

Short Communication

First report of South African flabellid coral *Truncatoflabellum zuluense* Cairns & Keller, 1993 (Scleractinia: Flabellidae) from Andaman and Nicobar Islands, India

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Limited research has been conducted on azooxanthellate scleractinian corals in Indian waters due to their wide vertical distributional range. The Flabellidae family of corals, which includes the *Truncatoflabellum* genus, can be found at various depths, ranging from shallow regions to the deeper parts of the oceans. In this particular investigation, a species of Flabellidae coral, *Truncatoflabellum zuluense* Cairns & Keller, 1993, was identified in Indian waters for the first time. This species was recorded at a depth of 31 m. Previously, it had only been documented off Zululand in South Africa, at depths ranging from 62 – 84 m. The addition of this species in Indian waters is significant as it expands its zoogeographic range beyond its original location. This finding emphasizes the importance of ongoing research on these corals in different regions to gain a better understanding of their distribution and diversity.

[**Keywords:** Azooxanthellate, Flabellidae, Indian waters, Scleractinian coral, Zoogeographic range]

Introduction

The taxonomy of flabellid corals has undergone multiple revisions throughout the years¹. Among the various flabellids, there are 65 species of corals that divide transversely and are classified into five distinct genera². One of these genera is *Truncatoflabellum*, which was identified as a separate genus in 1989^(ref. 1). It can be distinguished from the *Flabellum* genus by the presence of a basal scar, which is a result of transverse division through asexual reproduction¹. In terms of the overall diversity of azooxanthellate corals, there are a total of 725 recorded species belonging to 120 extant genera³. Within the *Truncatoflabellum* genus, there are 32 recorded extant species, ranking it as the 7th largest genus during the Holocene period². However, recent updates to the database suggest a total of 34 species within this genus⁴. These species of *Truncatoflabellum* are found worldwide in oceans,

with depths ranging from 2 to 3010 meters, except in the West Atlantic⁵. The paper focuses on a newly recorded species of *Truncatoflabellum* in the Andaman waters. Previously, this species had only been reported in South African waters, making this record an important addition to the distribution of *Truncatoflabellum* species.

Materials and Methods

A comprehensive survey was carried out to explore the scleractinian corals of Great Nicobar Island, Andaman and Nicobar Islands during February 2016 up to the depth of 40 m. Hand-picking method was applied during SCUBA diving to sample the specimens from the *in-situ* condition. The collected specimen was kept in freshwater for a few days and thoroughly cleaned in running tap water. Studies were carried out under a stereo zoom microscope (Model-Leica, M 205 A, DFC 500) to examine the morphological characters. Identification of the sampled specimens was carried out with available key characters following Cairns & Keller⁶ and Cairns².

Results

Systematics

Phylum: Cnidaria Verrill, 1865
Subphylum: Anthozoa Ehrenberg, 1834
Class: Hexacorallia Haeckel, 1896
Order: Scleractinia Bourne, 1900
Family: Flabellidae Bourne, 1905
Genus: *Truncatoflabellum* Cairns, 1989
Truncatoflabellum zuluense Cairns & Keller, 1993

Material Examined: One specimen (Reg. No.: ZSI/ANRC-18835) was collected from Great Nicobar Island (Lat.: 07°0'25.14" N; Long.: 93°56'31.68" E) of Andaman and Nicobar Islands on 12.ii.2016 at a depth of 31 m by employing SCUBA diving (Fig. 1).

Diagnostic features: The corallum is of a small size and has a nearly triangular shape. It possesses a single thecal edge spine. The edge angle (EAN) measures 49°, while the face angle (FAN) measures 25°. The Greater Calicular Diameter (GCD) of the anthocyathus is 10.28 mm, whereas the Lesser Calicular Diameter (LCD) is 5.38 mm (Fig. 2a & b). Additionally, the Greater Scar Diameter (GSD) of the

