

2. Littoral Marine Fauna : Kerimba Archipelago, Portuguese East Africa. Collected by James J. Simpson, M.A., B.Sc., University of Aberdeen, September 1907—May 1908 : HOLOTHURIOIDEA. By JOSEPH PEARSON, D.Sc., F.L.S., Demonstrator and Assistant Lecturer in Zoology, University of Liverpool.\*

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(Text-figures 13-17.)

I am indebted to Mr. James Simpson for the opportunity of making an examination of the Holothurians collected by him in Portuguese East Africa.

The collection consists of twenty-one species most of which do not offer any points of special interest. *Cucumaria turbinata* is recorded for the third time. It was first obtained by Hutton in New Zealand, who gave an unsatisfactory description of the species. Professor Herdman also obtained it from Ceylon, and a full account of the species was given by me in the report on the Ceylon Holothurians (29)†. The form described by Théel as *Colochirus violaceus* is represented by two specimens in the collection. For reasons which I shall give later, I think it necessary to establish a new genus for this species.

The following is a list of the species represented in the collection :—

- Synapta grisea* Semper.  
*Cucumaria semperi* Bell.  
*Cucumaria turbinata* Hutton.  
*Pseudocolochirus violaceus* Théel.  
*Stichopus chloronotus* Brandt.  
*Stichopus variegatus* Semper.  
*Mülleria lecanora* Jaeger.  
*Mülleria mauritiana* Quoy & Gaimard.  
*Mülleria miliaris* Quoy & Gaimard.  
*Holothuria albiventer* Semper.  
*Holothuria atra* Jaeger.  
*Holothuria atra*, var. *amboinensis* Théel.  
*Holothuria curiosa* Ludwig.  
*Holothuria dofleinii* Augustin.  
*Holothuria impatiens* Forskål.  
*Holothuria lineata* Ludwig.  
*Holothuria marmorata* Jaeger.  
*Holothuria martensii* Semper.  
*Holothuria monacaria* Lesson.  
*Holothuria scabra* Jaeger.  
*Holothuria vagabunda* Selenka.

\* Communicated by Prof. W. N. PARKER, Ph.D., F.Z.S.

† The numbers in brackets refer to the Bibliography, pp. 181 & 182.



*List of Stations at which Holothurians were obtained.*

## STATION I. Tunghi Bay.

*Bottom.* Sand, mud, and shell. *Depth.* 5-18 fathoms.*Synapta grisea.**Holothuria marmorata.**H. albiventer.**H. scabra.**H. dofleinii.*

## STATION II. Maiyapa Bay.

*Bottom.* Sand, mud, and coral. *Depth.* 10 fathoms.*Pseudocolochirus violaceus.**Stichopus variegatus.**Mülleria lecanora.**Holothuria impatiens.**H. lineata.*

## STATION VI. Kero-Nyuni Bay.

*Bottom.* Sand. *Depth.* 5-10 fathoms.*Pseudocolochirus violaceus.**Holothuria albiventer.*

## STATION VII. Pekawi Bay. Exposed coral-reef.

*Cucumaria semperi.**C. turbinata.**Holothuria albiventer.**H. squamifera.**H. monacaria.*

## STATION IX. Ibo Bay. Reefs around Matemo Is.

*Stichopus chloronotus.**Mülleria mauritiana.**M. miliaris.**Holothuria impatiens.**H. atra.**H. vagabunda.**H. curiosa.**H. atra, var. amboinensis.*

## STATION XIII. Pemba Bay.

*Bottom.* Mud. *Depth.* 10-20 fathoms.*Holothuria albiventer.*

## SYNAPTA GRISEA Semper.

*Synapta grisea* Semper, 1868 (11); Ludwig, 1882 (15); Bell, 1884 (17); Théel, 1886 (20).

Two mutilated specimens from Station I. Tunghi Bay.

The colour in spirit is grey with a greenish tinge.

There are fourteen digitate tentacles, each being about 25 mm. long. Owing to the bad condition of the specimen it is difficult to say whether the digits of the tentacles are webbed.

There appears to be very little difference between *Synapta*



*grisea* and *Synapta glabra*. The spicules and the calcareous ring are very similar in both species.

The calcareous ring consists of fifteen pieces. Each of the five radial pieces has a broad anterior prolongation which is perforated by a small hole. The ten inter-radial pieces are prolonged in front as short rod-like processes.

The spicules agree with Semper's figures.

Total length of anchor 315  $\mu$ .

Total length of anchor-plate 225  $\mu$ .

Diameter of miliary granules 15  $\mu$ .

*General distribution.* Bohol, Fitzroy Is., Queensland, Indian Ocean.

#### CUCUMARIA SEMPERI Bell.

*Cucumaria semperi* Bell, 1884 (17); Lampert, 1885 (18); Théel 1886 (20).

One specimen from Station VII. South of Pekawi. Length 45 mm.; breadth 15 mm.

There is nothing to add to previous descriptions and to my notes given in the report on the Mergui Holothurioidea.

*General distribution.* Port Denison, Torres Str., Mergui.

#### CUCUMARIA TURBINATA Hutton.

*Labidodesmus turbinata* Hutton, 1878 (13).

*Cucumaria turbinata* Lampert, 1885 (18).

(?) *Cucumaria (Labidodesmus) turbinata* Théel, 1886 (20).

*Cucumaria (?) turbinata* Dendy, 1897 (27).

*Cucumaria turbinata* Pearson, 1903 (29).

One specimen from Station VII. South of Pekawi. Length 48 mm.; breadth 13 mm.

I have already given a full description of this species in the report on the Ceylon Holothurioidea (29). In the present specimen the body has not the same shape as in the Ceylon specimen. It is evidently in a contracted condition so that the tapering anterior end which was characteristic of the Ceylon specimen is not shown.

