

Spongia / Demospongia /
Litt. Indo-pacifica

Demosponges from the Western Coast of Kii Peninsula, Japan*

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ABSTRACT Reported on in this paper are 13 species of the Class Demospongia collected from Shirahama and Kushimoto on the western coast of Kii Peninsula, Japan. These are as follows. *Callyspongia confoederata* (Ridley), *Callyspongia waguensis* Tanita, *Siphonochalina truncata* Lindgren, *Myxilla incrustans* (Johnston), *Strongylophora corticata* Wilson, *Petrosia volcano* n. sp., *Raspailia microacanthoxea* n. sp., *Ceratopsis ramosa* Thiele, *Ceratopsis clavata* Thiele, *Spirastrella panis* Thiele, *Theonella swinhoei* Gray, *Discodermia irregularis* n. sp., and *Discodermia japonica* Döderlein. (*Zool. Mag.* 85: 248-261, 1976)

Reported on in this paper are sponges found among the debris of set nets (for fish or lobster) from two fishing ports, Shirahama and Kushimoto, on the western coast of Kii Peninsula, Japan in 1971. The collection yielded more than twenty specimens, including thirteen species belonging to ten genera. Of the 13 species, three species are new to science, and one species new to the demospongian fauna of Japan.

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Descriptions

Class Demospongia

Order Haplosclerina

* Contribution from the Mukaishima Marine Biological Station, No. 123

Family Callyspongiidae

1. *Callyspongia confoederata* (Ridley, 1881),
Pl. 1, Fig. 1

Callyspongia confoederata: Tanita, 1961, p. 133, pl. 3, fig. 3, t-fig. 2; 1967, p. 113; 1969, p. 72; 1970b, p. 101, pl. 1, fig. 3; Hoshino, 1970, p. 23, figs. 3 and 5; 1971, p. 25; 1975a, p. 32, pl. 4, fig. 11. (for further synonymy, Tanita, 1961)

Specimens examined: KI-2-1, 2, 3 (Kushimoto, 23-XI-1971), KI-23-1, 2, 3, 4 (Kushimoto, 25-VI-1971).

Distribution in Japan: Wagu, Tokushima, Seto Inland Sea, Moroyose, Aikawa (Sado Island).

Remarks: Commensal barnacles (*Acasta* sp.), numbering from 8 to 75 individuals per specimen, were found within the body of every specimen except for KI-23-2.

2. *Callyspongia waguensis* Tanita, 1961

Callyspongia waguensis Tanita, 1961, p. 134, pl. 3, figs. 4 and 5, t-fig. 3; 1970a, p. 89, pl. 1, fig. 5, pl. 2, fig. 6.

Callyspongia sp. Hoshino, 1975, p. 32, pl.

3, figs. 6 and 7.

Specimens examined: KI-3 (Kushimoto, 23-XI-1971), KI-21 (Kushimoto, 25-VI-1971).

Distribution in Japan: Sagami Bay, Wagu, Anan Coast.

Remarks: This species was originally described by Tanita (1961) from Wagu, Mie Pref., Japan, and later recorded from Sagami Bay by the same author (1970). The writer (Hoshino, 1975) described as *Callyspongia* sp. from Anan Coast a sponge which closely resembled this species and, since typical specimens of *Callyspongia waguensis* Tanita were observed in this work, it is confirmed that the species tentatively identified as *Callyspongia* sp. in the previous paper is conspecific to this species.

Family Halicionidae

3. *Siphonochalina truncata* Lindgren, 1893, Pl. 1, fig. 7

Siphonochalina truncata Lindgren, 1898, p. 296, pl. 18, figs. 6 and 7a-b, pl. 19, figs. 8a-h; Tanita, 1961, p. 339, pl. 1, fig. 2, 1970a, p. 89, pl. 1, fig. 1, 1970b, p. 100; Hoshino, 1975a, p. 31, pl. 1, fig. b, pl. 3, figs. 4 and 5, 1975b, p. 18, pl. 1, fig. 3.

Specimens examined: KI-1-1, 2, 3, 4, 5 (Kushimoto, 23-XI-1971), KI-18-1, 2, 3 (Kushimoto, 25-VI-1971).

Distribution in Japan: Sagami Bay, Wagu, Tokushima, Seto Inland Sea, Kottoi (Sea of Japan, Yamaguchi Pref.).

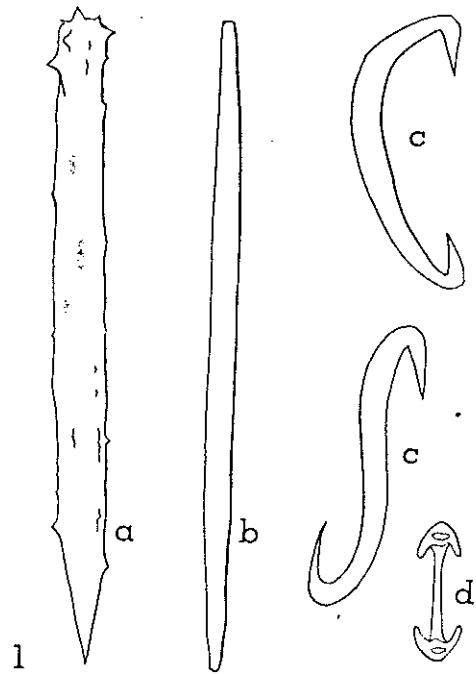
Order Poecilosclerina

Family Myxillidae

4. *Myxilla incrustans* (Johnston, 1842), Pl. 1, Figs. 4-6, T-Fig. 1

Myxilla incrustans: Burton, 1935, p. 70; Koltun, 1959, p. 108, pl. 13, figs. 3 & 4, t-figs. 61-65; Bakus, 1966, p. 494, figs. a-h; Tanita, 1968, p. 45, t-fig. 5; 1970a, p. 89, pl. 2, fig. 8; Rho et al., 1969, p. 157, pl. 2, figs. 9 & 10, t-fig. 3, (for further synonymy, Bakus, 1966)

Specimen examined: KI-4 (Kushimoto, 23-XI-1971).



Text-Fig. 1 *Myxilla incrustans* (Johnston),
a. acanthostyle $\times 325$ b. tornote $\times 400$
c. sigma $\times 600$ d. isochela $\times 1000$

External form: Irregular, massive, with several, low, exhalent chimneys, 2-4 mm across.

Dimension: $7 \times 2.5 \times 2.5$ (H) cm.

Consistency: Nonelastic in dry state.

Color: Peach Red (20 LA). Though the specimen had been dried when collected, it seemed that coloration differed little from the tint in life.

Skeleton (Pl. 1, Fig. 5): Dermal.. Tracts containing tornotes and echinating acanthostyles make up regular reticulations in mesh diameter of 100-200 μm . These tracts are 30-100 μm wide. Sigmas are found close to the tracts and isochelas are scattered or gathered in zones in the dermis. Endosome.. Ascending tracts containing slender acanthostyles running perpendicularly to surface. The tracts are 30-100 μm wide, with echinating acanthostyles. They are connected by transverse tracts of similar width. Sigmas and

isochelas are found around the tracts.

