

ON SOME HOLOTHURIANS FROM HONG KONG

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As stated by Dr. *Th. Mortensen* the following species of Holothurians have hitherto been recorded from Hong Kong:

Polycheira rufescens (Brandt).
Colochirus tuberculatus (Quoy & Gaimard).
Holothuria insignis Ludwig.
Holothuria Dietrichii Ludwig.
Holothuria Möbii Ludwig.
Holothuria vagabunda Selenka.

(The 4 latter species are now all referred to the genus *Halodeima*).

In the material sent by Dr. *Herklots* the following species are represented:

Cucumaria tricolor Sluiter.
Colochirus crassus, var. **dyscritus** n. var.
Phyllophorus cornus n. sp.
Phyllophorus (Urodemas) perspicillum Selenka.
Halodeima insignis (Ludwig).
Halodeima pardalis (Selenka).
Halodeima vagabunda (Selenka).
Halodeima fusco-cinerea (Jäger).
Halodeima scabra (Jäger).
Halodeima dicorona n. sp.

CUCUMARIA TRICOLOR Sluiter.

Sluiter 1901: Die Holothuriden der Siboga-Expedition pag. 81, Taf. I, fig. 3, Taf. VII, fig. 8.

2 specimens labelled Aberdeen, Hong Kong, November 1931.

1 specimen labelled Hong Kong Nr. 4.

In spite of the poor state of preservation of the specimens at hand, there can hardly be any doubt but that they really are *Cucumaria tricolor* Sluiter. The remarkable colour has almost quite disappeared, and the calcareous deposits are in a very high degree attacked by acid in the preserving fluid.

The calcareous ring of the one specimen, that from Hong Kong, quite agrees with that of the type, but the two other specimens differ therefrom in having the radials distinctly broader. Further, it ought to be mentioned that the calcareous ring in one of these specimens is abnormal, having two interradials in the dorsal interambulacrum and two radials in the right dorsal ambulacrum. It is rather difficult to understand how this remarkable anomaly has arisen.

Distribution: This species is recorded from the island Jedan, at the eastern shore of the Aru Islands.

COLOCHIRUS CRASSUS, var. **DYSCRITUS** n. var.

(Plate 9.)

1 specimen from Hong Kong.

3 specimens from Aberdeen, Hong Kong.

3 specimens from Repulse Bay, Hong Kong 4-XI-31.

The specimens at hand measure from 6 cm. (Repulse Bay) to 13 cm. (Aberdeen) in length and nearly one-third thereof in diameter. They are in alcohol clear bluish grey on the dorsal side, and whitish grey on the ventral side. The papillæ are all somewhat lighter than the surrounding body-wall. The anus and the mouth and in some of the specimens also the ventral radii are pale red. The mouth is terminal and the anus placed a little dorsal to the posterior end.

The trivium forms a well-marked creeping-sole surrounded by a row of 32 large (12 mm. long) conical papillæ without any terminal tubefect. The tubefect of the trivium are confined to the radii, where they are placed in 5-7 irregular rows. The interradii of the trivium are within the creeping-sole quite devoid of tubefect, papillæ and other waternvascular appendices. Outside the creeping-sole, at the two ends of the specimen, the radii as well as the interradii are supplied with some small papillæ and tube-feet.

The bivium is supplied with a large number of conical papillæ scattered over the interradii as well as over the radii. Though the size of these papillæ is very varying, it is obvious that those of the radii are the largest. Real tube-feet are absent in the bivium, though small waternvascular appendices may be found.

Anteriorly the species has five large, two-three times branched papillæ placed one in each of the radii. They are in contracted specimens stretched forwards and serve for hiding the retracted tentacles. Around the anus there are five solid, red anal-teeth.

The calcareous ring consists of ten pieces of which the interradials are distinctly smaller than the radials. The latter have their rather long anterior process deeply hollowed in the exterior side and anteriorly bifurcate for one-third of their length. There is one polian vesicle and numerous small free stone-canals placed all around the ring-canal. The gonads consist of many solid, orange tubes.

The alimentary canal is very like that of *C. quadrangularis* (Lesson) figured by *Ekman* (Holothurioidea from Dr. E. Mjöberg's Swedish scientific Expeditions to Australia 1910-13, Pl. 3, fig. 15), only the posterior loop of the intestine has no folds, and the second descending part (in the left ventral interambulacrum) is much folded, though the mesentery is fastened quite straight to the left side of the mid-ventral longitudinal muscle.