The whole of the body has a brown colour. The pedicels are black and are arranged in five double rows at both ends of the body. In the central region the tube-feet also spread over the inter-ambulacra and are more numerous on the ventral surface.

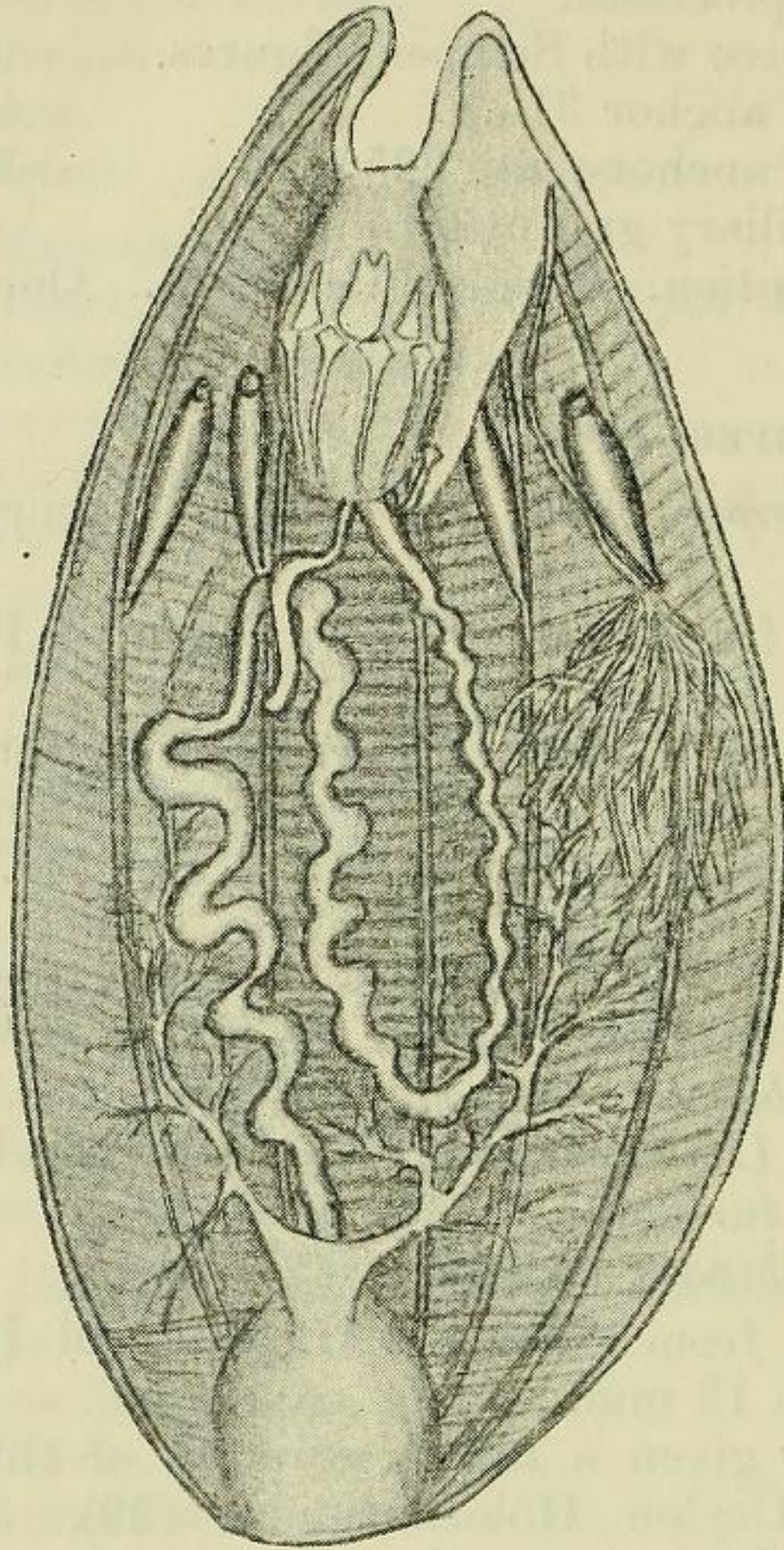
The tentacles are absent. There is one Polian vesicle and the stone-canal. There are two respiratory trees (see text-fig. 13, p. 170).

In addition to the deposits in the general integument which have been already described in the Ceylon Report, there are well-developed tables in the pedicels. These tables are long and narrow and are prolonged into two arms (text-fig. 14 A, p. 171). In the centre are four holes and at the end of each arm there are two or three holes (text-fig. 14 B). From the centre of the table arises a short tower having one cross-beam and being surmounted by a few



teeth. In addition to these tables there are a few perforated plates (text-fig. 14 C) and also numerous miliary granules similar to those present in *Synapta* (text-fig. 14 D).

Text-fig. 13.



*Cucumaria turbinata*, showing internal organs.  $\times 2$ .

Size of crosses in general integument—length  $67 \mu$ ; breadth  $11 \mu$ . Miliary granules  $26 \mu$ .

Size of tables in pedicels—length  $166 \mu$ ; greatest width  $44 \mu$ ; height of tower on table about  $50 \mu$ .

The perforated plates are about the same length as the tables.

*General distribution.* Stewart Is., New Zealand, Ceylon.

#### PSEUDOCOLOCHIRUS VIOLACEUS Théel.

*Colochirus violaceus* Théel, 1886 (20); Koehler, 1895 (26); Koehler & Vaney, 1908 (31).

One specimen from Station II. Maiyapa Bay.

Length 85 mm.; breadth 48 mm.

