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A COLLECTION OF HOLOTHURIANS IN THE LEIDEN MUSEUM FROM THE EAST INDIES AND NEW GUINEA, WITH THE DESCRIPTION OF A NEW SPECIES OF *PROTANKYRA* (HOLOTHURIOIDEA: SYNAPTIDAE) FROM JAVA

by

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With 1 text-figure

SUMMARY

Twenty-seven species of holothurian are recorded from the East Indies, including a new species in the synaptid genus *Protankyra* collected from the central north coast of Java. The majority of the species are widely distributed throughout the Indo-west Pacific region. However, *Labidoplax incerta* (Ludwig, 1875), known only from Java, is recorded for the second time from the same area.

INTRODUCTION

During a study visit to the Université Libre de Bruxelles in 1978, the author was invited by Dr. J. C. den Hartog (Curator of Coelenterates etc.) of the Rijksmuseum van Natuurlijke Historie in Leiden (RMNH) to identify and report on a collection of holothurians housed in that Museum and which had been sent to the Université for examination. The holothurians were collected in the early part of the present century, mostly by P. Buitendijk (1906-1926) and more recently by L. D. Brongersma (1952), from localities mainly throughout the East Indies and from New Guinea. Although no depth data are available, it would appear that the collections were made from littoral or at the most very shallow water (< 10m). The only previous report on holothurians in the Leiden Museum collections is that of Ludwig (1882). He recorded a world-wide collection of some fifty-two species of which only twenty-six were recorded from the East Indian region. Eighteen of those species are duplicated in the present collection.

A number of papers have been published describing collections of holothurians from the East Indian region, most notably those of Ludwig (1875), Semper (1868) and Sluiter (1881-1914). More recently Clark & Rowe (1971) detailed the distribution of shallow-water species of each echinoderm class occurring throughout the Indo-west Pacific region, listing all references known up to that time. No further papers have been written since Clark & Rowe (1971) dealing with holothurian collections made in the East Indian region (Indonesia, Malaysia) or New Guinea, though several papers describe collections from, and survey the literature pertaining to, the Philippines (e.g. Tan Tiu, 1981) or southern China (e.g. A. M. Clark, 1980).

Of the twenty-seven species reported in this paper one, *Protankyra buitendijki* is described as new to science. Of the remaining twenty-six species eighteen are widely distributed in the Indo-west Pacific region, though eight of these are not recorded from Hawaiian shores. Five species are recorded only from the East Indies and at least the eastern part of the Indian Ocean; two species are recorded from the East Indies and south western Pacific Islands and one species, *Labidoplax incerta*, has previously only been recorded, and is recorded for only the second time, from Java.

SYSTEMATIC ACCOUNT

In the interest of brevity the format of Rowe & Doty (1977) is followed where the list of references for each species is minimised to include only that of the original describer, and authors responsible for nomenclatorial changes, and authoritative references to synonymies and distribution. The general distribution for each species is stated and remarks added where appropriate. A Leiden Museum registered number (prefixed by RMNH) is given for each lot of specimens recorded from each locality. This is followed by a number in parentheses, which denotes the number of specimens collected.

The following list gives Dutch terms and old Dutch names given with the material examined, and the English translations and current names (kindly provided by Dr. Den Hartog).

Baai van	= Bay of
Batavia	= Jakarta (Java, Indonesia)
Eiland(en)	= Isle(s)
Java Zee	= Java Sea
Noord k.v.	= North coast of
Poeloe Weh	= Small island north of Sumatra, Indonesia (Poeloe = island)

Reede (van) Batavia	= Roads of Jakarta (where ships anchor etc.)
Strand bij	= Beach at
Strandjes in en om de baai van Hollan- dia	= Little beaches in and around the Bay of Hollandia (now Djajapura)
Zuidkust	= South coast

New species recorded

Protankyra buitendijki sp. nov.

Material examined. — RMNH 5453 (Holotype), Semarang, Java, 1907, P. Buitendijk; RMNH 5452 (Paratype), Reede van Semarang, November, 1907, P. Buitendijk.

Description. — Both specimens are fragmented. The fragments of the holotype measure 35 mm × 8 mm (with tentacles) and 90 mm × 8 mm, whereas those of the paratype measure 9 mm × 6 mm (with tentacles) and 37 mm × 6 mm.

There are 12 tentacles, each with 2 pairs of digits. No sensory cups are present. The calcareous ring has well developed muscular impressions and the radial plates are perforated for nerves (fig. 1a).

