



Short Communication

Acropora teres (Verrill, 1866): in the verge of regional vulnerability from Andaman and Nicobar Islands, India

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India is endowed with exceptionally enriched coastal and marine biodiversity in its peninsular coastal regions, island ecosystems as well as EEZ zones along with four major reef areas and other patchy reef areas. Being one of the major reef areas of India, Andaman and Nicobar Islands are considered the prime treasure-trove marine biodiversity with mostly fringing type reefs and one barrier reef. Comprehensive studies were carried out in the coral reef ecosystems of Andaman and Nicobar Islands for more than a decade to explore the coral reefs and associated faunal communities along with the estimation and monitoring of their health status. During the surveys, the live colonies of *Acropora teres* (Verrill, 1866) were recorded from North Reef Island in 2009 while all the colonies were found dead due to the bleaching event of 2010. None of the colonies showed resilience due to the arrival of biogenic habitat during the post-bleaching period. None of the live colonies were seen in other areas of the Andaman and Nicobar Islands. Hence, it is presumed that *A. teres* faced regional vulnerability.

[**Keywords:** Acroporidae, A&N Islands, Coastal and marine biodiversity, Fringing reef]

Introduction

Acropora spp. is susceptible to environmental changes to a great extent¹. The deviation or alternation of any sort of physiological changes in reef habitat or adjoining sea by means of natural and anthropogenic clues used to make significant changes in the sustainability of scleractinian corals, especially acroporid corals²⁻⁴. *Acropora teres* (Verrill, 1866) form arborescent colonies⁵. The axial corallites are small, while radial corallites are small and immersed. Veron^{6,7} considered this one a valid species, while Wallace⁸ mentioned this species under the 'unresolved' category. Hoeksema^{9,10} considered this species as *taxon inquirendum*. There is no significant

data on the population trend of this species and considered Data Deficient (the population status is decreasing) under IUCN Red list^{11,12}. The global distributional record implies that this species is available in "American Samoa, Australia, Cambodia, Cook Islands, Fiji, Guam, Indonesia, Japan, Kiribati, Malaysia, Micronesia, Federated States of Niue, Northern Mariana Islands, Palau, Philippines, Samoa, Singapore, Taiwan, Province of China, Thailand, Tokelau, Tonga, Tuvalu, United States Minor Outlying Islands, Viet Nam, Wallis, and Futuna"^{11,12} while in India, it is reported from Lakshadweep¹³, and Andaman and Nicobar Islands¹⁴.

Materials and Methods

Extensive undersea explorations were carried out in the Andaman Sea and Bay of Bengal coastal areas of Andaman and Nicobar Islands for more than a decade from 2009 to 2020 by SCUBA diving and snorkelling to study the status of the coral reef ecosystem. Primary undersea observations were made by the "Manta tow" method, while 20 m long Line Intercept Transects (LITs) and Quadrat methods were applied at various depth regions of the reef flat and reef edges¹⁵. The underwater video-transect method was also employed to record the reef habitat¹⁵. Digitization was carried out using Sony -Canon Power Shot G15, Canon G7X and Canon G1X Mark II cameras to record the *in-situ* species images. Identification of the recorded species was made in conjunction with the available literature, while morphometric analysis of *Acropora* spp. was carried out by Veron and Wallace¹⁶ and Veron⁷.

Results

Based on the thorough undersea studies, it was found that *A. teres* (Verrill, 1866) were observed only at the North Reef Island of Andaman and Nicobar Islands at the depth of 5 m during October 2009 (Fig. 1). The cover of *A. teres* was restricted within an area of 25 m² (Fig. 2). There was no record of *A. teres* from any other areas or islands of Andaman and Nicobar Islands during the period of surveys. The heat stress destroyed all the colonies of *A. teres* at North Reef Island in April-May 2010. None of the colonies recovered or showed resilience during a favourable and conducive environment from July-September 2010, resulting in dead colonies (Fig. 3).

