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Further Studies on the Sponges Obtained from the Sado Island and Its Adjacent Waters

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In 1965, the writer has reported on the sponges obtained from the neighbourhood of the Sado Island. The report contains 17 genera, 22 species which were collected by dredging from moderately deep sea and obtained from the shallow water near the Marine Biological Station of the Niigata University at Aikawa.

Since then, numerous sponge specimens were secured by several investigators in the Sado Island, Awashima, Tobishima, and their adjacent waters as shown in the next table and the identification was submitted to the writer.

Localities	Collector	Date	Species No. contained
Tobishima	SUZUKI	?, 1962	5
Awashima	TANITA	July, 1964	1
	INO	Aug. "	3
Sado Island	USUKI	July, 1965	15
	KITAMI	Mar. 1966	3
Sado Strait	MIO	Oct. 1964	1
"	OKIYAMA	Jan. 1965	1

The collection includes representatives of 24 species, belonging to 17 genera, of which 4 are Calcarea and the rest belong to the Demospongiae, and 19 of these are described from this sea area for the first time. The sponges reported from the Sado Island and its adjacent waters are, therefore, 45 species in total; Calcarea and 36 Non-calcarea.

Here the writer wishes to express his hearty thanks to the collectors, Dr. RICHIRO SUZUKI of the Yamagata University, Dr. TAKASHI INO of the former Director of Nansei Regional Fisheries Research Laboratory, Dr. ITARU USUKI and Dr. TAKEHIKO KITAMI of the Niigata University, Dr. SHIN-ICHI MIO of the Seikai Regional Fisheries Research Laboratory, and Mr. MUNEKO OKIYAMA of the Japan Regional Fisheries Research Laboratory for their kindness in allowing me to examine their collections.

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Systematic List of Species

Class Calcarea

Order Homocoela

Family Homocoelidae

1. *Leucosolenia canariensis* (MICHLUCHO-MACLAY)
2. *Leucosolenia gardineri* DENDY
3. *Leucosolenia laxa* KIRK

Order Heterocoela

Family Heteropiidae

4. *Grantessa mitsukurii* HOZAWA

Class Demospongiae

Order Haplosclerina

Family Halicionidae

5. *Haliclona permollis* (BOWERBANK)
6. *Haliclona tenuispiculata* BURTON
7. *Haliclona loosanojii* HARTMAN

Family Callyspongiidae

8. *Callyspongia confederata* (RIDLEY)
9. *Callyspongia elongata* RIDLEY and DENDY
10. *Ceraochalina differentiata* DENDY

Order Poecilosclerina

Family Tedaniidae

11. *Iotrochota baculifera* RIDLEY

Family Ophlitaspongiidae

12. *Mycale plumosa* (CARTER)

Order Halichondrina

Family Halichondriidae

13. *Halichondria panicea* (PALLAS)

Order Hadromerina

Family Choanitidae

14. *Spiraestrella abata* TANITA
15. *Spiraestrella insignis* THIELE

Family Suberitidae

16. *Suberites ficus* (JOHNSTON)

Order Tetractinellida

Family Tetillidae

17. *Tetilla ovata* (THIELE)

Family Tethyidae

18. *Tethya amamensis* THIELE
19. *Tethya japonica* SOLLAS

Family Geodiidae

20. *Caminus awashimensis*, n. sp.

Family Chondrillidae

21. *Chondrilla australiensis* CARTER

Order Keratosa

Family Spongiidae

22. *Hyattella intestinalis* (LAMARCK)
23. *Ircinia fasciculata* (PALLAS)
24. *Thorecta elegans* (LENDENFELD)

Descriptions of the Species

1. *Leucosolenia canariensis* (MICHLUCHO-MACLAY)

Nardoa canariensis, MICHLUCHO-MACLAY (1868) p. 230.

Nardoa sulphurea, MICHLUCHO-MACLAY (1868) p. 230.

Nardoa rubra, MICHLUCHO-MACLAY (1868) p. 230.

Torroma canariensis, HAECKEL (1870) p. 244.

Torroma rubrum, HAECKEL (1870) p. 245.

Ascallis canariensis, HAECKEL (1872) p. 52, Pl. 9, figs. 1-3, Pl. 10, fig. 1.

Ascallis compacta, SCHUFFNER (1877) p. 404, Pl. 25, fig. 9.

Leucosolenia nanseni, BREITFUSS (1896) p. 427; (1898) p. 13; p. 106, Pl. 12, figs. 1-9; (1932) p. 242; LUNDBECK (1909) p. 458;

Leucosolenia canariensis, LACKSCHEWITZ (1886) p. 300, Pl. 7, fig. 1; THACKER (1908) p. 762, Pl. 40, fig. 3, text-figs. 157-160; DENDY and ROW (1913) p. 724; HOZAWA (1918) p. 528; (1933) p. 2, Pl. 1, fig. 1; 1940) p. 134, Pl. 6, fig. 2, text-fig. 2; BREITFUSS (1932) p. 240; TANITA (1941) p. 264, Pl. 17, fig. 1; (1942) p. 77; (1943) p. 376, Pl. 12, figs. 11, 12.

The collection contains eight specimens of this cosmopolitan species which were collected from the shore of Aikawa. They vary both in shape and size considerably.

Each of the specimens forms an irregularly shaped massive colony, consisting of net-work of anastomosing Ascon-tubes. The color in alcohol is dirty grey.

Occurrence: Sado-Aikawa.

