

NEW RECORD OF TWO ALCYONACEAN CORALS TO INDIAN WATERS FROM ANDAMAN ISLANDS

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ABSTRACT

Two species of Alcyonacean corals *Lobophytum venustum* Tixier-Durivault, 1957 and *L. rotundum* Tixier-Durivault, 1957 were collected from Andaman Islands, which are reported as new records to Indian waters. Detailed descriptions with morphological features, sclerites structures and images are provided.

Keywords: New records, soft corals, *Lobophytum*, sclerites, Andaman Islands, India

INTRODUCTION

Alcyonacea is one of the largest orders of Octocorallia which contains soft corals and sea fans. Alcyonacean corals form fleshy colonies characterized by having polyps aggregated or concentrated into polyparies (Williams, 1992). Taxonomic identification and arrangement in systematics of soft corals are quite different from others due to the structural morphology and skeletal elements which are made up of protein calcite and calcium carbonate (Rahman, 2001, Ruppert *et al.*, 2004). *Lobophytum* spp. is short or encrusted and surface of the capitulum of colony is finger or crest like lobes or dish or bowl shaped with a more or less distinct stalk (Verseveldt, 1983). The genus *Lobophytum* is similar to genus *Sarcophyton* because of the presence of siphonozooids and contains photosynthetic pigments. But traits are less developed, club shaped sclerites in surface layer and coenenchyme sclerites are wider spindles commonly called capstans (Janes, 2008), which is distinguished from the genus *Sarcophyton*. Presence of zooxanthellate algae and absence of tuberculated spheroids shaped sclerites vary from the genus *Paraminabea*, presence of siphonozooids

and sclerites structures differ from the *Sinularia* of the same family Alcyoniidae. Sclerites are key characters to identify soft coral species mostly internal sclerites structures and sizes are important to differentiate within species (Bayer *et al.*, 1983). The genus *Lobophytum* distributed from intertidal to sub tidal region and mostly in clear water eminence of epipelagic benthic environment as they need light for photosynthesis (Fabricius & Alderslade, 2001).

MATERIAL AND METHODS

Surveys were conducted in the coral reef area of Andaman Islands to evaluate the Alcyonacean corals at the depth of 15 m adopting SCUBA. A colony or small portion of the colony was sampled for identification by using hand picking method. The collected specimens were fixed in 4% formalin with seawater then washed with freshwater, and preserved in 70% alcohol (Fabricius & Alderslade 2001; Benayahu and van Ofwegen, 2009). Extraction of sclerites from different regions of the colony for the identification of species, such as sclerites of surface layer and coenenchyme of the both lobe and base by dissolving in 5% common household bleach Sodium hypochlorite (Bayer,

1961) and studied various shapes of sclerites and their size in under stereo-zoom microscope (LEICA M 205A) for taxonomic identification.

RESULTS

Two species of alcyonacean coral belongs to the family Alcyoniidae and genus *Lobophytum* were identified as new distributional records to Indian waters.

SYSTEMATIC ACCOUNT

Phylum CNIDARIA Verrill, 1865

Class ANTHOZOA Ehrenberg, 1834

Subclass OCTOCORALLIA

Order ALCYONACEA Lamourox, 1812

Suborder ALCYONIINA

Family ALCYONIIDAE Lamourox, 1812

Genus *Lobophytum* Marenzeller, 1886

1. *Lobophytum venustum* Tixier-Durivault, 1957 (Fig. 1)

1956/57. Tixier-Durivault, A., Les Alcyonaires du Museum. I. Famille des Alcyoniidae. 4. Genre *Lobophytum*. – *Bull. Mus. nat. Hist. nat. Paris*, (2) 28 (4): 401-405, (5): 476-482. (6): 541-546, 29(1): 106-111.

1958. Tixier-Durivault, A., Revision de la Famille des Alcyoniidae: les genres *Sarcophytum* et *Lobophytum*. – *Zool. Veehand.*, 36: 1-180, figs. 1-214.

