

***Ophiura ljungmani* (Lyman, 1878)**

Ophioglypha lepida Lyman, 1878: 70-71, pl. 3, figs 71-73, Lyman 1882: 43-44, pl. 4, figs 1-3; Koehler 1907: 294; Koehler 1914a: 20.

Ophioglypha ljungmani Lyman 1878: 71-72, pl. 3, fig. 77; Lyman 1882: 44-45, pl. 4, figs 8-10; Koehler 1907: 294.

Ophioglypha thouletii Koehler, 1895: 456-458, fig. 4; Koehler 1896a: 241; Koehler 1909b: 158-159, pl. 6, fig. 6; pl. 26, figs 1, 2.

Ophiura ljungmani: Ludwig, 1901: 925; Clark 1915a: 321; Mortensen 1927: 240-242, fig. 130; Clark 1954: 377; Alva & Vadon 1989: 828; Hernández-Herrejón *et al.* 2008: 101-102, fig. 3e-f; Laguarda-Figueras *et al.* 2009: 74-75, fig. 19.

Ophiura lepida Ludwig 1901: 925.

Ophioglypha ljungmanni: Koehler 1906: 6; Koehler 1909: 152.

Ophiura (Ophiura) ljungmani: Paterson 1985:118-120, fig. 44; Alva & Vadon 1989: 828-829, 841-831, fig. 8a, b.

Diagnosis – Adapted from Lyman (1882) and Mortensen (1927). D.D. up to 13 mm, disc round. Central disc plate and primary rosette distinct in some specimens, remainder of disc covered in plates and small spines (easily rubbed off), plates larger towards disc margin. Radial shields pyriform or teardrop-shaped, half disc radius in length, separated by plates, may or may not be contiguous distally. Arm combs present at arm bases, comb papillae longest in middle of comb. Ventral interradiation area covered in overlapping plates, but most of area taken up by large, triangular oral shield. Adoral shields narrow, contiguous. Oral papillae 3-4 either side of blunt apical papillae. Teeth 3-4, uppermost two square, others same shape as apical papillae. Genital slits long, single and armed with many small genital papillae. Dorsal arm plates rhombic, convex distally, contiguous proximally, almost as wide as long, becoming longer than wide and not contiguous on distal arm. Ventral arm plates fan-shaped, distal edge convex, not contiguous, becoming semi-circular, separated by large lateral arm plates. Arm spines three, small, tapering, high on lateral arm plate, upper arm spines as long as segment length, lower spines no longer than half segment length, arm spines begin on second or third segment and similar in size to tentacle scales. Oral tentacle pores with many scales, up to 10 on first and second oral pore. Tentacle scales on remainder of arm vary from 1-3.

Distribution and habitat – Brazil, Mexico, Tobago, Bay of Biscay, Azores, Florida north to Labrador Basin, south east Iceland to North Africa (Clark 1915a; Mortensen 1927; Paterson 1985; Laguarda-Figueras *et al.* 2009), South Africa: off Orange River (NC) to off Cape Town (WC); depth range: 528-3906 m. Off South Africa the species is only known from 2688-3906 m. Habitat: mud.

Remarks – Disc spines were only seen on a single examined specimen, many specimens damaged. Paterson (1985) also recorded that disc spines had been rubbed off in many specimens he examined. Radial shields usually not contiguous, this variation also noted by Lyman (1882).

Paterson (1985) stated that *Ophiura ljungmani* had been recorded in 'Southern Africa' but the source of this record could not be traced. In addition, Paterson (1985) also stated the type specimens of *Ophioglypha lepida* were in the Natural History Museum in London, however, these types could not be traced in the online catalogue. Type locality off Bermuda, depth 2469 m.



Fig. 64. Distribution of *Ophiura ljungmani* in South Africa.

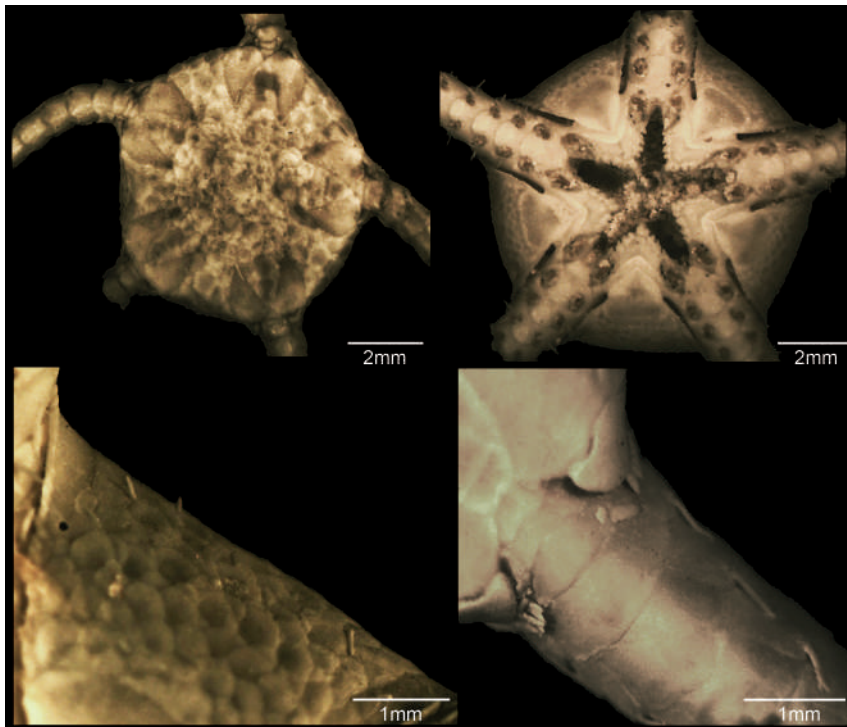


Fig. 65. Dorsal disc (top left), ventral disc (top right), ventral disc spines (bottom left), dorsal arm bases (bottom right) views of *Ophiura ljungmani* (SAMC A23344).

Ophiura trimeni Bell, 1905

Ophiura trimeni Bell, 1905: 257-258, pl. 1, figs 3, 4; Clark 1923: 360-361; Mortensen 1933a: 384-385, fig. 84; Clark 1974: 475-476.

Ophiura (Ophiura) trimeni: Clark & Courtman-Stock, 1976: 194-195, figs 224, 127, 107; Alva & Vadon 1989: 841-842, figs c, d.

Gymnophiura novembris Hertz, 1927a: 72-73, pl. 6, figs 9, 10; Mortensen 1933a: 393-394, fig. 89.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 9 mm. Disc plates present, sometimes armed with small spines, primary rosette and central plates distinct in some specimens. Radial shields half disc radius, twice as long as wide, approximating distally, but not contiguous. Arm combs present, not always distinct and rubbed off easily, papillae short and stout. Ventral interradiar area covered in small, overlapping plates. Oral shields large, pentagonal, constricted in vicinity of genital slits and strongly pointed on both sides, distal edge truncated. Adoral shields narrow, contiguous. Oral papillae three, distalmost broadest, apical papillae pointed. Teeth 3-5, same shape as apical papillae. Genital slits long, single and armed with small, rounded genital papillae. First 2-4 dorsal arm plates elongated, contiguous, wider than long, flat on distal side, becoming oval and small, distal side convex, becoming longer than wide, not contiguous, straight proximal edge. Ventral arm plates fan-shaped, as wide as long for first 2-3 segments, contiguous, becoming small and wider than long and semi-circular with median tip on distal edge. Lateral arm plates large, separating both dorsal and ventral arm plates distally, notch on distal sides adjacent to tentacle pores. Arm spines three, proximally spines twice segment length, one segment length distally. Spines irregular, in some specimens uppermost longest or thicker, remaining spines three, equal in size. Oral tentacle pores with up to ten rounded scales. Tentacle scales up to seven from segments 1-3, then on free segments decreasing from 3-1 distally, elongated but blunt.

Distribution and habitat – South Africa: off Platbaai (NC) to Sodwana Bay (KZN); depth range: 165-1647 m. Habitat: sand, mud, rough bottom and sponge.



Fig. 66. Distribution of *Ophiura trimeni* in South Africa.

Remarks – This species, closely related to the Indo-Pacific *Ophiura ooplax* H.L. Clark, 1911, is endemic to South Africa, with the distribution range extended to Sodwana Bay (Kendyl le Roux, pers. comm.). Arm combs not distinct and can be easily missed (Mortensen 1933a) or completely absent (Clark 1923). The Iziko South African Museum material includes a ‘cotype’ (SAMC A7471), type locality is west of Cape Town, depth 285-420 m.

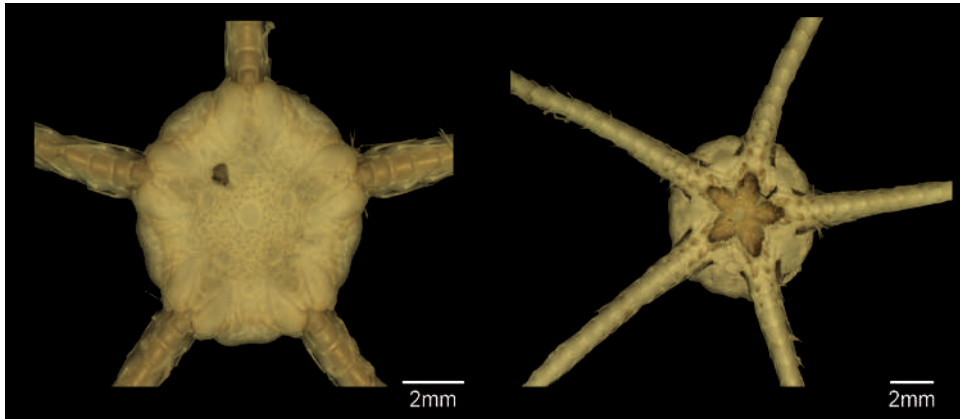


Fig. 67. Dorsal (left) and ventral (right) views of *Ophiura trimeni* (SAMC A084237).

Genus *Dictenophiura* H.L. Clark, 1923

Diagnosis – Adapted from Clark (1923) and McKnight (2003). Primary dorsal disc plates enlarged. Radial shields contiguous. First dorsal arm plate with longitudinal furrow. Double arm combs.

Dictenophiura anoidea H.L. Clark, 1923

Dictenophiura anoidea Clark, 1923: 361-363, pl. 19, figs 1, 2; Mortensen 1933a: 388-390, figs 86, 87a; Clark & Courtman-Stock 1976: 188, 125, 107, fig. 220; Morgans 1959: 303; Day *et al.* 1970: 80.

Diagnosis – Adapted from Clark (1923) and Clark & Courtman-Stock (1976). D.D. up to 10 mm, disc round, thick with vertical edge, disc plates thick, primary rosette distinct in most specimens, surrounded by slightly smaller plates. Radial shields oval or pyriform, longer than wide, c. half disc radius, approximating distally, contiguous. Arms inserted below disc. Arm combs present, double set, primary arm comb extending from genital slit, secondary comb opposing primary comb. Ventral interradiar area covered in thick, overlapping plates. Oral shields large, pentagonal, slightly constricted by genital slits. Adoral shields contiguous. Oral papillae three, distalmost broadest, apical papillae pointed. Teeth same shape as apical papillae. Genital slits long, single, armed with small, rounded, blunt genital

papillae. Dorsal arm plates fan-shaped, wider than long, contiguous proximally, becoming non-contiguous and as long as wide distally. Lateral arm plates large, separating both dorsal and ventral arm plates distally. Ventral arm plates fan-shaped, only contiguous on first 3-5 segments, becoming small distally. Arm spines three, short, thick, half segment length, tapering, blunt. Oral tentacle pores with up to seven rounded scales. Tentacle scales round, up to three basally, becoming one on remainder of arm.

Distribution and habitat – South Africa: Lambert’s Bay (WC) to Amanzimtoti (KZN); depth range: 0-250 m. Habitat: sand, shell, rock and mud.



Fig. 68. Distribution of *Dictenophiura anoidea* in South Africa.

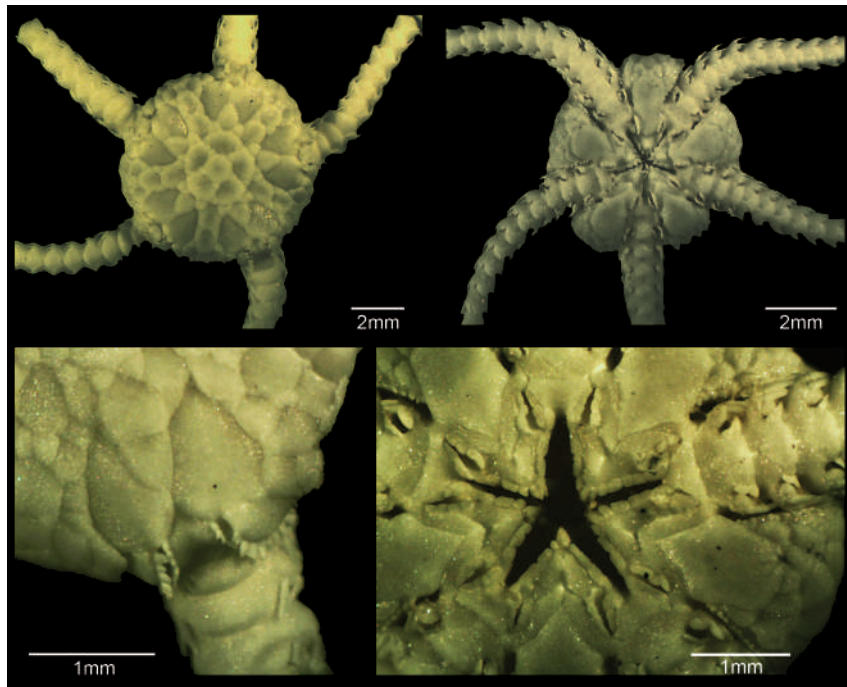


Fig. 69. Dorsal (top left), ventral (top right), dorsal arm bases (bottom left), jaws (bottom right) views of *Dictenophiura anoidea* (SAMC A084244).

Remarks – Endemic to South Africa. Although Madsen (1970) demoted *Dictenophiura anoidea* to *Ophiura (Dictenophiura) anoidea*, Clark & Courtman-Stock (1976) ignored this, even though they referred to Madsen's suggestion. This species is morphologically more similar to *D. skoogi* (Koehler, 1923) from West Africa and *D. carnea* (Lütken, 1856) from the north-east Atlantic, than *Dictenophiura* species from Australia.

Clark (1923) stated that the holotype was at the Iziko South African Museum (SAMC A6438; False Bay, depth 40 m), but this specimen was not located. Three paratypes were examined, namely SAMC A7473 (Great Fish Point, depth 90 m), SAMC A7474 (Cove Rock, depth 79m) and SAMC A7505 (False Bay, depth 40 m).

4.2.4. Family OPHIOPYRGIDAE Perrier, 1893

Genus *Amphiophiura* Matsumoto, 1915

Diagnosis – Adapted from Matsumoto (1915) and Mortensen (1927). Disc thickly scaled and plated, primary rosette distinct. Radial shields stout. Oral shields oval, pyriform or trefoil. Arms moderately long, tapering gradually to blunt tips, distinctly keeled. Dorsal and ventral arm plates fairly well-developed, broadly in contact in at least proximal segments, arm spines tapering but blunt, few to numerous. Second oral tentacle pore open or entirely outside oral slits, tentacle pores large. Tentacle scales numerous.

Amphiophiura sculptilis (Lyman, 1878)

Ophioglypha sculptilis Lyman, 1878: 84-85, pl. 4, figs 115, 116; Lyman 1882: 37; Koehler 1914a: 24.

Ophioglypha variabilis Lyman, 1878: 85-86, pl. 4, figs 113, 114; Lyman 1882: 37.

Ophiura sculptilis: Ludwig 1901: 925; Clark 1911: 77.

Ophioglypha remota Koehler, 1904a: 54, pl. 9, figs 1-3.

Amphiophiura sculptilis: Koehler 1922b: 364; Clark 1915a: 313; Matsumoto 1915: 77; Hertz 1927a: 74; Clark H.L. 1939: 108; Madsen 1951: 114; Litvinova 1971: 299, pl. 3, figs 2, 4, 5; Vadon & Guille 1984: 588, 592-593, pl. 5, 1-4; Guille & Vadon 1986: 169; Manso 2010: 196; Olbers *et al.* 2015: 91.

Diagnosis – Adapted from Lyman (1878), Vadon & Guille (1984) and Olbers *et al.* (2015). D.D. up to 15 mm. Dorsal disc thick, plates flat, large round central plate, five distinct primary plates separated by small irregular scales. Radial shields distinct, D-shaped or broad triangular, contiguous distally, tapering proximally with wedge of scales between them, large scale present marginally on dorsal interradial area. Ventral interradial areas scaled, but dominated by large oral shield. Oral shield pentagonal, distal edge rounded, slightly longer than wide, covering most of the ventral disc surface. Adoral shields relatively broad, contiguous. Oral papillae five, broad, closely set, apical papillae blunt. Genital slits moderately long, genital papillae present, squarish becoming spiniform, forming arm combs dorsally. Dorsal arm plates fan or diamond-shaped, rounded distal edge, contiguous. Lateral arm

plates broad, meeting ventrally. Ventral arm plates squat, bell-shaped, constricted by large tentacle pores, distal edge longer than proximal edge, wider than long, distal edge straight, becoming rounded, not contiguous. Arm spines up to six, blunt. Tentacle pores large, tentacle scales up to five within disc, two on remaining arm.

Distribution and habitat – Antarctic Ocean, Reunion, Zanzibar, Oman, Bay of Bengal, Indonesia, Japan, South America, Brazil (Koehler 1914a; Koehler 1922b;



Fig. 70. Distribution of *Amphiophiura sculptilis* in South Africa.

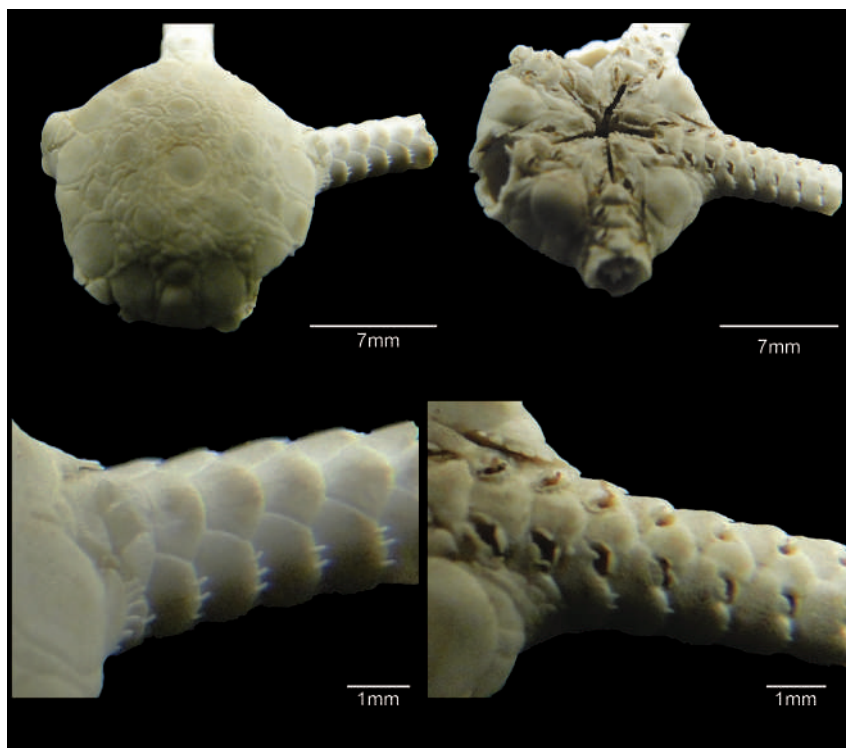


Fig. 71. Dorsal disc (top left), ventral disc (top right), dorsal basal arms (bottom left), ventral basal arms (bottom right) views of *Amphiophiura sculptilis* (USNM E42847).

Vadon & Guille 1984), South Africa: off Durban (KZN) (Guille & Vadon 1986); depth range: 1000-4320 m. Habitat: grey sand and mud, *Globigerina* ooze.

Remarks – Reported as a new record for South Africa in Olbers *et al.* (2015) from a single record, collected during the French expedition Safari I with the research vessel *Marion-Dufresne*. The syntypes are in the Museum of Comparative Zoology (MCZ OPH-731 and MCZ OPH-715), type locality off Yokohama, Japan, depth 3429 m.

***Amphiophiura trifolium* Hertz, 1927**

Amphiophiura trifolium Hertz, 1927a: 78-79, pl. 6, figs 14, 15; Clark H.L. 1939: 108-109; Clark 1974: 476; Clark & Courtman-Stock 1976: 187, 107, 125.

Diagnosis – Adapted from Hertz (1927) and Clark & Courtman-Stock (1976). D.D. up to 12 mm. Dorsal disc fairly thick, plates thick, moderately distinct, primary and central plates better defined. Radial shields usually distinct, rounded triangular, contiguous distally, length less than half disc radius. Arm combs present, primary set coarse papillae becoming broader ventrally, secondary set with blunt, finer papillae. Ventral interradial areas minimal, scaled, but dominated by the large oral shields, which are trefoil in shape with distalmost side being rounded, broad and proximal side protruding from constriction at about one-third of length. Adoral shields narrow, contiguous proximally. Oral plates slightly sunken. Single apical papillae with 5-6 oral papillae either side, not well defined, some broad. Teeth 2-3, tapering. Dorsal arm plates oval or bell-shaped, twice as long as wide proximally, first 4-5 contiguous, then separated. Lateral arm plates broad and large. Ventral arm plates squat bell-shaped, wider and round on distal side, not contiguous. Arm spines 2-3, small, short, no more than one-third segment length, on the distal arm one spine (usually uppermost) becoming hooked. Genital slits long, genital papillae present only on distalmost side, forming arm combs on dorsal side. Tentacle pores large, tentacle scales 2-3.

