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ANNOTATED CATALOGUE OF RECENT ECHINODERM TYPE SPECIMENS IN THE COLLECTION OF THE RIJKSMUSEUM VAN NATUURLIJKE HISTORIE AT LEIDEN

by

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M. Jangoux & C. De Ridder: Annotated catalogue of recent echinoderm type specimens in the collection of the Rijksmuseum van Natuurlijke Historie at Leiden.

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The Leiden Museum houses 82 type specimens of recent echinoderms representing 59 nominal species, one nominal subspecies and one variety. Each species, subspecies or variety is presented (original name, current status, Museum characteristics, brief bibliography, and eventual remarks).

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INTRODUCTION

The echinoderm collection of the Rijksmuseum van Natuurlijke Historie at Leiden houses specimens from all over the world, being particularly rich in species originating from the Indo-Malayan area, the central Atlantic area, and the European seas.

The Leiden museum was founded in the year 1820 under the directorate of C.J. Temminck (see Gijzen, 1938). Rather numerous echinoderm specimens reached the museum in Temminck's time, especially due to the activity of overseas residents (such as Von Siebold, who was in Japan; see Holthuis and

Sakai, 1970) and of the members of the "Natuurkundige Commissie" who collected specimens in the Indo-Malayan area. Among the latter, one has to cite the names of Kuhl, van Hasselt, Boie, Macklot and Salomon Müller (see Herklots, 1869, Gijzen, 1938). Since that time the museum's collection was continuously enriched with additional specimens of echinoderms from the Indo-Malayan area. They were mostly collected either by individual scientists and travellers (see Rowe, 1983) or by scientific expeditions, particularly the Snellius Expedition 1929-1930 (see Boschma, 1936, A.H. Clark, 1936, 1964, Jangoux, 1978, Guille & Wolff, 1984) and the Indonesian-Dutch Snellius II Expedition 1984-1985. As for the echinoderm specimens from the central Atlantic area housed at Leiden they were mostly collected after 1965, either from 1966 to 1970 by several expeditions that surveyed the Guyana Shelf (see Walenkamp, 1976, 1979), or from 1980 to 1984 by successive expeditions in the Canary-Cape Verde area.

The echinoderm collection of Leiden was never revised completely but parts were on various occasions, namely by Müller (1841, 1847), Carpenter (1881) and A.H. Clark (1911) for the crinoids, by Ludwig (1882) for the holothuroids, and by Müller & Troschel (1842) for the asteroids and ophiuroids. Since these works were published, the echinoderm type collection has no more been revised. In total the Leiden museum houses 82 type specimens of echinoderms representing 59 nominal species, 1 nominal subspecies and 1 variety, viz. 20 species and 1 variety of crinoids (26 type specimens), 7 species of holothuroids (9 type specimens), 8 species and 1 subspecies of echinoids (10 type specimens), 14 species of asteroids (24 type specimens), and 10 species of ophiuroids (17 type specimens).

CATALOGUE OF NOMINAL SPECIES

The five classes of recent echinoderms are considered successively. Within each class nominal species are presented according to the alphabetic order of the specific names used in the original descriptions. Main bibliographical references and actual status are given for each species. Other information given include the reference numbers of the type specimens, the number of syntypes, the mode of preservation (dry or alcohol-preserved), and the origin of the specimens (type locality and collector).

CRINOIDEA

The Leiden collection houses type specimens of twenty species and one variety of comatulid crinoids. These specimens originate mainly from Indonesian waters. Most of them were collected either by Dutch and German naturalists in the early nineteenth century (New-Guinea, types of five species; Ambon, types of two species; Moluccas, type of one species; Aru islands, type of one species; Banda sea, type of one species) or by Dutch scientific expeditions, viz. the Siboga Expedition (types of one species) and the Snellius Expedition (types of four species). Other type specimens originate from Japan (type of one species) or are of unknown origin (types of four species).

The type-specimens of two species previously housed in the collection were not recovered. These species are:

- *Actinometra peronii* Carpenter, 1881: 214 (South coast of Ceram; Hoedt coll.) [= *Comanthus bennetti* (Müller, 1841); see A.H. Clark, 1931: 532].
- *Alecto timorensis* Müller, 1841: 145 (Timor; Boie & Salomon Müller coll.) [= *Comanthus timorensis* (Müller, 1841); see A.H. Clark, 1931: 602].

alternans, *Actinometra* Carpenter, 1881: 208; see also A.H. Clark 1911: 178 (as *Comantheria alternans*); A.H. Clark, 1931: 488 (as *Comantheria alternans*).

= *Comanthus alternans* (Carpenter, 1881); see Rowe et al., 1986: 224, fig. 6A.

Type specimen: ref. 1713, 1 syntype (alcohol), origin unknown.

Remark: Additional type-specimen(s) occur in the collection of the British Museum (Natural History) (A.M. Clark & Rowe, 1971).

andromacha, *Dorometra* A.H. Clark, 1936: 316.

Type specimen: ref. 1828, holotype (alcohol), Snellius Expedition, Lembeh Strait (Celebes).

bennetti, *Alecto* Müller, 1841: 146; see also Müller, 1847: 164; Carpenter, 1881: 212 (as *Actinometra bennetti*); A.H. Clark, 1911: 180 (as *Comanthus bennetti*); A.H. Clark, 1931: 531, pl. 66 figs. 186, 187, pl. 67 fig. 188, pl. 68 fig. 189, pl. 82 fig. 225 (as *Comanthus bennetti*); Meyer, 1986: 212 (colour photograph) (as *Comanthus bennetti*).

= *Oxycomanthus bennetti* (Müller, 1841); see Rowe et al. 1986: 259, figs. 3B, 9G.

Type specimens: ref. 1726, 2 syntypes (alcohol), origin unknown, Bennett coll.

bimaculata, **Antedon** Carpenter, 1881: 186.

= *Dichrometra bimaculata* (Carpenter, 1881); see A.H. Clark, 1911: 185; A.H. Clark, 1941: 541.