The holotype has 8 polian vesicles of similar length to the gonad which is a short (c. 14 mm) tuft of branched, possibly spent, tubules. The madreporite has a sinuous head (fig. 1b). These internal structures are missing from the paratype.

The ciliated funnels occur at the base of the dorsal mesentery and are in small, stalked clusters (fig. 1c). The funnels are long and slender (c. 200 μm long) and the clusters measure some 700 μm in height.

The radial muscles are very well developed, so that in the preserved state the larger holotype appears, externally, to have 5 smooth radial and 5 very corrugated interradial regions. This longitudinal division of the body is not apparent in the paratype.

The spicules comprise anchors, anchor plates, miliary granules and curved, slender, often terminally bifid rods.

The anchors are symmetrical and range in size from about 650-700 μm in length × 425-450 μm in breadth across the flukes in the anterior fragments and 550-620 μm in length × 330-360 μm in breadth in the (?) posterior fragments. In the paratype smaller anchors 350-500 μm in length × about 285 μm in breadth are also present. The flukes bear 10-16 serrations and the vertex is smooth. The stock is branched and denticulate (fig. 1e).

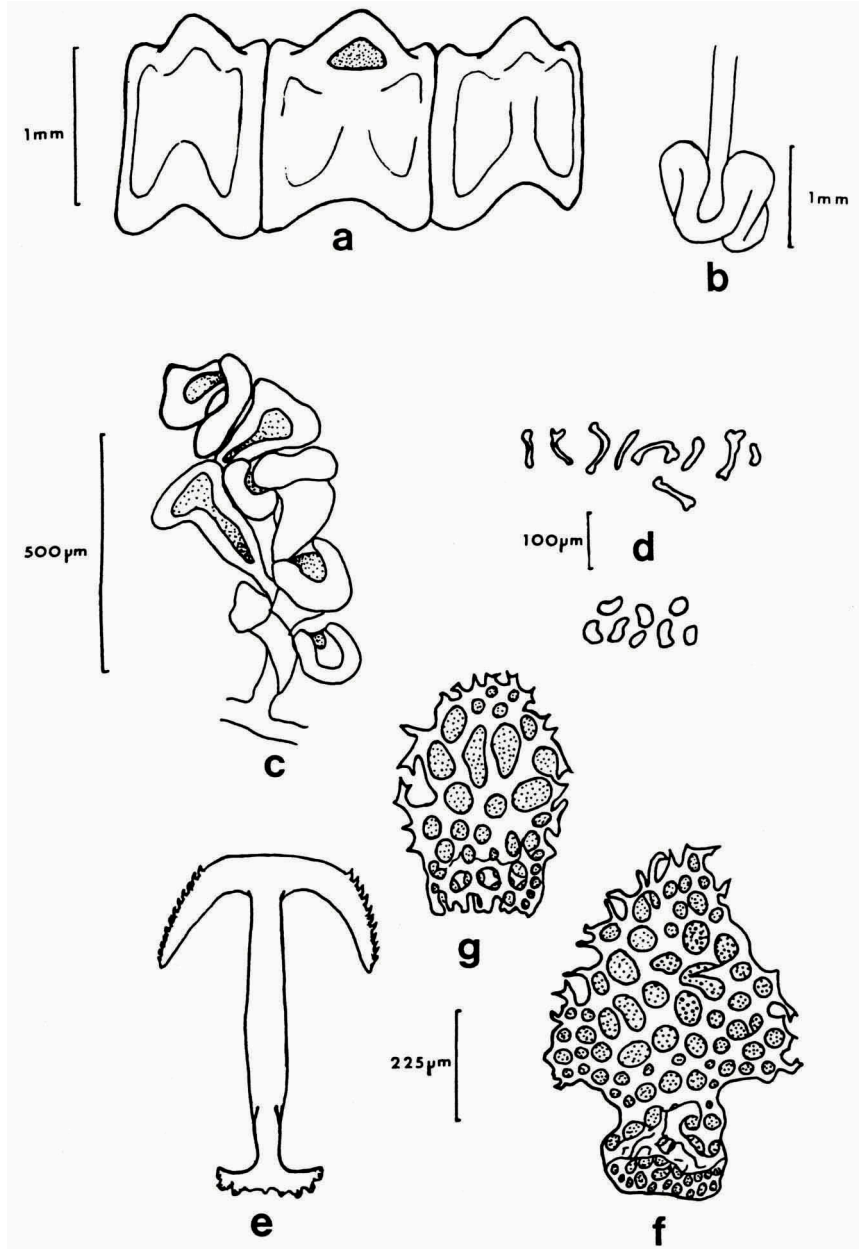


Fig. 1. *Protankyra buitendijki* sp. nov. a, dorsal radial (perforated) and adjacent interradial plates of the calcareous ring; b, head of madreporite; c, cluster of ciliary funnels; d, curved rods and miliary granules; e, anchor; f-g, anchor plates.

