponge is massive, with triangular outline but this only a part of a large specimen being cut off at the side and the base of the body. The surface is covered with numerous, closely placed

papillae. The colour in dry state is light gray and the texture is hard but rather spongy and cavernous internally.

The skeleton and spiculations of this species were already fully described by the writer, and there is no need to add any further descriptions.

Locality : — Aikawa, Sado Island.

Previously known distribuiton : — Sagami Sea ; Kurushima Strait ; Noto Peninsula.

14. *Tetilla ovata* (THIELE)
(Pl. II, fig. 10)

Craniella ovata, THIELE (1898) p. 27, Pl. 5, fig. 16, Pl. 7, figs. 15a—c.
Tethya ovata, LENDENFELD (1903) p. 24 ; LEBWOHL (1914) p. 5, Pl. 1, figs. 1—29.

There are five specimens of this species in the collection. They agree fairly closely with one another in external form. All ot them were obtained by a trawl-net from four stations off Sado Island, in July and November, 1955. Most of them resemble those which were figured by LEBWOHL. The largest (Pl. II, fig. 10) measures 55 × 49 *mm* in diameters and 63 *mm* in height including the root tuft. The colour in formalin is yellowish pale brown and the texture is firm but slightly elastic.

The skeleton consists of oxeas of two sizes, protriaenes, and anatriaenes ; all of them radiate from a centrally placed skeleton nucleus. Microscleres are of one sort. Sigmas scattered througout the sponge body.

As the shapes and the dimensions of these spicules are almost identical with LEBWOHL's description, there is no need for further descriptions on the skeleton or spicules.

Locality : — Off Sado Island.

Previously known distribution : — Sagami Sea, 50 ~ 150 *m*.

Remarks : — This species was described as *Craniella ovata* by THIELE, 1898, p. 27, from Sagami Sea. In 1914, LEBWOHL reported this species from the same locality under the name of *Tethya ovata*, but judging from the skeletal arrangement, spicules, and other characteristics of the specimens, this species should be transferred to the genus *Tetilla*.

15. *Tetilla ginzan*, n. sp.
(Pl. II, fig. 11, text-fig. 5)

There are two specimens of this new species in the collection, the larger of which is designated as the type. They were obtained by a trawl-net from the III Region off Sado Island, in July 1955.

The larger specimen (Pl. II, fig. 11) is irregularly ellipsoidal in shape with dimensions of 40 × 24 × 18 *mm*. The surface of the sponge is hirsute, owing to the presence of long spicules projecting outwards. There is no record of the colour of the sponge in the living state, but in the preserved state in formalin it is pale grayish white and the texture is slightly elastic.

The skeleton consists chiefly of stout spiculo-bundles and, as usual in the genus, radiating from a centrally placed skeleton nucleus to the surface of the sponge. The bundles consist chiefly of long oxeas, but fairly numerous protriaenes occur mixed with these in the surface brushes. There is no cortex and no visible distinction between the ectosome and choansome.

Spicules (Text-fig. 5) : — Megascleres : 1) Oxeas (*a*) stout, fusiform, nearly

straight, gradually and finely pointed at each end, measure 3 ~ 6.5 *mm* × 32 ~ 40*μ*. 2) Protriaenes (*b*) with unequal, slender, straight, sharp-pointed cladi, and very long, slender shaft tapering to hair-like fineness. The shaft measures up to 7 *mm* in length with a thickness of 10 ~ 15 *μ* near the cladal end. The cladomes are usually three in number, projecting forwards at only a very small angle with the shaft ; the longer one 200 ~ 240 *μ* and the shorter about 80 *μ* in length.

Microscleres: Sigmaspires(*c*) usually contort, located throughout the sponge, measuring 12 ~ 15 *μ* from bend to bend.

Locality : — Off Sado Island.

Remarks : — This species is perhaps related with CARTER's *Tetilla casula* and DENDY's *T. furcifer*. These species have no anatriaenes at all, a very unusual feature of the genus, but the present species is easily distinguished from the other species by the heterocladal protriaenes.

The species name is taken from the name of the research vessel "Ginzan-maru".

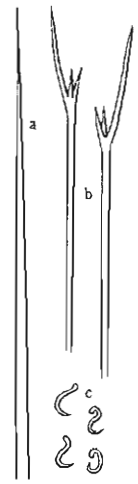

Fig. 5.
Spicules of *Tetilla ginzan*, n. sp. ; *a*, oxea × 60 ; *b*, protriaenes × 60; *c*, sigmaspires × 240.

16. *Pachastrella tenuilaminaris* (SOLLAS)

(Pl. III, fig. 12, text-fig. 6)

Normania tenuilaminaris, SOLLAS (1886) p. 186.
Poecillastra tenuilaminaris, SOLLAS (1888) p. 95, Pl. 5, figs. 17, 18.
Pachastrella crassiuscula, LENDENFELD (1903) p. 77.
Pachastrella tenuilaminaris, LEBWOHL (1914) p. 72, Pl. 7, figs. 16—25, pl. 9, fig. 21.

The collection contains two specimens of this species which were collected by a trawl-net from the northern part of Sado Island on September 20, 1955 (VIII Reg.).

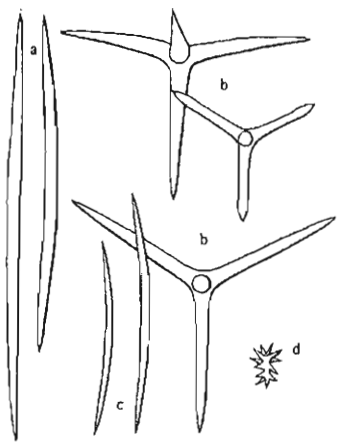

Fig. 6.
Spicules of *Pachastrella tenuilaminaris* (SOLLAS) ; *a*, oxeas × 20 ; *b*, calthrops × 32 ; *c*, microxeas × 130 ; *d*, metaster × 240.

