



Research Paper

OCCURRENCE OF CORAL DISEASES IN THE GULF OF KACHCHH

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INTRODUCTION

The coral reef ecosystem is well known for their prodigious density and diversity of inhabitants hence sometimes referred as marine rain forests [1]. However, it is considerable that the most biologically diverse ecosystem is degrading at an alarming rate in all tropical oceans due to a number of anthropogenic and natural causes [2]. Climate change is one of the natural threats on coral reefs. The increasing Sea Surface Temperature (SST) weakens corals against the adverse environmental conditions and may predispose them to diseases; on the other hand the elevated temperature may increase the virulence of the pathogens making corals more vulnerable [2]. Worldwide, more than forty different coral diseases and syndromes have been reported [2], among which White Band Disease (WBD), White Plaque Disease, Black Band Disease (BBD) and Yellow Band Disease (YBD) are commonly found. The study of the coral disease is also crucial in terms of ecological perspective as White Band Disease resulted in the loss of acroporids as the dominant reef builders in the Caribbean, an unprecedented change within the past 3000-7000years [3]. The BBD is common on Indian reefs and was noticed on *Porites sp.* on Kavaratti atoll, Lakshadweep. WBD has also been observed on several massive corals at Lakshadweep. A total of 9 coral diseases were described from the coral reefs of Gulf of Mannar that affected four coral species *i.e.*, *Porites sp.*, *Pocillopora sp.*, *Favia sp.* and *Favites sp* [4].

The present observation is recorded from the Gulf of Kachchh (GoK). It is situated at western coast of India and located between 22°15' N and 23°40' N Latitudes and 68°20' E and 70°40' E Longitudes. The Gulf of Kachchh is the only site in Gujarat bestowed with one of the four major coral reef formations of the country. Patchy coral formations are evident on intertidal sandstones in the GoK. The observations of coral diseases were recorded on Laku point (Poshitra)-a coastal location and Paga reef - a submerged reef situated at the western part of the Gulf.



Map: 1 Study area-the Gulf of Kachchh

Present work describes occurrence of 4 coral diseases from the GoK *i.e.*, Focal Bleaching, Ulcerative White Spot, Atramentous Necrosis (AtN) and Non Focal Bleaching. Kumar *et al.* (2014) surveyed the coral reefs of GoK in order to provide disease prevalence on the 11 study sites and found out the five types of disease *i.e.*, Pink Spot; White

Plague, Ulcerative White Spots, Yellow Spot and Black Band [5]. However, the present work focused on infected host (coral species) along with additional type of diseases on *i.e.*, Focal Bleaching and Atramentous Necrosis (AtN). The massive faviid species *Plesiastrea versipora*, encrusting species *Siderastrea savignyana* and two species of family poritidae were recorded with the disease symptoms. The symptoms of the diseases and infected host have been described below:

i) Focal Bleaching (FB): The symptoms of FB were evident in the form of circular white lesion and annular margins on the colony. The annular margin appeared slightly swollen or embossed and their diameter ranged from 10 to 16 mm. Such symptoms were found on *Plesiastrea versipora*.

ii) Ulcerative White Spot (UWS): The symptoms of UWS were observed in the form of small, oval to circular white spots and their diameter ranged from 5 to 10 mm. During the present observations, it was recorded on 2 coral species *i.e.*, *Plesiastrea versipora* and a large patch of *Siderastrea savignyana*.

iii) Atramentous Necrosis (AtN) (Black Death): The symptoms of this disease were found on *Porites lutea*. The colony showed oval grey patch following white patches. The diameter of the patches ranged from 10 cm to 30 cm. It was described as multifocal patterns of tissue loss that expose spots or patches of bare white skeleton subsequently colonized by a distinctive dark fouling community [6]; Lesions typically start as small (<1cm diameter) bleached spots, which may coalesce to create larger patches of tissue loss [6]; In the final stages, lesions may develop a white film overlying black deposits giving them a greyish appearance [6]. Hence, as per the description of various disease stages, it is clear that the disease was at its final stage at the time of present observation.

iv) Non Focal Bleaching (White Patches): The non-focal bleaching in the form of a white patch, was recorded on *Porites compressa* colonies. It appeared like unusual pattern of bleaching which is not resulted after specific response to thermal or other environmental stress; Borders between bleached patch and typically coloured tissue are often discrete. The bright white patch was present at the base of one of the vertically

projected branch of the colony and its diameter was ranging from 4 to 5 cm. The descriptions have been developed from the Indo- Pacific Underwater ID Card [6].

Plesiastrea versipora is a rare species and it is distributed on restricted locations in the GoK [7, 8]. This species was infected by two diseases *i.e.*, (i) Focal Bleaching (FB) and (ii) Ulcerative White Spot (UWS). Hence, threats to its survival may further affect the population trend and distribution of the species in the GoK. *Porites lutea* and *Porites compressa*, considered as major reef builders of the GoK coral reef were found with two different diseases. Therefore, threats to the health and survival of these species raise the call for revealing causes behind the diseases which will bring forth the spread and possible causes of the diseases covering larger area in the GoK.

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Figure 1 Ulcerative White Spot on *Plesiastrea versipora*



Figure: 2 Colony and closer view of all the disease infected corals; a, b: Focal Bleaching on *Plesiastrea versipora*; c, d: Ulcerative White Spot on *Plesiastrea versipora*; e, f: Focal bleaching on *Siderastrea savignyana*; g, h: Atramentous Necrosis (AtN) (Black Death) on *Porite lutea*; i, j: Non Focal Bleaching *Porites compressa*;

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