1966a. Tixier-Durivault, A., Les octocoralliaires de l'île avoisinantes, -*Faune de Madagascar*, 21: 1-456, figs. 1-399.

1983. Verseveldt, J., A revision of the genus *Lobophytum* Von Marenzeller (Octocorallia: Alcyonacea). *Zool. Med. Leiden*, (200). 1-134, fig. 1-34.

1992. Van Ofwegen, L.P. & Y. Benayahu., Notes on Alcyonacea (Octocorallia) from Tanzania. *Zool. Med. Leiden* 66(6), 139-154, figs. 1-15.



Fig. 1. *Lobophytum venustum* Tixier-Durivault, 1957 – preserved specimen

Material examined: One colony was sampled at Round Island (Lat: 12°20.070'N Long: 92°54.627'E), North and Middle Andaman. Total length of the colony is 36 mm, length of stalk is 22 mm, width is 40 mm, expanded length of the capitulum is 63 mm and the width of lobe or crest at the peripheral region is 0.3 mm to 0.5 mm. The identified sample was registered in the National Zoological Collections and deposited at the Zoological Survey of India, Port Blair (Reg. No. ZSI/ ANRC-2849).

Diagnostic characters: Colony is bowl or cup shaped with raised borders, which are lobes or crest like structure (Fig. 1). Colony contains both autozooids and siphonozooids; where the former are fully retracted. One to two siphonozooids are present between the autozooids. The distances between autozooids are 0.5 mm to 1.2 mm and between siphonozooids is 0.20 mm to 0.31 mm. The distance between autozoooid and siphonozooids, it is 0.30 mm to 0.53 mm. Surface layer of the lobe contain club shaped sclerites, measures about 0.7 mm to 0.18 mm (Fig. 2, A-P). These clubs are wider head and handles contain one whorl warts and some are smaller tubercles. Interior of the lobe contains spindles shaped sclerites which measures about 0.22 mm to 0.36 mm size (Fig. 2, P-Y). These are all strong spindles contains 3 to 4 girdles of warts and at the end of spindle has low prominences of tubercles. The surface layer of the base contains club shaped sclerites about 0.7 mm to 0.19 mm (Fig. 3, A-M) and almost equal to the surface layer of the lobes. The heads of the clubs are little wider than the clubs of lobe. Interior of the base contain capstans about 0.22 mm to 0.29 mm in size (Fig. 3, N-U). These are all containing middle two to four girdles of warts.

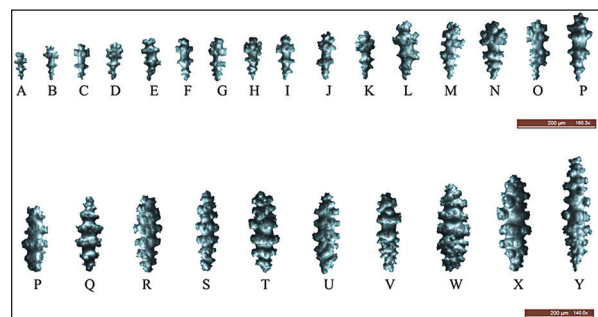


Fig. 2. *Lobophytum venustum* Tixier- Durivault, 1957, A – P Sclerites of lobe exterior, P – Y sclerites of lobe interior

Colour: Live colony is yellow brown and preserved colony is brown in colour.

Distribution: India: Andaman Islands;
Elsewhere: Aldabra I, Tanzania and Southern Taiwan.

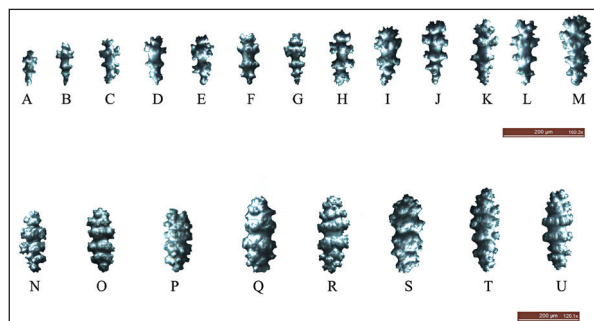


Fig. 3. *Lobophytum venustum* Tixier- Durivault, 1957, A – M sclerites of base exterior, N –U sclerites of base interior.