The larger specimen (Pl. III, fig. 12) is an irregular plate-like, flattened body with a thickness of 3 ~ 6 *mm*. It measures 84 *mm* in length and 72 *mm* in breadth. The margins of the body is more or less irregularly curved and broken off at one corner. The colour in formalin is grayish white and the texture is compact and slightly compressible.

The surface of the sponge is even, slightly hispid owing to the projecting oxeas. Oscula small and scattered uniformly on one side of the body and the pores are scattered on the opposite side, but in some portion of the body the difference between them are not clear.

The smaller specimen is flabellate, about 70 *mm* long, 27 *mm* broad and 7 *mm* thick in the middle part of the body.

The skeleton of the body is composed mainly of large oxeas and calthrops arranged irregularly. Among these megascleres, two sorts of microscleres, microxeas and metasters, are scattered densely. At the dermal portion, the metasters are scattered more densely

than in the internal part, and the microxeas are scattered uniformly.

Spicules (Text-fig. 6) : — Megascleres : Oxeas (*a*) smooth, nearly straight or slightly curved, not so sharply ended, sometimes one or both ends bluntly ended so as to deform to styles or strongyles, measuring 1050 ~ 3600 × 25 ~ 70 μ. Calthrops (*b*) usual form, with rays each 110 ~ 640 × 35 ~ 70 μ, rays nearly equal in length, smooth, straight but someone undulated, sharply pointed at each end.

Microscleres : Microxeas (*c*) slightly curved, sharply pointed at both ends, not smooth but minutely roughened, measures 150 ~ 190 × 5 ~ 6μ. Metasters (*d*) small, slighly twisted, with sharply pointed spines, measures 15 ~ 17 μ in length.

Locality : — Off Sado Island.

Previously known distribution : — Sagami Sea.

17. *Geodinella hyotania*, n. sp.
(Pl. III, fig. 13, text-fig. 7)

This new species is based upon a single specimen (Pl. III, fig. 13). It was obtained by means of a trawl-net from the III Region off Sado Island on September 27, 1955.

The sponge is an irregularly, elongated, somewhat twisted mass. At the middle of the body, there is a large protuberance and near one end there are three smaller ones, while the other end of the sponge has a mouth-like appearance. The surface of the sponge is nearly smooth to the naked eye. The colour of the surface in formalin is nearly white with brownish spots but that of the inner is dirty brown. The texture is very hard owing to the thick cortex of sterrasters. The specimen is 100 *mm* long, about 50 *mm* broad in the middle part and 45 *mm* high.

The main skeleton consists of oxeas and styles forming a confused reticulation in the deeper parts of the sponge but showing a marked tendency to radial arrangement as the surface is approached. The cortex is very hard and about 1 *mm* thick.

Spicules (Text-fig. 7),: — Oxeas (*a*) nearly straight or slightly curved, smooth, equally sharply pointed at both ends, measuring 1500 ~ 2300 × 32 ~ 45 μ. Styles(*b*) smooth, nearly straight, tapering to a sharp end while the other end is rounded, frequently subtylostylote, measuring 1300 ~ 2100 × 45 ~ 55μ.

Sterrasters (*c*) are subspherical or ellipsoidal, 100 ~ 140 × 130 ~ 170 μ in diameters. Spherasters with several short sharply pointed rays, 12 ~ 15 μ in diameter.

Locality : — Off Sado Island.

Remarks : — This species is related to *Geodinella cylindrica* (THIELE) recorded from the Sagami Sea, but is easily distinguished from the latter by the external form and spiculations. This species has no reduced triaenes.

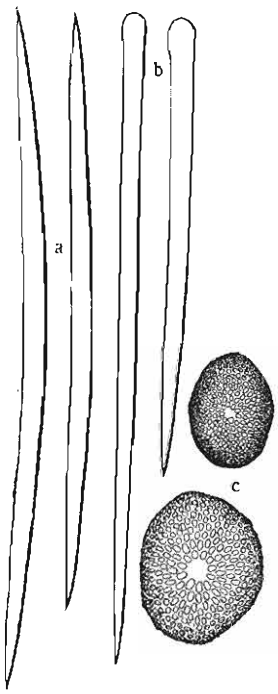

Fig. 7.
Spicules of *Geodinella hyotania*, n. sp. ; *a*, oxeas × 40 ; *b*, styles × 40 ; c, sterrasters × 75.

18. *Jaspis sadoensis*, n. sp.
(Pl. III, fig. 14, text-fig. 8)

In the collection there are two specimens upon which this new species was established. They were obtained by

means of a trawl-net in 1955 from the north of Sado Island (III & IV Regs.).

The larger specimen (Pl. III, fig. 14) which is designated as the type of this species, is a pear- or cake-shaped mass in form, more or less laterally compressed and is excavated by several canals. The diameter is 50 *mm* and the height is 36 *mm*.

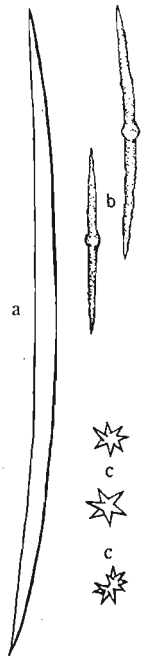

Fig. 8.
Spicules of *Jaspis sadoensis*, n. sp. ; *a*, oxea × 25 ; *b*, microxeas × 75 ; *c*, oxyasters × 160,

The surface of the sponge is very uneven and very harsh to the touch owing to the projection of the large oxeas.