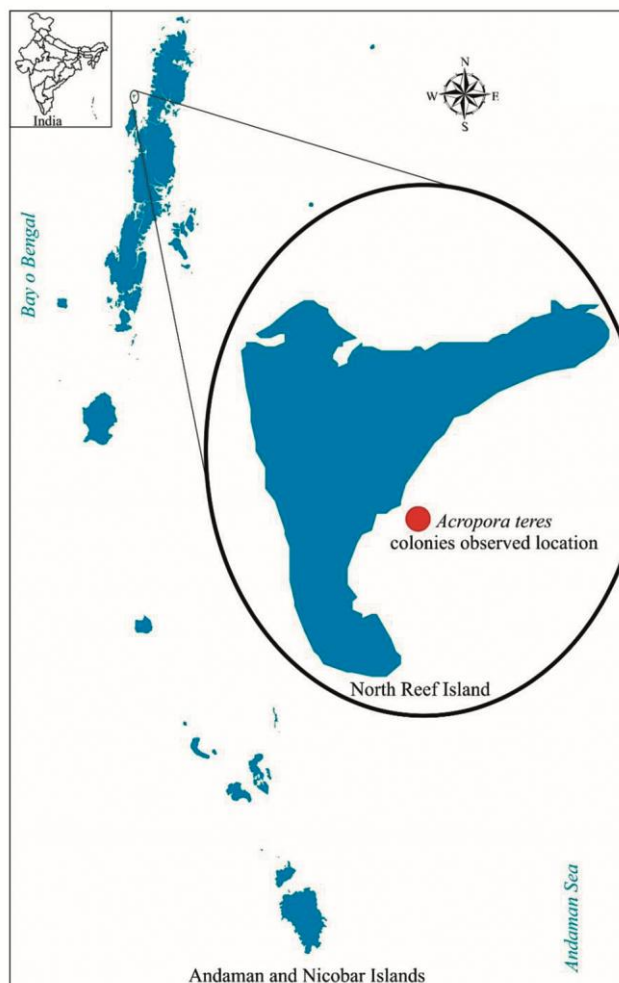


Fig. 1 — North Reef Island, observed location of *Acropora teres* (Verrill, 1866)



Fig. 2 — Colonies of *Acropora teres* (Verrill, 1866) in the North Reef Island in October 2009



Fig. 3 — Dead colonies of *Acropora teres* (Verrill, 1866) in the North Reef Island after the massive bleaching event of 2010

Discussion

During April-May 2010, the impact of *El-Nino* resulted in massive bleaching across the world's oceans with vigorous devastation of reef ecosystems and damaged scleractinian corals¹⁷. Andaman and Nicobar Islands also witnessed the impact of colossal bleaching on scleractinian corals with a record of 78.81 ± 11.10 ^(ref. 18). Thorough investigations were conducted at more than 560 sites in Andaman and Nicobar Islands, but none of the sites represented any colonies or new recruitment of *A. teres*. The systematic scrutiny of scleractinian corals in Andaman and Nicobar Islands reveals that the status of *A. teres* is primarily considered as possibly 'vulnerable' in the regional aspect due to the adverse effect of the massive global bleaching event as a natural threat in Andaman and Nicobar Islands. It is also plausible that there may be the existence of *A. teres* colonies in some pockets of Andaman and Nicobar Islands where the surveys are yet to be made. The decline of species' populations should be considered an alarm button for taking progressive and posing responses towards the conservation strategies to safeguard the whole ecosystem through well-designed mitigation measures. As coral reefs are the flag bearer of one of the most fragile, paramount and productive ecosystems, the vulnerability of any species can be considered a significant finding which needs to be restored and managed to safeguard the entire ecosystem.

Conclusion

More than decade-long inclusive studies on the coral reef ecosystem of Andaman and Nicobar Islands reveals that the occurrence of *A. teres* (Verrill, 1866) is under regional vulnerability as none of the live coral colonies of this species is reported in Andaman and Nicobar Islands after 2010. The live colonies were recorded from North Reef Island in 2009 and disappeared in 2010 due to a massive bleaching event. This implies a great deal of biodiversity loss which requires restoration for conservation of the oldest natural undersea heritage *i.e.*, the coral reef ecosystem.

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Conflict of Interest

There is no competing or conflict of interest.

Author Contributions

All the authors contributed substantially to the preparation of this manuscript. The conceptualization of the said work was framed by TM & CR. Field surveys were carried out by TM & CR. Funding acquisition was carried out by CR. Data analysis was carried out by TM & CR. The manuscript was written by TM. Review and editing were carried out by TM, CR & KC. CR & KC supervised the entire work.

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