Distribution and habitat – Mozambique, Zanzibar, Kenya, Somalia, Maldives (Stöhr 2007b), South Africa: Margate (KZN) to off Kosi Bay (KZN); depth range: 850-2727 m. Habitat: hard sand, rock and *Globigerina* ooze.



Fig. 72. Distribution of *Amphiophiura trifolium* in South Africa.

Remarks – Specimens examined were all damaged and missing arms. The number of tentacle scales could therefore not be determined.

Type material is in the Museum of Natural History of Berlin (syntype: ZMB Ech 6983), type locality off Somalia, depth 1289-1633 m.

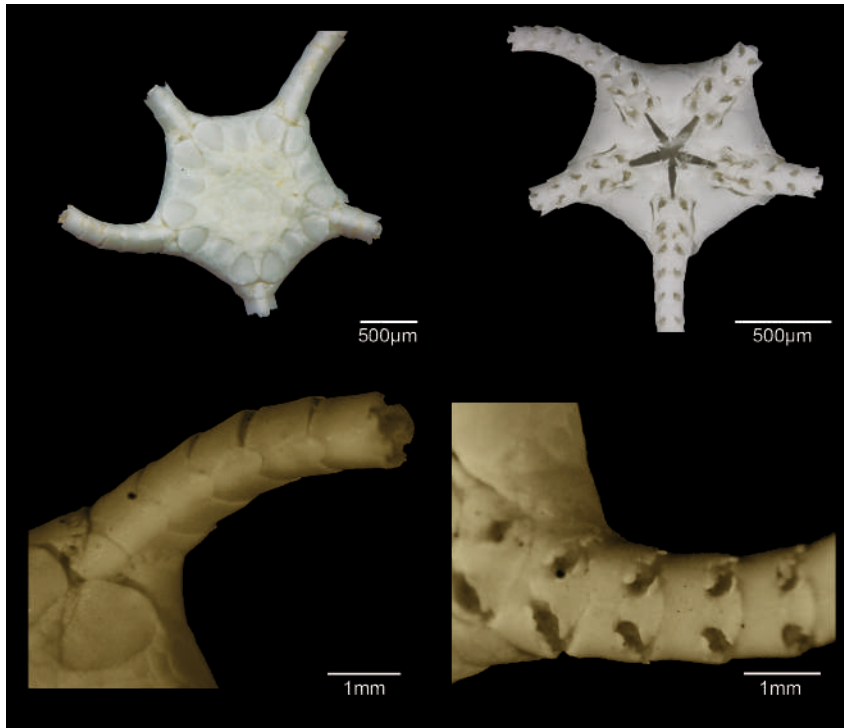


Fig. 73. Dorsal disc (top left), ventral disc (top right), dorsal basal arms (bottom left), ventral basal arms (bottom right) views of *Amphiophiura trifolium* (SAMC A23217).

Genus *Anophiura* H.L. Clark, 1939

Diagnosis – Adapted from Clark (1939). Disc flat and thin, interradial disc scales large, five marginal plates in each interradial. Arms slender. Dorsal and ventral arm plates small. Arm combs may or may not be present. Oral shields, adoral shields and oral plates large, covering most of interradial area. Oral papillae low, wide, quadrilateral. Genital slits two per interradius. Tentacle pores only three pairs on each arm, first pair with two low, wide tentacle scales, other two pairs with single, circular tentacle scale.

Anophiura simplex H.L. Clark, 1939

Anophiura simplex Clark H.L., 1939: 119, figs 55, 56; Clark 1977: 135, 143.

Diagnosis – Adapted from Clark (1939). D.D. up to 7 mm, D.D./A.L. = 1/2. Disc round, covered in plates both dorsally and ventrally, primary rosette distinct. Dorsal interradiar marginal area covered by single plate. Radial shields naked, large, broad triangular, one-third disc radius, as wide as long, contiguous but separated proximally by elongated scale. No arm combs. Oral papillae appear fused, with lowermost tooth distinct. Oral tentacle pores on outside of oral slit, with numerous scales surrounding pore. Oral shields naked, large, pentagonal, as wide as long, or slightly wider. Adoral shields large, contiguous. Genital slits long, thin, no genital papillae. Dorsal arm plates triangular, with slightly convex distal edge, small, as long as wide basally, becoming wider than long distally, not contiguous on entire arm. Ventral arm plates small, twice as wide as long, elliptical, distal edge convex, not contiguous for entire arm. Lateral arm plates make up most of arm segments, meeting dorsally and ventrally. Arm spines three, very short, tapering, uppermost longest, first two separated from third spine. Tentacle pores not present on entire arm. Tentacle scales two or three basally, becoming single, circular.

Distribution and habitat – South Arabia (Clark H.L. 1939), South Africa: off Kosi Bay (KZN); depth range: 720-1046 m. Habitat: no information available.

Remarks – Only one specimen was available for examination in the Iziko South African Museum collection. This species has three arm spines, in which two are separated from the third, similar to the spine arrangement in *Ophiura* (*Ophiuroglypha*) *irrorata irrorata*. The type material is in the Natural History Museum, London (NHMUK 1948.5.26.363) and the type locality is south Arabian coast, depth 1046 m.



Fig. 74. Distribution of *Anophiura simplex* in South Africa.

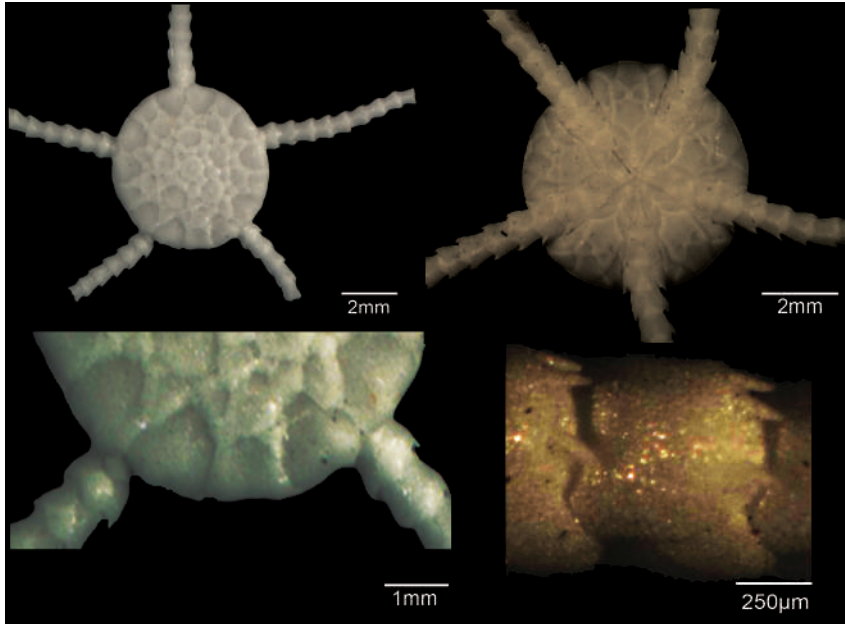


Fig. 75. Dorsal disc (top left), ventral disc (top right), radial shields (bottom left), arm spines (bottom right) views of *Anophiura simplex* (SAMC A22954).

Genus *Aspidophiura* Matsumoto, 1915

Diagnosis – Adapted from Matsumoto (1915). Disc elevated above arms, flat, covered with naked plates. Ventral interradiar areas dominated by single plate. Arm combs present. Oral shields large. Oral papillae joined, second oral tentacle pores outside oral slits, with numerous scales. Genital slits two per interradius. Arms relatively short. Dorsal arm plates small or absent. Ventral arm plates small, triangular. Tentacle pores present only on first few basal segments. Arm spines three, short, conical. Tentacle scales present or absent.

Aspidophiura corone Hertz, 1927

Aspidophiura corone Hertz, 1927a: 79-80, pl. 7, figs 1, 2; Clark 1977: 135, 143.

Diagnosis – Adapted from Hertz (1927) and Clark (1977). D.D. up to 5 mm. Disc round with slight indentations at arm bases, covered in plates dorsally and ventrally, primary rosette distinct with large central plate. Dorsal interradiar marginal area covered by large single scale. Radial shields naked, large, broad triangular, almost half disc radius, longer than wide, inner margins straight, not contiguous. Arm combs present. Oral papillae appear fused, lowermost tooth distinct. Oral tentacle pores lie outside of oral slit with numerous scales surrounding pore. Oral shields naked, large, spearhead-shaped with proximal tip triangular, sharp, lateral sides slightly restricted and distal edge with wide distal lobe. Adoral shields large,

contiguous. Genital slits long, slightly restricted on lateral sides of oral shield. Dorsal arm plates triangular, very small, widely separated. Ventral arm plates small, fan-shaped, wider than long, distal edge convex, not contiguous for entire arm. Lateral arm plates make up most of arm segments, meeting dorsally and ventrally. Arm spines three, short, tapering. Tentacle pores large. Tentacle scales two basally, becoming single.

Distribution and habitat – Somalia and East Africa, South Africa: Cape Vidal (KZN) to Kosi Bay (KZN); depth range: 740-977 m. Habitat: no information available.

Remarks – No new specimens have been found in South Africa since those identified by Clark (1977). The holotype (ZMB Ech 6984) is in the Museum of Natural History of Berlin, type locality is off Somalia, East Africa, depth unknown.



Fig. 76. Distribution of *Aspidophiura corone* in South Africa.

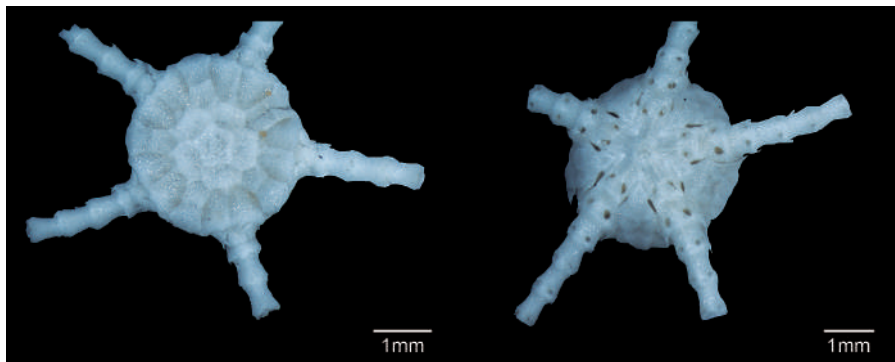


Fig. 77. Dorsal (left) and ventral (right) views of *Aspidophiura corone* (SAMC A22955).

Genus *Ophiuroglypha* Hertz, 1927

Diagnosis – Adapted from McKnight (2003). Usually recognised as having three small arm spines, middle spine becoming an upturned hooklet on distal arm segments (Hertz 1927a).

Ophiuroglypha costata (Lyman, 1878)

Ophioglypha costata Lyman, 1878: 76-77, pl. 4, figs 92-94; Lyman 1882: 50, pl. 5, figs 1-3.

Ophiozona capensis Bell, 1905: 256-257, pl.1, figs 1, 2.

Ophiura costata: Clark 1923: 357-358; Clark A.M. 1952: 201; Ludwig 1901: 925.

Ophiuroglypha capensis: Hertz 1927a: 90-91, pl. 7, fig. 10.

Ophiura (Ophiuroglypha) costata: Mortensen 1933a: 385-386, fig. 85a, d.

Ophiura (Ophiuroglypha) costata costata: Clark & Courtman-Stock 1976: 195-196, 127, 107, figs 209, 216; Alva & Vadon 1989: 828-829, 843, fig. 8e, f.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 23 mm, D.D./A.L. = 1/4. Disc pentagonal, disc plates flat, irregular, primary rosette distinct in most specimens. Few scattered disc spines dorsally and ventrally. Radial shields longer than wide, oval, separated by large plates. Arm combs present, not distinct, widely separated, papillae stout, thick and short, restricted to bases of radial shields. Ventral interradial area covered in thick, large plates. Oral shields fairly large, triangular, with rounded distal edge. Adoral shields contiguous. Oral papillae irregular, 3-5 either side of pointed apical papillae. Teeth three, broad triangular, oral slits narrow, base of jaws sunken. Genital slits long, single and armed with squat, broadly attached genital papillae. Dorsal arm plates not carinate, elongated trapezoidal, contiguous, wider than long, becoming fan-shaped with rounded point on distal side, contiguous for c. half arm then separated by lateral arm plates. Ventral arm plates pentagonal, contiguous for one or two segments, becoming diamond-shaped, wider than long. Lateral arm plates large, separating both dorsal and ventral arm plates distally, arm spines low on plate. Arm spines three, very short. Second oral tentacle pores not in series with oral papillae, with up to 12 scales, then decreasing towards free segments, small and indistinct from arm spines. Tentacle scales from segments 1-3, up to seven scales, then decreasing to one distally on free segments, elongated but blunt, adradial tentacle scale not enlarged.

Distribution and habitat – South Africa: off Orange River (NC) to Cape St Francis (EC); depth range: 43-1647 m. Habitat: sand, mud, shells, stones, gravel and rock.

Remarks – Endemic to South Africa. The type material is in the Museum of Comparative Zoology (syntype: MCZ OPH-577), type locality Agulhas Bank, depth 275m. O'Hara *et al.* (2017) recognised *Ophiuroglypha* as a separate genus, as genetic data indicates that these species are in a separate family than the true *Ophiura* species.



Fig. 78. Distribution of *Ophiuroglypha costata* in South Africa.

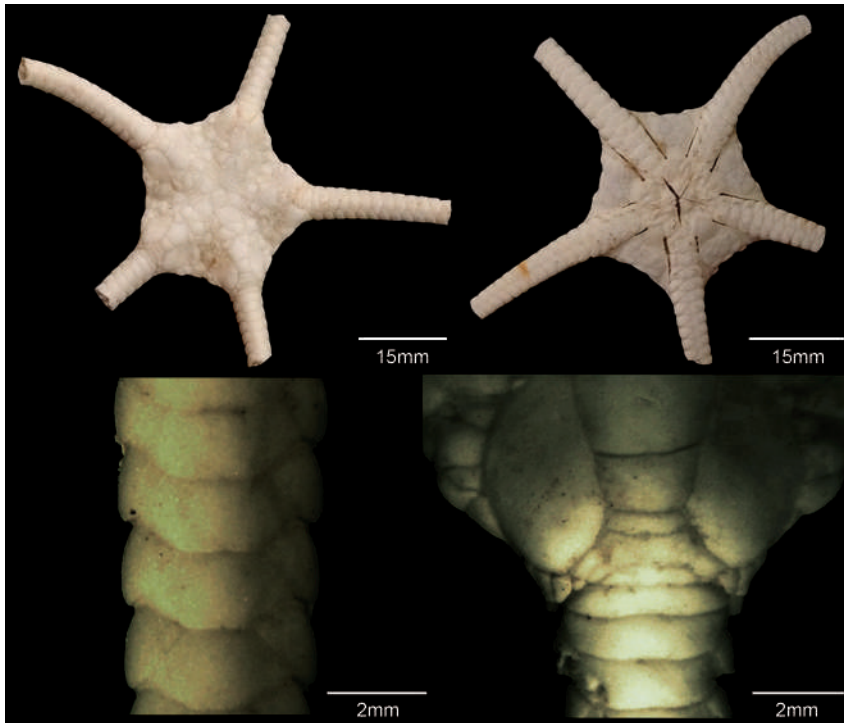


Fig. 79. Dorsal disc (top left), ventral disc (top right), dorsal arm plates (bottom left), arm base (bottom right) views of *Ophiuroglypha costata* (SAMC A23265).

***Ophiuroglypha tumida* Mortensen, 1933**

Ophiura (Ophiuroglypha) tumida Mortensen, 1933a: 387-388, fig. 85b, c, pl. 19, figs 22-23.

Ophiura (Ophiuroglypha) costata tumida: Clark & Courtman-Stock 1976: 196, figs 223, 225, 127, 107; Alva & Vadon 1989: 843.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 13 mm, disc round, tumid, plates medium-sized, thick, irregular, primary rosette distinct. Radial shields slightly longer than wide, oval, separated interradially by single disc scale, just shorter than half disc radius. Ventral interradial area covered in four thick disc plates adjacent to two large genital plates, one wider than long on disc margin, two plates touching oral shield and smaller scale in between, often triangular in shape. Oral shields fairly large, pentagonal, rounded but flat distal edge. Adoral shields contiguous. Oral papillae irregular, 3-5 either side of pointed apical papillae, distalmost being broadest. Genital slits long, single and armed with squat, rectangular, broadly-attached genital papillae. Dorsal arm plates fan-shaped, not contiguous. Ventral arm plates bell-shaped, becoming triangular, distal edge straight, but rounded distally. Lateral arm plates large, separating both dorsal and ventral arm plates. Arm spines three, short, uppermost slightly longer. Oral tentacle pores not in series with oral papillae, with up to nine scales, then decreasing towards free segments from 3-1 tentacle scales and then one on remainder of arm, small and indistinct.

Distribution and habitat – Namibia, South Africa: Durban (KZN); depth range: 122-820 m. Habitat: no information available.

Remarks – Only recorded by the *Pickle* (1929) and *Valdivia* (1985). In this study, three specimens from the *Pickle* expedition were examined from the Iziko South African Museum (including two paratypes; SAMC A22369). All were in a poor condition and a count of tentacle scales could not be carried out with certainty. Type locality is off Durban, depth 232 m.



Fig. 80. Distribution of *Ophiuroglypha tumida* in South Africa.

It is uncertain whether this species is related to *O. costata*, it shows similarities to *O. scomba* as described by Paterson (1985) (O'Hara, pers. obs.), and as such warrants full species recognition.

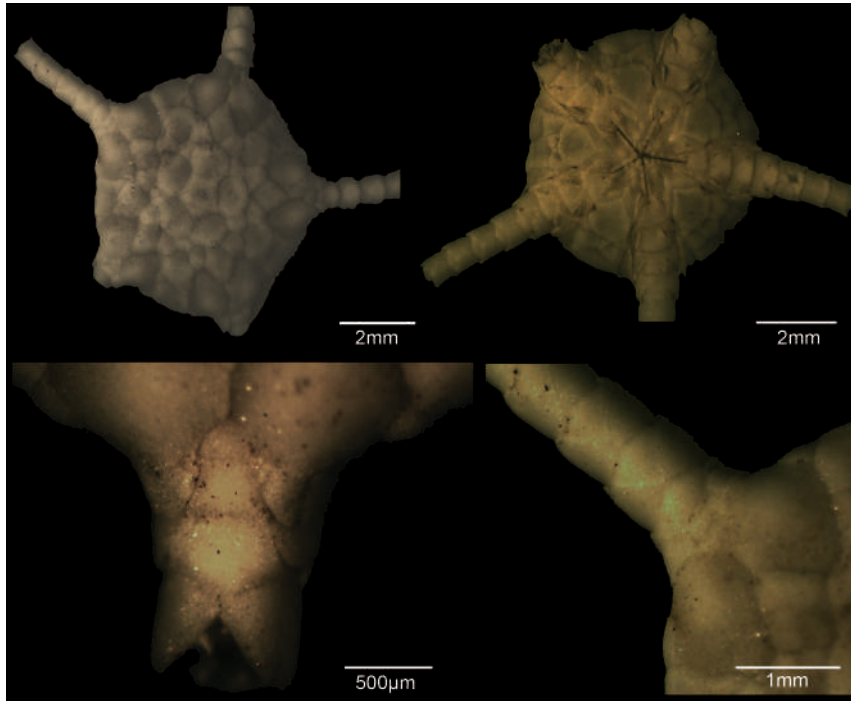


Fig. 81. Dorsal disc (top left), ventral disc (top right), dorsal arm base (bottom left), radial shields (bottom right) views of *Ophiuroglypha tumida* (SAMC A22370).

***Ophiuroglypha irrorata irrorata* (Lyman, 1878)**

Ophioglypha irrorata Lyman, 1878: 73-74, pl. 4, figs 106-108; Lyman 1882: 47-48, pl. 5, figs 7-9; Koehler 1914a: 18-20, pl. 1, figs 3, 4.

Ophioglypha orbiculata Lyman, 1878: 74-75, pl. 4, figs 103-105.

Ophioglypha grandis Verrill, 1894: 293-295.

Ophioglypha involuta Koehler, 1897: 295-297, pl. 6, figs 16-18; Koehler 1899: 15-16, pl. 8, figs 61-63.

Ophioglypha tumulosa Lütken & Mortensen, 1899: 120-122, pl. 1, figs 9-13.

Ophiura irrorata: Ludwig 1901: 925; Clark 1911: 62-64; Clark 1915a: 320; Matsumoto 1917: 277-278; Koehler 1922b: 380; Clark 1923: 358-359; Mortensen 1927: 235; Clark H.L. 1939: 109; Madsen 1955: 11; Madsen 1956: 26; Madsen 1967: 130; Martynov & Litvinova 2008: 79-80, pl. 1c.

Homalophiura irrorata: Koehler 1922a: 55-57, pl. 86, figs 15, 16.

Ophiuroglypha irrotata: Hertz 1927a: 86-87 (*lapsus calami*).

Ophiura (Ophiuroglypha) irrorata: Mortensen 1933a: 388; Clark & Courtman-Stock 1976: 107, 127, 197, fig. 217.

Ophiura (Ophiuroglypha) irrorata irrorata: Mortensen 1933c: 86-87; Paterson 1985: 123-124, figs 46, 47.