The colour in the preserved state in formalin is light brown and the texture is moderately firm but somewhat brittle.

In the body of the sponge the huge oxeas of which the skeleton is composed are for the most part arranged radially but partly scattered without order. The spicules of the ectosome are much smaller than those of the choanosome, and are designated as microxeas. They lie in a predominantly tangential direction and may constitute a well marked ectosomal skeleton. The microscleres, oxyasters, are especially abundant at the surface. Both the microxeas and oxyasters are scattered also sparsely among the megascleres in the choanosome.

The smaller specimen has the form of a deformed disc with the diameters of 44 × 35 *mm* and a height of 17 *mm*. The colour of the sponge in dry state is dirty white.

Spicules (Text-fig. 8) : — Oxea (*a*) smooth, stout, evenly tapering, straight or very slightly curved, sharply pointed both ends, measuring 2000 ~ 4000 × 50 ~ 60 μ.

Microxeas (*b*) nearly straight, centrotylote, minutely roughened but not spined, sharply pointed both ends, measuring 190 ~ 250 × 10 ~ 15 μ. Oxyasters (*c*) 12 ~ 20 μ in diameter, with several strong, sharp rays.

Locality : — Off Sado Island.

Remarks : — This species may be easily distinguished from the other members of the genus by external form and by the the presence of centrotylote roughened microxeas.

19. *Stelletta gigantea*, n. sp.
(Pl. III. fig. 15, text-fig. 9)

In the collection there is a single large specimen upon which this new species was established. It was dredged from the III Region off Sado Island (Hyotan-se) in November, 1955.

The sponge (Pl. III, fig. 15) is irregularly ellipsoidal in shape, and attached to a piece of rock. There is no indication of a root-tuft. It measures 125 *mm* in length, 98 *mm* in breadth and 72 *mm* in height. The surface of the sponge is coarsely hispid and is covered with numerous, minute pores. The colour is pale brown in formalin and the texture is hard and incompressible, owing to the strongly developed cortex.

The cortex is dense and hard, very fibrous, being built up of the densely packed brushes of triaenes ; about 2.5 *mm* thick. The cladomes of dichotriaenes and plagiotriaenes are just beneath the dermal membrane, which is sustained by a single layer of chiasters ; these latter also occur in the interior of the sponge.

The skeleton of the choanosome is extremely lax, with loose bundles of oxeas

running towards the cortex and numerous foreign debris.

Spicules (Text-fig. 9) : — Megascleres : Oxeas of two kinds. Stout oxeas (*a*) nearly straight, tapering to sharp ends, measuring 2 ~ 6 *mm* × 80 ~ 110 *μ*. Slender oxeas (*b*) also straight, very finely pointed at each end, measuring 2 ~ 5 *mm* × 15 ~ 18 *μ*. Dichotriaenes (*c*) with long, stout shaft and relatively small cladomes ; shaft measure 2 ~ 2.5 *mm* × 60 ~ 120 *μ* ; protoclad about 200 *μ* long and deuteroclad 130*μ* in length. Plagiotriaenes (*d*) ; shaft nearly the same with the forgoing spicules ; cladomes 200 ~ 250 × 50 ~ 75*μ*.

Microscleres are of one sort only. Chiasters (*e*) minute, with tylote rays varying in number, measuring 14 ~ 17*μ* in total diameter.

Locality : — Off Sado Island.

Remarks : — This species seems to be closely related with *Stelletta agulhana* LENDENFELD in spiculation, but differs from the latter in the external form, thickness of megascleres, size of chiaster and in the absence of oxyasters.

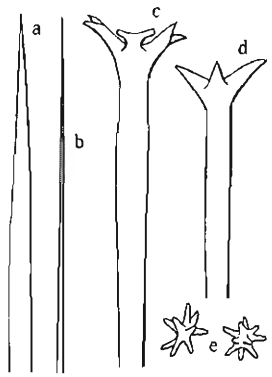

Fig. 9.
Spicules of *Stelletta gigantea*, n. sp. ; *a*, stout oxea × 25 ; *b*, slender oxea × 25 ; *c*, dichotriaene × 25 ; *d*, plagiotriaene × 25 ; *e*, chiasters × 300.

20. *Stelletta misakiensis* LEBWOHL
(Pl. III, fig 16, text-fig. 10)

Stelletta misakiensis, LEBWOHL (1914) p. 13, Pl. 1, figs. 33—38.

I have no hesitation in referring to this species two specimens in the collection. They closely resemble one another, and were obtained by a trawl-net from the same station, namely from the V Region off Sado Island on July 10, 1955. Each of them is massive, irregularly spherical, averaging about 32 *mm* in diameter. Where the surface is intact it is coarsely hispid owing to the projecting oxeas. At or near the top of the sponge, there are one or two naked circular oscula, of about 3 *mm* in diameter. The texture is very hard and colour in formalin is pale brown.

The cortex is thick and hard, being built up of the densely packed brushes of dichotriaenes and plagiotriaenes, up to 2 *mm* thick. The choanosome is not so hard as the cortex, and is penetrated by numerous small grooves. The cladomes are placed just beneath the dermal membrane, which is sustained by a thick layer of small spherasters.