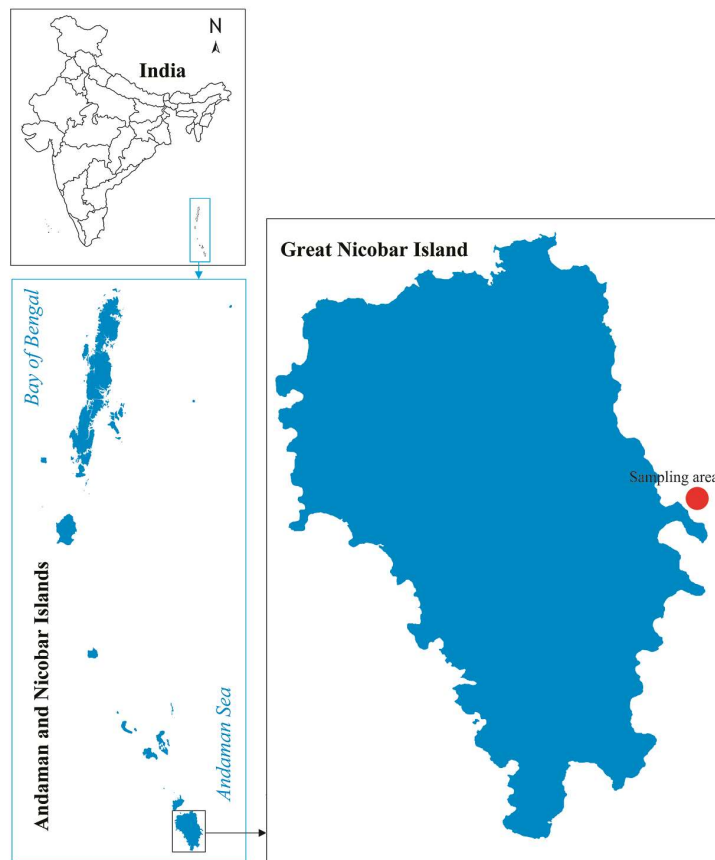


Fig. 1 — Study area of Andaman and Nicobar Islands

anthocyathus is 1.82 mm, and the Lesser Scar Diameter (LSD) is 1.27 mm (Fig. 2a & b). The height (H) of the corallum in this particular specimen is 11.03 mm. This specimen represents the attached anthocaulus to the anthocyathus, which will be separated just below the thecal spine (Fig. 2a & b). Upon recalculation, the height of the corallum, excluding the anthocaulus portion, is determined to be 8.1 mm, and the GSD of the anthocyathus measures 4.85 mm. The ratio of the greater calicular diameter to the lesser calicular diameter (GCD:LCD) of the studied corallum is 1.91. Furthermore, the ratio of the corallum height to the greater calicular diameter (H:GCD) is 0.78. Lastly, the ratio of the basal greater scar diameter to the greater calicular diameter of the corallum (GSD:GCD) is 0.47. The specimen contains a total of 56 septa, which are arranged in a hexamer pattern across four distinct cycles ($S_1-S_2 > S_3 > S_4$), with an additional pair of septa (S_5) located at the end area of the corallum (Fig. 2c – e). The fossa is characterized by its deep and narrow structure, while the septa exhibit tall granular formations (Fig. 2f).

Holotype: The holotype specimen was recorded from off Zululand (KwaZulu-Natal) of South Africa, and the other specimens were recorded within the depth ranges of 62 – 84 m [MN-ZK21, 1, USNM 91747 (Holotype) - deposited at NMNH]⁶.

Distribution: *India* - The studied specimen was recorded from the Great Nicobar Island of Andaman and Nicobar Islands, India, at a depth of 31 m (present record); *Elsewhere* - South Africa.

Discussion

The research on azooxanthellate corals in Indian waters is limited. These corals are found vertically up to depths of 6,328 m worldwide, with the highest diversity observed between 200 and 1,000 m^(refs. 6-8). To date, a total of 56 species of azooxanthellate corals have been documented in the Indian waters. Among them, eight species belong to the genus *Truncatoflabellum*. These species include *T. spheniscus*, *T. compressum*, *T. irregulare*, *T. aculeatum*, *T. incrustatum*, and *T. crassum* (found in the Andaman and Nicobar Islands), *T. paripavonium*

