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First distributional report of Scleractinian species *Favites spinosa* (Klunzinger, 1879) from Gulf of Mannar

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Abstract

Gulf of Mannar is comprised of rich marine and coastal resources which provide various goods and services to coastal population of India. Coral reefs in Gulf of Mannar (GoM) is one of the key components of marine biodiversity in India. During an intensive coral reef monitoring survey in Mandapam group of Islands, a scleractinian coral species *Favites spinosa* was recorded for the first time from Gulf of Mannar with photographic evidences. Colonies are found at a depth range between 0.5m to 3m in reefs of Manoli Island and Shingle Island. Colonies are submassive, cream or yellow in colour. Corallites are angular, deeply excavated and septa arranged in alternating rows. The detailed morphological characteristics and earlier distributional range of *F. spinosa* are described in the present study.

Keywords: Scleractinian corals, *Favites spinosa*, shingle island, Manoli Island, Mandapam group of Islands, GoM

1. Introduction

Gulf of Mannar Marine National Park (GMMNP) consisting 21 islands along a stretch of 170 km between Tuticorin and Rameswaram (Lat. 8° 55' – 9° 15'N and Long. 78° 0' and 79°16' E), is located along the southeast coast of India. Because of its naturally diverse habitats such as coral rich islands, sea grass beds, chank beds, mangroves, sea beaches, the GMMNP has been considered as “Biological Paradise” to the researchers [1, 2]. A total of 4223 marine flora and faunal species were reported from Gulf of Mannar Biosphere Reserve (GoMBR), among which 117 scleractinian species recorded till date [3]. Research on coral taxonomy and distribution in India was first extensively carried out by Pillai (1996) [4] during which he recorded a total of 199 species belonging to 71 genera. Thereafter, Venkataraman *et al* [5] published a book on corals which reported 208 species from India. At present, 478 species of scleractinian corals have been reported so far from India [2]. Recently, 13 new records of scleractinian corals were also documented from Gulf of Mannar [3] which increases the taxonomic list of scleractinian corals from 104 to 117. However, diversity of scleractinian corals are well known to maintain the maximum productivity of a reef ecosystem and thus ensuring the existence of rich marine biodiversity. Despite of such essential value, coral reefs in tropical islands and countries undergo acute disturbances in the past few decades which results in mass mortality of corals around the world [6-8]. Due to the rapid changes in the environmental condition and increased threats by human pressure, biodiversity extinction is triggered at an alarming rate of 0.1%-1% of species per decade [9]. Similarly, corals in Gulf of Mannar also faced severe degradation over the past few decades due to bleaching, sedimentation, destructive fishing and excessive growth of bio invasive species [6]. Therefore, documentation of reef taxonomy is essential to understand the species distribution range within specific geographic area and this information also helps in landscape level conservation measures to protect the exact number of flora and faunal species. In connection with long term coral monitoring programme in Gulf of Mannar, a scleractinian coral species *Favites spinosa* belonging to the family Merulinidae is being reported for the first time from islands of Gulf of Mannar.

2. Materials and Methods

Intensive underwater surveys were conducted in Shingle Island and Manoli island of Mandapam group of Islands in GoM during the month of January-February, 2019.

While diving, three colonies of *F. spinosa* were observed and photographed with NIKON Coolpix underwater camera. Locations of the observation sites (Site1: N09°14.702', E79°14.114'; Site2: N09°14.735', E79°13.960'; Site3: N09°13.186', E79°08.044') were marked with GARMIN e-Trex handled GPS device (Fig.1). Collection of specimen was not performed as coral considered under the schedule I category as per Wildlife Protection Act, 1972. Species identification was performed from the earlier literature of Veron, 2000^[10] and Venkataraman *et al.* 2012^[11].

3. Results and Discussion

3.1 Systematic Position

Phylum: Cnidaria Verrill, 1865

Class: Anthozoa Ehrenberg, 1834

Order: Scleractinia Bourne, 1900

Family: Merulinidae Verrill, 1865

Genus: *Favites* Link, 1807

Species: *Favites spinosa* (Klunzinger, 1879)

3.2 Morphological Features

Colonies are sub massive and cream or yellow color (Fig.2a, c). Corallites are irregular, deeply quarried. Wall of the corallite is off cream in color and the centre is dark brown. Septa are straight, widely spaced. Edge of the septa is rigid and prominent septal teeth have ragged margins (Fig.2b). Septa is usually arranged in two alternating orders (Fig2d.). Columellae is short and squeezed.

3.3 Distribution

In world: Red Sea, Madagascar and Sri Lanka^[11].