Spicule (Pl. 1, Fig. 6, T-Fig. 1): Two sorts of acanthostyle, tornote, sigma, and isochela.

Macrosclere: Acanthostyle (Pl. 1, Fig. 6 a).. straight or nearly straight, with more than ten spines at the base, and with numerous small spines throughout the length of the spicule. Size range: 163-183 (average)-210 μm long \times 11-13-17 μm wide. Auxiliary acanthostyle.. straight or nearly straight, with numerous spines coarser than those of the principal acanthostyle throughout the length of the spicule. Size range: 95-119-131 \times 8-10-13 μm . Tornote (Pl. 1, Fig. 6b).. nearly straight, smooth, uniformly thick throughout its entire length. Both ends are clearly cut, or slightly swollen and sharply pointed. Size range: 156-171-186 \times 3-4-6 μm .

Microsclere: Sigma (Pl. 1, Fig. 6c).. Two forms occur, C-shaped and S-shaped. The former are numerous and the latter rare. Size range: 41-48-52 \times 4 μm . Isochela.. arcuate type, measuring about 14 μm long.

Distribution in Japan: Common in shallow water.

Remarks: Bakus (1966) considered that *Myxilla incrustans* was originally described as *Alcyonium incrustans* by Esper (1804-15). However, Tanita (1968) described this species from Ariake Sea as *Myxilla incrustans* (Johnston) and recorded *Halichondria incrustans* Johnston, 1842 on the top line in the synonymy of the species. Since the writer failed to examine the original reports of Esper (1804-15) and Johnston (1842), he defers for the present to Tanita (1968).

Family Adociidae

5. *Strongylophora corticata* Wilson, 1925, Pl. 1, Figs. 2 and 3

Strongylophora corticata Wilson, 1925, p. 392, pl. 40, fig. 7, pl. 48, figs. 2 and 7; Tanita, 1970a, p. 89, pl. 7, fig. 7, t-fig. 1; Hoshino, 1975 a, p. 32, pl. 2, fig. 7.

Specimens examined: KI-11-1, 2, 3, KI-17

(Kushimoto, 23-XI-1971).

External form (Pl. 1, Figs. 2 and 3): Three fragmented specimens of KI-11 resemble small pieces of board in shape, with a few oscules (about 1 mm in diameter) scattered on the surface. KI-17 is irregular, massive, with two small, shallow depressions resembling Japanese motar on the upper part. One or two oscules open on the bottom surface of the two depressions, and, additionally, a few small oscules are situated on the side surface.

Dimension: Three specimens of KI-11, fragmented, several centimeters wide and less than a centimeter thick; KI-17, 7 \times 2.5 \times 4(H) cm.

Consistency: Solid.

Color: Isabella Color (05 GC), KI-11-1, 2, 3, and Ivory Buff (04 EB), KI-17 in dry state.

Skeleton: Dermal.. is formed by irregular networks of tracts containing several oxeas each, and microxeas standing and arranged perpendicularly on the tracts toward the outside. Dermal skeleton is 100-200 μm thick. Endosome.. is formed by regular networks of thick tracts containing dense strongyles and microstrongyles. The tracts generally run away perpendicularly and parallel to the surface. The meshes of networks are, roughly speaking, four to six cornered and about 600 μm in diameter.

Spicule: Strongyle, microstrongyle, oxea, and microxea.

Macrosclere: Strongyle.. slightly arched. Both ends ordinarily round, but occasionally taper to points. Size range: 281-308 (average) -355 \times 15-19-22 μm (KI-11) and 163-308-385 \times 16-26-33 μm (KI-17). Oxea.. leniently curved through the length of the spicule, tapering to a point. Size range: 146-241-315 \times 5-7-8 μm (KI-11) and 240-250-255 \times 7-8-9 μm (KI-17).

Microsclere: Microstrongyle.. leniently curved throughout its entire length, or slightly or strongly bent in the middle. Size range: 43-60-85 \times 10-12-14 μm (KI-11) and 42-52-83 \times 11-14.5-16 μm (KI-17). Microxea.. straight

or slightly bent. Size range: 45-75 μm (KI-11) and 65-78-85 \times 4-5-6 μm (KI-17).

Distribution in Japan: Sagami Bay, Anan Coast.

Remarks: This species varies greatly in external form. The specimens in this paper are board-like and massive, and that of Hoshino (1975) was large, dish-like. But the spiculation is uniform in shape and size.

(= *Petrosia volcano*) = *P. jiciformis* Poiret
n. sp., Pl. 2, Figs. 12-14
Specimen examined: KI-7 (Shirahama, 23-XI-1971).

External form (Pl. 2, Fig. 14): Irregular, massive, with three large open oscules on the summit of the body resembling craters. The three oscules extend uniformly in width through the middle part of the body to the substratum as cloaca. The surface of the sponge is smooth but uneven.

Dimension: 10 \times 4 \times 5(H)cm.

Consistency: Solid or stony.

Color: Van Dyke Red (26 PE) or Madder Brown (23 OG)

Skeleton (Pl. 2, Fig. 12): This sponge possesses typical skeletal structure of the genus *Petrosia*. The endosome skeleton is constituted by perpendicular and parallel tracts to the surface containing numerous strongyles. The uppermost parallel tracts are dermal skeleton or dermis in cross section. The reticulations of these tracts are secondarily connected by single strongyle or very slender tracts containing a few strongyles.

Spicule (Pl. 2, Fig. 13): Two categories of strongyle. Strongyle.. gently curved, with uniform thickness throughout its entire length, measuring 175-281(average) \times 380 \times 12-14-17 μm . Small strongyle.. These spicules are shorter and narrower than the strongyles described above, bent in the middle or gently curved throughout their length. Spicules of this category are clearly distinguishable by size from the other, measuring 56-117-150 \times 7-9.8-12 μm .

Type specimen: KI-7 (Holotype); Deposi-

tory, Mukaishima Marine Biological Station of Hiroshima University.

Remarks: This species is different from the previously described members of the genus in external form, characterized by oscules extending uniformly in width to substratum as cloaca.

Order Axinellida

Family Raspailiidae

7. *Raspailia microacanthoxea* n. sp., Pl. 2, Figs. 8-11, T-Fig. 2

Specimen examined: KI-12 (Kushimoto, 23-XI-1971).

External form (Pl. 2, Fig. 8): Dendroid, 4-5 mm thick, 5 cm high, divaricating at a point 2 cm above the basal part. One of the branches ramifies at a point 2 cm past the preceding divarication point; one branch reaches 11 cm in total length from the basal part. Both branches taper to points. The specimen resembles a lacing braid in appearance owing to peculiar skeletal structure.

Consistency: Bristly but not stinging.