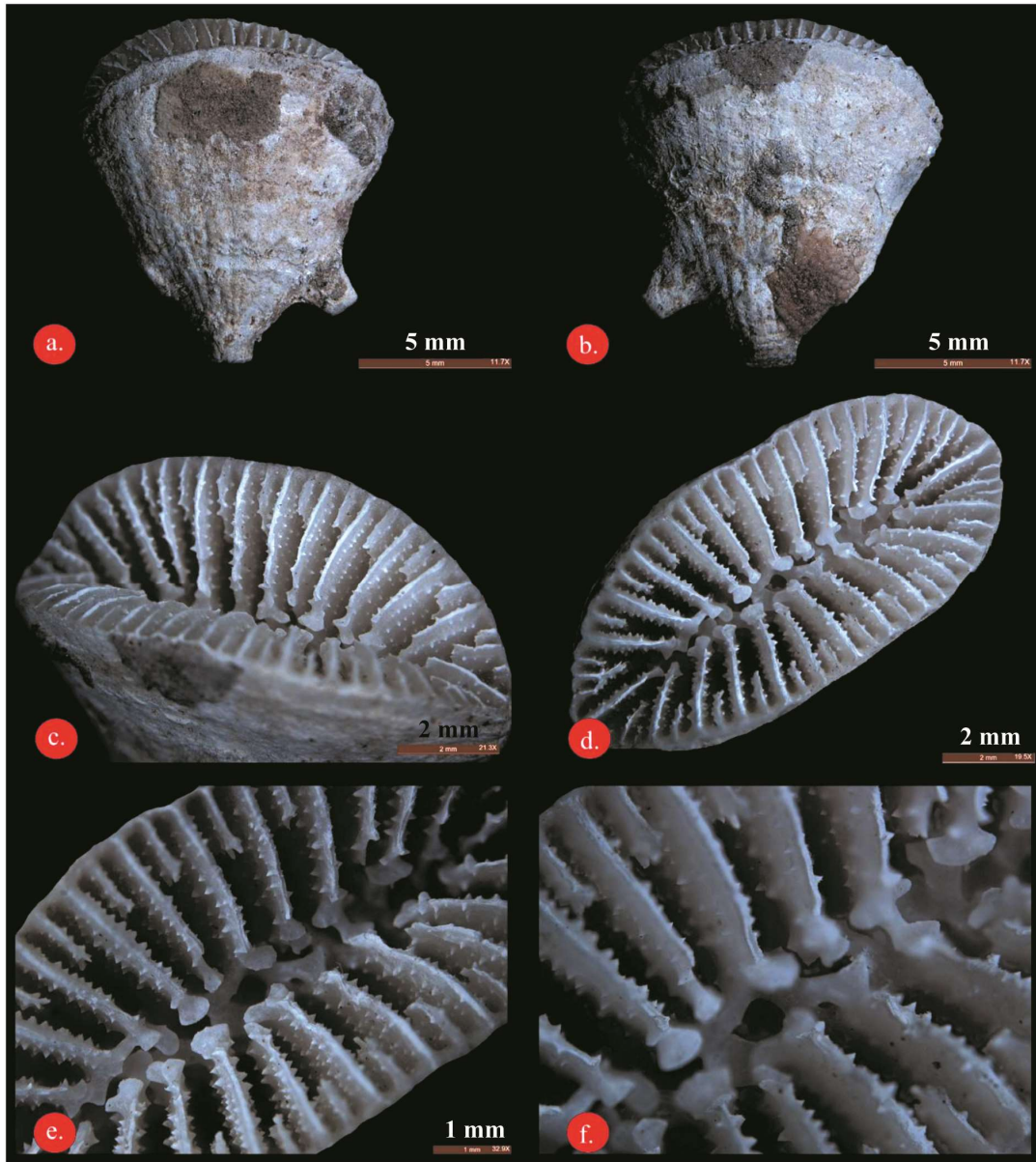


Fig. 2 — a, b) *Truncatoflabellum zuluense* Cairns & Keller, 1993 with attached anthocaulus to the anthocyathus which will be disassociated just below the thecal spine; c) Septal arrangement; d) 56 septa; e) Hexamerally arranged septa in 4 cycles ($S_1-S_2 > S_3 > S_4$), S_5 in pairs at the end area of corallum; and f) Septa with tall granular structures

(found in Lakshadweep), and *T. madrasensis* (found off the Chennai Coast)⁹⁻¹². The recent finding of *Truncatoflabellum zuluense* is a significant addition to the list of azooxanthellate scleractinian corals recorded in India. It is noteworthy that this species was previously known only from off Natal in South Africa, specifically at the coordinates Lat. 27°47'00" S and Long. 32°39'10" E, at a depth of 62 – 84 m^(ref.s. 2,13). This report indicates an expansion of the zoogeographic range for *T. zuluense*, suggesting that it is distributed beyond its known location. Among the species under the genus

Truncatoflabellum in Indian waters, *T. zuluense* is the smallest, and the presence of 56 septa adds to the differentiation of this species from those previously reported in the region. Considering these findings, it is imperative to conduct further studies in the near future to map the distributional range of *T. zuluense* beyond its current known locations. This will contribute to our knowledge on the distribution and diversity of these corals in Indian waters. Additional investigations are imperative to accurately delineate the geographical extent of *Truncatoflabellum zuluense* beyond its

present habitat. Ongoing scientific inquiries will enhance our understanding on the variety, distribution, and ecological importance of azooxanthellate corals in the Indian waters.

Conclusion

The report of *Truncatoflabellum zuluense* in Indian waters is of great interest. It represents a significant finding as it adds a new distributional record for this species. Previously, *Truncatoflabellum zuluense* was only known to exist off Natal in South Africa. This new report marks the first occurrence of the species outside its native range. This finding is important as it enhances the knowledge on distributional range of *Truncatoflabellum zuluense*. It suggests that the species has the ability to inhabit and establish populations in areas beyond what was previously known and this also provide valuable insights into the dispersal capabilities and ecological adaptability of coral species. The documentation of *Truncatoflabellum zuluense* in Indian waters emphasizes the need for the extension of ongoing research and monitoring programmes to comprehend the biodiversity and ecological dynamics of marine ecosystems. It highlights the importance of considering and updating species distribution records as new information becomes available.

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Conflict of Interest

There is no competing or conflict of interest for this said research paper.

Author Contributions

TM made field studies and the entire taxonomical studies on this scleractinian coral along with the

sample processing, preservation, identification and draft writing of this manuscript. CR scrutinized, edited and reviewed manuscript.

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