The respiratory trees are well developed, with a solid tube-shaped base and a fine bushy main-part. They are symmetrically placed one in each of the ventral interambulacra.

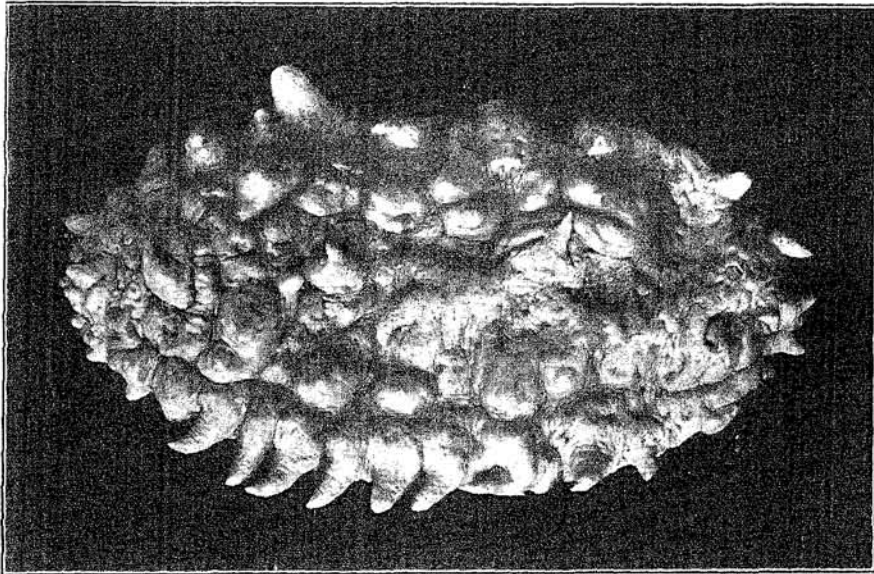


Plate 9. *Colochirus crassus* var. *dyscritus* Heding
Printed by S. C. M. Post, Ltd. Dorsal side, natural size.