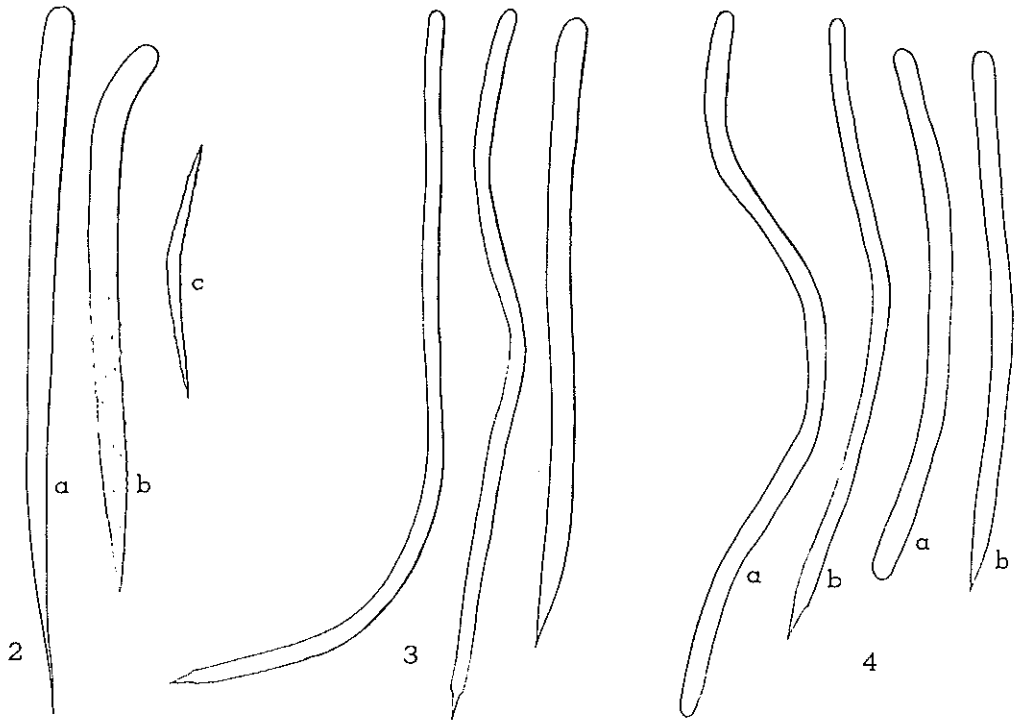
Color: Kahki (08 LD) in dry state.

Skeleton (Pl. 2, Fig. 9): Several feather-like skeletal units constituted by trachystyles and styles arrange radially around the axis of the dendroid sponge. A few styles are found on the outer tip of the feather-like structure.

Spicule (T-Fig. 2): Style, trachystyle, and microacanthoxea.

Macrosclere: Style.. straight or slightly bent, measuring 820-919(average)-1090 \times 9-17-26 μm . Trachystyle (Pl. 2, Fig. 10).. bent slightly or markedly near the base, and tapering to a point at the head. Two fifth to a half of the head part is minutely spined, the spicules measure 280-309-375 \times 7-9-12 μm . Very slender spicules considered as juveniles were not measured.

Microsclere: Microacanthoxea (Pl. 2, Fig. 11).. bent at the center of the spicule, like toxa, and bearing minute spines throughout its length. Size range: 62-80 μm .



Text-Fig. 2 *Raspailia microacanthoxea* n. sp., a. style $\times 100$
 b. trachystyle $\times 250$ c. microacanthoxea $\times 500$
 Text-Fig. 3 *Ceratopsis ramosa* Thiele, style $\times 100$
 Text-Fig. 4 *Ceratopsis clavata* Thiele, a. strongyle $\times 100$
 b. style $\times 100$

Type specimen: KI-12 (Holotype); Depository, Mukaishima Marine Biological Station of Hiroshima University.

Remarks: This species differs from any other members of *Raspailia* in spiculation, being characterized by the possession of microacanthoxea bearing minute spines throughout its entire length.

Family Axinellidae

8. *Ceratopsis ramosa* Thiele, 1898, Pl. 3, Figs. 16-19, T-Fig. 3

Ceratopsis ramosa Thiele, 1898, p. 58, pl. 4, fig. 7, pl. 8, figs. 45a-b.

Specimen examined: KI-5 (Kushimoto, 23-XI-1971).

External form (Pl. 3, Fig. 16): Dendroid,

13 cm high. The numerous flattened branches expand into one plane from a basal column 1.5 cm in diameter. The branches ramify several times and these ramification also occur in the same plane. The tips of the branches taper to points.

Color: Maple (07 GD) in the part with dermis exfoliated, and Ivory Buff (04 EB) in the part with dermis in dry state.

Skeleton (Pl. 3, Fig. 17): Observing the transverse section (7 \times 5 mm in major and minor axes) of a branch, there is an elliptical axis of 3 \times 0.5 mm in the central part of the branch. Stylote spicules project radially from this axis. This axis is comprised of dense numerous spicules arranged toward the tip of the sponge branches. Dermal skeleton i

constituted with randomly arranged raphides.

Spicule (Pl. 3, Figs. 18 and 19): Style and raphide.

Macrosclere: Style (T-Fig. 3).. The spicules vary from nearly straight to irregular sinuous. The irregular, sinuous spicules constitute the central axis of the sponge and the nearly straight styles project radially from the axis. Size range: 685-901.1(average)-1240×5-18-28 μm. The longer spicules are not invariably wider.

Microsclere: Raphide (Pl. 3, Fig. 19).. Size range: 52-60-73 μm.

Distribution in Japan: Sagami Bay.

9. *Ceratopsis clavata* Thiele, 1898, Pl. 3, Fig. 15, T-Fig. 4

Ceratopsis clavata Thiele, 1898, p. 57, pl. 5, fig. 23, pl. 8, figs. 42a-c, Hoshino, 1975a, p. 33, pl. 1, figs. 7 and 8, pl. 4, fig. 10.

Specimen examined: KI-6 (Kushimoto, 23-XI-1971)

External form (Pl. 3, Fig 15): Compressed with two, fan-shaped, elongated branches from the basal part. These flattened branches expand into the same plane.

Dimension: 6.5 cm high, 5 cm, wide, and 4-5 mm thick.

Color: Maple (07 GD) or Ivory Buff (01 EB) in dry state.

Skeleton: The sponge has an axial skeleton, spicules projecting radially from the axis, and a dermal skeleton of raphides.

Spicule: Style, strongyle, and raphide.

Macrosclere: Style (T-Fig. 4b)..markedly sinuous, measuring 730-964(average)-1150×12-24-36 μm. Strongyle (T-Fig. 4a).. markedly sinuous, measuring 780-1020-1285×8-18-26 μm.

Microsclere: Raphide.. Size range: 50-60-70 μm.

Distribution in Japan: Sagami Bay, Anan Coast.

Order Hadromerida

Family Spirastrellidae

10. *Spirastrella panis* Thiele, 1898, Pl. 4, Figs.

24-26

Spirastrella panis Thiele, 1898, p. 43, pl. 2, figs. 3 and 4, pl. 8, figs. 19a-d.

Specimen examined: KI-14 (Kushimoto, 23-XI-1971).

External form (Pl. 4, Fig. 24): This specimen is irregular, massive; it is supposed that this is merely a portion pulled off by a fishing net from the intact body. The surface of the sponge is conulous. The surface region without conules possesses numerous pores 0.1 mm in diameter. The endosome resembles a breadcrumb with numerous, small apertures.

