Amphipholis strata Mortensen, 1933

Amphipholis strata Mortensen, 1933a: 361-363, pl. 19, fig. 20, fig. 68; Clark 1974: 450-452, fig. 5b-d; Clark & Courtman-Stock 1976: 103, 117, 152, figs 138, 144, 147.

Diagnosis – Adapted from Clark & Courtman-Stock (1976). D.D. up to 9 mm; D.D./A.L. = 1/3. Primary rosette distinct, plates relatively large, with plates between them. Disc plates large, coarse, polygonal. Ventral interradial areas covered in coarse, imbricated plates. Row of 8-9 square plates just below disc margin. Radial shields broad D-shape, fully contiguous, one-third to two-fifths of disc radius. Oral shields diamond-shaped, as long as wide or slightly longer. Adoral shields contiguous. Oral papillae three, in continuous series, outermost very broad and opercular, no oral tentacle scale visible. Genital papillae absent. Dorsal arm plates broad, fan-shape, wider than long, distal margin slightly convex, contiguous. Ventral arm plates fan-shaped, wider than long, distal sides flat or slightly convex, may or may not be narrowly contiguous. Lateral arm plates large. Arm spines three, middle one longest, slightly cigar or club-shaped, may be pointed. Tentacle scales two, fairly large. Disc pale, arms grey (Clark & Courtman-Stock 1976).

Distribution and habitat – South Africa: off Platbaai (NC) to Port Elizabeth (EC); depth range: 12-349 m. Habitat: sand, rock, shells, limestone and with polychaete *Phyllochaetopterus* species.

Remarks – Endemic to South Africa and easily distinguished from the other two South African *Amphipholis* species by two main features, i) middle arm spine is longest and cigar-shaped and ii) row of square plates below the disc margin. The syntypes are in the Natural History Museum of Denmark (ZMUC OPH-274 and ZMUC OPH-259) and in the Iziko SA Museum (SAMC A22378), type locality being Cape Point, depth 55 m.

Fig. 216. Distribution of *Amphipholis strata* in South Africa.

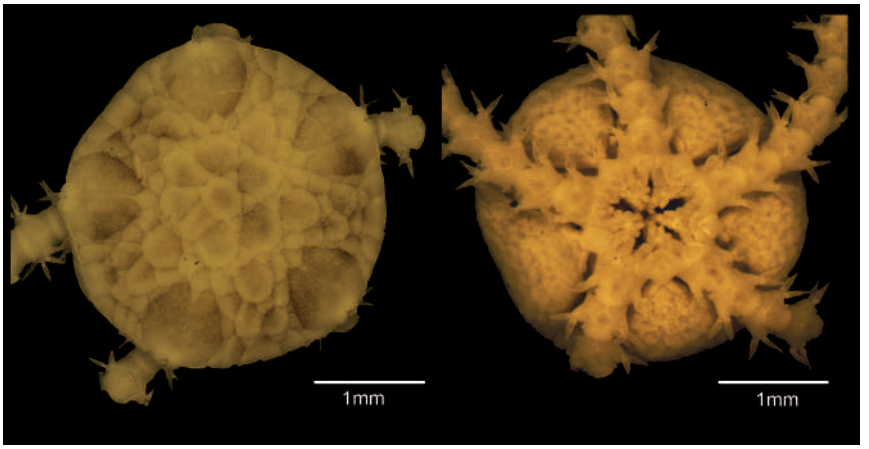

Fig. 217. Dorsal (left) and ventral (right) views of *Amphipholis strata* (SAMC A073832).

Genus ***Amphiura*** Forbes, 1843

Diagnosis – Adapted from Forbes (1843), Matsumoto (1917), Clark (1970) and Clark & Courtman-Stock (1976). Disc usually fully-scaled, but without armament. Scaling sometimes reduced on ventral side. Jaws armed with one infradental pair of papillae and one distal oral papilla each side, rarely two arising from the point of contact with the adoral shield. Oral tentacle scale inset in oral slit. Arms moderate or long in length. Tentacle scales 0-2.

Amphiura (Amphiura) acutisquama A.M. Clark, 1952

Amphiura acutisquama Clark A.M., 1952: 200, 213-215, fig. 1a, b.
Amphiura (*Amphiura*) *acutisquama*: Clark & Courtman-Stock 1976: 103, 115, 153, fig. 134.

Diagnosis – Adapted from Clark & Courtman-Stock (1976). D.D. up to 15 mm, D.D./A.L. = 1/5. Disc indented interradially, disc fully-scaled with small, fine plates, plates slightly larger in vicinity of radial shields and genital slits. Radial shields long and narrow, truncated distally, half disc radius, separated by numerous rows of plates. Ventral interradial area covered in fine plates. Madreporite swollen and circular in outline. Oral shields spearhead-shaped or oval, with lobe on distal side, may be equal or longer than wide. Adoral shields usually not contiguous. Distalmost oral papillae massive, usually with double apex, infradental papillae, elliptical leaf-shaped, sometimes double, ill-defined apex, wide diastema between infradentals and oral papillae. Oral tentacle scale visible between infradental and second oral papillae. Genital slits long, genital papillae absent. Arms moderately long. Dorsal arm plates oval, wider than long, with indistinct rounded distal lobe,

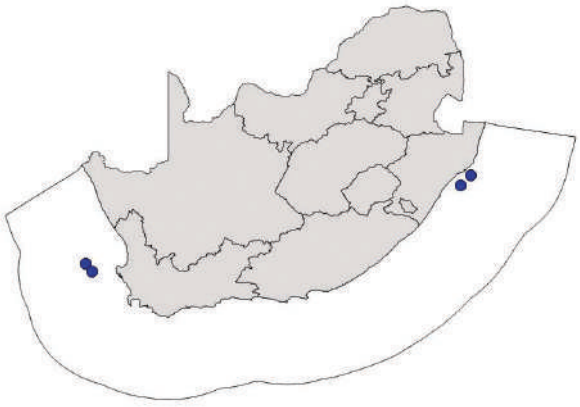

Fig. 218. Distribution of *Amphiura* (*Amphiura*) *acutisquama* in South Africa.

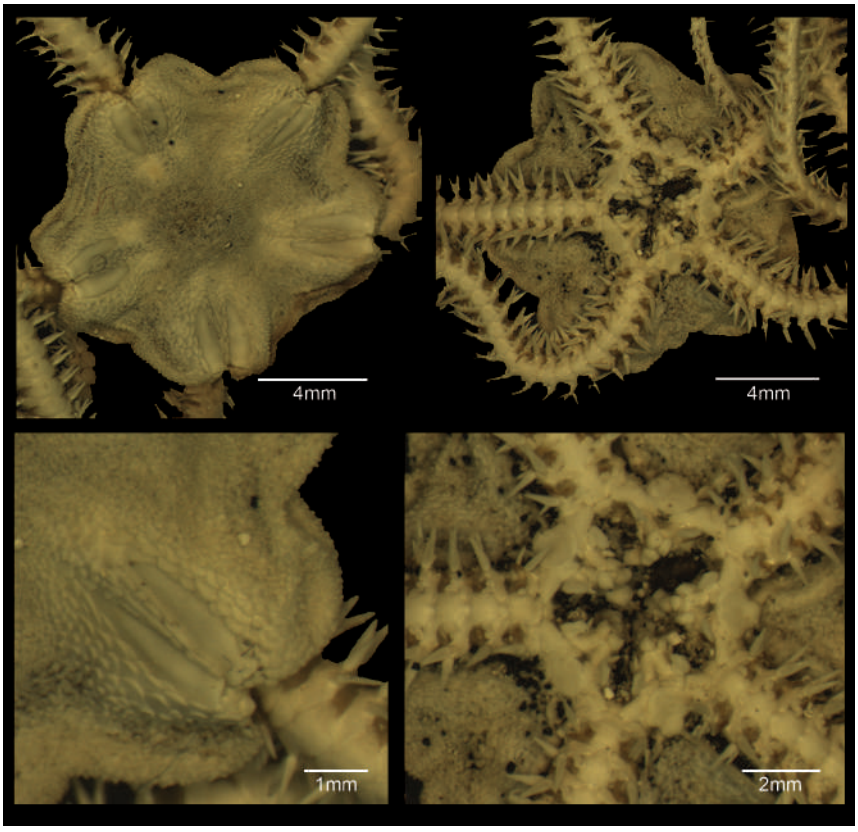

Fig. 219. Dorsal disc (top left), ventral disc (top right), radial shields (bottom left), jaws (bottom right) views of *Amphiura* (*Amphiura*) *acutisquama* (SAMC A073830).

not contiguous basally. Ventral arm plates pentagonal, truncated on proximal edge, distally straight or convex on proximal plates, equally long as wide. Arm spines five basally, then three from *c.* segment 13, tapering to a point, as long as or just longer than segment length. Tentacle scales two, moderate in size, tentacle pores on arm large.

Distribution and habitat – South Africa: Zout River (NC) to Port Durnford (KZN); depth range: 340-800 m. Habitat: sand and mud.

Remarks – Endemic to South Africa. Until this study, only a single specimen was known. Four additional specimens were found during this investigation, extending the distribution range from the west coast eastwards to Tinley Manor in KZN and further westwards to the Zout River. The type material is presumably in the Natural History Museum (London), but could not be located. The specimen was collected by the *Africana***,** station number (AFR798C), but no details other than 'West coast of South Africa' are available.

Amphiura (Amphiura) albella Mortensen, 1933

Amphiura albella Mortensen, 1933a: 359-361, fig. 67a, b; Clark 1974: 444.
Amphiura (*Amphiura*) *albella*: Clark & Courtman-Stock 1976: 103, 115, 153, fig. 131.

Diagnosis – Adapted from Clark & Courtman-Stock (1976). D.D. up to 6 mm, D.D./A.L. = 1/6. Disc indented interradially, disc fully scaled with fine plates. Radial shields long and relatively narrow, separated by single row of plates, *c.* one-third disc radius, approximating distally. Ventral interradial area excavated, naked in proximal areas, then covered in similar plates to dorsal disc. Oral shields vary from spearhead to diamond-shape, may be equal in length and width, or slightly wider. Adoral shields mostly not contiguous. Distal oral papilla one, broad elliptical leaf-shaped, infradental or apical papillae paired, rounded, wide diastema between infradentals and oral papillae. Genital slits long, genital papillae absent. Arms moderately long. Dorsal arm plates broad, fan-shaped with rounded edges, contiguous or barely contiguous proximally, wider than long. Ventral arm plates pentagonal, truncated proximally, as long as wide or slightly longer, broadly contiguous. Lateral arm plates protruding slightly from arm. Arm spines up to five, tapering, proximal ones stout, approximately one segment length. Tentacle scales two proximally, sometimes only one distally.

Distribution and habitat – South Africa: Umgababa (KZN) to Island Rock (KZN); depth range: 411-930 m. Habitat: Soft clay and mud.

Remarks – Endemic to South Africa. Distribution range here extended from Amatikulu (KZN) to Island Rock (KZN). The holotype (ZMUC OPH-79) and paratype (ZMUC OPH-361) are in the Natural History Museum of Denmark and the type locality is off Durban, depth 412 m.

Fig. 220. Distribution of *Amphiura* (*Amphiura*) *albella* in South Africa.

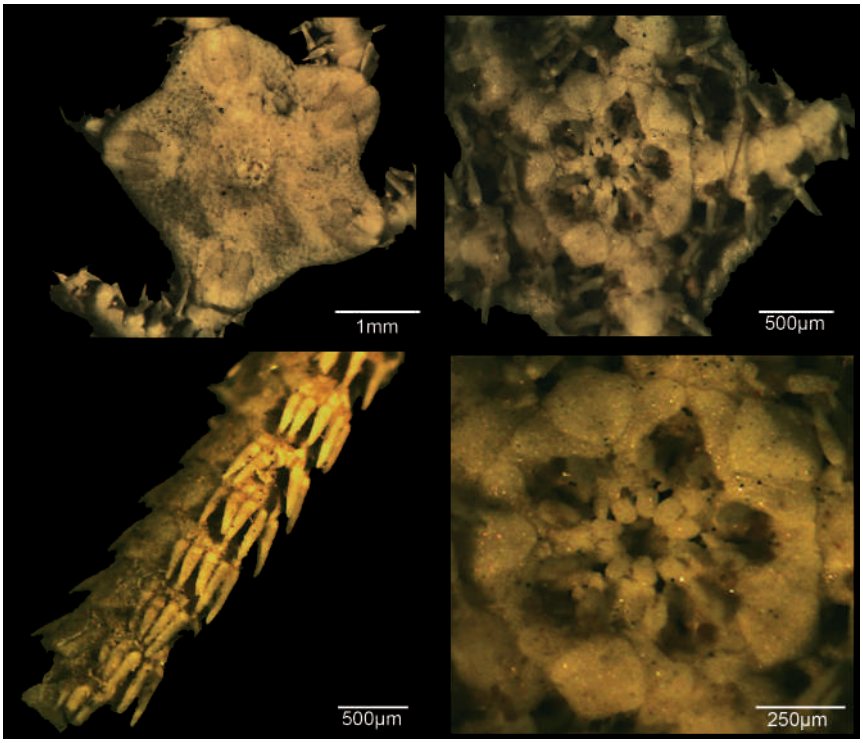

Fig. 221. Dorsal disc (top left), ventral disc (top right), arm spines (bottom left), jaws (bottom right) views of *Amphiura* (*Amphiura*) *albella* (SAMC A22938).

Amphiura (Amphiura) angularis Lyman, 1879

Amphiura angularis Lyman, 1879: 25-26, pl. 11, figs 311-313; Lyman 1882: 134-135, pl. 29, figs 1-3; Clark 1923: 327-328; Mortensen 1933a: 354; Downey 1969: 21.
Amphiura angularis angularis: Branch *et al.* 1993: 51.

Diagnosis – Adapted from Lyman (1879). D.D. up to 9 mm, D.D./A.L. = 1/4. Disc flat, plates indistinct, coarse, overlapping, primary rosette plates slightly larger than other plates. Radial shields short, narrow, longer than wide, tapering distally, separated by two or three rows of irregular plates. Marginal plates continue around outer end of radial shields. One-third ventral interradial areas covered in minute plates, with remaining areas naked. Oral shields large, nearly circular with lobe proximally. Adoral shields not contiguous. Distal oral papillae single, long triangular, tapering, pointed, infradental papillae paired, short, blunt, rounded, wide diastema between infradentals and oral papillae. Arms moderately long. Dorsal arm plates oval, wider than long. First ventral arm plate small and squarish, then nearly square and narrow. Lateral arm plates distinct, sometimes meeting above, but not contiguous ventrally. Arm spines up to five, stout, blunt, tapering, evenly spaced on lateral arm plate. Tentacle scales one, rounded on inner side of tentacle pore.

Distribution and habitat – Heard Island and Prince Edward Islands (Lyman 1879; Branch *et al.* 1993), South Africa: Langebaan (WC) to East London (EC); depth range: 0-348 m. Habitat: rock and sand.

Remarks – Only specimens from Marion Island were examined from the Iziko South African Museum collection. Clark (1923) and Mortensen (1933a) both reported this species in South Africa, but was not included by Clark & Courtman-Stock (1976) for unknown reasons. Mortensen (1936) found that '*angularis*' from the Southern Ocean differed in being fully scaled ventrally. A.M. Clark (1974) suggested that these small specimens are juvenile *A. capensis*. Additional records in this study derived from the UCT Ecological Survey collection. The syntypes are in the Museum of Comparative Zoology (MCZ OPH-1286 and MCZ OPH-1375) with the type locality being Heard Island, depth 274 m.

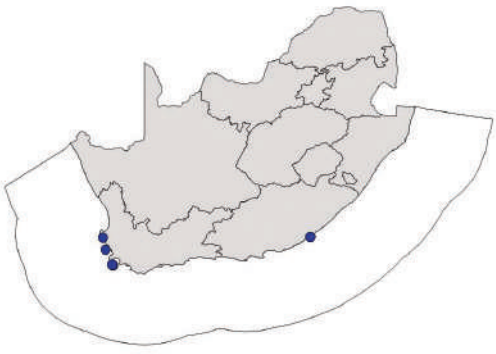

Fig. 222. Distribution of *Amphiura* (*Amphiura*) *angularis* in South Africa.

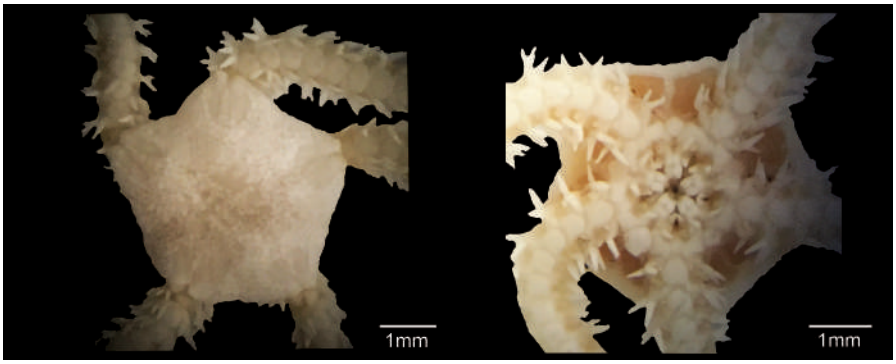

Fig. 223. Dorsal (left) and ventral (right) views of *Amphiura* (*Amphiura*) *angularis* (SAMC A23823).

Amphiura (Amphiura) atlantica Ljungman, 1867

Amphiura atlantica Ljungman, 1867: 321; Koehler 1926: 4-6, pl.1, figs 4, 6-9; Mortensen 1933d: 449-451, figs 17, 18; Madsen 1970: 181-182, fig. 15; Clark 1977: 135.