Diagnosis – Adapted from Lyman (1882), Clark & Courtman-Stock (1976) and Paterson (1985). D.D. up to 30 mm. Disc pentagonal, disc plates small and irregular, primary rosette distinct. Radial shields round to oval, separated by plates. Arm combs present, widely separated, papillae stout and short. Ventral interradial area covered in thick, medium-sized, overlapping plates. Oral shields pentagonal, flat distal edge, fairly large. Adoral shields contiguous. Oral papillae irregular, mostly pointed, 6-8 either side of pointed apical papillae, in series with first set of oral tentacle scales. Teeth 3-4, similar in shape to apical papillae. Genital slits long, single and armed with squat, broadly attached genital papillae. Dorsal arm plates trapezoid, contiguous for most of arm, becoming fan-shaped with round distal edge. Ventral arm plates bell-shaped proximally, becoming diamond-shaped, wider than long with rounded distal edge. Supplementary ventral arm plate adjacent to lateral arm plates present on basal segments. Lateral arm plates large, with three arm spines, very small, upper spine well-separated from other two spines. Oral tentacle pores, with up to 15 scales, then decreasing towards free segments to about 3-4 scales and further down the arm to one, small and not distinct from arm spines. Tentacle scales from segments 1-3 up to seven, then decreasing on free segments from 3-1 distally, barely distinct from segment 10-12, adradial tentacle scale slightly enlarged which may appear similar to a supplementary ventral arm plate.

Distribution and habitat – Currently considered almost cosmopolitan, but absent in Arctic seas (Clark H.L. 1939; Paterson 1985; Martynov & Litvinova 2008), South Africa: off Saldanha Bay (WC) to off Quoin Point (WC), depth range: 403-7340 m (Martynov & Litvinova 2008). This species is likely to contain numerous morphologically similar species across its wide range (O'Hara unpublished data). However, the species living at lower bathyal depths off South Africa is likely to be the true *O. irrorata* as the type locality occurs in this region. Habitat: *Globigerina* and grey ooze.



Fig. 82. Distribution of *Ophiuroglypha irrorata irrorata* in South Africa.

Remarks – *Anophiura simplex* (Ophiolepididae) has a similar arm spine arrangement with two arm spines widely separated from the third spine. The type material is in the Museum of Comparative Zoology (syntype: MCZ OPH-615), type locality south of Cape Agulhas, depth 3475 m.

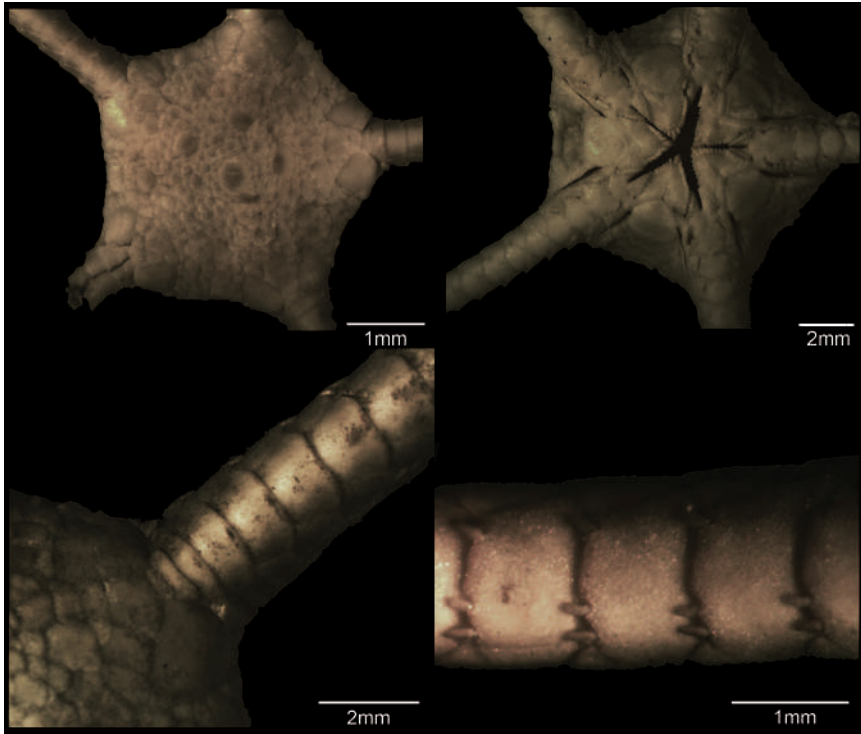


Fig. 83. Dorsal disc (top left), ventral disc (top right), dorsal arm and radial shields (bottom left), arm spines (bottom right) views of *Ophiuroglypha irrorata irrorata* (SAMC A23341).

***Ophiuroglypha schmidtotti* (Hertz, 1927)**

Ophiuroglypha schmidt-otti Hertz, 1927a: 91-93, fig. 5, pl. 7, figs 11, 12.

Homalophiura schmidtotti: Clark 1977: 136, 144-145.

Ophiura (Ophiuroglypha) schmidtotti Paterson 1985: 136, 151.

Diagnosis – Adapted from Clark (1977) and Paterson (1985). D.D. up to 9 mm, D.D./A.L. = 1/2.5. Disc round, disc plates thick, medium-sized, irregular, primary rosette distinct and large central disc scale. Radial shields triangular or oval, only just touching distally unless separated by row of plates, longer than wide, c. one-quarter to one-third disc radius in length. Arm combs distinct, papillae large, square. Oral shields rounded pentagonal, slightly convex on distal edge, slightly wider than long, fairly large. Adoral shields relatively large, contiguous. Oral papillae 3-6 either

side of apical papillae, all broad. Genital plates distinct, single, slits long, armed with short, squat, broad genital papillae. Dorsal arm plates triangular, contiguous for first 2-3 segments, wider than long basally. Ventral arm plates bell-shaped, then becoming wider than long and fan-shaped, only first two plates contiguous, remaining plates not contiguous. Lateral arm plates large, separating both dorsal and ventral arm plates. Arms relatively short. Arm spines three, short, blunt, equal



Fig. 84. Distribution of *Ophiuroglypha schmidtotti* in South Africa.

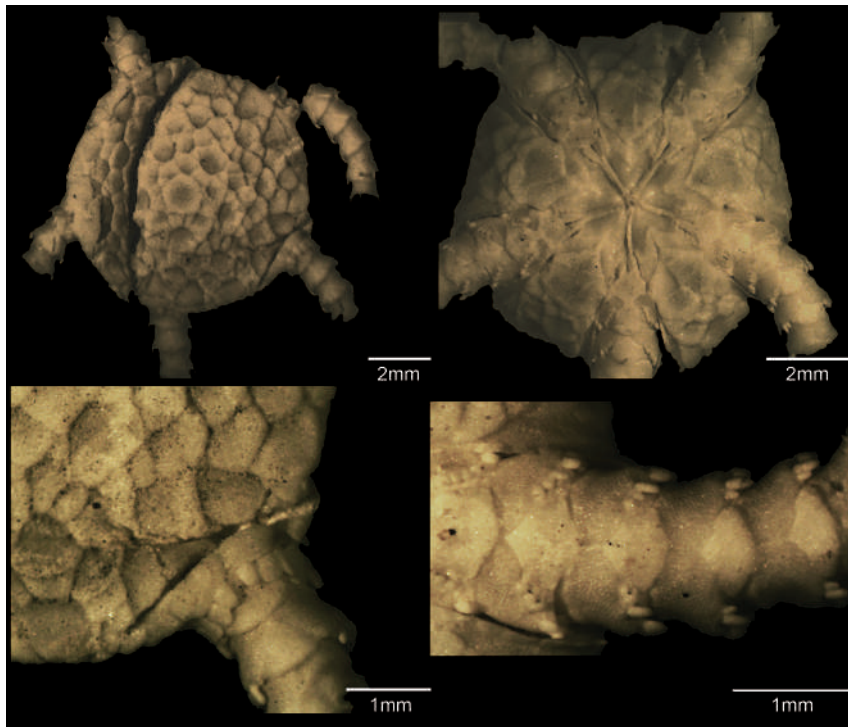


Fig. 85. Dorsal disc (top left), ventral disc (top right), arm combs (bottom left), ventral arms (bottom right) views of *Ophiuroglypha schmidtotti* (SAMC A22811).

in length, not tapering, one hooked and turned upwards. Oral tentacle pores in series with oral papillae, with up to ten scales, then decreasing to single, small tentacle scale distally.

Distribution and habitat – East Africa and Indonesia (Hertz 1927a), South Africa: St Lucia (KZN); depth range: 693-1644 m. Habitat: no details available.

Remarks – A single specimen was examined, on which all arms were broken and tentacle scale count could not be undertaken. The type material is in the Museum of Natural History of Berlin (ZMB Ech 7009, ZMB Ech 7010, ZMB Ech 7011 and ZMB Ech 7012, type locality is Sumatra and East Africa, depth 1143 m (Hertz 1927a)).

'*Ophiura*' *flagellata* (Lyman, 1878)

Ophioglypha flagellata Lyman, 1878: 69, pl. 2, figs 49-51; Lyman 1882: 42, pl. 4, figs 16-18; Koehler 1899: 18-19; Koehler 1904a: 56; Koehler 1907: 294.

Gymnophiura coeruleascens Lütken & Mortensen, 1899: 114-116: pl. 7, figs 4-6.

Ophiura flagellata: Clark 1911: 60-62, fig. 15; Matsumoto 1917: 273-274; Koehler 1922b: 375-377, pl. 85, figs 1, 6, 7, pl. 86, figs 1-4, 10; Clark 1923: 359-360; Mortensen 1933a: 383-384; Murakami 1942: 28; Baker 1979, 22, fig. 1a, c, e; Imaoka *et al.* 1990: 97, fig. 55.

Ophiura (Ophiura) flagellata: Clark & Courtman-Stock 1976: 193-194, figs 221, 127, 107; Alva & Vadon 1989: 828-829, 841.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 29 mm, disc pentagonal. Central disc plate covered in skin, not distinct in adults, surrounded by overlapping medium-sized plates. Radial shields small, oval in shape, partly covered by disc plates, widely separated. Arm combs present at base of arms. Ventral interradiar area covered in overlapping plates, but most of area taken up by large pentagonal oral shield with pointed proximal edge, equally long as wide, elongated in larger specimens. Adoral shields contiguous. Oral papillae five either side of rounded apical papillae, all squarish slightly tapering, distalmost smaller but not broader. Oral papillae in series with oral tentacle scales. Genital slits long, single and armed with many sharp genital papillae. First dorsal arm plates triangular, wider than long, with convex distal edge, remaining plates hexagonal, wider than long, contiguous for length of arm. Ventral arm plates rhombic proximally, wider than long, becoming diamond-shaped, but still wider than long, contiguous until fourth or fifth segment then separated by lateral arm plates, ventral arm plates becoming reduced distally. Oral tentacle pores within oral slit, with up to ten oral tentacle scales. Arm spines three, uppermost longest, about one to one-and-a-half times segment length, tapering but not sharp. Tentacle scales, many (up to eight in examined specimens) in proximal parts of arm, decreasing to one distally.

Distribution and habitat – Bering Sea, Andaman Islands, Indonesia, Japan, Australia, Tasman Sea, western Mexico, eastern Atlantic (Baker 1979; Rowe &

Gates 1995), South Africa: off Saldanha Bay (WC) to North of Richards Bay (KZN); depth range: 96-2330 m (Baker 1979). Habitat: mud.

Remarks – The DNA analysis of O'Hara *et al.* (2017) indicates that this species belongs to the family Ophiopyrgidae and thus requires a new genus name. Syntypes in the Natural History Museum in London (NHMUK 1882.12.23.444), type locality Japan (Rowe & Gates 1995), depth unknown.



Fig. 86. Distribution of '*Ophiura*' *flagellata* in South Africa.

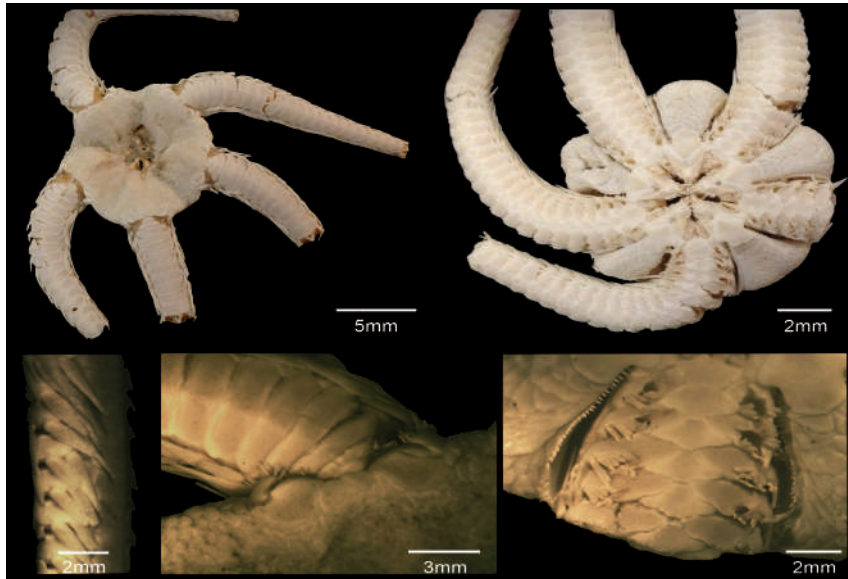


Fig. 87. Dorsal whole (top left), ventral disc (top right), arm spines (bottom left), basal dorsal arms (bottom centre), basal arms and genital slits (bottom right) views of '*Ophiura*' *flagellata* (SAMC A7470).

4.3. Order OPHIOSCOLECIDA O’Hara, Hugall, Thuy, Stöhr & Martynov, 2017
4.3.1. Family OPHIOSCOLECIDAE Lütken, 1869

Genus *Ophiolycus* Mortensen, 1933

Diagnosis – Adapted from Mortensen (1933a) and Martynov (2010). Disc covered in skin. Radial shields moderately developed, elongated, genital slits long; genital plates bordering about two-thirds of slits. Oral papillae spiniform, similar in shape to the cluster of teeth. Oral tentacle scales almost in series with oral papillae. Oral shield oval to rhomboidal, indistinct distal lobe. Adoral shields bilobed distally, very narrow proximally. Dorsal arm plates moderately developed, sometimes fragmented. Ventral arm plate well defined. Arm spines relatively long, flattened, distally transformed into hooks. Tentacle scale absent or small.

Ophiolycus dentatus (Lyman, 1878)

Ophioscolex dentatus Lyman, 1878: 157, pl. 7, figs 184-186; Lyman 1882: 233, pl. 24, figs 4-6; Bell 1905: 259; Clark 1923: 314; Clark A.M. 1952: 199.

Ophioscolex (Ophiolycus) dentatus: Mortensen 1933a: 309-312, figs 32-34; Clark & Courtman-Stock 1976: 101, 111, 135, fig. 104; Alva & Vadon 1989: 832-833.

Ophioscolex dentatus var. *spiniger* Mortensen, 1933a: 312-313, fig. 35.

Ophiolycus dentatus: Martynov 2010: 104, fig. 71a-h, fig. 72.

Diagnosis – Adapted from Lyman (1878), Lyman (1882); Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 23 mm, disc covered in thick skin dorsally and ventrally, small spines on dorsal disc. Radial shields narrow, just shorter than width of arm base. Oral shields oval, with broad distal lobe. Adoral shields contiguous, moderately narrow, with two spines, one in sequence with oral papillae. Oral papillae spiniform, long. Teeth similar in shape, but smaller and clustered at apex of jaw. Genital slits long, narrow. Genital plates present but not along entire length of slit. Arms five, simple, length moderate. Dorsal arm plates fragmented especially basally, but varied along length of arm, with no apparent pattern. Ventral arm plates distinct, equally as wide as long basally and contiguous, becoming longer than wide and not contiguous. Arm spines three, lowermost cigar-shaped, broad and flattened, approximately one segment length, remaining spines spiniform, uppermost being slightly longer than segment length, spines becoming hook-shaped distally. Tentacle pores large. Tentacle scales one, spiniform, small.

Distribution and habitat – Namibia, South Africa: off Groen River (NC) to Sodwana Bay (KZN); depth range: 129-450 m. Habitat: rock, black speckled sand, shell and mud.

Remarks – Specimens examined from Iziko South African Museum were all labelled as *Ophioscolex dentatus* var. *spiniger* Mortensen, 1933. See remarks

on *Ophiolycus* under *Ophioscolex inermis*. The syntype is in the Natural History Museum of Denmark (ZMUC OPH-284), type locality Agulhas Banks, depth 275 m.



Fig. 88. Distribution of *Ophiolycus dentatus* in South Africa.

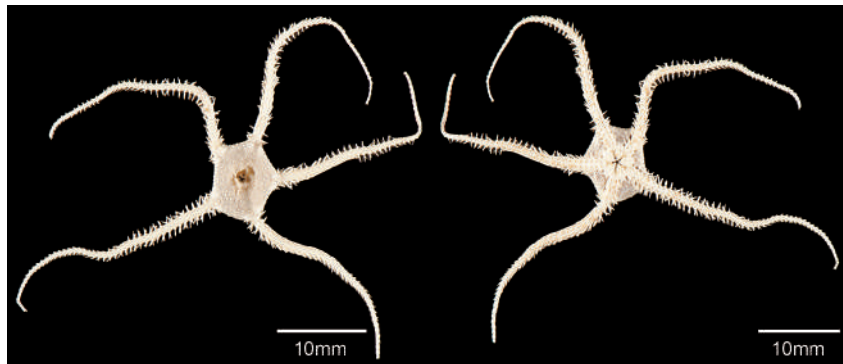


Fig. 89. Dorsal (left) and ventral (right) views of *Ophiolycus dentatus* (ZMUC OPH-284).

Genus *Ophioscolex* Müller & Troschel, 1842

Diagnosis – Adapted from Müller & Troschel (1842) and Martynov (2010). Disc covered in thick skin, small plates visible when dried, radial shields small, triangular, hardly conspicuous, genital slits long, conspicuous, genital plates border only distalmost part of slit. Oral papillae spiniform, teeth similar in shape, clustering. Oral shields vary in shape, with or without distinct distal lobe, adoral shields similar in size, slightly widened distally. Dorsal arm plates conspicuous in *O. inermis* only, ventral arm plates well-defined. Arm spines relatively long, conical, with or without hooks, tentacle scales absent or small, oval or spiniform.

Ophioscolex inermis Mortensen, 1933

Ophioscolex inermis Mortensen, 1933a: 313-315, fig. 36; Martynov 2010: 108, 111.

Ophioscolex (Ophioscolex) inermis: Clark & Courtman-Stock 1976: 136, 101, 111, fig. 103.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 8 mm. Dorsal disc covering unknown. Oral shields small, rounded semi-circular inner edge, straight or slightly concave outer edge. Adoral shields large, contiguous radially. Oral papillae spiniform, slender, small, apex of jaw with cluster of papillae which are slightly longer. Oral tentacle pore not within mouth slit. Dorsal arm plates thin, transparent, broadly contiguous, distally convex, some appear to be split transversely into two parts. Ventral arm plates slightly longer than wide, distal edge flat or slightly concave. Arm spines three, long, slender, glassy, lowermost club-shaped. Tentacle scales absent.



Fig. 90. Distribution of *Ophioscolex inermis* in South Africa.



Fig. 91. Dorsal (left) and ventral (right) views of *Ophioscolex inermis* (ZMUC OPH-126).

Distribution and habitat – South Africa: Durban (KZN) to off Tugela River mouth (KZN); depth range: 366-412 m. Habitat: sandy mud.

Remarks – No specimen was examined during this study, but known to be endemic to South Africa. According to Mortensen (1933a) and Clark & Courtman-Stock (1976) there is only one collected specimen of this species. However, a second specimen was located in the Smithsonian Institution (USNM E42564, off Durban, 366 m), but no photos were available to examine the dorsal disc (Dave Pawson, pers. comm.). The holotype is in the Natural History Museum of Denmark (ZMUC OPH-126), type locality off Durban, depth 412 m.

4.4. Order OPHIACANTHIDA O’Hara, Hugall, Thuy, Stöhr & Martynov, 2017

4.4.1. Family OPHIOTOMIDAE O’Hara *et al.*, 2018

Genus *Ophiotoma* Lyman, 1883

Diagnosis – Adapted from Martynov (2010) and Lyman (1883). Disc with numerous small plates or disc scales and sometimes spinelets of various lengths. Radial shields elongated, distinct. Oral papillae short, conical. Oral tentacle scales in continuous series with oral papillae. Teeth broad, conical to rectangular. Oral shields broadly spearhead-shaped, with a short distal lobe. Adoral shields with distal wings, proximally tapered. Dorsal and ventral arm plates well-developed. Arm spines relatively long, rounded, smooth, not hooked. Tentacle pores relatively large. Tentacle scales small, rudimentary or absent.

Ophiotoma cf. *alberti* (Koehler, 1896)

Ophiotrema alberti Koehler, 1896a: 251; Koehler 1906: 6; Koehler 1907: 324; Koehler 1908a: 612; Koehler 1909: 196-198; Matsumoto 1915: 62; Koehler 1922b: 90; Mortensen 1927: 183; Gage *et al.* 1983: 288; Paterson 1985: 57-58, fig. 3; Smirnov *et al.* 2014: 197.

Ophiotoma alberti: Madsen 1951: 113; O’Hara & Stöhr 2006: 75; Martynov 2010: 18, 92, 97-103, 126, 131, figs 66A-E, 67A, 68, 6C, H, 13C, E, F, 18L, 28B; Olbers *et al.* 2015: 104, pl. 6C, D.