Dimension: 10×6×7(H)cm.

Consistency: Hard.

Color: Vandyke Brown (17 PK) or Sepia (08 NL) in dry state

Skeleton (Pl. 4, Fig. 26): Vague tracts of styles through the endosome from the substratum turn into dermal skeleton expanding fanwise near the surface. The endosome is formed by irregular reticulation of thick vague tracts expanding from the substratum and free thin vague tracts of styles, resembling crumbs of bread on the whole. The ectosome is formed by a zone of spicules compactly arranged fanwise and perpendicular to the surface; spirasters densely cover this zone. Spirasters are found coarsely in the endosome also.

Spicule (Pl.4, Fig.26): Style and spiraster.

Macrosclere: Style.. smooth, straight or nearly straight. The bases of the spicules are slightly swollen. The heads ordinarily taper to points but occasionally do not. Size range; 360-434(average)-500×8-11-14 μm.

Microsclere: Spiraster.. The ratio of length to width varies remarkably. Size range:from 12×1 μm to 45×10 μm.

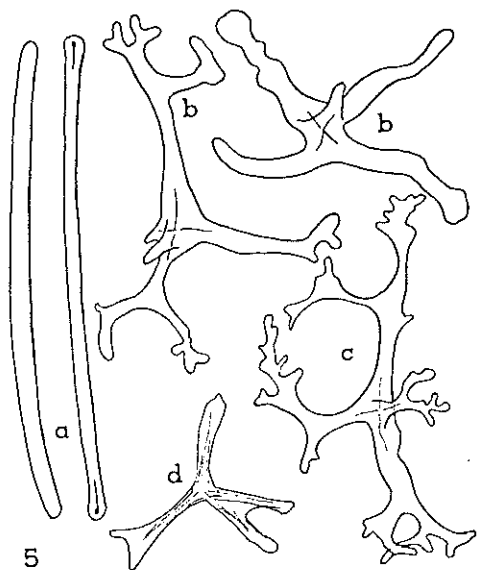
Distribution in Japan: Sagami Bay.

Order Choristida

Family Kaliapsiidae

11. *Theonella swinhoei* Gray, 1868, Pl. 4, Figs. 20-23, T-Fig. 5

Theonella swinhoei: Sollas, 1898, p. 281;



Text-Fig. 5 *Theonella swinhoei* Gray,
 a. strongyle $\times 120$ b. phyllotriaene
 $\times 125$ c. tetracrepid desma $\times 125$
 d. early form of desma $\times 80$

Thiele, 1899, p. 6; 1900, p. 52, pl. 3, figs. 3 & 4; Wilson, 1925, p. 448.

Specimen examined: KI-10 (Kushimoto, 23-XI-1971).

External form (Pl. 4, Fig. 20): Irregular, massive, with two small, circular oscules (1 cm and 1.5 cm across) opening near the summit of the body. Of the two oscules, the larger one is connected to a cloaca extending through the central part of the body. The surface of the sponge is partially covered with bryozoans, barnacles, and calcareous algae.

Dimension: $3 \times 5 \times 7$ (H) cm.

Color: Etruscan Red (21 KC) when collected. This coloration is probably the same in life.

Skeleton: Dermal.. is principally constituted by phyllotriaenes arranged in the surface and by microstrongyles congregated to cladomes of phyllotriaenes. Endosome.. is formed by solidly interlocking desmas and vague

tracts of strongyles through gaps in the desma skeleton.

Spicule: Phyllotriaene, tetracrepid desma, strongyle, and microstrongyle.

Macrosclere: Phyllotriaene (T-Fig. 5b).. rhabdome about $130 \mu\text{m}$ long, $10\text{--}15 \mu\text{m}$ thick ordinarily tapering to a point, occasionally strongylate. Clads are commonly $80\text{--}250 \mu\text{m}$ long, and $10\text{--}15 \mu\text{m}$ wide. Strongyle (T-Fig. 5a).. straight or nearly straight, with rounded ends, measuring $385\text{--}508$ (average) $\text{--}610 \times 8\text{--}10.1\text{--}12 \mu\text{m}$. Tetracrepid desma (Pl. 4, Figs. 21 & 22, T-Fig. 5c).. These spicules are up to 1 mm in total diameter, with four irregular, rugose epactines; epactines are about $30 \mu\text{m}$ in width near the origin of the spicule, without tubercles. The tubercles are greatly developed on the ends of each epactine.

Microsclere: Microstrongyle (Pl. 4, Fig. 23).. ordinarily bent in the middle, occasionally nearly straight, measuring about $20 \times 3 \mu\text{m}$, with roughened surface.

Distribution in Japan: Kushimoto (the first record from Japan)

Remarks: This species is newly recorded from the neighborhood of Japan. Since Gray (1868) first described it from Formosa, many other authors have recorded this species from localities in the Western Central Pacific. Its occurrence in Japan is the northernmost yet recorded. *Theonella swinhoei* is probably distributed along the warm current (Kuroshio) from the Central Pacific to the vicinity of Japan.

12. *Discodermia irregularis* n. sp., Pl. 5, Figs. 28-34

Specimen examined: KI-15 (Kushimoto, 23-XI-1971).

External form (Pl. 5, Fig. 28): Irregular, massive sponge. It appears that the basal part of the sponge attaches to a rocky substratum. It is at first sight difficult to recognize as a sponge because of its resemblance to stone bored by lithophagous molluscs. Numerous exhalant apertures of *ca* 1 mm

diameter open on the surface of the body.

Dimension: $3 \times 4 \times 8$ (H)cm.

Color: Gray or White in dry state.

Consistency: Stony.

Skeleton: Dermal.. is formed by phyllotriasenes arranged compactly on the surface of the sponge and a zone of microstrongyles covering phyllotriasenes. Endosome (Pl. 5, Fig. 29).. is constituted by rigidly fused desmas and microxeas scattered around the desma skeleton.

Spicule (Pl. 5, Fig. 30): Phyllotriasene, tetracrepid desma, microstrongyle and microxea.

Macrosclere: Phyllotriasene (Pl. 5, Figs. 31-34).. Rhabdomes are *ca* 200 μ m long, clads 400-500 μ m long. Each clad invariably bifurcates near the point about 150 μ m from the center of the cladome. The bifurcated branches may again bifurcate. Tetracrepid desma (Pl. 5, Fig. 32).. about 600 μ m in total diameter. Epactines are about 300 μ m long, bifurcate, and swell in places; the tips of epactines swell tuberculously. The axial thread lies near the origin of the spicules.

Microsclere: Microstrongyle.. cudgel-like. short, with minute spines throughout. Size range: 10-16 μ m. Microxea.. straight or slightly bent in the middle, with minute spines throughout. Size range: 55-61(average) $-75 \times 2-3 \mu$ m.

Type specimen: KI-15 (Holotype); Depository, Mukaishima Marine Biological Station of Hiroshima University.

Remarks: This species differs from the other members of the genus *Discodermia* in its lack of long oxeas and microacanthostyles.