Remarks: New distributional record to Indian waters.

2. *Lobophytum rotundum* Tixier – Durivault, 1957 (Fig. 4)

1956/57. Tixier- Durivault, A., Les Alcyonaires du Museum. I. Famille des Alcyoniidae. 4. Genre *Lobophytum*. – *Bull. Mus. nat. Hist. nat. Paris*, (2) **28**(4): 401-405, (5): 476-482. (6): 541-546, **29**(1): 106-111.

1983. Verseveldt, J., A revision of the genus *Lobophytum* Von Marenzeller (Octocorallia: Alcyonacea). *Zool. Med. Leiden*, (200). 1-134, fig. 1-34.



Fig. 4. *Lobophytum rotundum* Tixier – Durivault, 1957- preserved specimen

Material examined: One colony was collected at Neil Island (Lat: 11°52.112'N Long: 93°01.052' E), South Andaman. Total length of the colony is 32 mm, height of the base is 12 mm, width is 30 mm, width of the crest is 4 mm and length of the crest is 22 mm. The identified sample was

registered at the National Zoological Collections and deposited at the Zoological Survey of India, Port Blair (Reg. No. ZSI/ ANRC-12850).

Diagnostic characters: Colony is cup shaped contain both autozooids and siphonozooids (Fig. 4). Autozooids are fully retracted within calyx. Surface layer of the capitulum contain raised crests which measures about 22 mm in length. Between two autozooids, one to two siphonozooids on surface of the crest and one to three on the base of the crest of the capitulum were found. The distance between autozooids on the surface of the crests are 0.69 mm to 1.12 mm and 1.6 mm on the bade of the crest and between siphonozooids are 0.30 mm to 0.41 mm. The distance between autozooid and siphonozooids are 0.43 mm to 0.59 mm. The surface layer of the crests contain club shaped sclerites, which measures about 0.12 mm to 0.25 mm in length (Fig. 5: A-L). These clubs containing indistinct heads; handles which is cone shaped, prominences with two, sometimes ill-defined median zones of warts. Interior of the crest contain middle warty, pointed ends and surface spiny structured spindle shaped sclerites size is about 0.20 mm to 0.35 mm (Fig. 5: M-U). The surface layer of the base contains club shaped sclerites length up to 0.10 mm to 0.16 mm (Fig. 6: A-K). Interior of the base contain oval shaped sclerites with less spindle shaped sclerites. Oval shaped sclerites are numerous, densely placed warts, with or without a waist or with narrow one measures about 0.15 mm to 0.20 mm in length (Fig. 6: L-S). In addition, Spindles are 0.35 mm long is present (Fig. 6: L, S). They are ornamented with numerous warts.

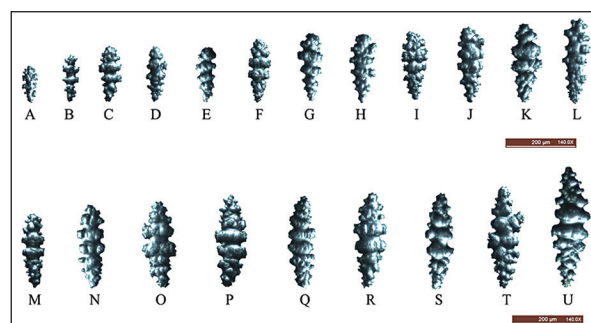


Fig. 5. *Lobophytum rotundum* Tixier – Durivault, 1957, A – L sclerites of lobe exterior, M-U sclerites of lobe interior.