In India: Andaman and Nicobar Islands^[11]

3.4 Remarks

F. spinosa is a closely related specie of *Favites flexuosa*. This

species is recently documented in a literature of Krishnan *et al.* 2018^[12] where it was listed from Tuticorin group of Islands. However, there are no valid distributional records or photographic evidences and morphological characteristics described for *F. spinosa* distributed in GoM. The previous study^[12] has only reported the bleaching incident in *F. spinosa*. This species is nowhere listed in other recent literature of Gulf of Mannar^[3, 11, 13].

The genus *Favites* sp. previously represented six species (*Favites abdita*, *Favites halicora*, *Favites melicerum*, *Favites pentagona*, *Favites complanata*, *Favites flexuosa*) from Gulf of Mannar^[3]. Among these species, *F. flexuosa* represent the similar characteristics with *F. spinosa*. However, *F. flexuosa* has much larger corallites and less spiny septa than *F. spinosa*. Almost all representing genus under family Faviidae now recently added to family Merulinidae except *Cladocora* sp. and *Solenastrea* sp. Many changes in coral nomenclature and classification have been newly described^{[14] [15]}. Therefore, checklist of Indian coral species along with their recent names and newly revised systematics needs to be updated for reliable identification and documentation of coral species.

Marine biodiversity loss due to environmental and anthropogenic pressure breaks the ecological balance of the ecosystem and also vanished the valuable marine resources from the nature^[16]. Coral Reefs in GoM provides essential marine resources to the coastal population in terms of fisheries and aquaculture^[1]. Hence, finding of new distributional reports of *F. spinosa* indicates that there might be many other coral species which are still unknown to us and needs to be investigated. A comprehensive taxonomic list of marine species along with its newly discovered resources aids us to bring proper conservation plan in protecting the Gulf of Mannar Marine National Park.

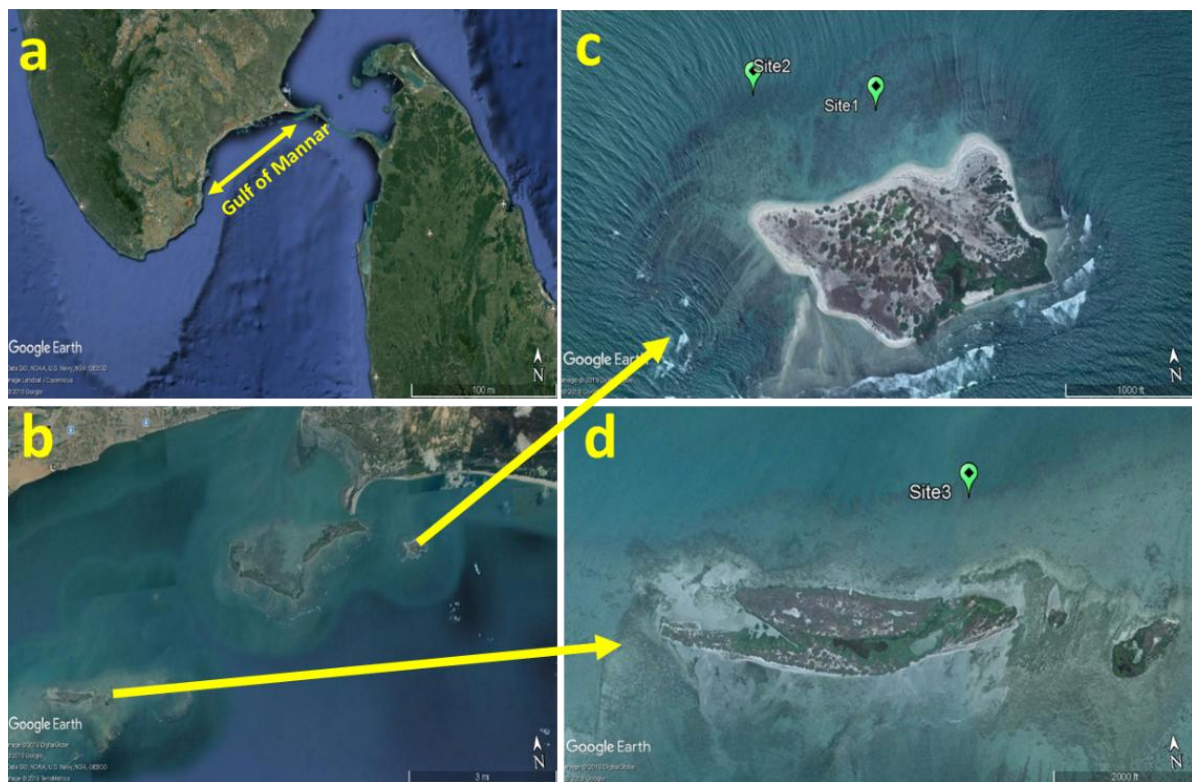


Fig 1: Study Sites: a. Area of Gulf of Mannar, b. View of Islands in Mandapam Group, c. Shingle Island, d. Manoli Island