13. *Discodermia japonica* Döderlein, 1883, Pl. 5, Fig. 27

Discodermia japonica Döderlein, 1883, p. 72, pl. 5, figs. 1 and 2, pls. 6 and 7; Sollas, 1888, p. 329; Lendenfeld, 1903, p. 129; Burton et Rao, 1932, p. 306; Tanita, 1961, p. 133, pl. 4, fig. 12; 1970b, p. 102, pl. 2, fig. 11; Hoshino, 1975a, p. 34, pl. 2, fig. 9

Specimen examined: KI-24 (Kushimoto, 25-VI-1971).

External form (Pl. 5, Fig. 27): Cudgel-like sponge, $8 \times 8 \times 9$ (H)cm. Eight trunks ramify around the base. Each trunk has a hollow on its summit and several oscules open in the hollow.

Consistency: Stone-like.

Color: Maple (07 GD) or Ivory Buff (04 EB).

Skeleton: Dermal.. is formed by phyllotriasenes arranged compactly all over the endosome, microstrongyles around the phyllotriasenes, and microacanthostyles standing perpendicularly toward outside from the surface of the phyllotriasenes. Endosome.. primarily formed by irregularly, substantially fused desmas. Vague tracts of large oxeas run vertically to the surface through gaps in the principal desma's skeleton; microstrongyles are scattered.

Spicule: Phyllotriasene, desma, large oxea, microacanthostyle, microxea, and microstrongyle.

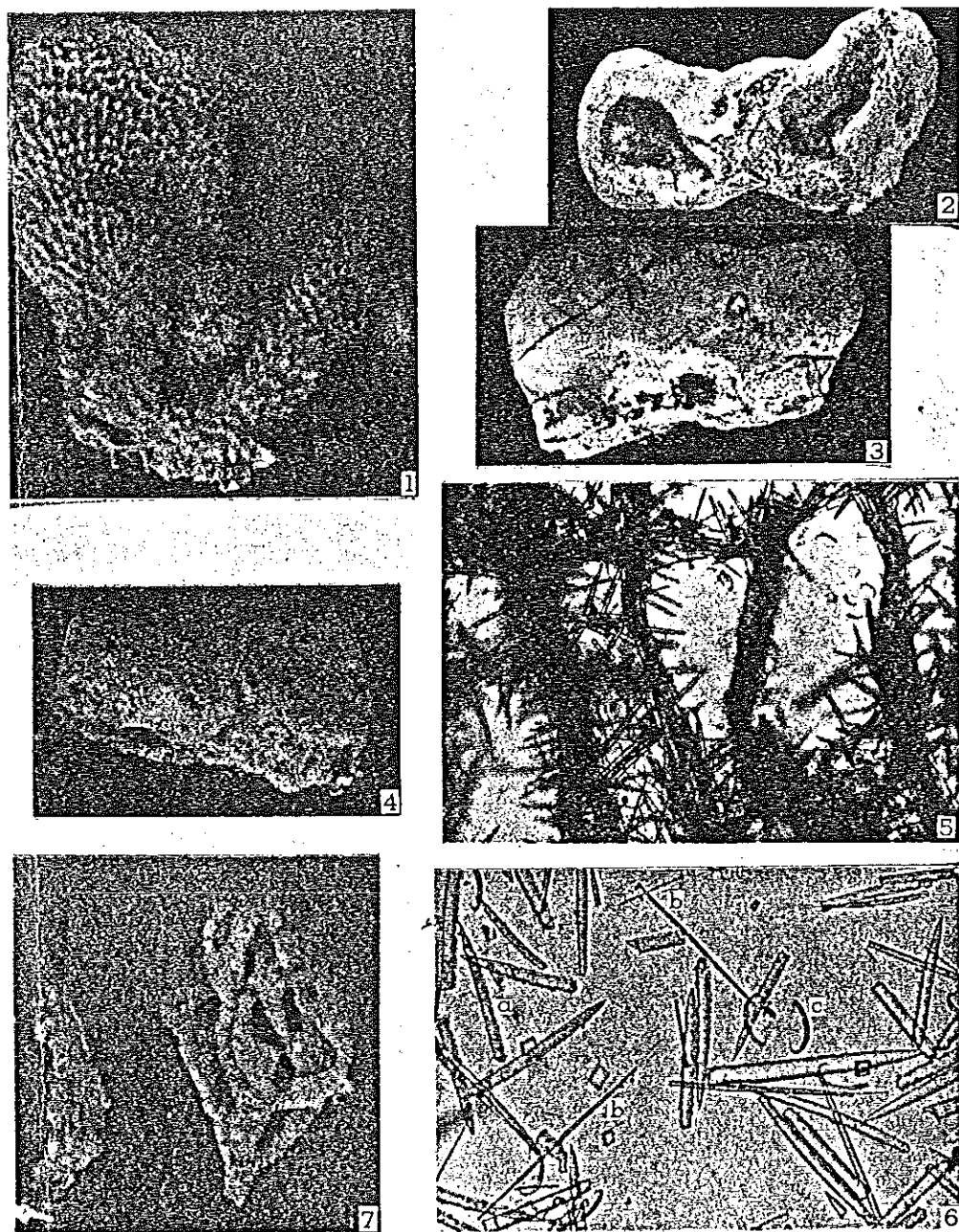
Macrosclere: Phyllotriasene.. Clads are 300-500 μ m long, about 60 μ m wide near their origin, and bifurcate in places. Rhabdomes are 300-250 μ m long, 40-60 μ m wide. The heads of rhabdomes ordinarily taper to points, but occasionally strongly latulate. Tetracrepid desma.. Epactines are 250-300 μ m long, 40-60 μ m wide, with numerous tubercles throughout their entire length. The heads of epactines swell tuberculously. Large oxea.. thin, long, slightly sinuous, more than $800 \times 5-7 \mu$ m. Unsnapped spicules can not be mounted on slide of spicules.

Microsclere: Microstrongyle.. short, bean-shaped, rough, measuring *ca* $15 \times 4 \mu$ m. Microxea.. straight or slightly bent, rough, occasionally swollen slightly in the middle portion of the spicule, measuring *ca* $70 \times 3 \mu$ m. Microacanthostyle.. straight, with long-spined base, and with sparsely spined body. The head tapers to a point. Size range: 76-99 (average) $-165 \times 5-7-8 \mu$ m.

