SRI LANKA STARFISH

A Guide to Common Species

Illustrated with photographs, coloured drawings, and anatomical line drawings

by

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Part 1

LIST OF SPECIES

PART 1

Exported ornamental species

Acanthaster planci (Linnaeus, 1758)

"Crown of thorns starfish"

Acanthasteridae

1991, Kalpitiya, Bar Reef, 4 metres

Live coral at upper left, coral recently eaten (white) at lower left and fragmented dead coral at lower right. This starfish eats coral polyps thereby killing the coral that eventually breaks up. The coral may regenerate in time from small areas not eaten.

29.2.2004, Kalpitiya, Bar Reef

Acanthaster has numerous arms armed with 2 inch long barbed spines. When they reach pest proportions they have to be manually removed. They are able to regenerate, so cannot be killed by cutting.

Acanthaster planci, the crown-of-thorns starfish, commonly referred to by its acronym COT, periodically reaches pest proportions on coral reefs where they prey on the living coral. They are particularly attracted to branching *Acropora*, or stag horn coral. To prevent the destruction of the popular coral reef at Pigeon Islands, there have been eradication programmes carried out by various groups when the COT population increases. One such programme was implemented in 2013 by the Sri Lanka Sub-Aqua Club (SLSAC) in partnership with the Nilaveli Beach Hotel, Ypsylon Diving Centre, and the Department of Wildlife Conservation.

A few photographs taken from the report produced by the SLSAC are reproduced on the next page. The photographs were taken by Dharshana Jayawardena.

- *Acanthaster planci* is described from the Ceylon Area" in Clark & Rowe, 1971

Images from the Crown-of-Thorns Eradication Project

6th September, 2013

Implemented by the Sri Lanka Sub-Aqua Club and Associated organisations

A group of COT feeding on staghorn coral polyps. Juveniles of this species look very different—with a small central disc and long arms as opposed to the adults that have a wide central disc and short arms. The juveniles hide during the daytime within the staghorn forest, wrapped around the bases of the coral branches, emerging at night to feed on coral polyps. They are said to appear on the surface during the daytime at about three years of age.

Spears were used to collect the animals and transfer to a container. The long, barbed spines are venomous and can cause very painful injuries. Contact must be avoided. Other operators use long tongs to pick the animals up.

The collected starfish were disposed of by burying in the sand at the Pigeon Islands. The underside of the animals can be seen.

Photography by Dharshana Jayawardena

Aquilonastra burtoni (Gray, 1840)

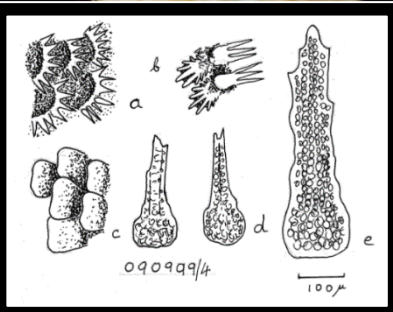
[Asterina burtoni Gray, 1840]

ASTERINIDAE

Nilaweli, Pigeon Islands, found under a small rock overhang.
9. 9. 1999
2 metres depth.

Drawing of animal in air.
Close-up photographs of aboral and oral surfaces - middle row below.
Drawing of armament with legend - bottom. R = 15 mm; r = 8 mm