Previously known distribution:—Canary Islands; Cape Verde Islands; Mauritius; Minorca; Spitzbergen; Arctic Ocean; Copper Island; Commander Island; Mexico; Palao. in Japan—off Yuriage and Onagawa Bay, Miyagi Pref.; Sensaki, Yamaguchi Pref.; Tsuiyama Bay, Hyogo Pref.; Takahama, Fukui Pref.; Naha, Okinawa Pref.

Remarks:—The present species may be considered to be cosmopolitan.

2. *Leucosolenia gardineri* DENDY

(Pl. I, fig. 1)

Leucosolenia gardineri, DENDY (1913) p. 2, Pl. 1, figs. 1, 2, Pl. 3, figs. 1-3; DENDY and ROW (1913) p. 725; HOZAWA (1940) p. 35; TANITA (1942) p. 78;

(1943) p. 377, Pl. 12, fig. 14; (1964) p. 16, Pl. 1, fig. 1.

Only a single specimen in the collection is referable to this species, secured by Dr. USUKI in the shore of Aikawa. The sponge is an irregularly flattened colony of Ascon-tubes, 35 mm in breadth, and attached to the substratum directly. The surface of the sponge is consisted of very slender tubes forming a very closely meshed reticulation. The color in alcohol is pale brown.

Occurrence: Sado-Aikawa.

Previously known distribution:—Chagas Archipelago: in Japan—V. and Tsukumo Bay, Ishikawa Pref.; Takahama, Fukui Pref.; Hamasaka, Pref.; Kagamura, Shimane Pref.; Mogi, Nagasaki Pref.; Amakusa, Kun Pref.

3. *Leucosolenia laxa* KIRK

(Pl. I, figs. 2, 3.)

Leucosolenia laxa KIRK (1895) p. 208, Pl. 4, fig. 1; DENDY and ROW (1913) 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. 20; (1964) p. 17; (1965) p. 45; (1967) p. 112, Pl. 1, fig. 1.

There are two specimens of this species in the collection which were obtained by Dr. USUKI from the shore of the Sado Marine Biological Station of the University in July, 1965.

Each of them is attached to a small crab, *Petalomera* sp. (*P. g. STIMPSON?*), and covered over the whole body. Pl. I, figs. 2, 3. The specimen measures 14.10×4 mm in dimensions. The color in alcohol is white.

Occurrence: Sado-Aikawa.

Previously known distribution:—New Zealand: in Japan—Honshu Pacific and Japan Sea sides: Kyushu.

Remarks:—This species is widely distributed in the Japanese waters. It was obtained previously by the author and by Dr. IWASAWA from the same locality.

4. *Grantessa mitsukurii* HOZAWA

Grantessa mitsukurii, HOZAWA (1916) p. 23, Pl. 1, fig. 7, Pl. 2, fig. 15, text (1929) p. 318; TANITA (1942) p. 37, Pl. 2, fig. 11; (1943) p. 416, figs. 47, 48; (1967) p. 113.

A single specimen of this species exists in the collection which was obtained by Dr. USUKI from the shore of Aikawa, Sado Island. It consists of two sub-compressed tubular individuals, each of which is provided with an osculum.

its upper end. The specimen is 12 mm high and 6 mm broad. The color in alcohol is pale brown and the texture is rigid.

Occurrence: Sado-Aikawa.

Previously known distribution:—Misaki; Tateyama; Awa-Kominato; Tanabe Bay; Kannoura, Kochi Pref.; Amakusa; Izumo-Kagamura; Tajima District.

5. *Halictona permollis* (BOWERBANK)

Isodictya permollis, BOWERBANK (1866) p. 278; (1874) p. 123, Pl. 48, figs. 9, 10.

Reniera tubifera, GEORGE and WILSON (1921) p. 145.

Halictona permollis, DE LAUBENFELS (1936) p. 444; (1939) p. 1; (1942) p. 363; (1949) p. 11; TANITA (1957) p. 130, Pl. 1, figs. 3, 4, text-fig. 2; (1961) p. 338; (1965) p. 45; (1967) p. 113.

This species is represented in the collection by five specimens, one of which was secured by Dr. SUZUKI in the shore of the Tobishima and the remaining four were obtained by Dr. USUKI from Aikawa.

The shape of the specimens varies according to the object to which it is attached. The sponges are irregularly massive or slightly encrusting in shape, with several oscula. The largest specimen, which came from Tobishima, is elongated massive and measures 65 · 25 · 20 mm in dimensions. The color is dull brown with faint lavender tint and the texture soft.

Occurrence: Tobishima, Yamagata Pref.; Sado-Aikawa.

Previously known distribution:—Cosmopolitan. In Japan—Matsushima Bay; Kurushima Strait; Sado Island; Kasumi, Hyogo Pref.

6. *Halictona tenuispiculata* BURTON

(Pl. I, fig. 4)

Halictona tenuispiculata, BURTON (1934) p. 533.

A single specimen in the collection is assigned to this species, which was collected by Dr. USUKI from the shore of Aikawa.

The sponge (Pl. I, fig. 4) is erect, consists of two cylindrical branches, measures 68 mm in height, 23 mm in the largest breadth. The surface is minutely hispid. Oscula are nearly round in shape with diameter of 1-2 mm and have a tendency to linear arrangement along the branches. The color in alcohol is pale brown with lavender tint and the texture soft.

The skeleton is an irregularly sub-isodictyal reticulation of small spicules. There is no special dermal skeleton.

Spicules are oxeas only; smooth, slightly curved, sharply pointed at both ends, measuring 155~180 × 7~10 μ .

Occurrence: Sado-Aikawa.

Previously known distribution: Malay Area; Indian Ocean.

7. *Haliclona loosanoffi* HARTMAN

(Pl. I, fig. 5)

Haliclona loosanoffi, HARTMAN (1958) p. 62, Pls. 11, 12, figs. 21-25.

