

New Record of Crinoid Associated Brittle Star *Gymnolophus obscura* (Ljungman, 1967) from Andaman and Nicobar Islands, India

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Abstract: The fringing reef ecosystem of Andaman and Nicobar Islands harbours diversified echinoderms. A crinoid associated brittle star *Gymnolophus obscura* (Ljungman, 1967) belonging to family Ophiotrichidae was reported for the first time from the Andaman and Nicobar Islands. The taxonomic characters of this ophiuroid species has been given in this paper.

Key words: *Gymnolophus* • Crinoid • Brittle Star • Association • Andaman and Nicobar Islands

INTRODUCTION

Association of faunal communities play an important role in survival for food, shelter, reproduction, protection against predator in marine ecosystem. Crinoids represent diversified symbiotic association with other faunal creatures under the phylum Echinodermata [1]. The structural complexity of crinoids serves as host for many smaller symbiotic animals such as ophiuroids, decapods, crustaceans, sponges and molluscs [2, 3]. Crinoids harbor significant level of symbiosis in comparison with corals and sponges as it hosts of several numbers of brittle stars [4]. The Ophiuroidea or brittle stars, basket stars are the largest group among of extant echinoderms. About 2064 ophiuroid species are described in world from the intertidal to the greatest depths of the ocean [5]. One species of brittle star i.e. *Gymnolophus obscura* (Ljungman, 1967) commonly associated with the crinoid species *Comanthina schlegeli* (Carpenter 1881) was reported from Andaman and Nicobar Islands for the first time. This present paper dealt with the morphological characters of newly recorded brittle star along with the host crinoid and their distribution across the world's ocean.

MATERIALS AND METHODS

A study was carried out at Hut Bay, Little Andaman Island by employing Self Contained Underwater Breathing Apparatus (SCUBA) diving during November,

2015. The crinoid specimen with the association of brittle star on its central disk were collected by hand picking. The brittle star was separated from crinoid and preserved in 95% ethanol [6]. For examining the morphological characters, stereo zoom (Leica M 205 A) microscope was used and identification of the brittle star was made using Keys of Clark [7] and Clark & Rowe [8]. The crinoid identification was carried out by consultation with the literature Clark & Rowe [8] & Messing [9]. On completion of study the specimen was deposited in the National Zoological Collections at Zoological Survey of India, Port Blair.

RESULTS

Systematics

Phylum: ECHINODERMATA Klein, 1734
Class: OPHURIDEA Gray, 1840
Order: OPHURIDA Müller and Troschel, 1840
Family: OPHIOTIRCHIDAE Müller and Troschel, 1840
Genus: *Gymnolophus* Brock, 1888
Species: *Gymnolophus obscura* (Ljungman, 1967)

Material Examined: A sample was collected from Hut Bay (Lat: 10°37.789'N and Long: 92°33.873'E), Little Andaman Island on 19.xi.2015, at the depth of 12 m. (Reg. No.: ZSI/ANRC-13586). The morphometric measurements were carried out (Disc diameter: 15.954 mm, Dorsal arm plate: 0.254 mm, Ventral arm plate: 6.350 mm, Length of spine: 1.323 mm, Length of arm: 64.6 mm) for species identification.

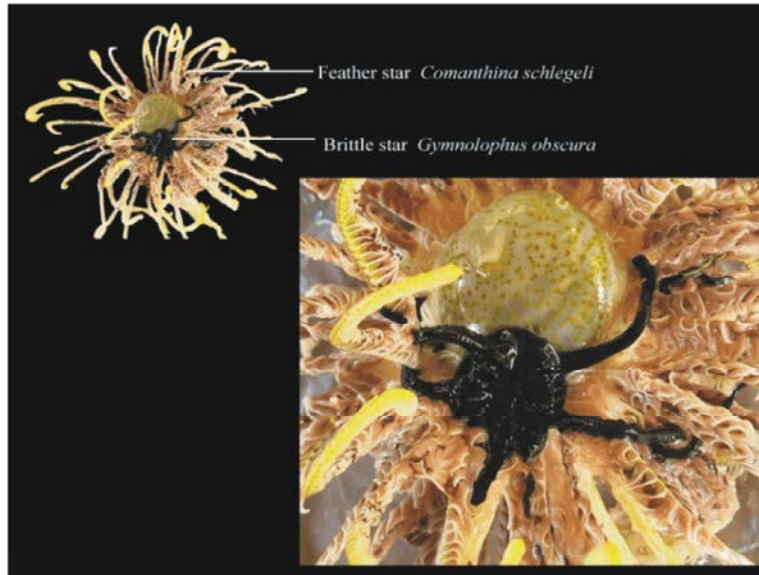


Fig. 1: Crinoid - *Comanthina schlegeli* (Carpenter 1881) associated brittle star - *Gymnolophus obscura* (Ljungman, 1967)