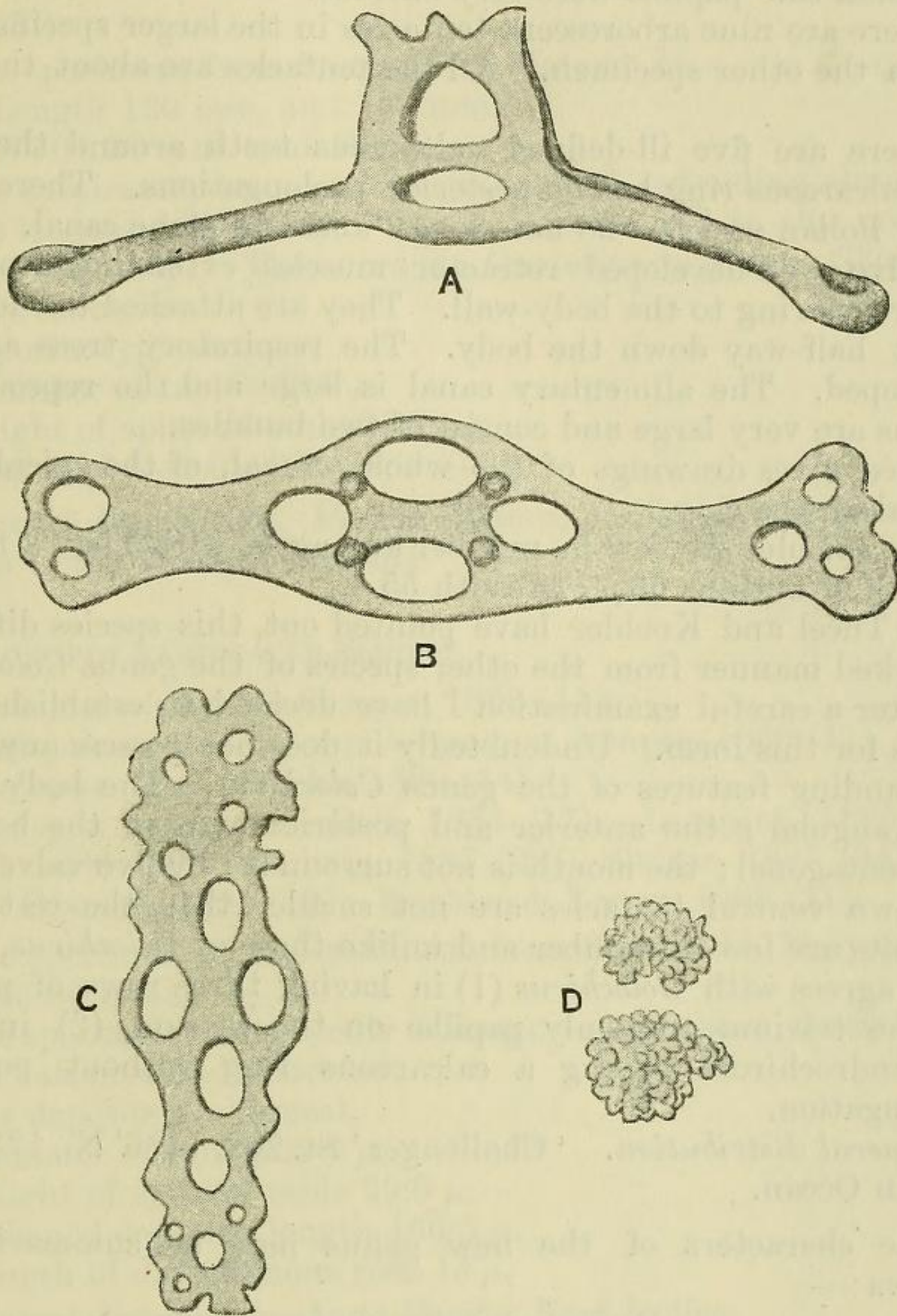
One specimen from Station VI. Kero-Nyuni Bay.

Length 95 mm.; breadth 50 mm.

The specimen from Station II. is white. That from Station VI.



Text-fig. 14.

*Cucumaria turbinata.*

- A. Table with tower (side view).  $\times 450$ .  
 B. Table with tower (plan).  $\times 450$ .  
 C. Perforated plate.  $\times 320$ .  
 D. Miliary granules.  $\times 460$ .

is violet-coloured on the interambulacra and white on the ambulacra. When the latter specimen first came into my hands the colouring was very decided, but in the course of a few months the colour has almost entirely disappeared, owing probably to the action of light and the effect of the preservative.

Externally the specimens agree with Théel's description. There are no pedicels on the bivium and those on the trivium are confined to three definite rows. Very few papillæ are shown



in the specimens under examination. In the 'Challenger' specimen the papillæ were very obvious.

There are nine arborescent tentacles in the larger specimen and ten in the other specimen. All the tentacles are about the same size.

There are five ill-defined calcareous teeth around the anus. The calcareous ring has no posterior prolongations. There is one large Polian vesicle—28 mm. long—and one stone-canal. There are five well-developed retractor muscles extending from the calcareous ring to the body-wall. They are attached to the latter about half-way down the body. The respiratory trees are well developed. The alimentary canal is large and the reproductive organs are very large and consist of two bundles.

Théel gives drawings of the whole animal, of the spicules and the calcareous ring.

The spicules are few in number and agree with Théel's figures. Length of buttons  $63\ \mu$ ; breadth  $55\ \mu$ .

As Théel and Koehler have pointed out, this species differs in a marked manner from the other species of the genus *Colochirus*.

After a careful examination I have decided to establish a new genus for this form. Undoubtedly it does not possess any of the outstanding features of the genus *Colochirus*. The body is not quadrangular; the anterior and posterior ends of the body are not pentagonal; the mouth is not surrounded by five valves; and the two ventral tentacles are not smaller than the rest. The deposits are few in number and unlike those of *Colochirus*.