The anchor plates are generally arrowhead-shaped with a narrow, squared posterior region bearing a well developed bridge. The edge of the plates is very irregular. The plates from the anterior fragments measure 500-620 μm in length \times 330-430 μm in breadth (at the widest point) (fig. 1f). Smaller, more ovoid plates in the paratype range from about 380-500 μm \times 250-380 μm (fig. 1g). The holes of the plates are smooth, rarely a few central holes have one or two minute thorns.

Curved rods (45-60 μm \times 7.5 μm) usually occur grouped in papillae but some may be scattered throughout the body wall. Most rods have swollen or bifurcate ends. Smaller, usually kidney-shaped or oval miliary granules (30-40 μm \times 15 μm) also occur scattered in the body wall (fig. 1d). Similar rods are found in the tentacles.

Etymology. — Named for P. Buitendijk, who collected the majority of specimens which constitute the basis of this report.

Remarks. — The shape of the anchor plates and small rods, with the arrangement of rods in small papillae appears to be very distinctive. Although the shape of the plates is similar to those in *P. suenisoni* Heding and *P. javaensis* Heding, the shape and arrangement of the rods separate *buitendijki* from those species. Also, the tentacles of *suenisoni* bear sensory cups (not reported for *javaensis*) and the larger plates of *javaensis* do not possess a posterior bridge. The arrangement of ciliary funnels is similar in *buitendijki* and *suenisoni* but those of *javaensis* are arranged singly. The anchor stock of *javaensis* and *suenisoni* is finely denticulated, not branched as in *buitendijki*. This latter feature, as well as the denticulation of the holes of the anchor plates also separates *P. verrilli* (Theel), and *P. insolens* (Theel) from the new species.

The species which appears most closely related to *buitendijki* is *P. errata* Koehler & Vaney, 1905, collected from deep water (234-864 m) off the Andaman Islands in the Gulf of Bengal. The depth of the new species is unknown but it is considered to have been collected from shallow water (see p. 149). The main differences appear to lie in the shape of the anchor plates. *P. buitendijki* has two types (at least in the paratype), the larger having a very pronounced, squared posterior and a more angular arrowhead-shaped anterior region whilst smaller, oval plates may also be present. In *errata* only oval-shaped plates are present, the size not being recorded by Koehler and Vaney. The stock of the anchors of *errata* are described as bearing short, irregularly arranged projections, whereas in *buitendijki* denticulated projections occur. The rods appear to be similar in both species but the arrangement of these (in papillae in *buitendijki*) is not recorded for *errata*. Koehler and Vaney do not mention sensory cups on the 11-12 tentacles of *errata* but do mention that there are sometimes 3 pairs of digits.

Other species recorded

Stichopus chloronotus Brandt

Stichopus (Perideris) chloronotus Brandt, 1835: 50.

S. Chloronotus; Ludwig, 1882: 133; H. L. Clark, 1922: 53, pl 2 (synonymy) figs. 1-10; Clark & Rowe, 1971: 178 (distribution), pl. 27, fig. 18.

Material examined. — RMNH 5390 (1.2), Baai van Batavia, Java, 1909, P. Buitendijk; RMNH 5391 (1), Poeloe Weh, ten N. van Sumatra, 1913, P. Buitendijk; RMNH 5392 (1), Poeloe Weh, ten N. van Sumatra, april, 1914, P. Buitendijk.

Distribution. — Indo-west Pacific; East Africa to Hawaii (Clark & Rowe, 1971).

Bohadschia argus Jaeger

Bohadschia argus Jaeger, 1833: 19, 2 fig. 1; Panning, 1944: 36 (synonymy), figs. 7-8; Rowe, 1969: 130; Clark & Rowe, 1971: 176 (distribution), pl. 27, fig. 6.

Holothuria argus; Ludwig, 1882: 135.

Material examined. — RMNH 5393 (1), Rif bij Sorido, Eiland Biak, Nieuw Guinea, juli-augustus, 1952, L. D. Brongersma and W. J. Roosdorp; RMNH 5394 (1), Poeloe Weh, ten N. van Sumatra, april, 1914, P. Buitendijk.

Distribution. — Tropical Pacific extending into the Indian Ocean at least as far as Ceylon. It has also been recorded from the islands of the western Indian Ocean (Clark & Rowe, 1971).

