



Short Communication

An extensive monospecific stand of Blue coral *Heliopora coerulea* (Pallas, 1766) in the Chetlat atoll of Lakshadweep Archipelago

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The study reports massive and dense Blue coral *Heliopora coerulea* (Pallas, 1766) population in Chetlat atoll, one of the northernmost atolls in the Lakshadweep Archipelago. Globally, there are only a few instances of the occurrence of such massive blue coral populations, mostly from Japan. Underwater survey shows that about 60 % of the entire reef area is occupied by the Blue coral. In addition, this atoll was observed to have lesser cover of different species of *Acropora* as compared to the reports from other Lakshadweep atolls. Both *Acropora* and *Heliopora* are described to be mutually competitive and *Heliopora* are comparatively more resilient to climatic stressors. The knowledge about the occurrence of such a large swathe of the Blue corals is important in the current scenario of the widespread deterioration of the coral reefs due to changing climate.

[**Keywords:** Climate, Coral reef, Microhabitats, Resilience, Single-species stands]

Introduction

Lakshadweep-Chagos ridge supports the longest chain of true atolls in the world and supporting divergent ecosystems characterised by a rich diversity of corals and associated marine organisms¹. Chetlat is one of the northernmost inhabited atolls in this chain. An exceptional feature recorded at this atoll is the dense population of hermatypic non-scleractinian octocoral *Heliopora coerulea* (Pallas, 1766) (Anthozoa, Octocorallia, Helioporacea), commonly known as the Indo-Pacific Blue coral (Fig. 1). Such massive single species populations are previously recorded only from the Shiraho Island², Oura Bay³ and Ishigaki Island, Japan⁴.

H. coerulea was the first and only extant species described under the family Helioporidae⁶, an Octocoral family, until the recent discovery of a new species *Heliopora hiberniana* from north Western

Australia. It is a hermatypic coral capable of dominating the reef structure in many shallow reef areas⁷. *H. coerulea*, a "living fossil", first evolved in the Lower Cretaceous and survived to date without many evolutionary modifications⁸. Classified as Vulnerable as per the IUCN Red List Category & Criteria in October 2008^(ref.9), it is widespread throughout the Indo-West Pacific region and thought to be a consequence of climatic history and lack of tolerance to low temperatures⁶.

Materials and Methods

The location of the study was Chetlat atoll (11°41'34.52" N, 72°42'30.56" E). The current study was performed during September 2019 using Line Intercept Transect (LIT)⁵ based underwater survey. We quantified the average percent coverage of blue coral species using three 10 meter transect tapes placed 5 meters apart at each station. A total of 12 reef stations were surveyed in the lagoon.

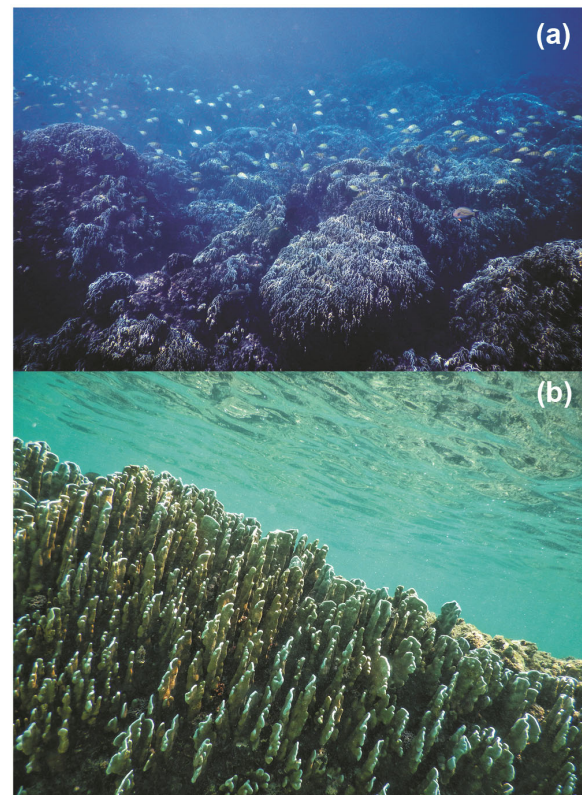


Fig. 1 — a) Blue corals at Chetlat reef, and b) Blue corals at Chetlat reef (close view)

