

STUDIES ON INDIAN ECHINODERMS - 8 ON A NEW GENUS
OPHIOLEGANS (OPHIUROIDEA : OPHIURIDAE) WITH NOTES
ON *OPHIOLEPIS SUPERBA* H. L. CLARK, 1938*

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ABSTRACT

Ophiolepis cincta Muller and Troschel which differs markedly from the other species of *Ophiolepis* is removed to a new genus *Ophioelegans* due to the presence of disc scales and dorsal arm plates with a row of small scales surrounding them. Type species of *Ophiolepis*, *O. superba* H. L. Clark is also described in detail.

INTRODUCTION

UNDER the genus *Ophiolepis* Muller and Troschel, 1840 six species viz., *Ophiolepis cardioplax* Murakami, *O. cincta* Muller and Troschel, *O. irregularis* Brick, *O. nodosa* Duncan, *O. rugosa* Koehler, *O. superba* H. L. Clark and *O. unicolor* H. L. Clark are known from the shallow water (upto 20 metres) of Indo-West Pacific region (A.M. Clark and Rowe, 1971). Of these species *O. nodosa* is here removed to the genus *Ophioteichus* H. L. Clark, 1938 since it agrees in every respect with the new genus described by H. L. Clark (1938). It is surprising that H.L. Clark (1946) does not include *O. nodosa* under his new genus *Ophioteichus* while writing on the Australian echinoderms. In the remaining six species *O. cincta* stands out distinctly separate from the other species since the scales on the dorsal and ventral side of the disc are surrounded by a row of small scales. The dorsal arm plates are also separated by a row of small scales. Because of these differences *O. cincta* is removed to a new genus

Ophioelegans. The type species of *Ophiolepis* is *O. superba* H. L. Clark, 1938. The photographs of *Ophiolepis superba* and *Ophioelegans cincta* are given in Plates I and II to show the contrast.

I am grateful to Dr. S. Jones, former Director of C. M. F. R. Institute who introduced me to the study of these interesting organisms. I thank Dr. E. G. Silas, Director, C. M. F. R. Institute for his kind interest and encouragement. I am also thankful to Miss. A. M. Clark of the British Museum (Natural History) for her critical comments.

Ophioelegans gen. nov.

Type species : *Ophiolepis cincta* Muller and Troschel, 1842.

Diagnosis: Disc diameter upto 15 mm; dorsal and ventral scales of the disc surrounded by a row of small scales; dorsal arm plates separated from each other by a row of small scales; arms long 3.8 to 4.9 times the diameter of disc, thin and highly flexible in living condition; show very little movement in the living condition even when disturbed.

Ophioelegans cincta (Muller & Troschel) (Pl. I A)

Ophiolepis cincta Muller and Troschel, 1842, p. 90: Red Sea. Lyman, 1882, p. 19: Philippines. Duncan

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1887, p. 86: Mergui Archipelago. Bell, 1888, p. 338: Bay of Bengal. Doderlein, 1889, p. 83: Sri Lanka. Koehler, 1905, p. 16: East Indies. H. L. Clark, 1915, p. 96: Sri Lanka. Matsumoto, 1917, p. 299. H. L. Clark, 1921, p. 143: Torres Strait. Engel, 1938, p. 27: East Indies. H. L. Clark, 1946, p. 273: Australia. A. M. Clark, 1952, p. 204: Red Sea. Balinsky, 1957, p. 28: Inhaca Island. A. M. Clark and Davies, 1965, p. 603: Maldives. James, 1969, p. 57: Andamans. A. M. Clark and Rowe, 1971, pp. 90, 129. Devaney, 1974, p. 186: Southeastern Polynesia. A. M. Clark and Courtman-Stock, 1976: South Africa. Yulin, 1978, p. 95: Xisha Islands (China). Tortonese, 1979, p. 318: Saudi Arabia. James, 1983, p. 91: Port Blair (Andamans).

Material: Port Blair (South Andamans), 17 specimens, intertidal.

Description: The diameter of the disc ranges from 6 to 15 mm and the arms are 3.8 to 4.9 times the diameter of the disc which is pentagonal in shape and slightly arched. At the centre of the disc there is a circular scale around which there are small scales. The whole dorsal surface of the disc is uniformly covered by large imbricating scales which are surrounded by regular rows of smaller scales. The scales at the margin of the disc are slightly larger than those found at the centre. In a specimen of 9 mm disc diameter there are six rows of scales interradially at the margin of the disc. The radial shields are small, narrow about three times as long as wide. They are roughly oval in shape and are separated by two scales.