Amphiura dilatata Lyman, 1879: 26, pl. 9, figs 314-316; Lyman 1882: 135-136, pl. 29, figs 4-6; Clark 1923: 326-327.

Amphiura (*Amphiura*) *atlantica*: Clark & Courtman-Stock 1976: 103, 115, 153-154, figs 126, 132.

Diagnosis – Adapted from Clark & Courtman-Stock (1976) and Madsen (1970). D.D. up to 6 mm, D.D./A.L. = 1/7. Disc indented interradially, disc fully scaled with fine plates. Primary rosette sometimes distinct. Radial shields long and narrow, wider proximally, separated by usually one elongated scale, less than half disc radius. Ventral interradial area excavated, plates absent, sometimes on disc margin only. Oral shields vary in shape, but usually have proximal lobe which may be flat or rounded and a truncated distal lobe, usually equal in length and width or slightly wider. Adoral shields usually not contiguous, or only just touching. Distal oral papilla one, spiniform, infradental papillae, paired, elliptical leaf-shaped, wide diastema between infradentals and oral papillae. Arms moderately long. Dorsal arm plates fan-shaped with rounded edges, wider than long, not contiguous, usually separated by lateral arm plates, some plates have an indistinct distal lobe. Ventral arm plates square or pentagonal, restricted in middle by tentacle pores, slightly concave on distal side, contiguous. Lateral arm plates distinct. Arm spines up to six, tapering, shorter or equal to segment length, second lowest spine slightly broader at tip with lateral projection, giving it a pick-hammer or axe shape. Genital slits long, genital plates distinct. Tentacle scales rudimentary or absent. Colour in life uniformly orange (Clark & Courtman-Stock 1976).

Distribution and habitat – St Helena Island, Senegal (Madsen 1970), South Africa: off Galjoen Bay (NC) to off Durban (KZN); depth range: 30-930 m. Habitat: sand, mud, shell, silt, rock and among Foraminifera.

Remarks – Distribution range within South Africa here extended from the Northern Cape to KwaZulu-Natal. The syntypes are in the Museum of Comparative Zoology (MCZ OPH-1304) (Downey 1969). The type locality is St Helena Island, South Atlantic Ocean, depth unknown (Ljungman 1867).

Fig. 224. Distribution of *Amphiura* (*Amphiura*) *atlantica* in South Africa.

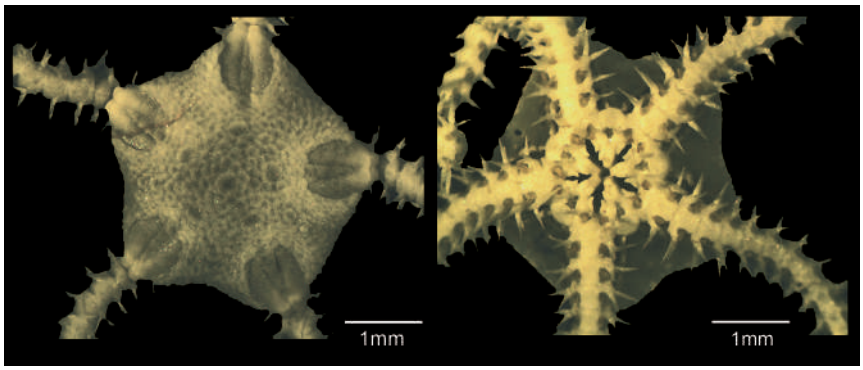

Fig. 225. Dorsal (left) and ventral (right) views of *Amphiura* (*Amphiura*) *atlantica* (SAMC A084229).

Amphiura (Amphiura) capensis Ljungman, 1867

Amphiura capensis Ljungman, 1867: 320; Lyman 1882: 129, pl. 18, figs 14-16; Koehler 1908a: 634; Döderlein 1910: 253-254, pl. 5, fig. 2; Koehler 1914b: 190; Clark 1923: 327; Mortensen 1933a: 348-350; Stephenson *et al.* 1937: 380; Bright 1937a: 63; Bright 1937b: 76, 86, 87; Eyre 1939: 304; Clark A.M. 1952: 200; Clark 1955: 18; Day 1959: 544; Grindley & Kensley 1966: 13; Day *et al.* 1970: 81; Clark 1974: 445-447.
Amphiura adjecta Mortensen, 1933a: 355-357, fig. 62.
Amphiura compressa Mortensen, 1933a: 357-358, figs 63, 64.
Amphiura (*Amphiura*) *capensis*: Clark & Courtman-Stock 1976: 103, 117, 155, figs 121, 143; Olbers *et al.* 2014: 15, pl. 2F.

Diagnosis – Adapted from Clark & Courtman-Stock (1976) and Mortensen (1933a). D.D. up to 11 mm, D.D./A.L. = 1/5. Disc with moderately coarse plates, primary rosette moderately distinct, ventral interradial areas fully scaled, but sometimes reducing in density proximally and sometimes even naked in patches, plates slightly less coarse than on dorsal surface. Radial shields longer than wide, shorter than half disc radius, diverging and tapering distally, contiguous at distal ends, separated by numerous irregular plates. Oral shields broad spearhead-shaped, equal or longer than wide. Adoral shields not contiguous except in smaller specimens. Distal oral papilla single, short, cone-shaped, flattened, rarely spiniform. Infradental papillae broad with rounded square tips, wide diastema between infradentals and oral papillae. Dorsal arm plates oval to fan-shape, wider than long, contiguous. Ventral arm plates pentagonal or square, truncated, equally or only just wider than long, distal side concave basally. Lateral arm plates distinct, not meeting dorsally or ventrally. Arms moderately long. Arm spines up to seven, upper spines flattened or spatulate and may be axe-shaped at tip. Tentacle scales single, rounded. Colour in life, disc greyish sometimes nearly black, arms yellow or orange, may have dark spots within indistinct bands.

Distribution and habitat – Namibia, Angola, Senegambia (Gambia and Senegal) (Koehler 1914b; Clark 1955), South Africa: Orange River (NC) to Sodwana Bay (KZN); depth range: 0-179 m. Habitat: under stones intertidally, rock, stone, sand, mud, shingle, kelp, associated with patellid molluscs and / or *Gunnarea* (reef-worm) colonies, broken *Lithothamnion.*

Remarks – Distribution extended north east from Amatikulu (KZN) to Kosi Bay (KZN). Types in the Museum of Comparative Zoology (MCZ OPH-1294; MCZ OPH-1286; MCZ OPH-1375) (Downey 1969) and the Natural History Museum of Denmark with a paratype (as *Amphiura adjecta*) ZMUC OPH-77 (off Durban, depth 64 m) and the holotype (as *Amphiura compressa*) ZMUC OPH-78 (False Bay, depth 55 m).

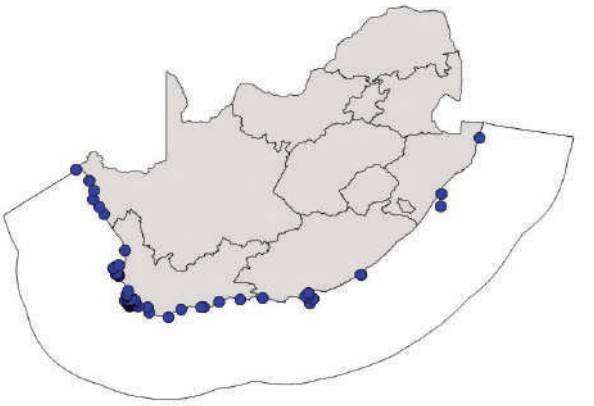

Fig. 226. Distribution of *Amphiura* (*Amphiura*) *capensis* in South Africa.

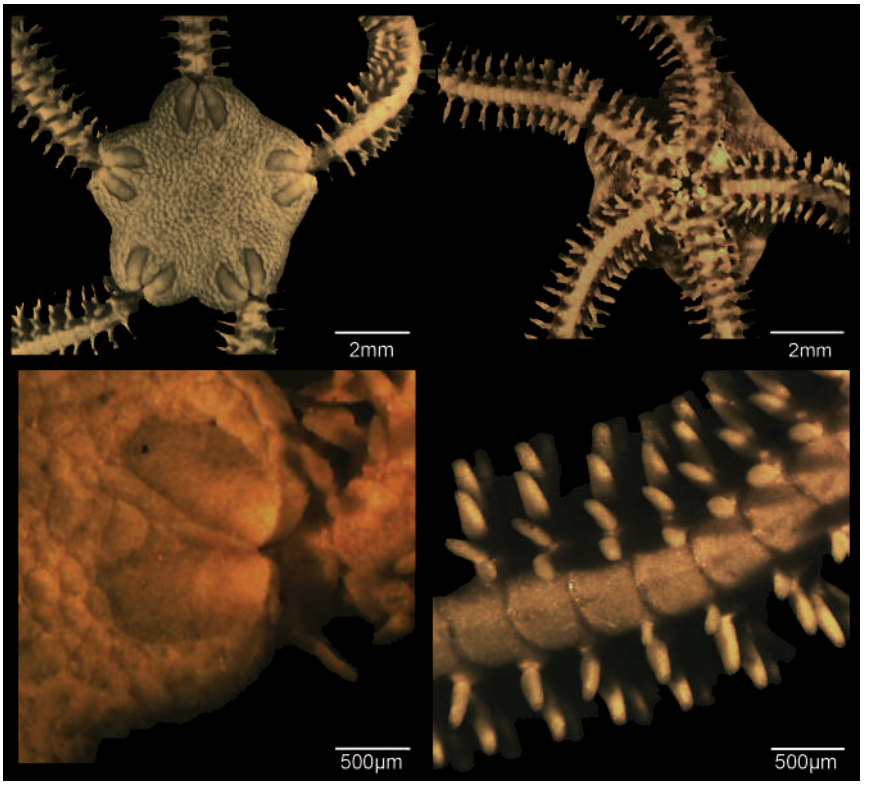

Fig. 227. Dorsal disc (top left), ventral disc (top right), radial shields (bottom left), dorsal arms (bottom right) views of *Amphiura* (*Amphiura*) *capensis* (SAMC A084226).

Amphiura (Amphiura) grandisquama natalensis Mortensen, 1933

Amphiura grandisquama natalensis Mortensen, 1933a: 353-354, fig. 60; Clark 1974: 447-448, fig. 3.

Amphiura (*Amphiura*) *grandisquama natalensis*: Clark & Courtman-Stock 1976: 103, 115, 155-156, fig. 142.

Diagnosis – Adapted from Clark (1974) and Clark & Courtman-Stock (1976). D.D. up to 4 mm. Disc fully scaled, plates fine dorsally, ventral interradial scaling slightly finer. Dorsally, primary rosette not distinct. Radial shields moderately long and narrow, converging distally, not contiguous. Oral shields triangular, rhombic or spearhead-shaped, wider than long. Adoral shields may be only just contiguous, or not at all. Distal oral papillae single, small, moderate in size. Infradental papillae paired, blunt and elliptical leaf-shaped, wide diastema between infradentals and oral papillae. Dorsal arm plates fan-shaped, slightly rounded, becoming pointed distally. Ventral arm plates truncated pentagonal with distal lobe. Arm spines up to five, pointed, tapering, one segment length, lowest spine longer, up to three times segment length, may be clavate or slightly curved. Tentacle scale single, large, round, covering pore.

Distribution and habitat – South Africa: Durban (KZN) to Black Rock (KZN); depth range: 225-825 m. Habitat: green sand and mud.

Remarks – Endemic to South Africa, distribution range here extended from Durban to Black Rock in KZN. The paratype (SAMC A22365) is in Iziko South African Museum and a paratype in the Natural History Museum of Denmark (ZMUC OPH-210). The type locality is off Durban, depth 411 m.

Fig. 228. Distribution of *Amphiura* (*Amphiura*) *grandisquama natalensis* in South Africa.

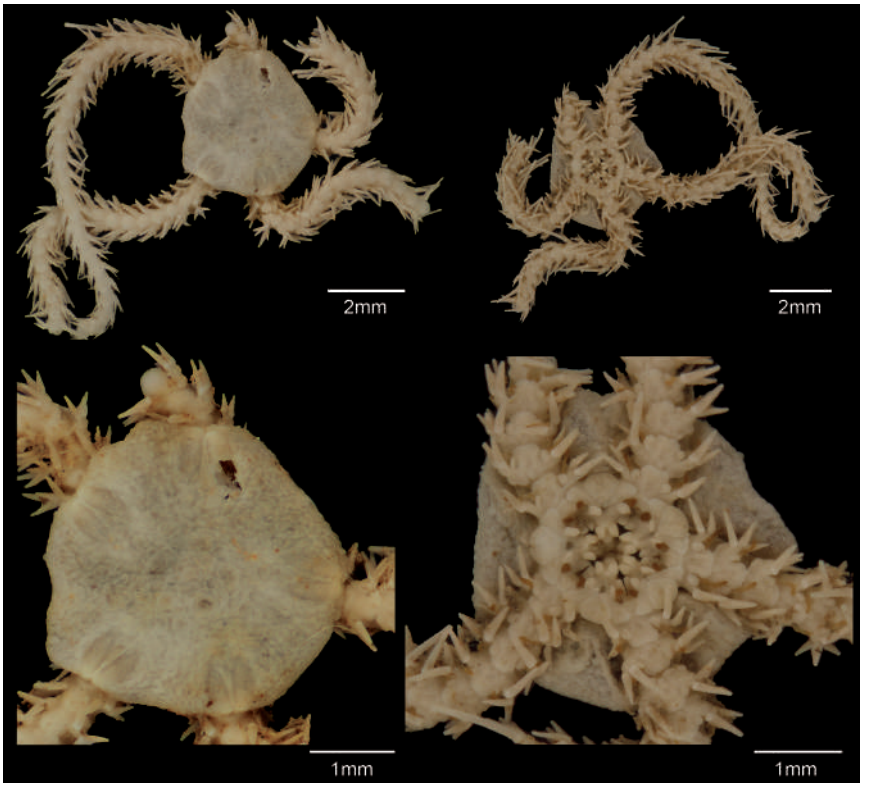

Fig. 229. Dorsal whole (top left), ventral whole (top right), dorsal disc (bottom left), ventral disc (bottom right) views of *Amphiura* (*Amphiura*) *grandisquama natalensis* (ZMUC OPH-210).

Amphiura (Amphiura) incana Lyman, 1879

Amphiura incana Lyman, 1879: 20, pl. 11, figs 285-287; Lyman 1882: 128, pl. 33, figs 5-7, pl. 46, fig. 5; Clark 1923: 328-329; Hertz 1927b: 34, pl. 7, fig. 1; Mortensen 1933a: 351, fig. 60c; Mortensen 1936: 286-287; Clark A.M. 1952: 200; Morgans 1959: 308-310, 312, 313, 315, 322; Downey 1969: 29; Day *et al.* 1970: 81; Madsen 1970: 173-177, figs 8-10.

Amphiura atlantica var. *dilatata* Mortensen, 1933a: 351-353, figs 59, 60b; Clark A.M. 1952: 200; Day *et al.* 1970: 81.

Amphiura sculpta Clark, 1955: 19, 26, 47-48, fig. 22.

Amphiura (*Amphiura*) *incana*: Clark & Courtman-Stock 1976: 103, 156.

Diagnosis – Adapted from Lyman (1879) and Clark & Courtman-Stock (1976). D.D. up to 9 mm, D.D./A.L. = 1/7. Disc with tumid, coarse plates, primary rosette moderately distinct, ventral interradial areas fully scaled with fine plates. Radial shields short to moderately long, narrow, *c.* one-quarter to one-third disc radius, tapering distally, separated by two or three rows of irregular plates with marginal plates continuing around outer end of radial shields. Oral shields vary in shape, spearhead-shaped, pentagonal, nearly circular or rhombic, may be sunken centrally, as long as wide or wider. Adoral shields just contiguous or not. Distal oral papillae single, short, very broad. Infradental papillae paired, broad, pointed, wide diastema between infradentals and oral papillae. Arms moderately long. Dorsal arm plates rounded to square in shape, slightly wider than long. Ventral arm plates squarish to pentagonal, with distal edge concave. Lateral arm plates thick but not prominent, not meeting dorsally or ventrally. Arm spines up to eight, short, thick, blunt, flattened and shorter than segment length. Tentacle scales two, rounded, moderate to small in size. Colour in life, disc grey, arms with pink, orange or red longitudinal stripe (Clark & Courtman-Stock 1976).

Distribution and habitat – North Atlantic Ocean, West Africa, west Mediterranean (Madsen 1970), South Africa: Lambert's Bay (WC) to Tugela River (KZN); depth range: 7-300 m. Habitat: sand, rock, mud, shell, shingle, limestone and broken *Lithothamnion.*

Remarks – Distribution range extended here from Durban (KZN) to off Tugela River mouth (KZN). The distinguishing features of *Amphiura* (*Amphiura*) *incana* include the arm spines, which are short, thick and up to eight. The type material is in the Museum of Comparative Zoology (syntypes: MCZ OPH-1323 and MCZ OPH-1389) and the type locality is Simon's Bay, depth 18-36 m.

Fig. 230. Distribution of *Amphiura* (*Amphiura*) *incana* in South Africa.