Diagnosis – Adapted from Paterson (1985) and Martynov (2010). D.D. up to 17 mm. Disc with small disc scales, scattered spinelets also extending onto ventral interradial areas. Radial shields naked, sometimes visible, rounded pear-shaped. Oral papillae 4-5, in continuous series with two scales at oral tentacle pores. Oral shields large, wider than long, nearly D-shaped, with rounded proximal edge and slight distal lobe. Adoral shields wing-like, proximal edge indented opposite second oral tentacle pore. Dorsal arm plates triangular to bell-shaped, twice as wide as long, nearly contiguous. Ventral arm plates rectangular, with obtuse proximal angle and slight indent on distal edge, nearly contiguous on proximal arm. Arm spines four, glassy, smooth, slightly flattened, rounded tip, uppermost longest, up to two

segments in length. Tentacle pores large. Tentacle scales needle-like or round, variable, small if not absent, 0-5 in number.

Distribution and habitat – North Eastern Atlantic (Paterson 1985), South Africa: off Cape Town (WC); depth range: 1862-4354 m. Habitat: no information available.

Remarks – Olbers *et al.* (2015) recorded this species as a new record for South Africa.



Fig. 92. Distribution of *Ophiotoma cf. alberti* in South Africa.

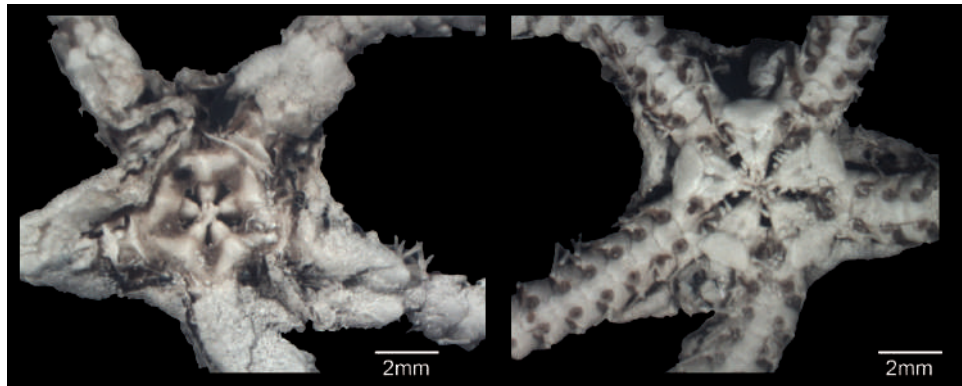


Fig. 93. Dorsal (left) and ventral (right) views of *Ophiotoma cf. alberti* (SAMC A22112).

***Ophiotoma cf. gracilis* (Koehler, 1914)**

Ophiotrema gracilis Koehler, 1914a: 112-114, pl. 12, figs 1, 2; Paterson 1985: 54, 58, fig. 23; Borrero-Perez *et al.* 2008: 181, fig. 71.

Ophiotoma gracilis: Martynov 2010: 98, 103, 141; Olbers *et al.* 2015: 104-105, pl. 6E, F.

Diagnosis – Adapted from Paterson (1985) and Martynov (2010). D.D. up to 11 mm. Disc with small disc scales, scattered spinelets also extending onto ventral interradiar areas, but not up to oral shields. Radial shields naked, elongated triangular, rounded distal margin, separated but diverging. Oral papillae five, conical, in a continuous series with two scales at oral tentacle pores, which are more elongated, almost spiniform. Oral shields large, much wider than long, spearhead-shaped, with distinct distal lobe. Adoral shields elongated, contiguous. Genital slits narrow. Dorsal arm plates triangular, distal edge convex, almost as long as wide, not contiguous. Ventral arm plates pentagonal, proximal edge concave and obtuse, lateral edges excavated by tentacle pores, much longer than wide, not contiguous. Arms relatively slender. Arm spines four, fine, smooth, pointed, uppermost longest, up to one-and-a-half segments in length. Tentacle pores large. Tentacle scales subequal, 5-6, spinose.

Distribution and habitat – Lesser Antilles and Columbia (Borrero-Pérez *et al.* 2008), South Africa: off Cape Town (WC); depth range: 490-2948 m. Habitat: no information available.

Remarks – Olbers *et al.* (2015) recorded this species as a new record for South Africa. In addition, they noted a number of differences which occur between *Ophiotoma alberti* and *O. gracilis*. In *O. gracilis* the arms are more slender, arm spines finer, dorsal arm plates narrower, smaller and more widely separated, ventral arm plates longer, the oral tentacle pore scales are different in size and shape to the oral papillae and the oral shields are spearhead-shaped. The tentacle scales in *O. alberti* are small, while in *O. gracilis* they are spinose and more distinct.

According to Borrero-Perez *et al.* (2008) the type locality of *O. gracilis* is Lesser Antilles and the type is in the Smithsonian Institution (USNM 32301), depth 1256 m (Koehler 1914a).



Fig. 94. Distribution of *Ophiotoma cf. gracilis* in South Africa.

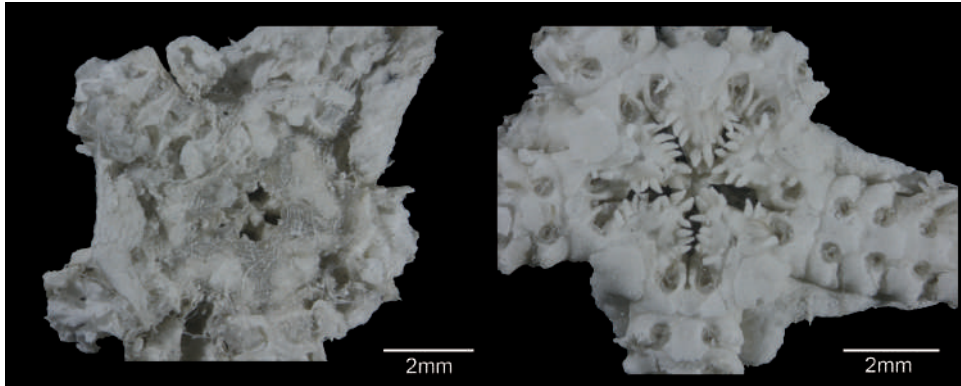


Fig. 95. Dorsal (left) and ventral (right) views of *Ophiotoma* cf. *gracilis* (SAMC A22103).

Genus *Ophiotreta* Verrill, 1899

Diagnosis – Adapted from Verrill (1899b). Jaw elongated with 5 or more oral papillae that can extend around the oral tentacle pore. Adoral shields may or may not be contiguous. Ventral arm plates as wide as long, proximal edge obtuse, distal edge convex, not contiguous distally. Arm spines cylindrical, but tapering slightly, flattened, slender, serrated or nearly smooth, do not approximate towards dorsal midline. Disc with spines or granules. Tentacle scales large, 1-2.

Ophiotreta durbanensis (Mortensen, 1933)

Ophiacantha (*Ophiotreta*) *durbanensis* Mortensen, 1933a: 324-325, fig. 44, pl. 19. figs 13-15.

Ophiacantha durbanensis: Clark & Courtman-Stock 1976: 105, 121, 171, fig. 176.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 7 mm, A.L. = 40 mm, D.D./A.L. = 1/6. Disc not constricted interradially. Disc covered with fine granules scattered, sometimes with few spines interspersed, extending to ventral interradiial areas, leaving areas closest to genital slits naked. Radial shields small, oval, partly naked, widely separated. Oral shields spearhead-shaped, longer than wide, distal sides slightly sunken. Adoral shields approximating or just contiguous. Oral papillae 5-6, oral tentacle scale also present at distal end of series. Genital slits narrow. Dorsal arm plates fan-shaped or triangular, distal edge slightly convex, just contiguous. Ventral arm plates broad fan-shaped, slightly wider than long, distal edge convex, contiguous, at least basally. Arm spines up to five, tapering, smooth or finely serrated, two segments in length, middle spines may be truncated. Tentacle pores small. Tentacle scales two, becoming one on distal arms, small, papilliform. Colour faint mottling of white and brown which disappears on distal arms.

Distribution and habitat – South Africa: Durban (KZN) to Sodwana Bay (KZN); depth range: 400-550 m. Habitat: no information available.

Remarks – Endemic to South Africa. The syntype is in the Natural History Museum of Denmark (ZMUC OPH-116) and the type locality is Durban, depth 411 m.



Fig. 96. Distribution of *Ophiotreta durbanensis* in South Africa.

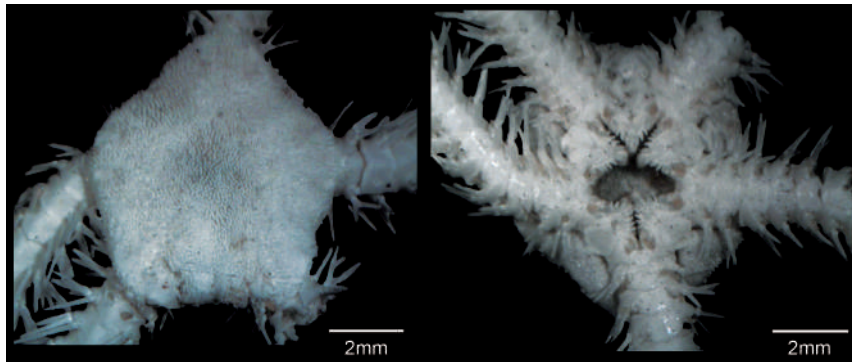


Fig. 97. Dorsal (left) and ventral (right) views of *Ophiotreta durbanensis* (SAMC A22797).

Ophiotreta matura (Koehler, 1904)

Ophiacantha matura Koehler, 1904a: 112-113, pl. 23, figs 2-4.

Ophiotreta matura: Koehler 1922b: 76-81, pl. 12, figs 1-6, pl. 13, figs 1-5, pl. 14, figs 1-5, pl. 15, figs 1-3, pl. 95, fig. 2; Koehler 1930: 66; Clark H.L. 1939: 53-54; Clark 1977: 135, 141; Clark & Courtman-Stock 1976: 121 (footnote); O'Hara & Stöhr 2006: 59-60, figs 4h-l, 17r.

Ophioprium kapalae Baker, 1979: 38-39, fig. 6g-m.

Ophiotreta kapalae: Paterson 1985: 56.

Diagnosis – Adapted from O’Hara & Stöhr (2006). D.D. up to 8 mm, D.D./A.L. = 1/4. Disc not constricted interradially. Disc covered in dense spines obscuring underlying plates, disc spines long, thorny, several with multiple thorns at tips, extending to ventral interradiial areas, leaving areas closest to genital slits naked. Radial shields covered in disc armament. Oral shields diamond-shaped, wider than long, distal edge convex. Adoral shields short, thick, contiguous. Oral papillae up to seven, with one or two oral tentacle scales at distal end of series, all spiniform. Genital slits wide. Dorsal arm plates triangular, distal edge convex, not contiguous, basal plates with tiny spines. Ventral arm plates fan-shaped, equally wide as long, distal edge strongly convex, not contiguous. Arm spines up to eight, finely serrated, tapering, uppermost longest, up to five segments long, lowest spine hooked on distal segments, spines meeting at dorsal midline. Tentacle scales two on basal pores, large, wide and rounded, becoming tapered sharp and thorny tipped, may be longer than ventral arm plate. Colour slightly green when dry (O’Hara & Stöhr 2006).

Distribution and habitat – Gulf of Aden, Indonesia, Philippines, eastern Australia, New Caledonia (O’Hara & Stöhr, 2006), South Africa: North of Richards Bay (KZN) to Sodwana Bay (KZN); depth range: 239-1270 m. Habitat: no information available.



Fig. 98. Distribution of *Ophiotreta matura* in South Africa.

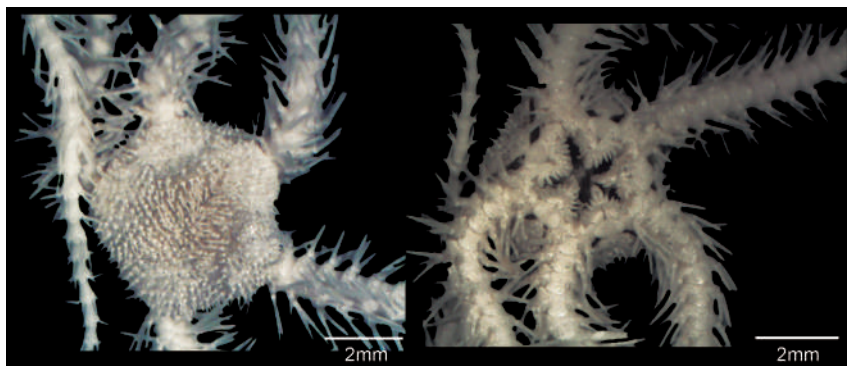


Fig. 99. Dorsal (left) and ventral (right) views of *Ophiotreta matura* (SAMC A22919).

Remarks – Clark & Courtman-Stock (1976) only mention *Ophiotreta matura* in a footnote, noting that *O. matura* differs from *O. durbanensis* by the dense covering of elongated spinelets on disc and single, very large tentacle scale. Clark (1977) recorded this species as a new record for southern Africa. The type material is in the Zoological Museum Amsterdam (now Naturalis) (syntype: ZMA.ECH.O.2349) and the type locality is Maluku, Indonesia, depth 397 m.

4.4.2. Family OPHIACANTHIDAE Ljungman, 1867 as restricted by O'Hara *et al.* (2018).

Diagnosis – Adapted from Mortensen (1927), Clark & Courtman-Stock (1976), Paterson (1985), O'Hara & Stöhr (2006) and Martynov (2010). Disc covered to a varying degree by spines, stumps or granules, which may or may not conceal the plates. Single unpaired infradental apical papilla with three or more smaller oral papillae on either side in a continuous series, mostly pointed, papilliform or sometimes spine-like. Within this series, papillae may arise from the jaws. Teeth sometimes present. Arms flexible horizontally or dorsoventrally, sometimes with vertebrae being restricted, giving a moniliform appearance. Arm spines usually long and serrated to varying degrees. Tentacle pores usually small. Tentacle scales usually single. Most species found in deep-water, often clinging to corals, sponges or gorgonians.

Genus *Ophiacantha* Müller & Troschel, 1842

Diagnosis – Adapted from Mortensen (1927), Clark & Courtman-Stock (1976) and Devaney (1978). Disc not restricted interradially, covered by spines, stumps, granules or a combination of these, which may or may not conceal the plates. Radial shields inconspicuous, separated, bar-like, but only distal ends visible. Oral shields broad-rhombic, adoral shields relatively large and usually broadly contiguous, single unpaired apical papilla with three or more smaller oral papillae either side in a continuous series, mostly pointed, papilliform, and sometimes spine-like, often distalmost papillae enlarged. Teeth in single series, pointed. Dorsal arm plates small, fan-shaped or triangular with distal side convex, plate becoming rhombic distally. Ventral arm plates pentagonal or bell-shaped with distal side convex, not usually contiguous. Arm spines erect, often long, sometimes rugose, tapering, pointed. Tentacle pores small. Tentacle scales usually single, papilliform.

***Ophiacantha baccata* Mortensen, 1933**

Ophiacantha baccata Mortensen, 1933a: 319-322, figs 40, 41, pl. 19; Clark & Courtman-Stock 1976: 104, 121, 167, figs 170, 181; Clark 1977: 135.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 6.5 mm, D.D./A.L. = c. 1/6. Disc armed above and below with small trifid and multifid thorny stumps. Radial shields indistinct with distal ends naked. Oral shields diamond-shaped, with point on proximal side, sunken in the middle. Adoral

shields with narrow distal lobe, broadly contiguous. Oral papillae three each side of broad apical papilla, outermost broadest. Arms moniliform. Dorsal arm plates diamond-shaped, equally wide as long, widely separated by lateral arm plates. Ventral arm plates pentagonal, all plates smooth. Arm spines up to seven, slender, rugose, long, up to three times segment length. Tentacle scale small, single, elongated and rugose. Colour in life light straw, numerous dark spots scattered on disc, dark spots often have single, darker stump, arms lightly banded.



Fig. 100. Distribution of *Ophiacantha baccata* in South Africa.

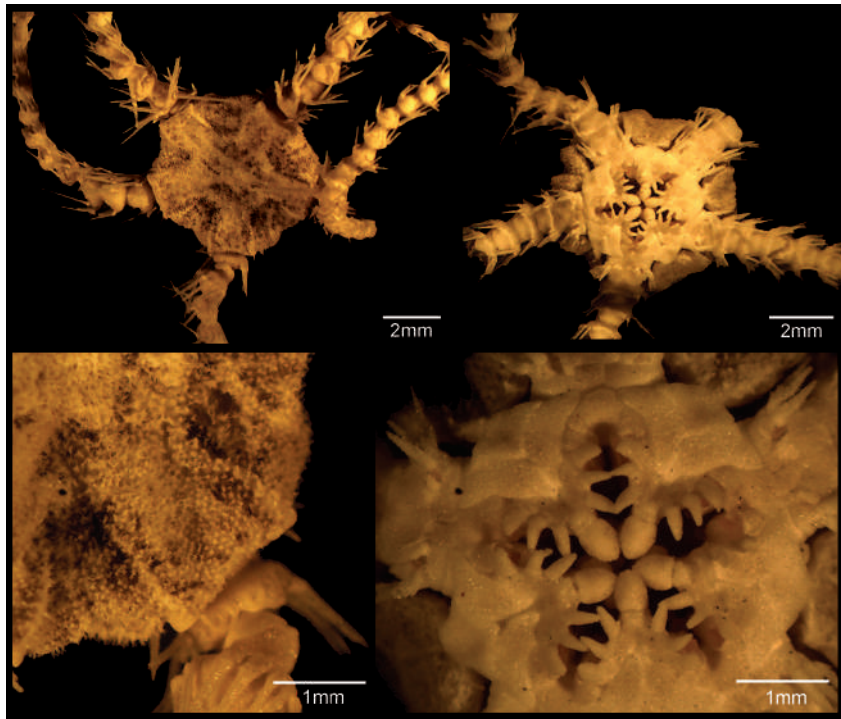


Fig. 101. Dorsal whole (top left), ventral whole (top right), dorsal disc and arm bases (bottom left), jaws (bottom right) views of *Ophiacantha baccata* (SAMC A084245).

Distribution and habitat – Mozambique (Mortensen 1933a; Clark & Courtman-Stock 1976), South Africa: Cape Town (WC) to Kosi Bay (KZN); depth range: 9-900 m. Habitat: sand, shells and stones.

Remarks – Mortensen's Pacific Expedition collection of 1933 is lodged at the Natural History Museum of Denmark, which includes syntypes ZMUC OPH-75 and ZMUC OPH-359, while in the Iziko South African Museum, additional syntypes are housed (labelled as 'cotypes') (SAMC A22372), which were examined during this study. The type locality is Durban, depth 400-450 m.

***Ophiacantha nerthepsila* H.L. Clark, 1923**

Ophiacantha nerthepsila Clark, 1923: 319-322, fig. 1, pl. 19, figs 3, 4; Mortensen 1933a: 316-317, fig. 37; Day *et al.* 1970: 80; Clark & Courtman-Stock 1976: 104, 121, 168, fig. 173.

Ophiacantha barracoutae Koehler, 1923: 3-5, figs 1-3.

Diagnosis – Adapted from Mortensen (1933a). D.D. up to 7 mm, D.D./A.L. = c. 1/3-4. Disc round, disc armed above with granules and scattered spinelets, sometimes extending onto ventral interradial areas. Radial shields widely separated, c. as wide as arm, mostly covered in granules and spines, with only small triangular portion of each exposed. Disc margin vertical. Oral shields broad diamond-shaped, sunken. Adoral shields with no distal lobe, contiguous. Oral papillae three each side of broad apical papilla, outermost broadest. Teeth becoming square deep in mouth. Dorsal arm plates fan-shaped or triangular, distal edge convex, may be bell-shaped if successive arm plates are sinuous, narrowly contiguous, if at all. Ventral arm plates pentagonal, distal side straight. Arm spines up to seven, uppermost longest, at most three times segment length, usually twice segment length. Tentacle scale small, single, spiniform but blunt. Colour pale brown, lighter below, dorsal interradial area with faint white patches surrounded by darker brown, arms banded.

Distribution and habitat – South Africa: Elands Bay (WC) to Mfafazana (KZN); depth range: 22-900 m. Habitat: rock, sand and mud.



Fig. 102. Distribution of *Ophiacantha nerthepsila* in South Africa.

Remarks – Endemic to South Africa. Distribution here extended both east and west within South Africa. The Iziko South African Museum has a type specimen, SAMC A6437 (examined), accessioned as the paratype, but according to Clark (1923) (original description) this accession number is the holotype. Additional types available include: paratypes: SAMC A7478 (examined) and ZMUC OPH-221. The type locality is Riet Point, Eastern Cape, depth 42 m.

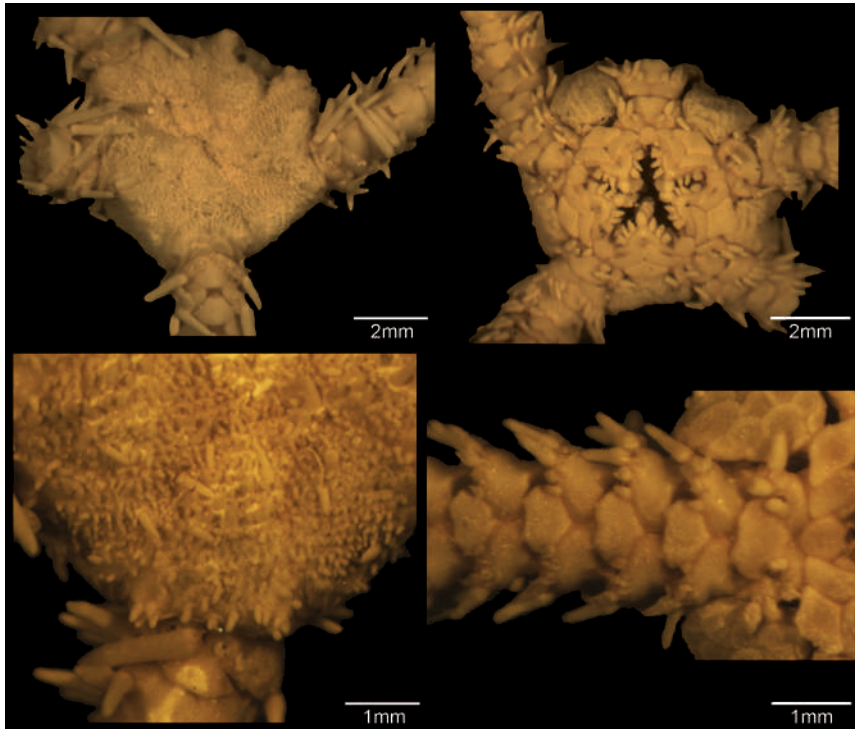


Fig. 103. Dorsal disc (top left), ventral disc (top right), dorsal disc and arm bases (bottom left), ventral arms (bottom right) views of *Ophiacantha nerthepsila* (SAMC A084235).