There are nine colonial specimens in the collection which I refer to this species. All of them were collected by Dr. USUKI from the shore of Aikawa and are nearly the same in appearance, one of them is shown in Pl. I, fig. 5.

The sponge consists of tubular bodies which often branch distally. Oscula are distributed along the sides of the branches and also seen at the top of tubes, nearly circular in outline with 0.8~1.5 mm in diameter. The surface of the sponge is slightly hispid. The color is drab and the texture soft and compressible.

The skeleton is composed of multispicular tracts which run towards the surface and terminate in the dermal membrane. The spicules are oxeas only, measuring 110~140 \cdot 5~10 μ . Gemmules, which characteristic of this species, could not seen in the specimen at hand.

Occurrence: Sado-Aikawa.

Previously known distribution: Milford Harbor, Long Island Sound.

8. *Callyspongia confederata* RIDLEY

Tuba confederata, RIDLEY (1884) p. 400.

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

Siphonella confederata, 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.

Spinosella confederata, TOPSENT (1897) p. 479, Pl. 19, fig. 20.

Callyspongia confederata, BURTON (1934) p. 541; TANITA (1961) p. 133, Pl. 3, text-fig. 2; (1967) p. 113.

A single specimen of this species is contained in the collection. The sponges is not perfect as the upper half of the body was torn off. The specimen measures 20 mm high, attached to a stone by its base, with uneven surface proliferating into small, blunt outgrowths. The color is pale yellowish brown and the texture fibrous and elastic.

Occurrence: Sado-Aikawa.

Previously known distribution: Australia; Malay Area; Penguin Channel; in Japan Wagu, Mic, Pref.; Tajima Moroyose.

9. *Callyspongia elongata* (RIDLEY and DENDY)

- Pachychalina elongata*, RIDLEY and DENDY (1886) p. 329; (1887) p. 23, Pl. 6, fig. 1.
Cladochalina elongata, BURTON (1927) p. 510.
Callyspongia elongata, TANITA (1961) p. 339, Pl. 1, fig. 3; (1964) p. 17, Pl. 1, fig. 3;
(1967) p. 114.

There is a single specimen of this species in the collection which was obtained by Dr. USUKI from the shore of Aikawa. The sponge consists of two branches, measuring 64 mm height. The color in alcohol is very pale yellowish white and the texture soft but elastic.

Occurrence: Sado-Aikawa.

Previously known distribution: --Bass Strait; in Japan -- Kurushima Strait; Noto Peninsula; Tajima Moroyose.

10. *Ceraochalina differentiata* DENDY

- Ceraochalina differentiata*, DENDY (1921) p. 34, Pl. 3, fig. 7, Pl. 12, fig. 11; TANITA (1964) p. 17; (1965) p. 47, Pl. 1, fig. 3.

This species is represented by a single specimen in the collection. It was obtained by Dr. SUZUKI from the shore of Nezugaseki, Yamagata Prefecture. It measures 75 × 50 × 15 mm in dimensions. The color in dry state is light brown and the texture spongy and resilient.

Occurrence: Nezugaseki, Yamagata Pref.

Previously known distribution: --Amirante; in Japan --Noto Peninsula; Sado-Aikawa; Funakawa, Akita Pref.

11. *Iotrochota baculifera* RIDLEY

(Pl. II, fig. 6; Text-fig. 1)

- Iotrochota baculifera*, RIDLEY (1884) p. 435; p. 610, Pl. 39, fig. M, Pl. 42, fig. f;
THIELE (1899) p. 18, Pl. 2, fig. 6; DENDY (1887) p. 59; (1905) p. 165
(1916) p. 123; (1921) p. 97; TOPSENT (1893) p. 173; (1897) p. 455;
LINDGREN (1897) p. 482; (1898) p. 300; BURTON and RAO (1932) p. 353;
BERGQUIST (1965) p. 163.

Hiattrochota baculifera, DE LAUBENFELS (1954) p. 124, text-fig. 77.

Hiattrochota hiatti, DE LAUBENFELS (1954) p. 125, text-fig. 78.

Hiattrochota mystile, DE LAUBENFELS (1954) p. 126, text-fig. 79.

This species is represented by three specimens in the collection which were collected from the shore of Sado-Aikawa. They are irregular crust, rather thick, attached directly to the substrata, did bleed a rich purple exudate when handled.

The largest specimen (Pl. II, fig. 6) measures 65 × 45 mm in horizontal dimensions and has an average thickness of about 8 mm. The surface of the sponge is rough, covered irregularly with small, sharp conules. Several vents, which must be regarded as oscula, scattered over the surface and are nearly round in

shape with varying diameters of 0.8~4 mm. Pores not apparent. The color in spirit is blackish purple and the texture slightly soft with stiffy spongy fibre

The skeleton is composed of spiculo-fibres of various thickness. The fibres of the main skeleton reticulation are stout and contain much spongin as well as vary many spicules. Most of the spicules which core the fibres and are scattered loosely throughout the flesh are styles. Numerous microscleres are scattered also throughout the endosome. The ectosome consists of a thin proto plasmic dermis. Most of the megascleres near the surface are strongyles.

Spicules (Text-fig. 1): Styles (a) fairly smooth, somewhat curved, usually abruptly pointed at one end, measure 130~165 · 6~8 μ . Strongyles (b) smooth, nearly straight, chiefly in ectosome, measuring 200~260 · 4~5 μ . The microscleres are birotulates (c) 11~15 μ in length, with four or more clads at each end, but the exact number of the clads is difficult to make out because of the small size.

Occurrence: Sado-Aikawa.