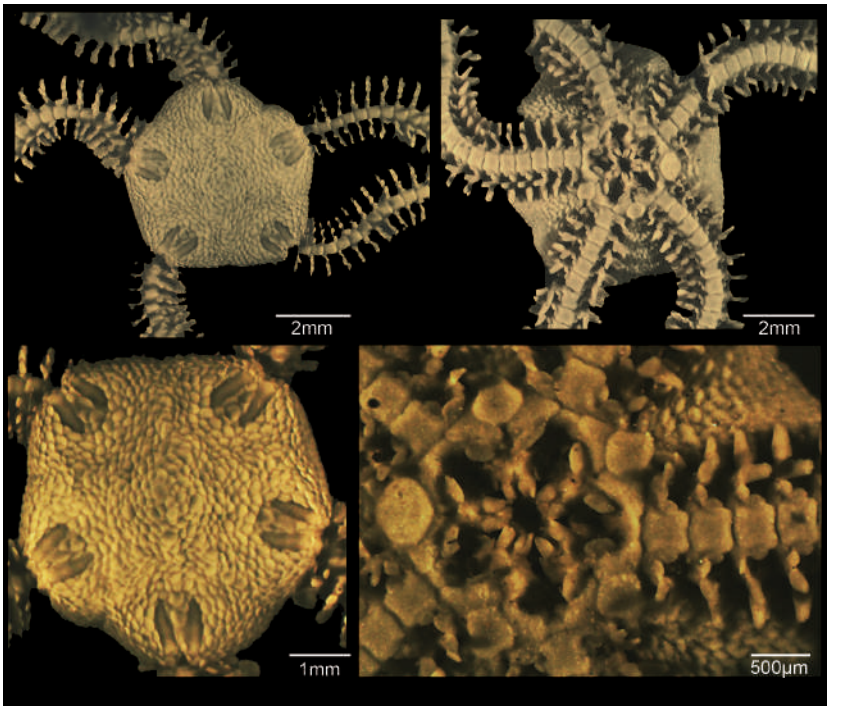

Fig. 231. Dorsal whole (top left), ventral disc (top right), dorsal disc (bottom left), jaws (bottom right) views of *Amphiura* (*Amphiura*) *incana* (SAMC A23378).

Amphiura (Amphiura) linearis Mortensen, 1933

Amphiura linearis Mortensen, 1933a: 354-355, fig. 61; Clark 1974: 475.
Amphiura (*Amphiura*) *linearis*: Clark & Courtman-Stock 1976: 103, 115, 157, fig. 141.

Diagnosis – Adapted from Clark & Courtman-Stock (1976) and Clark (1974). D.D. up to 3.5 mm, D.D./A.L. = 1/5. Disc with small fine plates both dorsally and ventrally. Radial shields narrow, linear or nearly parallel, more than one-third disc radius, not tapering, well-separated. Oral shields broad spearhead-shaped with rounded proximal lobe, as wide as long. Adoral shields triangular, just contiguous. Distal oral papilla single, pointed. Infradental papillae paired, pointed, wide diastema between infradentals and oral papillae. Arms moderately long. Dorsal arm plates narrow, fan-shape, longer than wide. Ventral arm plates narrow, pentagonal, truncated or rounded distal edge. Arm spines up to six, slightly flattened, tapering, pointed, lowermost longest, exceeding segment length. Tentacle scales single, moderately large, slightly elongated, triangular or cone-shaped.

Distribution and habitat – South Africa: Amanzimtoti (KZN) to Durban (KZN); depth range: 91-165 m. Habitat: no information available.

Remarks – Endemic to South Africa. There are only two damaged specimens known, presumably the two in the Natural History Museum of Denmark. Both Clark (1974) and Clark & Courtman-Stock (1976) mentioned that the type material is damaged and should be re-examined and compared to *Ophiopsila bispinosa*, which has similar radial shields and arm spines. The type material is in the Natural History Museum of Denmark (syntypes: ZMUC OPH-190 and ZMUC OPH-360) with the type locality off Durban, depth 91-165 m.

Fig. 232. Distribution of *Amphiura* (*Amphiura*) *linearis* in South Africa.

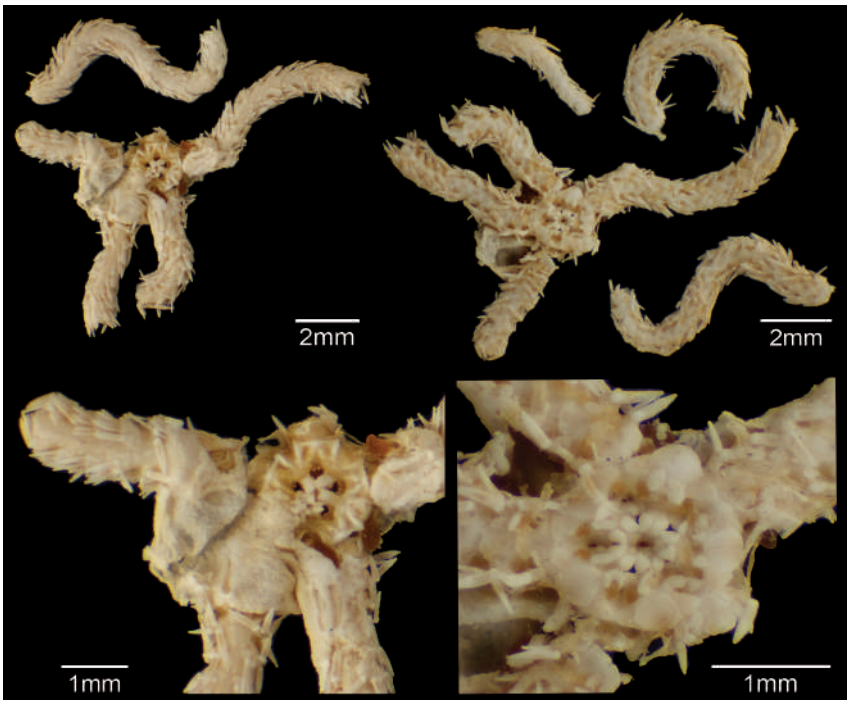

Fig. 233. Dorsal whole (top left), ventral whole (top right), dorsal disc (bottom left), jaws (bottom right) views of *Amphiura* (*Amphiura*) *linearis* (ZMUC OPH-190).

Amphiura (Amphiura) otteri Ljungman, 1872

Amphiura otteri Ljungman, 1872: 631-632; Lyman 1879: 32; Lyman 1882: 128; Lyman 1883: 252; Koehler 1907: 302, pl. 11, fig. 19; Koehler 1914a: 61, pl. 8, figs 5-9; Mortensen 1927: 210; Paterson 1985: 86-87, fig. 33.
Amphiura grandis Koehler, 1896a: 246-247; Koehler 1907: 301; Koehler 1909b: 175-177; pl. 27, figs 3, 4; Mortensen 1927: 210.

Diagnosis – Adapted from Paterson (1985). D.D. up to 11 mm. Disc pentagonal, indented interradially, with moderate coarse plates, primary rosette distinct, ventral interradial areas fully scaled with fine plates. Radial shields moderately long, about half disc radius, converging distally and touching on distal ends. Oral shields spearhead-shaped, longer than wide. Adoral shields not contiguous. Distal oral papillae one, spiniform, arising from adoral shields. Infradental papillae paired, elliptical leaf-shaped, often contiguous, wide diastema between infradentals and oral papillae. Dorsal arm plates oval or hexagonal, wider than long, proximal plates almost contiguous. Ventral arm plates pentagonal, becoming squarish distally, contiguous, may have slight concave notch on distal side. Tentacle pores large. Arm spines up to eight, pointed, some with terminal hook. Tentacle scales two, small in size, may be missing on some segments.

Distribution and habitat – North Atlantic (West Indies to Cape Verde), Gulf of Mexico, Caribbean, British Isles (Paterson 1985), South Africa: off Cape Town (WC) to Port Elizabeth (EC); depth range: 198-3200 m. Habitat: no information available.

Remarks – Two specimens (SAMC A22102 and SAMC A22100) were determined by A.M. Clark after 1959, but they were badly damaged. The identification could not be confirmed or disputed, possibly a reason why this species was not included by Clark & Courtman-Stock (1976). This species remains as part of the South African fauna, but is considered dubious. The syntypes are in the Swedish Museum of Natural History (SMNH-Type-1412) and the type locality is off Portugal, depth 1001 m.

Fig. 234. Distribution of *Amphiura* (*Amphiura*) *otteri* in South Africa.

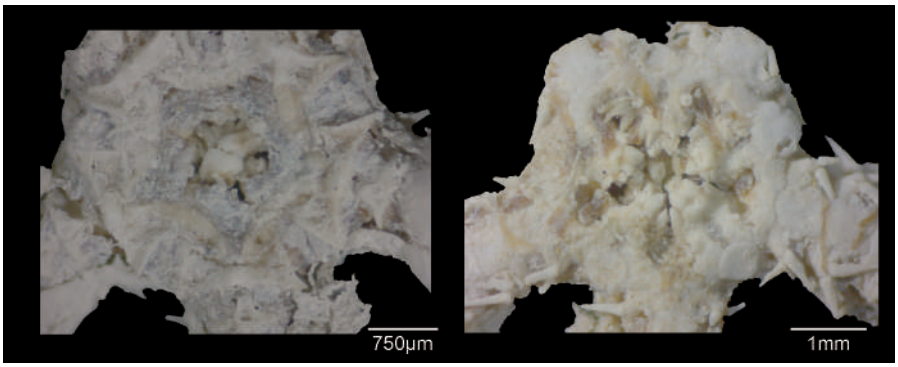

Fig. 235. Dorsal (left) and ventral (right) views of *Amphiura* (*Amphiura*) *otteri* (SAMC A22100).

Amphiura (Amphiura) simonsi A.M. Clark, 1952

Amphiura simonsi Clark A.M., 1952: 215-217, fig. 2; Morgans 1959: 322; Clark 1974: 448-449, fig. 4.

Amphiura (*Amphiura*) *simonsi*: Clark & Courtman-Stock 1976: 103, 115, 157, figs 129, 133.

Diagnosis – Adapted from Clark & Courtman-Stock (1976) and Clark (1974). D.D. up to 7 mm, D.D./A.L. = 1/9. Dorsal disc with small, coarse, delicate and thin plates, ventral interradial areas lacking scales, but these easily rubbed off. Primary rosette not distinct. Radial shields relatively small, contiguous distally and diverge proximally, less than one-third of disc radius. Oral shields small, vary in shape, oval or broad triangular. Adoral shields large, with broad distal lobe between oral shield and first lateral arm plate, contiguous. Distal oral papillae two[3], one short and conical, the other more rounded or blunt. Infradental papillae paired, broad, blunt, wide diastema between infradentals and oral papillae. Arms long. Dorsal arm plates fan-shaped, wider than long, rudimentary on basal segments exposing underlying structure. Ventral arm plates square to rectangular, distal edge slightly concave. Arm spines up to five, as long as segment length, spines flattened and paddle-shaped, second lowest spine conspicuously curved, hook-shaped sometimes with hyaline hooks, lowest spine flattened or cylindrical but tapering. Tentacle scale one, small, usually absent in basal pores. Colour in life, arms pale orange and banded (Clark & Courtman-Stock 1976).

Distribution and habitat – South Africa: Cape Town (WC) to Mtunzini (KZN); depth range: 0-110 m. Habitat: sand, shell, shingle, gravel, mud and rock.

[3] Both Clark (1974) and Clark & Courtman-Stock (1976) noted that the outer papilla may not be a true papilla but rather a calcified extension of the rim of the second oral tentacle pore.

Remarks – Endemic to South Africa. The type material in Iziko South African Museum (SAMC A23228) is labelled as a 'cotype'. The type locality is Gordon's Bay, depth 36 m.

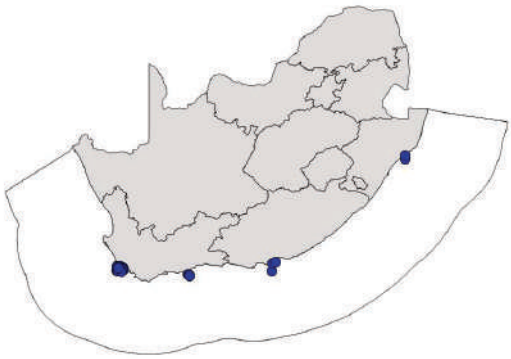

Fig. 236. Distribution of *Amphiura* (*Amphiura*) *simonsi* in South Africa.

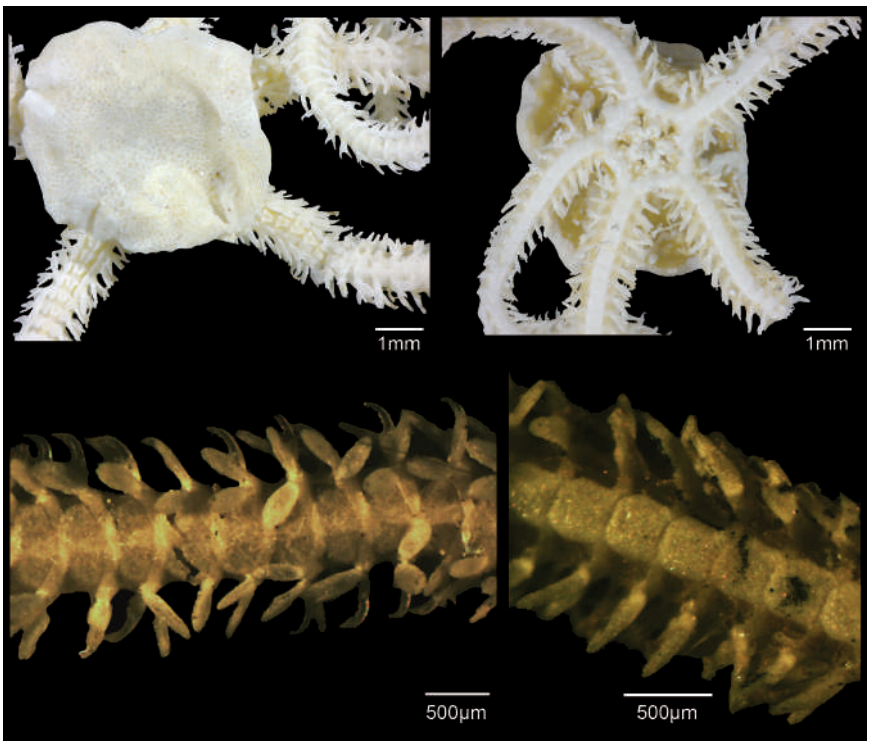

Fig. 237. Dorsal disc (top left), ventral disc (top right), dorsal arms (bottom left), ventral arms (bottom right) views of *Amphiura* (*Amphiura*) *simonsi* (SAMC A084236).

Amphiura (Amphiura) uncinata Koehler, 1904

Amphiura uncinata Koehler, 1904a: 76-77, pl. 14, figs 3, 4; Koehler 1922b: 160, pl. 65, fig. 6-8, pl. 96, fig. 4; Mortensen 1933a: 358-359, figs 65, 66; Clark H.L. 1939: 58.

Amphiura (*Amphiura*) *uncinata*: Clark & Courtman-Stock 1976: 103, 115, 158, fig. 125.

Diagnosis – Adapted from Clark & Courtman-Stock (1976). D.D. up to 11 mm, D.D./A.L. = 1/10. Dorsal disc with moderately large, coarse plates, primary rosette distinct with plates in between. Ventral interradial area scaled distally with scattered plates proximally. Radial shields large, long and narrow, more than half disc radius, tapering proximally, separated by rows of irregular plates, approximating distally. Oral shields spearhead-shaped to triangular, longer than wide. Adoral shields contiguous, triangular. Distal oral papilla single, short, broad, semi-circular or conical. Infradental papillae paired, moderately broad, pointed, wide diastema between infradentals and oral papillae. Arms long. Dorsal arm plates broad fan-shaped with rounded distal edge, wider than long, contiguous. Ventral arm plates pentagonal to almost fan-shaped, narrowly contiguous. Arm spines up to six basally, pointed, middle spines hyaline and curved with hooked tip, distally some spines not curved. Tentacle scales two, moderate in size.

Distribution and habitat – Zanzibar, South Arabian Coast, East indies, Java, Philippines, Kei Islands (Clark H.L. 1939), South Africa: Durban (KZN) to Umhlanga (KZN); depth range: 100-1415 m. Habitat: sandy and green mud.

Remarks – Type material whereabouts unknown, type locality is East of Java, East Indies, depth 250-350 m.

Fig. 238. Distribution of *Amphiura* (*Amphiura*) *uncinata* in South Africa.

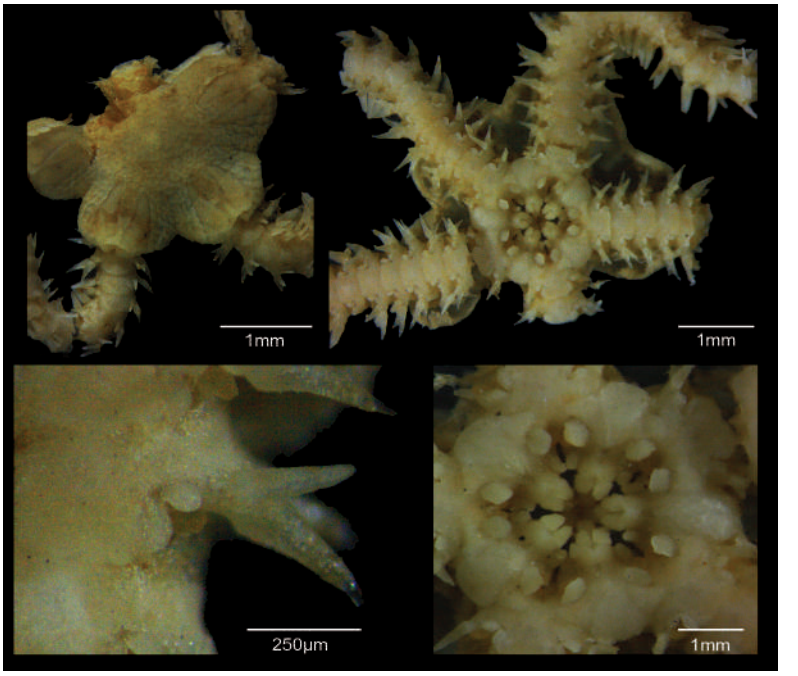

Fig. 239. Dorsal disc (top left), ventral disc (top right), arm spines (bottom left), jaws (bottom right) view of *Amphiura* (*Amphiura*) *uncinata* (SAMC A23229).