There are five oral papillae on each side of the jaw. The basalmost papilla is the longest and the one next to it is the largest. The rest of the three papillae gradually decrease in size towards the tip of the jaw. In some specimens the basalmost papilla is divided. The oral shields are three-sided with the posterior edge convex and the proximal edge slightly concave. The adoral shields are large, as long as the oral shield and are three-sided. They meet radially. The distal margin of the oral shield is bordered by a row of scales.

The interbrachial areas on the ventral side have large imbricating scales which are

arranged in regular rows and are surrounded by small scales. The scales bordering genital slits are smaller than those found at the middle. The genital slits are short and narrow.

The dorsal arm plates are swollen and four-sided. The distal edge is convex, the proximal edge and the sides are straight. The dorsal arm plates are separated from each other by a row of small scales. The scale which is present at the angle where the dorsal arm plate meet the lateral arm plates is large. The first dorsal arm plate is small and triangular in shape. The second and third plates are also small and narrow and are much wider than long. The proximal plates are wider than long whereas the distal arm plates are as long as wide.

The first ventral arm plate is small, narrow and is triangular in shape, with the distal edge convex. These plates overlap on one another and they are four-sided. The proximal edge is straight, the sides are concave and the distal edge is convex. The distal edge is wider than the proximal edge and they are as long as broad. At the distal end of the arm the plates are pentagonal in shape and are longer than wide. There are two flat tentacle scales for each tentacle pore.

The first three lateral arm plates do not bear any spines. From the fourth plate onwards there are three spines. All the spines are small, short and adpressed to the lateral plate.

In the living condition the disc is variegated with dull brown, dirty green and white colours. In some of the specimens some of the disc scales have very small dark brown or dirty green and white bands. The white bands are longer than the coloured bands. The ventral side is almost white in colour.

Notes on habitat: This is a common brittle star at Port Blair. They live under small stones

