

On some Muriceid Corals belonging  
to the Genera *Filigella* and *Acis*.

By

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*With 2 plates.*

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The four species of Muriceid corals, which form the subject of this paper, belong to the genera *Filigella* and *Acis*. Three of these species seem to be new to science and will be briefly described herein. The specimens studied are preserved in the Alcyonarian collection of the Science College.

To Prof. IJIMA and Dr. YATSU I offer my best thanks for their kind help in the preparation of this paper.

*Filigella* GRAY.

*Filigella* GRAY, Ann. Mag. Nat. Hist., (4) 11, 1868, p. 443.

*Elasma* STUDER, Arch. Naturgesch., 53, 1, 1887, p. 58.

*Elasmogorgia* WRIGHT & STUDER, Challenger Report, 1889,  
p. LVI and p. 132.

*Filigella mitsukurii*, n. sp.

(Pl. I., fig. 1; Pl. II., figs. 7-9).

This species is represented by thirteen specimens, of which only three are perfect. They are all extremely thin, thread-

like and flexible, measuring 0.6–0.8 mm. in diameter in the middle parts and 1.5 mm. at the swollen end; unbranched except three specimens which send out a branch at right angle. The stems or portions of stems obtained measure 4.5, 5.5, 8.5, 9.5, 12.0, 14.5, 14.5, 15.5, 25, 29, 31, 41 cm. in length. The length of branches in the three specimens just mentioned measures: 18, 19, 21 cm.

The majority of the specimens before me are imperfect, being broken at one—assumably the basal—end. The preserved end (Pl. II., fig. 7) is swollen and blunt, and greatly resembles the thicker end in GRAY'S figure (l.c., p. 444, fig. 2). This end was proved in longitudinal sections to be the growing or the distal end of the colony, i.e., the thin horny lamellæ are here found to be convex towards the tip. In the three complete colonies before me, the other end also terminates bluntly, as shown in Pl. I., fig. 1. This end is narrower than the other and resembles the thinner end in GRAY'S figure. In all the three cases, the end in question was also proved to be the growing end. These colonies, therefore, must have been free—not attached—in the nature.

The spicules of the cœnenchyma are fusiform, straight or slightly curved, with tuberculated warts. Those near the surface are thicker and show more pronounced warts. Below these are others more slender in shape and provided with weaker warts in a smaller number. The measurements of some of the spicules are: 0.14 × 0.04, 0.19 × 0.05, 0.2 × 0.09, 0.25 × 0.08, 0.28 × 0.05, 0.29 × 0.05, 0.29 × 0.11, 0.29 × 0.12, 0.33 × 0.11, 0.35 × 0.11, 0.37 × 0.13, 0.39 × 0.09 mm.

The polyp-cells are irregularly disposed around the stem, and sometimes show slight indications of subalternate arrangement. They are usually 1–3mm. apart, but are often more crowded.

They run up very near to tip of stem, but stop short of it. The calyx, into which the anthocodia can be completely withdrawn, is conical, 1 mm. in diameter at base, not higher than 0.5 mm., and is covered with spicules which resemble those of the general cœnenchyma but are smaller, those at the tip of calyx being smallest.

The spicules of the base of tentacles are arranged transversely, forming a complete ring; they number 3-6, are curved upwards, and show weakly developed warts. The spicules of the aboral side of tentacles, are similarly characterized but are arranged longitudinally *en chevron*. They are 0.02-0.03 mm. in diameter and 0.23, 0.25, 0.26, 0.26, 0.27, 0.28, 0.31, 0.32, 0.36 mm. in length.

The axis is entirely horny, soft, flexible, 0.25 mm. in thickness and dark brown in colour.

The spicules are white, probably due to the action of formalin, in which the specimens have been preserved for nearly five years.

Locality: south of Jogashima, Sagami Bay, 70 fathoms.

There is another specimen in our museum which agrees well with those above described, but differs in the color of the cœnenchyma, which is pale brown.

Locality: 5 kilometers south-west of Jogashima.

This species may be readily distinguished from *F. filiformis* (WR. & ST.) by the mode of ramification and by the size of the spicules of operculum; from *F. flexilis* (HICKSON), by the size of the spicules of cœnenchyma; and from *F. gracilis* GRAY, by the denser occurrence of polyp-cells.

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The genus *Filigella* was established by GRAY on the basis of a specimen of a Muriceid coral (*F. gracilis*) obtained on the

Brasilian coast. The essential characteristics of this singular genus and species are as follows: Coral free, thread-like, simple, with rounded ends; axis horny; cortex formed of fusiform spicules placed closely side by side; polyp-cells alternate, short, broad, conical, covered with spicules as the stem.

