

## Short Communication

# First report of *Drupella cornus* Röding, 1798 (Gastropoda: Muricidae), a biological indicator of coral reef habitat of Lakshadweep Archipelago, India

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## Abstract

The present study infers that the impact of *Drupella cornus* Röding, 1798, particularly on the coral, *Pocillopora verrucosa* (Ellis and Solander, 1786) at Minicoy Island, Lakshadweep Archipelago, India. During the benthic reef monitoring in connection with the health of the reef ecosystem under Tourism Capacity Building project, it was identified as one of the biological indicators of the reef habitat. Further, the description and morphometric characters of the species were studied and presented in this paper.

**Keywords:** Biological indicator, Coral bleaching, Coral reef, *Drupella cornus*, *Pocillopora verrucosa*

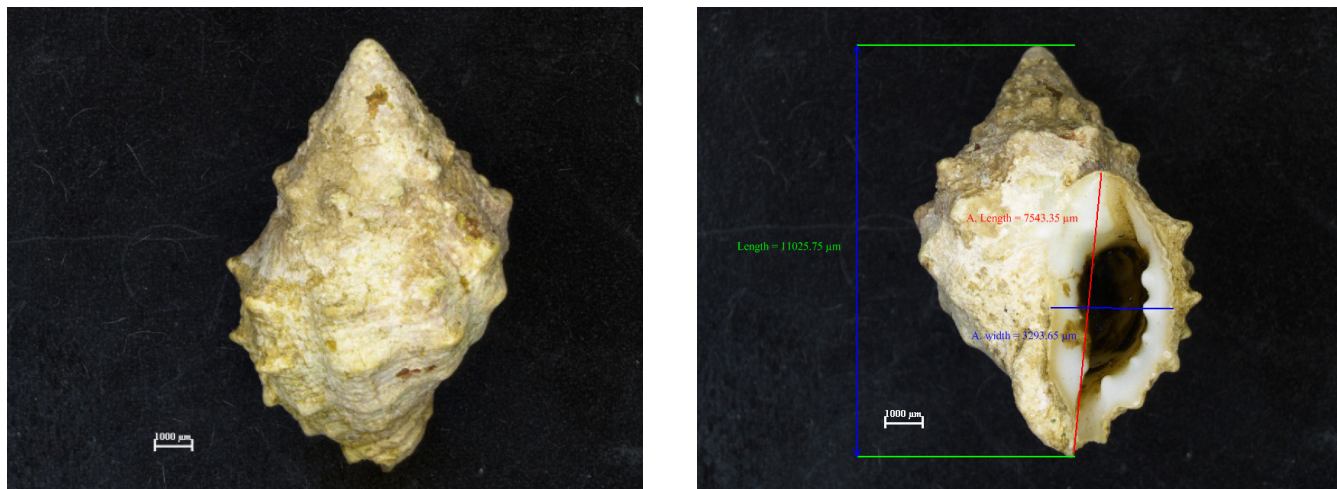
## Introduction

The study on biological indicator on coral reef habitat is helpful to assess the health of the coral reef ecosystem (Al-Sofyani *et al.*, 2014; Marimuthu *et al.*, 2016). The common coral predator, Crown of Thorn Starfish (*Acanthaster planci* Linnaeus, 1758) believed as a biological indicator in the benthic reef ecosystem. Besides, coral predating gastropod is also reported as an indicator for health in the Red Sea reef ecosystem (Al-Sofyani *et al.*, 2014; Mohamed *et al.*, 2012). In the path of large extent benthic reef monitoring at different Islands of Lakshadweep archipelago (Minicoy, Kalpeni, Kilthan and Kadamath Islands) in connection with the health of the reef ecosystem, it was observed that some corals were affected by localised bleaching, due to the presence of corallivorous gastropod, *Drupella cornus* Röding, 1798 (Figure 1). This impact was identified only in the coral species, *Pocillopora verrucosa* (Ellis and Solander, 1786).