Type specimen: ref. 1782, holotype (alcohol), Ambon, Lüdeking coll.

boschmai, **Basilometra** A.H. Clark, 1936: 305, pl. 7 figs. 1-4.

Type specimen: ref. 1797, holotype (alcohol), Snellius Expedition, Ternate, 2-4 m.

Remark: *B. boschmai* is the type species of the genus *Basilometra*.

brevicuneata, **Antedon** Carpenter, 1881: 187; see also A.H. Clark, 1911: 186 (as *Dichrometra protectus*).

= *Lamprometra palmata palmata* (Müller, 1841); see A.H. Clark, 1941: 474, pl. 53 figs. 243-246, pl. 54 figs. 248-252, pl. 55 fig. 257.

Type specimen: ref. 1793, holotype (alcohol), Ambon, Lüdeking coll.

elongata, **Alecto** Müller, 1841: 146; see also Müller, 1847: 257; Carpenter 1881: 184 (as *Antedon elongata*).

= *Dichrometra flagellata* (Müller, 1841); see A.H. Clark, 1941: 544, pl. 56 figs. 258-262.

Type specimen: ref. 1783, holotype (alcohol), New Guinea, Salomon Müller coll.

flagellata, **Alecto** Müller, 1841: 145; see also Müller, 1847: 263; Carpenter, 1881: 183 (as *Antedon flagellata*).

= *Dichrometra flagellata* (Müller, 1841); see A.H. Clark, 1911: 184; A.H. Clark, 1941: 544, pl. 56 figs. 258-262; Meyer, 1986: 225 (colour photograph).

Type specimen: ref. 1784, holotype (alcohol), origin unknown, Brugmans coll.

japonica, **Alecto** Müller, 1841: 145; see also Müller, 1847: 261; Carpenter 1881: 202 (as *Actinometra japonica*).

= *Comanthus japonica* (Müller, 1841); see A.H. Clark, 1911: 180; A.H. Clark, 1931: 564, pl. 71 fig. 195, pl. 72 figs. 196-198, pl. 73 fig. 201, pl. 82 figs. 226, 227.

Type specimen: ref. 1742, holotype (alcohol), Japan, Von Siebold coll.

laevicirra, **Antedon** Carpenter, 1881: 189; see also A.H. Clark 1911: 186 (as *Dichrometra laevicirra*).

= *Lamprometra palmata palmata* (Müller, 1841); see A.H. Clark, 1941:

474, pl. 53 figs. 243-246, pl. 54 figs. 248-252, pl. 55 fig. 257.

Type specimen: ref. 1794, holotype (alcohol), Aru Island.

novaeguineae, *Alecto* Müller, 1841: 146; see also Müller, 1847: 264; Carpenter 1881: 193 (as *Actinometra novaeguineae*); A.H. Clark, 1911: 178 (as *Comaster novaeguineae*).

= *Comaster multifida* (Müller, 1841); see A.H. Clark, 1931: 413, pl. 46 figs. 140, 141.

Type specimen: ref. 1712, holotype (alcohol), Eydouma (New Guinea), Salomon Müller coll.

perspinosa, *Antedon* Carpenter, 1881: 178.

= *Colobometra perspinosa* (Carpenter, 1881); see A.H. Clark, 1911: 188; A.H. Clark, 1947: 117, pl. 14 figs. 67-69; Meyer, 1986: 217 (colour photograph).

Type specimen: ref. 1799, holotype (alcohol), Jobi (New Guinea), Rosenberg coll.

pinniformis, *Antedon* Carpenter, 1881: 180.

= *Amphimetra pinniformis* (Carpenter, 1881); see A.H. Clark, 1911: 182; A.H. Clark, 1941: 358.

Type specimen: ref. 1769, holotype (alcohol), Andai (New Guinea).

priamus, *Strotometra* A.H. Clark, 1912: 811; see also A.H. Clark, 1918: 194, pl. 24 figs. 64-65; A.H. Clark, 1950: 363, pl. 31 fig. 97.

Type specimens: ref. 1813, 2 syntypes (alcohol), Siboga Expedition, station 266, 5°56'.5 S-132°47'.7 E (Arafura sea), 595 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam).

robustispinna, *Actinometra* Carpenter, 1881: 201; see also A.H. Clark, 1911: 182 (as *Himerometra* sp.).

= *Himerometra robustispinna* (Carpenter, 1881); see A.H. Clark, 1941: 193, pl. 16 fig. 60, pl. 17 fig. 63, pl. 18 figs. 68, 69; Meyer 1986: 221 (colour photograph).

Type specimen: ref. 1772, holotype (alcohol), Moluccas, Macklot coll.

schlegelii, *Actinometra* Carpenter, 1881: 210.

= *Comanthina schlegeli* (Carpenter, 1881); see A.H. Clark, 1911: 179; A.H. Clark, 1931: 466, pl. 53 fig. 158, pl. 54 fig. 159, pl. 55 figs. 160, 161,

pl. 64 fig. 180; Meyer, 1986: 212 (colour photograph); Rowe et al., 1986: 244, figs. 2E, 8C-D.

Type specimen: ref. 1711, holotype (alcohol), East Indies (?).

serripinna, *Antedon* Carpenter, 1881: 182; see also A.H. Clark, 1911: 189 (as *Oligometra serripinna*).

= *Oligometra serripinna serripinna* (Carpenter, 1881); see A.H. Clark, 1947: 217, pl. 27 fig. 143, pl. 28 figs. 153-155, pl. 29 fig. 156; Meyer, 1986: 215 (colour photograph).

Type specimen: ref. 1802, holotype (alcohol), Andai (New Guinea).

serripinna var. **macrobrachius**, *Oligometra* A.H. Clark, 1936: 310, pl. 9 figs. 10-11; see also A.H. Clark, 1947: 232, pl. 27 figs. 141-142.