In the Challenger Report, WRIGHT and STUDER described a species, *Elasmogorgia filiformis*, which comes very near to GRAY'S species above mentioned. But owing to the fact that his description was not satisfactory enough for identification and that his type specimen had been lost, they called their specimen *Elasmogorgia* (previously *Elasma*), avoiding GRAY'S generic name *Filigella*. Quite recently NUTTING has reported from the east Pacific two colonies determined to be *Elasmogorgia filiformis*.

A third species, *Elasmogorgia flexilis*, was added to the genus by HICKSON. Two of the twelve specimens examined by him were provided with a small disc for attachment.

The peculiar character of the colony described by GRAY, namely, that its both ends showed no sign of attachment or insertion into the sand, which fact was doubted by WRIGHT and STUDER, reappears in the complete specimens before me, both their ends having growing points as already described. That the coral is neither a creeping nor a climbing form, is proved by the fact that the polyp-cells are found entirely surrounding the stem. At the same time, since the majority of my specimens have broken ends, the possibility that under circumstances the species may be attached to some foreign body cannot be excluded. Possibly it may be that the character of the base differs in different colonies of the same species.

Since GRAY'S *Filigella* was established with a fairly satisfactory description and also with illustrations, this name has the

right to be retained and the name *Elasmogorgia* may well be dropped.

After my study, the diagnosis of the genus may be modified as follows :

Colony flexible, filiform, simple or slightly branched, free or fixed; distal end truncated, slightly swollen; proximal end rounded and either free or with disc for attachment; axis horny; cœnenchyma thin, formed of small warty spindles; polyp-cells subalternate or irregularly disposed; anthocodia with operculum<sup>1)</sup> composed of a number of very slender spicules transversely arranged at tentacle-base and arranged *en chevron* on the aboral side of tentacles, wholly retractile into low conical verrucæ provided with spicules resembling those of general cœnenchyma.

#### *Acis* DUCHASSAING & MICHELOTTI.

*Acis* DUCH. & MICH., Mém. corall., 1860, p. 19.

*Acis* DUCH. & MICH., Supplém. Mém., 1864, p. 14.

*Acis* KÖLL., Icones Histologicae, 1864, p. 136.

*Acis* RIDL., Ann. Mag. Nat. Hist., (5) X., 1882, p. 126.

*Acis* STUD., Arch. Naturgesch., 53, I, 1887, p. 58.

*Acis* WR. & ST., Challenger Report, 1889, p. LVI and p. 121.

#### *Acis pustulata* WR. & ST.

*Acis pustulata* WR. & ST., Challenger Report, 1889, p. 122.

(Pl. I., fig. 2; Pl. II., figs. 10-12).

Several specimens of a Muriceid coral have come into my possession, which I do not hesitate to identify with *Acis pustulata*.

<sup>1)</sup> Whether the type species also had an operculum of the same construction cannot be decided, as the specimen of it was lost.

They exhibit in details a perfect identity with one another, except in the color of spicules. Namely in one specimen the spicules are white, while in all the other specimens they are purplish red.<sup>2)</sup>

The following description is based upon the specimen with white spicules, which is shown in fig. 2.

The polyp-cells are arranged irregularly on the anterior surface of the colony and subalternately in two rows on terminal twigs, with the exception of a branch on which they occur in reversed arrangement. The numerical density of polyp-cells on the branches varies considerably, usually 12-14 in one centimeter. On tip of the twigs there always exist a pair of polyps. The polyp-cells occur only exceptionally on the posterior surface of the colony.

The polyp-calyx is, when retracted, 1 mm. in diameter and 0.3 mm. in height. It is composed of two kinds of scaly spicules arranged in two circles. The one, arranged in one or two transverse rings at the base of calyx, is thick, dentate and elongate or slightly rounded, the outer surface being densely covered with large tuberculated warts, which often develop into high pointed protuberances. The size varies a great deal. The other kind of the spicules is scaly, with marginal teeth and notches; the portion above the nucleus is generally somewhat elongated, armed with long teeth (usually somewhat more distinctly pointed than shown in fig. 10), and provided with median warts, which unite themselves into comb-like ridges. The dimensions of this kind of spicules are:  $0.48 \times 0.23$ ,  $0.45 \times 0.21$  mm.