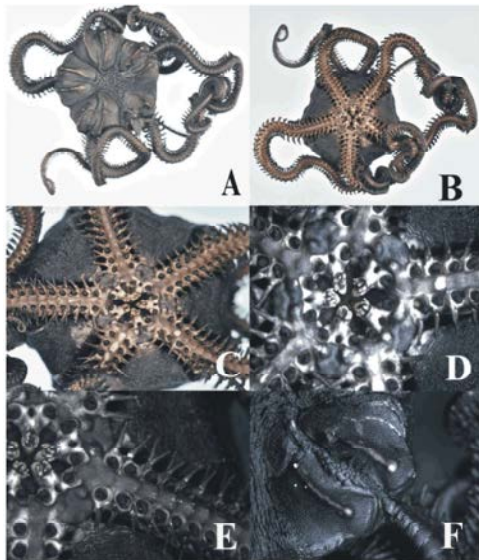


Fig. 2: General view of *Gymnolophus obscura* A- Dorsal side view, B- Entire ventral view, C- Lateral arm plate view, D- Tooth papillae, E- Detail of oral shield and oral papilla absent, F- Oblique side view of arm base

Key Characters: Oral papillae absent on jaw crowned with more compact cluster of apical tooth papillae. Side of the each arm characterized by presence of radial shield with a higher longitudinal crest Genus: *Gymnolophus* Dorsal process absent on the arms bases *Gymnolophus obscura* (Fig. 1).

Diagnosis: Five simple arms were visible. Dorsal and ventral arm plates were clearly visible and covered with spine lets (Figs. 2 A&B). A cluster of smaller tooth papillae and apical papillae are single on all the jaw lateral arm plate (Fig. 2C). Oral papillae absent, more compact cluster of tooth papillae with smooth edges (Fig. 2D). Oral shields not reduced in size, tooth rounded with many superficial papillae (Fig. 2E). Oblique side view of arm base crests on the radial shield and first dorsal arm plate (Fig. 2F).

Colour: Dark blackish brown in live condition.

Host: The present specimen *Gymnolophus obscura* (Ljungman, 1967) was found at central disk of crinoid species *Comanthina schlegeli* (Carpenter 1881) (Fig. 1).

Habitat: This species of brittle star is exclusively available in association of crinoids in subtidal zone, coral reefs and epizooic regions.

Distribution: *India:* Andaman and Nicobar Islands (This report), Gulf of Mannar; *Elsewhere:* Australia, China, Maldives, Sri Lanka, Sumatra and Vietnam.

Remarks: This is the first record from Andaman and Nicobar Islands; However: the species is reported earlier from eastern coast of peninsular India.

DISCUSSION

Interclass associations among the faunal communities of echinoderms were reported from the world's ocean especially for food and shelter as reported earlier for brittle star and crinoids [10]. Due to the smooth and pointed spines, brittle stars used to be in attached state on the central disk of crinoids by curling around its body along with the arms. A total of 109 species of brittle stars were reported from Andaman and Nicobar Islands [11-13] while Indian database represents 150 species [14]. The Ophiuroid species i.e. *Gymnolophus obscura* previously reported from Gulf of Mannar [15] of India. Occurrence of this brittle star on any feather star depends on the size of calyx which can be supportive for them. Limited studies on crinoid associated ophiuroid was reported from Gulf of Mannar [15, 16], Sri Lanka [17], Sumatra [17], Western Australia [18], South China [19], Nhatrang Bay and Vietnam [20] so far. This paper indicates the first report of this brittle star from Andaman and Nicobar Islands. Further extensive studies are required in near future to explore the crinoid associated ophiuroids from Andaman and Nicobar Islands to increase the species database of echinoderms of these islands as well as in Indian context.

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