ISSN 0375-1511

Rec. zool. Surv. India : 115(Part-4) : 357-360, 2015

FIRST REPORT OF FEATHER STAR *TROPIOMETRA CARINATA* (LAMARCK, 1816) TO ANDAMAN AND NICOBAR ISLANDS

Naveen Kumar Nigam* and C. Raghunathan

[1]*Zoological Survey of India, Andaman and Nicobar Regional Centre, Port blair-744102, Andaman and Nicobar Islands, India*

Corresponding author *Email: naveennigam88@gmail.com

INTRODUCTION

Andaman and Nicobar Islands comprised of 572 islands and islets in the Bay of Bengal (Latitude: 6°-14°N and Longitude: 91°-94°E) with a coast line of 1,962 km and provides a great biodiversity of coral reef ecosystem. Crinoidea is one of the five classes under the phylum Echinodermata. Crinoids are beautiful, delicate and brilliantly colored species. In coral reef communities, crinoids are suspension feeders and they carry out their feeding behavior by the movement of water and mostly they are nocturnal feeder. They use arms movement to catch and feed. Many faunal communities such as crabs, shrimps and brittle star are showing close association with the crinoids species. All living unstalked crinoids species belong to subclass Articulata (Ausich and Messing, 1998) commonly called feather stars and sea lilies. In modern marine environments feather star belongs to order- Comatulida and also a dominant group of living feather star (Messing,1997). They live in intertidal zone to abyssal (Belyaev, 1966; Oji *et al*., 2009). Comatulids are cup like body structure and with 5 to 200 arms (Towle, 1989). Crinoids represent 600 extant species in World's Oceans while India represents 80 species, of which 50 species were reported from Andaman and Nicobar Islands (James, 2008). The present study describes new report of *Tropiometra carinata* (Lamarck, 1816) to Andaman and Nicobar Islands from Mahatma Gandhi Marine National Park, Wandoor.

MATERIAL AND METHODS

A study was carried out at Rutland Island of Mahatma Gandhi Marine National Park; South Andaman by employing Self Contained Under water Breathing Apparatus (SCUBA) to explore the species diversity of reef associated faunal communities up to the depth of 20 m during February 2015. A specimen of crinoid was sampled by hand picking method. The specimen was fixed in 95% ethanol and preserved in 70% ethanol by following standard methods (Hendler, 2004; Messing, 2006). Identification of morphological characters of the said sample was made in conjunction with Clark and Rowe (1971). The key characters such as cirri stout, pinnules,

Fig. 1. *Tropiometra carinata* (Lamarck, 1816). a. General view of Tropiometra carinata

cirrus segment and diameter of central dorsal disc observed by Leica stereo zoom (Model: 205 A) microscope. The specimen was deposited in the National Zoological Collections at Zoological Survey of India, Port Blair.

RESULT

Tropiometra carinata (Lamarck, 1816),

SYSTEMATICS ACCOUNT

Phylum ECHINODERMATA Klein, 1734

Class CRINOIDEA J.S. Miller, 1821

Subclass ARTICULATA von Zittel, 1879

Order COMATULIDA A.H. Clark, 1908

Family TROPIOMETRIDAE A.H. Clark, 1908

Genus *Tropiometra* A.H. Clark, 1907

Material examined: Ten samples were observed at the Rutland Island (Lat: 11°23.737'N and Long: 92°40.838'E). One sample was collected on 09.II.2015, at the depth of 15m. (Reg. No.: ZSI/ANRC-12390).

Description: A total of 10 arms are present (Fig. 1a). The arms are 90-110 mm in length and P_1 has 18 segments. The dorsal pole of the centrodorsal is 4.1 mm in diameter (Fig. 1b). The cirri are stout with XX, 30-45, 20-25 mm long and dorsal is smooth (Fig. 1d, e). All the proximal pinnules are smooth and prismatic (Fig. 1f). Mouth is near the edge of the disc and anal tube in central. The I Br series (Fig. 1c) and the first two brachials are large and broad, in lateral apposition, and some flattened laterally, carination.

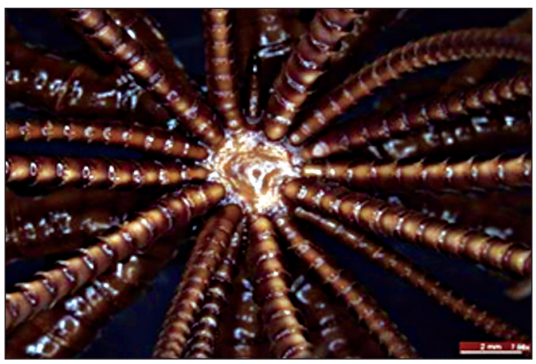

Fig. 1b. Centrodorsal view

Fig. 1c. I Br series

Fig. 1d. Cirri of dorsal view

Fig. 1e. Cirri of inside view

Fig. 1f. Proximal pinnules

Colour: This species is variably brown.

Habitat: Mostly observed in sub tidal, reef flat and slope.