The spicules of the second kind are loosely set and movable. In typical cases they are arranged regularly in two transverse rings. The upper ring is composed of eight spicules, arranged opposite

<sup>2)</sup> Compare HICKSON: *Alcyonaria of Maldives*, III., p. 816.

tentacles. The lower one is also composed of the same number of spicules, but these are arranged alternately with reference to those of the upper ring. In all there are thus sixteen longitudinal rows of the spicules. This arrangement seems to be peculiar to this species.

The spicules of the tentacle-base, forming a collaret, are arranged transversely in groups of three or four (Pl. II., fig. 11, a). The spicule is straight or slightly curved, usually with warts in its middle parts only. The measurements of six spicules are as follows:  $0.29 \times 0.04$ ,  $0.33 \times 0.03$ ,  $0.28 \times 0.025$ ,  $0.32 \times 0.04$ ,  $0.38 \times 0.045$ ,  $0.3 \times 0.03$  mm.

On the aboral side of tentacles there are from two to four spicules, which are disposed longitudinally and cling to the collaret spicules with their externally curved lower ends (Pl. II., fig. 11, b). The warts are well developed in the middle parts, especially on the under side of the curved parts, so that it very often happens, that the warts come in contact with the spicules of the collaret and give to the spicules an almost scaly appearance. The upper end is straight or markedly swollen and is provided with long foliaceous ridges. The measurements of five spicules are as follows:  $0.42 \times 0.05$ ,  $0.38 \times 0.04$ ,  $0.3 \times 0.06$ ,  $0.31 \times 0.04$ ,  $0.34 \times 0.35$  mm. Fig. 11 represents a typical case of the spiculation of this region.

The dorsal side of tentacles above the opercular spicules is provided with spicules arranged in pairs forming two longitudinal series (Pl. II., fig. 12, a-b). The first pair usually greatly exceed other pairs in size (0.2 mm. in length); they are straight or curved and are sometimes provided with very well developed warts. The rest of the pairs, on the other hand, become gradually smaller towards the tip of the tentacle. On the dorsum of each pinnule is

a slender spicule resembling the floating rib of mammals (Pl. II., fig. 12, c).

The cœnenchyma is formed of two kinds of spindle-shaped spicules. The one kind is very large, lies exposed on the surface and can be easily seen with the naked eye. It presents the form of a spindle or rhombus, sometimes with bifid end. They are closely set, so as to make a continuous pavement. They are especially large and conspicuous on the posterior surface of the colony, reaching 4 mm. in length by a breadth of less than 0.5 mm. When well developed, they are arranged longitudinally. The outer surface shows the same sculpture as that of the lower calycinal spicules already described; the inner surface is very closely and uniformly covered with small rough grains. In the cœnenchyma of basal stem and of certain branches, the spicules are very small ( $0.42 \times 0.22$ ,  $0.52 \times 0.25$  mm.) and fusiform. Proximal to the above described kind of cœnenchyma spicules, there is the second kind consisting of smaller typical spindles with rough grains.

Locality: the coral ground of Uji Island, south-west of the Province of Satsuma, 80 fathoms; collected by the author (June 1908). The type of this species was secured by the Challenger in the Bay of Sagami, 345 fathoms.

*Acis ijimai*, n. sp.

(Pl. I., fig. 3; Pl. II., figs. 13-16).

A perfect specimen measuring 53 mm. in height and 95 mm. in breadth. The colony spreads in one plane, excepting a branch, which sets out nearly perpendicularly from that plane, a fact also observed in *Acis pustulata*. The branches are sent off



pinnately from the stem or from larger branches at an angle of 60–90°. The pinnate arrangement is not always regular in that the branches or the branchlets sometimes arise in nearly opposite pairs and sometimes alternately at intervals of up to one centimeter in length. They are often bent slightly upwards at a short distance from their origin. Both the stem and branches are cylindrical and rigid, the diameter measuring 2 mm. in the basal part of stem and 1.5 mm. in the terminal parts of final branches.

The axis is light or dark brown, and is entirely devoid of lime.

The polyp-cells are disposed all around the cœenchyma; only in terminal twigs are they arranged alternately in two rows in the plane of branching. On the tip of twigs there almost always exists a pair of polyps.

The calyx, into which the distal portion of the polyp can be withdrawn, is low and conical, measuring 0.5–0.8 mm. in height and 1–1.2 mm. in diameter at base. It is formed of scaly spicules arranged in eight longitudinal rows (Pl. II., fig. 13). Usually there are in each row two scales, of which the upper one alone seems to be movable, when the polyp is expanded. The scale is polygonal, dentate in the margin, and often provided with an apical process; the outer surface is covered with small round warts, which in the distal margin are drawn out radially (Pl. II., fig. 14).

