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Short Communication

Polychaete infestation on porite corals in the Andaman Sea

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Abstract

Polychaete infestations are common among the porites group of corals in Andaman and Nicobar group of islands. However, these infestations occur in small numbers and the intensity of the effect is not so pronounced. The number and intensities of polychaetes in various transects surveyed indicates that anthropogenic activities are playing a major role in proliferating the polychaete infestation, which are otherwise in a low profile. The surveys were conducted for assessing the reef health status at North Bay, Havelock Hathi Dera, Aberdeen jetty, Chidiyatapu, and North Wandoor. In sites which are directly exposed to human activities, the number of feather duster polychaetes and Christmas tree polychaetes are high. In North Bay reef the polychaete infection was very high which shows the effect of tourism. Aberdeen jetty and Havelock jetty also, the polychaete number is high on *Porites* sp. Such incidences are not encountered in areas with less anthropogenic disturbance.

Keywords: Porites, polychaete infestations, anthropogenic disturbance, health status

Introduction

In the last two decades there were several initiatives to study the coral reefs in Andaman and Nicobar. Wood (1989) reported damage and death of corals in four out of five observed sites. The infestations of 'crown of thorns' and the occurrence of live baitfishes in the marine park area have been investigated by James *et al.* (1990). Serious issues like diseases, bleaching and the like were reported in 1998 (Ravindran *et al.*, 1998). All these studies were pointing out the vulnerability of reefs due to anthropogenic activities and bleaching. But the effect of polychaete infestation on coral reefs of Andaman and Nicobar Islands failed to get recorded in these studies as the polychaete infestations were not severe compared to other clinical symptoms referred as diseased or stressed.

Methodology

The survey team consisted of, from time to time, two or three field investigators assisted by two diving assistants. Survey stations were selected from topographic maps (Fig. 1). The following three

categories of stations were selected: (i) Those areas with known coral reefs as indicated in the maps with less anthropogenic activity; (ii) areas along the coast situated in the vicinity of construction sites such as jetties, breakwaters, etc., and (iii) areas subjected to tourism related operations.

The surveys were carried out by snorkelling and free diving and so were essentially confined to the reef flats. This precluded the possibility of taking observations beyond a depth of 10 metres. The surveys were conducted in two phases. Phase I involved a preliminary survey in which the investigators swam over the reef area to make observations, which were qualitative in nature. Phase II consisted of detailed quantitative observations using the Line Intercept Transect survey method (English *et al.*, 1997).

Transect survey: Three parallel transects, 50 meters apart, were initially laid out at each station. Each transect was laid out perpendicular to the shore line, commencing from the shoreward edge of the reef and extending up to the end of the reef flat. Observations were taken for every metre of the