Genus ***Ophiodaphne*** Koehler, 1930

Diagnosis – Adapted from Tominaga *et al*. (2004) and Parameswaran *et al*. (2013). A sexually dimorphic genus, male dwarfed and attached to larger female mouth-to-mouth with alternating arms. The female oral structure is indented to accommodate the smaller male. Infradental papillae paired. Oral papillae fused, sometimes forming a serrated flange. Oral shields smaller than adoral shields. All known species are epizoic on other echinoderms.

Ophiodaphne scripta (Koehler, 1904)

Amphiura scripta Koehler, 1904b: 70-71, figs 23, 24.

Amphilycus androphorus Mortensen, 1933b: 185-188, figs 4-6; Tortonese 1936: 221; Balinsky 1957: 11; Macnae & Kalk 1962: 115, 118; Balinsky 1969: 99, 106, 129.

Amphilycus scripta: Clark 1967: 41, fig. 2a, c; Clark & Rowe 1971: 103, fig. 32a, c; Clark & Courtman-Stock 1976: 102, 114, 147, fig. 124; Vine 1986: 195; Liao & Clark 1995: 182, fig. 82.

Ophiodaphne scripta: Cherbonnier & Guille 1978: 128-130, fig. 58; Parameswaran *et al.* 2013: 333-339, figs 1, 2, 4.

Diagnosis – Adapted from Cherbonnier & Guille (1978) and Parameswaran *et al*. (2013). D.D. up to 4 mm (female), up to 1 mm (male). Sexually dimorphic, male dwarfed, attached to underside of female. Female with distinct grooves on ventral side with the whole jaw structure indented. Disc round to pentagonal, dorsal disc plates moderately coarse, primary rosette moderately distinguishable, centre plate present and conspicuous, rows of slightly larger dorsal disc plates in interradial areas, matching where male places his arms, these plates approximately same size as primary rosette plates. Radial shields naked, D-Shaped, moderate in size, just less than half disc radius, contiguous for entire length except proximal-most parts, where small triangular disc scale present. Ventral interradial areas scaled and unarmed. Oral shields diamond-shaped, small. Adoral shields large, contiguous. Infradental papillae more or less symmetrical. Oral papillae none, but long, continuous, serrated flange along oral plate. Genital slits reach disc margin, genital papillae absent. Dorsal arm plates elliptical, with slight lobe distally, narrowly contiguous. Lateral arm plates almost touching dorsally. Ventral arm plates square, very slight distal notch, contiguous. Arm spines five, cylindrical, tapering, slightly longer than segment length, but may be up to twice segment length, some with double or triple hooks at their bases directed proximally. Tentacle scale one, large. Male: identical to female except smaller in size, dorsal disc with primary rosette of five plates and central plate, no indentation of jaws and dorsal arm plates fan-shaped. Colour in life, disc grey or pale lavender-blue, distal edges of radial shields white, arm plates variegated with purple-red, grey and white, arm spines glassy or colourless (Clark 1938).

Distribution and habitat – Mozambique, Madagascar, Red Sea, Persian Gulf and India (Mortensen 1933b; Cherbonnier & Guille 1978; Parameswaran *et al.* 2013), South Africa: Sodwana Bay (KZN) to Kosi Bay (KZN); depth range: 0-78 m. Habitat: sand, found on the underside of the cake urchins *Echinodiscus auritus* and *E. bisperforatus*.

Fig. 240. Distribution of *Ophiodaphne scripta* in South Africa.

Remarks – The southern-most record for southern Africa from Clark & Courtman-Stock (1976) was the degree square (26/33) which overlaps the border between South Africa and Mozambique and perhaps represents the first record for South Africa. However, the two specimens examined during this study, were collected in 1999 together with their dwarfed males from Sodwana Bay and are now housed at Royal Museum for Central Africa in Belgium. The type material was assumed to be in the Muséum national d'Histoire naturelle in Paris (MNHN) but it was not located, type locality is Oman, depth unknown.

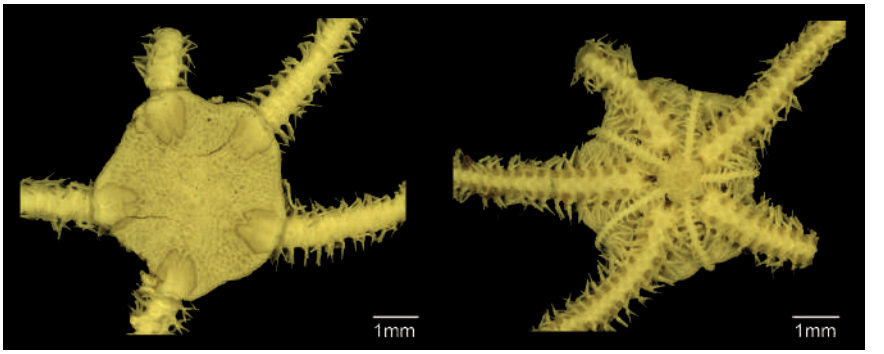

Fig. 241. Dorsal (left) and ventral (right) views of *Ophiodaphne scripta*, together with dwarf male attached (RMCA MT2311).

Genus ***Ophionephthys*** Lütken, 1869

Diagnosis – Adapted from Lyman (1882) and Lütken (1869). Disc small and naked except at radial shields and on margin. Arms long, slender. Oral papillae 2-6. Arm spines 4-5, small. Genital slits two, small.

Ophionephthys lowelli Clark, 1974

Ophionephthys lowelli Clark, 1974: 462-464, fig. 10a-e; Clark & Courtman-Stock 1976: 103, 116-117, 159-160; Mbongwa 2013: 15; Olbers *et al.* 2015: 93, pl. 3A, B.

Diagnosis – Adapted from Clark (1974) and Clark & Courtman-Stock (1976). D.D. up to 8 mm, D.D./ A.L. = 1/10. Disc round, in all specimens on hand, dorsal disc 'lid' missing. Oral shields variable, as wide or wider than long, triangular with broadly rounded angles, widest proximally or rhombic with proximal lobe flattened. Adoral shields triangular, widely separated interradially, with broad distal lobe contiguous with lateral arm shield. Jaws slightly sunken, with two large, broad infradental oral papillae, appearing in preserved specimens to be apical papillae. Two spiniform, rugose-tipped oral papillae, one shorter than the other and both attached to oral plate and in series with infradental papillae. Oral tentacle scale distinct, short and

sharp, situated close to teeth. No genital papillae, genital slits small and indistinct. Arms long, first 7-9 dorsal arm plates rudimentary, showing underlying structure, plates becoming whole, square or slightly longer than wide, with rounded edges slightly convex on distal side and concave on proximal side, broadly contiguous. Ventral arm plates identical in shape, convex distally, overlapping each other, longer than wide. Arm spines 4-5, lowest one thick, blunt, approximately segment length, remaining spines slightly shorter and tapering but blunt, covering not smooth, slightly rough. Tentacle scale single, oval, longer than wide, *c.* half segment length.

Distribution and habitat – South Africa: East London (EC) to Sodwana Bay (KZN); depth range: 0-55 m. Habitat: found in brown sand, shell, mud and coral sand.

Remarks – Endemic to South Africa. Olbers *et al.* (2015) suggested that a neotype be designated, as the holotype had disintegrated in the jar. The type material is in Iziko South African Museum (holotype: SAMC A22782; paratype: SAMC A22781). Type locality East London, depth 51 m.

Fig. 242. Distribution of *Ophionephthys lowelli* in South Africa.

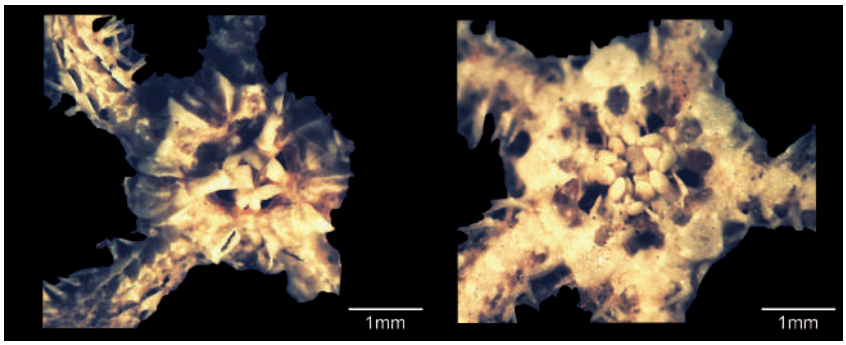

Fig. 243. Dorsal (left) and ventral (right) views of *Ophionephthys lowelli* (SAMC A22781).

4.6.7. Family AMPHILEPIDIDAE Matsumoto, 1915

Genus ***Amphilepis*** Ljungman, 1867

Diagnosis – Adapted from Ljungman (1867) and Lyman (1882). Disc flat, large, with naked overlapping scales, radial shields large. Teeth large, no dental papillae. Oral papillae small, unequal, scale-like. Arms flattened, slender. Arm spines usually three, short, tapering. Genital slits single.

Amphilepis scutata Mortensen, 1933

Amphilepis scutata Mortensen, 1933a: 372-373, fig. 76; Clark 1974: 464; Clark & Courtman-Stock 1976: 103, 119, 146-147, fig. 155; Clark 1977: 135.

Diagnosis – Adapted from Mortensen (1933a). D.D. up to 6 mm. Disc round, flat, disc plates moderate in size, overlapping, primary rosette and central plates distinct. Radial shields moderately large, triangular, *c.* half disc radius, approximating distally but not contiguous, separated by elongated, triangular plates. Ventral interradial area covered in smaller, overlapping plates. Oral shields moderately large, triangular with rounded edges. Adoral shields contiguous. Oral papillae two, distalmost elongated and much longer than proximal-most. Teeth triangular and long. Genital plates large, thin. Arms moderately long, thin. Dorsal arm plates semi-circular with straight edge on distal edge, wider than long, not contiguous, appear restricted at vertebrae joints. Ventral arm plates bell-shaped, rounded on distal side, pointed on proximal side, longer than wide, not contiguous, restricted at tentacle pores. Arm spines three, slender, pointed, middle spine slightly longer. Tentacle pores large, tentacle scales absent.

Distribution and habitat – South Africa: off Duyker Eiland (WC) to Black Rock (KZN); depth range: 175-810 m. Habitat: sandy mud, with polychaetes.

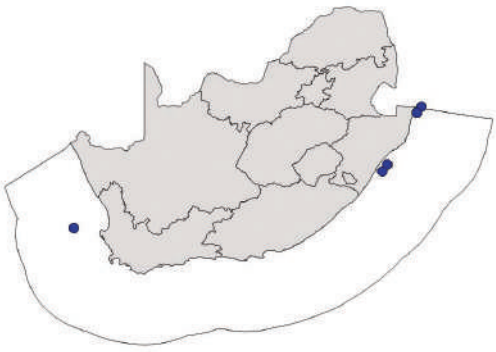

Fig. 244. Distribution of *Amphilepis scutata* in South Africa.

Remarks – Endemic to South Africa. Cherbonnier & Guille (1978) synonymised *Amphilepis scutata* with *Amphilepis mobilis* Koehler 1904. The drawings of *A. mobilis* in Koehler (1904) and Cherbonnier & Guille (1978) are quite different from the specimens examined and the drawings of *A. scutata* in Mortensen 1933a. The drawings of *A. mobilis* have round disc plates separating the radial shields, an indistinct primary rosette and lack a central disc scale. In *A. scutata*, radial shields approximate distally and the separating plates are triangular. The primary rosette and central disc scale are distinct. Therefore, *A. scutata* and *A. mobilis* are considered to be separate species here.

A specimen of *A. scutata* was dredged at 440 m offshore of Duyker Eiland on the west coast of South Africa. Although this is the most modern record of this species (2007), it is a peculiar distribution record, because other specimens were found in subtropical waters in KZN. The holotype is in Natural History Museum of Denmark (ZMUC OPH-264) and the type locality is off Durban, depth 411 m.

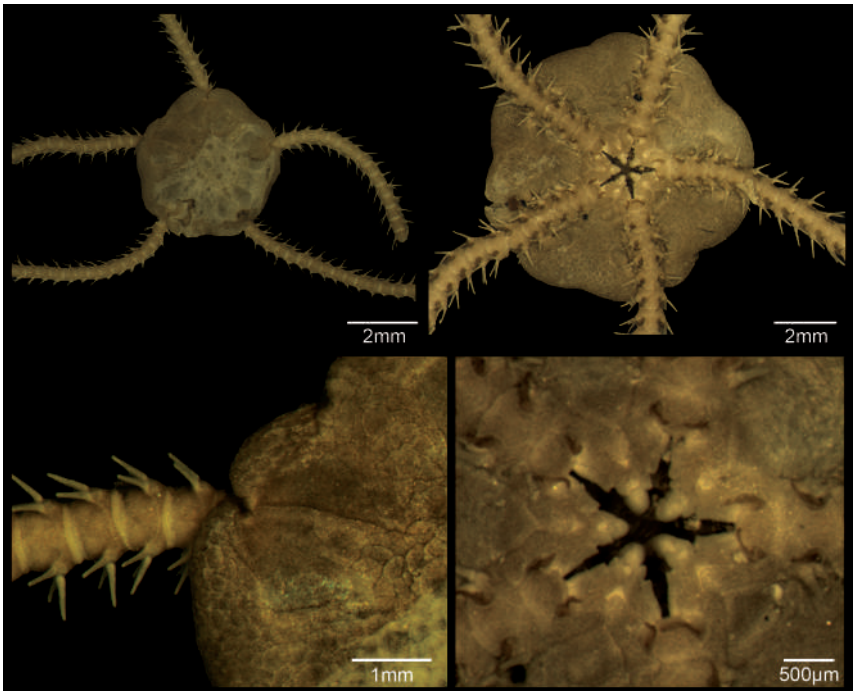

Fig. 245. Dorsal whole (top left), ventral disc (top right), radial shields and basal arms (bottom left), jaws (bottom right) views of *Amphilepis scutata* (SAMC A073834).

4.6.8. Family OPHIOTHAMNIDAE O'Hara *et al.*, 2018

Genus ***Ophiothamnus*** Lyman, 1869

Diagnosis – Adapted from Lyman (1869) and Lyman (1882). Disc tumid and overlying arm bases covered with large plates, scattered with fine thorns or spines. Radial shields naked, large, wide and contiguous for most of their length. Adoral shields long and stout, contiguous, extending outside oral shields, creating a raised pentagon. Teeth present. Oral papillae stout, closely packed. Lateral arm plates meeting dorsally and ventrally. Arm spines numerous (up to eight), serrated, may meet on dorsal midline. Genital slits begin close to oral shields.

Ophiothamnus remotus Lyman, 1878

Ophiothamnus remotus Lyman, 1878: 149-150, pl. 8, figs 201-203, Studer 1882: 24; Lyman 1882: 212-213, pl. 14, figs 1-3; Bell 1905: 258; Clark 1923: 324-325; Mortensen 1933a: 327-330, figs 46, 47a; Clark & Courtman-Stock 1976: 105, 121, 170-171, fig. 171.

Ophiothamnus remotus var. *cordatus* Mortensen, 1933a: 330-331, fig. 47b. Clark 1977: 135.

Diagnosis – Adapted from Lyman (1878) and Mortensen (1933a). D.D. up to 3.5 mm. A.L. up to 12 mm, D.D./A.L. = 1/3-4. Disc tumid, dorsally covered with plates and scattered, tapering spines. Radial shields large, triangular, inner sides convex, more than half disc radius, contiguous for more than half their length. Ventral interradial areas almost not existent as deeply constricted. Oral shields small, triangular or heart-shaped, distal side may be slightly convex or concave. Adoral shields large, broadly contiguous. Oral papillae three, distalmost broad and opercular. Genital slits short. Dorsal arm plates triangular, with rounded corners, wider than long, not contiguous. Ventral arm plates pentagonal, not contiguous. Lateral arm plates meeting dorsally and ventrally. Arm spines seven, slender, smooth or finely serrated, pointed, only two uppermost spines exceeding segment

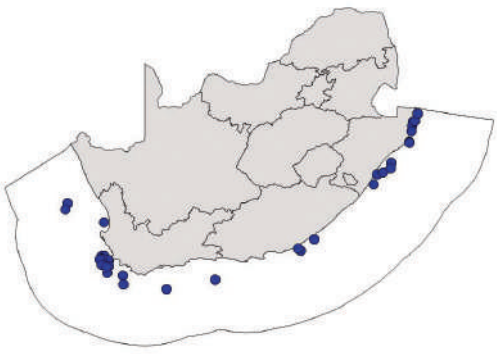

Fig. 246. Distribution of *Ophiothamnus remotus* in South Africa.

length. Tentacle pores small. Tentacle scales small, single, pointed. Colour in life orange.

Distribution and habitat – South Africa: Jakkelshoek (NC) to Black Rock (KZN); depth range: 88-900 m. Habitat: rock, sand, stones, mud and gravel.