Even when the scales on the margin of calyx are closed, the operculum is usually visible from above. On the dorsal side of tentacles there are two, or rarely three, spicules set close together side by side (Pl. II., fig. 15, b). These are usually unequal in size and slightly bent outwards. The distal extremity of these spicules, when well developed, is rounded but is provid-

ed with some foliaceous, longitudinally directed ridges, while the remaining parts show closely arranged warts. The spicules are 0.6–0.3 mm. long. Beneath these spicules, there may exist two pairs of smaller ones set *en chevron*, but these are sometimes completely obliterated (Pl. II., fig. 15, a). The sculpture on these spicules is represented only by warts. Above the large opercular spicules there are numerous, small (0.15 mm.), fusiform spicules arranged longitudinally and closely disposed (Pl. II., fig. 16, a). The pinnules are provided with a single slender spicule, resembling the floating rib of mammals (Pl. II., fig. 16, b).

The spicules of *cœnenchyma* are typical scales, slightly imbricated and polygonal or elliptical in shape. The outer surface is covered with rounded warts, just as in the case of proximal calyx-scales. The size of *cœnenchyma* scales varies generally between 2 and 4 mm. On the inner side of the superficial layer formed by the scales, there are present a few small (0.4 mm.) spicules of an irregular shape, covered with granulated warts.

The spicules are colorless, but owing to the presence of pigments in the tentacular region of the polyps, the polyp-cells appear brown with a purplish tint.

Locality: the coral ground of Uji Island, Province of Satsuma, 80 fathoms; collected by the author (June 1908).

*Acis miyajimai*, n. sp.

(Pl. I., figs. 4–6; Pl. II., figs. 17–20).

This interesting species, which is evidently new, is represented by a single dried specimen. The *cœnenchyma* is for the most part rubbed off, only the terminal parts of branches remaining intact (Pl. I., fig. 4).

The colony is about 70 cm. high and 50 cm. broad; it is branched in one plane. Since the specimen has been kept in a small box, several of the branches are distorted as seen in fig. 4. The basal stem measures 2 cm. by 1.5 cm. and is flattened in the plane perpendicular to that of the branches. The thicker branches are also compressed in the same way, while the terminal twigs are nearly cylindrical. The branching is pinnate, very rarely dichotomous. The angle and distance between two successive branches vary very much.

The axis is horny and wholly devoid of lime. Its thicker parts are blackish and the terminal parts dirty brown; it is considerably shrunk as the result of desiccation. The basal part is entirely horny and lamellar.

The polyp-cells and coenenchyma are, as already mentioned, preserved only in the terminal parts of the colony. The polyp-cells are found solely on one side of the branches. The other side of the branches is covered with a complete armour of scaly spicules (Pl. I., fig. 6 and Pl. II., fig. 17). The polyp-cells are arranged in two or more (often as many as five) subalternate irregular rows, and are usually closely set, though often leaving short intervals between adjacent cells (Pl. I., fig. 5). They are wart-like, measuring 1.5 mm. in both diameter and height.

The polyp-cells are covered with thick scaly spicules, generally arranged in eight regular longitudinal rows, just as in the case of some Primnoids (Pl. II., figs. 17, 18). The number of the scales in one longitudinal row is from two to four. Fig. 18 shows a typical polyp-cell seen *en face*. The lower scales are so firmly packed together that they do not seem to separate from one another, when the polyps are expanded; while the upper four, or sometimes all the eight scales, are loosely jointed, bending

over the contracted operculum in the state of rest. The calyx-spicules are, on the whole, scaly and wider than high; their free margin is usually rounded and rarely provided with a rounded process; the inner margin is pointed. The warts, with which the outer surface is densely covered, are round, low, and drawn out into dentation at the margin. The nucleus is excentrically situated near the base. The size of these scales is not constant, but usually becomes smaller towards the margin of the calyx. The measurements in length and width are as follows:  $1.1 \times 0.7$ ,  $0.8 \times 0.7$ ,  $0.7 \times 0.6$  mm. (proximal scales);  $0.35 \times 0.27$ ,  $0.3 \times 0.15$  mm. (distal scales).

The operculum, which is composed of the spicules of the tentacles, can be drawn into the calyx, but is always visible through the terminal pore of the calyx, sometimes even in profile view (Pl. II., figs. 17, 18).