Spicules (Text-fig. 10) : — Megascleres : 1) Oxeas, fusiform, straight or slightly curved, tapering gradually to a sharp point at each end ; size variable, measuring 2.5 ~ 4 *mm* × 50 ~ 60*μ*. These are mainly restricted to the interior of the sponge but may also partake in the building up of the cortex, being intercalated between the triaenes. 2) Dichotriaenes(*a*,*a'*); shaft measuring up to about 3.5 *mm* by 100*μ* ; pro-

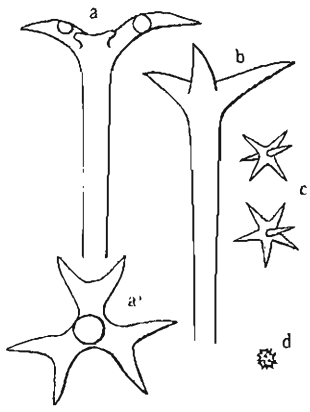

Fig. 10.
Spicules of *Stelletta misakiensis* LEBWOHL ; *a*, dichotriaene × 25 ; *a'*, cladome of the same × 25 ; *b*, plagiotriaene × 25 ; *c*, oxyasters × 160 ; *d*, spheraster × 300.

toclad 140μ and deuteroclad 180μ long. 3) Plagiotriaenes(b) with short, conical cladomes projecting more or less forwards, and stout shaft. Size somewhat variable ; shaft measure 2 ~ 3 mm × 110μ and cladomes about 300 × 90μ.

Microscleres : 4) Oxyasters (c) very abundant in the choanosome, with slender, conical sharp-pointed, smooth rays, varying in number ; total diameter 50 ~ 70 μ. 5) Spheraster (d) most numerous in the dermal crust, 5 ~ 7μ in total diameter.

Locality : — Off Sado Island.

Previously known distribution : — Misaki, Sagami Sea.

21. *Stelletta ovalae*, n. sp.

(Pl. III, fig. 17, text-fig. 11)

This new species is represented by a single specimen in the collection which was obtained from the Hyotan-se off Sado Island (V Reg.) by a trawl-net in July,1955.

The sponge (Pl. III, fig. 17) is compressed dorso-ventrally, oval-shaped, with a diameter of 61 × 41 mm and 30 mm high. There is no sign of a roottuft, but on the upper surface of the body is an orifice of 10×3.5 mm. The surface is coarsely and strongly hispid. The texture is firm and coarse. The colour in spirit is pale brown but that of the surface is dirty gray owing to the contamination with mud.

The skeleton is radially arranged, consisting of large, stout and long, slender oxeas and triaenes grouped to some extent in loose, ill-defined bundles. Most of the triaenes are in the outermost portion, whose cladomes usually project beyond the surface and the greater part of the projecting ends of the spicules are practically broken off. The cortex is feebly developed and not sharply differentiated from the choanosome. Microscleres are arranged densely in the dermal crust but they are scattered also in the choanosome.

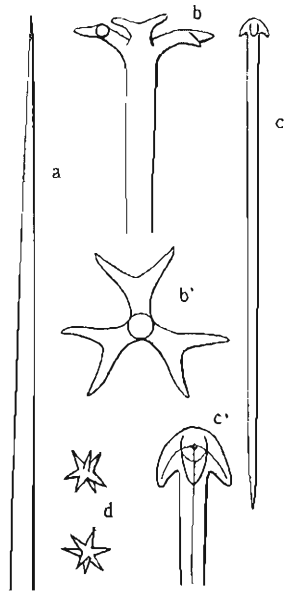

Fig. 11.
Spicules of *Stelletta ovalae*, n. sp. ; a, stout oxeas × 25 ; b, dichotriaene × 25 ; b', cladome of the same ×25 ; c, anatriaene × 25 ; c', cladome of the same × 100; d, oxyasters × 300.

Spicules (Text-fig. 11) : — Megascleres : 1) Oxeas are of two sorts. Stout oxeas (a) nearly straight, sharply ended to each end, measuring up to about 5 mm in length by 70 ~ 80μ · Slender oxeas also long with the thickness of 12 ~ 16 μ, but I have never seen it unbroken so can say nothing of its exact length. Dichotriaenes (b, b') with long, stout, sharply ended shaft and relatively small cladomes ; shaft measure up to 5.5 mm long by 75 ~ 130μ ; protoclad 100 ~ 140 × 70 ~ 90μ and deuteroclad 170 ~ 200μ in length. Anatriaenes (c, c') with long, slender, sharply pointed shaft and small cladomes ; shaft measuring 1.7 ~ 2.5 mm × 32 ~ 40μ and the cladome 70μ long.

Microscleres is of one sort only. Oxyasters (d) with slender, sharply ended, smooth, 6 ~ 10 rays; 14 ~ 18μ in total diameter.

Locality : — off Sado Island.

22. *Stelletta splendens*, n. sp.

(Pl. III, fig. 18, text-fig. 12)

This new species is based upon a single specimen in the collection which was obtained by a trawl-net from the III Region (Hyotan-se) off Sado Island, in November, 1955.

The sponge (Pl. III, fig. 18) is an irregularly rounded mass, attached to a piece of rock. The maximum dimensions are as follows : — Length 110 *mm*, breadth 83 *mm*, height 65 *mm*. There is a single vent in the middle portion of the upper side, its margin is level with the general surface. The surface is rather uneven, harsh to the touch, subglobrous for the most part, but hispid in places, especially at one end. The colour in the preserved state is pale chocolate brown and the texture is rather compact and slightly elastic.