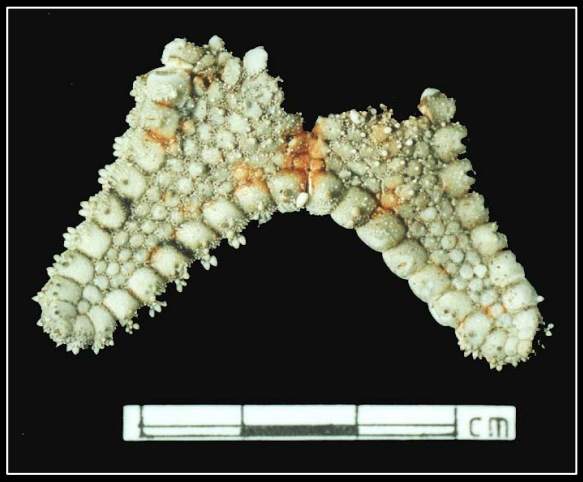
Asterina burtoni Gray, 1840
Trincomalee, Nilaveli, Pigeon Islands
a) Abactinal spines in-situ as seen through a hand lens. (Proximal to left).
(b) Two fans of furrow spines (l) and two groups of actinal spines in-situ.
(c) Abactinal plates (denuded) – prox. to l.
(d) Abactinal spines. (e) Actinal spines. (d & e to same scale)



- *Asterina burtoni* is described from the “Ceylon Area” in Clark & Rowe, 1971

Valvaster cf. *striatus* (Lamarck, 1816)

ASTEROPSEIDAE



Two fragments of a starfish collected from the beach at Beruwela in August, 2002, together with three specimens of *Acanthaster*, suggesting that they were fishing trash from a bottom-set net. The key in Clark & Rowe, 1971 came out at *Valvaster*, possibly *striatus*, a genus not reported from the Ceylon area in that publication.

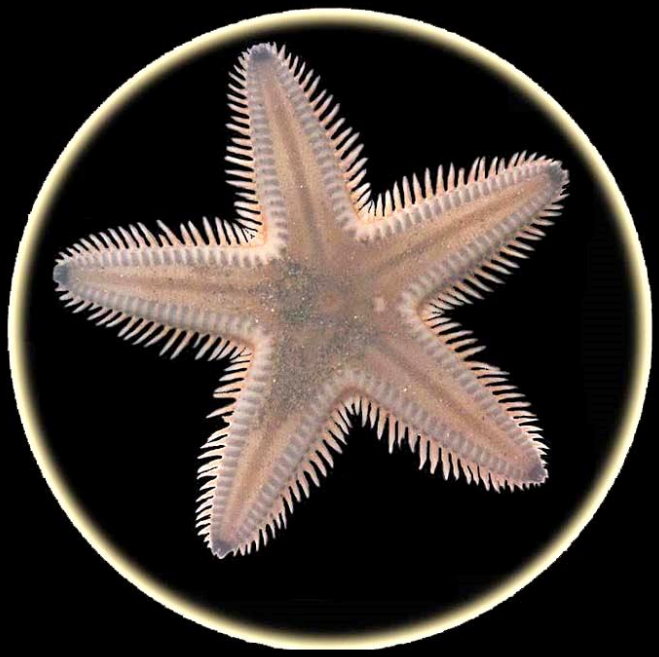
The huge marginal pedicellariae are quite striking and supported the diagnosis. The upper (abactinal) surface has lost its surface granulation and only the plates are visible. The lower image shows the actinal (under) surface. with a covering of granules—the pedicellariae are seen in the slits of the marginal plates (arrowed)

The specimen was rotting when obtained and has since fragmented further. No soft tissue was seen except for the rust-coloured patches that agree with the colour of the living animal (images in George & George p. 111/3 and Allen & Steene p. 219).

The footnote to the species in Clark & Rowe gives the type locality as Mauritius and occurrances in Hawai and Australia.

Astropecten andersoni Sladen, 1888

ASTROPECTINIDAE



R = 25 mm; r = 9 mm; br = 10 mm

Three specimens collected from the sand bottom of the Mount Lavinia Hotel Bay have been identified as *A. andersoni.* Only the largest was complete, having been collected alive and lived in an aquarium for some time, feeding on bits of boiled prawn which it ingested. These are sand dwellers, burrowing just below the surface. The grey patches seen in the image are bits of the substrate adhering to the live animal.

Although superficially like *A. vappa* it differs in arm shape and colour, as well as in the supero-marginal and infero-marginal spines.