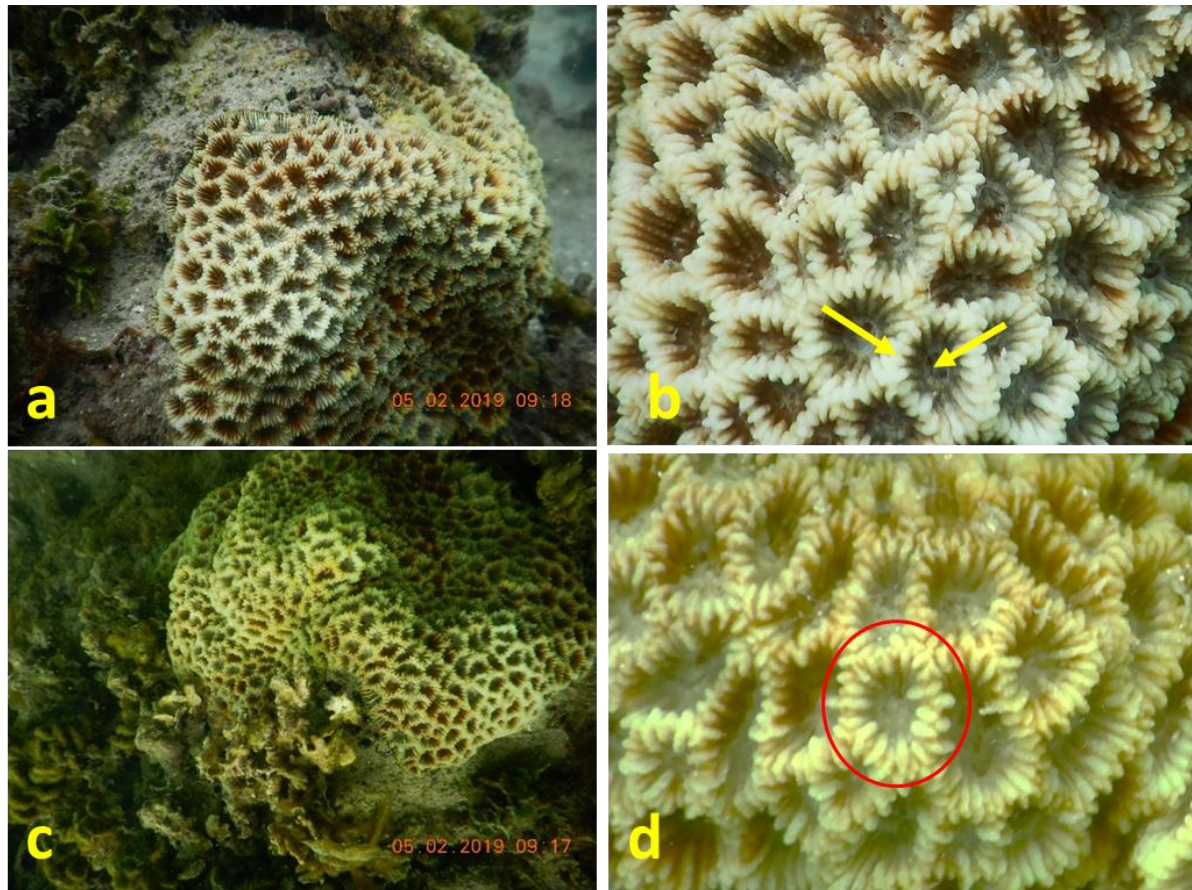


Fig 2: a. Sub massive cream coloured colony of *Favites spinosa*; b. Close view of corallite structure; c. Sub massive yellow coloured colony; d. septa arranged in alternate rows.

4. Conclusion

The present study described the first distributional record of *F. spinosa* from the Gulf of Mannar with new systematics of coral species. Finding of new distribution of coral species indicated that reefs in Gulf of Mannar is enriched with many unknown faunal resources which needs to be studied comprehensively in future. NCCR also initiated long term coral reef monitoring programme to assess the health of coral reefs and to find out the associated macro faunal resources of Gulf of Mannar Marine National Park.

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