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Research Note

Plankton Productivity in Lagoons of Agatti and Bangaram Atolls of Lakshadweep Archipelago, India

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Phytoplankters and zooplankters function as important links in the food chain and form the food of a large number of organisms in the aquatic ecosystem. As plankters play an important role in the health of an aquatic ecosystem, the study on these resources in the productive aquatic ecosystems of Lakshadweep is significant. Earlier studies carried out earlier from Agatti and Bangaram are by Pratap et al. (1977), Achuthankutty et al. (1989) and Casanova & Nair (1999). No recent reports are available on plankters from Agatti and Bangaram. Hence, an attempt is made to study the qualitative and quantitative abundance of phytoplankters and zooplankters in the selected lagoons of Lakshadweep.

Phytoplankton and zooplankton samples were collected from the lagoon areas of Agatti and Bangaram Islands of Lakshadweep during March, 2013. Phytoplankters were identified upto genus level and zooplankters upto group level and were enumerated. A total of 19 genera of phytoplankters *viz., Trichodesmium, Melosira, Peridinium, Gonyaulax, Chaetoceros, Surirella, Pleurosigma, Spirulina, Ceratium, Coscinodiscus, Pyrophacus, Dinophysis, Asteromphalus, Eucampia, Oscillatoria, Rhizosolenia, Fragilaria, Amphora* and *Tolypothrix* were recorded during the study. Zooplankters were identified under 19 groups *viz.,* copepods, chaetognaths, *Lucifer* spp., medusae, euphausiids, ostracods, amphipods, decapod larvae, gastropod larvae, polychaete larvae, doliolids, salps, actinotroch larvae, mysids, appendicularians, squilla larvae, other invertebrate larvae, fish eggs and fish larvae.

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Among the 16 genera of phytoplankters recorded in Agatti, *Trichodesmium* dominated (92%) in numbers. In the lagoon areas of Bangaram (Fig. 1), the genus *Trichodesmium* dominated (53%) followed by *Peridinium* (21%). The concentration of phytoplanktons in Agatti and Bangaram islands were 85600 and 9400 numbers per m^3 respectively. Hence, blooming of *Trichodesmium* sp. was visible in both the Island waters with more intensity in Agatti. The blooming of *Trichodesmium* sp. was also recorded earlier by Qasim (1970) and Said Koya & Kaladharan (1997) in Lakshadweep Sea.

Sixteen groups of zooplankters were observed from Agatti, while 18 groups were recorded from Bangaram. The phytoplankton density in Agatti was 58495 numbers per 100 m^3 while, it was 117173 numbers per 100 m^3 in Bangaram. The displacement volume of zooplankton in Agatti and Bangaram were 15 and 20 ml 100 m^{-3} respectively. The distribution of zooplankton groups in Agatti is shown in Fig. 2.

Among the zooplankton, copepods dominated with 39%. Achuthankutty et al. (1989) recorded copepods as the biggest group among the holoplankton in the lagoon of Agatti. Pratap et al. (1977) reported copepods as the major group in zooplankton to the tune of 53.77% from the lagoon areas of Agatti. The percentage composition of zooplankters like chaetognaths, polychaete larvae, decapod larvae and fish eggs were more during the present study compared to previous report and a decrease was noticed in case of molluscs during the present study.

The changing pattern in the composition of zooplankters over the years can be due to variations in different hydro-biological characteristics and this in