Type specimens: ref. 1805, 4 syntypes (alcohol), Snellius Expedition, Ternate, 4 m.

snelliusi, *Stenometra* A.H. Clark, 1936: 313, pl. 8 fig. 9; see also A.H. Clark, 1950: 12, pl. 1 fig. 1.

Type specimen: ref. 1817, holotype (alcohol), Snellius Expedition, 2°51' S-128°48' E, ca 200 m.

solaris, *Comatula* Lamarck, 1816: 533; see also A.H. Clark, 1931: 323, pl. 33 fig. 99.

Type specimen: ref. 833, 1 syntype (dry), Indian Ocean, Péron coll.

Remark: The label indicates that the specimen was collected by Péron. It should thus be considered as a syntype of the species. Other type specimens are housed in the collection of the Muséum national d'Histoire naturelle de Paris (Marshall et al., 1981).

spicata, *Antedon* Carpenter, 1881: 190.

= *Stephanometra spicata* (Carpenter, 1881); see A.H. Clark, 1911: 183; A.H. Clark, 1941: 424, pl. 40 figs. 223, 224, pl. 91 fig. 447; Meyer, 1986: 223 (colour photograph).

Type specimen: ref. 1781, holotype (alcohol), Sea of Banda, Semmelinck coll.

HOLOTHUROIDEA

The Leiden collection houses type specimens of seven species of

holothuroids. They originate from Indonesian waters (Siboga Expedition, types of two species; Java, types of one species; Ambon, type of one species), from the Cape of Good hope (type of one species), and from an unknown locality (type of one species).

buitendijki, *Protankyra* Rowe, 1983: 151, fig. 1.

Type specimens: ref. 5453, holotype (alcohol), harbour of Semarang (Java), leg. P. Buitendijk; ref. 5452, paratype (alcohol), same origin.

frauenfeldi, *Cucumaria* Ludwig, 1882: 130.

= *Roweia frauenfeldi* (Ludwig, 1882); see Thandar, 1984: 110, figs. 1, 2.

Type specimens: ref. 1986, 1 syntype (alcohol), Cape of Good Hope, Kuhl & van Hasselt coll.; ref. 1987, 1 syntype (alcohol), origin unknown, Leuckaert coll.; ref. 1988, 1 syntype (alcohol), origin unknown.

fuscopunctata, *Holothuria* Jaeger, 1833: 23; see also Cherbonnier, 1980: 623, figs. 5A-5H; Féral & Cherbonnier, 1986: 88 (colour photograph).

Type specimen: ref. 1855, neotype (alcohol), origin unknown, Leuckaert coll.

Remark: The specimen was designated neotype by Cherbonnier (1980).

hyalegerus, *Meseres* Sluiter, 1901a: 12; see also Sluiter, 1901b: 50, pl. 5 figs. 2-4.

Type specimen: ref. 1928, 1 syntype (alcohol), Siboga Expedition, station 251, 5°28' .4 S-132°0' .2 W, 204 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam).

luteus, *Colochirus* Sluiter, 1901b: 100, pl. 2 fig. 6, pl. 7 fig. 2.

Type specimen: ref. 1960, 1 syntype (alcohol), Siboga Expedition, station 51, Molo Strait, 69-91 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam) and in the collection of the Musée océanographique de Monaco (Jangoux, in press).

magnum, *Thyonidium* Ludwig, 1882: 132; see also Sluiter, 1901b: 112, pl. 4 fig. 5, pl. 5 fig. 1.

= *Neothyonidium magnum* (Ludwig, 1882); see Hedding & Panning, 1954: 197, fig. 98; Féral & Cherbonnier, 1986: 103 (colour photograph).

Type specimen: ref. 1989, holotype (alcohol), Ambon, Ludeking coll.

purpureopunctatus, Paelopatides Sluiter, 1901a: 8; see also Sluiter, 1901b: 43.

Type specimen: ref. 1943, 1 syntype (alcohol), Siboga Expedition, station 316, 7°19'.4 S-116°49'.5 W, 538 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam) and in the collection of the Musée océanographique de Monaco (Jangoux, in press).

ECHINOIDEA

The Leiden collection houses type specimens of eight species and one subspecies of echinoids. Most of them originate from Indonesian waters where they were collected by the Dutch Siboga Expedition (types of eight species). The syntype of the subspecies comes from the Sinai coast (Red Sea).

anale, Laganum De Meijere, 1904: 129, pl. 6 figs. 71-72, pl. 18 figs. 340-343.

= *Peronella analis* (De Meijere, 1904); see Mortensen, 1948: 293, pl. 51 figs. 24-25, pl. 72 figs. 9, 10, 12.

Type specimen: ref. 1113, 1 syntype (alcohol), Siboga Expedition, station 260, 5°36'.5 S-132°55'.2 E, 90 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam) and in the collection of the Musée océanographique de Monaco (Jangoux, in press).

decipiens, Genocidaris De Meijere, 1904: 76, pl. 16 figs. 264-266.

= *Temnopleurus decipiens* (De Meijere, 1904); see Mortensen, 1943: 104, pl. 3 figs. 34-36, pl. 45 figs. 7, 8, 13.

Type specimen: ref. 993, 1 syntype (alcohol), Siboga Expedition, station 313, Dangar Besar (Saleh Bay), 36 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam), in the collection of the Paris Museum (Vadon et al., 1984), and in the collection of the Musée océanographique de Monaco (Jangoux, in press).

denudata, Astropyga De Meijere, 1903: 4; see also De Meijere, 1904: 57, pl. 4 figs. 31-32, pl. 14 figs. 209-214.

= *Eremopyga denudata* (De Meijere, 1903); see Mortensen, 1940: 209, pl. 17 figs. 2-3, pl. 24 fig. 1, pl. 25 figs. 1-4, pl. 26 figs. 1-2, pl. 27 fig. 5, pl. 71 figs. 9-11, 13-19.