Previously known distribution: Coast of Cochín China; Philippine Marshall Islands; Truk; Amboina; Seychelles; Celebes; Ternate; Port Darwin; Aru Islands; Gulf of Manaar; Ceylon Sea; Okhamandal; Nicobars; Christmas Island; Mascarene Islands.

12. *Mycale plumosa* (CARTER)

Esperia plumosa, CARTER (1882) p. 299.

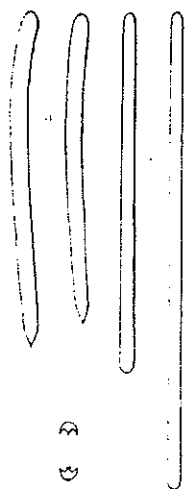
Esperella plumosa, DENDY (1905) p. 159; (1916) p. 121, Pl. 1, figs. 4a-4g, Pl. 3, fig. 1

Mycale plumosa, TANITA (1958) p. 133, Pl. 2, figs. 10, 11, text-fig. 5.

This species is represented by a single, small specimen which was collected by Mr. KITAMI from the shore of Aikawa. The sponge is very thin, encrusting on the substratum, measures 15 × 7 mm in dimensions. The surface is irregularly cactiform. The color is pale yellowish white in spirit and the texture soft and somewhat elastic.

Occurrence: Sado-Aikawa.

Previously known distribution: ---Mauritius and Mergui Archipelago; Ceylon; Okhamandal; in Japan --- Matsushima Bay.



Text-fig. 1. Spicules of *Iotraciola baculifera* DENDY. a, styles (x300); b, strongyle (x300); c, birotulate (x630).

13. *Halichondria panicea* (PALLAS)

- Spongia panicea*. PALLAS (1766) p. 388.
Amorphina panicea, SCHMIDT (1870) p. 77; FRISTEDT (1887) p. 421.
Amorphina megalorhaphis. CARTER (1881) p. 368; RIDLEY (1884) p. 416; (1885) p. 571.
Halichondria panicea, JOHNSTON (1842) p. 114, Pl. 10, Pl. 11, figs. 5, 6; RIDLEY and DENDY (1887) p. 2, Pl. 2, figs. 2, 3; LAMBE (1893) p. 25; (1896) p. 182; DENDY (1905) p. 146; (1916) p. 112; (1921) p. 37; BABIC (1922) p. 220, Text-fig. B; BRÖNDSTED (1924) p. 451; WILSON (1925) p. 394; HENTSCHEL (1929) p. 902; p. 990; BURTON (1929) p. 421; (1932) p. 199, Pl. 7, figs. 5-9; (1934) p. 13; p. 43; (1935) p. 75; DE LAUBENFELS (1932) p. 56, Fig. 28; (1936) p. 449; (1949) p. 17, Figs. 14, 15; ARNDT (1935) p. 103, Fig. 221; TANITA (1958) p. 134, Pl. 3, figs. 12-15, text-fig. 6; (1963) p. 125; (1964) p. 18.

The collection contains seven specimens of this species. All of them were obtained by Dr. USUKI from the shore of Aikawa, and are alike in appearance and structure. The largest specimen is an irregular mass with flabellate habit, measures 55 mm in the greatest breadth. The color in alcohol is dull brown.

Occurrence: Sado-Aikawa.

Previously known distribution: -Cosmopolitan. In Japan -Matsushima Bay; Noto Peninsula.

14. *Spirastrella abata* TANITA

- Spirastrella abata*, TANITA (1961) p. 348, Pl. 4, fig. 16, text-fig. 8; (1967) p. 117, Pl. 2, fig. 9.

A single specimen of this species is contained in the collection. It was collected by Dr. SUZUKI from the shore of Tobishima and preserved in formalin. The sponge is massive, hemi-spherical in shape, with the warty surface, measures 90·75 mm in horizontal dimensions and about 35 mm in height. The color in formalin is light brown. The skeleton is composed of tylostyles and spirulae.

As the species has already been fully described, I need no further details.

Occurrence: Tobishima, Yamagata Prefecture.

Previously known distribution: Kurushima Strait; Kasumi and Takeno, Hyogo Pref.

15. *Spirastrella insignis* THIELE

- 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; (1965) p. 50, Pl. 2, fig. 9; (1967) p. 117, Pl. 2, fig. 8.

There are two large, splendid specimens of this species in the collection. They were obtained by Dr. Ino by diving from the depth of 20~30 meters off Awashima, Niigata Prefecture.

The sponge is irregularly massive, with closely placed papillated surface. The larger specimen measures 170 × 95 × 63 mm in dimensions. The color in life is purplish grey and the texture is rather spongy.

Occurrence: off Awashima, Niigata Pref., 20~30 m.

Previously known distribution: — Sagami Sea; Kurushima Strait; Noto Peninsula; Sado Island; Kasumi, Hyogo Pref.

16. *Suberites ficus* (JOHNSTON

(Pl. II, fig. 7

Halichondria ficus, JOHNSTON (1842) p. 144, Pl. 15, figs. 4, 5.

Hymeniacidon ficus, BOWERBANK (1885) p. 206; 1874 p. 82, Pl. 36, figs. 10, 17; (1882) p. 89.

Ficulina ficus, GRAY (1867) p. 523.

Suberites ficus, LAMBE (1896) p. 193, Pl. 2, fig. 4; SCHMIDT (1870) p. 76; ARNDT (1935) p. 39, fig. 64; HARTMAN (1958) p. 3, Pl. 1, fig. 5; Koltun (1962) p. 182; TANITA (1965) p. 95, Figs. a, b.

Suberites placenta, THIELE (1898) p. 39, Pl. 8, fig. 8.

