



Short Communication

New record of the echinoid *Clypeaster reticulatus* (Linnaeus, 1758) off Andhra Pradesh, east peninsular India

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A reticulated sea biscuit clypeasterid echinoderm, *Clypeaster reticulatus* (Linnaeus, 1758), is recorded for the first time from Andhra Pradesh coastal waters, indicative of a range extension to the eastern peninsular India. This communication provides brief information on the systematics and description of the specimens obtained.

[**Keywords:** Andhra Pradesh, East coast of India, Echinoderm, New record, Sea biscuit]

Introduction

Echinoderms are entirely marine and extensively distributed in benthic habitats extending from the foreshore and sea shore zone to the deep sea. Many species, for example sea urchins are commercially harvested and processed in the food industry and cosmetics, with immense prospectives for the development of pharmaceutical compounds¹. Of interest is the family Clypeasteridae recorded from late Eocene to recent age². Currently, there are 49 extant species of genus *Clypeaster*, and is considered as the most speciose genus of echinoids³. In the Indian context, 10 species of the aforementioned genus have been reported from the coastal waters⁴. The 8000 km (approx.) long Indian coastline with its differing ecological habitats⁵ supports a large diversity of echinoderms. In all, 741 species of echinoderms were documented from India⁴. The addition of a new species⁶ currently raised the total to 742, of which 57.27 % (425 species) are known from the Andaman and Nicobar Islands⁷. Benthic investigations in the subtidal waters off coastal Andhra Pradesh

(13°59.988' N, 80°11.599' E to 18°59.509' N, 84°42.934' E), India, yielded diverse macrofaunal organisms. Of the 20 species of echinoderms from 11 families, contributing 7.94 % to the total population of benthos, *Clypeaster reticulatus* (Linnaeus, 1758) is new to Andhra Pradesh. It was previously reported only from the soft substrata of coastal waters off Karnataka, Lakshadweep and Andaman Islands⁸. The species is an addition to the 100 species of echinoderms already known from the coast of Andhra Pradesh⁹. The geographic distribution of the aforementioned species has been reported along the entire tropical Indo-west Pacific extending from south east Africa to the Hawaiian Islands¹⁰. Its occurrence off Andhra Pradesh is a new record for the east coast of India.

Materials and Methods

Two specimens of *C. reticulatus* were obtained with a Naturalist's dredge (20 x 50 cm; mesh size ~0.6 cm²) operated from a fishing trawler in the coastal corridor (15°20.120' N, 80°08.218' E; depth: 30 m) at Singaroyakonda, off Andhra Pradesh, India (Fig. 1). After collection, the specimens were washed with seawater, carefully oven dried at 60 °C to preserve the specimen sans corrosive formaldehyde and vouchered in zip lock plastic pouches. Morphometric measurements were recorded using a dial caliper. Identification was done based on key taxonomic features and appropriate literature¹¹. The specimens were photographed (digital camera, Nikon D5600), and deposited in the collections of the Marine Biology Laboratory, Department of Zoology, Andhra University, Visakhapatnam, India. Seawater salinity, and dissolved oxygen were analyzed according to standard analytical methods^{12,13}. Sand, silt and clay were determined by pipette method¹⁴ and nomenclature assigned¹⁵. Organic matter was estimated by the wet-oxidation method of Walkey-Black, later modified¹⁶.

Results

Systematic account

Phylum: Echinodermata Bruguière, 1791
Subphylum: Echinozoa
Class: Echinoidea Leske, 1778