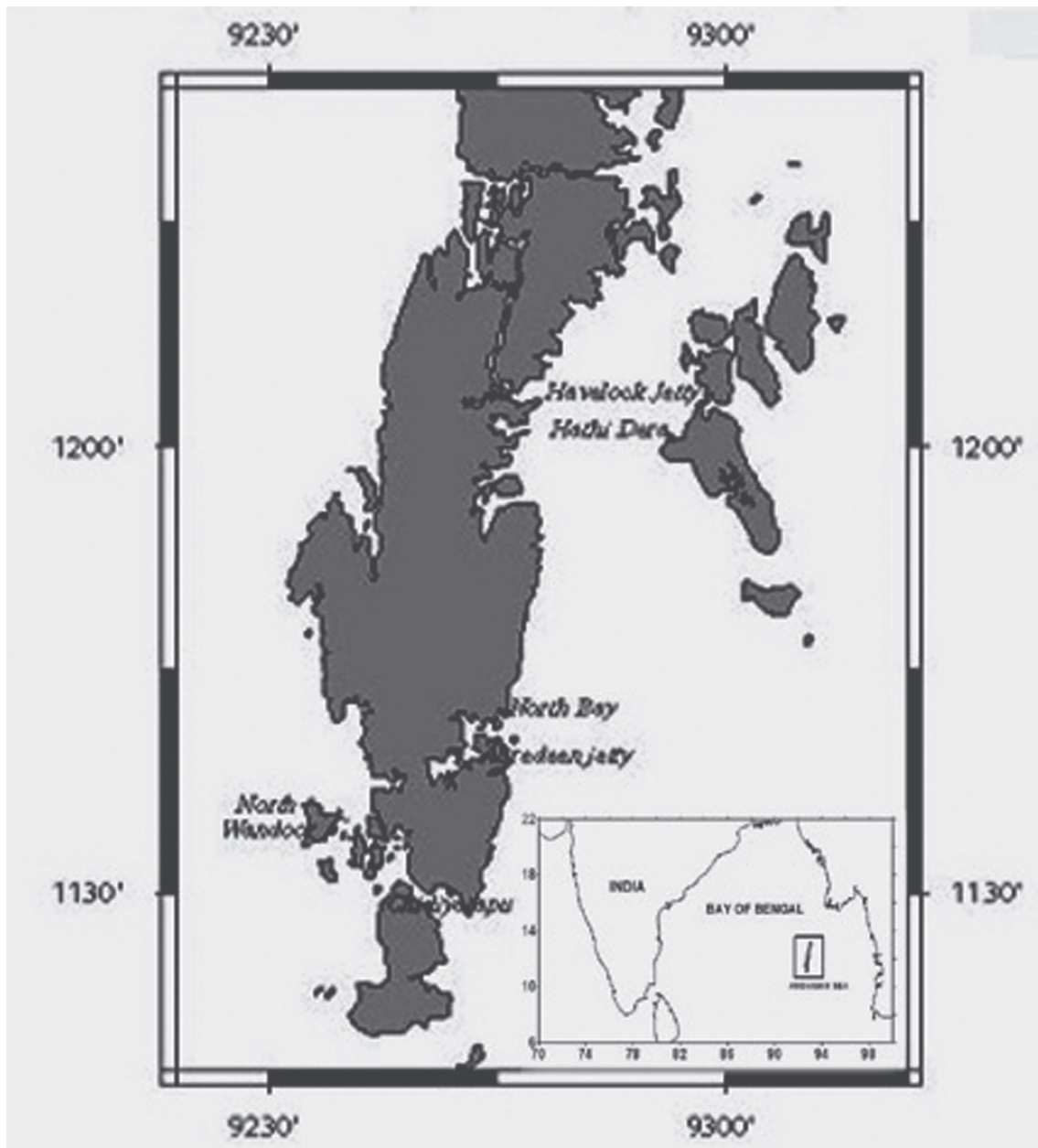


Fig. 1. Study sites in the Andaman Sea

transect for all the abiotic and biotic elements. The mean values of the data collected from the three transects were used for all the computations. Observations on Andaman reefs are carried out since 2004 on regular basis for pre-monsoon,

monsoon and postmonsoon seasons (Dam Roy *et al.*, 2007), but the present study is based on transect observations during March - June 2008 as proliferation of polychaetes to this extent were notable only during this period.

Results and Discussion

Andaman reefs are rich in their biodiversity and abundance as revealed in our surveys (Dam Roy *et al.*, 2007). There are reports world-wide regarding the polychaete infection on corals due to enhanced anthropogenic activities in reef areas (Wielgus *et al.*, 2006). The study sites Aberdeen jetty, North Bay and Havelock jetty are regularly visited by tourists. Other sites Hathi Dera, North Wandoor and Chidiyatapu are having lesser anthropogenic pressure as they are away from main stream tourism areas. Havelock jetty is having only degraded corals with the reefs affected during jetty construction. Usually the number of polychaetes in a transect of 50 meters is 100-200 (Fig. 2), but in places of infection, the number goes up to 80-120 number per meter (Fig. 3). This high number of polychaetes seems to affect the health of corals