It is inferred that the bleaching effect (Baird, 1999) on corals due to the loss of symbiotic algae *i.e.*, zooxanthellae as *Drupella cornus* consume them for food. Ultimately, corals lose its partial energy source and lead to death, and thereby habitat degradation occurs. Antonius and Riegl (1997) correlated the outbreak of this species with the coral disease. This outbreak was observed only in the reef slope area of the present study.

The greater intensity of this indicator organism, *Drupella cornus* on the reef habitat is observed to be a result of the impact of various natural and anthropogenic factors. The probable reasons for the increment of this biological indicator (McClanahan, 1994) include indirect impact due to unsustainable coastal tourism and thereby significant increment in nutrients due to coastal developmental activities and pollution. It was also evident that over-exploitation of natural predators of the coral predator (Nelson, 2009; Mallon, 2010; Al-Sofyani *et al.*, 2014) is considered to be a factor in the outbreak

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**Figure 1.** *Drupella cornus* Röding, 1798, collected at benthic coral reef habitat of Minicoy Island, Lakshadweep.

of *Drupella cornus*. This paper discussed the presence of such indicator in coral reef ecosystem in Lakshadweep archipelago.

## Systematic Account

### *Drupella cornus* Röding, 1798

1832. *Purpura elata* Blainville, *Nouvelles Annales du Muséum d'Histoire Naturelle*. 1: 189-263.
1929. *Drupa spectrum* Reeve, Société d'Éditions géographiques, maritimes et coloniales: Paris. 321-636, plates IV-VII pp.
1958. *Sistrum elatum* Blainville, A natural history of Inhaca Island, Mozambique. 163 pp.
1961. *Morula elata* Blainville, Tanganyika Notes and Records 56.
1997. *Thais cornus* Röding, A guide to the seashores of Eastern Africa and the Western Indian Ocean islands. 448 pp.

**Materials examined:** *Drupella cornus* is a solid shell with the series of rows of spines and the surface of the shell partially occupied by coralline algae. During the benthic reef monitoring in connection with the health of the reef ecosystem under Tourism Capacity Building project (conducted by NCSCM, Chennai during the month of January 2016), Nine exs. of Corallivorous snail collected by SCUBA diving at a depth of 10m from the branching portion of the coral *Pocillopora verrucosa* (Ellis and Solander, 1786) at Minicoy Island, Lakshadweep (N 08° 18' 28.47" E 73° 01' 05.98") on 21.01.2016. The estimated

opening height, opening width and large diameter of a single specimen among nine exs. as 7543.35µm, 3293.65 µm and 11025.75 µm respectively. The collected specimens were registered (No. M-29888/7) at Mollusca Section of Zoological Survey of India (ZSI), Kolkata, India and deposited in the National Zoological Collections of ZSI.

**Distribution:** *Drupella cornus* Röding, 1798 were reported from Australian coast to East African coast (Wilkinson, 2008; Houart, 2009; Cumming, 2009). In Indian waters, Raj *et al.*, (2014) reported this organism up to generic level at Van Island, Gulf of Mannar.

**Remarks:** The information on the outbreak of this biological indicator has been reported at Red sea (Antonius and Riegl, 1997; Wilkinson, 2008; Mohamed *et al.*, 2012; Al-Sofyani *et al.*, 2014) which is a neighbouring marine realm. In order to find out the travel path of this biological indicator, the study on genetic similarity of the species between these environmental regions is need of the hour. There are no historical records of *Drupella cornus* from coral reef ecosystem in India and it was reported only in 2014 (Raj *et al.*, 2014) at Vaan Island up to Genus level. Raj *et al.* (2014) reported about the density of drupellid snails on *Montipora digitata*, but the report lacks on the description of the observed corallivorous organism at Gulf of Mannar. Therefore the occurrence of this species in the reef ecosystem need a proper verification, as well as molecular phylogeny of this species, will suggest the

natural niche and its movement from neighbouring marine environment in due course of time. Also, rigorous data collection on environmental parameters may bring some significant fact about evolving this species and changes if any in their biology and behaviour including feeding pattern and food preference.

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