Suberites subcreus, THIELE (1898) p. 38, Pl. 1, figs. 11, 12, Pl. 5, fig. 7.

The collection contains a single specimen of this species which was collected by Mr. OKIYAMA by a trawl-net from the depth of 411 meters of the Sado Strait.

The specimen (Pl. II, fig. 7) consists of two sponges attached to a stone by each base. Each of the sponges is solitary, fig-like in shape. The larger one measures 88 mm in height, 70 mm in the greatest breadth, and 43 mm in thickness. The color in formalin is dirty grey and the texture slightly hard and rather spongy.

Occurrence: Sado Strait, 411 m.

Previously known distribution: —Cosmopolitan. In Japan Enoshima; Hakodate; Sado Island.

17. *Tetilla ovata* (THIELE)

Craniella ovata, THIELE (1898) p. 27, Pl. 5, fig. 16, Pl. 7, fig. 15.

Tethya ovata, LENDENFELD (1903) p. 24; LEBWOHL (1914) p. 5, Pl. 1, figs. 1-29.

Tetilla ovata, TANITA (1965) p. 51, Pl. 2, fig. 10.

There is a single specimen of this species in the collection. It was obtained by Dr. Mio by a trawl-net from the depth of 130~180 meters off Sado Island.

The sponge is nearly spherical in shape, measures 44 × 42 mm in diameters and 59 mm in height including the root tuft. The color in formalin is brownish grey and the texture firm.

Occurrence: off Sado Island, 130~180 m.

Previously known distribution: —Sagami Sea; Sado Island.

18. *Tethya amamensis* THIELE

Tethya amamensis, THIELE (1898) p. 30, Pl. 7, fig. 19; TANITA (1961) p. 350, Pl. 4, fig. 18, text-fig. 10.

This species is represented in the collection by a single specimen which was obtained by Dr. SUZUKI from Tobishima, Yamagata Prefecture.

The sponge is nearly spherical in shape with diameter of 15 mm. The surface of the specimen is tuberculate with tubercles of 1 mm in diameter. The color is greenish grey and the texture hard in dry state.

The skeleton is composed of two sorts of styles which arranged radiately, with two sorts of microscleres, spherasters and strongylasters.

Occurrence: Tobishima, Yamagata Pref.

Previously known distribution: Amami-Ohshima; Kurushima Strait

19. *Tethya japonica* SOLLAS

(Pl. II, fig. 8)

Tethya japonica, SOLLAS (1888) p. 430, Pl. 44, figs. 7-14; LINDGREN (1897) p. 483; 1898) p. 317; BURTON (1934) p. 568; TANITA (1964) p. 19, Pl. 1, fig. 8, text-fig. 3.

Donatia japonica, BURTON (1924) p. 1039; BRÖNDSTED (1924) p. 444.

There is a single specimen of this species in the collection which was obtained by Dr. USUKI from the shore of Aikawa.

The sponge (Pl. II, fig. 8) is almost spherical in shape with the dimensions of 34 · 23 · 18 mm. The surface of the sponge is tuberculate, as all species of this genus, with tubercles of about 2 mm in diameter, which separated from each other by only narrow grooves. The color is dirty brown and the texture somewhat cartilagenous.

The skeleton consists of long, radially arranged styles, containing microscleres of two kinds, spherasters and strongylasters.

Occurrence: Sado-Aikawa.

Previously known distribution:- Philippine; Malay Area; Java; Indian Ocean; Red Sea; New Plymouth; in Japan Noto Peninsula.

20. *Caminus awashimensis*, n. sp.

(Pl. II, figs. 9-11, text-fig. 2)

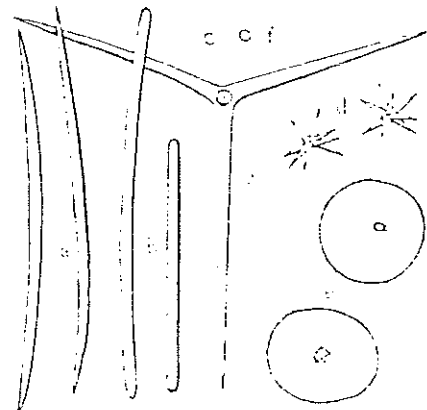
This new species is based upon four solitary specimens which were obtained by Dr. Iso by diving from the depth of 20~30 meters off Awashima.

The largest specimen (Pl. II, fig. 9) which is designated as the type of this species is a pear-shaped mass in form with an osculum at the top of the body, and attached to a rock directly by the under side of the body. It measures 53 mm in length, 41 mm in breadth and 37 mm in height. The osculum is nearly

round with a diameter of about 2 mm. The surface of the sponge is nearly smooth to the naked eye. The color in the preserved state is pale brown with a purplish tint and the texture is very hard owing to the thick cortex of sterrasters.

The cortex is about 1.5 mm thick, very sharply differentiated from the underlying choanosome and consists of densely packed sterrasters and of spherules. The skeleton of the choanosome consists mainly of oxeas, strongyles and orthotriaenes. These spicules are arranged towards the surface and grouped to some extent into loose bundles. Among these spicules, oxyasters, sterrasters, and spherules are scattered sparsely.