On the dorsal side of tentacles there are usually present two spicules, which touch each other with their upper ends, but diverge downwards to terminate usually with a bent end. They are spindle-like or flattened, covered with warts, and are very variable in size.

Above the spicules just described, are numerous small rods (about  $0.1 \times 0.02$  mm.) arranged in two or more rows (Pl. II., fig. 19, c). At the base of the two large opercular spicules on each tentacle, there are further one or more (often five, in one case even seven) spicules, set in close succession parallel to the inner side of the proximal end of the former (Pl. II., fig. 19, a).

The cœnenchyma spicules, which make up a complete armour, are a little imbricated or lie side by side. They are all typical scales, usually polygonal with rounded angles and often somewhat elongate in shape; the outer surface, which is slightly concave

in well developed cases, is covered with small rounded warts. They vary in size a great deal, the largest of them being arranged on the median line of the sterile side of branches. They are usually 1.5 mm., sometimes 3 mm., in major diameter.

On a thick branch is preserved a small portion of the cœnenchyma; the spicules here are small, markedly elongate and irregularly directed.

Beneath the superficial layer of the flattened cœnenchyma scales above described, there are others of small (0.45 mm.), fusiform or club-like shape (Pl. II., fig. 20).

All the spicules are white.

Locality: The single specimen was collected by Mr. MIYAJIMA in the summer of 1898 on the coral ground off the Province of Satsuma.

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So far as I am aware, the following are all the species that have hitherto been described as belonging to the genus *Acis*:

- 1 *Acis gaudalupensis* DUCH. & MICH. 1860
- 2 *Acis nutans* DUCH. & MICH. 1864
- 3 *Acis solitaria* POURT. 1868
- 4 *Acis orientalis* RIDL. 1882  
(*A. o.* THOMS. & HEND. 1905)  
(*A. sp.* HICKSON. 1905)
- 5 *Acis pustulata* WR. & ST. 1889
- 6 *Acis alba* THOMS. & HEND. 1905
- 7 *Acis indica* THOMS. & HEND. 1905
- 8 *Acis ceylonensis* THOMS. & HEND. 1905  
(*A. c.* var. *imbricata* THOMS. & HEND. 1905)
- 9 *Acis spinosa* THOMS. & HEND. 1906

According to WRIGHT and STUDER, *Acis nutans* DUCH. & MICH. does not belong to this genus, but should be a form very closely allied to *Keroeides koreni* WR. & ST. *Acis solitaria* POURTALÈS seems not to have been taken into consideration by them, or by RIDLEY either. At any rate, this species is very imperfectly known.

In *Acis ijimai* and *miyajimai*, the scales on the calyx, into which the anthocodia is nearly completely retractile, are very often arranged in such a way that the four scales alternate in successive heights, while in many other cases a certain irregularity predominates (Pl. II., figs. 13, 17 and 18). Judging from the figure given by DUCHASSAING and MICHELOTTI, *Acis gaudalupensis* seems to exhibit a similar arrangement of the calyx-scales. In another species, which I have identified with *Acis pustulata* WR. & ST., I could often perceive a regular but somewhat different arrangement of the calyx-scales. In this case they were set opposite to the tentacles at the margin of the calyx and alternately in the lower ring. This mode of arrangement, eight scales in one ring, seems to be due to the weak development of the scales and seems to represent a more primitive condition than that observed in the cases of the two former species.

In *Acis ijimai* and *miyajimai*, the operculum is composed of two large, almost longitudinally set, spicules and of two rows of somewhat smaller spicules arranged at the base of the former. But in *Acis pustulata*, a single series of some relatively large spindles is set transversely at the base of the large opercular spicules and in touch with those of adjacent radii. The modes of arrangement of anthocodia spicules referred to above differ so much that the homology of the longitudinal spicules in the two cases is made doubtful.

Taking into consideration the above facts, this genus shall have to be diagnosed as follows :

Colony branched in one plane. Polyyps arranged in two rows in the plane of the branching, or around the stem and branches, or only on their anterior surface. Calyces usually low, conical, armed with scaly spicules, sometimes arranged in more or less regular longitudinal and transverse rows. Anthocodia retractile into the calyces, with operculum composed of curved, club-like or fusiform, sometimes very flat spicules set *en chevron*, and of a collaret formed of spicules arranged in single or double rows. Cœnenchyma with enormous spicules or scales arranged in a single layer and slightly overlapping or touching one another by their sides.

Zoological Laboratory,  
 Tokyo Imperial University,  
 April 20, 1909.