Bohadschia marmorata Jaeger

Bohadschia marmorata Jaeger, 1833: 18, pl. 3 fig. 9; Rowe, 1969: 129, fig. 2; Clark and Rowe, 1971: 176 (distribution), pl. 27, fig. 8.

B. marmorata marmorata; Panning, 1944: 39 (synonymy), figs. 9-10.

Holothuria marmorata; Ludwig, 1882: 135.

Material examined. — RMNH 5395 (1), Rif bij Sorido, Eiland Biak, Nieuw Guinea, februari-me, 1952, L. D. Brongersma; RMNH 5396 (1), Eiland Enkhuizen, Baai van Batavia, Java, augustus, 1914, P. Buitendijk.

Distribution. — Indo-west Pacific, except Hawaii (Clark & Rowe, 1971).

Actinopyga echinites (Jaeger)

Muelleria echinites Jaeger, 1833: 17; Ludwig, 1882: 134.

Actinopyga echinites; Panning, 1944: 48, fig. 17; Rowe, 1969: 130, fig. 3; Clark & Rowe, 1971: 176 (distribution), pl. 27, fig. 1.

Material examined. — RMNH 5397 (1), Poeloe Weh, ten N. van Sumatra, 1913, P. Buitendijk.

Distribution. — Indo-west Pacific, except Hawaii (Clark & Rowe, 1971).

***Actinopyga mauritiana* (Quoy & Gaimard)**

Holothuria mauritiana Quoy & Gaimard, 1833: 137.

Muelleria mauritiana; Ludwig, 1882: 134

Actinopyga mauritiana; Panning, 1944: 55 (synonymy), fig. 24; Rowe, 1969: 131; Clark & Rowe, 1971: 176 (distribution), pl. 27, fig. 3; Rowe & Doty, 1977: 228, figs. 2f, 6d.

Material examined. — RMNH 5398 (14), Poeloe Weh, ten N. van Sumatra, april, 1914, P. Buitendijk; RMNH 5399 (1), Java Zee, oktober, 1907, P. Buitendijk; RMNH 5400 (1), Poeloe Weh, ten N. van Sumatra, P. Buitendijk, 1913; RMNH 5401 (1) Poeloe Weh, ten N. van Sumatra, januari, 1913, P. Buitendijk; RMNH 5402 (1), Poeloe Weh, ten N. van Sumatra, april, 1915, P. Buitendijk; RMNH 5403 (1), Poeloe Weh, ten N. van Sumatra, augustus, 1916, P. Buitendijk; RMNH 5404 (1) Kisser (8° 12' S, 127° E), 1898, K. Schädler; RMNH 5405 (1), Insoemoar, Wak-de Eilanden (2° S: 139° E), 7 juli, 1952, L. D. Brongersma.

Distribution. — Throughout the Indo-west Pacific (Clark & Rowe, 1971).

***Labidodemas semperianum* Selenka**

Labidodemas semperianum Selenka, 1867: 309, pl. 17 figs. 1-3; Cherbonnier, 1970: 566 (synonymy), figs. A-P; Rowe, 1969: 132, fig. 4; Clark & Rowe, 1971: 176 (distribution), pl. 28, fig. 12.

Material examined. — RMNH 5406 (1), Rif bij Sorido, Eiland Biak, Nieuw Guinea, februari-mei, 1952, L. D. Brongersma.

Distribution. — Indo-west Pacific from Maldive Islands (Indian Ocean) to Hawaii (Clark & Rowe, 1971).

***Holothuria (Acanthotrapeza) pyxis* Selenka**

Holothuria pyxis Selenka, 1867: 337.

H. (Holothuria) pyxis; Panning, 1934: 36, fig. 31.

H. (Acanthotrapeza) pyxis; Rowe, 1969: 138, fig. 8; Clark & Rowe, 1971: 176 (distribution).

Material examined. — RMNH 5407 (1, 1) Poeloe Weh, ten N. van Sumatra, 1913, P. Buitendijk.

Distribution. — Recorded only from the Bay of Bengal and East Indies (Clark & Rowe, 1971).

***Holothuria (Halodeima) atra* Jaeger**

Holothuria atra Jaeger, 1833: 22; Ludwig, 1882: 137.

H. (Halodeima) atra; Pearson, 1914: 170; Rowe, 1969: 137, fig. 7; Clark & Rowe, 1971: 176 (distribution), pl. 27, fig. 11.