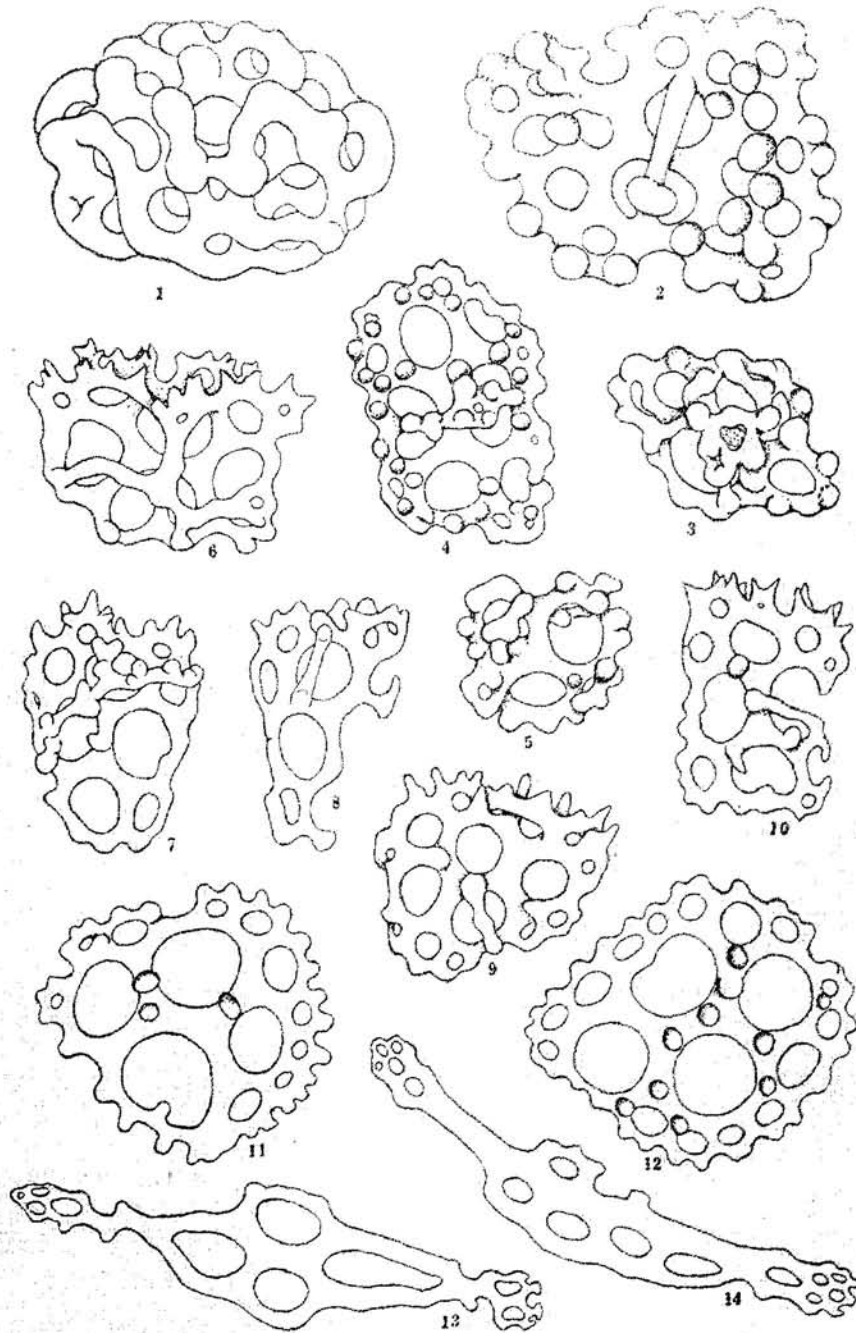


Fig. 1. *Colochirus crassus* var. *dyscritus* Heding.

1 Egg-shaped body or sphere.

2-5 Different forms of knobbed plates.

6-10 Baskets.

11-12 Circular plates from distal end of tube feet.

13-14 Perforated rods from tube feet.

1-12 465/1, 13-14 390/1

The calcareous deposits of the body-wall consist of four different sorts:

- (1) large plates (up to 2 mm. in diameter) of fine calcareous network,
- (2) hollow egg-shaped bodies or spheres (Text fig. I, 1),
- (3) knobbed plates supplied with large holes and more or less developed spires or bridges (Text fig. I, 2-5),
- (4) incomplete baskets (Text fig. I, 6-10).

The large plates, which are placed the deepest in the body-wall, are, especially on the dorsal side of the specimens, forming a dense layer, and thus causing the stiffness of the body-wall. They are the largest in the conical papillæ, which may be finely faceted due to their size and their flat or faintly excavated exterior surface.

The egg-shaped bodies are very regularly built (Text fig. I, 1) and are nearly always of the same size (100-120 μ), though some few smaller and a single much larger may be found.

The knobbed plates are very varying both in shape and size, and often they form real small tables with a short spire (Text fig. I, 3). They measure normally abt. 80 μ . Apparently the knobbed plates are developmental stages of the hollow spheres, but a closer comparison shows that this cannot be the fact, and indeed real developmental stages of spheres may be found.

The "baskets" which are placed the most exterior in the body-wall are usually small perforated plates with faintly developed "bridges" and on the three sides with an irregularly undulating margin. The margin on the fourth side differs distinctly from that of the others in being sharply dented, and in having many of the teeth out of the plane of the plate. In a few cases the "bridges" are so well developed that the whole body forms a real "basket" as seen in Text fig. I, 6.

Besides the large terminal plate, there are two different sorts of deposits in the tube-feet. The one, and the most common, consists of rather large perforated rods which are placed at an angle to the longitudinal axis of the tube-foot (Text fig. I, 13-14). The other which is only found rather close to the terminal plate consists of nearly circular perforated plates with a very regular undulating margin (Text fig. I, 11-12).

In the stem of the tentacles the deposits are very large, slightly bent, perforated rods (Text fig. II, 1-2), only close to the branches they may form large, more or less triangular perforated plates (Text fig. II, 5-7), and in the branches there are numerous smaller rods and plates of varying size and shape.

In the deeper layer of the oral disk there is a dense layer of nearly parallel perforated rods (Text fig. II, 8) which are quite like the normal tentacle-rods, being only bent in the plane of the rod and not as in the tentacle-rods out of the rod-plane.