Distribution: *India*: Rutland Island of Andaman and Nicobar Islands (this report), Andhra Pradesh and Gulf of Mannar (Sastry, 2007) *Elsewhere:* Aldabra, Cargados Carajas, Caribbean Sea, Dominician Republic, East Africa, East Indies Lesser Antlles, Madagascar, Mascarene Basin, Mauritius, Mozambique, Red Sea, Seychelles, South Africa, Sri Lanka, Tanzania, Trinidad and Tobago, Venezuela (Clark and Rowe, 1971).

Remarks: This is the first record from Andaman and Nicobar Islands while previous Indian report was made from eastern coast of peninsular India.

DISCUSSION

The Echinoderms species plays an ecological role in coral reef and deep sea ecosystem by association of themselves with other species and take part in food web of marine ecosystem. Clark (1912) described the taxonomy of crinoids from Indian subcontinent. The presently described species of crinoid belongs to the family Tropiometridae with a total of 4 species from world's ocean while one species was recorded from Madras, Gulf of Mannar and Andhra Pradesh of Indian waters. The detailed documentation of the taxonomical studies of crinoids is comparatively lesser than the other Echinoderms. As very few studies made so far. Previous reports elucidate the crinoids in form of annotated checklist of Echinoderms from India and also from Andaman and Nicobar Islands (Sastry, 2005, 2007). Sadhukhan and Raghunathan (2012, 2013) reported six feather stars from Andaman and Nicobar Islands as new distribution in India. Raghunathan *et al.* (2013) presented taxonomical description of commonly found 14 species of crinoids of Andaman and Nicobar Islands. Further extensive studies are required in near future to explore the crinoids from Andaman and Nicobar Islands which may bring serval new reports and new species from Indian seas.

ACKNOWLEDGEMENTS

The authors are grateful to Ministry of Environment, Forest and Climate Change, Govt. of India for providing facilities and financial support.

REFERENCES

Ausich, W. I. and Messing, C.G. 1998. Crinoidea. Sea Lilies and Feather Stars, Version 21, The Tree of Life Web Project, http://tolweb.org/.

Grzimek, B. 2003. Lower Metozoans and Lesser Deutero- stomes, *Animal Life Encyclopedia: Mollusks and Echinoderms*, 2nd Edition, Vol. 1, Van Nostrand Reinhold Company, New York.

Belyaev, G.M. 1966. Bottom fauna of the ultraabyssal depths of the world ocean. [In Russian]. Akademy Nauk. SSSR, Institute Okeanologii, 247.

Clark, A.H. 1912. The Crinoidea of the Indian Ocean. Echinoderma of the Indian Museum. Part VII: 1-325, *Indian Museum*, Calcutta.

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.

Messing, C.G. 1997. Living Comatulids. *Paleontological Society Papers*, **3**: 3–30.

Messing, C.G. 2006. Charles Messing's Crinoid Pages Florida: Nova Southeastern University Oceanographic Center. http://www.nova.edu/ocean/ messing/crinoids.

Hendler, G. 2004. Collecting, Preserving and Archiving Echinoderms, Natural History of Los Angeles, Country, Los Angels.

James, D.B. 2008. Diversity of Echinoderms in India. In: Milton J., (ed.). 2011. Perspectives of Animal Taxonomy and Systematics. Methodology for Classification of Echinoderms, **Chapter 9**: 149-197, Published by Loyla College, Chennai.

Oji T. Ogawa, Y. Hunter A.W. and Kitazawa K. 2009. Discovery of dense aggregations of stalked crinoids in Izu-Ogasawara Trench, Japan. *Zoological Science*, **26**: 406–408.

Raghunathan, C. Sadhukhan, K. Mondal, T. Sivaperuman, C. and Venkataraman, K. 2013. A Guide to Common Echinoderms of Andaman and Nicobar Islands, *Zool. Surv. India, Kolkata,* p: 1-210.

Sastry, D.R.K. 2005. Echinodermata of Andaman and Nicobar Islands, Bay of Bengal: An Annotated List*, Rec. zool. Surv. India*, *Occ. Paper*, **233**: 1-207.

Sastry, D.R.K. 2007. Echinodermata of India: An Annotated list, *Rec. zool. Surv. India, Occ. Paper No*., **271**: 1-387.

Sadhukhan, K. and Raghunathan, C. 2012. New record of feather stars (Class: Crinoidea) from Andaman and Nicobar Islands. *International Journal of Plant, Animal an Environmental Sciences*, **2**(1): 183-189.

Sadhukhan, K. and Raghunathan, C. 2013. New Record of Crinoid *Comanthina belli* (P.H. Carpanter, 1888) from Andaman and Nicobar Islands. *Advances in Biological Research,* **7**(3):109-111.

Towle A., 1989. Modern Biology. Austin, TX: Holt, Rinehart and Winston. ISBN 0-03-013919-8.

Manuscript Received : 24th September, 2015; Accepted : 14th March, 2016.