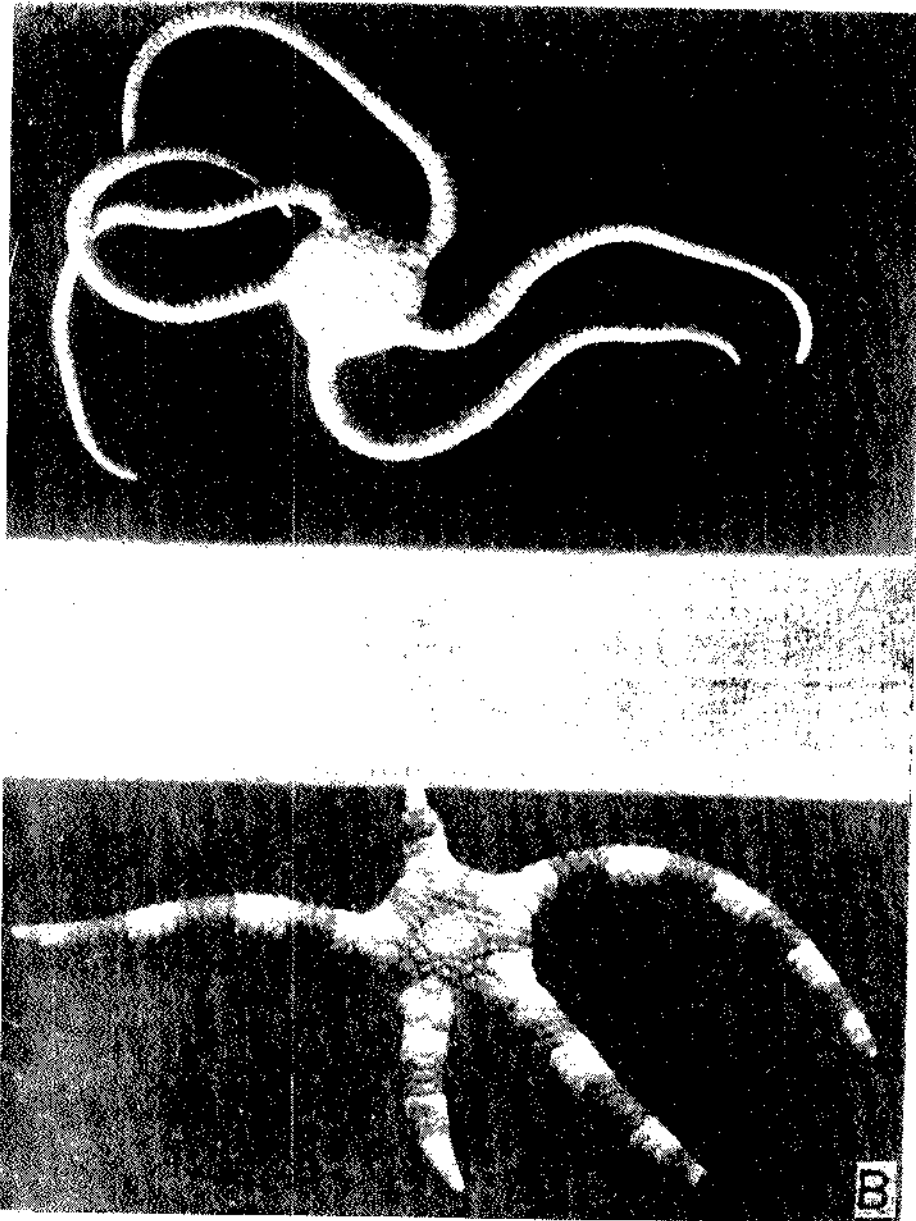


PLATE I. A. *Ophiocystis caeta* (Muller and Troschel) and B. *Ophiotepis superba* H. J. Clark showing the regenerating arms.

in the intertidal region. Often two or three are found under the same stone. It is very inactive showing very little movement. Even when disturbed it does not try to escape. The arms of the specimens are highly flexible in the living condition.

Distribution: It is known from the islands of the Western Indian Ocean, Mauritius, East African Coast, Red Sea, South East Arabia, Maldives, Sri Lanka, Bay of Bengal, East Indies, North Australia, Philippines, Japan and South Pacific Islands. It was recorded for the first time from Andamans by the author in 1969.

Remarks: In this species Sloan *et al.* (1979) found two colour forms at Aldabra which are treated as two separate subspecies. Majority of them were dark brown on the disc with some white spots or larger patches and some were drab coloured. At Port Blair (Andamans) only later colour forms were collected.

Ophiolepis suberba H. L. Clark (Pl. I B)

Ophiolepis annulosa Muller and Troschel, 1842, p. 89. Lyman, 1882, p. 19. Bell, 1887, p. 140: Andaman Islands. Doderlein, 1889, p. 831: Sri Lanka. Koehler, 1905, p. 17: East Indies. Matsumoto, 1917, p. 300: Japan.

Ophiolepis suberba H. L. Clark, 1915, p. 89: Sri Lanka. H. L. Clark, 1946, p. 272: Australia. James, 1969, p. 56: Solomon Islands. A. M. Clark and Rowe, 1971, pp. 90, 126. Yulin, 1978, p. 95: Xisha Islands (China). Tortonesc, 1979, p. 318: Saudi Arabia. James, 1983, p. 91: Port Blair (Andamans)

Material: Port Blair (South Andamans), 1 specimen; Mayabunder (North Andamans), 1 specimen, both collected from intertidal region under coral stones.

Description: The disc is pentagonal with the radial shields and other plates conspicuous. The arms are 2.1 to 2.7 times the diameter of the disc. The scales on the disc are arranged in a symmetrical manner. At the centre of

the disc there is a circular scale. Surrounding this circular scale there are five large oval scales which are radial in position and alternating with them there are five small scales which are interradial in position. The radial shields are roughly semi-circular in shape and well separated. The arrangement of the large scales is as follows. Between a pair of radials there are three large scales. In each radial area there are three large scales. In each interradial area there are four circular scales arranged in a row. On either side of this row of scales there is a row of four smaller oval scales.

The interbrachial areas on the ventral side are covered by large scales only. No regular arrangement of scales is discernible on the ventral side.

On each side of the jaw there are four oral papillae. The oral papillae are small and pointed. At the apex of the jaw there is an unpaired oral papilla. The oral shields are large and pear-shaped. The adoral shields are small and are placed at the proximal end of the oral shield.

The dorsal arm plates are thick and semi circular in shape. On either side of the dorsal arm plates there are triangular plates. The plates are not separated by supplementary plates. The distal plates are triangular.

The proximal ventral arm plates are four-sided with the distal margin expanded and drawn to a point on either side. The sides are concave and the proximal margin is straight. The distal plates are dumb-bell shaped.

The proximal lateral arm plates bear six small, smooth, short and adpressed spines. The uppermost spine is the shortest. The distal plates have only four spines. There are two tentacle scales for each tentacle pore.

