

CORAL BLEACHING OBSERVED NEAR MANDAPAM, KEEZHAKKARAI, PALK BAY

Relevant for: Geography | Topic: Islands & Coral Reefs, changes therein and in Flora & Fauna and the Effects of such changes

Acropora formosa. Photo: National Centre for Coastal Research

The National Centre for Coastal Research, an institute under the Ministry of Earth Sciences, in India, has a field research station in the Gulf of Mannar region, and researchers led by Dr. Shanmugaraj have found an alarming pattern of bleaching in the reefs in Mandapam, Keezhakkarai and Palk Bay. They have found that sea surface temperature ranged from 28.7°C to 31°C in the August 2018-February 2019 period and there was no bleaching seen then. However, when the temperatures rose to between 32°C and 36°C between March 2019 and May 2019, researchers observed a pattern of bleaching in corals, which was different at different layers within the sea.

About 12% of coral species observed at depths between 0m and 2m such as *Porites solida*, *Porites lutea*, *Montipora digitata*, *Acropora hyacinthus* were completely bleached. About 5% of species observed at depths between 2m and 4m such as *Acropora formosa*, *Acropora hyacinthus*, *Montipora digitata*, *Montipora foliosa*, *Pocillopora damicornis*, *Goniastrea retiformis*, *Platygyra sinensis*, *Dipsastrea favus*, *Dipsastrea speciosa* were partially bleached. *Porites* species observed in Palk Bay region were completely bleached at depths from zero to 4 metres. Corals at depths over 5m did not face bleaching.

In some sites the massive corals such as *Porites* species were completely bleached but branching corals such as *Montipora digitata* and *Acropora* species, were not bleached.

Coral reefs are important hotspots of biodiversity in the ocean. Corals are animals in the same class (Cnidaria) as jellyfish and anemones. They consist of individual polyps that get together and build reefs. Coral reefs support a wide range of species and maintain the quality of the coastal biosphere. Corals control the level of carbon dioxide in the water by converting it into a limestone shell. If this process does not take place, the amount of carbon dioxide in the ocean water would increase significantly and affect ecological niches.

Coral reefs are threatened by climate change. When the sea surface temperature increases beyond a tolerable limit, they undergo a process of bleaching. Basically bleaching is when the corals expel a certain algae known as zooxanthellae, which lives in the tissues of the coral in a symbiotic relationship. About 90% of the energy of the coral is provided by the zooxanthellae which are endowed with chlorophyll and other pigments. They are responsible for the yellow or reddish brown colours of the host coral. In addition the zooxanthellae can live as endosymbionts with jellyfish also.

When a coral bleaches, it does not die but comes pretty close to it. Some of the corals may survive the experience and recover once the sea surface temperature returns to normal levels.

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The study uses tree ring records to reconstruct the Asian summer monsoon back to 1566.

This is in connection with a proposal to ban walkers

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