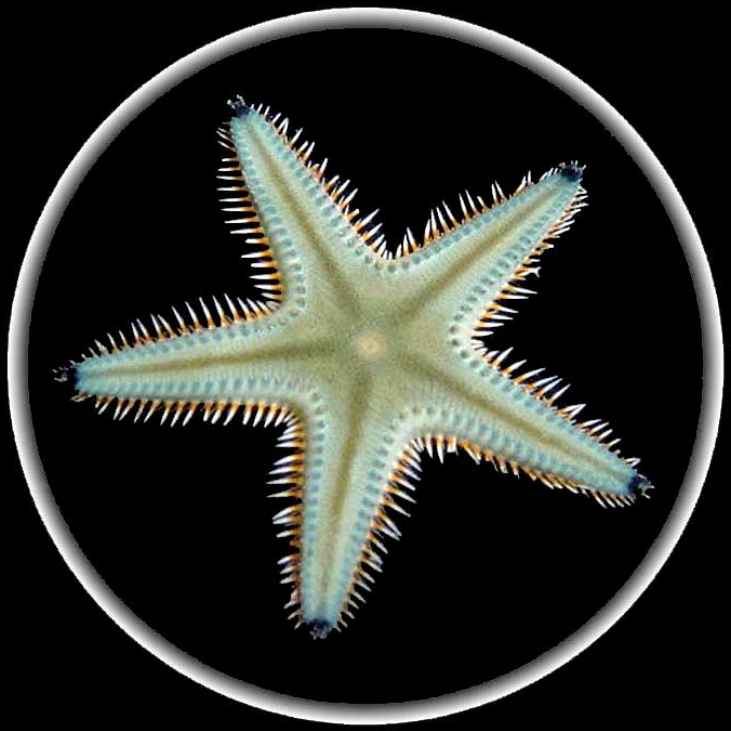
- *Astropecten andersoni* is described from the "Ceylon Area" in Clark & Rowe, 1971.

Astropecten vappa Müller & Troschel, 1843

ASTROPECTINIDAE

Puttalam lagoon, shallow water near the shore. Collected alive.

R = 23 mm; r = 8 mm; R/r = 2.88/1



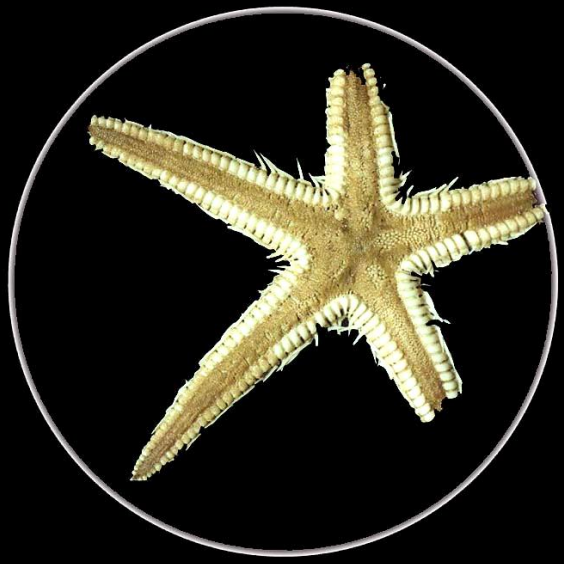
An attractive small starfish (comb sand-star or painted sand-star in internet images). Upper (aboral) surface olivaceous green with tan mid-radial rays. Arm tips black. Upward-pointing supero-marginal spine bases bright blue green. Fringing spines white with orange bases. Under (oral) surface white.

Clark & Rowe key on page 44 comes down to this species.

- *Astropecten vappa* is described from the "Ceylon Area" in Clark & Rowe, 1971

Astropecten velitaris von Martens, 1865

ASTROPECTINIDAE



R = 66 mm; r = 13 mm; br = 15 mm

Many specimens collected from the Beruwela beach over several years. Likely to be fishing trash, possibly from beach seines.