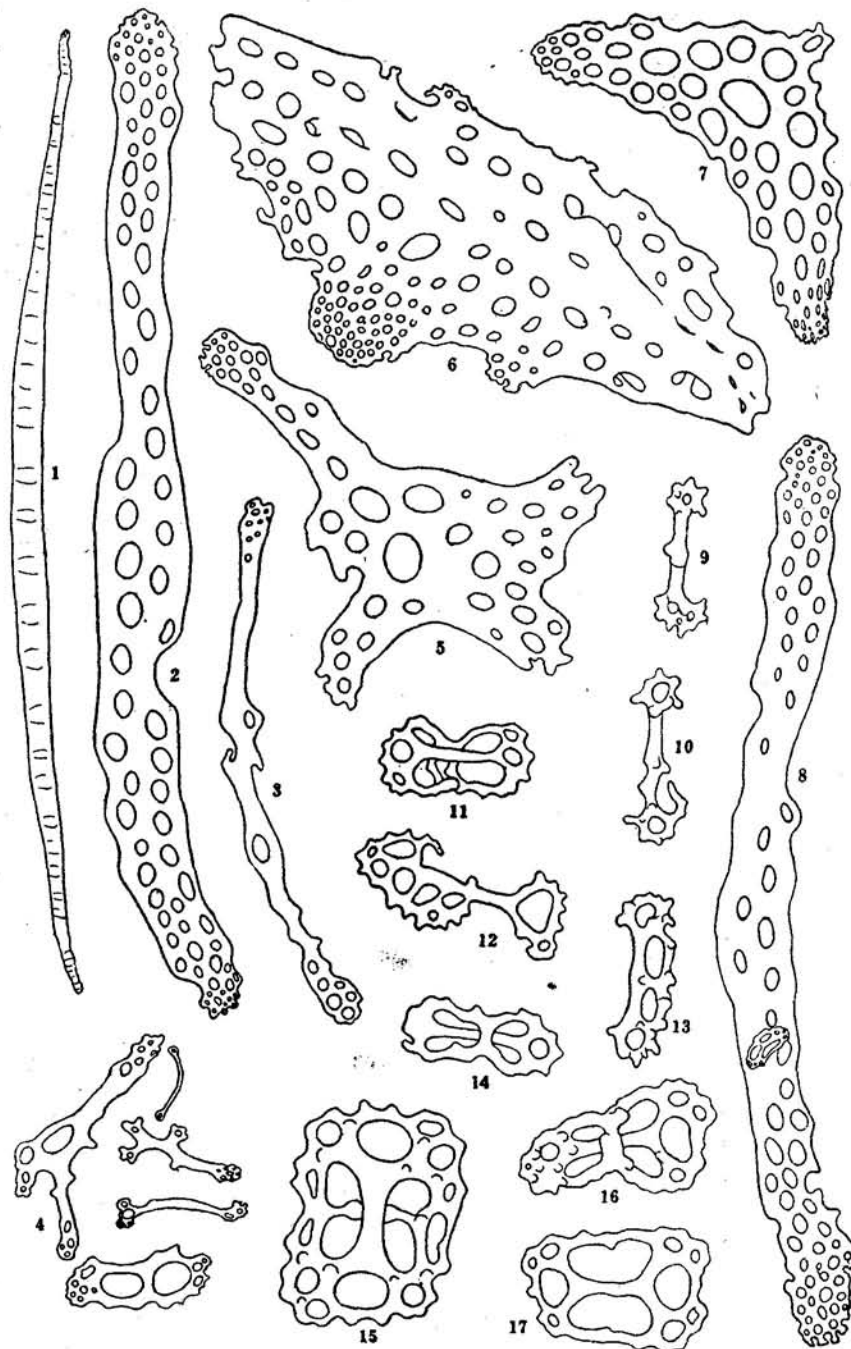


Fig. II. *Colochirus crassus* var. *dyscritus* Heding.
 1 Tentacle-rod seen from the side. 2-7 Deposits from the tentacles.
 8 Rod from deeper layer of oral disk. 9-17 Deposits from superficial layer of oral disk.
 1-8 180/1, 9-17 465/1

Exteriorly of these large rods there is a dense layer of very small bodies, rods and plates, which in spite of the great variation in shape are exceedingly characteristic (Text fig. II, 9-17).

The present *Colochirus*-form is rather closely related to *Col. crassus* Ekman, though it differs in several characters distinctly from it. The two forms differ especially in the shape of the deposits of the body-wall and the fastening of the mesentery. In *crassus* the anterior loop of the mesentery crosses the mid-ventral longitudinal muscle twice, which is not the case in the variety, in which the mesentery only bends towards the muscle and fastens itself only to the left side of it, though the folds of the intestine itself may cross the muscle.

PHYLLOPHORUS CORNUS n. sp.