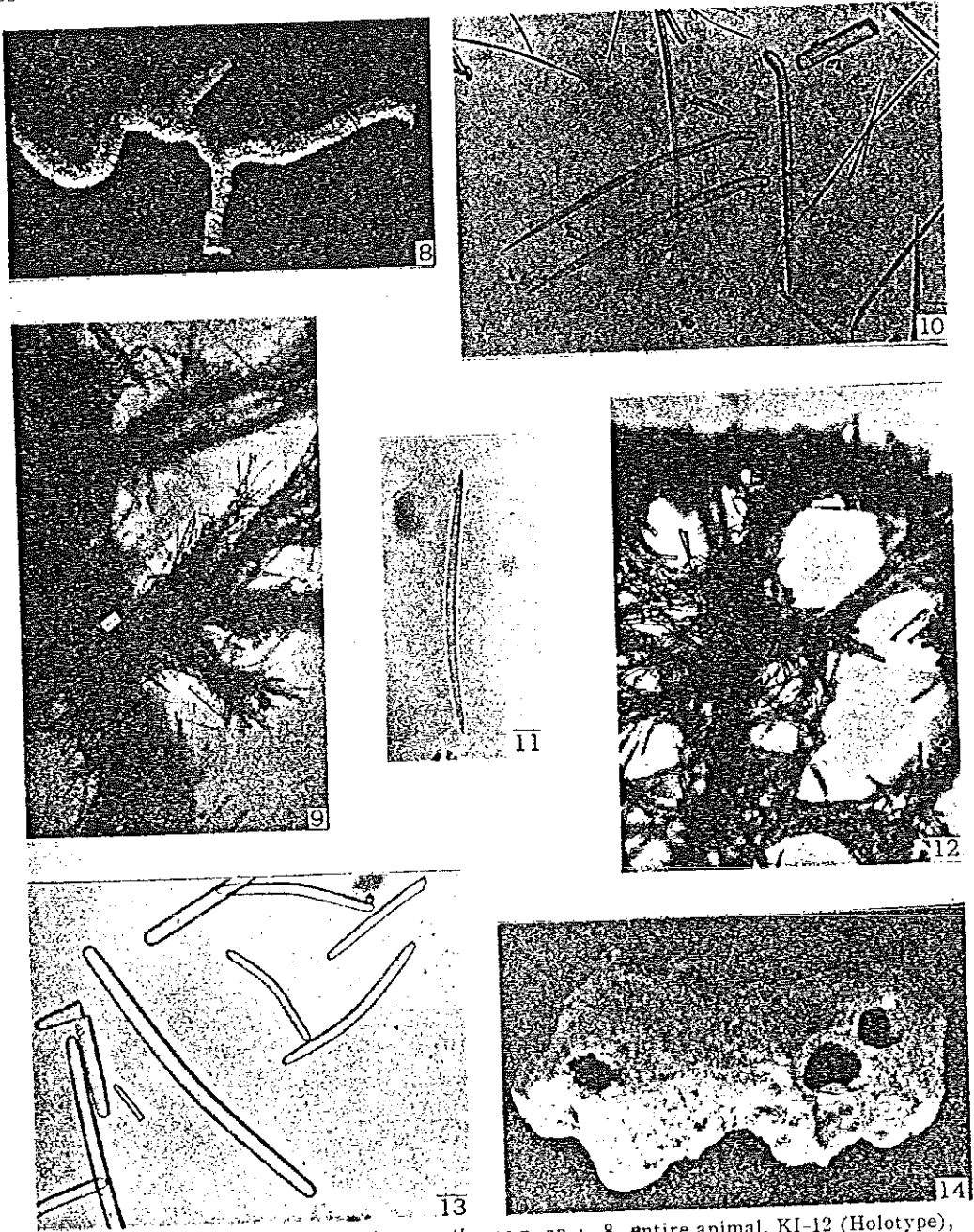
Distribution in Japan: Sagami Bay, Wagu, Anan Coast.

References

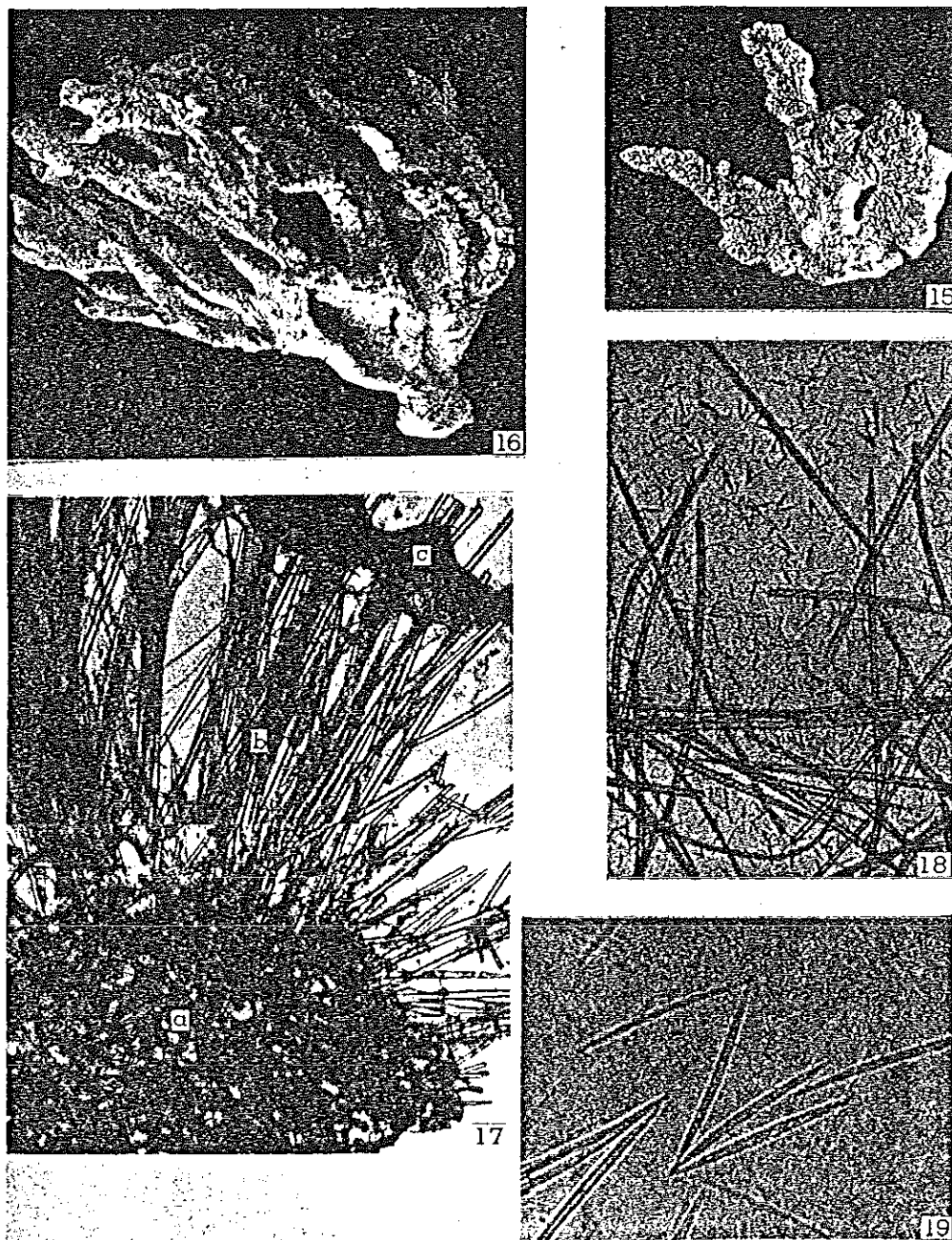
- BAKUS, G. J. (1966) Marine poeciloscleridan sponges of the San Juan Archipelago. Washington. *J. Zool. Lond.* 149: 415-521.
- BURTON, M. (1935) Some sponges from the Okhotsk Sea and the Sea of Japan. *Issled. Morel. SSSR* 22: 64-81.
- AND S. RAO (1932) Report on the shallow water sponges in the collection of the Indian Museum. *Rec. Ind. Mus.* 34(3): 299-356.
- DÖDERLEIN, L. (1883) Studien an japanische Lithistiden. *Zeit. Wiss. Zool.* 40:62-104.
- HOSHINO, T. (1970) 15 sponges (Demospongiae) obtained from Mukaishima and its adjacent waters. *Bull. Biol. Soc. Hiroshima Univ.* 36: 21-26. (in Japanese)
- (1971) Sponge fauna of Seto Inland Sea (Demospongiae, Calcarea), *Bull. Biol. Soc. Hiroshima Univ.* 38: 21-30. (in Japanese)
- (1975a) Nine species of Demospongia from the coast of Hibiki-Nada, Sea of Japan. *Bull. Biol. Soc. Hiroshima Univ.* 41: 17-21.
- (1975b) The sponges of the Anan Coast. *Zool. Mag.* 84(1): 30-38. (in Japanese)
- KOLTUN, V. M. (1959) Silicospongin sponges of the northern and far eastern seas of the USSR. *Opred. Faune SSSR* 67: 1-227. (in Russian)
- LAUBENFELS, M. W. DE (1936) A discussion of the sponge fauna of the Dry Tortugas in particular and the West Indies in general, with material for a revision of the families and orders of the Porifera. *Pap. Tortugas Zool.* 30: 1-225.
- LENDENFELD, R. VON (1903) Tetraxonida. *Das Tierreich* 19: 1-168.
- LINDGREN, N. G. (1898) Beitrag zur Kenntnis der Spongienfauna des malayischen Archipels und der chinesischen Meerenge. *Jahrb. Abt. Anz.* 20: 283-378.
- RHO, B. J., H. S. KIM AND C. J. SIM (1965) Marine sponges in South Korea (1962-1964). *Korean Res. Inst. Bett. Liv. Ewha Univ.* 3: 153-160.
- SOLLAS, W. J. (1888) Report on the Tetraxonida collected by H. M. S. "Challenger", during the years 1873-76. *Sci. Res. Challenger, Zool.* 25: 1-458.
- TANITA, S. (1961) Report on the sponges collected from the Kurushima Strait, Inland Sea. *Mem. Ehime Univ. Sci. Ser. B* 4: 151-170.
- (1967) Report on the sponges obtained from the adjacent waters of Sado Island Sea. *Bull. Jap. Sea Reg. Fish. Res. Lab.* 14: 43-66.
- (1968) Sponge-fauna of the Sea of Japan. *Bull. West Sea Reg. Fish. Res. Lab.* 36: 39-63.
- (1969) Further studies on the sponges obtained from the Sado Island and its adjacent waters. *Bull. Jap. Sea Reg. Fish. Res. Lab.* 21: 67-88.
- (1970a) Sponge fauna of Sagami Bay, especially the Demospongiae. *Tohoku Reg. Fish. Res. Lab.* 30: 1-72. (in Japanese)
- (1970b) The sponges in the collection of the Kurushima Museum. *Bull. Tohoku Reg. Fish. Res. Lab.* 30: 99-105. (in Japanese)
- THIELE, J. (1898) Studien über pazifische Spongien I. *Zoologica* 24: 1-72.
- (1899) Studien über pazifische Spongien II. *Zoologica* 24: 1-33.
- (1900) Kieselschwämme von Teufelsberg. *Abhandl. Senkenb. Naturf. Ges.* 21: 1-80.
- WILSON, H. V. (1925) Siliceous and calcareous sponges collected by the U.S. Fish Commission Steamer "Albatross" during the Philippine Expedition 1907-10. *U.S. Nat. Mus. Bull.* 100. 2 273-506.