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**H. Kinoshita :**

**ON SOME MURICEID CORALS BELONGING  
TO THE GENERA *FILIGELLA* AND *ACIS*.**

**PLATE I.**

**Plate. I.**

- Fig. 1. *Filigella mitsukurii*, n. sp.; two complete specimens.  $\times \frac{1}{4}$ .  
Fig. 2. *Acis pustulata* WRIGHT & STUDER; anterior surface of the colony.  $\times \frac{1}{4}$ .  
Fig. 3. *Acis ijimai*, n. sp.  $\times \frac{1}{4}$ .  
Fig. 4. *Acis miyajimai*, n. sp.; entire colony.  
Fig. 5. Same; portion of branch; anterior surface.  $\times \frac{1}{4}$ .  
Fig. 6. Same; portion of branch; posterior surface.  $\times \frac{1}{4}$ .

Fig. 1

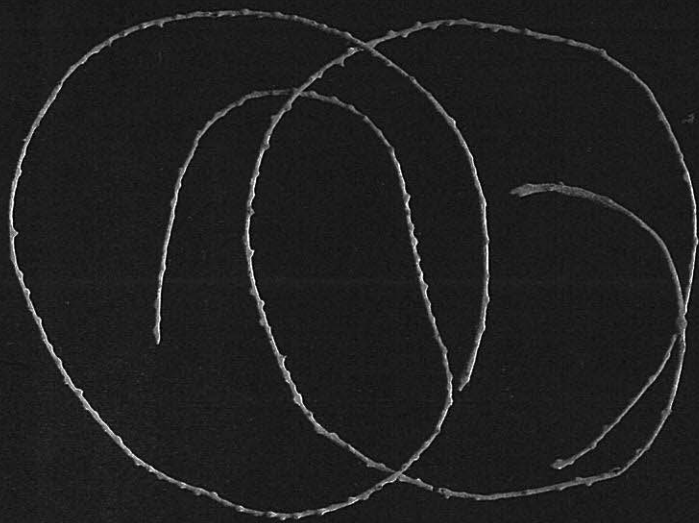


Fig. 3

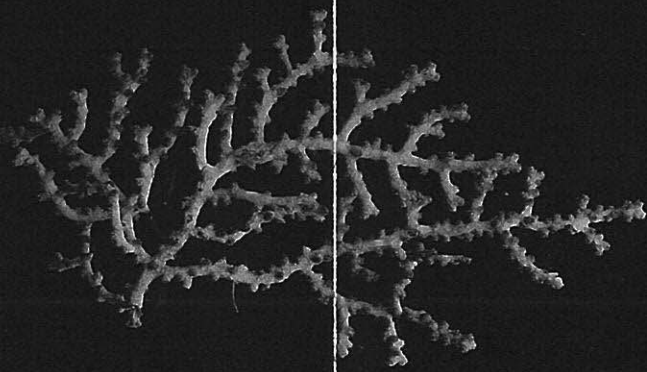


Fig. 5



Fig. 2

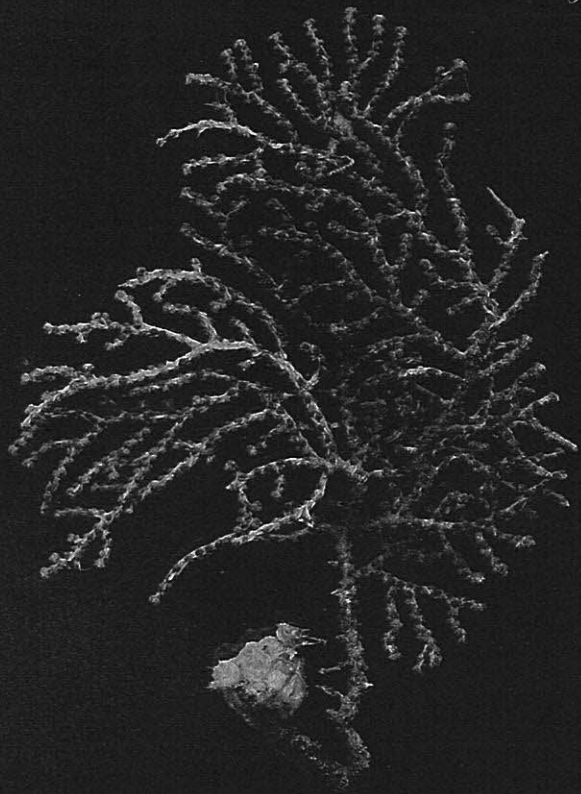


Fig. 4

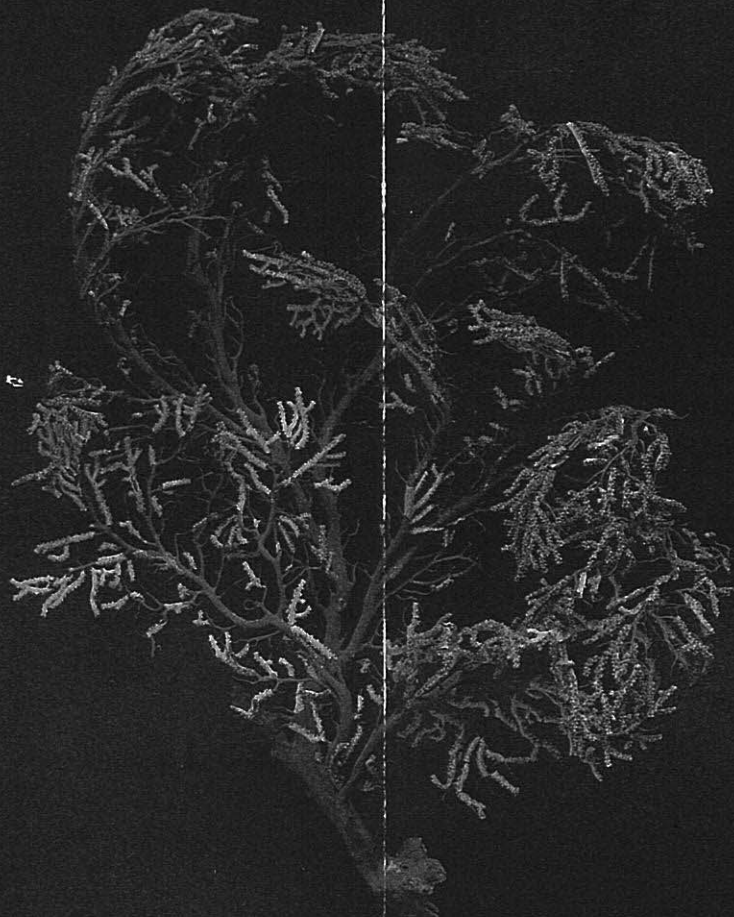
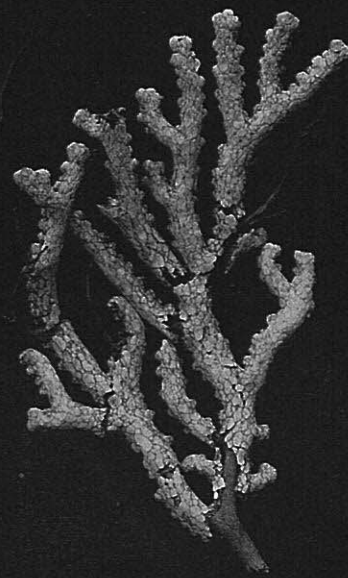


