



# A record of Mono-specific Carpets of Genus –*Sinularia* on Coral reefs of the Gulf of Kachchh, Gujarat, India

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## Abstract

The present observation is confined to the coral reefs of the Gulf of Kachchh at the western coast of India. The observation describes occurrence of two large patches of soft coral belonging to genus *Sinularia* on Mangunda reef and Paga reef at the Gulf of Kachchh (GoK). It was observed that the colonies of *Sinularia* completely surrounded other Scleractinians. The present observation indicates occurrence of Allelopathic phenomenon on reef habitat.

**Keywords:** Gulf of Kachchh, *Sinularia* sp., scleractinians, allelopathic phenomenon.

## Introduction

Gujarat is one of the maritime states of the country, having the longest coastline in India. The length is mainly attributed two Gulfs of the state i.e., Gulf of Kachchh and Gulf of Khambhat. However, the coral reef formations are restricted to the Gulf of Kachchh. The Saurashtra shore of GoK has numerous Islands which harbour vast area of mangrove and coral reefs. In order to conserve the rich marine biodiversity, the area was declared as India's first Marine National Park and Sanctuary (MNP and S) in 1982. India having four main diverse coral reef areas, The Gulf of Kachchh (GoK) is one of them. The vast coral reef area is bestowed with rich marine biodiversity exhibiting a number of ecological phenomena. Especially, the benthic animals and plants have to compete in order to spread their coverage on the sea bottom. In order to survive in this competition, organisms show certain phenomena called allelopathy which helps them to increase their benthic coverage by inhibiting the growth of other nearby organisms with toxic secretions. In the present studies intertidal areas of GoK were surveyed under two projects i.e., i. Integrated Coastal Zone Management (ICZM) Project (Mangunda reef) funded by World Bank and ii. Impact of Global Changes on Marine Ecosystems with special emphasis on Coral Reefs (Paga reef) funded by Space Applications Centre (SAC), Indian Space Research Organisation (ISRO).

## Methodology

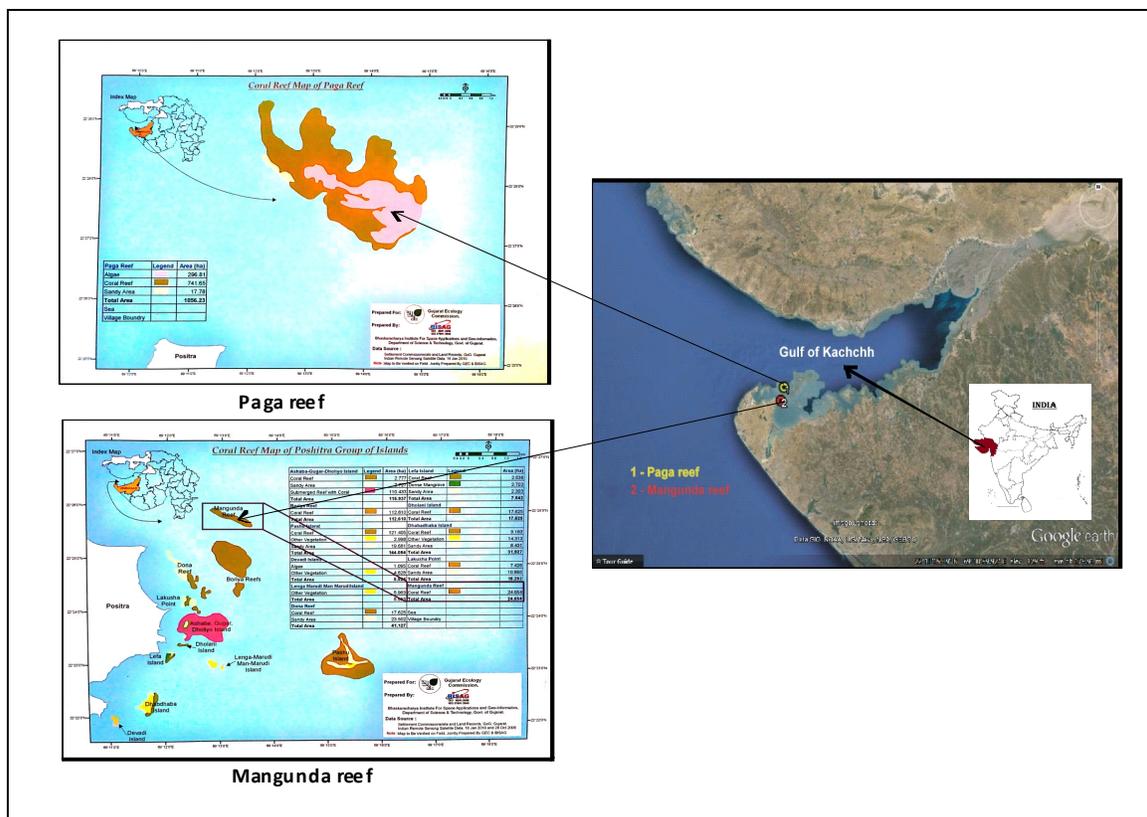
The present observations were recorded on an Island and a submerged reef. Both the locations are offshore, hence were approached by fishing trawl from the nearest coastal location. The observation was recorded by the authors during the field work of other projects where the data collection was carried out by laying quadrates on reef. The quadrate size was 1m X 1m and having 100 grids in order to collect data precisely i.e., each small square representing 1 % of the benthic category. The reef of the Gulf of Kachchh fringes the island coasts in more or less parallel manner, hence the quadrates were laid parallel to the

reef edge. However, the large patch of the soft coral was not spread parallel to the observation line of the quadrate. In order to get all the dimensions of the soft coral patch, it was required to cover all the extreme direction of the patch and take measurements. Therefore, the present observation was accomplished by collecting GPS coordinates of the large patches from various directions in order to get the coverage of the soft coral.