Type specimens: ref. 893, 2 syntypes (alcohol), Siboga Expedition, station 207, 5°7'.5 S-122°54'.5 E, 247 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam), in the collection of the Paris Museum (Vadon et al., 1984), and in the collection of the Musée océanographique de Monaco (Jangoux, in press).

excentricus, *Linopneustes* De Meijere, 1903: 13; see also De Meijere, 1904: 180, pl. 10 figs. 94-96, pl. 22 figs. 454-457; Mortensen, 1950: 220, pl. 24 figs. 5, 16, 22.

Type specimen: ref. 1149, 1 syntype (alcohol), Siboga Expedition, station 314, 7°36' S-117°0'.8 E, 694 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam).

glandulosa, *Cidaris* De Meijere, 1904: 13, pl. 1 figs. 5-6.

= *Prionocidaris glandulosa* (De Meijere, 1904); see Mortensen, 1928: 461, pl. 54 figs. 7-8, pl. 73 fig. 11, pl. 87 fig. 9.

Type specimen: ref. 889, 1 syntype (alcohol), Siboga Expedition, station 51, Molo Strait, 69-91 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam), in the collection of the Paris Museum (Vadon et al., 1984), and in the collection of the Musée océanographique de Monaco (Jangoux, in press).

gratilla elatensis, *Triopneustes* Dafni, 1983: 2, textfigs. 2, 4.

Type specimen: ref. 5612, 1 syntype (dry), Wadi Tweibe (Sinai, Red Sea), leg. J. Dafni.

rarispinus, *Clypeaster* De Meijere, 1903: 7; see also De Meijere 1904: 134, pl. 6 figs. 55-56, pl. 18 figs. 354-361, pl. 19 fig. 362; Mortensen 1948: 58, pl. 6 figs. 1-15, pl. 40 figs. 4, 5, 8, 9, pl. 44 figs. 11, 12, 14-17, 20.

Type specimen: ref. 1098, 1 syntype (alcohol), Siboga Expedition, station 51, Molo Strait, 60-91 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam), in the collection of the Paris Museum (Vadon et al., 1984), and in the collection of the Musée océanographique de Monaco (Jangoux, in press).

solidum, *Laganum* De Meijere, 1904: 121, pl. 6 figs. 64, 66.

Type specimen: ref. 372, 1 syntype (dry), Siboga Expedition, station 289, 9°0'.3 S-126°24'.5 E, 112 m.

Remarks: Mortensen (1948: 338, 344) thought that the species could be a synonym of *Laganum fudsiyama* Doederlein, 1885. Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam).

spectabilis, *Palaeopneustes* De Meijere, 1903: 11; see also De Meijere, 1904: 172, pl. 8 figs. 86-90, pl. 21 figs. 422-426.

= *Linopneustes spectabilis* (De Meijere, 1903); see Mortensen, 1950: 213, pl. 9 figs. 1, 2, pl. 10 figs. 1-4, pl. 11 figs. 1-3, pl. 13 fig. 17, pl. 24 figs. 4, 9, 13, 24.

Type specimen: ref. 1128, 1 syntype (alcohol), Siboga Expedition, station 74, 5°3'.5 S-119°0' E, 450 m.

Remark: Additional type specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam) and in the collection of the Musée océanographique de Monaco (Jangoux, in press).

ASTEROIDEA

The Leiden collection houses type specimens of fourteen species of asteroids. These specimens originate from Java (types of two species), New Guinea (types of three species), China (type of one species), Japan (types of three species), "South Seas" (type of one species), Cap of Good Hope (type of one species), coast of Surinam (type of one species), and from unknown localities (types of two species).

The type-specimens of ten species previously housed in the collection were not recovered. These species are:

- *Archaster angulatus* Müller & Troschel, 1842: 66 (Java; Salomon Müller coll.) [= *Archaster angulatus* Müller & Troschel, 1842; see Sukarno & Jangoux, 1977: 830].
- *Archaster typicus* Müller & Troschel, 1840: 323; see Müller & Troschel 1842: 65, pl. 5 figs. 2a-2b, pl. 11 figs. 2-3 (origin unknown, coll. Macklot); see also Sukarno & Jangoux, 1977: 822.
- *Astropecten armatus* Müller & Troschel, 1842: 71 (Japan, coll. Von Siebold) [= *Astropecten polyacanthus* Müller & Troschel, 1842; see Doederlein, 1917: 134].
- *Astropecten granulatus* Müller & Troschel, 1842: 75 (origin unknown); see also John, 1948: 486.
- *Astropecten hispidus* Müller & Troschel, 1842: 73 (origin unknown) [=

- Astropecten irregularis* var. *serrata* Müller & Troschel, 1842; see Doederlein, 1917: 72].
- *Astropecten japonicus* Müller & Troschel, 1842: 73 (origin unknown; coll. Von Siebold) [= *Astropecten scoparius* Müller & Troschel, 1842; see Doederlein, 1917: 142].
 - *Astropecten longispinus* Müller & Troschel, 1842: 73 (origin unknown; coll. Kuhl & van Hasselt). Species of doubtful validity according to Doederlein, 1917: 183.
 - *Echinaster gracilis* Müller & Troschel, 1842: 23 (origin unknown). Status unknown.
 - *Ophidiaster tuberculatus* Müller & Troschel, 1842: 32 (East Indies; coll. Kuhl & van Hasselt) [= *Nardoa tuberculata* Gray, 1840; see Fisher, 1919: 384].
 - *Scytaster kuhlii* Müller & Troschel, 1842: 36 (Java; coll. Kuhl & van Hasselt). This species belongs to the ophidiasterid genus *Neoferdina* but its description does not allow specific recognition (see Jangoux, 1973: 789).

africanus, *Asteracanthion* Müller & Troschel, 1842: 15.

= *Marthasterias glacialis* (Linnaeus, 1758); see A.M. Clark & Courtman – Stock, 1976: 94.