Remarks – Endemic to South Africa. Studer (1882) erroneously recorded this species at 34º13'S; 18º0'W (mid Atlantic Ocean) but Mortensen (1933a) believed this was an error and it should have read 34º13'S; 18º00'E, which places it off the Cape of Good Hope. The type material is in the Natural History Museum of Denmark (syntype: ZMUC OPH-76) and the type locality is Agulhas Bank, depth 275 m.

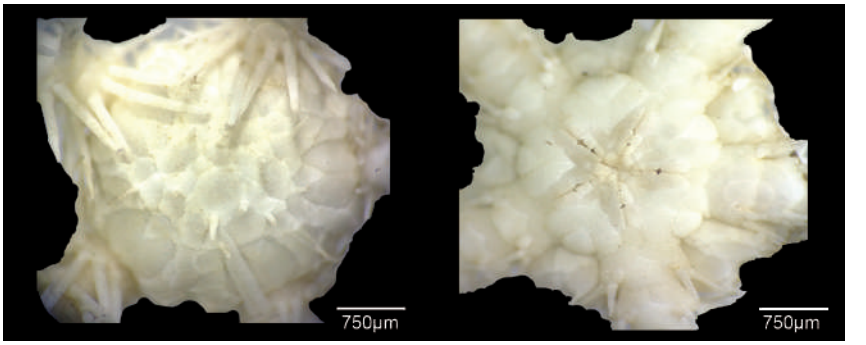

Fig. 247. Dorsal (left) and ventral (right) views of *Ophiothamnus remotus* (SAMC A073875).

Genus ***Histampica*** A.M. Clark, 1970

Diagnosis – Adapted from Clark (1970). Disc covered with overlapping plates, armament absent. Radial shields moderately large. Oral papillae 4-5 on either side of each jaw, unequal in size, arranged almost in a continuous series. Teeth triangular, with pointed ends. Dental papillae absent. Oral shields large. Adoral shields long and slender. Tentacle scales two.

Histampica duplicata (Lyman, 1875)

Amphiura duplicata Lyman, 1875: 19-20, fig. 87, pl. 5, fig. 78; Lyman 1882: 136, pl. 17, figs 10-12; Lyman 1879: 31-32; Koehler 1896a: 244; Koehler 1896b: 208.
Amphiura partita Koehler, 1897, 336-337, pl. 7, figs 50, 51.
Ophiactis duplicata: Lütken & Mortensen 1899: 142-143; Koehler 1909: 171; Koehler 1914a: 40-41.
Amphiactis duplicata Matsumoto 1915: 66-67; Matsumoto 1917: 146-147; Koehler 1922b: 204-205, pl. 63, figs 1-4; Mortensen 1927: 198.
Histampica duplicata: Clark 1970: 73-74; Clark 1977: 142; Paterson 1985: 80, fig. 32.

Diagnosis – Adapted from Paterson (1985). D.D. up to 9 mm, D.D./A.L. = *c.*1/4. Disc round, covered with large, thick overlapping plates. Central plate and primary rosette distinct, primary plates may have knobs in centre. Radial shields twice as long as wide, nearly half disc radius, separated by wedge of plates. Ventral interradial areas covered in plates slightly smaller than those on dorsal side. Oral shields diamond-shaped, rounded distally, equally long as broad. Adoral shields

Fig. 248. Distribution of *Histampica duplicata* in South Africa.

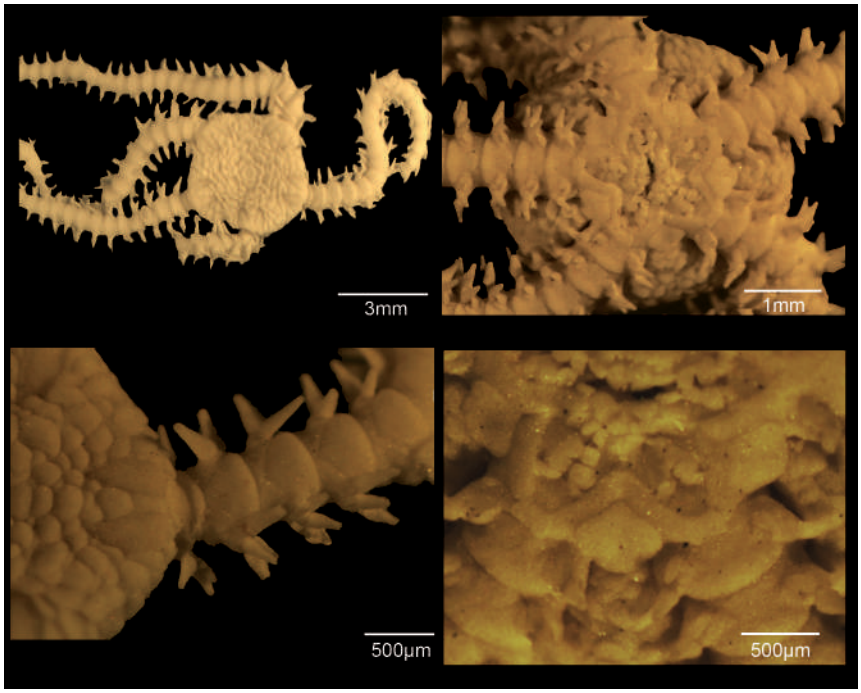

Fig. 249. Dorsal whole (top left), ventral disc (top right), radial shields and basal arms (bottom left), jaws (bottom right) views of *Histampica duplicata* (SAMC A22947).

large, separating oral shield from first lateral arm plates, contiguous. Single large tricuspid apical papillae, 3-5 rounded oral papillae. Oral tentacle scale may be superficial and fall into series with oral papilla. Arms moderately long, able to coil. Dorsal arm plates fan-shaped, wider than long, contiguous basally. Ventral arm plates fan- or axe-shaped, may be indented laterally, sometimes contiguous basally. Arm spines three, flattened, conical, middle spine largest, *c.* same length as segment. Tentacle scales two, large, rounded or slightly elliptical.

Distribution and habitat – West Indies, Bay of Biscay to North Africa, east Pacific off Columbia to Ecuador (Paterson 1985), South Africa: North of Richard's Bay (KZN) to Island Rock (KZN); depth range: 125-2870 m. Habitat: no information available.

Remarks – The syntypes are in the Museum of Comparative Zoology (MCZ OPH-4092, MCZ OPH-1262 and MCZ OPH-1263) and the type locality is Barbados, depth 183 m.

4.6.9. Family OPHIACTIDAE Matsumoto, 1915

Genus ***Ophiactis*** Lütken, 1856

Diagnosis – Adapted from Mortensen (1927). Disc scaling coarse, primary rosette often distinct. Plates with scattered spinelets or granules. Infradental papillae on apex of jaws, one or two distal oral papillae. Arm spines short.

Ophiactis abyssicola (Sars, 1861)

Amphiura abyssicola Sars, 1861: 18-21, pl. 2, figs 7-12.
Ophiactis abyssicola: Ljungman 1867: 324; Lyman 1882: 122; Clark 1918: 304-305; Clark 1923: 334-335; Mortensen 1927: 202-203, fig. 114, Mortensen 1933a: 347; Clark & Courtman-Stock 1976: 104, 119, 161; Rodrigues *et al.* 2011: 11, fig. 6.
Ophiactis poa Lyman, 1879: 40; Lyman 1882: 119.
Ophiactis corallicola Koehler, 1895: 460-461, fig. 5.
Ophiactis echinata Koehler, 1898a: 48-49, pl. 5, figs 15, 16.

Diagnosis – Adapted from Clark & Courtman-Stock (1976). D.D. up to 8 mm, D.D./A.L. = 1/3-8. Disc round, dorsal disc plates overlapping, primary rosette distinct, scattered conical spines on disc, concentrated on margin. Radial shields *c.* half to slightly more than disc radius in length, naked, D-shaped, large, separated by one or two rows of scales, approximate distally, not contiguous. Ventral interradial area with finer plates than dorsal, some scattered spines. Oral shields fan-, bell- or diamond-shaped, wider than long, adoral shields broadly contiguous. Apical papillae single, large, round. Distal oral papillae two, large, distalmost slightly larger. Arms five, simple, moniliform distally. Dorsal arm plates diamond-shaped, twice as wide as long, not contiguous distally. Ventral arm plates pentagonal or fan shaped, either rounded distal edge, or with concave notch. Lateral arm plates meeting ventrally on distal arms only. Arm spines 3-4, erect, pointed or blunt, cylindrical, middle spine longest, half to two times longer than segment. Genital papillae absent. Tentacle

scale one, large, oval. Colour in life orange with light purple-orange disc, grey, brown and some specimens with a pinkish tinge (Clark 1923).

Distribution and habitat – Atlantic Ocean to South Africa and across to the SW Indian Ocean Ridge (Mortensen 1927; O'Hara *et al.* 2014), South Africa: off Cape Columbine (NC) to off Still Bay (WC); depth range: 167-2743 m. Specimens from Australia and New Zealand are a distinct species *Ophiactis cuspidata* (see O'Hara *et al.* 2014). Habitat: green sand and mud.

Fig. 250. Distribution of *Ophiactis abyssicola* in South Africa.

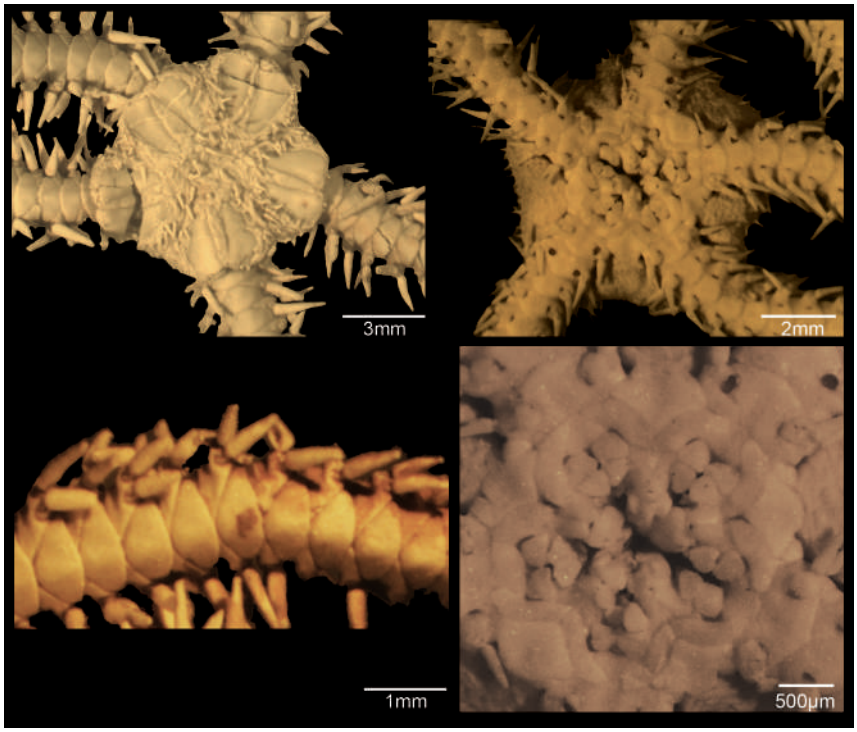

Fig. 251. Dorsal disc (top left; SAMC A23238), ventral disc (top right; SAMC A23333), arm spines and dorsal arms (bottom left; SAMC A23238), jaws (bottom right; SAMC A23333) views of *Ophiactis abyssicola*.

Remarks – The type material is in the Museum of Comparative Zoology (syntypes: MCZ OPH-1161 and MCZ OPH-1188), type locality is Norway (Clark & Courtman-Stock 1976), depth unknown. O'Hara *et al.* (2014) found that South African populations were genetically similar to those from the North Atlantic, and distinct from those across southern Australia and New Zealand.

Ophiactis carnea Ljungman, 1867

Ophiactis carnea Ljungman, 1867: 324-325; Lyman 1882: 120; Clark 1923: 332-333, pl. 20, figs 3, 4; Mortensen 1933a: 342-345, figs 54-56; Stephenson *et al.* 1937: 380; Eyre & Stephenson 1938: 39; Clark H.L. 1939: 76; Clark A.M. 1952: 199; Balinsky 1957: 11-12; Kalk 1958: 197, 200, 215, 237; Morgans 1959: 414, 422; 1962: 303; Macnae & Kalk 1962: 114; Balinsky 1969: 106, 129; Day *et al.* 1970: 81; Clark & Rowe 1971: 82, 104, fig. 31e; Clark & Courtman-Stock 1976: 104, 119, 161, fig. 165; Clark 1980: 548, 549; Vine 1986: 195; Olbers *et al.* 2014: 16, pl. 3A; Mbongwa 2013: 15.
Ophiactis africana Koehler, 1911: 17-19, pl. 3, figs 4, 5.
Ophiactis africana capensis: Hertz 1927b: 6.

Diagnosis – Adapted from Clark & Courtman-Stock (1976). D.D. up to 6 mm, D.D./A.L. = 1/5-6. Arms five, simple. Disc round, dorsal disc plates thin and overlapping, primary rosette not distinct, sometimes dark spot in centre of disc visible, scattered spines close to disc margin, may be absent. Radial shields elongated D-shaped, moderate in size, single disc scale separating them, touching distally, length half to one-third disc radius. Ventral interradial area covered in plates, no spines. Oral shields diamond-shaped, adoral shields broadly contiguous. Distal oral papillae single, large, round and flattened. Dorsal arm plates broadly rhombic, broadly contiguous, becoming fan-shaped, as long as wide. Ventral arm plates fan-shaped or octagonal, distal ends becoming rounded. Arm spines 3-5, uppermost arm spines thin and tapering, middle spine longest, blunt, lowest spine stubby and short. Longest arm spine slightly longer than length of segment, shortest spine shorter than segment. Tentacle scale one, large, oval. Colour in life reddish brown to brown, with white patches.

Distribution and habitat – Mozambique, tropical Indo-Pacific, Red Sea, South East Arabia, Persian Gulf (Kalk 1958; Clark & Rowe 1971; Vine 1986), South Africa: Cape Town (WC) to Cape St Lucia (KZN); depth range: 0-220 m (Clark & Courtman-Stock 1976). Habitat: coral reefs, *Cymodocea* beds, rock, sand and shell.

Remarks – Some specimens at hand had light patches on the distal portions of the radial shields, similar to *Ophiactis savignyi* and *O. picteti*, but easily distinguished from those two species by the single oral papillae on each side of the jaw. The syntypes are in the Swedish Museum of Natural History (SMNH-Type-1422) and the type locality is Port Natal (Durban), depth unknown.

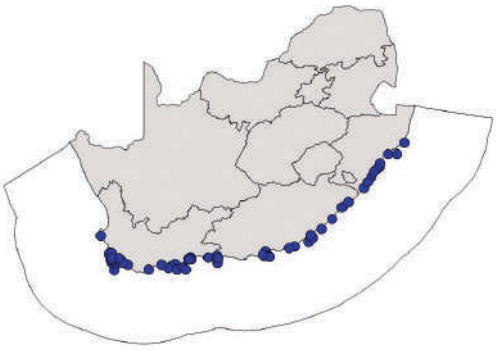

Fig. 252. Distribution of *Ophiactis carnea* in South Africa.

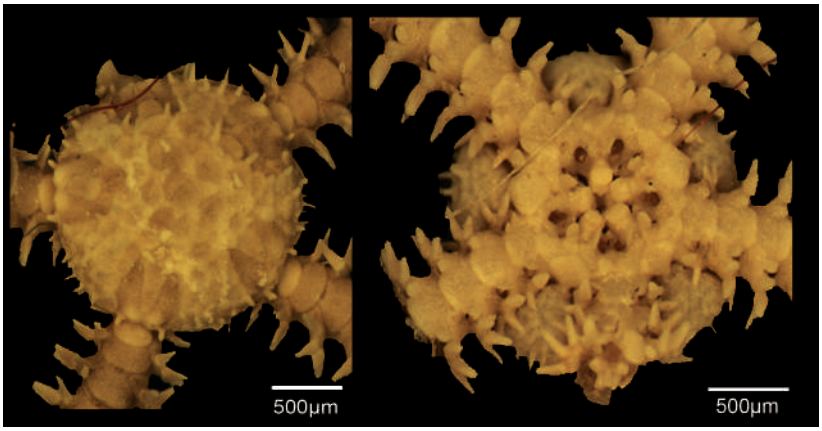

Fig. 253. Dorsal (left) and ventral (right) views of *Ophiactis carnea* (DNSM ECH21B).

Ophiactis nidarosiensis Mortensen, 1920

Ophiactis nidarosiensis Mortensen, 1920: 60-63, fig. 5; Mortensen 1927: 200, fig. 111; Mortensen 1933a: 346-347, fig. 58a; Clark & Courtman-Stock 1976: 163; Alva & Vadon 1989: 829, 839, fig. 5c, d.

Diagnosis – Adapted from Mortensen (1920) and Clark & Courtman-Stock (1976). D.D. up to 3.5 mm, D.D./A.L. = 1/5-6. Disc covered in coarse plates and sparsely scattered short spines, primary rosette not distinct. Radial shields *c.* half disc radius, not contiguous, separated by 2-3 plates. Ventral interradial areas with more delicate plates, usually with no spines. Fissiparous, arms usually six but sometimes five or seven. Dorsal arm plates fan-shaped, broadly in contact, longer than wide. Ventral arm plates pentagonal, distal edge convex, longer than wide, proximal edge narrow, truncated and/or convex. Lateral arm plates prominent. Oral shields

rhombic, as long as wide. Adoral shields large, contiguous. Distal oral papillae two, sometimes one. Arm spines up to four, upper spine in larger specimens longer, smoother and thinner, three lower spines equal in size, finely serrated, erect, about equal to segment length. Tentacle scales one, round.