It agrees with *Colochirus* (1) in having three rows of pedicels on the trivium and only papillæ on the bivium, (2) in being a Dendrochirote having a calcareous ring without posterior prolongation.

*General distribution.* 'Challenger' St. 203,  $11^{\circ} 6' N.$ ,  $123^{\circ} 9' E.$  Indian Ocean.

The characters of the new genus may be summarised as follows:—

PSEUDOCOLOCHIRUS, gen. n.

Body cucumiform. Pedicels present only on the trivium where they are arranged in three well defined rows. Small papillæ scattered on the bivium. A few also on the trivium. Ten arborescent tentacles of equal size. The anus is surrounded by five calcareous teeth. The perisome is thick but is not strengthened by many deposits. The spicules are few in number and consist of small perforated buttons. The calcareous ring is devoid of posterior prolongations and has five well developed retractor muscles.

STICHOPUS CHLORONOTUS Brandt.

*Stichopus chloronotus* (subgenus *Perideris*), Brandt, 1835 (6).

*Stichopus chloronotus* Selenka, 1867 (10).

*Stichopus cylindricus* Haacke, 1880 (14).

*Stichopus chloronotus* Ludwig, 1882 (15); Lampert, 1885 (1



Bell, 1886 (19); Théel, 1886 (20); Ludwig, 1887 (23); Sluiter, 1887 (24), 1901 (28); Pearson, 1903 (29); Koehler & Vaney, 1908 (31).

Two specimens from Station IX. Matemo Is.

Length 120 mm. and 140 mm.

Width 30 mm. and 42 mm.

The respiratory trees are well developed, extending almost the entire length of the body. The gonads extend to the posterior end of the body. There are no Cuvierian organs. There are twenty tentacles.

Deposits typical.

Diameter of tables  $33.3 \mu$ .

Height of spine of table  $33.3 \mu$ .

Length of C-shaped deposits  $37 \mu$ .

*General distribution.* Pacific Islands, Indian Ocean from East Africa to the Malay Peninsula.

#### STICHOPUS VARIEGATUS Semper.

*Stichopus variegatus* Semper, 1868 (11).

*Stichopus variegatus*, var. *herrmanni* Semper, 1868 (11).

*Stichopus nasso* Haacke, 1880 (14).

*Stichopus variegatus* Bell, 1884 (17); Lampert, 1885 (18); Théel, 1886 (20); Ludwig, 1887 (23); Sluiter, 1887 (24), 1901 (28); Pearson, 1903 (29); Koehler & Vaney, 1908 (31).

One specimen in bad condition from Station II. Maiyapa Bay. Length 80 mm.

The specimen undoubtedly belongs to the above species but is much flattened and distorted.

The deposits are typical.

Diameter of tables  $29.6 \mu$ .

Height of spire of table  $29.6 \mu$ .

C-shaped deposits, length  $166.5 \mu$ .

Length of dichotomous rods  $15 \mu$ .

*General distribution.* Indo-Pacific, East Indies.

#### MÜLLERIA LECANORA Jaeger.

*Mülleria lecanora* Jaeger, 1833 (3).

*Holothuria dubia* (subgenus *Microthele*), Brandt, 1835 (6).

*Actinopyga lecanora* Bronn, 1860 (9).

*Mülleria lecanora* Semper, 1868 (11); Lampert, 1885 (18); Théel, 1886 (20); Sluiter, 1901 (28); Koehler & Vaney, 1908 (31).

Two specimens from Station II. Maiyapa Bay.

Length 145 mm. and 125 mm.

Breadth 80 mm. and 70 mm.

The specimens are dark brown on the dorsal side and lighter on the ventral surface. There is a light patch around the anus. The pedicels are scattered over the trivium but are more densely

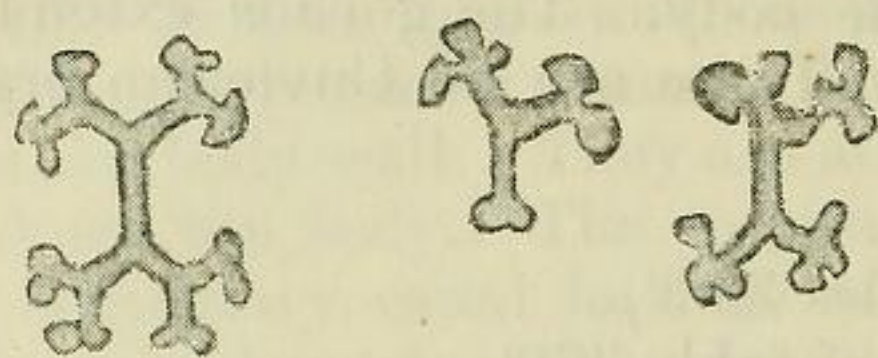


aggregated on the three ambulacra. The papillæ on the dorsal surface are small.

There are three polian vesicles, their respective lengths being 26 mm., 10 mm., and 6 mm. There is one madreporite.

The twenty tentacular ampullæ are extremely long—30 mm.

Text-fig. 15.



*Mülleria lecanora*. Spicules.  $\times 550$ .

Both the respiratory trees are well developed.

The dichotomous rods occur in groups, each rod has a length of  $26 \mu$  (text-fig. 15).

*General distribution.* Philippines, Celebes, Bonin Is., Timor, Mauritius, Fiji Is., Indian Ocean.

MÜLLERIA MAURITIANA Quoy & Gaimard.

*Holothuria mauritiana* Quoy & Gaimard, 1833 (4).