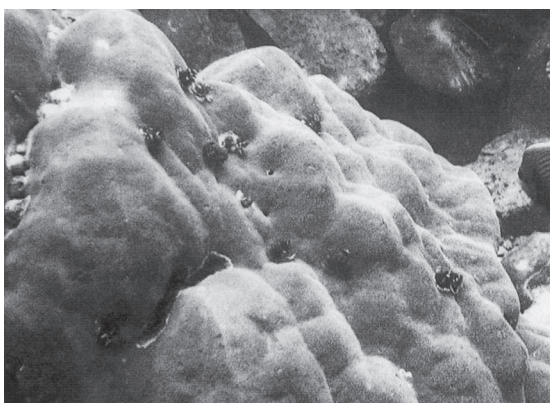


Fig. 2. Representative sample of low infestation of polychaetes on porite coral from a transect of 50m

in that area. At one site in North Bay, more than 300 polychaetes per meter were noticed. In areas with less anthropogenic activities like Chidiyatapu, North Wandoor and others, the number of polychaetes is very low.

The polychaetes infecting the porites are *Spirobranchus giganteus* (Grube 1862), *S. spinosus* and *Sabella* sp. The polychaete infection leads to bleaching of corals in a small area which looks similar to infection by fungal diseases. The increased presence of polychaetes leaves the corals



Fig. 3. Representative sample of high infestation of polychaetes on porite coral from 1m transect in North Bay

under stress leading to heavy mortality of polyps and partial bleaching. The polychaetes leave a bleached coral with a small hole which also affects the health of the corals.

Polychaetes are filter feeders, which are free living or sessile. The feather star polychaetes are sessile forms which are boring in nature. They bore the corals and live inside them, extend their feathers outside and block light source to the corals which leads to the bleaching. *S. giganteus* is an obligate associate of living corals. The present study shows that the associated coral reef fauna turn hostile to some reefs in the Bay Islands where anthropogenic pressure is reportedly higher. The increased presence of polychaetes on reefs (Table 1) is an indication of crucial observations to be carried out in these areas. There was a significant difference in the number of individuals recorded at each site. Generally higher numbers were found at North Bay, and significantly so at the reef slope. There was no significant difference in the numbers observed at each site on the reef crest, but there was on the reef flats of Aberdeen Jetty having significantly higher numbers than the other three less anthropogenically disturbed sites of North Wandoor, Hathi Dera and Chidiyatapu. Havelock Jetty is having very less live coral substrate to provide a niche enough for polychaete proliferation.

Table 1. Observation on increased polychaete infestation in phase II surveys

Site	Percentage cover of live coral	Porites coverage (%)	Number of polychaete (per 100 meter)
North Bay	62.49	48.51	4784
Havelock-elephant beach (Hathi Dera)	39.73	58.81	39
Havelock Jetty	9.96	55.71	6
Aberdeen Jetty	44.00	73.3	5290
Chidiyatapu	9.56	55.43	83
North Wandoor	28.06	76.18	14

There are several existing threats on Andaman reefs like increasing Sea Surface Temperature resulting in massive bleaching, earthquake and tsunami related stress, anthropogenic pressure which call for an in-depth study.

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References

- Dam Roy, S., Grinson George, Anjali Bahuguna, R.C. Srivastava, S. Murugesan and M. Kaliyamoorthy. 2007. Final Report of the Project on "Assessment of coral Reef Health using Satellite Data". Published by Director, CARI, Port Blair, 102 pp.
- English, S., C. Wilkinson, and V. Baker. 1997. Survey Manual for Tropical Marine Resources, Australian Institute of Marine Science, Townsville, 2nd edn, 390 pp.
- James, D. B., C. S. Gopinatha Pillai and G. Gopakumar. 1990. A case study of infestation of *Acanthaster planci* in Andaman waters. *Mar. Fish. Infor. Ser. T & E Ser.*, 106: 1-3.
- Ravindran G., Chandralata, Raghu Kumar and S. Raghu Kumar. 1999. Disease and stress – induced mortality of corals in Indian reefs and observations on bleaching of corals in the Andamans. *Curr. Sci.*, 76(2): 233-237.
- Wielgus, J., D. Glassom, Chadwick and E. Nanette. 2006. Patterns of polychaete worm infestation of stony corals in the northern Red Sea and relationships to water chemistry 2006. *Bull. Mar. Sci.* 78(2): 377-388.
- Wood, E. 1989. Corals: Wandoor marine national park, sane awareness series 4, *INTACH, A&N Chapter*, 14pp.

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