H. (Holothuria) atra Panning, 1934: 30 (synonymy), fig. 22.

Material examined. — RMNH 5408 (1, 2), Rif bij Sorido, Eiland Biak, Nieuw Guinea, februari-mei, 1952, L. D. Brongersma; RMNH 5409 (1), Strandjes in en om de Baai van Hollandia, Nieuw Guinea, 27 september, 1959. Exp. Sterrengebergte, Nieuw Guinea; RMNH 5410 (1), "Base" Eiland Biak, Nieuw Guinea, februari-mei, 1952, L. D. Brongersma; RMNH 5411 (3), Poeloe Weh, ten N. van Sumatra, april, 1914, P. Buitendijk; RMNH 5412 (1), Java Zee, oktober, 1907, P. Buitendijk; RMNH 5413 (1), Eiland Alkmaar, Baai van Batavia, Java, 1906, P. Buitendijk.

Distribution. — Throughout the Indo-west Pacific (Clark & Rowe, 1971).

Holothuria (Halodeima) edulis Lesson

Holothuria edulis Lesson, 1830: 125, pl. 46 fig. 2; Ludwig, 1882: 137.

H. (Holothuria) edulis; Panning, 1934: 43 (synonymy), fig. 36.

H. (Halodeima) edulis; Rowe, 1969: 138; Clark & Rowe, 1971: 176 (distribution), pl. 27, fig. 14.

Material examined. — RMNH 5414 (1), Rif bij Sorido, Eiland Biak, Nieuw Guinea, februari-mei, 1952, L. D. Brongersma.

Distribution. — Indo-west Pacific, except Hawaii (Clark & Rowe, 1971).

Holothuria (Lessonothuria) pardalis Selenka

Holothuria pardalis Selenka, 1867: 336, pl. 19 fig. 85; Ludwig, 1882: 137.

H. lineata; Ludwig, 1882: 136

H. (Holothuria) pardalis; Panning, 1935: 3 (synonymy), fig. 106.

Lessonothuria pardalis; Deichmann, 1958: 295, pl. 2 figs. 1-17.

H. (Lessonothuria) pardalis; Rowe, 1969: 149, fig. 15; Clark & Rowe, 1971: 176 (distribution), pl. 28, fig. 11.

Material examined. — RMNH 5415 (1), Eiland Enkhuizen, Baai van Batavia, Java, april, 1906, P. Buitendijk; RMNH 5417 (1), Poeloe Weh, ten N. van Sumatra, 30 november, 1910, P. Buitendijk; RMNH 5418 (1), Endeh, Flores, 1891, Dr. Ten Kate.

Distribution. — Throughout the Indo-west Pacific (Clark & Rowe, 1971).

Holothuria (Mertensiothuria) leucospilota (Brandt)

Stichopus (Gymnochirota) leucospilota Brandt, 1835: 51.

Holothuria vagabunda; Ludwig, 1882: 135.

Mertensiothuria leucospilota; Deichmann, 1958: 297 (synonymy), pl. 3 figs. 1-9.

Holothuria (Mertensiothuria) leucospilota; Rowe, 1969: 148, fig. 14; Clark & Rowe, 1971: 176 (distribution), pl. 28, fig. 19.

Material examined. — RMNH 5419 (1) Tandjong Priok, Java, oktober, 1907, P. Buitendijk;

RMNH 5420 (7), Java Zee, P. Buitendijk; RMNH 5421 (2), Reede van Batavia, Java, 1907, P. Buitendijk; RMNH 5422 (5), Strand bij Kampong Saba, Eiland Biak, Nieuw Guinea, 15 februari, 1952, L. D. Brongersma; RMNH 5423 (3), Rif bij Sorido, Eiland Biak, Nieuw Guinea, februari-me, 1952, L. D. Brongersma; RMNH 5424 (1, 8), Noordkust van Java, 1908, P. Buitendijk; RMNH 5425 (1), Eiland Owi, Nieuw Guinea, 6 april, 1952, W. J. Roosdorp; RMNH 5426 (5), Java Zee, oktober, 1907, P. Buitendijk; RMNH 5427 (1), Baai van Batavia, Java, 1909, P. Buitendijk; RMNH 5428 (1), Ambon, Indonesia, D. S. Hoedt, 1863-1866; RMNH 5429 (1), Telote Semawe, Atjeh, N. Sumatra, 26 januari, 1895, G. A. J. v.d. Sande; RMNH 5430 (1), Aroe Eilanden, 1894, A. J. ? van Stockum; RMNH 5431 (1), Poeloe Kloewang, Westkust van Atjeh, N. Sumatra, april, 1889, W. Baerts; RMNH 5432 (1), West Java, 1907, P. Buitendijk; RMNH 5433 (3), Java Zee, 1907, P. Buitendijk; RMNH 5434 (1), Eiland Enkhuizen, Baai van Batavia, Java, april, 1906, P. Buitendijk; RMNH 5435 (1, 1), Poeloe Weh, N. van Sumatra, maart 1906 & 1911, P. Buitendijk; RMNH 5436 (1), Poeloe Weh, ten N. van Sumatra, 1907, P. Buitendijk.