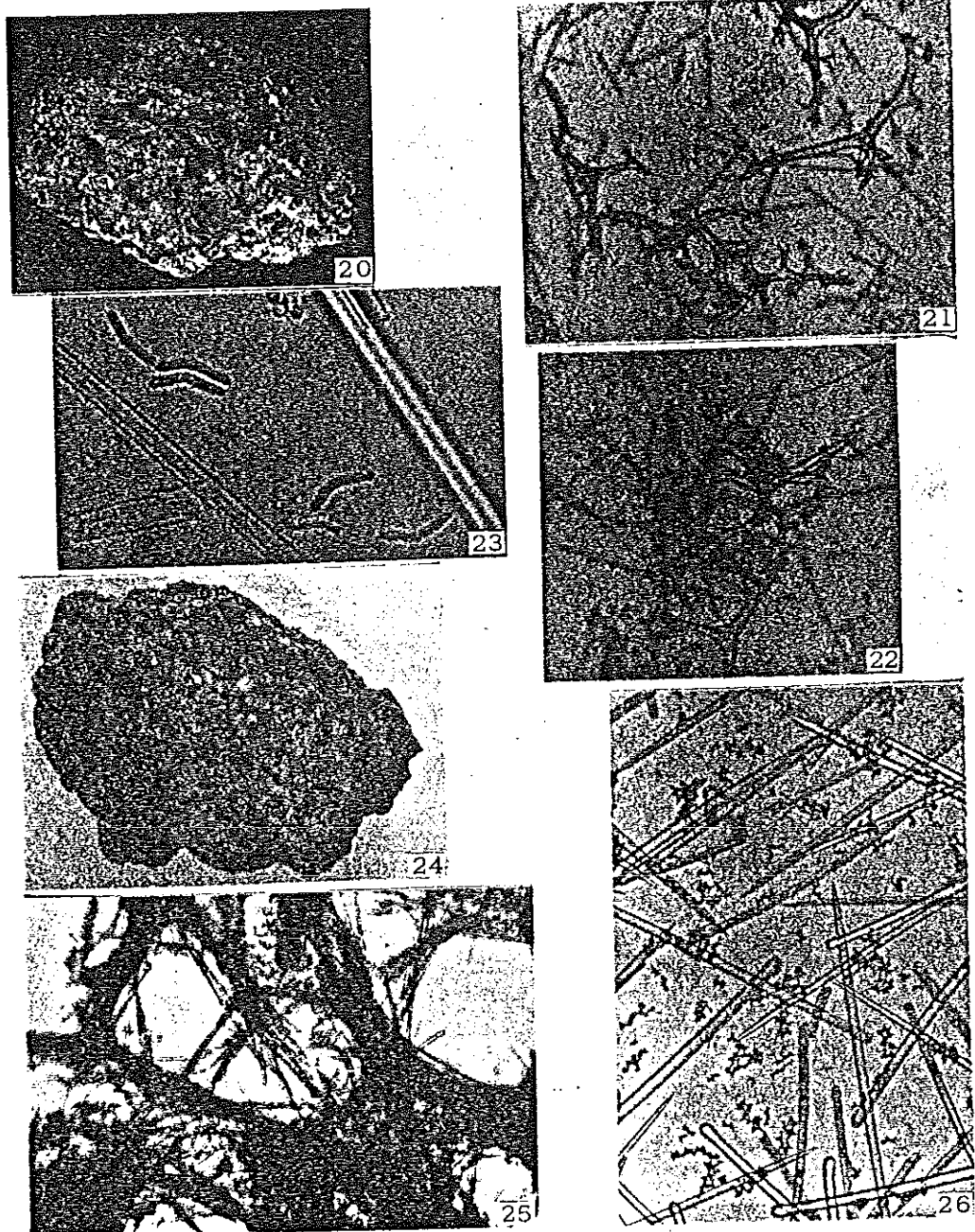
Pl. 1 Fig. 1 *Callyspongia confederata* (Ridley), entire animal, KI-2-3, $\times 0.40$
 Figs. 2 and 3 *Strongylophora corticata* Wilson, top and side view, KI-17, $\times 0.75$
 Figs. 4-6 *Myxilla incrustans* (Johnston); 4, entire animal, KI-14, $\times 0.66$;
 5, cross section showing primary (vertical in picture) and secondary
 spiculo-fiber, $\times 670$; 6, spicules, acanthoyle (a), tylote (b), and
 sigma (c) $\times 1100$
 Fig. 7 *Siphonochalina truncata* Lindgren, entire animal, KI-1-2, 4 $\times 0.33$