1 specimen, loc. Aberdeen, Hong Kong.

The single specimen at hand measures 7 cm. in length and 1.5 cm. in diameter. The colour is in alcohol greyish brown. The tube-feet are, except in the anterior end, scattered all over the body, only a little denser in the radii than in the interradii.

The anterior tubefeet are thick and solid, and as their terminal plates are either absent or quite rudimentary they form five *Colochirus*-shaped papillæ which cause that pentagonal appearance which is characteristic to that genus.

The calcareous ring consists of ten pieces (Figure III, 11) supplied with insertions for 20 tentacles. They are further deeply hollowed for the insertion of the retractor, and perforated for the passage of the nerve and the radial canal. In reality they are only deeply notched as the tissue anteriorly of the perforation is not fully calcified. All the pieces of the calcareous ring are solid and none of them have any posterior prolongations. In accordance with the number of insertions in the calcareous ring there are 20 tentacles, five of which are placed in a circle within that of the 15.

There is one large polian vesicle and one little, free stonecanal. The retractors are solid and thick and free from the anterior part of the longitudinal muscles. The intestine has a large loop, and goes in the mid-dorsal interambulacrum to one-third of the length of the specimen from the posterior end, here it bends across the left dorsal longitudinal muscle and goes forwards to the calcareous ring, where it bends across the left ventral muscle and runs along the left side of the mid-ventral longitudinal muscle. There is only one, but solid, branched respiratory tree, placed at the left side of the intestine. Five anal teeth are present.

There is apparently but one sort of calcareous deposit in the body-wall (Figure III, 2 & 4). They are very like figures-of-eight. Among the normal deposits there are some few as figured in Figure III, 3. They look like normal deposits seen from the side, but this they cannot be, and probably they may be regarded as a second sort of deposits, characteristic of this peculiar species.

In the tube-feet there are large rods of a very characteristic shape. They rather resemble a miniature cranium of a bull (Figure III, 7), and they are all of the same shape, though a few not fully developed samples may be found.

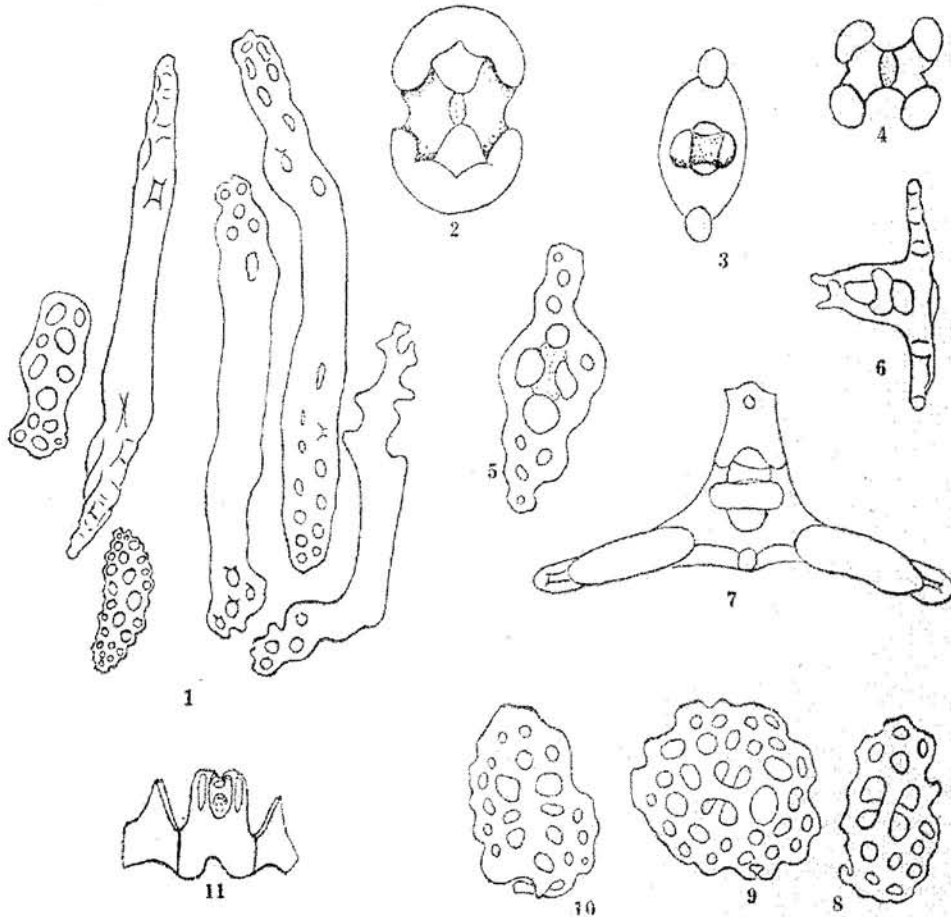


Fig. III. *Phyllophorus cornus* Hedding.