Distribution and habitat – Namibia, North Atlantic (Alva & Vadon 1989), South Africa: off Orange River mouth (NC); depth range: 175-307 m. Habitat: no information available.

Remarks – Mortensen (1933a) remarked that *Ophiactis nidarosiensis* is very similar to *O. savignyi* and *O. plana* because they are also fissiparous. He suggested that the most reliable character for differentiation is the shape of the dorsal arm plates, which are narrow fan-shaped, broadly in contact and longer than wide, whereas in *O. plana* they are fan-shaped, barely contiguous proximally, separated distally and wider than long and in *O. savignyi* oval to elliptical, twice as wide as long and rounded distally.

Fig. 254. Distribution of *Ophiactis nidarosiensis* in South Africa.

Fig. 255. Dorsal (left) and an atypical 5-armed ventral (right) views *Ophiactis nidarosiensis* (ZMUC OPH-216).

No specimens were available for examination. Clark & Courtman-Stock (1976) and Mortensen (1933a) reported *O. nidarosiensis* to occur in southern Africa, but gave no details of distribution or specimens. Later, Alva & Vadon (1989) reported specimens to have been collected by the Instituto de Ciencias de Mar in Namibia, one specimen was collected on the Namibia / South African border off the Orange River at 307m. The syntypes are in the Natural History Museum of Denmark (ZMUC OPH-322, ZMUC OPH-323, ZMUC OPH-324 and ZMUC OPH-216) and the Museum of Comparative Zoology (MCZ OPH 4781). Type locality is Norway, depth unknown.

Ophiactis* cf. *picteti (de Loriol, 1893)

Ophiocnida picteti de Loriol, 1893b: 405-407, pl. 13, fig. 2.
Ophiactis picteti: Clark 1915a: 267; Clark & Rowe 1971: 82,104; Cherbonnier & Guille 1978: 123-125, fig. 56; Sloan *et al.* 1979: 101-102; Humpreys 1981: 10, 21; Liao & Clark 1995: 216; Milne 2012: 155; Olbers *et al.* 2015: 95, pl. 3C, D.
Ophiactis sinensis Mortensen, 1934: 11, figs 7-9, pl. 1, fig. 3.

Diagnosis – Adapted from Cherbonnier & Guille (1978). D.D. up to 6 mm, D.D./A.L. = 1/9. Disc round, dorsally covered with overlapping plates, many conical small spinelets mainly in interradial areas and on margin. Ventral interradial areas with finer plates, scattered conical spines. Arms five, long, simple. Radial shields elongated, narrow triangular, length at least two-thirds disc radius, each pair separated by four enlarged plates, distally approximating or contiguous, light patch on distal part of each radial shield. Genital slits ending at edge of disc, no distinct plates, genital papillae absent. Oral shields spearhead-shaped or oval, slightly wider than long, may be truncated on distal side. Adoral shields contiguous interradially. Distal oral papillae 2-3. Up to seven arm spines (usually six), short, longest less than twice segment length, tapering to blunt tips, three uppermost ones stout, conical and rugose, remaining spines elongated and decreasing in size toward ventral side. Dorsal arm plates oval, becoming elliptical, wider than long, distal edge convex, broadly contiguous. Ventral arm plates hexagonal, edges rounded in proximal part of arm, becoming flat-truncated on both sides, slightly wider than long. Single tentacle scale large, round. Colour in life, disc and arms brown with white, marbled, arms banded sometimes with dark spots, ventrally arms white, spinelets white.

Distribution and habitat – Madagascar, Tanzania, Kenya, East Indies, Indo-Malayan region, Australia (Clark & Rowe 1971; Cherbonnier & Guille 1978; Humpreys 1981; Rowe & Gates 1995), South Africa: Trafalgar (KZN) to Sodwana Bay (KZN); depth range: 0-50 m. Habitat: coral patches and coral reef flats.

Remarks – According to Olbers *et al.* (2015) this was a new record for South Africa. They also confirmed that South African specimens of *O. picteti* have a narrow median distal lobe on the oral shields, as suggested by Sloan *et al.* (1979) for Indian Ocean specimens. A closely related species *O. hemiteles* H.L. Clark, 1915 occurs in the east Indo-West Pacific waters.

Fig. 256. Distribution of *Ophiactis* cf. *picteti* in South Africa.

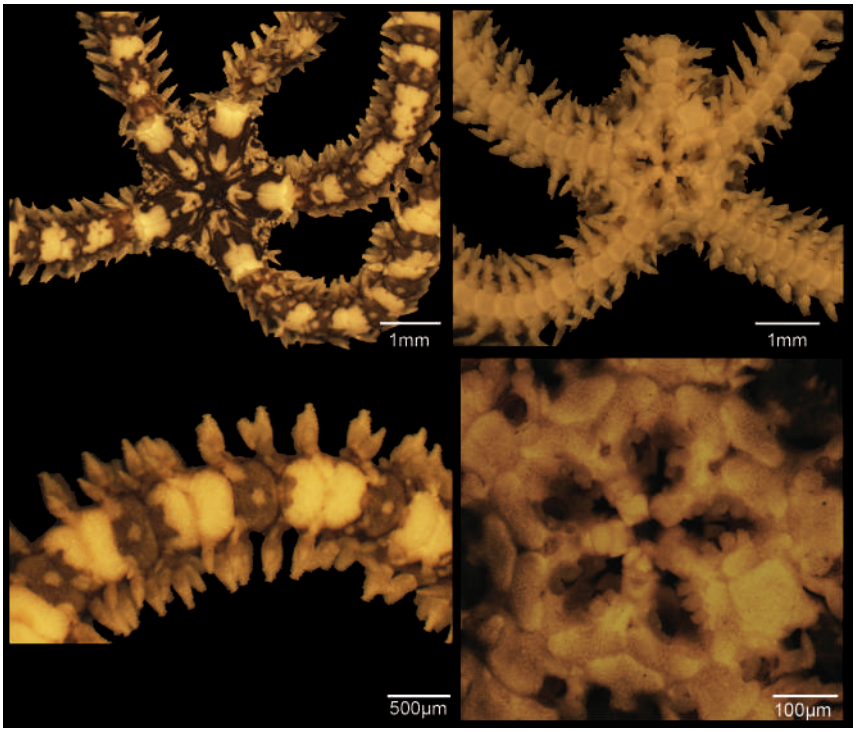

Fig. 257. Dorsal whole (top left), ventral whole (top right), dorsal arms (bottom left), jaws (bottom right) views of *Ophiactis* cf. *picteti* (SAMC A74065).

Ophiactis plana Lyman, 1869

Ophiactis plana Lyman, 1869: 330-331; Clark 1915a: 264; Clark 1923: 333; Mortensen 1933a: 345-346, fig. 57; Clark H.L. 1939: 76-77; Day & Morgans 1956: 308; Clark 1974: 464-465; Olbers *et al.* 2014: 16, pl. 3B.

Diagnosis – Adapted from Mortensen (1933a). D.D. up to 4 mm, D.D./A.L. = 1/3-4. Disc covered with moderately coarse, thin, overlapping plates, may have spines. Interradial areas with finer plates. Radial shields relatively small, D-shaped, less than half disc radius, not contiguous. Oral shields rhombic or rounded triangular, almost circular, as long as wide. Adoral shields may be contiguous. Distal oral papillae one, large, triangular, apical tooth present. Arms simple, usually six, fissiparous species. Dorsal arm plates broad fan-shaped, barely contiguous proximally, separated distally, wider than long. Ventral arm plates truncated pentagonal, distal edge straight or slightly concave. Arm spines up to four, stout, smooth, tapering to blunt tips, shorter than segment length. Tentacle scale one, large, round or oblong. Colour variable, green and reddish in different shades.

Distribution and habitat – Mozambique, Red Sea, Gulf of Aden, North Carolina, Gulf of Mexico, Bermuda (Clark 1915a; Clark H.L. 1939; Felder & Camp 2015), South Africa: Cape Town (WC) to Tugela River (KZN); depth range: 0-412 m. Habitat: rock, shell, mud, sand, coral and stones.

Remarks – Even though *Ophiactis flexuosa* only has five arms, Clark (1974) suggested that *O. lymani* Ljungman, 1872 and *O. flexuosa* be synonymised with *O. plana*, while according to Mortensen (1933a) and H.L. Clark (1946), *O. profundi* Lütken & Mortensen, 1899 and *O. plana* may be also be synonyms (Rowe & Gates 1995). In addition, various authors have commented on the similarities of various features among ophiactid species (Lyman 1882; Mortensen 1933a; Madsen 1970). According to Tim O'Hara (pers. comm.), a global phylogeography of this species is required because tropical specimens in the south west Pacific are a separate clade from those in the southern Ocean (including Tasmania and the South west

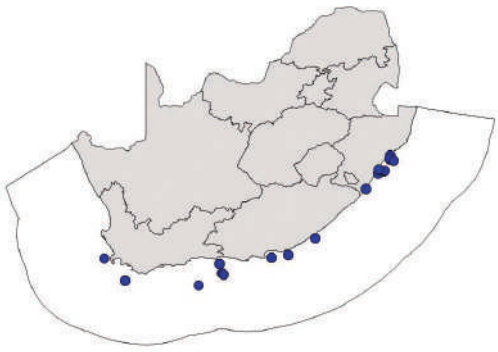

Fig. 258. Distribution of *Ophiactis plana* in South Africa.

Indian Ocean Ridge). Given that *O. plana* was originally from the Caribbean, the correct identity of any South African specimens is therefore unclear at present.

The type material is in the Museum of Comparative Zoology (Holotype MCZ OPH-1184, paratypes MCZ OPH-1185, MCZ OPH-1242 and MCZ OPH-4632). Type locality is off Carysfort Reef, Florida, depth 210 m.

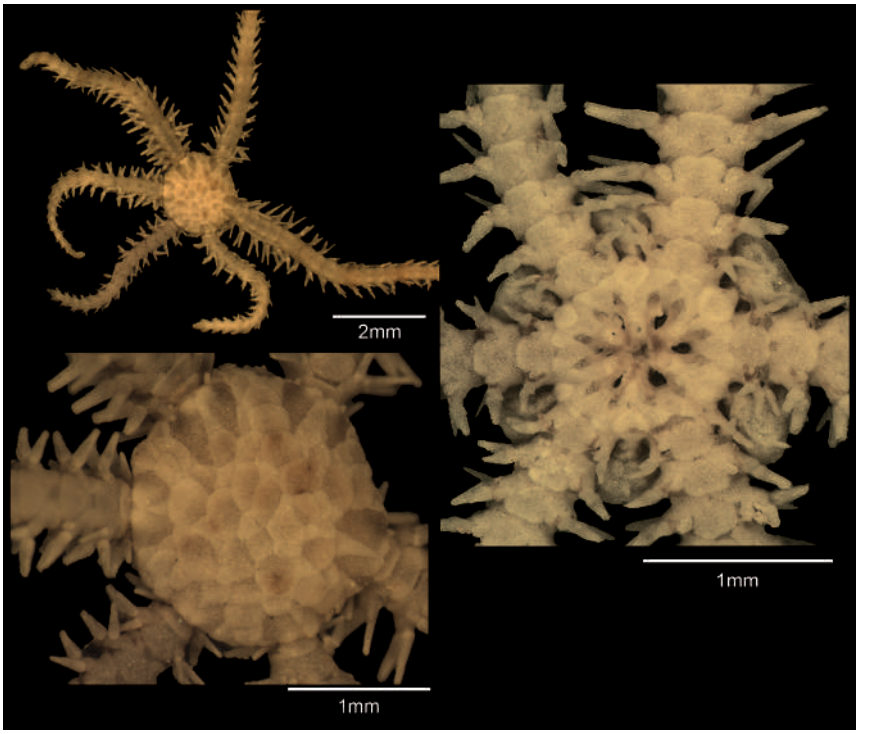

Fig. 259. Dorsal whole (left top), ventral disc (right) and dorsal disc (bottom left) views of *Ophiactis plana* (DNSM ECH23B).

Ophiactis savignyi (Müller & Troschel, 1842)

Ophiolepis savignyi Müller & Troschel, 1842: 95.
Ophiactis sexradia Grube, 1857: 343; de Loriol 1893b: 398-401; Koehler 1898b: 72.
Ophiolepis sexradia Grube 1857: 343.
Ophiactis reinhardtii Lütken, 1869: 262-264, pl. 3, fig. 7a, b.
Ophiactis maculosa von Martens, 1870: 248.
Ophiactis savignyi: Lyman 1882: 115; Clark 1932: 204; Clark H.L. 1939: 77; Day & Morgans 1956: 308; Balinsky 1957: 14; Clark & Rowe 1971: 82, 83, 103; Clark & Courtman-Stock 1976: 104, 119, 164, figs 156, 161; Hughes & Gamble 1977: 355; Cherbonnier & Guille 1978: 125-128, fig. 57; Sloan *et al.* 1979: 102;

Marsh 1986: 70; Vine 1986: 195; Sastry 1991: 376, pl. 3, fig. 14; Hendler *et al.* 1995: 148-150, fig. 70; Liao & Clark 1995: 217-218, fig. 110; Pomory 2003: 74-76, fig. 33; Laguarda-Figueras *et al.* 2009: 178, fig. 71; Picker & Griffiths 2011: 76; Milne 2012: 155; Mbongwa 2013: 15.

Ophiactis conferta Koehler, 1905a: 25-26, pl. 3, figs 15-17.

Ophiactis versicolor Clark H.L., 1939: 81-82, fig. 36.

Diagnosis – Adapted from Clark & Courtman-Stock (1976). D.D. up to 5 mm, D.D./A.L. = *c.*1/7. Arms up to seven, usually six, sometimes three, fissiparous. Disc round, dorsal disc plates armed with scattered spinelets, usually marginal. Radial shields moderately large, naked, elongated triangular or D-shaped, length varies from approximately half to just over disc radius, each pair separated by single row of elongated plates, contiguous distally. Ventral interradial area with thick imbricating plates, sometimes with scattered spines. Oral shields rhombic, longer than wide, adoral shields not always contiguous. Oral papillae two, with apical tooth, tooth may be rubbed off. Genital slits surrounded by larger plates. Dorsal arm plates oval to elliptical, twice as wide as long, rounded distally, with median distal lobe emphasised by two spots, developing after first 2-3 segments. Ventral arm plates hexagonal, wide as long, proximally becoming pentagonal and longer than wide. Arm spines up to six, short, finely serrated, no more than single segment length, stouter proximally, becoming slightly elongated and blunt. Tentacle scale single, large, rounded. Colour in life variable, generally green with green and white markings, arms similarly banded, ventrally lighter, arms banded with green, some specimens with white patch on distal edge of each radial shield.

Distribution and habitat – Cosmopolitan (Clark 1915a; Kalk 1958; Hendler *et al.* 1995), South Africa: Umgazana (EC) to Kosi Bay (KZN); depth range: 0-1000 m. Habitat: associated with sponges, sea-grass, rock, coral fragments, coralline algae, fouling communities and intertidal algal turf.

Remarks – Abundant in KZN on rocky shores, among turf algae. A well-studied species, known to have variable morphological characters.

Fig. 260. Distribution of *Ophiactis savignyi* in South Africa.

High polymorphism (coloration, number of arms, shape of arm plates, radial shields, number of oral papillae and arm spines) in Indo-Pacific species of *Ophiactis* is astounding. The uncertainty of characters and identity of many specimens is documented by many authors (de Loriol 1893b; Clark 1915a; Clark 1923; Mortensen 1933a; Mortensen 1933d; Clark H.L. 1939; Balinsky 1957; Madsen 1970; Clark 1974; Clark & Courtman-Stock 1976; Sloan *et al.* 1979). The Indo-Pacific ophiactids require comprehensive revision, as it is believed that many of the species are in fact the same. In this study, the differences between *O. hemiteles* and *O. picteti* were so minor that it is doubtful both exist in South African waters. Two noteworthy studies, Hendler *et al.* (1995) and Pomory (2007), both reported that specimens may have three oral papillae as opposed to two, as reported here. The type material came from Egypt but their location is unknown.

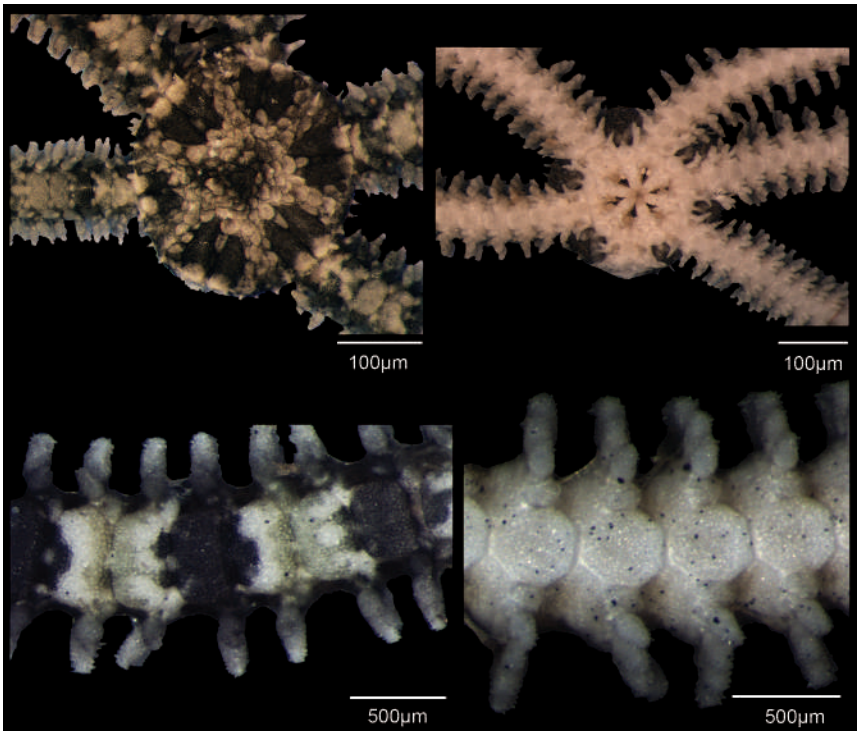

Fig. 261. Dorsal whole (top left), ventral whole (top right), dorsal arms (bottom left), ventral arms (bottom right) views of *Ophiactis savignyi* (RMCA MT2259).