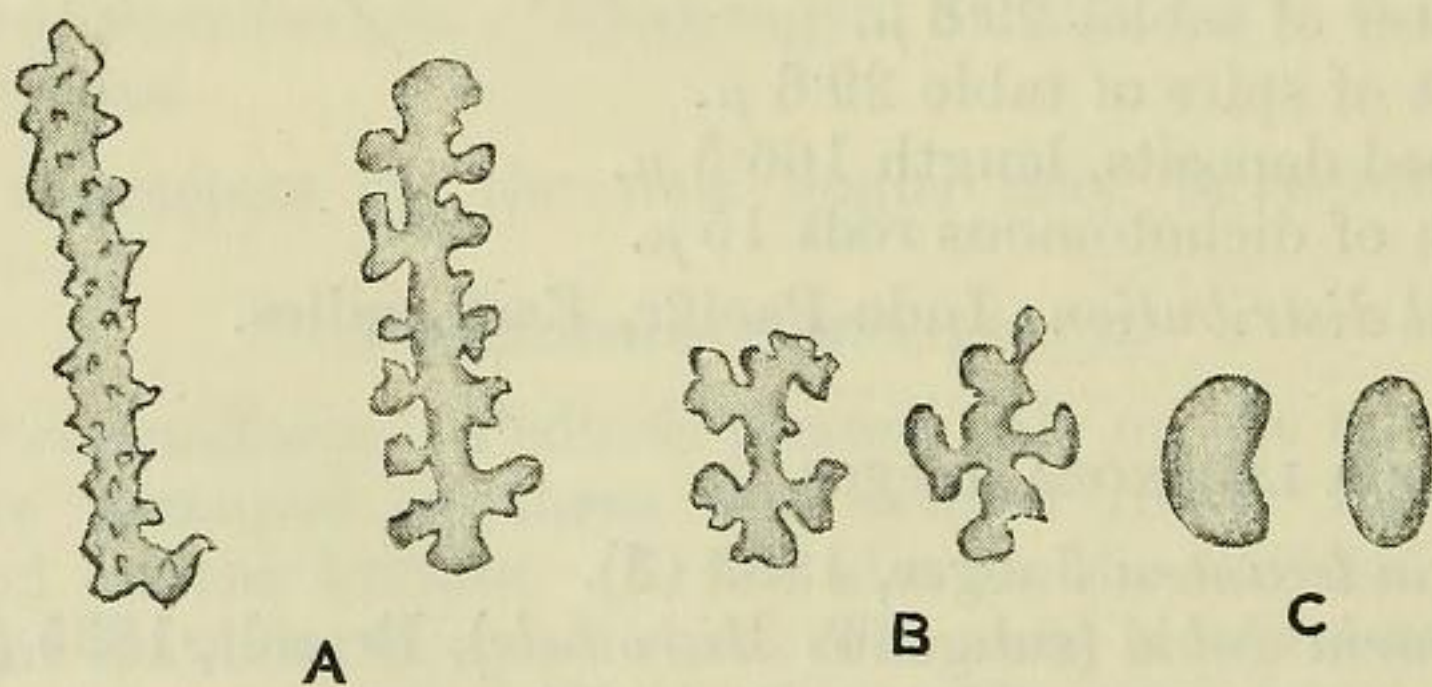
*Mülleria varians* Selenka, 1867 (10).

*Mülleria mauritiana* Semper, 1868 (11); Lampert, 1885 (18); Théel, 1886 (20); Sluiter, 1867 (24), 1901 (28).

*Actinopyga mauritiana* Bell, 1887 (22); Pearson, 1903 (29).

*Mülleria mauritiana* Koehler & Vaney, 1908 (31).

Text-fig. 16.



*Mülleria mauritiana*. Various forms of spicules.

A. Spinous rods in dorsal integument.  $\times 430$ .

B. "Rosettes" in dorsal integument.  $\times 450$ .

C. Spherical bodies in ventral integument.  $\times 430$ .

One specimen from Station IX. Matemo Is.

Length 175 mm.; breadth 60 mm.

As in the Ceylon specimen examined by me, there is a well-defined white patch on the ventral surface. The deposits are



similar to those described by Théel. Those of the ventral surface consist of large numbers of spherical bodies.

Length of spinous rods in dorsal integument  $63 \mu$   
(text-fig. 16 A).

Length of rosettes in dorsal integument  $22 \mu$  (text-fig. 16 B).

Length of spherical bodies in the ventral integument  $18.5 \mu$   
(text-fig. 16 C).

Width of spherical bodies in the ventral integument  $11 \mu$ .

*General distribution.* Indian Ocean from E. Africa to the East Indies; Funafuti.

#### MÜLLERIA MILIARIS Quoy & Gaimard.

*Holothuria miliaris* Quoy & Gaimard, 1833 (4).

*Holothuria lineolata* Quoy & Gaimard, 1833 (4).

*Mülleria lineolata* Brandt, 1835 (6).

*Mülleria plebeja* Selenka, 1867 (10).

*Mülleria miliaris* Semper, 1868 (11); Lampert, 1885 (18); Théel, 1886 (20).

*Muelleria miliaris* Bell, 1887 (21).

*Actinopyga miliaris* Bell, 1887 (22).

*Mülleria miliaris* Ludwig, 1887 (23); Sluiter, 1887 (24), 1901 (28); Koehler & Vaney, 1908 (31).

Two specimens from Station IX. Matemo Is.

Length 90 mm. and 125 mm.

Breadth 35 mm. and 45 mm.

The body is wrinkled and much contracted. The pedicels are arranged in three indefinite rows on the ventral surface. The papillæ are scattered over the dorsal surface. There are twenty tentacles and a similar number of long tentacular ampullæ. The calcareous ring consists of ten simple pieces. The body has well developed circular muscles and there are five rows of longitudinal muscles, each row being double. The deposits are typical. The dichotomous rods vary in shape and size.

Minimum length of rods  $7.4 \mu$ .