Type specimen: ref. 768, 2 syntypes (dry), Cape of Good Hope.

chinensis, *Oreaster* Müller & Troschel, 1842: 46.

= *Pentaceraster orientalis* Müller & Troschel, 1842; see Doederlein, 1936: 356, pl. 31 figs. 4-4b.

Type specimens: ref. 593, 2 syntypes (dry), China, Von Siebold coll.

clugreta, *Tosia* Walenkamp, 1976: 61, pl. 4 fig. 2, pl. 9 fig. 4, pl. 12 figs. 1, 2, 4.

Type specimen: ref. 4613, holotype (alcohol), Surinam, 07°18.5' N-53°48.7' W.

echinulatus, *Ophidiaster* Müller & Troschel, 1842: 32.

= *Mithrodia clavigera* (Lamarck, 1816); see Engel et al., 1948: 5; Jangoux, 1986: 149 (colour photograph).

Type specimen: ref. 726, 2 syntypes (dry), South Seas.

grex, *Culcita* Müller & Troschel, 1842: 39; see also Hartlaub, 1892: 87, pls. 1-2; A.M. Clark & Rowe, 1971: 34 & 54.

Type specimen: ref. 610, 1 syntype (dry), origin unknown.

hesperus, *Archaster* Müller & Troschel, 1840: 323; see also Müller & Troschel, 1842: 66.

= *Craspidaster hesperus* (Müller & Troschel, 1840); see Fischer, 1919: 60, pl. 9 fig. 3.

Type specimen: ref. 509, 1 syntype (dry), Japan, Von Siebold coll.

maculata, *Luidia* Müller & Troschel, 1842: 77; see also Doederlein, 1920: 262, pl. 18 figs. 4, 13, pl. 19 fig. 16, pl. 20 figs. 21, 24; A.M. Clark & Rowe, 1971: 30 & 43, pl. 4 fig. 3; Jangoux, 1986: 120 (colour photograph).

Type specimens: ref. 539, 2 syntypes (dry), Japan, Von Siebold coll.

novaeguineae, *Culcita* Müller & Troschel, 1842: 38; see also Doederlein, 1896: 34, pl. 19 figs. 1-2a; A.M. Clark & Rowe, 1971: 34 & 54, pl. 7 figs. 3-5; Jangoux, 1986: 124 (colour photograph).

Type specimen: ref. 611, 1 syntype (dry), New Guinea, Salomon Müller coll.; ref. 1300, 1 syntype (alcohol), same origin.

Remark: The syntype ref. 1300 is the holotype of the species *Culcita plana* Hartlaub, 1892 (see below).

ornatum, *Astrogonium* Müller & Troschel, 1842: 55.

= *Tosia magnifica* (Müller & Troschel, 1842); see A.M. Clark, 1953: 408, pl. 45 fig. 5, pl. 46 figs. 4-5.

Type specimen: ref. 579, holotype (dry), origin unknown.

pectinifer, *Asteriscus* Müller & Troschel, 1842: 40.

= *Asterina pectinifera* (Müller & Troschel, 1842); see Hayashi, 1973: 79, pl. 12 fig. 1.

Type specimens: ref. 1362, 3 syntypes (alcohol), Japan, Von Siebold coll.

pentagonus, *Asteriscus* Müller & Troschel, 1842: 42.

= *Patiriella exigua* (Lamarck, 1816); see Perrier, 1875: 302 (as *Asterina*); A.M. Clark & Rowe, 1971: 38 & 67, pl. 9 fig. 3; Dartnall, 1971: 40, 43.

Type specimens: ref. 687, 3 syntypes (dry), Java, Boie coll.

plana, *Culcita* Hartlaub, 1892: 84.

= *Culcita novaeguineae* var. *plana* Hartlaub, 1891; see Doederlein, 1896: 311.

Type specimen: ref. 1300, 1 syntype (alcohol), New Guinea, Salomon Müller coll.

Remark: The holotype of *C. plana* is a syntype of the species *Culcita novaeguineae* Müller & Troschel (see above).

sebae, *Goniodiscus* Müller & Troschel, 1842: 58.

= *Culcita novaeguineae* Müller & Troschel, 1842; see Doederlein, 1888: 311.

Type specimens: ref. 1295, 2 syntypes (dry), New Guinea.

Remark: Doederlein (1888) demonstrated that *G. sebae* is a juvenile form of *C. novaeguineae*.

semiregularis, *Scytaster* Müller & Troschel, 1842: 36.

= *Certonardoa semiregularis* (Müller & Troschel, 1842); see H.L. Clark, 1921: 56, Hayashi, 1973: 59, pl. 2 fig. (colour photograph), pl. 9 figs. 1-3.

Type specimens: ref. 628, 2 syntypes (dry), Java, Boie coll.

OPHIUROIDEA

The Leiden collection houses type specimens of nine species of ophiuroids. These specimens originate from Indonesian waters (Snellius Expedition, types of three species; Siboga Expedition, types of one species; Ambon, types of two species; Moluccas, type of one species; Java, type of one species) and from the Indian Ocean (types of two species, one of them having been collected by the "Investigator").

The type specimens of two species previously housed in the collection were not recovered. These species are:

- *Ophiarachna infernalis* Müller & Troschel, 1842: 105 (Indian Ocean) [= *Ophiarachnella infernalis* (Müller & Troschel, 1842); see Koehler, 1922: 343].
- *Ophiothrix alopecurus* Müller & Troschel, 1842: 111 (Adriatic sea, coll. Ferdeck) [= *Ophiothrix fragilis* (Abildgaard, 1789); see Koehler, 1924: 263 & 271].

boschmai, *Ophiochaeta* A.H. Clark, 1964: 388, fig. 2; see also A.M. Clark & Rowe, 1971: 127 (note 92).

Type specimen: ref. 3645, holotype (alcohol), Snellius Expedition, Obi latoe.

clavigera, *Ophiarachna* Brock, 1888: 495.