Distribution. — Throughout the Indo-west Pacific region (Clark & Rowe, 1971).

Holothuria (Microthele) nobilis (Selenka)

Muelleria nobilis Selenka, 1867: 313, pl. 7 figs. 13-15.

Holothuria (Microthele) nobilis; Panning, 1929: 131 (synonymy), fig. 15; Rowe, 1969: 162, fig. 21; Clark & Rowe, 1971: 178 (distribution), pl. 27, fig. 10, pl. 28, fig. 20.

Material examined. — RMNH 5437 (1), Rif bij Sorido, Eiland Biak, Nieuw Guinea, juli-augustus, 1952, L. D. Brongersma and W. J. Roosdorp.

Distribution. — Throughout the Indo-west Pacific (Clark & Rowe, 1971).

Holothuria (Platyperona) difficilis Semper

Holothuria difficilis Semper, 1868: 92, pl. 30 fig. 21.

Microthele difficilis; Deichmann, 1958: 288 (synonymy), pl. 1, figs. 6-9.

Holothuria (Platyperona) difficilis; Rowe, 1969: 143, fig. 12; Clark & Rowe, 1971: 178 (distribution), pl. 27 fig. 9.

Material examined.—RMNH 5438 (1); Kisser (8° 12' S, 127°E), 1898, K. Schädler.

Distribution. — Throughout the Indo-west Pacific (Clark & Rowe, 1971).

Holothuria (Selenkothuria) erinaceus Semper

Holothuria erinaceus Semper, 1868: 91, pl. 30 fig. 24.

H. erinaceus var. *pygmaea* Semper, 1868: 91, pl. 30 fig. 23.

H. marenzelleri Ludwig, 1883: 167.

H. (H.) lubrica var. *marenzelleri*; Panning, 1934: 47 fig. 41.

H. (H.) lubrica var. *glaberrima*; Panning, 1934: 47, fig. 42 (part).

Selenkothuria erinaceus; Deichmann, 1958: 314 (synonymy), 315 (keys).

Holothuria (S.) erinaceus; Rowe, 1969: 135; Clark & Rowe, 1971: 178 (distribution), pl. 28, fig. 5.

Material examined. — RMNH 5439 (1), Zuidkust Java, 1911, P. Buitendijk.

Distribution. — Described from the Philippines, this species has been recorded as far west as Ceylon and (doubtfully) from East Africa, and in the South Pacific Islands (Clark & Rowe, 1971).

Holothuria (Selenkothuria) moebii Ludwig

Holothuria lubrica; Ludwig, 1882: 137 (non *H. Lubrica* Selenka, 1867).

Holothuria moebii Ludwig, 1883: 171.

H. (H.) lubrica var. *lubrica*; Panning, 1934: 45 (part), fig. 38.

H. (H.) lubrica var. *moebii*; Panning, 1934: 46, fig. 40.

Selenkothuria moebii; Deichmann, 1958: 314 (synonymy), 315 (key).

H. (S.) moebii; Rowe, 1969: 135; Clark & Rowe, 1971: 178 (distribution); Sloane et al., 1979: 122.

Material examined. — RMNH 5440 (9), Endeh, Flores, 1891, Dr. Ten Kate.

Distribution. — Similar to *H. (S.) erinaceus* (Clark & Rowe, 1971). In the western Indian Ocean this species is known from Mauritius and more recently (Sloan et al., 1979) from Aldabra.

Holothuria (Theelothuria) squamifera Semper

Holothuria squamifera Semper, 1868: 83, pl. 30 fig. 15.

H. (H.) squamifera; Panning, 1935: 99, fig. 90.

Theelothuria squamifera; Deichmann, 1958: 326 (misspelt *squamata*).

H. (T.) squamifera; Rowe, 1969: 158; Clark & Rowe, 1971: 178 (distribution), pl. 28, fig. 17.

Material examined. — RMNH 5441 (1); Semarang, Java, 1907, P. Buitendijk; RMNH 5442 (4), Reede van Semarang, Java, augustus, 1907, P. Buitendijk.