- | | |
|--|-------------------------------------|
| 1 Rods and plates from tentacles. | 2 Normal deposit from body-wall. |
| 3 Rare deposit from body-wall. | 4 Development stage of 2. |
| 5-6 Tables from outside the tentacles. | 7 Rod from tube-foot. |
| 8-10 Perforated plates from oral disk. | 11 Three pieces of calcareous ring. |
- 1 180/t, 2-4 and 8-10 465/t, 5-7 300/t, 11 8/t

In the thin skin between the base of the tentacles and the large papilla, i.e. in that part of the body-wall which may be retracted with the tentacles, there are some small tables, which in some degree resemble the rods from the tube-foot (Figure III, 5-6). In the oral disk itself there are small rounded or oval plates (Figure III, 8-10), and in the tentacles there are large rods with perforated ends, and small perforated plates (Figure III, 1).

This species is exceedingly characteristic and apparently not closely related to any of the other members of the genus, as far as they are described, and probably it does not really belong to the genus *Phyllophorus*. As however this genus, like so many others, needs a careful revision, it may for the present be the best course to place this species in *Phyllophorus*.

PHYLLOPHORUS (URODEMAs) PERSPICILLUM Selenka.

Urodemas perspicillum Selenka 1867. Beiträge zur Anatomie und Systematik der Holothurien, pag. 352, Taf. XX, fig. 110-111.

Phyllophorus incompertus Théel 1886. Report on the Challenger Holothurioidea II, pag. 97. Pl. V, fig. 8 & Pl. VIII, fig. 5.

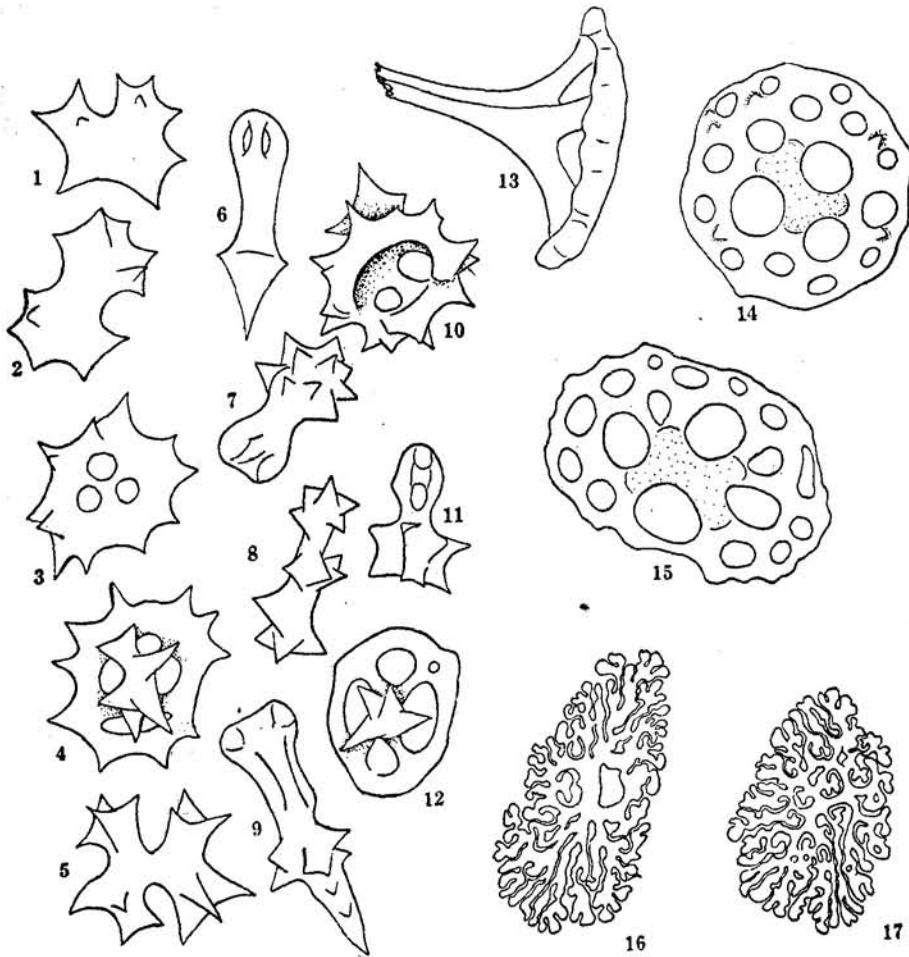


Fig. IV. *Phyllophorus perspicillum* Selenka.