Results and Discussion

Out of the 12 stations surveyed, four northern stations were dominated by blue coral (87 to 97 % of total coral cover). They form a robust reef crest in the northern part and occupy a distinct zone in the deepest portion of the lagoon (Fig. 2). They rise from a depth of up to three to four meters from the floor, usually forming a continuous massive colony surface. The crevices and gaps of this structure provide shelters for a variety of fish and invertebrates. The total reef area inside the lagoon is estimated to be approximately 42.6 hectares out of which 28.2 hectares (60 %) is occupied by the blue coral. Its southern end is bounded by the channel that cuts the lagoon into two.

Poor coverage of the hard corals of *Acropora* genus also was noticed in Chetlat during this study, which is an abundant species in all other reefs of the Lakshadweep Islands¹⁰. A study by Zann & Bolton¹¹ observed *Heliopora* and *Acropora* as being mutually competitive. The possible reason for the success of *Heliopora* over scleractinian corals is their ability to compete effectively for settlement space on the reef by inhibiting the settlement of other coral larvae in its immediate vicinity¹². The ability of the Blue coral to resist mortality due to bleaching could also be an

important reason for their success. They are understood to be less vulnerable to climate change and increased sea surface temperature¹³. Nonetheless, the exact reasons behind the exceptional dominance of *H. coerulea* in Chetlat lagoon are largely unknown. The massive colonies of these corals tend to protect the island against storms and waves more effectively than would more delicate branching corals. It is extremely important to investigate population dynamics further including their reproduction, larval settlement, diversity of other organisms supported by them etc. and the measures to be adopted to conserve this species in a changing climate scenario.

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Conflict of Interest

The authors have declared that no competing interests exist.

Author Contributions

Field work, data preparation and manuscript writing were performed by AA & AKR. Study was conceived by SKR. Analysis of data was performed by JKK & MPS. Manuscript editing, drafting and coordination of the work done by SJ and LR. All authors read and approved the final manuscript.

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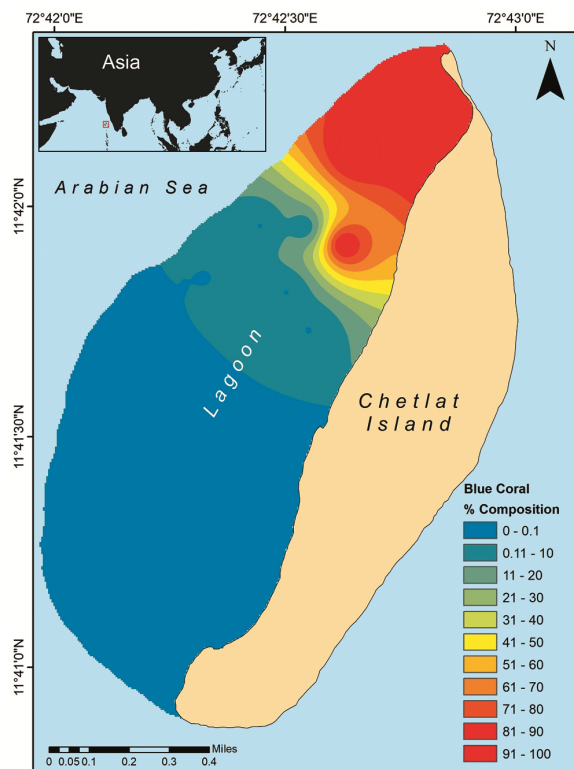


Fig. 2 — Interpolated map indicating the blue coral cover in the Chetlat lagoon

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