The cortex is thick and hard, being built up of the densely packed brushes of dichotriaenes and plagiotriaenes ; it is up to 2.5 *mm* thick. Nearly all the triaenes have their cladomes either actually or just beneath the surface. Associated with these cortical brushes of triaenes, are a few anatriaenes and slender oxeas. The cladomes of anatriaenes usually project beyond the surface and the most of them are nearly all broken off.

The skeleton of the choanosome mainly consists of large oxeas grouped to some extent in loose, ill-defined bundles, radiating from the center of the sponge to the surface. Two sorts of small oxeas and a few anthasters are scattered through the ground-substance in the interior of the sponge, along with the radiating bundles of large, stout oxeas.

Two kinds of chiaster are very sharply contrasted with one another. The large ones are almost confined to the choanosome, while the small ones are abundant in a dense layer at the surface of the sponge, and also occur in great numbers in the interior of the body.

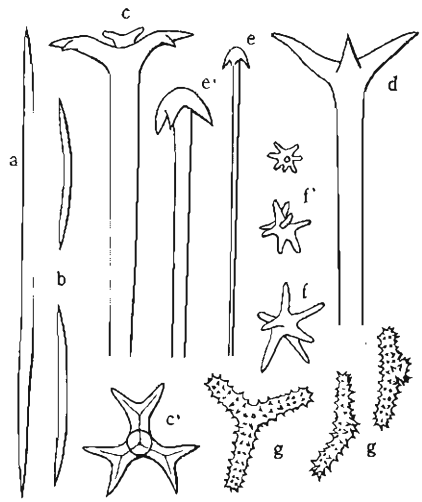

Fig. 12. Spicules of *Stelletta splendens* n. sp. ; *a*, intermediate oxea × 40 ; *b*, small oxeas × 40; *c*, dichotriaene × 25 ; *c'*, cladome of the same × 25 ; *d*, plagiotriaene × 25 ; *e*, anatriaene × 25 ; *e'*, cladome of the same × 75 ; *f*, larger chiaster × 300 ; *f'*, smaller chiasters × 300 ; *g*, anthasters × 75.

Spicules (Text-fig. 12) : — Megascleres : Oxeas of four sorts ; long stout, long slender, intermediate, and small. Long stout oxeas nearly straight, tapering equally to each end, measure up to 4 mm in length by 55 ~ 60μ, mainly restricted to the interior of the sponge. Long slender oxeas straight or slightly curved, sharply pointed at each end, project here and there from the surface, size 3 *mm* or more long by about 17μ. Intermediate oxeas (*a*) fusiform, slightly curved, measuring 1000 ~ 1200 × 25μ. Small oxeas (*b*) straight or slightly curved, sharply ended, size 350 ~ 420 × 10 ~ 12μ. Dichotriaenes (*c*, *c'*) ; with long, stout, sharply ended shaft and bifulcated cladomes ; shaft 2.2 ~ 4.5 *mm* × 100 ~ 120μ ; protoclad about 160 × 90μ ; deuteroclad

abut 200μ in length. Very numerous. Plagiotriaenes (*d*) : with long, stout shaft and conical cladi projecting forwards ; shaft abut 3 *mm* by 100μ ; cladi about 320 × 80μ. Anatriaenes (*e*, *e'*) ; with long slender shaft tapering to sharp point, and short, strongly recurved cladi ; shaft more than 2 *mm* in length by about 28μ ; cladi about 70μ. Few in number.

Microscleres : Chiasters of two sizes, with small centrum and long tylote rays varying in number ; the larger (*f*) about 25μ in total diameter and the smaller (*f'*) ones 14 ~ 17μ in diameter. The latter very numerous, especially at the surface of the sponge. Anthasters (*g*) usually have three rays. Rays are more or less blunted at the apex and thickly covered with small, sharp spines ; ray measures about 95×25μ.

Locality : — Off Sado Island.

Remarks : — The present species, so far as the external form concerned, closely resembles *Stelletta communis* (Sollas) and *S. pyriformis* (Sollas), but it differs from these species in the presence of plagiotriaenes. This species is easily distinguished from the other members of the genus by the presence of anthasters, plagiotriaenes and four sorts of oxeas.

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佐渡島周辺から採られた海綿

谷　田　専　治

これまで佐渡島およびその周辺から報告されている海綿は5種類にすぎず，しかもそれらはすべて石灰海綿に属するものであつた．

本報告が取扱つた海綿標本は，日水研が1955年に数度にわたつて行なつた佐渡島北方の瓢箪瀬の調査の際に，水深200～500 *m* のところから底曳網で採取されたものと，1956，'57年に新

潟大学の岩沢博士が佐渡相川町にある同大学附属臨海実験所付近で採集したものである．これらは17属22種に及び，そのうち２種は石灰海綿に，他の20種は無石灰海綿の尋常海綿に属し，新種８を含んでいる．佐渡周辺海域の無石灰海綿に関する報告はこれが最初である．

本報告に記載した海綿は次の通りである．

1) *Leucosolenia laxa* KIRK　カゴアミカイメン

採 集 地 —— 佐渡相川沿岸.

分　　布 —— ニユージーランド；本邦太平洋および日本海の各地沿岸.

2) *Grantessa intusarticulata* (CARTER)　コトゲカイメン

採 集 地 —— 佐渡相川沿岸.

分　　布 —— オーストラリア；ニユージーランド：本邦では三崎・鎌倉・下田・州の崎・三重県和具・能登半島.

3) *Haliclona permollis* (BOWERBANK)　ムラサキカイメン

採 集 地 —— 佐渡相川沿岸.

分　　布 —— 世界的広分布.

4) *Haliclona clathrata* (DENDY) (Pl, I, fig, 1)

採 集 地 —— 佐渡相川沿岸.