= *Ophiarachna affinis* (Lütken, 1869); see de Loriol, 1893: 411; A.M. Clark & Rowe, 1971: 123 (note 83).

Type specimen: ref. 1548, 1 syntype (alcohol), Ambon.

conspicua, *Pectinura* Koehler, 1897: 322, pl. 6 figs. 36, 37; see also Koehler, 1899: 37, pl. 2 figs. 14, 15.

= *Bathypectinura conspicua* (Koehler, 1897); see Koehler, 1922: 342, pl. 77 figs. 1-15.

Type specimen: ref. 1521, 1 syntype (alcohol), "Investigator", station 327, 16°01' N-81°25' E (Godavery Delta), 410 fathoms, leg. Indian Museum Calcutta.

expedita, *Ophiothrix* Koehler, 1905: 96, pl. 9 figs. 10-14, pl. 15 fig. 5.

= *Macrophiothrix expedita* (Koehler, 1905); see A.M. Clark, 1966: 648.

Type specimens: ref. 1639, 2 syntypes (alcohol), Siboga Expedition, station 49a, 8°23'.5 S-119°4'.6 E (Sapeh Strait), 69 m.

Remark: Additional specimens are housed in the collection of the Instituut voor Taxonomische Zoologie (University of Amsterdam).

imbricata, *Ophiopelis* Müller & Troschel, 1842: 93.

= *Ophioplocus imbricatus* (Müller & Troschel, 1842); see Cherbonnier & Guille, 1978: 239, fig. 77.

Type specimen: ref. 857, 1 syntype (dry), Indian Ocean, Salomon Müller coll.

picta, *Ophiocoma* Müller & Troschel, 1842: 102.

= *Ophiarthrum pictum* (Müller & Troschel, 1842); see Koehler, 1905: 72.

Type specimens: ref. 803, 5 syntypes (dry), Java, Kuhl & van Hasselt coll.

Remark: An additional specimen without any indication of origin is labelled as holotype (ref. 1688, alcohol preserved).

pusilla, *Ophiomastix* Brock, 1888: 499.

= *Ophiocoma pusilla* (Brock, 1888); see A.M. Clark & Rowe, 1971: 118 (note 66).

Type specimen: ref. 1502, 1 syntype (alcohol), Ambon.

septemspinosa, *Ophiarachna* Müller & Troschel, 1842: 105, pl. 7 fig. 2.

= *Ophiarachnella septemspinosa* (Müller & Troschel, 1842); see Cherbonnier & Guille, 1978: 218, pl. 16 fig. 1-2.

Type specimen: ref. 1515, holotype (dry), Moluques, Salomon Müller coll.

snelliusi, *Ophiarachna* A.H. Clark, 1964: 385, fig. 1.

= *Ophiarachnella snelliusi* (A.H. Clark, 1964); see A.M. Clark & Rowe, 1971: 126 (note 90); Guille & Vadon, 1986: 195 (colour photograph).

Type specimen: ref. 3657, holotype (dry), Snellius Expedition, Obi-latoe.

tetradontus, *Paramphichondrius* Guille & Wolff, 1984: 9, figs. 1 & 2.

Type specimens: ref. 3648, holotype (dry), Snellius Expedition, station 37, 1°03' S-117°35' E, 50 m; ref. 3649, paratype (dry), same origin.

Remark: *P. tetradontus* is the type species of the genus *Paramphichondrius*.

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REFERENCES

- Boschma, H., 1936. Biological data. — Rep. Snellius Exp. 4: 1-29, 1 map.
- Brock, J., 1888. Die Ophiuriden-fauna des indischen Archipels. — Z. wiss. Zool. 47: 465-539.
- Carpenter, P.H., 1881. The Comatulæ of the Leyden Museum. — Notes Leyden Mus. 3: 173-217.
- Cherbonnier, G., 1980. Holothuries de Nouvelle-Calédonie. — Bull. Mus. natn. Hist. nat., Paris (4) 2 (A3): 615-667, 22 textfigs, 1 pl.
- Cherbonnier, G. & A. Guille, 1978. Echinodermes: Ophiurides. — Faune de Madagascar 48: 1-272, 77 textfigs, 17 pls. C.N.R.S., Paris.
- Clark, A.H., 1911. The recent crinoids of the Leyden Museum. — Notes Leyden Mus. 33: 175-192.
- Clark, A.H., 1912. Revision of the crinoid family Comasteridae, with descriptions of new genera and species. — Proc. U.S. natn. Mus. 36: 79-85.
- Clark, A.H., 1931. A monograph of the existing crinoids. 1. The comatulids. Superfamily Comasterida. — Bull. U.S. natn. Mus. 82 (3): 1-816, 82 pls.
- Clark, A.H., 1936. Biological results of the Snellius Expedition. I. The unstalked crinoids of the Snellius Expedition. — Temminckia 1: 294-319, pls. 7-9.
- Clark, A.H., 1941. A monograph of the existing crinoids. 1. The comatulids. Superfamily Mariametrida (except the family Colobometridae). — Bull. U.S. natn. Mus. 82 (4a): 1-603, 61 pls.
- Clark, A.H., 1947. A monograph of the existing crinoids. 1. The comatulids. Superfamily Mariametrida (concluded — the family Colobometridae) and superfamily Tropiometrida (except the families Thalassometridae and Charitometridae). — Bull. U.S. natn. Mus. 82 (4b): 1-473, 43 pls.
- Clark, A.H., 1950. A monograph of the existing crinoids. 1. The comatulids. Superfamily Tropiometrida (the families Thalassometridae and Charitometridae). — Bull. U.S. natn. Mus. 82 (4c): 1-381, 32 pls.
- Clark, A.H., 1964. Description of two new species of Ophiuroidea collected during the Snellius Expedition. — Zool. Med. Leiden 39: 385-390, 2 textfigs.
- Clark, A.M., 1953. Notes on asteroids in the British Museum (Natural History). III. Luidia. IV. Tosia and Pentagonaster. — Bull. Brit. Mus. nat. Hist. (Zool.) 1: 379-412, pls. 39-46.
- Clark A.M., 1966. Notes on the family Ophiotrichidae (Ophiuroidea). — Anns. Mag. nat. Hist. (13) 9: 636-655, pls. 10-11.
- Clark, A.M. & J. Courtman-Stock, 1976. The Echinoderms of South Africa: 277 pp., 275 figs. Trustees of the British Museum (Nat. Hist.), London.