***Ophiacantha scutigera* Mortensen, 1933**

Ophiacantha scutigera Mortensen, 1933a: 317-319, figs 38, 39, pl. 19, figs 6, 7;
Clark & Courtman-Stock 1976: 104, 121, 168, figs 174, 179.

Diagnosis – Adapted from Mortensen (1933a). D.D. up to 6 mm, D.D./A.L. = 1/6. Disc covered with tubercles or low, blunt stumps with some scattered slender spinelets, becoming longer towards centre of disc. Radial shields short and small, tapering proximally, separated by less than arm width. Disc margin vertical, disc plates distinct, some tubercles present. Ventral interradial areas with medium to coarse scaling, with one or two scattered tubercles. Oral shields rhombic or

oval, with proximal point. Oral papillae three, sometimes four, may be concaved, outermost papilla sometimes slightly enlarged, broader infradental papilla. Teeth present, c. 5-6, similar in shape to apical papilla. Adoral shields contiguous. Dorsal arm plates triangular, twice as wide as long, with distal side convex, not contiguous, separated by lateral arm plate. Ventral arm plates fan-shaped, not contiguous, separated by lateral arm plates. Lateral and ventral arms plates with transverse concentric striations. Arm spines up to ten proximally, upper spines long and smooth, lower spines slightly serrated, spiniform, c. four times segment length on basal segments then two times on remaining arm. Uppermost arm spines on both sides of the arm almost meet at dorsal midline. Arms not moniliform. Tentacle scale single, rounded, fairly large. Colour light grey or brown with small dark spots around radial shields with dark patches on distal edges and dark spots along dorsal midline of arms.

Distribution and habitat – South Africa: Amanzimtoti (KZN) to Leven Point (KZN); depth range: 164-450 m. Habitat: no information available.

Remarks – Endemic to South Africa. Distribution here extended north and south within KwaZulu-Natal. The type material in the Iziko South African Museum was labelled as ‘cotype’ (SAMC A22368). Additional syntypes were located in the Natural History Museum of Denmark (ZMUC OPH-358 and ZMUC OPH-263). The type locality is off Durban, depth 219 m.



Fig. 104. Distribution of *Ophiacantha scutigera* in South Africa.

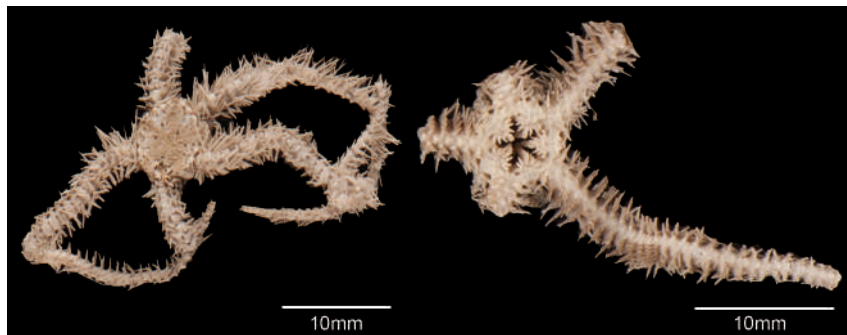


Fig. 105. Dorsal (left) and ventral (right) views of *Ophiacantha scutigera* (ZMUC OPH-263).

***Ophiacantha striolata* Mortensen, 1933**

Ophiacantha striolata Mortensen, 1933a: 322-324, figs 42, 43; Clark 1974: 442; Clark & Courtman-Stock 1976: 105, 121, 168-169, figs 169, 175, 180; Clark 1977: 135.

Diagnosis – Adapted from Mortensen (1933a). D.D. up to 3 mm, D.D./A.L. = 1/4. Disc covered with small, thorny, trifold stumps. Radial shields mostly covered in same armament, with only distal ends visible. Ventral interradial areas covered in same stumps, except in areas closest to oral shields. Oral shields almost triangular, with slight distal lobe. Adoral shields fairly narrow, contiguous, with narrow distal lobe. Oral papillae three, all similar and narrow, conspicuously smaller than apical papilla. Dorsal arm plates small, triangular, distal side convex, not contiguous. Ventral arm plates fan-shaped, not contiguous, separated by lateral arm plates, first ventral arm plate narrow, longer than wide and distal edge strongly convex. All arm plates having transverse concentric striations. Arm spines up to eight, deeply serrated, slender, longest being twice segment length, distally spines nearly smooth except for lowermost, which have fine serrations. Arms not moniliform. Tentacle scale single, pointed, with furrow on upper side.

Distribution and habitat – South Africa: Cape Town (WC) to Sodwana Bay (KZN); depth range: 84-650 m. Habitat: fine khaki sand and gravel.

Remarks – Endemic to South Africa. A syntype is in the Natural History Museum of Denmark (ZMUC OPH-271), depth unknown.



Fig. 106. Distribution of *Ophiacantha striolata* in South Africa.

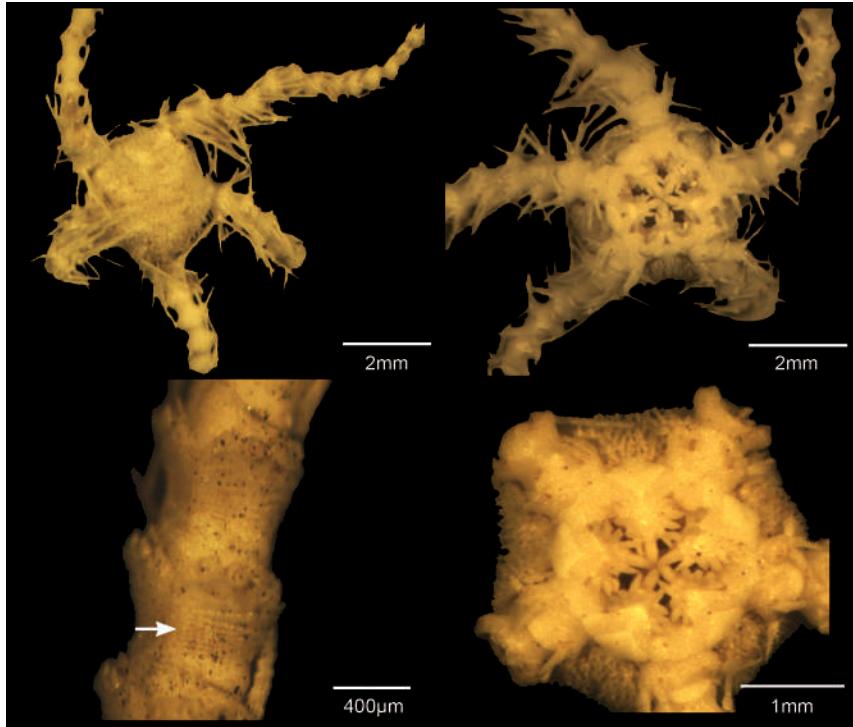


Fig. 107. Dorsal whole (top left; SAMC A084241), ventral whole (top right; SAMC A084241), concentric striations, as indicated by the arrow on arm plates (bottom left; SAMC A084241), jaws (bottom right; SAMC A088364) views of *Ophiacantha striolata*.

Genus *Ophiolimna* Verrill, 1899

Diagnosis – Adapted from Verrill (1899b). Disc plates and radial shields concealed by granules and spines. Jaws more or less granulated. Arm spines seven or eight, nearly smooth, placed obliquely on distal portion of lateral arm plates, not strongly divaricate or spreading.

Ophiolimna perfida (Koehler, 1904)

Ophiacantha perfida Koehler 1904a: 118-120, pl. 23, figs 5, 6; Clark 1915a: 204.
Ophiolimna perfida: Koehler, 1922b: 64-66, pl. 9, figs 7-9, pl. 92, fig. 6; Clark 1977: 139-140.
Ophiacantha lambda Clark, 1911: 231-232, fig. 108; Clark 1915a: 199.

Diagnosis – Adapted from Clark (1911) and Clark (1977). D.D. up to 12 mm, D.D./A.L. = 1/6. Disc covered with small, elongated granules. Radial shields mostly covered in same armament, with distal ends bare and visible. Ventral interradial areas covered in same granules up to oral shields, less dense than dorsal side,

jaws also covered in coarse granules. Oral shields almost oval, wider than long. Adoral shields covered in granules, contiguous. Oral papillae four, distalmost much broader. Apical papilla blunt, similar in size to first three oral papillae. Teeth round, larger than infradental. Genital slits small. Dorsal arm plates fan-shaped, convex distally, not contiguous. Ventral arm plates fan-shaped to pentagonal, with distal edge convex, not contiguous, wider than long. Arm spines up to five, slender, tapering, smooth, uppermost spine longest, three times segment length. Tentacle scale single, oval, fairly large.

Distribution and habitat – Southern Japan to Indonesia (Clark 1977), South Africa: Sodwana Bay (KZN); depth range: 411-1280 m. Habitat: fine sand and mud.

Remarks – Only a single damaged specimen was available for examination in the Iziko South African Museum collection. Most of the type material of *O. perfida* is in the Naturalis Biodiversity Centre (ZMA) in Leiden, with syntypes also in the Museum of Comparative Zoology (OPH-1986) and the Monaco Oceanographic Museum.



Fig. 108. Distribution of *Ophiolimna perfida* in South Africa.

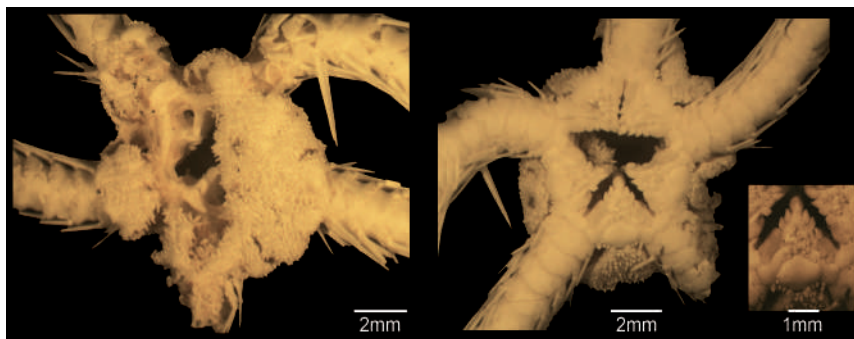


Fig. 109. Dorsal disc (left), ventral disc (right) and jaws (inset) views of *Ophiolimna perfida* (SAMC A22936).

Genus *Ophiomitrella* Verrill, 1899

Diagnosis – Adapted from Verrill (1899b) and Clark & Courtman-Stock (1976). Disc not constricted interradially, disc armament covered in large, thick plates and bearing stumps or granules of varying densities. Radial shields broad, rounded, may be widely separated or partially contiguous. Oral shields usually wider than long. Adoral shields relatively large, wide and contiguous. Oral papillae three, papilliform either side of apical papilla. Dorsal arm plates small rhombic or fan-shaped, not contiguous. Ventral arm plates fan- or bell-shaped, not contiguous. Arm spines long and slender. Tentacle pores small. Tentacle scales small, single.

Ophiomitrella corynephora H.L. Clark, 1923

Ophiomitrella corynephora Clark, 1923: 322-324, fig. 2, pl. 19, figs 5, 6; Mortensen 1933a: 331-333, figs 48, 49; Clark A.M. 1952: 199, 212; Clark 1974: 441; Clark & Courtman-Stock 1976: 105, 121, 169, figs 172, 177; Alva & Vadon 1989: 829.

Diagnosis – Adapted from Clark (1923). D.D. up to 10 mm, D.D./A.L. = 1/3-4. Disc round, covered with overlapping plates bearing cylindrical granules with rounded tips. Some plates with multiple granules, others bare. Radial shields about one-third to half disc radius, naked or covered in similar granules to dorsal disc, rounded triangular, as wide as long, separated from each other by a series of plates. Ventral interradiation areas covered in same granules as dorsal disc, but scattered and less dense. Oral shields diamond-shaped, wider than long, two proximal sides slightly concave, distal sides convex. Adoral shields large, contiguous. Jaws sunken. Oral papillae three, large, tapering, thick. Teeth four, squarish to pointed. A calcified elevation distal to outermost oral papillae arising from edge of first ventral arm plate adjoining oral tentacle pore. Genital slits long and narrow. Dorsal arm plates rhombic, not contiguous. Ventral arm plates rhombic with very rounded, obtuse distal edge, almost half moon-shaped, basal ventral arm plates with rounded distal edge. Arm spines up to seven, smooth or very finely serrated, uppermost long, pointed, exceeding one segment length, lowermost two spines short and blunt. Tentacle scale single, moderately large, narrow, long and tapering, but blunt. Colour in life white to red and pink.

Distribution and habitat – South Africa: Orange River (NC) to off Clansthal (KZN); depth range: 42-900 m. Habitat: rock, sand, mud, stones and on alcyonarians.

Remarks – Endemic to South Africa. Clark (1923) states that SAMC A6441 (examined) is the holotype, but the specimen label reads that it is a paratype. The holotype was not found. Distribution within South Africa here extended north to Clansthal in KZN and west from Port Elizabeth to Orange River in the Northern Cape. The type locality is Vasco da Gama Peak, Cape, depth 42 m.



Fig. 110. Distribution of *Ophiomitrella corynephora* in South Africa.

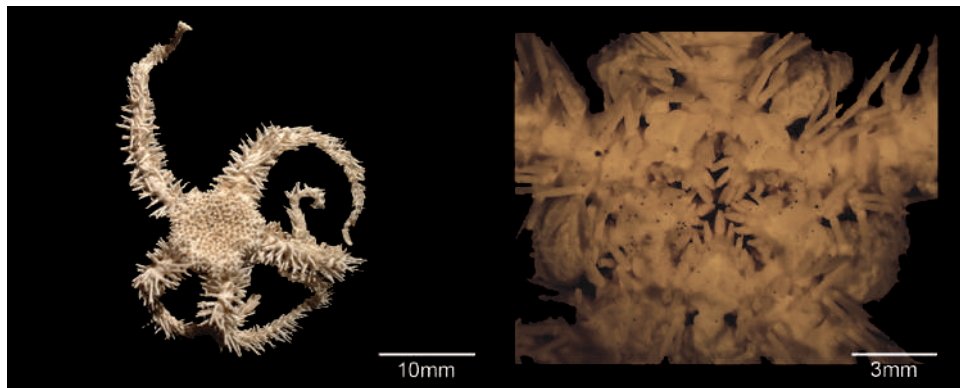


Fig. 111. Dorsal (left) and ventral (right) views of *Ophiomitrella corynephora* (SAMC A23252).

***Ophiomitrella hamata* Mortensen, 1933**

Ophiomitrella hamata Mortensen, 1933a: 333-335, figs 50, 51, pl. 19, fig. 12;
Clark & Courtman-Stock 1976: 105, 121, 169, figs 168, 178; Olbers *et al.* 2014:
16, pl. 3C.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 4 mm, D.D./A.L. = 1/3. Disc round, covered with plates bearing short rugose-tipped stumps, some plates with multiple stumps, while others have one. Radial shields no more than one-third disc radius, converging, contiguous distally only, oval in shape, longer than wide. Ventral interradial areas covered in same stumps. Oral shields diamond-shaped, wider than long, with two proximal sides slightly concave. Adoral shields large, contiguous. Jaws not sunken. Oral papillae three, large, similar in size and shape. Teeth four. Genital slits long and narrow. Dorsal arm plates rhombic, not contiguous. Ventral arm plates rhombic with very rounded obtuse distal edge, becoming almost flat in mid-arm, first ventral arm

plates fan-shaped with rounded distal edge, first two ventral arm plates narrowly contiguous. Arm spines up to five, serrated, longest not exceeding segment length. Tentacle scales single, small, pointed.

Distribution and habitat – South Africa: Waterfall Bluff (EC) to Durban (KZN); depth range: 63-900 m. Habitat: on gorgonians, including *Thouarella* species.

Remarks – Endemic to South Africa. The distribution is here extended to the Eastern Cape. Type material was located in Iziko South African Museum (syntype: SAMC A22380), type locality is off Durban, KZN, depth 412 m.



Fig. 112. Distribution of *Ophiomitrella hamata* in South Africa.

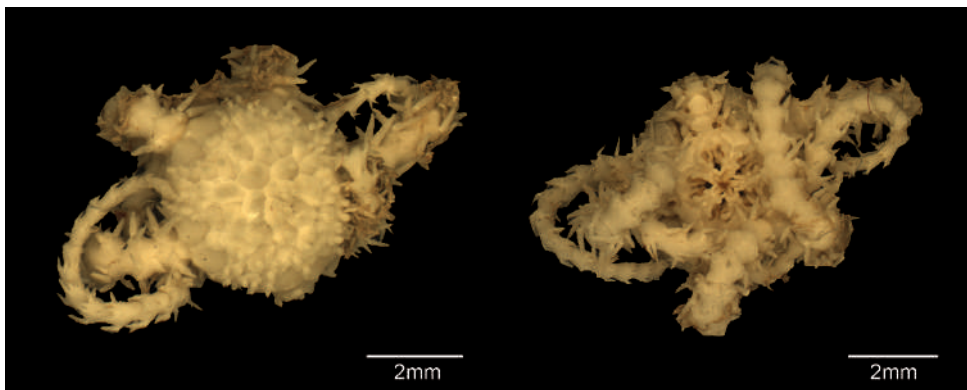


Fig. 113. Dorsal (left) and ventral (right) views of *Ophiomitrella hamata* (DNSM ECH26).

Genus '*Ophiophthalmus*'² Matsumoto, 1917

Diagnosis – Adapted from Matsumoto (1917), Koehler (1922) and Paterson (1985). Disc covered with irregular plates, may be armed with coarse granules. Radial shields naked, round or oval. Oral papillae 3-6. Teeth present in single series. Dorsal arm plates contiguous only in basal segments. Arm spines numerous, long, conical, finely serrated, do not approximate dorsally. Tentacle scale single, large, flat, elliptical leaf-shaped.

To distinguish *Ophiophthalmus* from *Ophiomitrella*, Matsumoto (1917) suggested that in *Ophiophthalmus*, the basal dorsal arm plates are contiguous and there is an absence of a fan arrangement of arm spines on the basal arm segments. Subsequently, Koehler (1922) also distinguished that the disc plates were imbricating and radial shields were naked and round. However, Paterson (1985) suggested that these characters are not reliable or consistent across all species within the genera and that a comprehensive revision of both *Ophiophthalmus* and *Ophiomitrella* is required.

'*Ophiophthalmus*' *relictus* (Koehler 1904)

Ophiacantha relictus Koehler, 1904a: 106-107, pl. 17, figs 4-6.

Ophiacantha oedidisca Clark, 1911: 219-221, fig. 101.

Ophiophthalmus relictus: Koehler 1922b: 124-127, pl. 9, figs 1-4, pl. 95, fig. 3; Clark A.H. 1939: 54-55; Clark 1977: 130, 140; Baker 1979: 39; Rowe & Gates 1995: 375; O'Hara & Stöhr 2006: 134.

Diagnosis – Adapted from Koehler (1904), Clark (1911) and Koehler (1922). D.D. up to 12 mm, D.D./A.L. = 1/5. Disc round, tumid or swollen, covered in closely-packed minute granules, but not touching each other, granules may have thorns. Radial shields well-separated, naked, oval, longer than wide. Ventral interradial areas covered in same granules, but not as dense. Oral shields diamond-shaped, wider than long, with two proximal sides slightly concave. Adoral shields narrow, long, straight, contiguous. Oral papillae 3-4, long, flat, pointed. Genital slits long. Dorsal arm plates triangular, may be contiguous basally, wider than long, distal margin of basal plates may have granules like those on disc. First ventral arm plates small, wider than long, but narrow distally, plates becoming squarish, their outlines becoming indistinct, not contiguous. Lateral arm plates fairly small, not meeting dorsally or ventrally. Arms flexible dorsoventrally. Arm spines up to six, usually five, thorny, stout, short, upper two longest, longer than one segment in length, lowest arm spine with rough tips, arm spines do not reach to mid-dorsal arm. Tentacle scale single, small, pointed.

Distribution and habitat – Western Indian Ocean, Gulf of Aden, Japan, Indonesia, and northern Tasman Sea (Baker 1979; Rowe & Gates 1995), South Africa: Richards Bay (KZN) to Black Rock (KZN); depth range: 100-2194 m. Habitat: mud, fine grey sand, foraminifera, small stones, epizoic.

² Paterson (1985) correctly stated that *Ophiophthalmus* is a junior homonym of a reptilian genus described by Fitzinger (1843). A replacement name is required.

Remarks – Type material is in the Naturalis (ZMA.ECH.O.2351- ZMA.ECH.O.2359) and the type locality is Indonesia; depth unknown.



Fig. 114. Distribution of '*Ophiophthalmus*' *relictus* in South Africa.