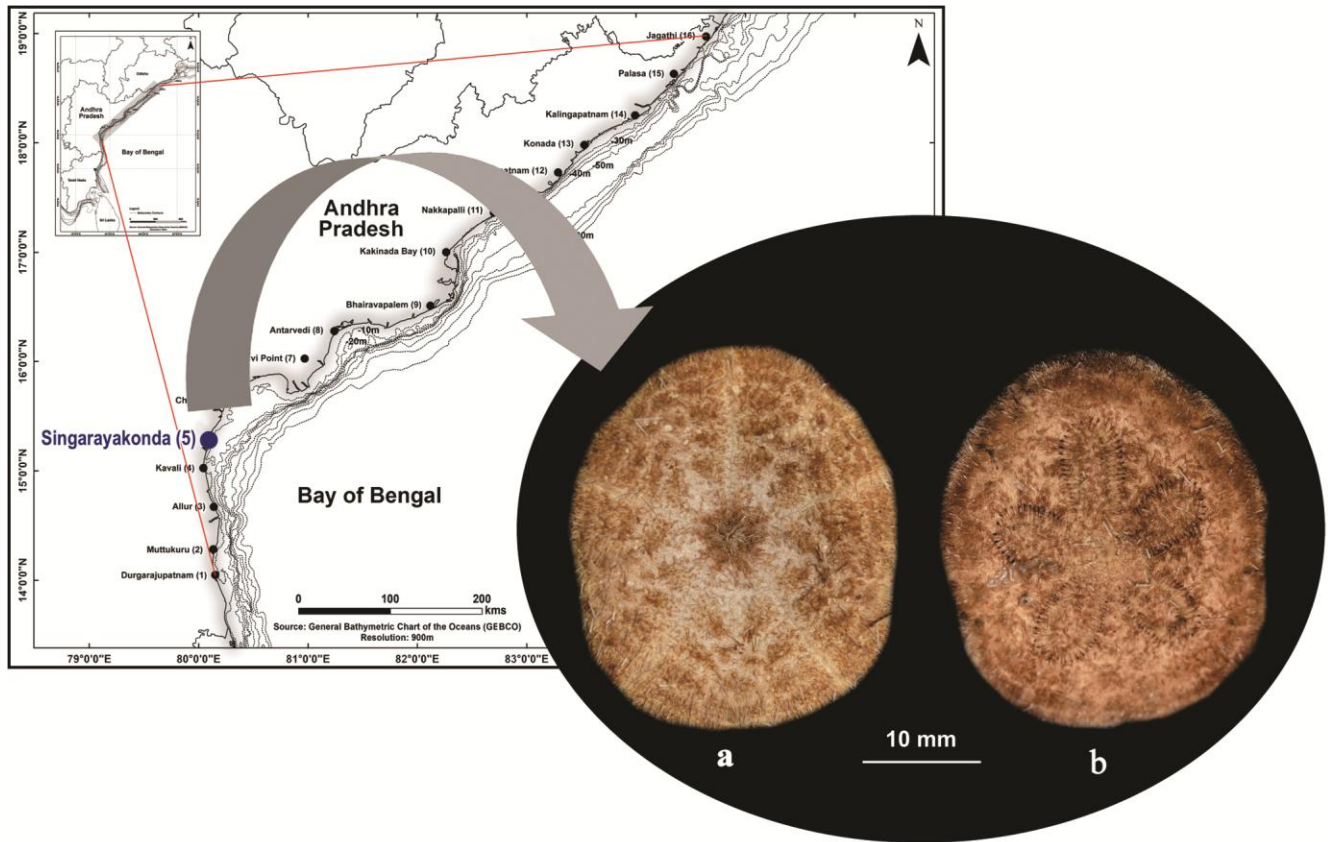


Fig. 1 — Distribution map showing the site of collection. *Clypeaster reticulatus* (Linnaeus, 1758): a – Oral surface; b – Aboral surface.

Sub class: Euechinodea Bronn, 1860
 Order: Clypeasteroidea A. Agassiz, 1872
 Sub order: Clypeasterina von Zittel, 1879
 Family: Clypeasteridae L. Agassiz, 1835
 Genus: *Clypeaster* (Lamarck, 1801)
Clypeaster reticulatus (Linnaeus, 1758) (Fig. 1)

Synonyms

Clypeaster scutiformis Lamarck, 1816
Echinanthus coleae Gray, 1851
Rhaphidoclypus reticulatus (Linnaeus, 1758)

Material examined

Two specimens, Voucher no. MBLDZAU-352; dated 03.03.2017; collected off Singarayakonda (15°20.082' N, 80°25.463' E) of Andhra Pradesh, India (depth: 30 m).

Description

Length 30 and 33 mm, l/b = 30/26 mm and 33/25 mm. Test firm, somewhat elliptical, approximately pentagonal in outline, longer than broad, with numerous spines. Petals five in number, broad distally, petaloid region about 65 % of aboral surface.

Distinctly thick margin separated by characteristic ringed depression from petals. Oral side concave; peristome small, fairly pentagonal; Periproct small and nearer to the posterior margin. Poriferous zones not deep set. Pores of each pair separated by a small number of fine tubercles. Spines of oral surface longer than those on aboral surface. Colour: brownish spotted margins; base colour white.

Ecology

The specimens were recorded from silty loam textured sediments (83.27 % sand, silt 16.72 % and clay 0.03 %), at a depth of 30 m where the salinity was 33.69 psu; dissolved oxygen 7.87 mg l⁻¹ and sediment organic matter 1.04 %. Additionally, a single individual of *C. humilis* (Leske, 1778) and 35 individuals of *C. rarispinus* de Meijere, 1903 were also obtained from the same location.

Conclusion

The present communication documents the first time occurrence and a north east ward range extension of the echinoid *C. reticulatus* from coastal Andhra Pradesh.

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Conflict of Interest

There is no conflict of interest.

Author Contributions

Specimen acquisition: AR; Laboratory analysis and figure: SSR & BD; Preparation of map: SSR & BD; Taxonomic identification: DRKS; Writing: DR & SSR. Editing and review: AR and DRKS; and funding acquisition: AR.

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