4.6.10. Family OPHIOTRICHIDAE Ljungman, 1867

Diagnosis – Adapted from Clark (1966) and Clark & Courtman-Stock (1976). D.D./A.L. = 1/10 or more commonly D.D./A.L. = 1/5-8. Disc plates small, juveniles with enlarged central plate. Dorsal disc often covered with armament of thorny stumps, spines or granules or a thick skin, but rarely naked. Radial shields more or less conspicuous, unless covered in armament. Jaw structure consistent in all species, with oral shields broadly rhombic, teeth broad-rectangular with compact cluster of small, rounded tooth papillae on apex, oral papillae absent, leaving the second oral tentacle exposed. Arms stout or slender, sometimes very long, arms usually five, rarely six (only in fissiparous species). Successive dorsal and ventral arm plates usually contiguous, dorsal arm plates reduced in epizoic species. Arm spines more or less serrated and terminally rugose, may be glassy. Tentacle scale usually single and inconspicuous, if any.

Genus ***Macrophiothrix*** H.L. Clark, 1938

Diagnosis – Adapted from Clark (1938), Clark (1968), Clark & Courtman-Stock (1976) and Hoggett (1991). Species often exceeding D.D. 20 mm with arms being moderate to long (up to 200 mm), disc soft and puffy with fine scaling covered in low thorny stumps, thorny granules, short spinelets or rugose granules, granules often obscure large radial shields. Oral papillae absent. Arms mostly flexible horizontally, arm segments relatively broad. Dorsal arm plates broad, usually wider than long, hexagonal, trapezoidal, elliptical or fan-shaped, broadly contiguous. Arm spines long, serrated, sometimes smooth basally, glassy or opaque at tip (especially if clavate). Tentacle scales one.

Macrophiothrix demessa (Lyman, 1862)

Ophiothrix demessa Lyman, 1862: 82; Lyman 1865: 172-173; Marktanner-Turneretscher 1887: 310; Brock 1888: 513; Koehler 1905a: 91-92, pl. 9, figs 5, 6; Clark 1915a: 270; Clark 1921: 109; Clark H.L. 1939: 83.

Ophiothrix mauritiensis de Loriol, 1893a: 38, pl. 24, fig. 5.

Ophiothrix coronata Koehler 1905a: 91, pl. 9, figs 8, 9; Koehler 1922b: 217-218, pl. 40, fig. 5, pl. 41, figs 1-4, pl. 98, fig. 1; Koehler 1930: 137; Vine 1986: 195.

Amphiophiothrix demessa: Clark 1946: 217; Endean 1957: 243; Fell 1960: 24.

Macrophiothrix mossambica Balinsky, 1957: 18, fig. 7, pl. 3, figs 11, 12.

Macrophiothrix demessa: Clark 1968: 289-291, figs 3e, f, 4h, 5h, 7e; Clark & Rowe 1971: 82, 114, pl. 37f; Devaney 1974: 139-140; Clark & Courtman-Stock 1976: 111, 138, fig. 114; Cherbonnier & Guille 1978: 151-152, pl. 4, figs 1, 2; fig. 61: 7-9; Sloan *et al.* 1979: 102-103; Marsh 1986: 70; Hoggett 1991: 1089-1094, figs 6, 7; Sastry 1991: 374, 377, pl. 3, fig. 16; Liao & Clark 1995: 221-222, figs 112g,113h, 114h, 115f, 116f; Milne 2012: 155; Olbers *et al.* 2015: 98-99, pl. 4E, F.

Diagnosis – Adapted from Clark & Courtman-Stock (1976) and Cherbonnier & Guille (1978). D.D. up to 12 mm, arms up to 300 mm, D.D./ A.L. = 1/25. Disc

puffy, covered dorsally with long, thorny stumps, 2-6 terminal points, disc ventrally covered with similar stumps, but more scattered and typically with single terminal points. Radial shields triangular, two-thirds length of disc radius, covered with shorter and less numerous stumps than those on disc. Jaws elongated, oral shields broadly triangular, much wider than long. Adoral shields not contiguous. Genital slits half-way to disc margin, genital plate large, adjacent to slit, with disc spinelets not continuing to edge of genital slit. Dorsal arm plates broadly fan-shaped, about twice as wide as long or wider, broadly in contact, armed with small rugose granules or sparse stumps. Ventral arm plates wide, square to fan-shaped, but with rounded proximal edges, as long as wide, sometimes slightly longer than wide, contiguous. Arm spines up to 14, thorny over entire length, glassy, longest spine at least three times segment length, shortest ventrally. Tentacle scale single, triangular. Colour in life, dorsal side of disc greyish with more or less conspicuous dark pink spots, ventrally lighter with less spots. Arms banded purple, pink or red with white dorsally and lighter ventrally, with 2-3 arm segments between bands. One specimen with a white longitudinal band from *c.* half way down arms.

Distribution and habitat – Mozambique, Zanzibar, Red Sea, Mauritius, Seychelles, Maldives, India, China Sea, Philippines, Australia, Hawaiian Islands (Clark & Rowe 1971; Hoggett 1991; Sastry 1991; Rowe & Gates 1995), South Africa: Aliwal Shoal (KZN) to Bhanga Nek (KZN); depth range: 0-128 m. Habitat: concealed in coral, deep rocky crevices, under stones, coarse sand and with *Lithothamnion*.

Remarks – Olbers *et al.* (2015) recorded this as a new species to South Africa, although it was previously recorded from Mozambique (Clark & Courtman-Stock 1976). According to Rowe & Gates (1995) the type locality is Hawaiian Islands (recorded as Sandwich Islands) and specimens are in the Museum of Comparative Zoology (holotype: MCZ OPH-2278; paratypes: MCZ OPH-2279, MCZ OPH-2280, MCZ OPH-2281 and MCZ OPH-4095).

Fig. 262. Distribution of *Macrophiothrix demessa* in South Africa.

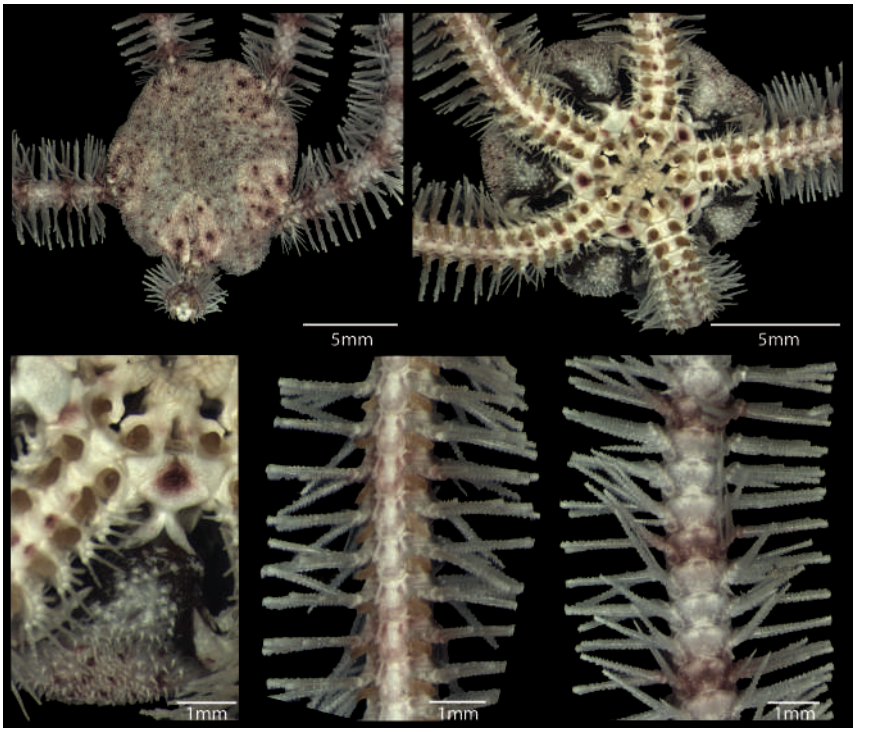

Fig. 263. Dorsal disc (top left), ventral disc (top right), ventral interradial (bottom left), ventral arms (bottom centre), dorsal arms (bottom right) views of *Macrophiothrix demessa* (RMCA MT2156).

Macrophiothrix hirsuta cheneyi (Lyman, 1862)

Ophiothrix cheneyi Lyman, 1862: 84; Lyman 1865: 175-176.
Ophiothrix hirsuta Müller & Troschel, 1842: Ludwig 1899: 549; Koehler 1905a: 95; Koehler 1922b: 234-235, pl. 31, fig. 1, pl. 33, fig. 13; pl. 99, fig. 2.
Macrophiothrix brevipeda Clark 1938: 290-292, fig. 20; Clark H.L. 1939: 91.
Macrophiothrix hirsuta: Balinsky 1957: 17-18; Kalk 1958: 207, 214; Macnae & Kalk 1962: 118; Macnae & Kalk 1969: 99, 101, fig. 27b.
Macrophiothrix hirsuta cheneyi: Clark 1968: 296-298, figs 3k, 4n, 5n, 7j; Clark & Courtman-Stock 1976: 101, 112, 138, fig. 115; Clark 1980: 548; Tortonese 1980: 123; Milne 2012: 155.

Diagnosis – Adapted from Clark (1938) and Clark & Courtman-Stock (1976). D.D. up to 20 mm, arms up to 160 mm; D.D./A.L. = 1/8. Disc round, covered in stumps dorsally and ventrally ending in three to several points, flaring, peripheral stumps mostly with 2-3 terminal points, armament close to oral shields more spiniform and scattered. Radial shields large, conspicuous, length *c*. one- to two-thirds disc

radius, triangular, almost completely naked, some thorny granules along the lateral edges. Jaws slightly elongated, oral shields naked, spearhead-shaped. Adoral shields moderate in size, sometimes contiguous. Genital slits almost reaching disc margin with large genital plate on lateral side, stumps reaching edge of genital slit. Dorsal arm plates hexagonal, up to three times wider than long, lateral angles more or less rounded, distal side with a median angle, the broadest part near middle of plate, broadly contiguous, armed with tiny spines. Ventral arm plates hexagonal but almost squarish, almost as wide as long, distal edge slightly concave, proximal edge convex, contiguous. Arm spines up to ten, middle spines longest, length more than three times segment length and somewhat clavate, glassy, opaque at tip, serrated for most of length. Tentacle scales one, small, flattened and pointed. Colour in life grey and dark blue or purple, both dorsally and ventrally, dorsal arms with longitudinal light stripe bordered by two dark blue lines, ventral arms with similar stripe but less conspicuous, radial shields variegated with blue.

Distribution and habitat – Mozambique, Tanzania, Somalia, Red Sea and Southern Arabia (Clark 1968; Clark & Courtman-Stock 1976; Clark 1980; Tortonese 1980), South Africa: Zotsha River (KZN) to Bhanga Nek (KZN); depth range: 7.5-70 m. Habitat: coarse sand, stones, pebbles and dead coral rubble.

Remarks – A number of authors have indicated the distribution of *M. hirsuta cheneyi* in South Africa as extending as far south as Mossel Bay (Clark 1968; Tortonese 1980), but this seems unlikely (this specimen was not located in the Natural History Museum catalogue) because the southern-most record for this species found in this study was in the vicinity of the Zotsha River (KZN) more than 300 km north east of Mossel Bay.

The paratype is in the Museum of Comparative Zoology (MCZ OPH-4097) and the type locality is Zanzibar, depth unknown. Location of holotype is unknown.

Fig. 264. Distribution of *Macrophiothrix hirsuta cheneyi* in South Africa.

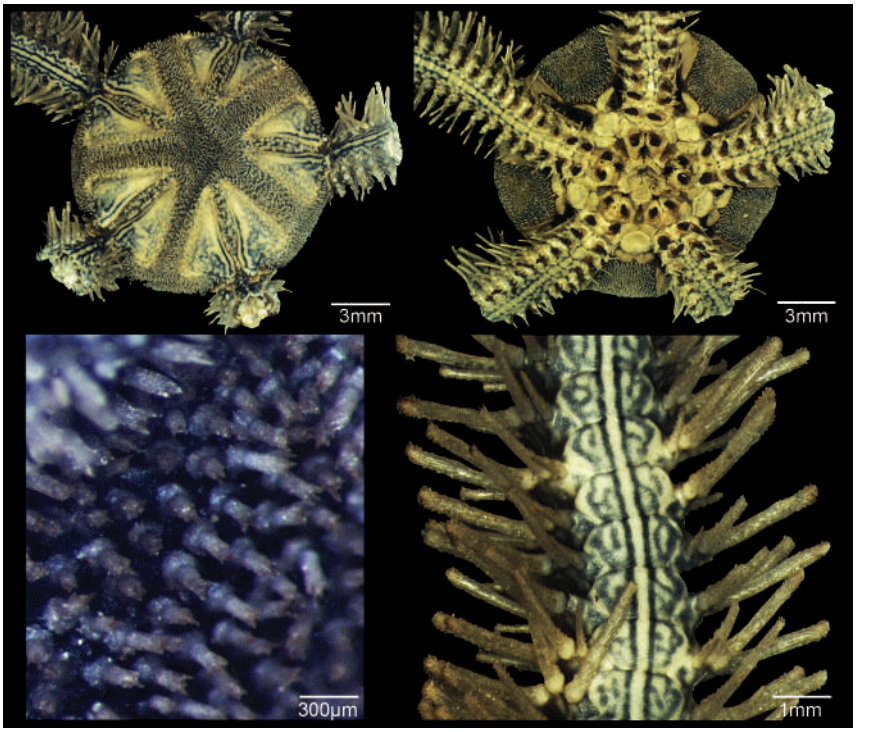

Fig. 265. Dorsal disc (top left), ventral disc (top right), disc armament (bottom left), dorsal arms (bottom right) views of *Macrophiothrix hirsuta cheneyi* (RMCA MT2333).

Macrophiothrix longipeda (Lamarck, 1816)

Ophiura longipeda Lamarck, 1816: 544.

Ophiothrix longipeda Müller & Troschel 1842: 113; Lyman 1879: 54; Clark 1911: 263; Clark 1921: 110, pl. 15, fig. 5, pl. 33, fig. 1; Clark 1923: 340; Clark 1932: 204.

Ophiothrix punctolimbata von Martens, 1870: 257-258.

Ophiothrix microplax Bell, 1884: 143-144.

Macrophiothrix longipeda Clark 1938: 288-290; Clark 1946: 221; Balinsky 1957: 17; Fell 1960: 24; Clark 1968: 300-302, figs 3m-o, 4p-r, 5p-r, 7l, m; Clark & Rowe 1971: 82, 83, 114; Devaney 1974: 140-141; Clark & Courtman-Stock 1976: 101, 112, 139; Hughes & Gamble 1977: 355; Cherbonnier & Guille 1978: 153-154; pl. 4, figs 3, 4, figs 61: 28, 29; Sloan *et al.* 1979: 102-103; Guille & Vadon 1985: 62; Marsh 1986: 70; Hoggett 1991: 1103-1108, figs 14, 15; Sastry 1991: 377, pl. 3, fig. 17, pl. 4, fig. 31; Liao & Clark 1995: 226-228, figs 112b, 113b, 114b, 115b, 116b; Rowe & Gates 1995: 413; Mbongwa 2013: 16.

Diagnosis – Adapted from Clark & Courtman-Stock (1976). D.D. up to 37 mm, A.L. up to 625 mm; D.D./A.L. = 1/17. Disc round, puffy. Dorsal disc with thorny stumps, becoming sharper on ventral side near oral shields. Radial shields large, triangular, with some short stumps, distally concave, more than three-quarters disc radius. Arms very long. Genital slits almost up to disc margin, sharp stumps to edge of genital slit. Jaws elongated, making oral shield far from teeth / oral papillae. Adoral shields most often contiguous. Dorsal arm plates broadly fan-shaped, at least twice as wide as long, broadly contiguous, in smaller individuals plates may be split into two, fan-shaped proximally. Ventral arm plates square, almost as long as wide, also more or less with dark spots or small blotches. Arm spines up to ten, translucent, long, three times segment length, shortest spines on ventral side, one segment length, cigar-shaped, though middle ones somewhat club-shaped. Tentacle scales single, moderately large, round. Colour in life, disc dorsally and ventrally blue or purple with blue or purple spots and blotches, radial shields spotted, ventrally similar but lighter, arms banded with white, or spotted with purple.

Distribution and habitat – Mozambique, Tanzania, Zanzibar, Aldabra, Red Sea, Madagascar, Chagos, Mauritius, Mascarene Basin, Seychelles, Sri Lanka, Singapore, south Japan, China, Philippines, Australia (Hoggett 1991; Rowe & Gates 1995), South Africa: Port Edward (KZN) to Kosi Bay (KZN); depth range: 8-92 m. Habitat: under coral boulders, crevices, stone slabs and broken shell. Characteristically buries its disc in crevices, or deep within coral, with two arms holding onto substrate and remaining three arms held up in water column.