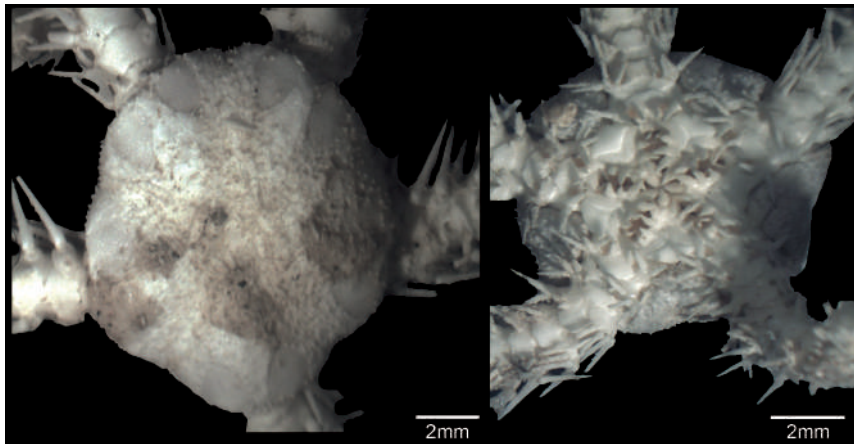


Fig. 115. Dorsal (left) and ventral (right) views of '*Ophiophthalmus*' *relictus* (SAMC A22929).

Genus *Ophioplinthaca* Verrill, 1899

Diagnosis – Adapted from Verrill (1899a). Interradial areas deeply constricted, centre of disc deeply concave, disc plates large, no armament on ventral interradian areas. Disc marginal and submarginal plates large and specialised. Radial shields large, naked. Oral shields contiguous with first lateral arm plates. Arm spines long, thorny, not approximating dorsally. First tentacle pore large, with one or two tentacle scales.

***Ophioplinthaca papillosa* H.L. Clark, 1939**

Ophioplinthaca papillosa Clark H.L., 1939: 49-51, figs 10, 11; Clark 1977: 135, 140-141.

Diagnosis – Adapted from Clark (1939). D.D. up to 10 mm, A.L. 50-60 mm, D.D./A.L. = 1/5. Disc tumid, but deeply concave in centre and constricted in interradial areas. Disc covered with irregular plates. Centre of disc with distinct thorny stumps terminating in 2-6 sharp teeth. Margin and interradial areas may have scattered stumps including inside creases. Radial shields large, narrow, naked, length just more than half disc radius. Ventral interradial areas small and covered in disc plates with no stumps. Genital slits wide and moderately long, but do not reach disc margin. Oral shields diamond-shaped, wider than long. Adoral shields fairly wide, contiguous. Oral papillae 3-4, subequal, narrow, long, pointed. Arms five. Dorsal arm plates broadly bell-shaped, distal margin convex, not contiguous. Ventral arm plates small, wider than long, proximal margin almost straight, proximal edge slightly concave, not contiguous. Lateral arm plates large, meeting dorsally and ventrally. Arm spines up to seven, not approximating dorsally, uppermost two longest, usually equal to three segments, but in one specimen (SAMC A22918) uppermost spine on second segment six times segment length, lowermost spine shortest and also exceeds one segment length, tapering, finely serrated. Tentacle scale single, moderately large, flat, pointed.

Distribution and habitat – Gulf of Aden and Maldives area (Clark H.L. 1939), South Africa: off Richards Bay (KZN); depth range: 1000-1200 m. Habitat: most *Ophioplinthaca* species are epizoic on corals.

Remarks – A single damaged specimen from North of Nhlabane (KZN) from 1000-1200 m was available for examination.

The type material is in Natural History Museum (BMNH 1948.5.26.36-8) with a paratype also in the Museum of Comparative Zoology (MCZ OPH-6009), type locality Maldives, depth 914-1646 m.



Fig. 116. Distribution of *Ophioplinthaca papillosa* in South Africa.

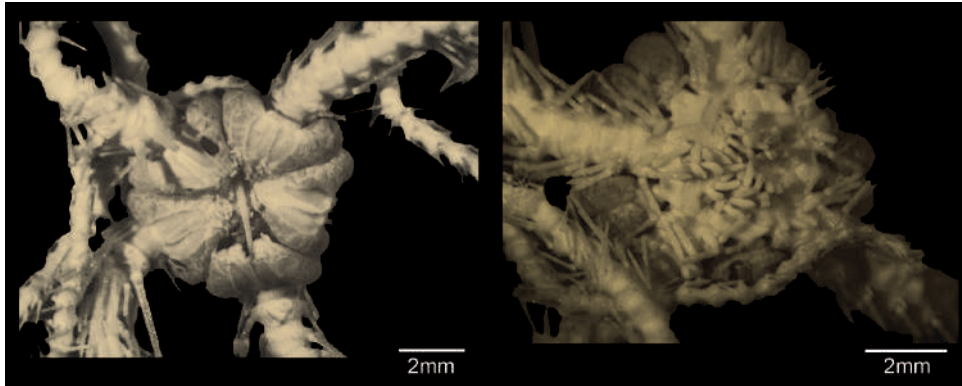


Fig. 117. Dorsal (left) and ventral (right) views of *Ophioplinthaca papillosa* (SAMC A22918).

Ophioplinthaca rudis (Koehler, 1897)

Ophiomitra rudis Koehler, 1897: 358-360; Koehler 1899: 65; pl. 7, figs 58, 59.

Ophioplinthaca rudis: Koehler 1904a: 132; Clark 1915a: 211; Koehler 1922b: 142-147, pl. 24, figs 1-6, pl. 96, fig. 1; Clark H.L. 1939: 46-47; Clark 1977: 135, 141; Imaoka *et al.* 1990: 17, 79; Rowe & Gates 1995: 375; O'Hara & Stöhr 2006: 85-86, fig. 9A-C.

Ophiomitra cardiomorpha Clark, 1911: 179-180, fig. 81.

Diagnosis – Adapted from Koehler (1922) and Clark (1977). D.D. up to 16 mm. A.L. 90 mm, D.D./A.L. = 1/5-6. Disc tumid, but not deeply concave in centre, interradiial areas constricted. Disc covered with irregular plates and spines. Disc centre with distinct long spines, disc margin spines conical, present adjacent to radial shields but absent or sparse elsewhere. Radial shields large, triangular, twice as long as wide, slightly more than half disc radius, separated for entire length, but approximating distally. Ventral interradiial areas heart-shaped, covered in smooth plates. Oral shields diamond-shaped, as long as wide or slightly wider, with distal lobe. Adoral shields large, contiguous. Oral papillae 5-6, all pointed except proximal- and second proximal-most, which are flattened. Apical papillae larger than other oral papillae. Genital slits distinct. Dorsal arm plates fan-shaped, twice as wide as long, distal margin slightly convex or straight, contiguous basally. Ventral arm plates triangular, wider than long, distal edge straight, longer than proximal edge, lateral margins concave, diverging distally, only first two basal plates contiguous. Lateral arm plates large, meeting dorsally and ventrally relatively narrowly. Arms five, wide compared to other ophiacanthids. Arm spines up to seven, slender, long, uppermost 3-4 segments in length, sharp, lowermost being blunt, shortest and more serrated than others, spines do not approximate to dorsal midline. Tentacle scale single, moderately large, thick, sharply pointed. Colour in life red (Imaoka *et al.* 1990).

Distribution and habitat – Indo-West Pacific (Clark 1977; Imaoka *et al.* 1990; Rowe & Gates 1995), South Africa: Richards Bay (KZN) to Black Rock (KZN); depth range: 165-3124 m. Habitat: recorded from mud and sand, but in reality probably living on corals.

Remarks – Koehler (1897) included incorrect figures in the original description (plate 9; figures 75 and 76) which caused some confusion and led to Clark H.L. (1911) describing the species as new, *Ophiomitra cardiomorpha*. Later, Clark H.L. (1939) noted this error and included photographs of *Ophioplinthaca rudis*.

O'Hara & Stöhr (2006) designated a lectotype (ZSI 8581/6), type locality Bay of Bengal, depth 1450 m and noted that the “form of the long slender spines is very characteristic of this species”. A paralectotype is also present in the Natural History Museum (BMNH 98.7.11.17).



Fig. 118. Distribution of *Ophioplinthaca rudis* in South Africa.

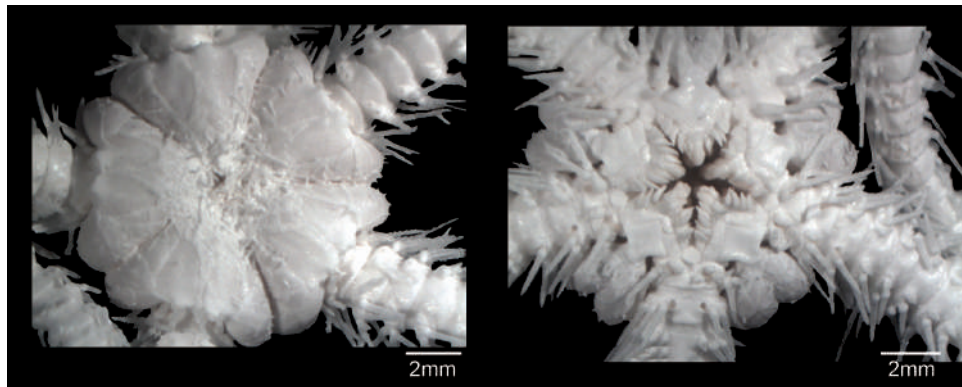


Fig. 119. Dorsal (left) and ventral (right) views of *Ophioplinthaca rudis* (SAMC A22913).

***Ophioplinthaca sexradia* Mortensen, 1933**

Ophioplinthaca sexradia Mortensen, 1933a: 326-327, fig. 45; Clark & Courtman-Stock 1976: 105, 121, 170.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 2.5 mm. A.L. up to 12 mm. D.D./A.L. = 1/ 4-5. Disc tumid, slightly concave in centre and interradial areas constricted. Disc covered with irregular plates, granules and stumps, mainly towards centre of disc. Dorsal interradial areas almost not present due to large radial shields. Radial shields large, triangular, approximating, contiguous distally, more than half disc radius in length. Ventral interradial areas almost not-existent as deeply constricted. Oral shields rhombic with obtuse distal edge, slightly wider than long. Adoral shields large, contiguous, wider distally. Oral papillae three, distalmost broader. Genital slits short. Dorsal arm plates triangular, not contiguous, distal edge slightly convex. Ventral arm plates pentagonal, wider than long, distal edge convex. Lateral arm plates meeting dorsally and ventrally. Arms six. Arm spines up to four, thick, short, tapering, shorter than single segment. Tentacle scale small, single, pointed.

Distribution and habitat – South Africa: East London (EC); depth range: 44 m. Habitat: on gorgonians.

Remarks – Endemic to South Africa. No material is housed in the Iziko South African Museum collection. Type material in the Natural History Museum of Denmark (syntype: ZMUC OPH-278) and the type locality is near East London, depth 44 m.



Fig. 120. Distribution of *Ophioplinthaca sexradia* in South Africa.

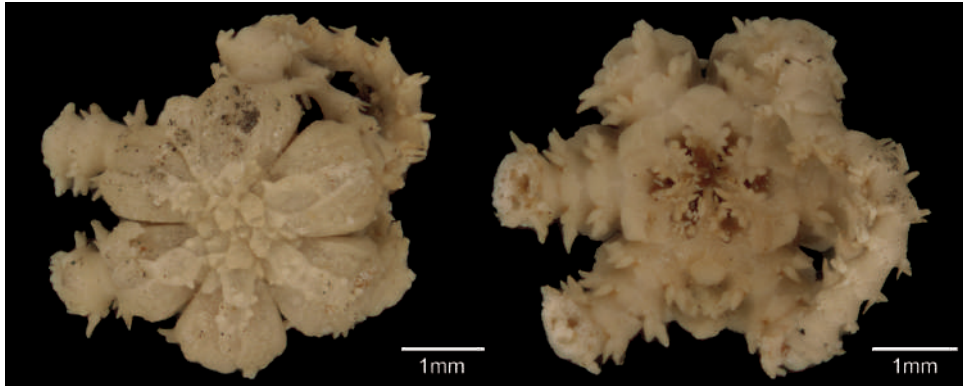


Fig. 121. Dorsal (left) and ventral (right) views of *Ophioplinthaca sexradia* (ZMUC OPH-278).

4.4.3. Family OPHIODERMATIDAE Ljungman, 1867

Genus *Cryptopelta* H.L. Clark, 1909

Diagnosis – Adapted from Clark (1909). Disc, radial shields, interradial areas, oral shields, adoral shields and arm bases usually covered in fine granules. Arm spines up to seven, short and appressed. Oral papillae numerous, distal papillae wide and blunt, proximal papillae sharp and narrow. Teeth few, narrow. Genital slits two per interradius. Tentacle scales one.

Cryptopelta aster (Lyman, 1879)

Ophiopelta aster Lyman, 1879: 50, pl. 14, figs 395-397, Lyman 1882: 12, pl. 21, figs 16-18.

Cryptopelta aster Clark 1909: 131; Clark 1923: 350-351; Mortensen 1933a: 376-379, figs 78a, 79a, 80a, d, pl. 19, fig. 21; Clark & Courtman-Stock 1976: 106, 124, 182, fig. 204.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 13 mm, D.D./A.L. = 1/3. Disc pentagonal, flat, covered dorsally and ventrally in fine granules extending onto basal arm segments. Granules covering adoral shields, jaws and oral shields, granulation on jaws slightly coarser. Oral papillae eight or nine, in series with second oral tentacle scale, proximal-most papillae narrower and more pointed, distal-most ones broad. Madreporite naked. Genital slits one, not reaching disc margin. Dorsal arm plates fan-shaped, broadest near middle, wider than long, distal edge convex. Ventral arm plates bell-shaped, distal edge convex. Arm spines up to seven, sometimes eight, less than half segment length. Tentacle scale one, oval. Colour in life cream or orange to brick-red on the disc, orange and red, mottled, arms banded.

Distribution and habitat – South Africa: Cape Town (WC) to off Shaka's Rock (KZN); depth range: 75–421 m. Habitat: rock, shell, sand and coral.

Remarks – The records from Sulu Islands (Philippines) and Pternoster Islands (Indonesia) cited by Clark (1909) are unconfirmed as they are not cited anywhere else. Therefore, *Cryptopelta aster* may be endemic to South Africa.

The type material is presumably in the Natural History Museum (BMNH) and the Museum of Comparative Zoology (syntype: MCZ OPH-155), type locality is Agulhas Bank, depth 274 m.



Fig. 122. Distribution of *Cryptopelta aster* in South Africa.

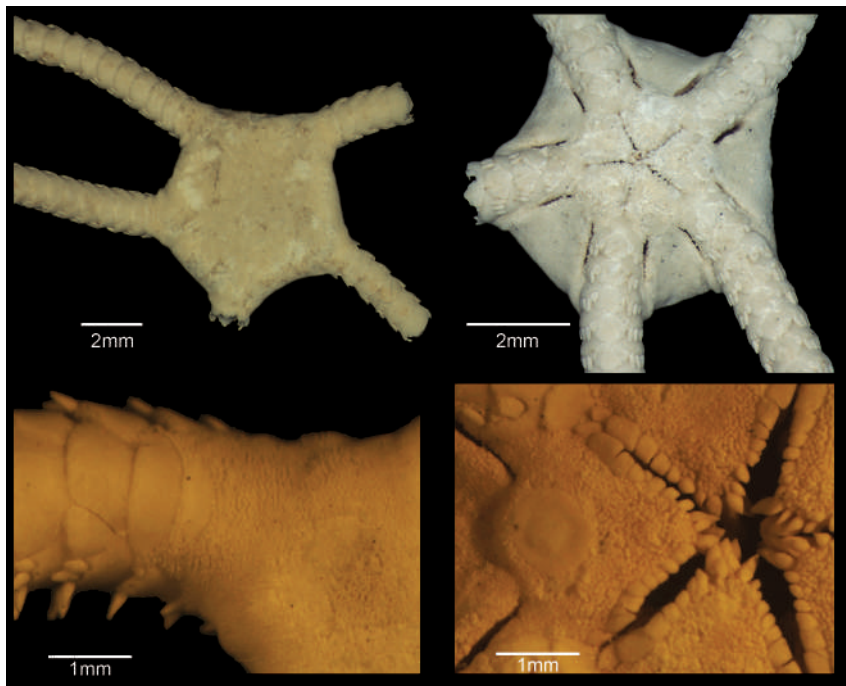


Fig. 123. Dorsal whole (top left), ventral disc (top right), dorsal basal arms (bottom left), jaws (bottom right) views of *Cryptopelta aster* (SAMC A23236).

Genus *Ophiodyscrita* H.L. Clark, 1938

Diagnosis – Adapted from Clark (1938). Disc covered in granules extending over arms both dorsally and ventrally, as well as over the entire oral surface of disc and oral frame. Disc margin with large plates. Genital slits two per interradius. Tentacle scales two, sometimes three proximally.

Ophiodyscrita acosmeta H.L. Clark, 1938

Ophiodyscrita acosmeta Clark, 1938: 356-357; Clark 1946: 265; Clark & Rowe 1971: 88-89, 128; Rowe & Gates 1995: 399; Price & Rowe 1996: 79; Lane *et al.* 2000: 483; Marsh & Morrison 2004: 295, 298, 302, 306, 312, 337; Olbers *et al.* 2015: 107, pl. 7E, F.

Ophiocryptus pacificus Murakami, 1943a: 188-189, fig. 10.

Ophiostegastus compsus Clark, 1968: 317-321, fig. 10.

Diagnosis – Adapted from Clark (1938). D.D. up to 8 mm. Disc round to pentagonal, covered with small, slightly-indented granules completely covering dorsal and ventral side. Granules on oral shields, adoral shields, supplementary oral shields and dorsal, ventral and lateral arm plates. Radial shields also concealed, some granules slightly enlarged over marginal area. Oral shields ovate to spearhead-shaped, wider than long. Oral papillae 6-7, flattened. Genital slit up to two-thirds to margin of disc. Arms slightly flattened. Dorsal arm plates D-shaped, twice as wide as long, with rounded distal edge, with two more-or-less conspicuous whitish patches on distal edge of each plate, covered with granules similar to those on disc. Ventral arm plates more-or-less rhombic, becoming bell-shaped with distal edges round, not contiguous distally. Lateral arm plates slightly projecting. Arm spines up to eight, appressed, short, less than half segment length. Tentacle scales ovate, up to three basally, inner one largest, two becoming one toward distal segments of arm. Colour in life brown and grey dorsally, ventrally lighter, dorsal disc patchy light and dark, arms with dark bands of 3-5 segments.

Distribution and habitat – China, Japan and Australia (Clark & Rowe 1971), South Africa: Sodwana Bay (KZN); depth range: 0-23 m. Habitat: no information available.



Fig. 124. Distribution of *Ophiodyscrita acosmeta* in South Africa.

Remarks – Olbers *et al.* (2015) noted this species as a new record for South Africa.

The type material is in the Museum of Comparative Zoology (holotype: MCZ OPH-5294), type locality is Broome, Australia, depth unknown.

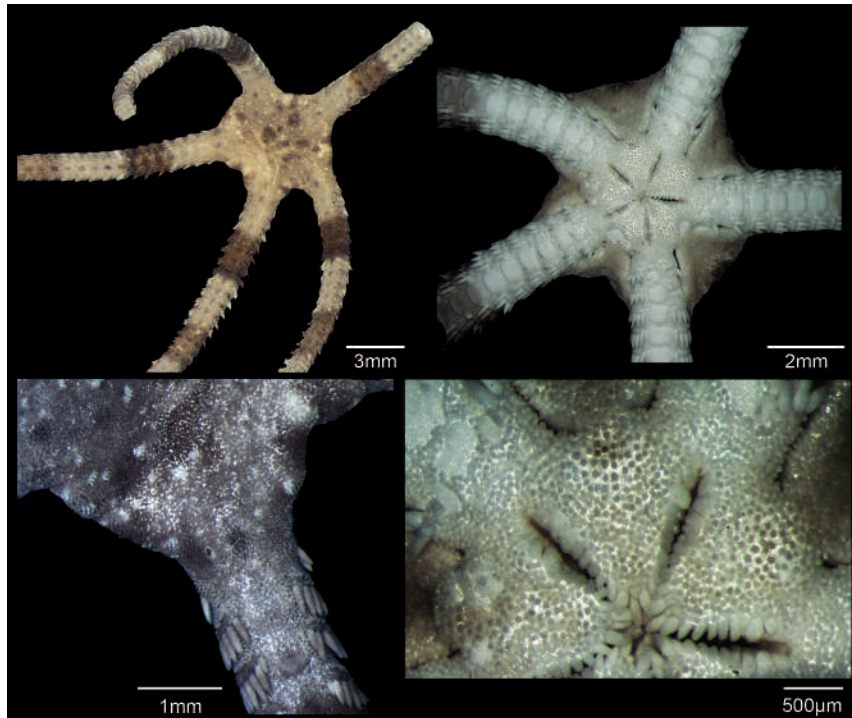


Fig. 125. Dorsal whole (top left), ventral disc (top right), dorsal basal arms and disc (bottom left), jaws (bottom right) views of *Ophiodyscrita acosmeta* (RMCA MT2183).

Genus *Ophiarachnella* Ljungman, 1872

Diagnosis – Adapted from Ljungman (1872) and Clark (1909). Disc granulated. Radial shields naked. Oral shields large, naked. Supplementary oral shields present, naked. Oral papillae large, numerous and close-set. Teeth in vertical series. Genital slits two per interradius. Arm spines smooth, more than five, shorter than arm segments. Tentacle scales two.

Ophiarachnella capensis (Bell, 1888)

Pectinura capensis Bell, 1888: 282, pl. 16, figs 3, 4.