Distribution. — Described from the Philippines, this species is also recorded from the Navigator Islands in the South West Pacific and from the East Indies.

Holothuria (Thymiosycia) hilla Lesson

Holothuria hilla Lesson, 1830: 226, pl. 79; Cherbonnier, 1951: 532, fig. 1.

H. monacaria; Ludwig, 1882: 134.

H. decorata; Ludwig, 1882: 135.

H. (H.) monacaria; Panning, 1934: 69 (synonymy), fig. 47.

H. (Thymiosycia) hilla; Rowe, 1969: 147; Clark & Rowe, 1971: 178 (distribution), pl. 28, fig. 9;

Rowe & Doty, 1977: 232 (synonymy), figs. 4b, 8b.

Material examined. — RMNH 5443 (1), Eiland Biak, Nieuw Guinea, februari-mei, 1952, L. D. Brongersma; RMNH (1), Endeh, Flores, 1891, Dr. Ten Kate.

Distribution. — Throughout the Indo-west Pacific (Clark & Rowe, 1971).

Holothuria (Thymiosycia) impatiens (Forskål)

Fistularia impatiens Forskål, 1775: 121, pl. 39 fig. B.

Holothuria impatiens; Ludwig, 1882: 136.

H. (H.) impatiens; Panning, 1935: 86 (synonymy), fig. 72.

H. (Thymiosycia) impatiens; Pearson, 1914: 171; Rowe, 1969: 145, fig. 13; Clark & Rowe, 1971: 178 (distribution), pl. 28, fig. 8.

Material examined. — RMNH 5445 (1), Poeloe Weh, ten N. van Sumatra, november, 1913, P. Buitendijk.

Distribution. — Tropical Indo-west Pacific and Atlantic and Mediterranean.

Hemithyone semperi (Bell)

Cucumaria semperi Bell, 1884: 147, pl. 9 fig. A.

Heterothyone semperi; Panning, 1949: 464.

Hemithyone semperi; Pawson, 1963: 28; 1967: 159, figs. 1-10; Clark & Rowe, 1971: 180 (distribution), pl. 29, fig. 15.

Material examined. — RMNH 5446 (2), Reede van Passeroean, Java Zee, 5 juni, 1913, P. Buitendijk.

Distribution. — Recorded from the Indian Ocean and East Indies (Clark & Rowe, 1971).

Leptopentacta imbricata (Semper)

Ocnus imbricatus Semper, 1868: 54, pl. 11 fig. 12, pl. 13 figs. 12-13, pl. 14 figs. 12-13.

O. javanicus; Ludwig, 1882: 131.

Trachythyone imbricata; Panning, 1949: 426; Clark & Rowe, 1971: 182 (distribution).

Leptopentacta imbricata; Panning, 1966: 57 (synonymy), fig. 4; A. M. Clark, 1980: 489.

T. typica; Clark & Rowe, 1971: 182 (distribution), pl. 29, fig. 4.

L. javanica; Clark & Rowe, 1971: 180 (distribution), pl. 29, fig. 5.

Material examined.—RMNH 5447 (2), Kust van Atjeh, N. Sumatra, 1894, G. A. J. v.d. Sande.

Distribution. — Recorded from South East Arabia, Maldive Islands, Ceylon, Bay of Bengal to the Philippines (Clark & Rowe, 1981) and more recently from Hong Kong (A. M. Clark, 1980).

Colochirus quadrangularis Troschel

Colochirus quadrangularis Troschel, 1846: 64; Ludwig, 1882: 131; Panning, 1949: 446, figs. 46-47; 1971: 42, fig. 5; A. M. Clark, 1980: 489, 494 (synonymy).

Pentacta quadrangularis; H. L. Clark, 1946: 391; Clark & Rowe, 1971: 180 (distribution) pl. 29, fig. 11.

Material examined. — RMNH 5448 (1), "Waarschijnlijk" (= probably) Indonesia.

Distribution. — Recorded from Ceylon, Bay of Bengal and East Indian region (Clark & Rowe, 1971).

Afrocucumis africana (Semper)

Cucumaria africana Semper, 1868: 53, pl. 15 fig. 16.

Afrocucumis africana; Heding & Panning, 1954: 109 (synonymy), fig. 39; Clark & Rowe, 1971: 182 (distribution), pl. 20 fig. 3.

Material examined. — RMNH 5449 (9), Poeloe Weh, ten N. van Sumatra, 1907, P. Buitendijk; RMNH 5450 (2), Java Zee, P. Buitendijk.