Maximum length of rods  $44.4 \mu$ .

*General distribution.* East coast of Africa, Indian Ocean, Red Sea, Sumatra, Fiji Is.

#### HOLOTHURIA ALBIVENTER Semper.

*Holothuria albiventer* Semper, 1868 (11); Lampert, 1885 (18); Théel, 1886 (20); Sluiter, 1901 (28).

Six specimens altogether.

	<i>Length.</i>	<i>Breadth.</i>
Tunghi Bay. Station I. . . . .	70 mm.	23 mm.
	85 mm.	30 mm.
Nero-Nyuni Bay. St. VI. . . . .	40 mm.	20 mm.
Pekawi Bay. St. VII. . . . .	85 mm.	35 mm.
Pemba Bay. St. XIII. . . . .	70 mm.	17 mm.
	45 mm.	23 mm.



*Colour.* The dorsal surface is brown with a few large dark brown spots. The ventral surface is lighter and each papilla is surrounded by a white patch. All the papillæ are white.

The anterior end of the body is blunt and the body tapers towards the posterior end. Papillæ are present all over the body, those on the dorsal surface being smaller than the ventral ones. The mouth is surrounded by a ring of digitate papillæ.

The circular muscles of the body-wall are poorly developed.

There is one Polian vesicle and a long madreporite as described by Théel. The calcareous ring agrees with Théel's description.

The deposits consist of tables and buttons.

Diameter of tables  $55.5 \mu$ .

Height of spire on tables  $37 \mu$ .

Length of buttons  $29.5 \mu$ .

*General distribution.* Philippines, Amboina, Red Sea, Labuan, Pacific.

#### HOLOTHURIA ATRA Jaeger.

*Holothuria atra* Jaeger, 1833 (3).

*Holothuria* (subgenus *Microthele*) *affinis* Brandt, 1835 (6).

*Holothuria floridana* Pourtalés, 1851 (8); Selenka, 1867 (10).

*Holothuria atra* Selenka, 1867 (10).

*Holothuria amboinensis* Semper, 1868 (11).

*Holothuria atra* Semper, 1868 (11); Théel, 1886 (20); Bell, 1886 (19), 1887 (22).

*Holothuria atra*, var. *amboinensis* Théel, 1886 (20).

*Holothuria atra* Sluiter, 1887 (24), 1901 (28); Ludwig, 1887 (23); Pearson, 1903 (29); Koehler & Vaney, 1908 (31).

One specimen from Station IX. Matemo Is. Length 115 mm.; breadth 35 mm.

This species is characterised by having numerous Polian vesicles and madreporic canals. The numbers vary in different individuals. In the specimen under examination there are four Polian vesicles and twelve stone-canals.

The deposits are typical.

Width of table  $22 \mu$ . Height of spine on table  $52 \mu$ .

Average length of perforated plates  $44.5 \mu$ .

*General distribution.* Celebes, Florida, Red Sea and Indian Ocean, East Indies, Pacific Islands.

#### HOLOTHURIA ATRA, var. AMBOINENSIS Théel.

*Holothuria atra* Selenka, 1867 (10).

*Holothuria amboinensis* Semper, 1868 (11).

*Holothuria atra*, var. *amboinensis* Théel, 1886 (20).

Two specimens from Station IX. Matemo Is.

Length 130 mm. and 125 mm.

Breadth 30 mm. and 30 mm.

Both specimens are black.

These specimens resemble *Holothuria atra* very closely except



in colour. There are some small points of difference in the spicules.

The tables have a larger base than in *H. atra* and have generally a few small peripheral holes. The edge of the base is often spinous. Fenestrated plates similar to those in *H. atra* are rare, but there are numerous small rods which branch dichotomously and which may represent stages in the disintegration of larger fenestrated plates.

Diameter of tables  $44.5 \mu$ .

Length of branched rods  $11 \mu$ .

There are numerous Polian vesicles and stone-canals as in *H. atra*.

*General distribution.* Amboina, Venezuela, East Africa.

#### HOLOTHURIA CURIOSA Ludwig.

*Holothuria curiosa* Ludwig, 1875 (12); Lampert, 1885 (18); Théel, 1886 (20); Sluiter, 1901 (28).

One specimen from Station IX. Matemo Is.

Length 32 mm.; breadth 12 mm.

The colour of this specimen does not agree with Théel's description of the species. The dorsal surface is dark brown over which are scattered numerous yellow spots. The ventral surface is much lighter. There is a small light area around each end of the body.

This specimen resembles *Holothuria curiosa* very closely in most respects. The deposits are very similar to those described by Théel. The tables in most cases have rudimentary spires, but in a few instances complete spires are present consisting of four upright rods surmounted by a spinous ring.

Diameter of tables from  $37 \mu$  to  $48 \mu$ .

Length of buttons  $41 \mu$ .

*General distribution.* Bowen, Fiji, New Guinea, Philippines, Indian Ocean.

#### HOLOTHURIA DOFLEINII Augustin.

*Holothuria dofleinii* Augustin, 1908 (30).

One specimen (much flattened) from Station I. Tunghi Bay.

Length 85 mm.

I have no hesitation in placing this specimen in Augustin's species.

The colour of the body is yellowish white. The papillæ have a brown colour and there is a dark brown ring around the base of each papilla.