Fig. 6



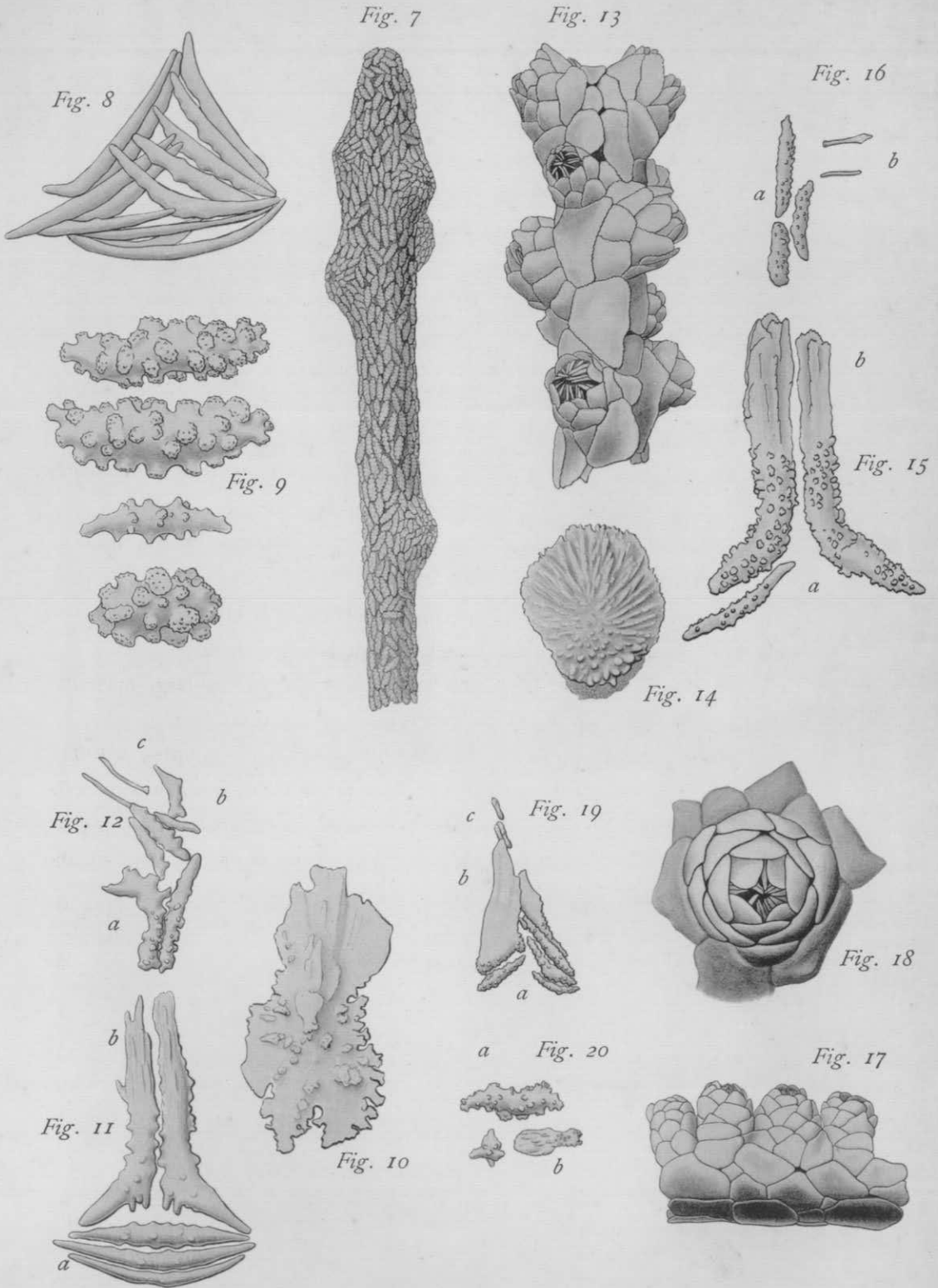
K. Kinoshita:

ON SOME MURICEID CORALS BELONGING  
TO THE GENERA *FILIGELLA* AND *ACIS*.

PLATE II.

**Plate. II.**

- Fig. 7. *Filigella mitsukurii*, n. sp.; distal portion of a colony.  $\times 10$ .
- Fig. 8. Same. Spicules of tentacle base.  $\times 100$ .
- Fig. 9. Same. Spicules of general coenenchyma.  $\times 100$ .
- Fig. 10. *Acis pustulata* WRIGHT & STUDER; scale at the margin of polyp-calyx.  $\times 100$ .
- Fig. 11. Same. a, collaret spicules at tentacle base; b, two large opercular spicules on the aboral side of tentacles.  $\times 100$ .
- Fig. 12. Same. a-b, spicules of tentacles; c, spicules of pinnules.  $\times 100$ .
- Fig. 13. *Acis ijimai*, n. sp.; terminal portion of a branch.  $\times 10$ .
- Fig. 14. Same. Scale at the margin of polyp-calyx.  $\times 50$ .
- Fig. 15. Same. a, spicule at the base of tentacle; b, two large opercular spicules on the dorsal side of tentacles.  $\times 100$ .
- Fig. 16. Same. a, spicules of tentacles; b, spicules of pinnules.  $\times 100$ .
- Fig. 17. *Acis miyajimai*, n. sp.; portion of a branch; lateral aspect.  $\times 5$ .
- Fig. 18. Same. Typical polyp-calyx; terminal aspect.  $\times 15$ .
- Fig. 19. Same. a, spicules of tentacle-base; b, opercular spicules on the dorsal side of tentacles; c, spicules of tentacles.  $\times 50$ .
- Fig. 20. Same Coenenchyma spicules from deeply situated layer; a, spindle; b, club-shaped spicules.  $\times 50$ .



K. K. del.

Fig. 7-9, *Filigella mitsukurii*, n. sp.

Fig. 13-16, *Acis ijimai*, n. sp

Fig. 10-12, *Acis pustulata* WR. & ST.

Fig. 17-20, *Acis miyajimai*, n. sp.