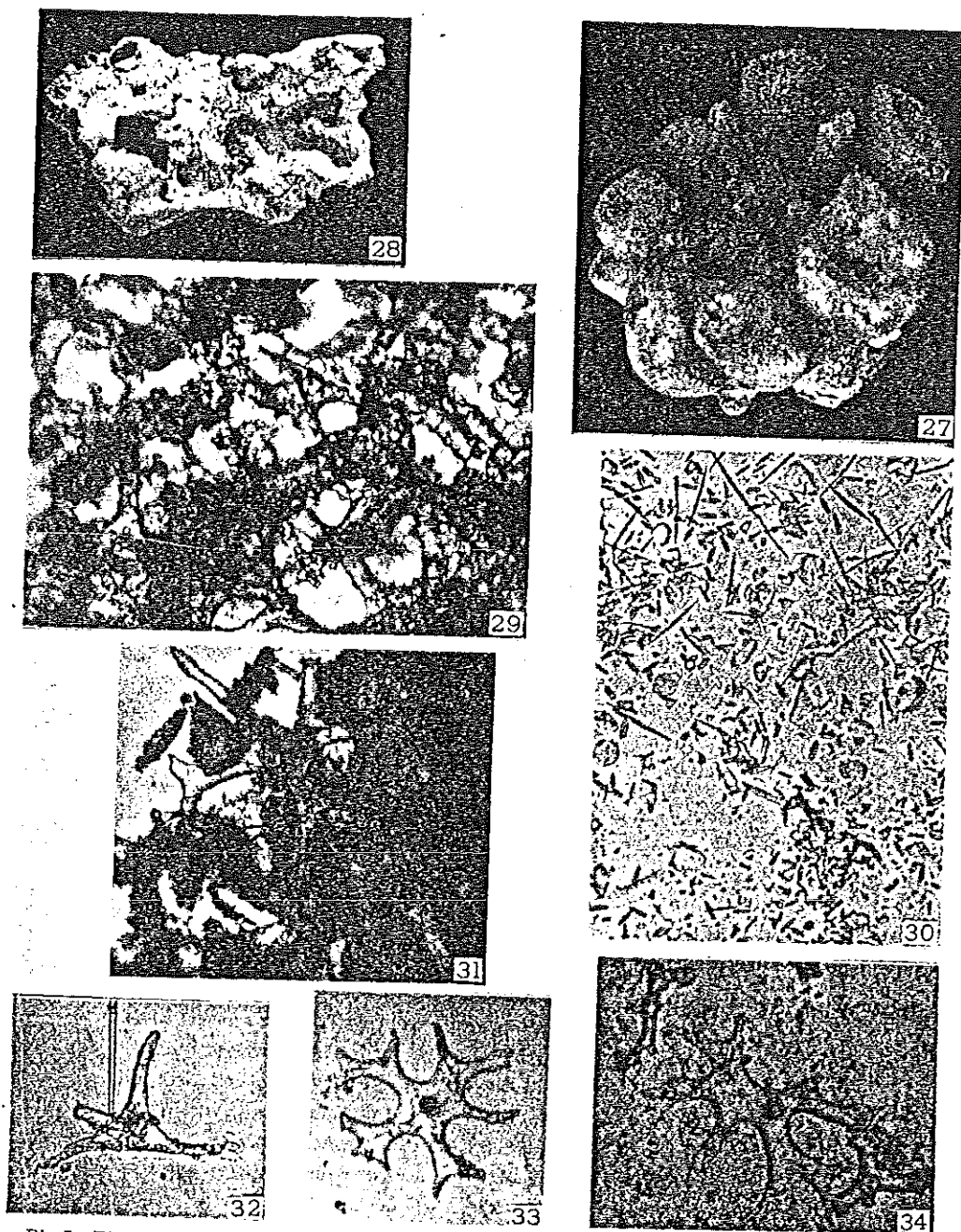
Pl. 2 Figs. 8-11 *Raspailia microacanthoxea* n. sp.; 8, entire animal, KI-12 (Holotype), $\times 0.5$; 9, cross section (Arrow indicates center of body.), $\times 33$; 10, trachystyles, $\times 120$; 11, microacanthoxea bearing spines throughout, $\times 500$
 Figs. 12-14 *Petrosia volcano* n. sp.; 12, cross section of endosome, $\times 45$; 13, strongyles, $\times 170$; 14, entire animal, KI-17 (Holotype), $\times 0.66$



Pl. 3 Fig. 15 *Ceratopsis clavata* Thiele, entire animal KI-6, $\times 0.66$
 Figs. 16-19 *Ceratopsis ramosa* Thiele; 16, entire animal, KI-5, $\times 0.5$; 17,
 cross section, central axis (a), radiating spicules (b), and dermal
 raphides (c), $\times 100$; 18, spicules, $\times 55$; 19, raphides, $\times 500$



Pl. 4 Figs. 20-23 *Theonella swinhoei* Gray; 20, entire animal, KI-10, $\times 0.66$;
 21 and 22, tetracrepid desma, $\times 25$; 23, microstrongyle, $\times 520$
 Figs. 24-26 *Spirastralla panis* Thiele; 24, entire animal, KI-14, $\times 0.6$;
 25, endosome skeleton (directing arrow to surface), $\times 35$; 26,
 spicules, $\times 120$



Pl. 5 Fig. 27 *Discodermia japonica* Döderlein, top view of entire animal, KI-24, $\times 0.66$
 Figs. 28-34 *Discodermia irregularis* n. sp.; 28, entire animal, KI-15 (Holotype), $\times 0.6$; 29, endosome desma skeleton, $\times 40$; 30, spicules, $\times 200$; 31, dermal phyllotriaene covered with microstrongyles, $\times 60$; 32, early form of tetracrepid desma, $\times 80$; 33 & 34, phyllotriaene, $\times 50$