## Results and Discussion

The major benthos of the GoK reefs includes hard and soft corals, other invertebrates, seaweeds and sea grasses<sup>1,2</sup>. The outer reef flat of Paga reef was evidently covered with mono-specific patch of the *Sinularia* sp., oriented parallel to the reef edge. It stretched about 90 m along the edge and its breadth was about 10 m contributing to 900 m<sup>2</sup>. The patch of Mangunda reef extended up to 150 m along the reef with the width up to 35 m covering about 5250 m<sup>2</sup>. The exposed patches appeared to be dark pinkish-brown carpets over the reef at both locations during low tide (figure-2 a, b). However, the underwater colonies appeared brown with yellow tinge (figure-2c). Some of the Scleractinians viz., *Montipora foliosa*, *Turbinaria peltata* and *Goniopora tenuidens* were also associated with this aggregation of *Sinularia*. It was observed that the colonies of *Favites complanata* and *T. Peltata* were completely surrounded by *Sinularia* sp. and it appeared that the colony growth of Scleractinians might be inhibited.

Such observations have also been recorded by reef scientists in other part of the world. Many soft corals including, *Sinularia* sp. form large patches on reefs<sup>3,4</sup>. It was noted that *Sinularia* possess toxic chemicals and limit the growth of smaller colonies of Scleractinians<sup>5</sup>. It was observed that approximately half of the soft corals of on the Great Barrier Reef contain toxic compounds<sup>6</sup>. Moreover Sammarco had also examined the allelopathic effects of *Sinularia pavidata* on scleractinians<sup>7</sup>.



Source: Paga and Mangunda reefs “Coral Atlas of Gujarat State” GEC, Gujarat, India

**Figure-1**  
 The two locations- Paga and Mangunda reefs in Gulf of Kachchh, Gujarat, India



**Figure-2a**  
 A large exposed patch of *Simularia sp.*



Figure-2b  
Exposed colonies of *Sinularia* sp. with retracted polyps

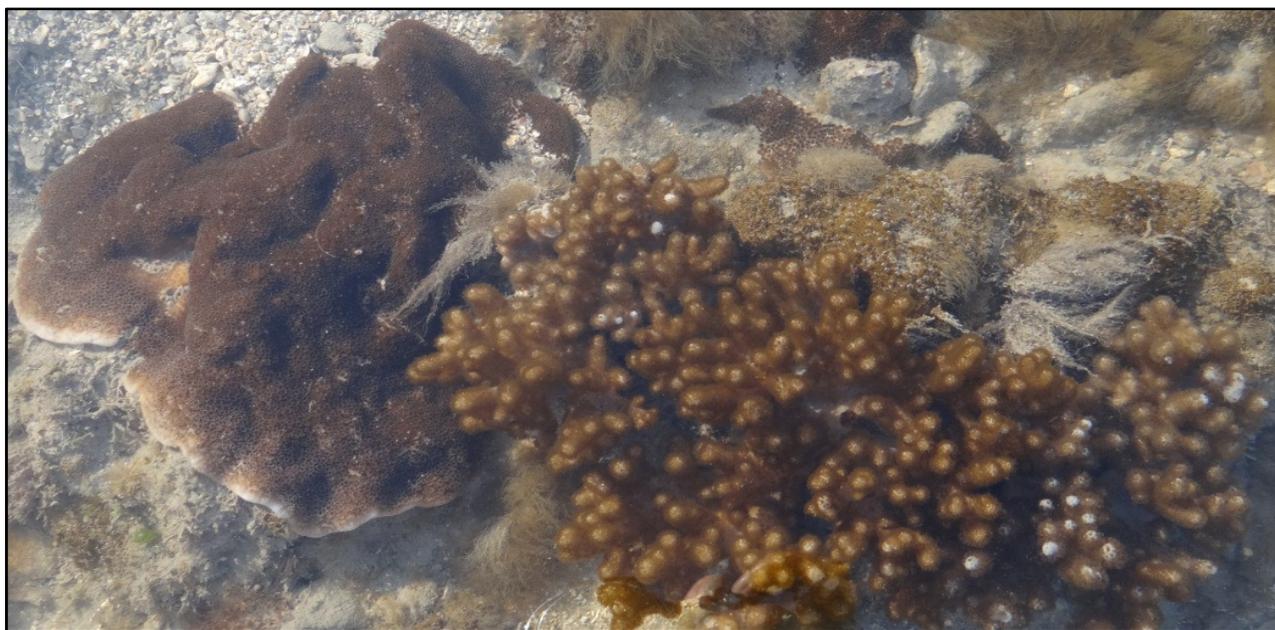


Figure-2c  
Under water view of *Sinularia* sp. extended polyps gives brownish yellow tinge



**Figure-2d**  
**Dominance of *Sinularia sp.* colonies in 1x1quadrat**



**Figure-2e**  
**Colonies of *Sinularia sp.***

## Conclusion

The present observation indicated occurrence of allelopathic effects, enabling *Sinulariasp.* to survive despite the likely competition with other benthos on reef. Hence, it is recommended to carry out further investigations in the GoK to identify and isolate relevant bio-active compounds from *Sinulariasp.*

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