Ophiarachnella capensis: Clark 1923: 351; Mortensen 1933a: 380-381, fig. 82, Stephenson *et al.* 1937: 380; Stephenson *et al.* 1938: 18; Stephenson 1944: 347; Clark 1955: 24, fig. 4b; Day 1959: 544; Day 1969: 184; Day *et al.* 1970: 81; Clark & Courtman-Stock 1976: 106, 124, 182, fig. 200, 205; Olbers *et al.* 2014: 17, pl. 3D.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 19 mm, D.D./A.L. = 1/5. Disc covered both dorsally and ventrally by granules. Radial shields naked, oval or pear-shaped, longer than wide. Oral shields naked, triangular or spearhead-shaped. Supplementary oral shields naked, as wide as oral shield. Adoral shields small, with slightly less granules, not contiguous. Jaws and / or oral plates covered in granules, slightly coarser than disc granules. Oral papillae 7-8, in series with the second oral tentacle scale, proximal papillae becoming narrower and pointed. Dorsal arm plates hexagonal, broadest near their distal ends, distal edge slightly convex, broadly contiguous. Ventral arm plates square with distal edge convex, broadly contiguous. Arm spines up to seven, short and conical, lowest less than half segment length. Tentacle scales two, oval. Colour, irregular dark spot or blotch in middle of disc, arms banded with broad bands.

Distribution and habitat – Vema Seamount (Clark & Courtman-Stock 1976), South Africa: Langebaan (WC) to Kosi Bay (KZN); depth range: 0-92 m. Habitat: rock, sand, shell and under stones.

Remarks – Range here extended from Cape Town (WC) to Langebaan (WC) to the west and from Amatikulu (KZN) to Kosi Bay (KZN) to the east. The type locality is Cape of Good Hope, depth unknown. This species is closely related to the common Indo-Pacific complex *Ophiarachnella gorgonia*.



Fig. 126. Distribution of *Ophiarachnella capensis* in South Africa.

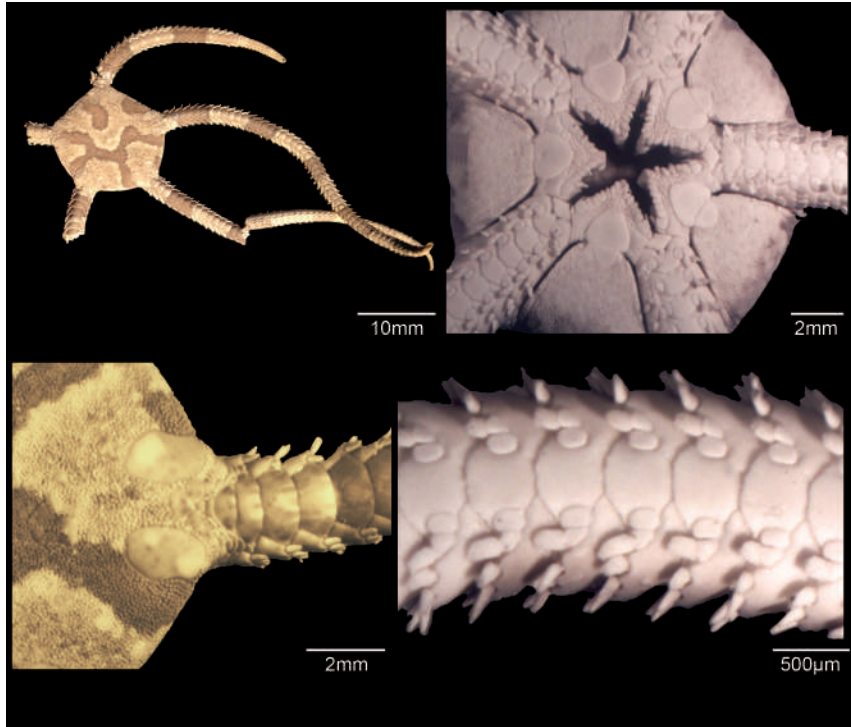


Fig. 127. Dorsal whole (top left), ventral disc (top right), dorsal disc and basal arms (bottom left), ventral arm (bottom right) views of *Ophiarachnella capensis* (SAMC A084228).

***Ophiarachnella gorgonia* (Müller & Troschel, 1842)**

Ophiarachna gorgonia Müller & Troschel, 1842: 105.

Pectinura gorgonia: Lütken 1869: 15; Lyman 1882: 15; Koehler 1898b: 59, pl. 2, figs 1, 2.

Pectinura marmorata Lyman, 1874: 222, pl. 5, figs 1-7.

Pectinura venusta de Loriol, 1893a: 16-19, pl. 23, fig. 3.

Ophiarachnella gorgonia: Clark 1909: 123-124; Matsumoto 1917: 323-324, pl. 6, fig. 7; Clark 1921: 141-142, pl. 12, fig. 5, pl. 35, figs 4, 5; Koehler 1922b: 339-340; Clark 1932: 209; Clark 1946: 260-261; Clark 1965: 66; Clark & Rowe 1971: 88, 125, fig. 42b, pl. 20, fig. 2; Cherbonnier & Guille 1978: 217-218, pl. 15, figs 5, 6; Sloan *et al.* 1979: 111; Tortonese 1980: 129; Humpreys 1981: 10; Irimura 1982: 66, 67, fig. 39, pl. 13, fig. 6; Guille & Vadon 1985: 64; Marsh *et al.* 1993: 62; Liao & Clark 1995: 281-282, fig. 156, pl. 19, figs 2, 3; Rowe & Gates 1995: 396; Putschakarn & Sonchaeng 2004: 423; Olbers *et al.* 2015: 109-110, pl. 8E, F.

Ophiarachnella marmorata: Clark 1915a: 305.

Diagnosis – Adapted from Cherbonnier & Guille (1978). D.D. up to 19 mm. Disc round, with slight indentations on both sides at base of arms, covered in rounded granules dorsally and ventrally, peripheral granules slightly elongated. Radial shields naked, ovate, longer than wide, relatively small. Granules on ventral interradial areas closely packed up to oral shields and onto jaws. Oral shields naked, pentagonal, large, supplementary oral shields distal to each oral shield, D-shaped, often equal to length of oral shield. Adoral shields small, not contiguous, triangular. Oral papillae oval and flattened, distalmost broadest. Teeth 4-5, lowermost square, others pointed. Genital slits reach disc margin, genital papillae absent, but disc granulation to slit edge. Arms triangular in cross section for more than half arm length. Arm spines up to 11, appressed to arm, tapering, approximately half segment length. Dorsal arm plates elliptical proximally, twice as wide as long, broadly in contact, becoming fan-shaped and narrowly in contact in distal parts. Distal edge on proximal-most segments sometimes scalloped. Ventral arm plates hexagonal, distal edge convex, becoming flattened distally, wider than long proximally, but longer than wide distally. Tentacle scales two for most of arm length, inner one oval and long, outer one rectangular and slightly pointed. Colour in life, disc green, brown and white with patches both dorsally and ventrally, radial shields may be mottled white, arms banded dark green and white, ventrally uniformly white, with white patches on interradial areas. Arm spines similar in coloration to arm segments.

Distribution and habitat – Western Indian Ocean and associated islands, Red Sea, East Indies, Sri Lanka, Bay of Bengal, Thailand, China, Japan, Philippines, Australia and South Pacific Islands (Clark & Rowe 1971; Rowe & Gates 1995), South Africa: Aliwal Shoal (KZN) to Kosi Bay (KZN); depth range: 0-50 m. Habitat: under *Porites* colonies over gravel, beneath encrusting coral colonies, rubble and among algae.

Remarks – Hoareau *et al.* (2013) found three clades within *O. gorgonia*, two from the Western Indian Ocean. Based on the colour morphology, it is believed that this species is from Hoareau's lineage number two (Tim O'Hara, pers. comm.). However, sequencing the South African *O. gorgonia* specimens would be required



Fig. 128. Distribution of *Ophiarachnella gorgonia* in South Africa.

to confirm these findings. Olbers *et al.* (2015) noted this species as a new record for South Africa.

One paratype is in the Museum of Comparative Zoology (MCZ OPH-135), type locality is Bohol, Philippines, depth 14-18 m.

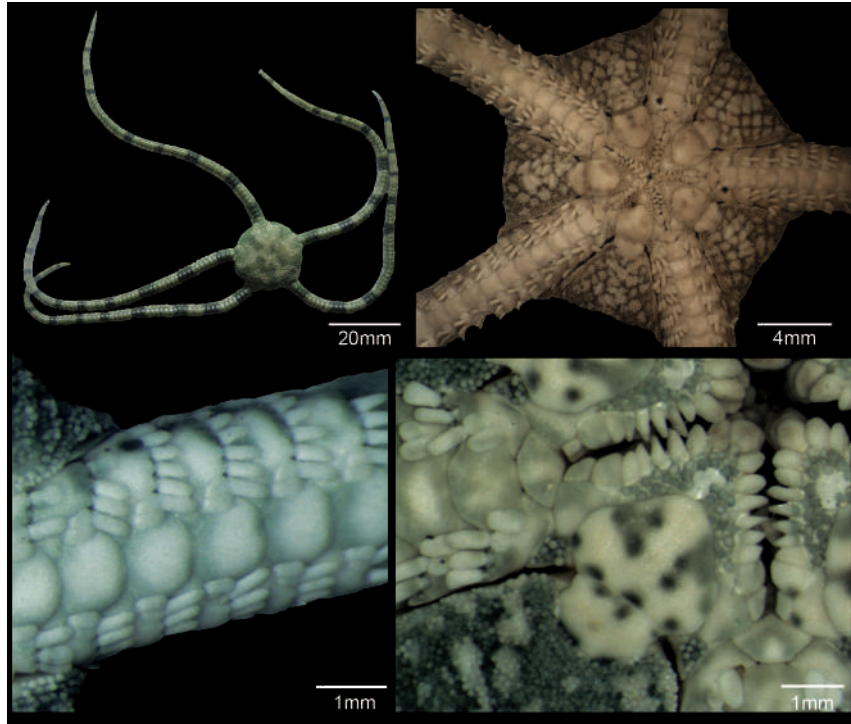


Fig. 129. Dorsal whole (top left; SAMC A081608), ventral disc (top right; RMCA MT2144), arm spines and ventral arms (bottom left; RMCA MT2322), jaw (bottom right; RMCA MT2322) views of *Ophiarachnella gorgonia*.

Genus *Ophiochasma* Grube, 1868

Diagnosis – Adapted from Grube (1868) and Clark (1909). Disc covered in granules. Radial shields naked, very large, widely separated. Oral shields distinct, no granulation. Ventral interradial areas small. Arm spines short, rarely exceeding segment length, more or less appressed to the arm. Genital slits two per interradius. Tentacle scales two, at least basally, outer scales sometimes overlapping base of lowest arm spine.

Ophiochasma nitida Hertz, 1927

Ophiochasma nitida Hertz, 1927a: 116-117, pl. 9, figs 13, 14; Mortensen 1933a: 216; Clark & Courtman-Stock 1976: 106, 124, 183 and 260, fig. 267a, b.

Diagnosis – Adapted from Clark & Courtman-Stock (1976). D.D. up to 12 mm, D.D./A.L. = 1/6. Disc covered in granules, easily rubbed off. Radial shields very large, naked, oval, widely separated, but not by more than arm width. Oral papillae 7-9, in series with second oral tentacle scale, distalmost oral papillae broader. Oral shields naked, hexagonal or elliptical leaf-shaped with rounded edges, short distal lobe, longer than wide. A disc scale that appears to be a supplementary oral shield, D-shaped, may or may not be covered in granules, longer than wide. Adoral shields naked on lateral parts, but covered in granules. Genital slits single. Dorsal arm plates broad, hexagonal, surface convex. Ventral arm plates broad, octagonal, or the three distal sides forming a continuous round edge or curve. Arm spines up to ten, short, no more than half segment length, tapering, lower spines blunter than others, appressed to arms or slightly projecting. Tentacle scales two.

Distribution and habitat – South Africa: Agulhas Bank (WC); depth range: 86-102 m. Habitat: no information available.



Fig. 130. Distribution of *Ophiochasma nitida* in South Africa.

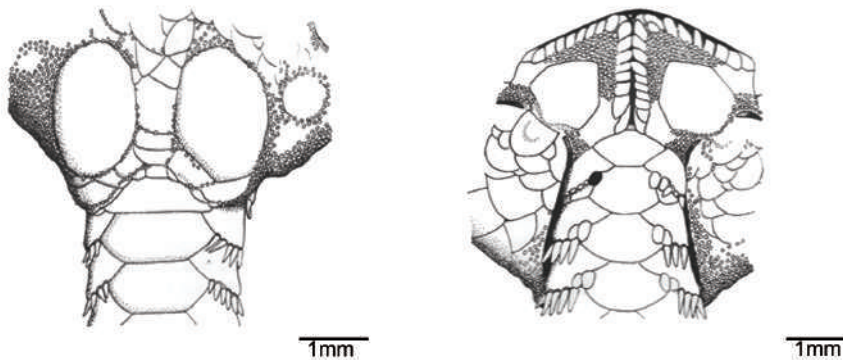


Fig. 131. Radial shields (left) and jaws and ventral arm plates (right) views of *Ophiochasma nitida* (ZMB 1623/1936 (538/1)), syntype, from Clark & Courtman-Stock (1976).

Remarks – Endemic to South Africa. No material was available for examination in the Iziko South African Museum collection and only three specimens are known. Type material is in the Museum of Natural History of Berlin (syntype: ZMB 1623/1936 (538/1)) and the type locality is Agulhas Banks, depth 86 m.

Genus *Ophioderma* Müller & Troschel, 1840

Diagnosis – Adapted from Müller & Troschel (1840) and Ziesenhenne (1955). Disc plates flat. Genital slits four per interradius. Arms more than twice length of disc.

Ophioderma wahlbergii Müller & Troschel, 1842

Ophioderma wahlbergii Müller & Troschel, 1842: 87; Clark 1923: 353; Mortensen 1933a: 382; Ziesenhenne 1955: 187, 189.

Ophiura wahlbergii Lyman 1865: 10; Lyman 1882: 10.

Ophioderma wahlbergi (lapsus calami): Ljungman 1867: 305; Clark & Courtman-Stock 1976: 106, 124, 183-184, 262-263, figs 206, 276c, d.

Ophioderma leonis Döderlein, 1910: 252-253, pl. 5, figs 1, 1a; Mortensen 1933a: 381-382; Day 1969: 184; Grindley & Kensley 1966: 12; Stöhr *et al.* 2009: 1, 18.

Diagnosis – Adapted from Clark & Courtman-Stock (1976) and Mortensen (1933a). D.D. up to 38 mm, D.D./A.L. = 1/3. Disc round, densely covered in round, flattish granules both dorsally and ventrally, extending to oral plates or jaws. Radial shields either naked or partly naked, small, oval. Oral papillae 5-6, in series with oral tentacle scale, elliptical leaf-shaped, slightly pointed, distalmost broader, Teeth broad but not square. Oral shields naked, oval to spearhead-shaped with distal lobe, approximately as wide as long, or slightly wider. Supplementary oral shields absent. Adoral shields small, not contiguous. Genital slits two, short, no genital papillae. Arms usually five, up to seven. Dorsal arm plates elliptical rectangular, more than twice as long as wide, distal edges mostly straight, but may be slightly concave, may be divided in some basal plates. Ventral arm plates hexagonal, convex distally, as wide as long, contiguous. Arm spines up to seven (exceptionally eight or nine), conical, blunt, shorter than segment. Tentacle scales two, oval. Colour in life grey, brown, dark brown, may have patterns on disc, arms not banded, lighter ventrally.

Distribution and habitat – Namibia (Branch *et al.* 2010), South Africa: Orange River (NC) to Danger Point (WC); depth range: 0-75 m. Habitat: shell, sand and stones.

Remarks – Type material is in the Museum of Natural History of Berlin (syntype: ZMB Ech 838 and ZMB Ech 839) and the holotype was lodged by Müller & Troschel in the Swedish Museum of Natural History (SMNH-Type-3292). The type locality is Port Natal (Durban), depth unknown.

Numerous authors (Mortensen 1933a; Clark 1923 and Ziesenhenne 1955) report that the type locality (Port Natal) is probably incorrect and that this is probably an

endemic SW African species. Given the specimens collected up to now, which have all been from Atlantic waters in the Western and Northern Cape, the record from KZN is considered incorrect.

Stöhr *et al.* (2009) referred to a South African ophiidermatid as *Ophioderma leonis*, however, this had been synonymised by Clark & Courtman-Stock (1976), based on the syntypes of Döderlein's *Ophioderma leonis*.

The reproduction and brooding behaviour of this species has been comprehensively studied by Landschoff (2014), Landschoff *et al.* (2015) and Landschoff & Griffiths (2015).



Fig. 132. Distribution of *Ophioderma wahlbergii* in South Africa.

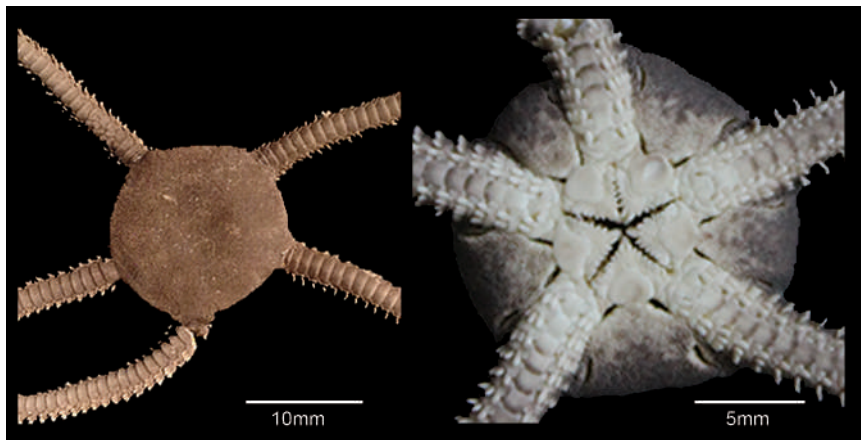


Fig. 133. Dorsal (left) and ventral (right) views of *Ophioderma wahlbergii* (SAMC A084232).

4.4.4. Family OPHIOPEZIDAE O'Hara *et al.*, 2018

Genus *Ophiochaeta* Lütken, 1869

Diagnosis – Adapted from Cherbonnier & Guille (1978) and Lyman (1882). Disc densely covered in small spines and or granules, radial shields concealed by same disc armament, no supplementary oral shields present. Oral papillae numerous, up to 14. Teeth various shapes, pointed, sharp or square. Genital slits two per interradius. Arm spines numerous, up to ten.

Ophiochaeta hirsuta Lütken, 1869

Ophiochaeta hirsuta Lütken, 1869: 38, 71; Clark 1915a: 222; Clark & Rowe 1971: 127, fig. 44a, b; Gibbs *et al.* 1976: 129; Sloan *et al.* 1979: 115; Marsh *et al.* 1993: 62; Rowe & Gates 1995: 398; Price & Rowe 1996: 78; Olbers *et al.* 2015: 105, pl. 7A, B.

Ophiochaeta boschmai Clark, 1964: 388-340, fig. 2.

Diagnosis – Adapted from Clark & Rowe (1971) and Sloan *et al.* (1979). D.D. up to 7 mm. D.D./A.L. = 1/4. Disc pentagonal, completely covered in indented granules and long, thin spinelets both dorsally and ventrally, spinelets densest on ventral interradiial areas close to oral shields. Oral shields and adoral shields may have granules, but few if present. Radial shields concealed by granulation and spinelets. Marginal plates covered by rounded and enlarged granules, disc spines dense on disc margin. Oral shields triangular, slightly longer than wide; no supplementary oral shields. Adoral shields large, triangular, not contiguous. Oral papillae 5-6, pointed. Teeth three, lowermost bluntly pointed, second square and uppermost pointed. Genital slits single, up to half-way to margin, genital papillae absent. Dorsal arm plates triangular, distal edge straight, proximally narrowly contiguous, distally not contiguous. Ventral arm plates pentagonal, distal edge straight or somewhat convex. Arm spines up to 12, tapering, subequal, all shorter than one segment length. Tentacle scales oval, two proximally, but one along most of arm. Colour in life grey to brown, mottled, arms banded with dark brown, light brown and white.



Fig. 134. Distribution of *Ophiochaeta hirsuta* in South Africa.

Distribution and habitat – Western Indian Ocean, Red Sea, Indo-Malayan region, Australia, South Pacific Islands (Clark & Rowe 1971; Rowe & Gates 1995; Richmond 2002), South Africa: Sodwana Bay (KZN) to Kosi Bay (KZN); depth range: 0-26 m. Habitat: associated with *Porites* coral colonies or on sandy gravel in lagoonal sea grass beds (Sloan *et al.* 1979).

Remarks – Olbers *et al.* (2015) noted this species as a new record for South Africa.