- Clark, A.M. & F.W.E. Rowe, 1971. Monograph of shallow-water Indo-West Pacific Echinoderms: 238 pp., 100 figs, 31 pls. Trustees of the British Museum (Nat. Hist.), London.
- Clark, H.L., 1921. The echinoderm fauna of Torres Strait. — Pap. Dep. mar. Biol. Carnegie Instn Wash. 10: 1-223, 38 pls.
- Dafni, J., 1983. A new subspecies of *Tripneustes gratilla* from the northern Red Sea (Echinodermata: Echinoidea: Toxopneustidae). — Israel J. Zool. 32: 1-12, 4 textfigs.
- Darnall, A.J., 1971. Australian sea stars of the genus *Patiriella* (Asteroidea, Asterinidae). — Proc. Linn. Soc. N.S.W. 96: 39-49, pls. 3-4.
- De Meijere, J.C.H., 1903. Vorläufige Beschreibung der neue, durch die Siboga-Expedition gesammelten Echiniden. — Tijdschr. nederl. dierk. Vereen. 8 (1): 1-16.
- De Meijere, J.H.C., 1904. Die Echinoidea der Siboga-Expedition. — Siboga Exped. Rep. 43: 1-251, 23 pls.
- Doederlein, L., 1888. Echinodermen von Ceylon. Bericht über die von Herrn Dres Sarasin gesammelten Asteroidea, Ophiuroidea und Echinoidea. — Zool. Jahrb. (Abt. Syst.) 3: 821-846, pls. 31-33.
- Doederlein, L., 1896. Bericht über die von Herrn Professor Semon bei Amboina und Thursday Island gesammelten Asteroidea. — Denk. Ges. Jena 8: 301-322, 4 pls.
- Doederlein, L., 1917. Die Asteriden der Siboga Expedition. I Die Gattung *Astropecten* und ihre Stammesgeschichte. — Siboga Exped. Rep. 46a: 1-190, 17 pls.
- Doederlein, L., 1920. Die Asteriden der Siboga Expedition. II. Die Gattung *Luidia* und ihre Stammesgeschichte. — Siboga Exped. Rep. 46b: 193-291, 3 pls.
- Doederlein, L., 1936. Die Asteriden der Siboga Expedition. III. Die Unterfamilie *Oreasterinae*. — Siboga Exped. Rep. 46c: 295-369, 12 pls.
- Engel, H., D.D. John & G. Cherbonnier, 1948. The genus *Mithrodia* Gray, 1840. — Zool. Verh. Leiden 2: 1-39, 7 pls.
- Féral, J.P. & G. Cherbonnier, 1986. Les holothuries. — In: Guide des Etoiles de Mer, Oursins et autres Echinodermes du Lagon de Nouvelle-Calédonie, A. Guille, P. Laboute & J.L. Menou (eds): 55-107. ORSTOM, Paris.
- Fisher, W.K., 1919. Starfishes of the Philippine seas and adjacent waters. — Bull. U.S. natn Mus. 100 (3): XII + 711 pp., 156 pls.
- Gijzen, A., 1938. 's Rijks Museum van Natuurlijke Historie 1820-1915: 335 pp. W.L. & J. Brusse, Rotterdam.
- Gray, J.E., 1840. A synopsis of the genera and species of the class *Hypostoma* (*Asterias* Linn.). — Anns. Mag. nat. Hist. (1) 6: 175-184 & 275-290.
- Guille, A. & C. Vadon, 1986. Les Ophiurides. — In: Guide des Etoiles de Mer, Oursins et autres Echinodermes du Lagon de Nouvelle Calédonie, A. Guille, P. Laboute & J.L. Menou (eds): 155-197. ORSTOM, Paris.
- Guille, A. & W.J. Wolff, 1984. Résultats biologiques de l'Expédition Snellius Echinodermata: Ophiuroidea I. — Zool. Verh. Leiden 213: 1-38, 1 fig., 6 pls.
- Hayashi, R., 1973. The Sea-Stars of Sagami Bay: 114 pp., 18 pls. Biol. Lab. Imperial Household, Japan.
- Hartlaub, C., 1892. Ueber die Arten und den Skelettbau von *Culcita*. — Notes Leyden Mus. 14: 65-118, 2 pls.
- Heding, S.G. & A. Panning, 1954. Phyllophoridae. — Spolia Zool. Mus. Hauniensis 13: 1-209, 102 figs.
- Herklots, J.A., 1869. Echinodermes peintes d'après nature, par les soins de Kuhl, Van Hasselt et Sal. Müller. — Bijdr. Dierk. 2 (9): 1-12, 10 pls.
- Holthuis, L.B. & T. Sakai, 1970. Ph.F. von Siebold and the Fauna Japonica: 323 pp., 5 + 32 pls. 1 map. Academic Press of Japan, Tokyo.
- Jangoux, M., 1973. Le genre *Neoferdina* Livingstone. — Rev. Zool. Bot. afr. 87: 775-794.
- Jangoux, M., 1978. Biological results of the Snellius expedition. XXIX. Echinodermata, Asteroidea. — Zool. Med. Leiden 52: 287-300.
- Jangoux, M., 1986. Les astérides. — In: Guide des Etoiles de Mer, Oursins et autres