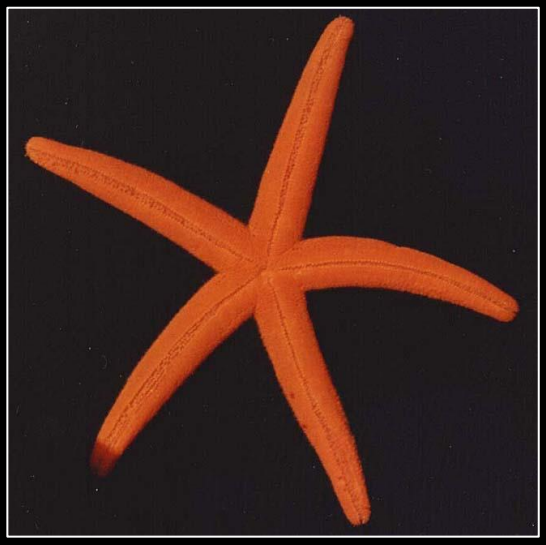
R = 62 mm; r = 13 mm; br = 13

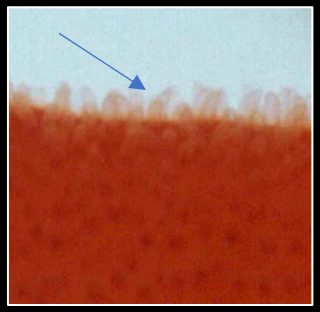
All specimens damaged and deteriorating, many with spines missing.

This species quite different in shape and colour from the other two of the genus that have been collected. Referred to *velitaris*, which is reported from the "Ceylon Area" by Clark & Rowe.

Echinaster purpureus (Gray, 1840)

ECHINASTERIDAE





A species of *Echinaster* collected for the aquarium trade. Photographs of living animals in small aquaria. The brilliant colour is probably due to the numerous papules, as see in the close-up at left. (Papules are retractable extrusions of tissue that serve a respiratory function.)

R = 88 mm; r = 12 mm; br = 14 mm. (Mostly smaller R = 65 mm)

No information regarding habitat and locality. Identification to species level was a problem—the spines are buried in tissue and tiny, 0.75 mm long with a base diameter of 0.5 mm. The key in Clark & Rowe, 1971 came out to suggest that this belongs to the *E. luzonicus / purpureus* complex, with *purpureus* being described as from the Indian Ocean; but the colour being described as purple.

There are many “red starfish” or “orange starfish” under this name, and of the same colour, in Internet aquarium trade catalogues; and, under the name *luzonicus*!

- *Echinaster purpureus* is described from the “Ceylon Area” in Clark & Rowe, 1971

Fromia ghadarqana Mortensen, 1938

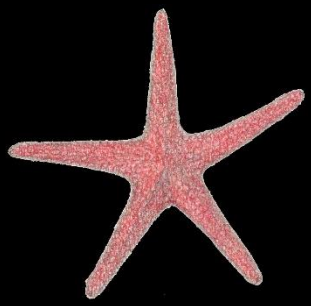
GONIASTERIDAE

Little Basses Reef, April, 1994. Hikkaduwa, Yakamuththa Gala, 10.11.1996. 20 m, on rock.

Colour deep crimson upper surface, deep pink under side.

Small size, arms narrow, rounded, tapering to blunt tips (see drawing below). Quite distinct from *Fromia indica.*

R = 33 mm, r = 8 mm, br = 9 mm



- *Fromia ghardaqana* is not reported from the "Ceylon Area" in Clark & Rowe, 1971

Fromia indica (Perrier, 1869)

GONIASTERIDAE

Nilaweli (Pigeon Islands), Trincomalee (Clappenburg Bay), Hikkaduwa (Yakamuththa gala). Rock strewn sand bottoms, rocky bottoms.
2 to 20 metres.

Live animal photographed in air.

Underwater photograph

Underwater colour: deep red both surfaces, tips of arms black. The live animal is speckled with black (the pores) and criss-crossed by fine black lines (plate margins). These markings disappear when the animal is disturbed. The tube feet are orange. At the surface the underside is vermilion.