It is one of the most beautiful ophiuroids. In the living condition it is cream coloured

with light purple star-shaped marking on the disc. The star shaped purple marking covers whole of the disc and has a small round cream-coloured patch at the centre. The arms of the star-shaped figure lie in the interradial position. The arms are also banded with light purple and cream-coloured markings. In the large specimen (d. d. 19 mm) there are eight bands of equal length alternating with each other. In the smaller specimen (d.d. 15 mm) there are five bands. The ventral side is white with light purple starshaped figure in the interradial areas. The markings of the light

purple bands of the dorsal side are seen at the sides on the ventral side of the arm.

Remarks: The thick arms are liable for damage. The smaller specimen collected from Port Blair (Pl. I B) has two of the arms in regenerating condition.

Distribution: It is known from the islands of the Western Indian Ocean, Mauritius, East Africa, Red Sea, S.E. Arabia, Maldives, Sri Lanka, Bay of Bengal, East Indies, North Australia, Philippine Islands, Japan and South Pacific Islands.

REFERENCES

- BALINSKY, J. B. The Ophiuroidea of Ithaca Island *Ann. Natal Mus.*, 14: 1-33.
- BELL, F. J. 1887. Report on a collection of Echinodermata from the Andaman Islands. *Proc. Zool. Soc. Lond.*, 1887: 139-145.
- 1888. Report on a collection of Echinoderms made at Tuticorin, Madras by Mr. E. Thurston. *Ibid.*, 1888: 383-389.
- CLARK, A. M. 1952. The 'Manihine' Expedition to the Gulf of Aqaba, 1948-1949. VII. Echinodermata. *Bull. Br. Mus. nat. Hist. (Zool.)*, 1: 203-214.
- AND P. S. DAVIES 1966. Echinoderms of the Maldive Islands. *Ann. Mag. nat. Hist.*, (13) 8: 597-612.
- AND F. W. E. ROWE 1971. *Monograph of shallow-water Indo-West Pacific Echinoderms*. London, 238 pp.
- AND J. COURTMAN-STOCK 1976. *The Echinoderms of Southern Africa*. British Museum London, pp. 277.
- CLARK, H. L. 1915. The Echinoderms of Ceylon (other than Holothurians). *Spoila zeylan.*, 10 (37): 83-102.
- 1921. The Echinoderm fauna of Torres Strait. *Pap. Dep. mar. biol. Carnegie Instn Wash.*, 10: 223.
- DEVANEY, D. M. 1974. Shallow-water asterozoans of Southeastern Polynesia. II. Ophiuroidea. *Micronesica*, 10 (1): 105-204.
- DODERLEIN, L. 1889. Echinodermen von Ceylon. Bericht über die von den Herren Dres. Sarasin gesammelten Asteroidea, Ophiuroidea and Echinoidea. *Zool. Jb.*, 3: 882-846.
- DUNCAN, P. M. 1887. On the Ophiuridae of the Mergui Archipelago, collected for the Trustees of the Indian Museum, Calcutta by Dr. J. Anderson. *J. Linn. Soc. (Zool.)*, 21: 85-106.
- ENGEL, H. 1938. Resultats scientifiques du voyage aux Orientales Neerlandaises de LL. AA. RR. le Prince. et la Princesse Leopold de Belgique. Asteries et Ophiures. *Mem. Mus. r. Hist. nat. Belg.*, 3 (18): 3-31.
- JAMES, D. B. 1969. Catalogue of echinoderms in the reference collections of the Central Marine Fisheries Research Institute. *Bull. cent. mar. Fish. Res. Inst.* 7:51-62.
- 1983. Sea cucumber and sea urchin resources and *Beche-de-mer* industry. *Ibid.*, 34: 83-93.
- KOEHLER, R. 1905. Ophiures littorales. *Siboga Exped.*, 45 b: 1-142.
- LYMAN, T. 1882. Ophiuroidea. *Rep. scient. Results Voy. Challenger* (Zool.) 5: 1-386.
- MATSUMOTO, H. 1917. A monograph of Japanese Ophiuroidea arranged according to a new classification. *J. Coll. Sci. imp. Univ. Tokyo*, 38: 1-408.
- * MÜLLER, J. AND F. H. TROSCHEL 1840. Ueber die Gattungen der Ophiuren. *Arch. Naturgesch.*, 6 (1). 327-330.
- 1842. *System der Asteriden*. Braunschweig. pp. 134.
- TORTONESE, E. 1979. Echinoderms collected along the eastern shore of the Red Sea (Saudi Arabia). *Atti Soc. ital. Sci. nat. Museo civ. Stor. nat. Milano.*, 120 (3 & 4): 314-319.
- YULIN, L. 1978. The echinoderms of Xisha Islands, Guangdong Province, China. II. Ophiuroidea. *Studia Marina Sinica*, 12 (12): 69-102.

* Not referred to in original