Spicules (Text-fig. 2): Oxeas (a) smooth, slightly curved, sharply pointed at both ends, measuring 540~700 · 9~12 μ . Strongyles (b) smooth, nearly straight or slightly curved, measuring 440~620 · 11~18 μ . Orthotriaenes (c) with straight, sharply pointed rhabdome, which measures 530~620 · 18~23 μ , and very slightly curved, sharply pointed, smooth cladi of 400~480 · 18~23 μ . Oxyasters (d) distributed sparsely in choanosome, with sharply pointed 8 rays, measure 20~25 μ in diameter. Sterrasters (e, Pl. II, figs. 10, 11) ellipsoidal or spherical in shape, 80~110 · 70~95 μ in diameters; not only thickly packed and formed a thick hard cortex, but also scattered sparsely in choanosome. Spherules (f) very small, measuring 2~4 μ in diameter, abundant in all parts of the body.



Text-fig 2. Spicules of *Caminus awashimensis*, n. sp.: a. oxeas · 90 \times ; b. strongyles · 90 \times ; c. orthotriaene · 70 \times ; d. oxyasters · 390 \times ; e. sterrasters · 130 \times ; f. spherules · 570 \times .

Remarks: This new species is related to *Caminus chinensis* LINDGREN recorded from the Strait of Formosa, but is distinguished from the latter not only by the external form but also by the following differences in spiculations, that is (1) this species has oxeas which lacks in LINDGREN's species, (2) other megascleres such as strongyles, orthotriaenes of this species are slender than that of *C. chinensis*, and (3) the rays of oxyasters are fewer in number in this species than that of LINDGREN's species.

Occurrence: -- off Awashima, 20~30 m., Niigata Pref.

21. *Chondrilla australiensis* CARTER
(Text-fig. 3)

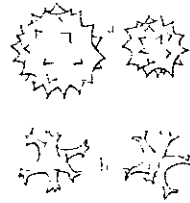
Chondrilla australiensis, CARTER (1873) p. 23, Pl. 1, figs. 10-14, 16; LENDENFELD (1885) p. 153; (1888) p. 71; LINDGREN (1897) p. 484; (1898) p. 320;

DENDY (1905) p. 132; (1916) p. 101; (1916) p. 267, Pl. 48, fig. 6; BURTON (1924) p. 207; (1934) p. 522; DENDY and FREDERICK (1924) p. 496; BURTON and RAO (1932) p. 325; DE LAUBENFELS (1954) p. 249, Text-fig. 173; LÉVI (1967) p. 14.

This species is represented by a single specimen in the collection which was obtained by Dr. USUKI from the shore of Aikawa.

The sponge is flat, spreading crust, measuring 52×36×8 mm in dimensions. It is for the most part dark brown or nearly black on the surface, owing to the strong development of pigment-granules in and beneath the cortex. The inner part of the body is fleshy color. The texture is very much like that of cartilage.

The skeleton consists principally of mesoglea. In addition, there are two kinds of microscleres present, spherasters and oxyasters. The spherasters (Text-fig. 3, a) occur chiefly in the cortex, but also sparsely in the choanosome, measuring 18~22 μ in diameter. The oxyasters (b) appear to be



Text-fig. 3. Spicules of *Chondrilla australiensis* GARTER.

a. spherasters; b. oxyasters. all ×350.

are sparsely scattered; with minutely spined rays, sometimes branched at ends and are of about the same size or a little smaller than the spherasters.

Occurrence: Sado-Aikawa.

Previously known distribution: Australia; Ceylon; Malay Area; Coast of Cochin China; Majuro Atoll; Likiep Atoll.

22. *Hyattella intestinalis* (LAMARCK)

(Pl. III, fig. 12.)

Spongia intestinalis, LAMARCK (1814) p. 439.

Hippospongia intestinalis, DENDY (1905) p. 214; DENDY and FREDERICK (1924) p. 512;

Hyattella intestinalis, LENDENFELD (1889) p. 116; DE LAUBENFELS (1948) p. 41, Pl. 6, fig. 13; TANITA (1967) p. 118, Pl. 3, fig. 11.

This species is represented by two specimens which were obtained by the writer from the shore of Awashima. The larger one (Pl. III, fig. 12) is a flattened crust, consists of irregularly anastomosed, low tubular bodies, with dimensions of 200 . 125 . 20 mm. The color is light brown in the dry state and the texture spongy.

The smaller one is 105 . 96 × 20 mm in dimensions.

Occurrence: Awashima, Niigata Pref.

Previously known distribution: -- Ceylon; Mascarene Islands; Amirante; Sandy Isle; Zanzibar; Mediterranean; Australia; West Indies; in Japan—Tajima District.

23. *Ircinia fasciculata* (PALLAS)

(Pl. III, fig. 13)

Spongia fasciculata, PALLAS (1766) p. 381.

Hircinia schulzei, DENDY (1955) p. 221, Pl. 16, fig. 3.

Hircinia mutans, WILSON (1925) p. 491, Pl. 44, fig. 2, Pl. 52, figs. 2, 4, 6, 7.

Ircinia fasciculata, DE LAUBENFELS (1948) p. 66, Pl. 13, fig. 27; LITTLE (1963)

RÜTZLER (1965) p. 48, Fig. 21; TANITA (1967) p. 118, Pl. 2, fig. 3, fig. 12.

There are three specimens of this species in the collection which secured in three different localities.

The largest one (Pl. III, fig. 13) which came from Awashima is somewhat flattened massive in shape, with dimensions of 80 × 74 × 40 mm, and attached the substratum directly by its basal part. The half of the sponge margin strongly incurved towards the osculum, probably owing to contraction in preservation after removal from the substratum. The surface is covered with conules of about 2 mm high. The dermis is very fibrous and tough. The color in the preserved state is dark brown and the texture spongy and compressible.

Occurrence: Sado-Aikawa, Awashima, Niigata Pref.; Tobishima, Yamaguchi Pref.

Previously known distribution: —Nearly cosmopolitan: Mediterranean Sea; Indian Ocean; Australia; East Indies; Atlantic coast of North America; West Indies; in Japan: Kasumi, Hyogo Pref.