- Echinodermes du Lagon de Nouvelle Calédonie, A. Guille, P. Laboute & J.L. Menou (eds): 109-153. ORSTOM, Paris.
- Jangoux, M., in press. Catalogue commenté des types d'échinodermes actuels conservés dans la collection zoologique du Muséum océanographique de Monaco. — Bull. Inst. océanogr. Monaco
- John, D.D., 1948. Notes on asteroids in the British Museum (natural History) I. The species of *Astropecten*. — *Novitates Zool.* 42: 485-508, 4 pls.
- Koehler, R., 1897. Echinodermes recueillis par "l'Investigator" dans l'Océan Indien. Premier mémoire. Les ophiures de mer profonde. — *Annls. Sci. nat.* (8) 4: 277-370, pls. 5-9.
- Koehler, R., 1899. Ophiures recueillies par l'Investigator dans l'Océan Indien. I. Les Ophiures de mer profonde. — *Echinoderma of the Indian Museum* 1: 1-76, 14 pls. (Trustees Indian Mus. Calcutta).
- Koehler, R., 1905. Ophiures de l'Expédition du Siboga. 2. Ophiures littorales. — *Siboga Exp. Rept* 45b: 1-142, 18 pls.
- Koehler, R., 1922. Ophiurans of the Philippine seas and adjacent waters. — *Bull. U.S. natn. Mus.* 100 (5): 1-486, 103 pls.
- Koehler, R., 1924. Echinodermes des mers d'Europe. vol. 1, 362 pp., 9 pls. G. Doin, Paris.
- Lamarck, J.B. de, 1816. Histoire naturelle des Animaux sans Vertèbres. Vol. 2: 522-568. Paris.
- Linnaeus, C. von, 1758. *Systema Naturae* (ed. 10) I: 824 pp. Stockholm.
- Loriol, P. de, 1893. Echinodermes de la Baie d'Amboine. — *Rev. suisse Zool.* 3: 359-426.
- Ludwig, H., 1882. List of the holothurians in the collection of the Leyden Museum. — *Notes Leyden Mus.* 4: 127-137.
- Lütken, C., 1869. *Additamenta ad historiam Ophiuridarum.* 3. Beskrivende og kritiske Bidrag til Kundskab om Schlangestjerne. — *K. danske Vidensk. Selsk. Skr.* 5 (8): 24-109, 3 figs.
- Marshall, J., A. Guille & M. Roux, 1981. Les types de Crinoïdes (échinodermes) du Muséum national d'Histoire naturelle de Paris. — *Bull. Mus. natn. Hist. nat., Paris* (4) 3A: 713-729.
- Meyer, D.L., 1986. Les Crinoïdes. — In: *Guide des Etoiles de Mer, Oursins et autres Echinodermes du Lagon de Nouvelle Calédonie*, A. Guille, P. Laboute & J.L. Menou (eds): 199-225. ORSTOM, Paris.
- Mortensen, T., 1928. A Monograph of the Echinoidea. I. Cidaroida: 551 pp., 88 pls. C.A. Reitzel, Copenhagen.
- Mortensen, T., 1940. A Monograph of the Echinoidea. III.1. Aulodonta: 370 pp., 77 pls. C.A. Reitzel, Copenhagen.
- Mortensen, T., 1943. A Monograph of the Echinoidea. III.2. Camarodonta I: 553 pp., 56 pls. C.A. Reitzel, Copenhagen.
- Mortensen, T., 1948. A Monograph of the Echinoidea. IV.2 Clypeastroïda: 471 pp., 71 pls. C.A. Reitzel, Copenhagen.
- Mortensen, T., 1950. A Monograph of the Echinoidea. V.1. Spatangoida I: 432 pp., 25 pls. C.A. Reitzel, Copenhagen.
- Müller, J., 1841. Ueber die Gattungen und Arten der Comatulen. — *Arch. Naturgesch.* 7: 139-148.
- Müller, J., 1847. Ueber die Gattungen Comatula Lam. und ihre Arten. — *Abh. preuss. Akad. Wiss.* 1847: 237-265.
- Müller, J. & F.H. Troschel, 1840. Ueber die Gattungen der Asterien. — *Arch. Naturgesch.* 6: 318-326.
- Müller, J. & F.H. Troschel, 1842. *System der Asteriden*: 135 pp., 11 pls. Braunschweig.
- Perrier, C., 1875. Révision de la collection de Stellérides du Muséum d'Histoire naturelle de Paris: 374 pp. Paris.
- Rowe, F.W.E., 1983. A collection of holothurians in the Leiden Museum from the East Indies and New Guinea, with the description of a new species of *Protankyra* (Holothuroidea: Synaptidae) from Java. — *Zool. Med. Leiden* 57: 149-164, 1 fig.
- Rowe, F.W.E., A.K. Hoggett, R.A. Birtles and L.L. Vail 1986. Revision of some comasterid genera from Australia (Echinodermata, Crinoidea), with descriptions of two new genera and nine new species. — *Zool. J. Linn. Soc.* 86: 197-277, 10 pls.

- Sukarno & M. Jangoux, 1977. Révision du genre *Archaster* Müller & Troschel (Echinodermata, Asteroidea: Archasteridae). — Rev. Zool. afr. 91: 817-844, 3 figs, 3 pls.
- Thandar, A.S., 1985. A new southern African genus in the holothurian family Cucumariidae (Echinodermata: Holothuroidea) with the recognition of two subspecies in *Cucumaria frauenfeldi* Ludwig. — S. Afr. J. Zool. 20: 109-114, 3 figs.
- Vadon, C., C. De Ridder, A. Guille & M. Jangoux, 1984. Catalogue des types d'échinides actuels (Echinodermes) du Muséum d'Histoire naturelle de Paris. — Bull. Mus. Hist. nat. Paris (4) 6 (Al suppl.): 1-38, 4 pls.
- Walenkamp, J.H.C., 1976. The asteroids of the coastal waters of Surinam. — Zool. Verh. Leiden 147: 1-91, 18 pls.
- Walenkamp, J.H.C., 1979. Asteroidea (Echinodermata) from the Guyana shelf. — Zool. Verh. Leiden 170: 1-97, 20 pls.