1-12 Deposits from body-wall.

13-15 Tables from tentacles.

16-17 Rosettes from base of tentacles and oral disk.

1-17 465/1

1 specimen—Hong Kong.

The specimen at hand forms a little sphere measuring 8 cm. in diameter, only the dorsal and darker side is somewhat shorter than the ventral one. The calcareous ring is 20 mm. high and agrees rather well with both *Selenka's* and *Théel's* figures of it. In the anatomy it quite agrees with the description of *Théel*, but the calcareous deposits show some faint differences. In Figure IV, 1-12 are shown a number of deposits from the superficial layer of the skin, and it appears that besides the reduced tables Figure IV, 6-7, 9 and 11 there are also some spiny deposits, Figure IV, 1-2, 5 and 8, and besides the rather well-formed table Figure IV, 12, which quite agrees with some of *Théel's* figures, there are also found some very spinous tables (Figure IV, 4 and 10). In the tentacles there are further found some large tables with rather long and slender spire (Figure IV, 13-15) and in the oral disk there are some large rosettes (Figure IV, 16-17).

There can be no doubt but that the specimen at hand is the same species as *Théel's incomptus*, and I quite agree with *Théel* that we may regard *incomptus* as synonymous with *Selenka's perspicillum*.

That *Selenka* has made his species the type of a separate genus, *Urodemas* seems rather reasonable, and *Théel* has only referred his species to the genus *Phyllophorus* with a? But as stated above, it is not the place here to take the genus *Phyllophorus* up for discussion.

HALODEIMA INSIGNIS (Ludwig).

Holothuria insignis Ludwig 1875, Beiträge zur Kenntniss der Holothurien, pag. 106, Pl. VII, fig. 28.

4 specimens, Hong Kong.

These specimens agree so well with the description of *insignis* that there can be no doubt but that they represent that species. Furthermore they differ clearly from *Selenka's* description of *pardalis* which indicates that *insignis* is a valid species and not synonymous with *pardalis*, as is supposed by *Ludwig*, *Lampert*, and *Panning*.

The species *insignis* is recorded from several localities in the Indopacific area, and had previously been found at Hong Kong.

HALODEIMA PARDALIS (Selenka).

Holothuria pardalis Selenka 1867, Beiträge zur Anatomie und Systematik der Holothurien, pag. 336, Pl. XIX, fig. 85.

2 specimens, Hong Kong.

The two specimens at hand agree well with the original description of *pardalis*, and must undoubtedly be referred to that species. *Lampert* states that *pardalis* has one to two polian vesicles, and *Semper* gives a figure of a specimen which he names *pardalis*, with 5-6 polian vesicles. The present specimens have, like the type, only one, and there is some reason to suppose that several different forms are mixed up under the name of *pardalis*.

The species is distributed throughout the whole Indopacific area, but was not hitherto recorded from Hong Kong.

HALODEIMA VAGABUNDA (Selenka).

Holothuria vagabunda Selenka 1867 op. cit. pag. 334, Taf. XIX, Fig. 75-76.

Holothuria vagabunda Ludwig 1875 op. cit. pag. 112, Taf. VII, Fig. 40.

3 specimens, Hong Kong.

Two of the three specimens at hand agree well with *Ludwig's* description and have, like *Ludwig's* specimen, two polian vesicles. The third specimen agrees better with *Selenka's* description of the type and has, like the type, but one polian vesicle and short tentacle-ampullæ. The specimens are however so alike, that I quite agree with *Ludwig* in regarding the two forms as the same species.

Halodeima vagabunda is recorded from several localities in the Indopacific area, and was previously also found at Hong Kong.

HALODEIMA FUSCO-CINEREA (Jäger).

Holothuria fusco-cinerea Jäger 1833, De Holothuriis pag. 22.

2 specimens, Hong Kong.