24. *Thorecta elegans* LENDENFELD

(Pl. III, figs. 14, 15)

Aplysinopsis elegans, LENDENFELD (1888) p. 149.

Aplysinopsis lobosa, BURTON (1932) p. 203, Pl. 8, fig. 15, Text-figs. 5, 6; KANEKO (1958) p. 74; (1959) p. 226, Pl. 34, fig. 2, Pl. 40, figs. 5, 6, text-fig. 1.

Thorecta elegans, DE LAUBENFELS (1948) p. 113, Pl. 19, fig. 37.

Three specimens of this sponge were collected by Dr. USUKI from the coast of Aikawa, two of these are shown in Pl. III, figs. 14, 15. All of them consist of two or several branching tubes. The pores are very small and abundant and the oscules are represented by the large apical openings. The surface is covered with conules of 1~2 mm high. They are flesh colored in external appearance in the preserved state but more or less yellowish within. The consistency is spongy in spirit but rather hard in the dry state.

The largest one measures 91 × 75 × 36 mm in dimensions.

Occurrence: Sado-Aikawa.

Previously known distribution: North Australia as far north as Jervis Bay.

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再び佐渡局辺海城の海綿について

谷田 専治

1965年に著者は佐渡局辺海城から採られた海綿22種について報告した。それは底曳網で比較的深きところから採られたものと、相川町の新潟大学臨海実験所附近で採集されたものであった。

その後現在まで、佐渡島のオガサ島・飛鳥等の周辺から、鈴木・猪野・白身・北見・三尾・沖山の諸氏により、かなりの数の海綿が採られ、著者に同定を求められたので、ここに報告する。

本報告に記載した海綿は次の17種24種であるが、その大部分は浅海のもので、この中にはこれまでこの海城から報告されたもの5種が含まれてゐる。従つて19種は今回あらたにこの海城から報告されるもので、その中には新種1を含んでゐる。この結果、佐渡局辺から報告された海綿の種数は、石灰海綿9種、無石灰海綿36種、計45種となつた。

- 1) *Leucosolenia canariensis* MICHLUCHO-MACLAY (カサノアミカイメン)
 採集地—佐渡相川。
 分—西—世界的広分布。
- 2) *Leucosolenia gardineri* DENDY (ザータイヤアミカイメン (Pl. I, fig. 1))
 採集地—佐渡相川。
 分—オ—オカス群島、本邦及び九州の日本海側。
- 3) *Leucosolenia laxa* KIRK (カノアミカイメン (Pl. I, figs. 2, 3))
 採集地—佐渡相川。
 分—西—ニュージラント、本邦の太平洋および日本海の各地沿岸。
- 4) *Grantessa mitsukurii* HOZAWA (ミツクワダカイメン)
 採集地—佐渡相川。
 分—西—三島・館山・田辺湾・天草・田舎及び但馬沿岸。
- 5) *Haliclona permollis* (BOWERBANK) (ムラサキカイメン)
 採集地—飛鳥島・佐渡相川。
 分—西—世界的広分布。
- 6) *Haliclona tenuispiculata* BURTON (Pl. I, fig. 4)
 採集地—佐渡相川。
 分—西—マナー群島・印度洋。
- 7) *Haliclona loosanoffi* HARTMON (Pl. I, fig. 5)
 採集地—佐渡相川。
 分—西—ミッドオード港。
- 8) *Callyspongia confederata* (RIDLEY) (サライカイメン)
 採集地—佐渡相川。
 分—西—オーストラリア・マナー海域・バシレン海峡・三重県和具・但馬沿岸。
- 9) *Callyspongia elongata* (RIDLEY and DENDY) (ホソナガサライカイメン)

EXPLANATION OF THE PLATES

Plate I.

- Fig. 1. *Leucosolenia gardineri* DENDY $\times 1.4$
- Fig. 2. *Leucosolenia laxa* KIRK, dorsal view $\times 2.1$
- Fig. 3. *Leucosolenia laxa* KIRK, ventral view $\times 2.1$
- Fig. 4. *Halictoma tenuispiculata* BURTON $\times 1.6$
- Fig. 5. *Halictoma toosanoffi* HARTMAN $\times 1.2$

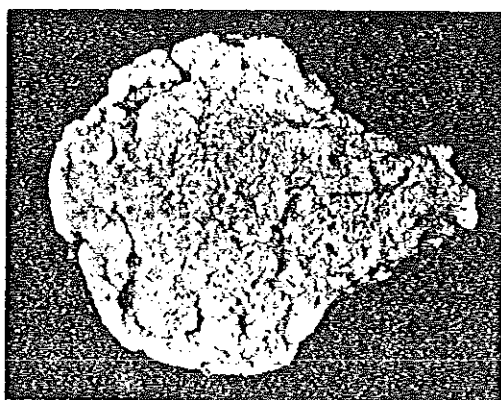
Plate II.

- Fig. 6. *Iotrochota baculifera* DENDY $\times 1.0$
- Fig. 7. *Suberites ficus* (JOHNSTON) $\times 0.6$
- Fig. 8. *Tethya japonica* SOLLAS $\times 1.5$
- Fig. 9. *Caminus awashimensis*, n. sp. $\times 0.7$
- Fig. 10. Sterrasters of *Caminus awashimensis* $\times 28$
- Fig. 11. Sterrasters of *Caminus awashimensis* $\times 280$

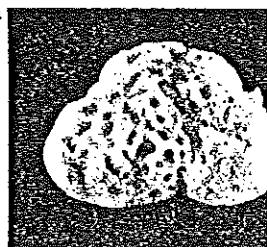
Plate III.