分　　布 —— オーストラリア；ニユージーランド；マレー群島.

5) *Callyspongia elegans* (THIELE)　ワタトリカイメン (Pl, I, fig, 2)

採 集 地 —— 佐渡相川沿岸.

分　　布 —— セレベス.

6) *Ceraochalina differentiata* DENDY (Pl, I, fig. 3)

採 集 地 —— 佐渡相川及び秋田船川沿岸.

分　　布 —— アミランテ；能登半島.

7) *Petrosia ushitsuensis* TANITA　ウシツカタカイメン (Pl. I, fig. 4)

採 集 地 —— 佐渡相川沿岸.

分　　布 —— 能登半島.

8) *Kallypillidion negro*, n. sp. (Pl. I, fig. 5, text-fig. 2)

コップ状または釣鐘状の一定の形をし，下部の短い柄状部で他物に付着．保存標本は黒褐色．軟かいがやや弾性がある．主骨格は桿状体からなる網目状を呈し，骨片の先端部は少量の海綿質で固められている．桿状体はわずかに曲り，先端はあまり尖つていない．

採 集 地 —— 佐渡沖　Ⅷ海区.

9) *Ophlitaspongia noto* TANITA　ノトハリカイメン

採 集 地 —— 佐渡相川沿岸.

分　　布 —— 能登半島.

10) *Esperiopsis plumosa*, n. sp, (Pl. II, fig. 6, text-fig. 3)

やや羽毛状の海綿．外表は突出する骨片繊維のため棘状を呈する．表皮はすり落ちたものと思われる．骨格は５～７本の骨片が平行にならび表皮の方へ向う主繊維と，これに直角に走る副繊維とからなり，ほぼ正方形の網目をなす．海綿質はほとんど発達していない．主大骨片は針状体，微小骨片は等錨状体.

採 集 地 —— 佐渡沖　Ⅵ及びⅧ海区.

11) *Dactylella hilgendorfi* THIELE (Pl. II, fig. 7)

採 集 地 —— 佐渡沖 Ⅲ海区.

分　　布 —— 函館.

12) *Halichondria disparilis* LAMBE (Pl. II, fig, 8, text-fig, 4)

採 集 地 —— 佐渡沖，詳細不明.

分　　布 —— バンクーバー島；オホーツク海；日本海シベリア沿岸.

13) *Spirastrella insignis* THIEIE　オウバンカイメン (Pl. II, fig. 9)

採 集 地 —— 佐渡相川沿岸.

分　　布 —— 相模湾；瀬戸内海；能登半島.

14) *Tetilla ovata* (THIELE)　マルトウナスカイメン (Pl. II, fig. 10)

採 集 地 —— 佐渡沖 Ⅲ海区.

分　　布 —— 相模湾.

15) *Tetilla ginzan* n. sp. (Pl. II, fig. 11, text-fig. 5)

不規則な楕円体で，体表は長い突出骨片のため棘状を呈する．保存標本は灰白色．骨格は体中心部から外表に向つて放散状にならぶ骨片束からなる．骨片は樫状体と前向三叉体のほか，微小骨片としてシグマ状螺旋体をもつ．前向三叉体は異枝輻状であり，後向三叉体を欠くことにより，本属の他種と容易に区別される.

採 集 地 —— 佐渡沖 Ⅲ海区.

16) *Pachastrella tenuilaminalis* (SOLLAS)　ウスイタカイメン (Pl. III, fig. 12, text-fig. 6)

採 集 地 —— 佐渡沖 Ⅷ海区.

分　　布 —— 相模湾.

17) *Geodinella hyotania*, n. sp (Pl. III, fig, 13, text-fig. 7)

不規則にややねじれた円筒状体で，数個のこぶ状の隆起があるが，体表はほぼ平滑・外表は白色であるが内部は汚褐色を呈する．体は約1㎜の厚さの槇充星体からなる外皮のために極めて硬い．主骨格は樫状体と針状体とよりなり，中に球星体を含む．外皮は楕円体をした塡充星体よりなる．本種には退化したと思われる三叉体はみられない.

採 集 地 —— 佐渡沖 Ⅲ海区.

18) *Jaspis sadoensis*, n. sp. (Pl. III. fig, 14. text-fig. 8)

体はやや側扁された梨状で，表面は長い突出骨片のためざらざらしている．保存状態では稀褐色で，かなり硬いがややもろい．骨格は大きな樫状体が入り乱れて形成され，表層に微小樫状体と鋭端星状体 (oxyaster) が多数並ぶが，両者は体内の主大骨片の間にも散在する．微小樫状体は中央に隆起があり，両端は尖り，表面には細かい凹凸が多数あつて，きわめて特異な骨片である.

採 集 地 —— 佐渡沖 Ⅲ及びⅣ海区.

19) *Stelletta gigantea*, n. sp. (Pl. III, fig. 15, text-fig. 9)

大さ12㎝をこす不規則な楕円体で，下部で岩につき足糸はない．体表は粗で，多数の小入水孔がみられる．保存状態で稀褐色．外皮は密にならぶ三叉体からなり，その厚さ 2.5㎜，最外層に交差星体 (chiaster) がならぶ．主骨格は樫状体束からなるが，中に異物をふくんでいる．主大骨片は2種の樫状体・分枝三叉体および正常三叉体，微小骨片は交差星体のみ.

採 集 地 —— 佐渡沖 Ⅲ海区.

20) *Stelletta misakiensis* LEBWOHL (Pl. III, fig. 16, text-fig. 10)

採 集 地 —— 佐渡沖 V海区.