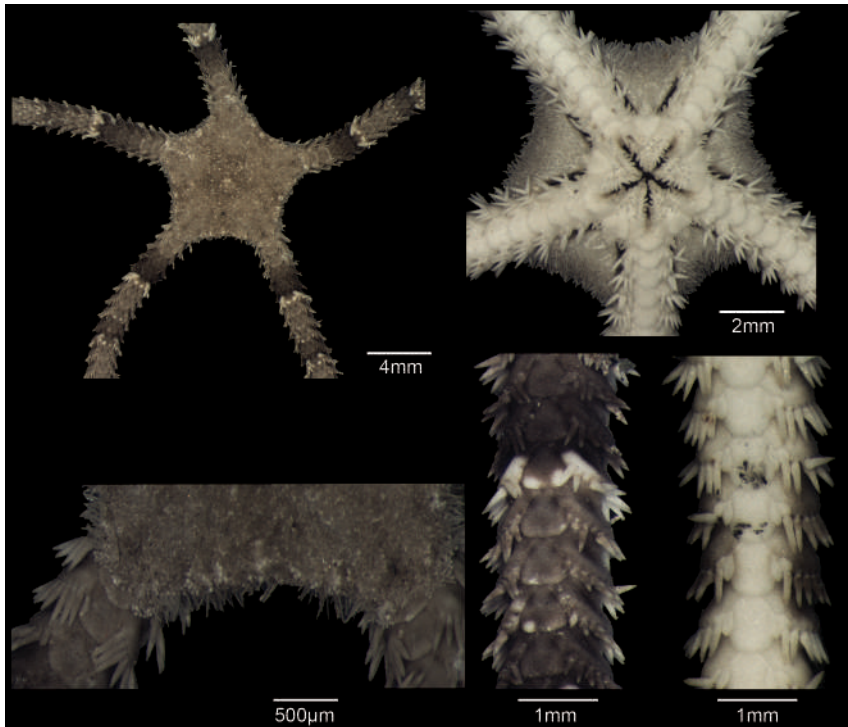


Fig. 135. Dorsal whole (top left), ventral disc (top right), dorsal interradial area (bottom left), dorsal arms (bottom centre), ventral arms (bottom right) views of *Ophiochaeta hirsuta* (RMCA MT2290).

Genus *Ophiopeza* Peters, 1851

Diagnosis – Adapted from Peters (1851), Lyman (1882) and Vail & Rowe (1989). Disc granulated, plates coarse, overlapping. Marginal plates enlarged, usually covered in granules. Radial shields obscured by granules. Jaws covered in granules. Oral shields naked, supplementary oral shields present. Genital slits two per interradius. Dorsal arm plates fan-shaped to rectangular, arm spines never exceeding single segment length, usually appressed. Tentacle scales one or two; smaller scale covering or overlapping base of lowest arm spine.

Ophiopeza fallax fallax Peters, 1851

Ophiopeza fallax Peters, 1851: 465-466; Lyman 1865: 39; Ljungman 1867: 305; Lyman 1874: 221; Studer 1882: 4; Lyman 1882: 13; de Loriol 1893a: 4, pl. 23, fig. 1; Clark & Rowe 1971: 90-91, 127; Clark & Courtman-Stock 1976: 106, 124, 184; Cherbonnier & Guille 1978: 225-226, pl. 17, figs 1, 2; Sloan *et al.* 1979: 115; Tortonese 1980: 129; Vine 1986: 195; Mbongwa 2013: 16.

Pectinura fallax: Clark 1909: 119; Clark 1915a: 303, pl. 18, figs 9, 10; Koehler 1930: 270.

Ophiopezella decorata Mortensen, 1933a: 379-380, fig. 81, pl. 19, fig. 24; Balinsky 1957: 28; Kalk 1958: 238; Macnae & Kalk 1969: 106, 130.

Ophiopeza fallax fallax: Clark 1968: 312-313, fig. 9c; Vail & Rowe 1989: 275, fig. 4.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 15 mm; D.D/A.L. = 1/3-3.5. Disc pentagonal, covered in dense coat of granules, closely packed up to oral shields (seldom on oral shields), extending onto jaws and basal dorsal arm segments. Marginal plates few, large and puffy. Radial shields concealed by granulation. Oral shields truncated, oval, wider than long, marbled white and brown; supplementary oral shields distal to each oral shield, small, normally covered by granulation. Adoral shields present, relatively small and usually covered in granules. Oral papillae 8-9. Oral tentacle scale single. Teeth four, lowermost squarish, becoming pointed. Genital slits almost reaching disc margin, no genital papillae but disc granulation continues up to genital slits. Dorsal arm plates broadly fan-shaped, wider than long, round distal edge becoming narrowly contiguous distally. Ventral arm plates fan-shaped, but distal edge angle more obtuse than for dorsal arm plates. Arm spines up to 13, conical, short, lowest spine longest, barely as long as segment length if at all, more or less appressed to arm. Tentacle scales two basally, inner one relatively large, ovate becoming pointed at distal end of arm, almost twice as long as outer one. Colour, disc grey to brown, mottled, sometimes with patchy patterns, arms banded.

Distribution and habitat – Mozambique, Tanzania, Madagascar, Philippines (Clark & Rowe 1971; Cherbonnier & Guille 1978), South Africa: Aliwal Shoal (KZN) to Bhanga Nek (KZN); depth range: 0-64 m. Habitat: under boulders over sand, under stones, on reef.



Fig. 136. Distribution of *Ophiopeza fallax fallax* in South Africa.

Remarks – Distribution range in South Africa here extended from Durban (KZN) (from synonym *Ophiopezella decorata*) south to Aliwal Shoal (KZN). Syntype in the Museum of Natural History of Berlin (ZMB Ech 973). The type locality is Quirimbas Island, Mozambique, depth unknown.

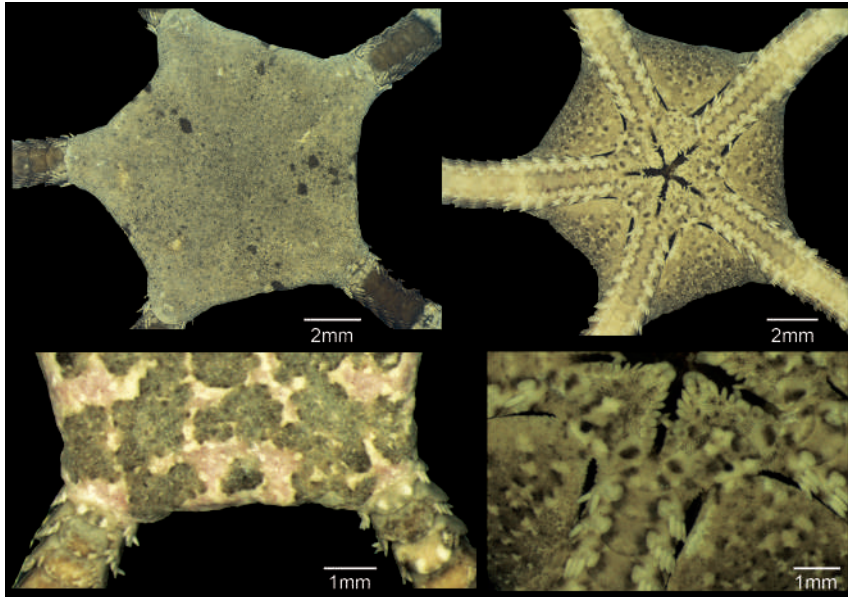


Fig. 137. Dorsal disc (top left), ventral disc (top right), dorsal interradial area (bottom left), jaws (bottom right) views of *Ophiopeza fallax fallax* (RMCA MT2251).

***Ophiopeza spinosa* (Ljungman, 1867)**

Ophiarachna spinosa Ljungman, 1867: 305.

Ophiopeza fallax Lütken, 1869 (non Peters 1851): 35.

Ophiopezella dubiosa de Loriol, 1893a: 7, pl. 23, fig. 2; Clark 1909: 120; Clark 1915a: 304.

Ophiopezella luetkeni de Loriol, 1893b: 392-394, pl. 13, fig. 1.

Ophiopeza dubiosa: Clark 1968: 313.

Ophiopeza spinosa: Clark & Rowe 1971: 90-91, 127, fig. 44e; Gibbs *et al.* 1976: 130; Cherbonnier & Guille 1978: 227-228, pl. 17, figs 3, 4; Tortonese 1980: 129; Humpreys 1981: 10; Marsh 1986: 71; Vine 1986: 195; Vail & Rowe 1989: 273-275, fig. 3; Marsh *et al.* 1993: 62; Liao & Clark 1995: 285-286, fig. 159; Rowe & Gates 1995: 400-401; Mbongwa 2013: 16; Olbers *et al.* 2015: 107, 109, pl. 8A, B.

Ophiopezella spinosa: Clark 1909: 120; Clark 1915a: 304; Clark 1921: 141; Koehler 1922b: 338-339; Clark 1946: 258.

Distichophis clarki Ely, 1942: 46-48, fig. 12.

Diagnosis – Adapted from Cherbonnier & Guille (1978). D.D. up to 11 mm. Disc pentagonal, covered with dense coat of small, indented granules, closely packed up to oral shields, extending onto jaws. Disc margin with small, inflated plates in interradial areas. Radial shields concealed by granulation. Oral shields spearhead-shaped, supplementary oral shields not covered by granulation, adoral shields present, relatively large, not contiguous, not distinct, covered in granules. Oral papillae 6-7, elliptical leaf-shaped, pointed but blunt. Teeth four. Genital slits reach half-way to disc margin, genital papillae absent. Dorsal arm plates broadly fan-shaped basally, wider than long, but rounded on distal edge, becoming more



Fig. 138. Distribution of *Ophiopeza spinosa* in South Africa.

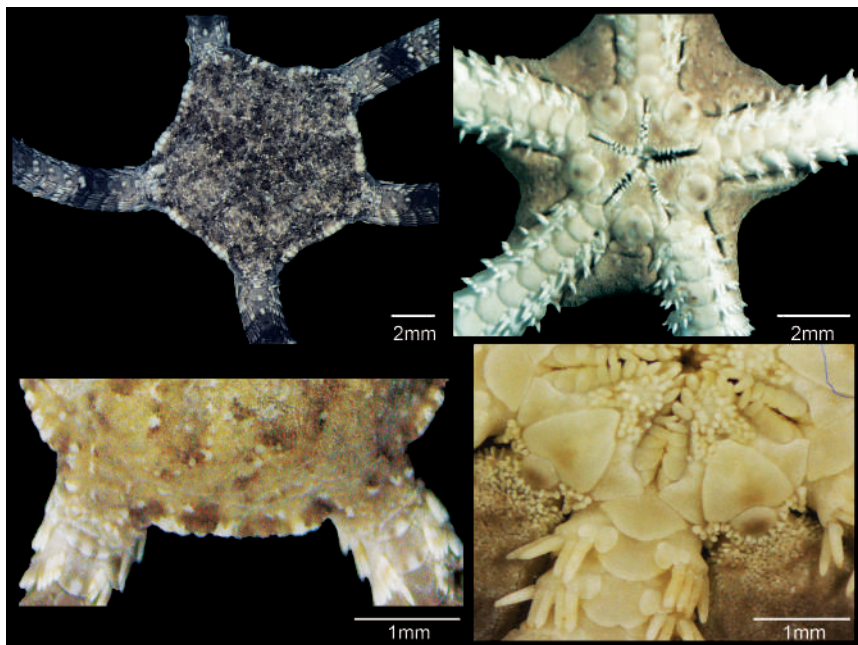


Fig. 139. Dorsal disc (top left), ventral disc (top right), dorsal interradial area (bottom left), jaws (bottom right) views of *Ophiopeza spinosa* (RMCA MT2284).

typical fan-shaped distally, not contiguous distally. Ventral arm plates bell- or fan-shaped, narrowly contiguous. Arm spines up to 12, conical, short, half segment length, slightly longer basally, appressed. Tentacles scales two for most of arm length, inner one large, ovate, almost twice as long as outer one. Colour in life, disc grey to brown yellow, sometimes with patchy patterns, arms banded and marbled.

Distribution and habitat – Western Indian Ocean, Mauritius, Aldabra, Seychelles, Red Sea, Mascarene Basin, South East Polynesia, Hawaii (Tortonese 1980; Rowe & Gates 1995), South Africa: Leadsman Shoal (KZN) to Kosi Bay (KZN); depth range: 0-74 m. Habitat: found under rocks and coral rubble, among mixed algae and on coral reefs.

Remarks – Olbers *et al.* (2015) noted this species as a new record for South Africa. The syntypes are in the Swedish Museum of Natural History (*Ophiarachna spinosa*: SMNH-Type-1424) and the type locality is Foa, Tonga, depth unknown.

4.4.5. Family OPHIOMYXIDAE Ljungman, 1867

Genus *Ophiomyxa* Müller & Troschel, 1842

Diagnosis – Adapted from Müller & Troschel (1842) and Lyman (1882). Disc and arms covered in thick, naked skin with few, thin underlying plates. Radial shields flattened. Oral shields more or less distinct. Oral papillae usually very broad, finely serrated, glassy and flattened. Dorsal arm plates whole or fragmented. Arm spines stout, spiny. Tentacle scales absent.

Mortensen (1927) placed the type specimen of *Ophiodera serpentaria* (Lyman 1883) into *Ophiomyxa*, thereby making *Ophiodera* the synonym of *Ophiomyxa*. Clark (1952) ignored this synonymy and described a new species as *Ophiodera punctata*. According to Franklin & O'Hara (2008), regardless if the synonymy is accepted, there is some merit in the characters being shared, i.e., shape of oral plates and the long arm spines becoming serrated on distal segments, which have proved useful in identifying different species.

Ophiomyxa australis Lütken, 1869

Ophiomyxa australis Lütken, 1869: 45, 98, 99; Lyman 1882: 246; Koehler 1907: 341, Benham 1909: 101; Clark 1915a: 168, pl. 1, figs 1-2; Clark 1916: 77; Matsumoto 1917: 19-21, fig. 3, pl. 1, figs 4-7; Clark 1932: 203; Clark 1938: 201, pl. 13, figs 1-21; Clark H.L. 1939: 36-37; Clark 1946: 170-171; Madsen 1967: 141; Clark & Rowe 1971: 78, 92-93, pl. 13, figs 3, 4; Devaney 1974: 115-116; Cherbonnier & Guille 1978: 18-19, pl. 3, figs 1, 2; Sloan *et al.* 1979: 99, figs 5, 6; Irimura 1982: 2-4, fig. 1; Guille & Vadon 1985: 62; Marsh 1986: 70; Sastry 1991: 375-376; Liao & Clark 1995: 155, fig. 64; Rowe & Gates 1995: 406; Mbongwa 2013: 15; Olbers *et al.* 2015: 89, pl. 1E, F.

Ophiomyxa brevispina von Martens, 1870: 249-50; de Loriol 1893b: 425-426; Döderlein 1896: 298, pl. 17, fig. 27; Koehler 1905a: 119; Clark 1915a: 170, pl. 1, figs 1, 2; Koehler 1930: 48.

Ophiomyxa robillardi de Loriol, 1893a: 53-54, pl. 25, fig. 5.

Ophiomyxa brevispina var. *irregularis* Koehler, 1898b: 111-112.

Ophiomyxa irregularis Koehler, 1905a: 119-120, pl. 12, fig. 1; Koehler 1922b: 17-20, pl. 2, fig. 18, pl. 5, figs 1, 2, pl. 6, fig. 4, pl. 92, fig. 2; Koehler 1930: 48.

Diagnosis – Adapted from Cherbonnier & Guille (1978). D.D. up to 23 mm. Disc pentagonal, covered with thick, opaque, smooth skin. Radial shields short, narrow, separated by width of arm base. Row of overlapping plates along disc margin. Genital slits bordered by plates similar to ones on disc margin, long, narrow. Oral shields oval, triangular, covered by thick skin, longer than wide, abutting genital slit. Oral papillae three, broad, serrated, flattened and transparent on edges. Teeth similar. Arms five, covered in thick, naked skin. Arm spines up to seven, one on segment one, then two and four on first free arm segments. Arm spines slender, serrated and rugose at tip, some becoming curved or slightly hooked. Dorsal arm plates irregular, fragmented, becoming less fragmented distally. Ventral arm plates distinctly wider than long, deep notch on distal side, not contiguous distally. True tentacle scales absent, tube of ossicles surrounding tube foot present. Colour in life blood-red dorsally and ventrally, arms lightly banded with yellow.

Distribution and habitat – East Africa and associated Islands, Madagascar, Mascarene Basin, Red Sea, Seychelles, New Zealand (Stöhr 2007d), Indo-West Pacific (Rowe & Gates 1995), South Africa: Mbashe River (EC) to Dog Point (KZN); depth range: 11-75 m. Habitat: in sand, grey ooze, coral, stones, gravel, mud, sandstone rubble, gorgonians.

Remarks – First reported in South Africa by Olbers *et al.* (2015). Genetic data indicates that this widespread ‘species’ is a complex of related forms, and the South African population is not conspecific with *O. australis* from Southern Australia (type locality ‘... inter Australian et Tasmaniam’, ZMUC OPH-474). The nearest type locality within this complex is *Ophiomyxa robillardi* from Mauritius.



Fig. 140. Distribution of *Ophiomyxa australis* in South Africa.

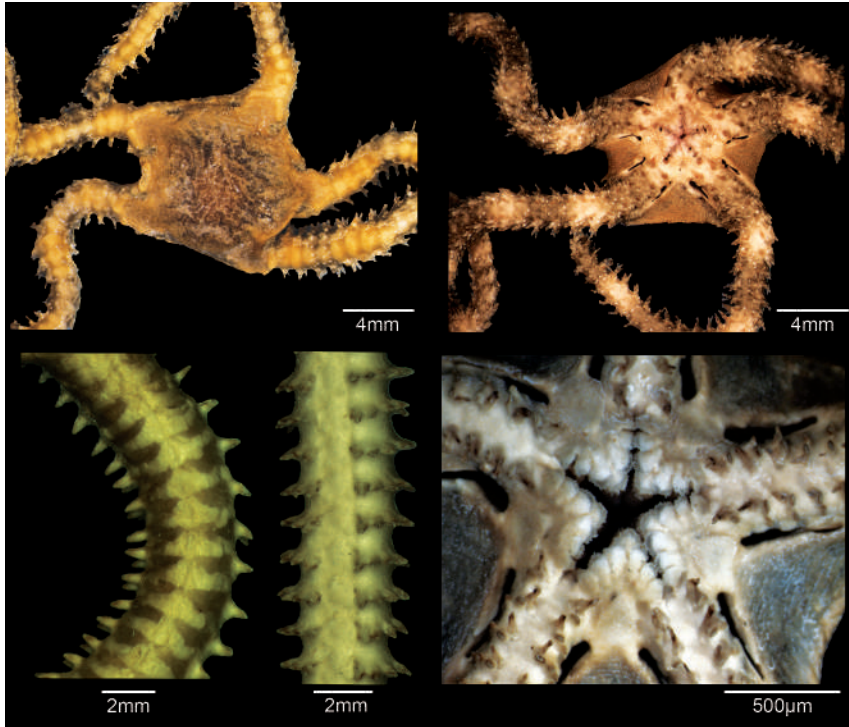


Fig. 141. Dorsal whole (top left), ventral whole (top right), dorsal arm plates (bottom left), ventral arm plates (bottom left), jaws (bottom right) views of *Ophiomyxa australis* (RMCA MT2274).

***Ophiomyxa bengalensis* Koehler, 1897**

Ophiomyxa bengalensis Koehler, 1897: 363-364, pl. 9. figs 70, 71; Koehler 1922b: 17, pl. 5, figs 5, 6; pl. 92, fig. 1; Koehler 1930: 48; Mortensen 1933a: 306-309, fig. 31; Clark & Courtman-Stock 1976: 134, 111, figs 98, 101.

Diagnosis – Adapted from Mortensen (1933a) and Clark & Courtman-Stock (1976). D.D. up to 30 mm, D.D./A.L. = 1/6-7. Disc pentagonal, covered with thick skin with white embedded ossicles, giving the disc a speckled appearance. Radial shields shorter than width of arm base, narrow. Oral shields oval, with distal lobe. Adoral shields narrow, not contiguous. Oral papillae 3-4, most pointed or rarely broad, serrated, flattened, some tapering to a point and transparent on edges. Teeth broad, serrated and translucent on edges. Dorsal arm plates whole, much longer than wide. Ventral arm plates equally wide and long, with deep distal notch. Arms simple, five, long, covered in thick skin. Arm spines 3-4, long, slender, serrated and rugose at tip, uppermost spine stout, one spine on first two segments, then two spines and 3-4 on free segments. Genital slits long, narrow, approximately

three-quarters length of interradial area, bordered by long plates. Tentacle scales absent. Colour in life red to orange.

Distribution and habitat – Andaman Islands, China Sea, Kei Islands (Koehler 1922b; Koehler 1930), South Africa: Treasure Beach (KZN) to Amatikulu (KZN); depth range: 33-1962 m. Habitat: fine, grey mud.

Remarks – The two specimens on hand were from a trawler and were quite damaged. This is the only ophiomyxid in South Africa that has pointed oral papillae and an oral shield with a distal lobe, absent in *O. tenuispina* and *O. australis*. The location of the type material is unknown, but the type locality is Andaman Islands, India, depth 316-457 m (Clark & Courtman-Stock 1976).



Fig. 142. Distribution of *Ophiomyxa bengalensis* in South Africa.

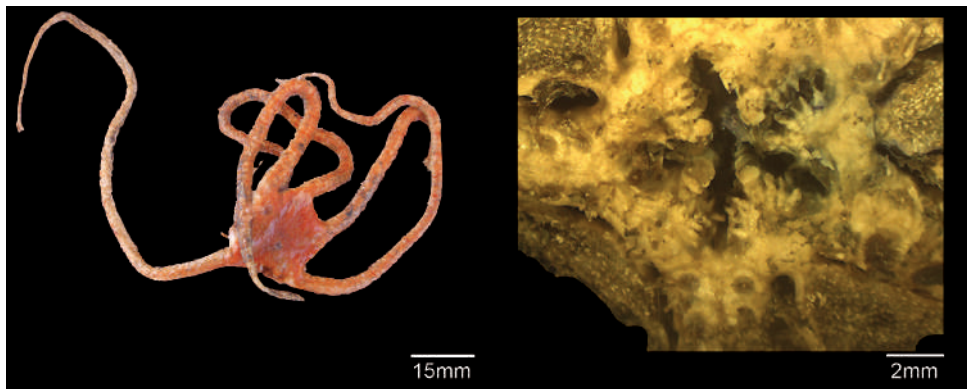


Fig. 143. Dorsal (left) and ventral (right) views of *Ophiomyxa bengalensis* (SAMC A084233).