The deposits agree with Augustin's description and consist of tables and buttons. The tables (text-fig. 17 A & C) generally have four large central holes and four smaller peripheral holes. In a few cases the peripheral holes are more numerous. The spines are short and are generally imperfectly formed. In the most perfect specimens the spire has a rectangular top which bears blunt spines. In the majority of instances, however,



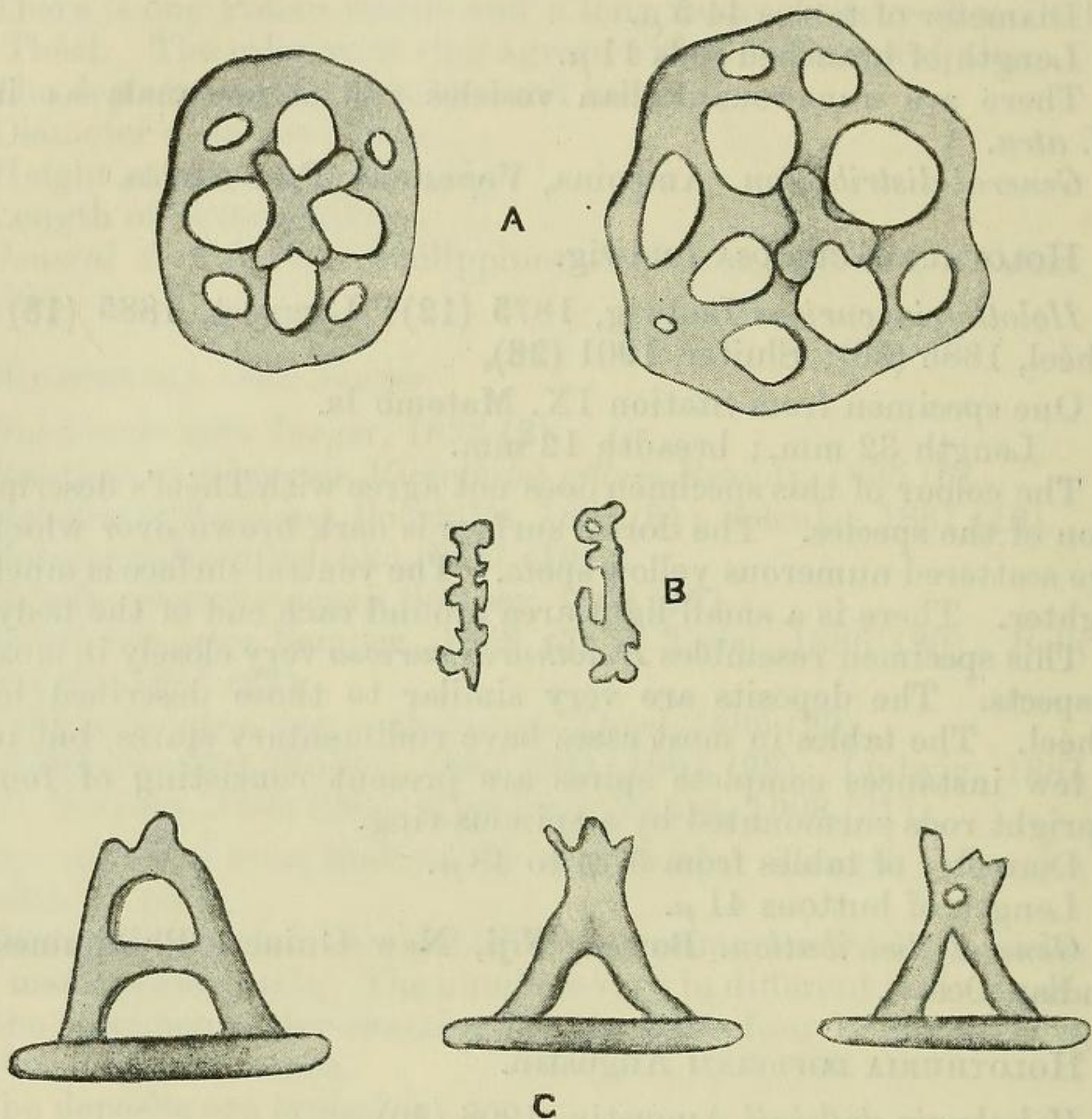
the tops of the spires are very imperfect and irregular. The buttons are very irregular in shape, and the more perfect specimens suggest a derivation from perforated plates (text-fig. 17 B).

Diameter of tables up to  $37\ \mu$ .

Length of buttons  $22\ \mu$ .

*General distribution.* East Africa, Japan.

Text-fig. 17.



*Holothuria dofleinii*. Spicules.

A. Tables, from above.  $\times 860$ .

B. "Buttons."  $\times 640$ .

C. Tables (side view).  $\times 670$ .

### HOLOTHURIA IMPATIENS Forskål.

*Fistularia impatiens* Forskål, 1775 (1).

*Trepang impatiens* Jaeger, 1833 (3).

*Holothuria fulva* Quoy & Gaimard, 1833 (4).

*Thyone impatiens* Blainville, 1834 (5).

*Sporadipus impatiens* Grube, 1840 (7).

*Holothuria botellus* Selenka, 1867 (10).

*Holothuria impatiens* Lampert, 1885 (18); Théel, 1886 (20); Bell, 1886 (19), 1887 (22); Ludwig, 1887 (23); Sluiter, 1887 (24), 1901 (28); Koehler & Vaney, 1908 (31).



One specimen from Station IX. Matemo Is.

Length 75 mm.; breadth 15 mm.

One specimen from Station II. Maiyapa Bay.

Length 90 mm.; breadth 20 mm.

The colour and general characters agree with Théel's description. There are eighteen pinkish coloured tentacles situated in two rows. The deposits consist of tables and buttons.

Diameter of tables 92.5  $\mu$ .

Length of buttons 80  $\mu$  to 95  $\mu$ .

*General distribution.* Mediterranean, Indian Ocean, East Indies, Pacific Islands.

HOLOTHURIA LINEATA Ludwig.

*Holothuria lineata* Ludwig, 1875 (12).

*Labidodemas punctulatum* Haacke, 1880 (14).

*Holothuria lineata* Bell, 1884 (17); Lampert, 1885 (18); Théel, 1886 (20).