分　　布 —— 相模湾三崎.

21) *Stelletta ovalae*, n. sp. (Pl. III, fig. 17, text-fig, 11)

体は上下に圧縮された卵形で，上端に口を開き，足糸はない．体表は粗で棘状，泥土の付着のため汚褐色を呈する．質は硬い．外皮の発達は著しくなく，内部との境界があまり判然としていない．主大骨片は2種の桿状体と分枝三叉体・後向三叉体・微小骨片は鋭端星状体ただ1種で，表層に密にならぶが，体内にも散在している．

採 集 地 —— 佐渡沖 V海区.

22) *Stelletta splendens*, n. sp. (Pl. III, fig. 18, text-fig. 12)

不規則円形の塊状体で，下部で岩につく．標本はチョコレート色をし，密で硬いがやや弾性がある．外皮は三叉体の密層よりなり厚く，最外層は小型の交差星体で覆われている．主大骨片は4種の桿状体・分枝三叉体・正常三叉体および後向三叉体．微小骨片として大小2種の交差星体と花星体（anthaster）を有する．

EXPLANATION OF THE PLATES

Plate I.

Fig. 1. *Haliclona clathrata* (DENDY) × 1.1
Fig. 2. *Callyspongia elegans* (THIELE)
Fig. 3. *Ceraochalina differentiata* DENDY × 0.8
Fig. 4. *Petrosia ushitsuensis* TANITA × 0.9
Fig. 5. *Kallypilidion negro*, n. sp. × 0.8

Plate II.

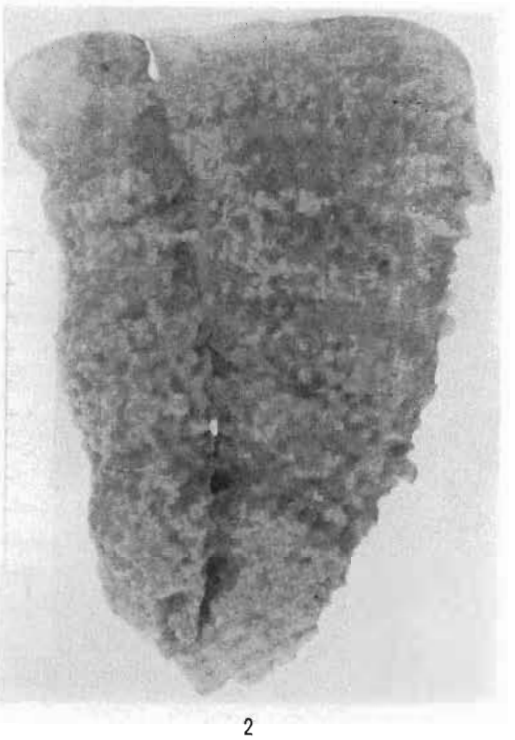
Fig. 6. *Esperiopsis plumosa*, n. sp. × 0.75
Fig. 7. *Dactylella hilgendorfi* THIELE × 0.8
Fig. 8. *Halichondria disparilis* LAMBE × 0.5
Fig. 9. *Spirastrella insignis* THIELE × 0.45
Fig. 10. *Tetilla ovata* (THIELE) × 0.8
Fig. 11. *Tetilla ginzan*, n. sp. × 0.75

Plate III.

Fig. 12. *Pachastrella tenuilaminaris* (SOLLAS) × 0.6
Fig. 13. *Geodinella hyotania*, n. sp. × 0.8
Fig. 14. *Jaspis sadoensis*, n. sp. × 0.4
Fig. 15. *Stelletta gigantea*, n. sp. × 0.4
Fig. 16. *Stelletta misakiensis* LEBWOHL × 0.8
Fig. 17. *Stelletta ovalae*, n. sp. × 0.8
Fig. 18. *Stelletta splendens*, n. sp. × 0.5

Plate I

1



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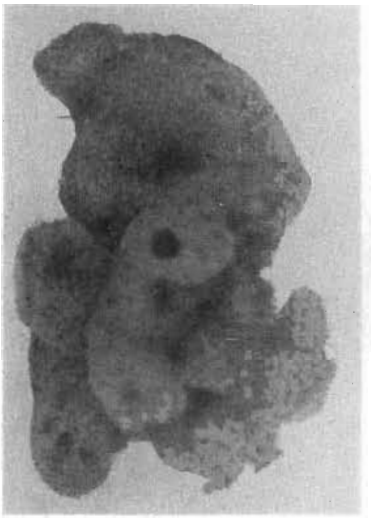

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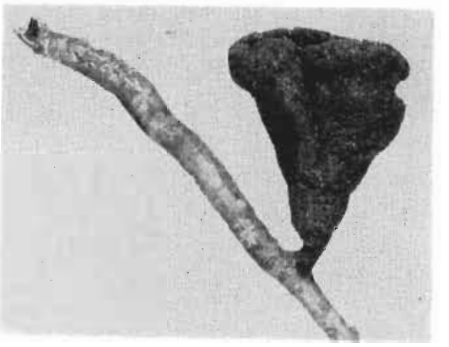

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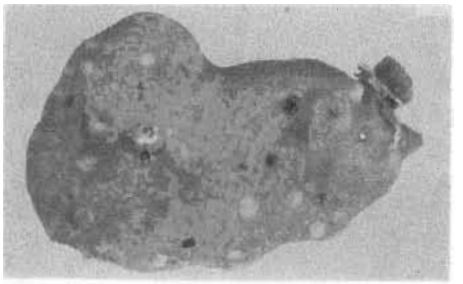