Size: R = 36 mm; r = 12.5 mm; br = 13 mm

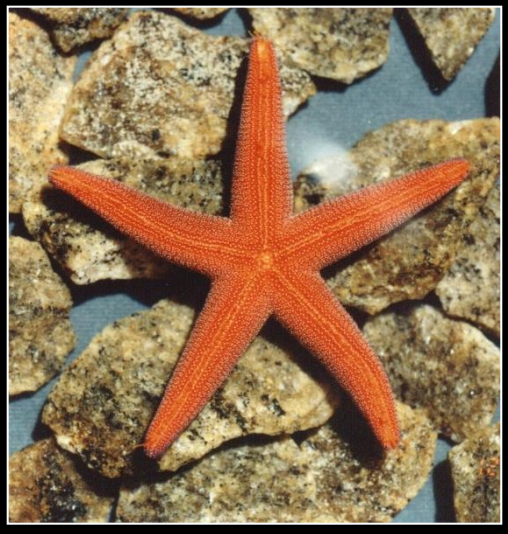
Common. Popular export item.

Fromia milleporella (Lamarck, 1816)

GONIASTERIDAE

Distant shoals off Colombo: Gigiripita, 22 metres

Pitagala, 23 metres
Rock strewn sand bottoms.
February 2001, March 2002
Rare.

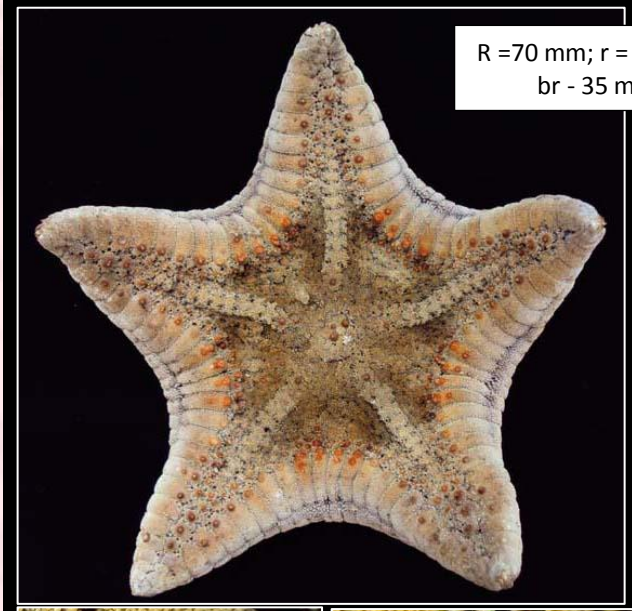


Live animal photographed in an aquarium. Upper surface top panel, lower surface below.
Underwater colour of the upper surface is purple, the undersurface red.

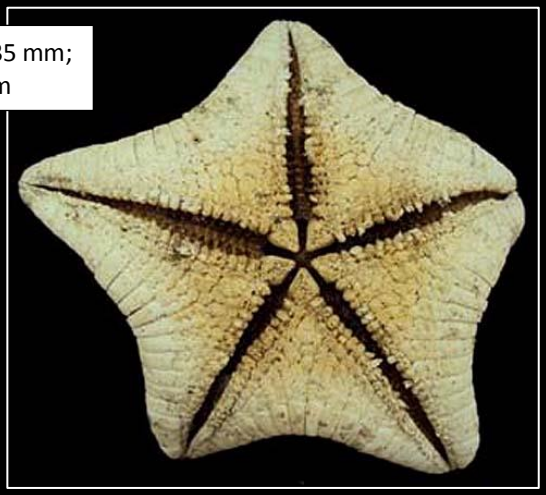
Size: R = 36 mm; r = 9 mm; br = 10 mm.