Remarks – Clark & Courtman-Stock (1976) commented that *Macrophiothrix aspidota* (Müller & Troschel 1842) should be synonymised with *M. longipeda* and suggested a revision, but the synonym was not accepted by Hoggett (1990). In addition, *M. longipeda* was recorded from Port Elizabeth by A.M. Clark in 1968, but later it was suggested this was incorrect (Clark & Courtman-Stock 1976). Hoggett (1990) suggested that two specimens referred by A.M. Clark (1980) to *M. aspidota* were actually *M. robillardi* (de Loriol, 1893). A revision of South African *Macrophiothrix* species is required.

Fig. 266. Distribution of *Macrophiothrix longipeda* in South Africa.

The type material is in the National Museum of Natural History (neotype: USNM 4291) and the type locality is " 'L'océan austral, prés de l'Ile de France" (Mauritius), depth unknown.

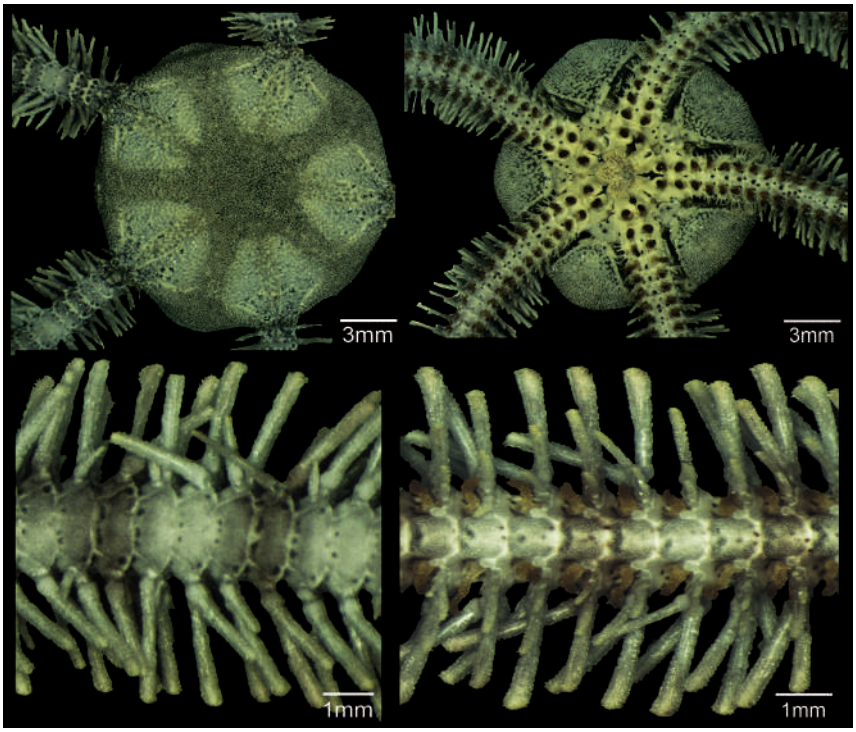

Fig. 267. Dorsal disc (top left), ventral disc (top right), dorsal arms (bottom left), ventral arms (bottom right) views of *Macrophiothrix longipeda* (RMCA MT2160).

Macrophiothrix propinqua (Lyman, 1862)

Ophiothrix propinqua Lyman, 1862: 83-84; Ljungman 1867: 333; Lyman 1874: 234; Marktanner-Turneretscher 1887: 308; Brock 1888: 510; Koehler 1898b: 98-100, pl. 3, figs 20-22; Koehler 1905a: 81; Clark 1915a: 277; Clark 1921: 113; Koehler 1922b: 256-257, pl. 38, figs 1, 2, pl. 101, fig. 4; Murakami 1943b: 207-208.
Ophiothrix triloba von Martens, 1870: 260-261.
Ophiothrix bedoti de Loriol, 1893b: 420-422, pl. 15, fig. 1.
Ophiothrix schmidti Djakonov, 1930: 237-239, pl. 12, figs 1, 2.
Ophiotrichoides propinqua: Clark 1946: 232; Balinsky 1957: 21; Endean 1957: 244.
Macrophiothrix schmidti: Clark 1966: 649.
Ophiothrix (*Keystonea*) *propinqua* Lyman, 1861: Clark 1966: 648; Clark 1968: 283, fig. 2e; Clark & Rowe 1971: 86-87, 107; Clark & Courtman-Stock 1976: 102, 111, 145; Gibbs *et al.* 1976: 127; Cherbonnier & Guille 1978: 149, pl. 5, figs 1,

2, fig. 61: 11, 12; Sloan *et al.* 1979: 103; Guille & Wolff 1984: 6; Marsh 1986: 71; Liao & Clark 1995: 244-245, figs 116a, 129.

Ophiothrix (*Placophiothrix*) *westwardi* Devaney, 1974: 143-148, figs 8-14.

Macrophiothrix propinqua: Clark 1980: 537; Guille & Vadon 1985: 62; Hoggett 1991: 1130-1133, figs 28, 29; Sastry 1991: 378, pl. 3, fig. 18; Milne 2012: 155; Olbers *et al.* 2015: 99, 101, pl. 5A, B.

Diagnosis – Adapted from Clark & Courtman-Stock (1976) and Cherbonnier & Guille (1978). D.D. up to 12 mm, arms up to 120 mm; D.D./A.L. = 1/10. Disc round, plates clearly visible, with or without armament. Radial shields large, more than half disc radius, naked, disc plates in single or multiple rows between radial shields, some with tubercles or spines. Ventral interradial areas with tubercles, but somewhat sharper than dorsal ones. Oral shields diamond-shaped, wider than long, adoral shields sometimes touching. Genital slits narrow, reaching margin of disc, genital papillae absent, genital plate conspicuous. Dorsal arm plates fan-shaped to elliptical, much wider than long, especially distally, with proximal edge short, distal edge slightly trilobed, broadly contiguous for more than one-third of their breadth, some proximal-most plates with point on distal end. Ventral arm plates square and slightly wider than long, most often with slight distal notch. Arm spines up to eight, finely serrated over total length and distal spines with long thorn, orientated proximally, glassy, longest twice segment length, shortest on ventral side. Tentacle scale one, large, oval. Colour in life pink, purple with patterns on disc, arms banded every 3-4 segments. Radial shields reddish, sometimes with blue patches, distal edge outlined with white.

Distribution and habitat – Mozambique, Tanzania, Kenya, Somalia, Red Sea, Madagascar, Mauritius, Mascarene Basin, Aldabra, Comoros, Seychelles, India (Rowe & Gates 1995; Richmond 2002), South Africa: Aliwal Shoal (KZN) to Kosi Bay (KZN); depth range: 0-80 m. Habitat: associated with coral, coral slabs, beach rock, sponges and found in crevices.

Remarks – See Olbers *et al.* (2015) for additional remarks. The type material is in the Museum of Comparative Zoology (holotype: MCZ OPH-2399) and the type locality is Kiribati (as Kingsmill Ils), depth unknown.

Fig. 268. Distribution of *Macrophiothrix propinqua* in South Africa.

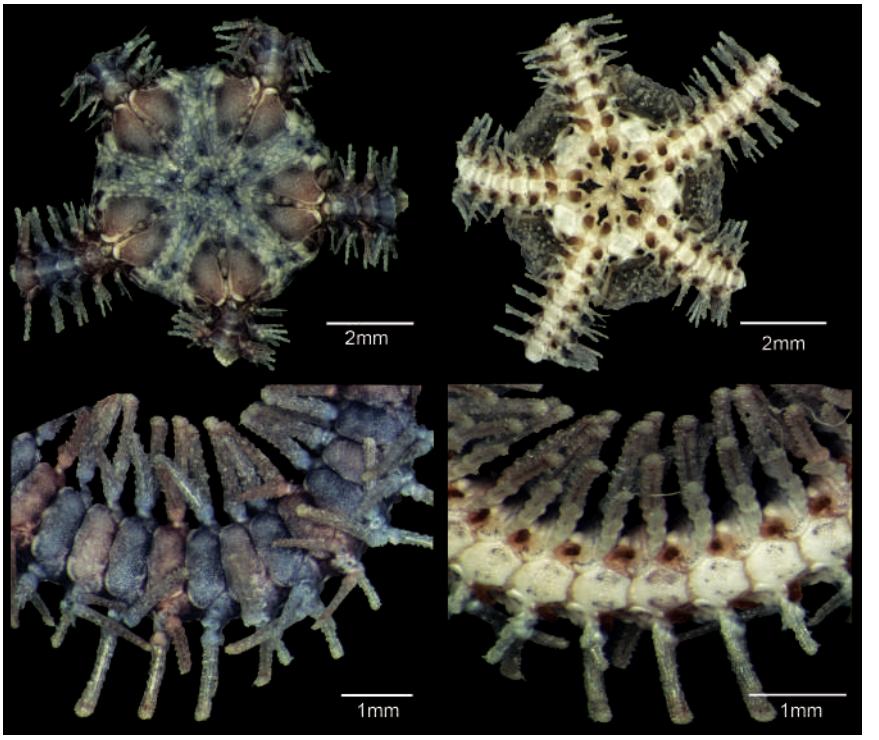

Fig. 269. Dorsal disc (top left), ventral disc (top right), dorsal arms (bottom left), ventral arms (bottom right) views of *Macrophiothrix propinqua* (RMCA MT2216).

Genus ***Ophiocnemis*** Müller & Troschel, 1842

Diagnosis – Adapted from Müller & Troschel (1842), Lyman (1882), Cherbonnier & Guille (1978). Dorsal disc plates with granules, radial shields very large, naked. Ventral disc finely scaled, teeth present, no oral papillae, dorsal arm plates trapezoid and wider than long. Arm spines numerous, rounded, not translucent.

Ophiocnemis marmorata (Lamarck, 1816)

Ophiura marmorata Lamarck, 1816: 543.

Ophiocnemis marmorata: Müller & Troschel 1842: 87-88; Lyman 1865: 152; Lyman 1882: 229, pl. 42, figs 14, 15; Duncan 1887: 103-104; Döderlein 1888: 833, pl. 31, figs 6a-c; Koehler 1905a: 112; Clark 1923: 341; Koehler 1926: 27; Koehler 1930: 187-188; Clark 1915a: 283; Mortensen 1934: 5; Clark 1938: 318; Clark 1946: 229; Clark & Rowe 1971: 84-85, 106, pl. 17, fig. 2; Clark 1974: 94; Clark & Courtman-Stock 1976: 101, 111, 139, fig. 107; Cherbonnier & Guille 1978 154-155; pl. 3, figs 5, 6; Liao & Clark 1995: 231-232, fig. 118; Fujita & Namikawa 2006: 31-34; Mbongwa 2013: 16.

Diagnosis – Adapted from Clark & Courtman-Stock (1976) and Cherbonnier & Guille (1978). D.D. up to 20 mm, D.D./A.L. = *c.*1/6. Arms relatively long, triangular in cross section. Disc round, dorsally covered with scales and granules, granules restricted to narrow bands between radial shields and in interradial areas, peripheral granules slightly elongated and disc scaling ends abruptly at disc margin. Ventral interradial areas with naked skin, with fine plates, sometimes with scattered granules close to oral shields. Radial shields naked, large, almost full disc radius. Genital slits reach half-way to disc margin and genital papillae present on large genital plates. Oral shields triangular, about three times wider than long. Adoral shields rounded and sometimes contiguous. Dorsal arm plates elliptical, four times as wide as long, convex on proximal side. Ventral arm plates not contiguous, hexagonal, with distal notch both proximally and distally, wider than long, becoming square distally but still slightly wider than long. Arm spines up to five, tapering, finely serrated or smooth. Middle spine up to four times segment length with uppermost spine same length as segment. Tentacle scale one, very small. Colour in life dorsally green, grey and white with white patches along dorsal arms, lighter ventrally, interradial areas brown, some with darker patches adjacent to genital slits.

Distribution and habitat – Tanzania, Mozambique, Madagascar, Sri Lanka, East Indies, Bay of Bengal, China, south Japan, Philippines, Australia (Clark & Rowe 1971; Liao & Clark 1995; Rowe & Gates 1995), South Africa: Isipingo (KZN) to Dog Point (KZN); depth range: 0-100 m. Habitat: sand, shells and associated with rhizostome jellyfish (*Rhopilema nomadica* (Berggren 1994); *R. hispidum* (Liao & Clark 1995); *R. esculentum* (Fujita & Namikawa 2006), *Cephea cephea* (Marsh 1998) and *Netrostoma* sp. (Marsh 1998)).

Remarks – Clark & Courtman-Stock (1976) stated that the tentacle scales were absent on large tentacle pores, but this was not the case in the material examined, in which the tentacle scales were visible but very small. This species is known as the 'hitch-hiker brittle star' as it is most often found on jellyfish; most of the records in the Iziko South African Museum collection being from jellyfish that have

Fig. 270. Distribution of *Ophiocnemis marmorata* in South Africa.

washed ashore. There does not appear to be a difference between size classes living within jellyfish versus specimens found in sand and shelly sediment.

The type material was suspected to be in the Muséum national d'Histoire naturelle, Paris (MNHN) (Rowe & Gates 1995), but was not located and the type locality is unknown.

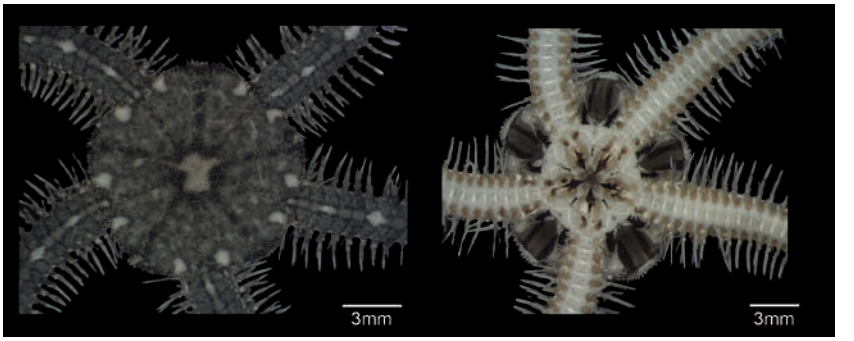

Fig. 271. Dorsal (left) and ventral (right) views of *Ophiocnemis marmorata* (RMCA MT2510).

Genus ***Ophiogymna*** Ljungman, 1866

Diagnosis – Adapted from Koehler (1922) and Clark & Courtman-Stock (1976). Disc soft and puffy; disc plates and majority of radial shields obscured by thick skin; plates bearing thorny stumps or spinelets. Arms very long, flexible, often forming circles; dorsal arm plates fragmented in large specimens but entire in small specimens; arm spines slender, opaque, fairly smooth except towards tips; tentacle scale present proximally, or possibly absent.

Ophiogymna capensis (Lütken, 1869)

Ophiothrix capensis Lütken, 1869: 59, 100; Clark 1923: 340.
Ophiogymna capensis: Mortensen 1933a: 340-341, figs 52b, 53b, pl. 19, fig. 26; Clark & Courtman-Stock 1976: 101, 113-114, 140, fig. 119.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. unknown. Disc puffy, soft, covered in skin, armed with slender spines placed between large radial shields. Dark line between each pair of radial shields extending onto approximately first five arm segments, but ending abruptly. Arms banded with dark bands every third to sixth segment dorsally, with colour extending onto uppermost arm spine, band may be constricted to sides or complete. Skin also somewhat finely dotted on dorsal side. Dorsal arm plates fragmented, but obscured by skin. Arm spines up to eight, long and thin. Tentacle scales absent.

Distribution and habitat – South Africa: off Cape of Good Hope (WC); depth range: unknown. Habitat: epizoic on gorgonians.

Remarks – Endemic to South Africa. This species has not been recorded again since its original description. Mortensen (1933a) suggested that *Ophiogymna capensis* may be *O. pulchella* (Koehler, 1905a), as he could not find any reliable characters that differed. There is no material of *O. pulchella* or *O. capensis* in the Iziko South African Museum collection, therefore no material was examined or compared.

According to Clark & Courtman-Stock (1976), the type material is in the Natural History Museum of Denmark (syntype: ZMUC OPH-478). The type locality is given as 'Cap' by Lütken, creating uncertainty that he was in fact referring to the Cape of Good Hope in South Africa.

Fig. 272. Distribution of *Ophiogymna capensis* in South Africa.

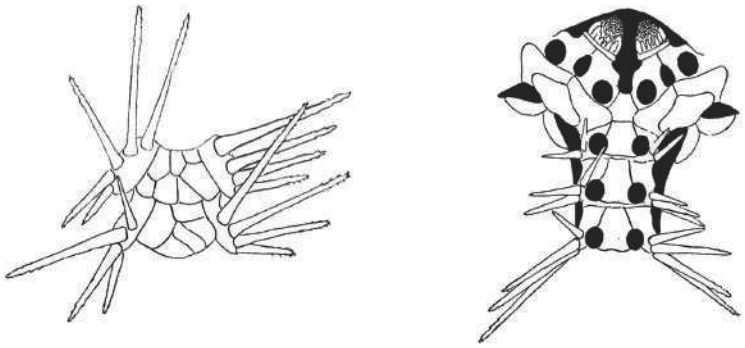

Fig. 273. Dorsal (left) and ventral (right) views of *Ophiogymna capensis* (ZMUC OPH-478, from Mortensen (1933a)).