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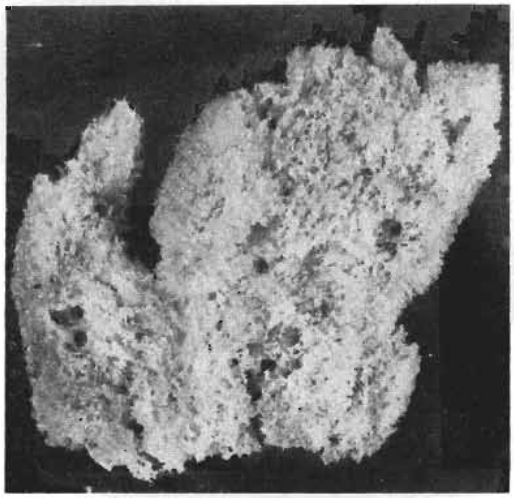
Plate II



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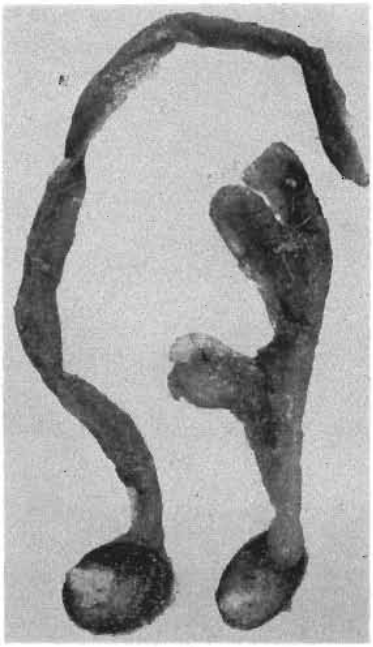

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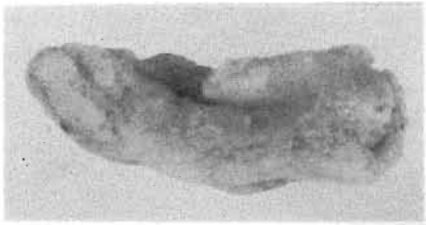

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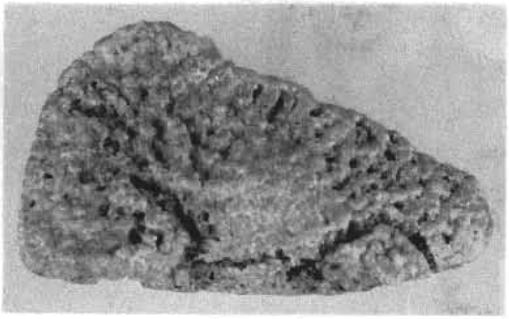

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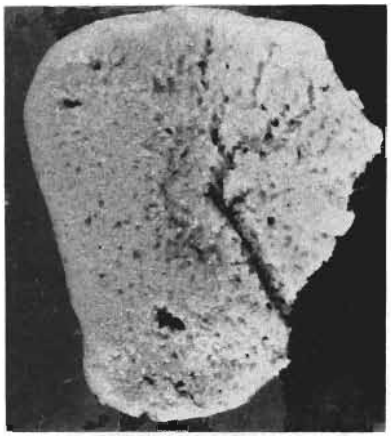
11

Plate III



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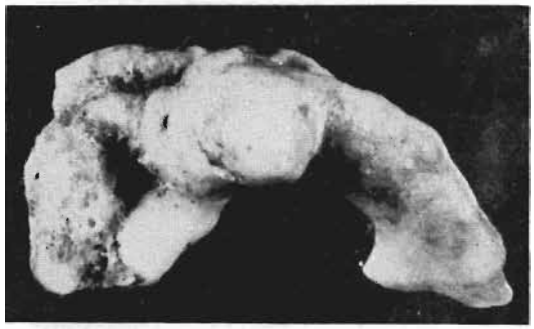

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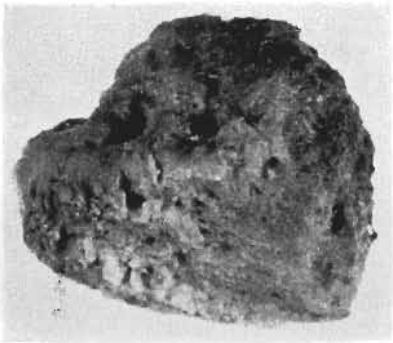

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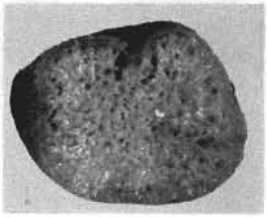

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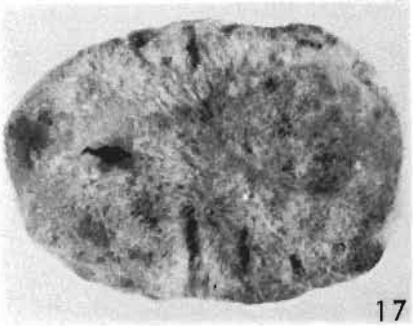

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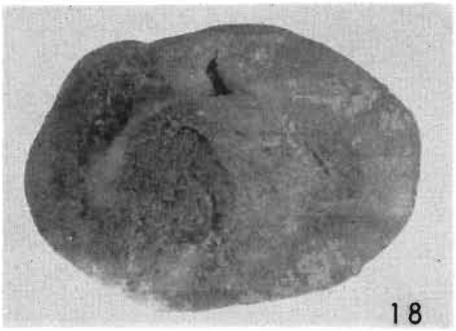

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