Distribution. — Recorded from the Indian Ocean, East Indies and western Pacific Islands but not from the Philippines or Hawaii (Clark & Rowe, 1971).

Acaudina molpadioides (Semper)

Haplodactyla molpadioides Semper, 1868: 41.

H. hyaloeides; Ludwig, 1882: 129.

Aphelodactyla molpadioides; Sluiter, 1912: 410 (synonymy), pl. 20.

Acaudina molpadioides; Deichmann, 1940: 212; Clark & Rowe, 1971: 184 (distribution), pl. 31, fig. 12.

Material examined. — RMNH 5451 (2), Java Zee, oktober, 1907, P. Buitendijk; RMNH 5469 (2), N. kust van Atjeh, N. Sumatra, 1 augustus, 1895, G. A. J. v.d. Sande; RMNH 5465 (6), Reede van Semarang, Java, augustus, 1907, P. Buitendijk; RMNH 5466 (4), Soerabaja, Java, november, 1926, P. Buitendijk.

Distribution. — Recorded from Ceylon, Bay of Bengal, East Indies, Philippines and southern China (Clark & Rowe, 1971).

Remarks. — The specimens fall within the range of forms described by Sluiter (1912) for *Aphelodactyla molpadioides*. None, however, possess the large crenulate plates described by Semper for *A. molpadioides* and would more appropriately fit his description of *Haplodactyla molpadioides* var. *sinensis*. The spicules are more or less restricted to the posterior end of the animals. Having examined material from Darwin and the Gulf of Carpentaria (northern Australia), I can see little justification for recognising the validity of either of H. L. Clark's (1938) species *Aphelodactyla leucoprocta* or *delicata* if Sluiter's (1912) rather sweeping synonymy is correct. Lack of sufficient material, however, makes me hesitate to formally commit Clark's species to synonymy. Similarly it is necessary to suspect the validity of *A. gephyra* (Sluiter, 1914). It is, however, more likely from Heding's (1940) description, that *Aphelodactyla iranica*, collected in the Persian Gulf should be referred to the synonymy of

Acaudina molpadioides (Semper). Without doubt the genus *Acaudina* is in need of further revision.

Labidoplax incerta (Ludwig)

Synapta incerta Ludwig, 1875: 77.

Labidoplax incerta; Clark & Rowe, 1971: 184 (distribution).

Material examined. — RMNH 5468 (1), Reede van Semarang, Java, januari, 1913, P. Buitendijk.

Distribution. — Apparently only known from Java.

Synapta maculata (Chamisso & Eysenhardt)

Holothuria maculata Chamisso & Eysenhardt, 1821: 352, pl. 25.

Synapta beselii; Ludwig, 1882: 128.

Synapta maculata; Heding, 1928: 113 (synonymy), pl 2 figs. 1-10; Clark & Rowe, 1971: 186 (distribution), pl. 30, fig. 9.

Material examined. — RMNH 5454 (3), Poeloe Weh, ten N. van Sumatra, april, 1914, P. Buitendijk; RMNH 5455 (2) Poeloe Weh, ten N. van Sumatra, januari, 1913, P. Buitendijk; RMNH 5456 (1) Eiland Biak, Nieuw Guinea, februari-mei, 1952, L. D. Brongersma.

Distribution. — Recorded throughout the Indo-west Pacific, except Hawaii (Clark & Rowe, 1971).

Polycheira rufescens (Brandt)

Chiridota rufescens Brandt, 1835: 59; Ludwig, 1882: 128.

Polycheira rufescens; H. L. Clark, 1907: 120 (synonymy), pl. 17, figs. 14-18; Clark & Rowe, 1971: 188 (distribution), pl. 31, fig. 11.

Material examined. — RMNH 5457 (10) Poeloe Weh, ten N. van Sumatra, april, 1914, P. Buitendijk; RMNH 5458 (1) Poeloe Weh, ten N. van Sumatra, april, 1926, P. Buitendijk; RMNH 5459 (3), Poeloe Weh, ten N. van Sumatra, december, 1922, P. Buitendijk; RMNH 5460 (1), Reede van Semarang, Java, 1906, P. Buitendijk; RMNH 5461 (2), Poeloe Weh, ten N. van Sumatra, 1907, P. Buitendijk; RMNH 5462 (1) Reede van Semarang, Java, augustus, 1907, P. Buitendijk; RMNH 5463 (1), Zuidkust Java, 1911, P. Buitendijk.

Distribution. — Recorded from the islands of the western Indian Ocean, East Africa, Ceylon, east to the western Pacific Islands and north to southern China and Japan (Clark & Rowe, 1971).

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