One specimen from Station II. Maiyapa Bay.

Length 23 mm.; breadth 9 mm.

This extremely small specimen possesses the characters of the above species.

There are twenty tentacles present.

The deposits are similar to those of *Holothuria lineata* and *Holothuria pardalis*, and consist of tables and buttons. The buttons are asymmetrical and are scattered.

Diameter of tables 75  $\mu$ .

Length of buttons 55  $\mu$ .

*General distribution.* Bowen, Red Sea, Mauritius, Thursday Is.

HOLOTHURIA MARMORATA Jaeger.

*Bohadschia marmorata* Jaeger, 1833 (3).

*Sporadipus ualensis* (subgenus *Colpochirota*) Brandt, 1835 (6).

*Holothuria ualensis* Selenka, 1867 (10).

*Holothuria brandtii* Selenka, 1867 (10).

*Holothuria marmorata* Semper, 1868 (11).

*Holothuria utrimquestigmosa* Haacke, 1880 (14).

*Holothuria marmorata* Lampert, 1885 (18); Théel, 1886 (20); Bell, 1887 (21); Sluiter, 1887 (24), 1901 (28); Pearson, 1903 (29).

One specimen from Station I. Tunghi Bay.

Length 90 mm.; breadth 20 mm.

This specimen is eviscerated, but it agrees with Théel's description.

The deposits consist of irregularly branched rods, the largest being about 48  $\mu$  long.

*General distribution.* Indo-Pacific region.

HOLOTHURIA MARTENSII Semper.

*Holothuria martensii* Semper, 1868 (11); Théel, 1886 (20).

Two specimens from Station VII. South of Pekawi.

Length 43 mm. and 30 mm.

Breadth 13 mm. and 10 mm.



These specimens agree with Théel's description.

*Deposits.* The tables vary in appearance and have a diameter ranging from  $70\ \mu$  to  $110\ \mu$ . The tables have an extremely high spire—up to  $110\ \mu$  in height—and have seven or eight cross-beams. The buttons present great variations in size and appearance. The largest are about  $110\ \mu$  in length. These are generally smooth and have eight or nine pairs of holes. The smaller buttons are about  $70\ \mu$  in length and are often knobbed and have about six pairs of holes.

*General distribution.* Amboina, Celebes, Banda, and East Africa.

#### HOLOTHURIA MONACARIA Lesson.

*Psolus monacaria* Lesson, 1830 (2).

*Holothuria flammea* Quoy & Gaimard, 1833 (4).

*Holothuria fusco-punctata* Quoy & Gaimard, 1833 (4).

*Holothuria fasciola* Quoy & Gaimard, 1833 (4).

*Stichopus flammeus* Brandt, 1835 (6).

*Stichopus gyriifer* Selenka, 1867 (10).

*Labidodemas leucopus* Haacke, 1880 (14).

*Holothuria monacaria* Lampert, 1885 (18); Théel, 1886 (20); Ludwig, 1887 (23); Sluiter, 1887 (24), 1901 (28); Pearson, 1903 (29).

One specimen from Station VII. Pekawi Bay.

Length 60 mm.; breadth 17 mm.

The spicules consist of tables and buttons.

The tables have twelve peripheral holes, those opposite the rods of the spire being slightly larger than the others. These four persist when the others are broken. Many of the tables, therefore, have only four peripheral holes.

Diameter of tables up to  $55.5\ \mu$ .

Length of buttons  $55.5\ \mu$ .

*General distribution.* Indian Ocean, East Indies, Australia, Pacific Islands.

#### HOLOTHURIA SCABRA Jaeger.

*Holothuria scabra* Jaeger, 1833 (3).

*Holothuria tigris* Selenka, 1867 (10).

*Holothuria scabra* Semper, 1868 (11); Lampert, 1885 (18); Théel, 1886 (20); Ludwig, 1887 (23); Sluiter, 1887 (24), 1901 (28).

*Holothuria cadelli* Bell, 1887 (21).

*Holothuria gallensis* Pearson, 1903 (29).

*Holothuria scabra* Koehler & Vaney, 1908 (31).

Two specimens from Station I. Tunghi Bay.

Length 150 mm. and 105 mm.

Breadth 40 mm. and 35 mm.

This is undoubtedly the same species as *Holothuria gallensis* Pearson (29), so that this latter name must be included as one of the synonyms of *Holothuria scabra*.



The two specimens in this collection agree with my description of *H. gallensis* (29) except with regard to the colour. In neither specimen is the dorsal surface marked by the transverse black and yellow bands that were present in the Ceylon specimens. The dorsal surface is uniformly grey in colour and evidently resembles the Fiji specimen described by Théel (20).

The ventral surface is yellowish-white and the dark grey patches are not nearly so numerous as in the Ceylon specimens.

The deposits are similar to those described in the Ceylon specimens.

Length of buttons 37  $\mu$ .

Diameter of tables 63  $\mu$ .

*General distribution.* Indian Ocean, Philippines, Fiji.

HOLOTHURIA VAGABUNDA Selenka.

? *Stichopus* (subgen. *Gymnochirota*) *leucospilota* Brandt, 1835 (6).

*Holothuria vagabunda* Selenka, 1867 (10); Semper, 1868 (11); Lampert, 1885 (18); Théel, 1886 (20); Bell, 1886 (19); Sluiter, 1887 (24), 1901 (28); Pearson, 1903 (29); Koehler & Vaney, 1908 (31).

One specimen from Station IX. Matemo Is.

Length 80 mm.; breadth 17 mm.

There is nothing new to add to previous descriptions of this species.

Length of buttons 44  $\mu$ .

Diameter of tables 44  $\mu$ .

*General distribution.* Indian Ocean, Hong Kong, Pacific Islands.

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