Colour: Live colony is brown, after preservation changes as pale green to creamy white.

Distribution: India: Andaman and Nicobar Islands; *Elsewhere:* New Guinea, Tanzania and Southern Taiwan.

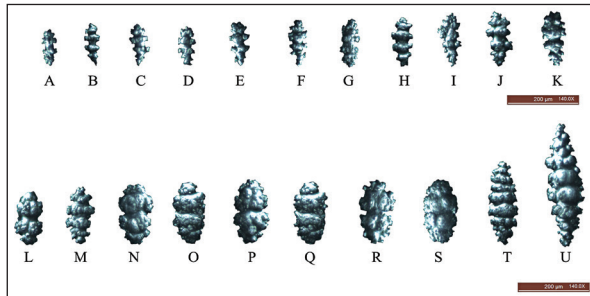


Fig. 6. *Lobophytum rotundum* Tixier – Durivault, 1957, A – K sclerites of base exterior, L – U sclerites of base interior.

Remarks: New distributional record to Indian waters.

DISCUSSION

The present described species belongs to the family Alcyoniidae, genus *Lobophytum*, and there are 61 species of *Lobophytum* reported from world oceans (WoRMS register). The key characters of the both species (*Lobophytum venustum* and *L. rotundum*), the structure of colony and skeletal elements vary in region of the colony. Sclerites in all parts of the colony showing clubs, spindles and capstans where measurements are significantly vary in different regions of the colony.

In *L. venustum*, presence of distinct heads of clubs of surface layer of the lobe and stalk are analogous to that of *L. latilobatum* Verseveldt, 1971. The lengths of the clubs of *L. venustum* are comparatively smaller than the *L. latilobatum*. Even though interior of the lobe contained spindles are also differ from size i.e. 0.45 mm in *L. latilobatum* but *L. venustum* contains upto 0.36 mm. The capstans of *L. venustum* are 0.22 mm to 0.29 mm, whereas *L. latilobatum* contains capstans of 0.25 mm to 0.28 mm and warty spindles up to 0.36 mm long. The colony of *L. venustum* is bowl shaped and raised borders, while *L. latilobatum* is also bowl shaped, however crest or finger like lobes found on surface of the colony.

When the key characters were described for identification of Genus *Lobophytum* species by Verseveldt (1983), he identified *Lobophytum rotundum* following Tixier- Durivault description, which mentioned the length of spindles as 0.42 mm in stalk interior. Later, Van Ofwegen & Benayahu (1992) collected type specimen from Mkandya reef, Tanzania; and observed that the traits are quite different than that of original description by Tixier- Durivault (1957). The length of spindles interior of the stalk was found 0.35 mm instead of 0.42 mm length. *L. rotundum* contains oval shaped sclerites, densely placed warts, with or without a waist or with narrow one and these are remembrance structures of the sclerites of *L. borbonicum*. The differences between two species are presence of spindles in *L. rotundum* and which is devoid in *L. borbonicum*.

Though the description of alcyonacean corals was initiated in India more than a century ago, by the collection of RIMS investigator (Thompson and Henderson, 1906; Thomson and Simpson, 1909). Till date very limited attention has been paid on alcyonacean corals. Later, few studies have been done on the Indian water soft corals (Pratt, 1903, 1905; Hickson, 1903, 1905; Jayasree, *et al.*, 1994; Jayasree, and Parulekar, 1997). Jayasree *et al.* (1994) described a new species of Alcyoniidae *i.e* *Sarcophyton andamanensis* from these Andaman Islands; however this is not mentioned in world register for marine species portal. The initial survey of soft coral distribution was conducted in 1996 and reported 26 new distributional records to the Indian waters (Jayasree *et al.*, 1996). Venkataraman *et al.* (2004) enlisted a total of 63 species under the said family and 12 species of the Genus *Lobophytum*. There is necessary to study of taxonomic features of alcyonacean corals in reef ecosystem in these islands.

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