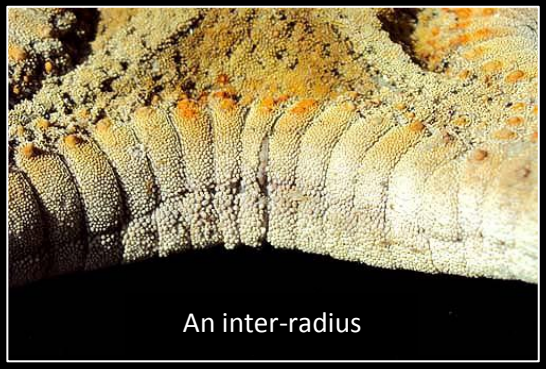
Goniodiscaster vallei (Koehler, 1910)

GONIASTERIDAE



R =70 mm; r = 35 mm;
br - 35 mm





An inter-radius

Left: Close-up of solitary tubercles and an abactinal pedicellaria (arrowed).

29.8.2009: A dried specimen found on a fishing trash pile at Anawasala, Kalpitiya. Reported from the 'Ceylon Area'. The single enlarged tubercles on the supero-marginal plates and the small, bi-valved pedicellariae the same size as the abactinal granules are characteristic of this species.

- *Goniodiscaster vallei* is described from the "Ceylon Area" in Clark & Rowe, 1971

Paraferdina sohariae Marsh & Price, 1991

GONIASTERIDAE

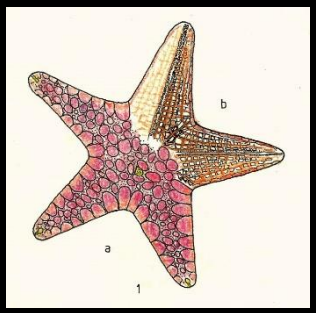
Great Basses ridge, Tangalle, Boossa, Hikkaduwa, Negombo.

Rocky areas on sand bottom.

14 to 20 metres.
1993 to 1999

R =39 mm; r = 16 mm;
br= 16 mm

Left: Three colour forms photographed in an aquarium. December 1999.
Below: Drawing - upper surface (a), under surface (b).



Underwater colour:

Upper surface - dirty green or olive green with yellow tints.
Under surface - cream, the plates outlined in purple.
Surface colour:
Upper surface - Red, yellow & orange in various combinations as illustrated.
Under surface – cream, the plates outlined in yellow or rose madder.

Original description of *Paraferdina sohariae* Marsh & Price, 1991, is based on specimens collected in Galle at "Deumba Gala", Sri Lanka, 12 - 15 m, during the Western Australian Museum *Sindbad* voyage, 1980-1981.
- World Asteroidea Database.

BIBLIOGRAPHY

Allen, G.R. & Steene, R., 1994. *Indo-Pacific Coral Reef Field Guide.* Tropical Reef Research, Singapore.

Clark, A.M. and Rowe, F.W.E., 1971. Monograph of shallow-water indo-west Pacific Echinoderms. *Trustees of the British Museum (Natural History)*. London. x + 238 p. + 30 pls.
Available online at http://www.abctaxa.be/downloads/additional-information-volume-1/works-famous-holothuroid-workers/fwe-rowe/MonographIndoWestPacific.pdf

George, J.D. & George, J.J., 1979. *Marine Life, An Illustrated Encyclopedia of Invertebrates in the Sea*. Lionel Leventhal, London.

Mah, C.L., 2020. World Asteroidea Database. Accessed at http://www.marinespecies.org/asteroidea on 2020-10-02

Marsh, L.M. and Price, A.R.G., 1991. Indian Ocean echinoderms collected during the Sinbad Voyage (1980-1981): 2. Asteroidea. Bulletin of the British Museum of Natural History (Zoology) 57(1): 61-70.
Available online at https://www.biodiversitylibrary.org/page/40583315 **(**original description of *Paraferdina sohariae*)

Koehler, R., 1910. An account of the shallow-water Asteroidea. *Echinoderma of the Indian Museum.* Part 6: 1-192. *Available online at*
https://www.biodiversitylibrary.org/page/49413290 page(s): 75 (original description of *Goniodiscus*)

MF: 2.10.2020