- Fig. 12. *Hyatella intestinalis* (LAMARCK)
- Fig. 13. *Ircinia fasciculata* (PALLAS) $\times 0.7$
- Fig. 14. *Thorecta elegans* (LENDENFELD) $\times 0.9$
- Fig. 15. *Thorecta elegans* (LENDENFELD) $\times 0.8$

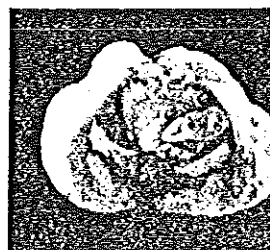
Plate I.



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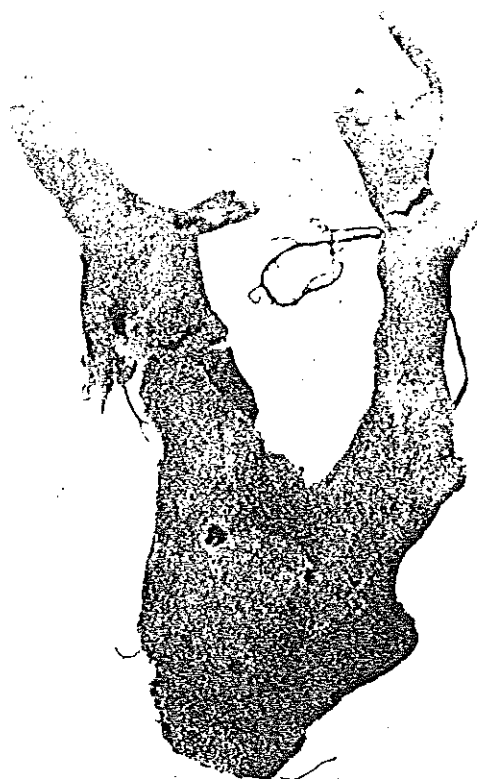


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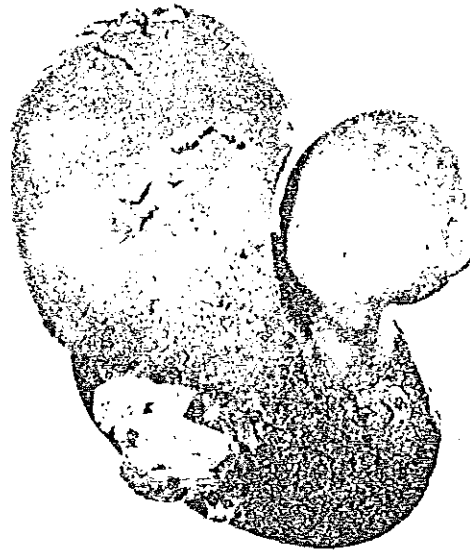
Plate II.



6



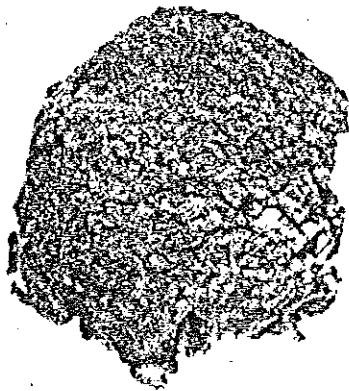
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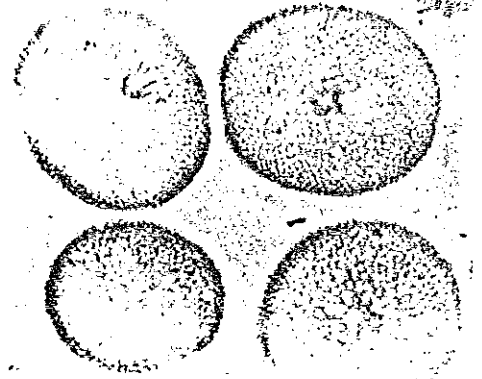
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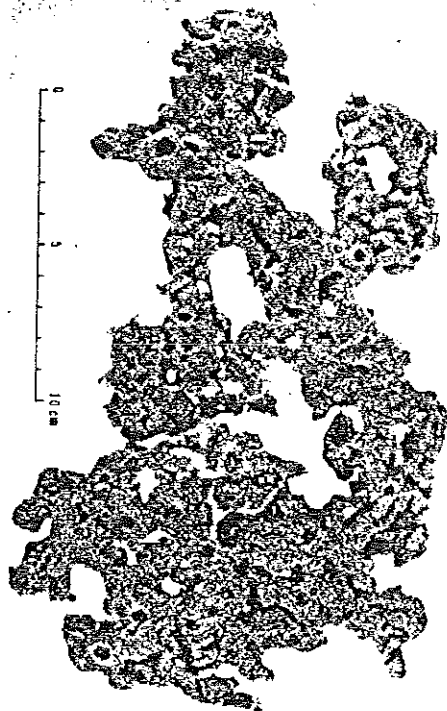


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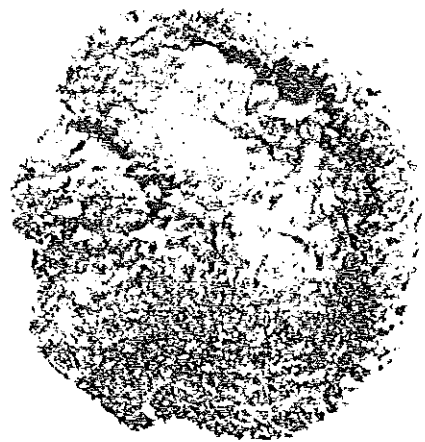


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Plate III



12



13



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