Distribution: Japan-Celebes-Samoa.

HALODEIMA SCABRA (Jäger).

Holothuria scabra Jäger 1833 op. cit. pag. 23.

1 specimen, Hong Kong.

Distribution: Indopacific area.

HALODEIMA DICORONA n. sp.

2 specimens, Hong Kong 17-1-31.

The two specimens at hand measure 7 cm. in length, but one of them is lacking the posterior end. The colour is reddish brown with some few black spots on the dorsal side. The tube-feet are scattered all over the body. Anal teeth are absent. The calcareous ring consists of 10 pieces and has insertions for 20 tentacles. There is one polian vesicle, which in the complete specimen measures 3 cm., in the other 6 cm. in length. The stone-canal is long and supplied with a large spherical madreporite. It ends free in the body-cavity. The alimentary canal is destroyed in both specimens, but the mesenteries are fastened to the body-wall in the mid-dorsal, the left dorsal, and the right ventral-interambulacra.

The calcareous deposits consist of two different sorts of tables, buttons and rods in the pedicels. The more numerous sort of tables (figure V, 1-2) are rather small and have a usually smooth disk with 10-12 holes, and a

large crown with eight teeth. There is but one transverse beam. Rather many of these tables have the basal plate reduced to a little square plate with but four holes (figure V, 3). The other sort of tables is more rare, on an average there may be three of the first form to every one of the latter. These tables are about one and a half times as large as the first. They have 9-10 holes in the basal plate and a rather high and slender spire with a little crown. The crown consists either of four large irregular teeth or of a varying number of small spines. The spire has usually two transverse beams.

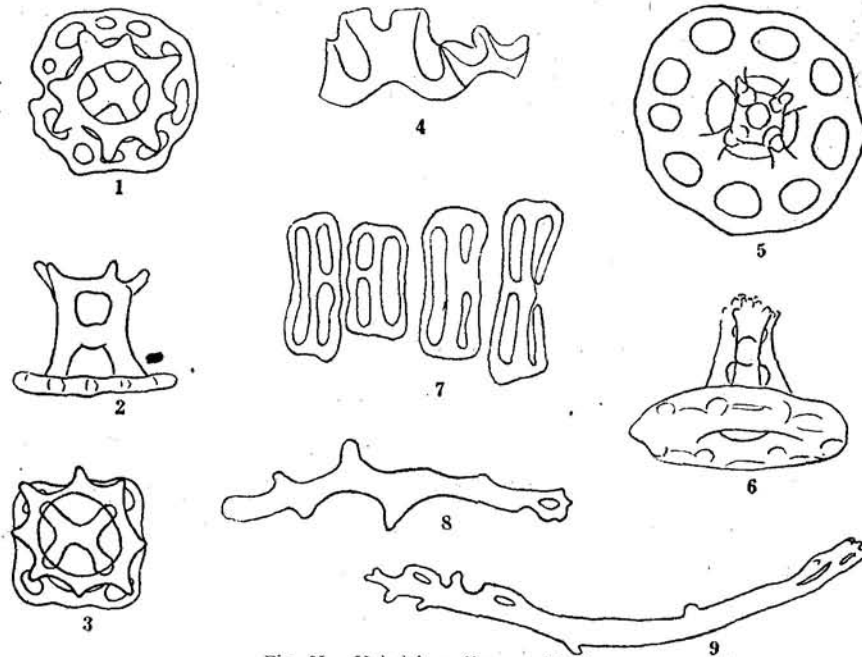


Fig. V. *Halodeima dicorona* Hedding.

1-2 Small tables.
4 Calcareous ring.
7 Buttons.

3 Small table with four-holed basal plate.
5-6 Large tables.
8-9 Rods from tubefect.

1-3 and 5-9 465/1, 4 8/1

The buttons are rather characteristic, having normally three holes, one long and two short ones (Figure V, 7). They may now and then be more or less reduced, forming then often a little double-anchor. In the tubefect there are some large spiny and perforate rods (Figure V, 8-9) but in the tentacles no calcareous deposits are found.

This species does not seem to be closely related to any of the other *Halodeima*-species. The shape of the tables and the buttons is very characteristic and make the species easily recognisable.

There is a third specimen from Hong Kong which most probably may be referred to this species, but it differs from the type-specimens in having small papillæ on the dorsal side, a feature which may ultimately show to be of no separating value, as the strong contraction of the type-specimens may have hidden the presence of such papillæ.