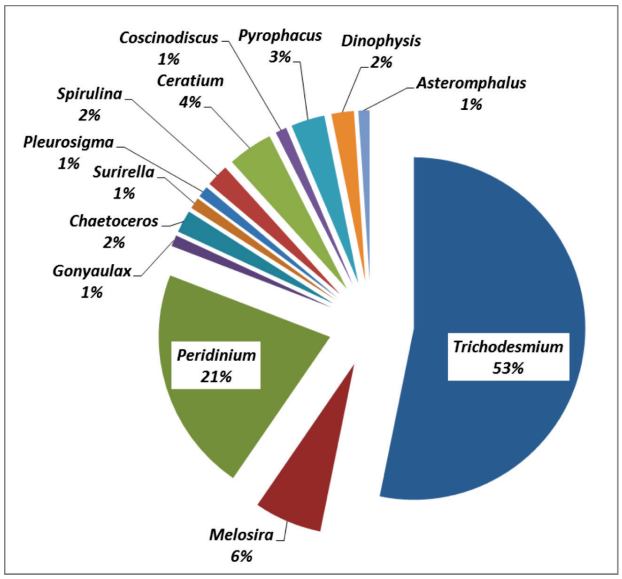

Fig. 1. Composition of Phytoplankters in Bangaram

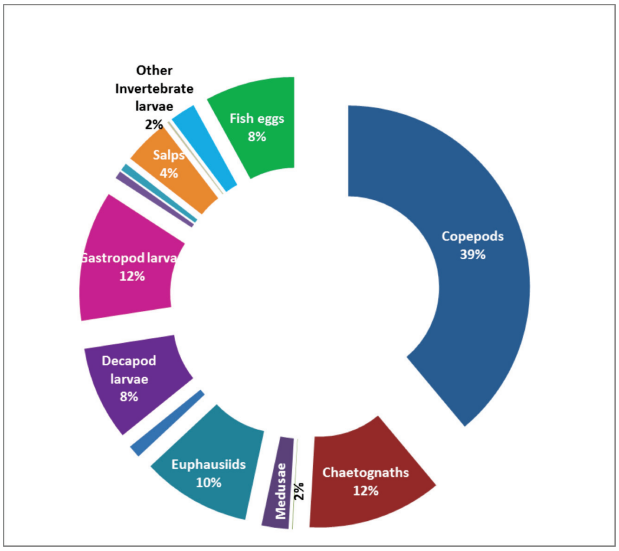

Fig. 2. Composition of zooplankters in Agatti

turn may affect the fishery resources prevailing in the area.

At Bangaram (Fig. 3), decapod larvae dominated (25%) followed by gastropod larvae (24%) and copepods formed only 19%. According to Goswami & Goswami (1990) meroplankton constituted an important component of zooplankton community in the Minicoy lagoon which was similar to the present study. Girijavallabhan et al. (1989) noticed decapod larvae as the dominant group followed by fish eggs in the lagoon of Bangaram. The dominance of

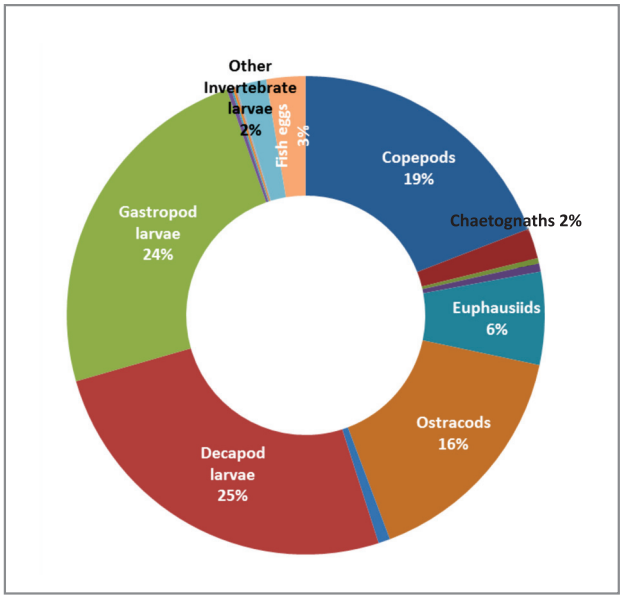

Fig. 3. Composition of zooplankters in Bangaram

decapod larvae was also recorded in the present study, but the second dominant group was gastropod larvae. This change may be due to variations in different factors affecting the composition of zooplankton like planktivorous fish (Ensign et al., 2014), phytoplankton biomass, salinity and temperature (Aziz et al., 2006) in the ecosystem.

The composition of zooplankton in Agatti and Bangaram showed considerable variation. A clear dominance of decapod larvae, gastropod larvae and ostracods was visible in Bangaram when compared to that of Agatti. The variations in composition of zooplankton groups can be due to several reasons. In coral reef ecosystem, zooplankton feed on mucus aggregates, which dominate the particulate matter in water (Gerber & Marshall, 1974). Thus, the abundance of such feed will vary with the availability of corals resulting variation in zooplankton. While studying the interaction between phytoplankton and zooplankton in a mixing area of lake and sea in Egyptian Mediterranean coast, Aziz et al. (2006) concluded that their interaction is governed by environmental factors as well as the species composition and abundance of both communities. They also observed that zooplankton grazes by either selective or non-selective mechanisms, but sometimes a zooplankton species may alternate the two mechanisms according to the available composition of phytoplankton community. The zooplankton community structure may be affected by the

abundance of planktivorous fishes also. Thus, the situation is very complex in an ecosystem and there are numerous factors such as salinity, temperature, dissolved oxygen, nitrite, ammonium, phosphate, turbidity and particulate matter governing the abundance of plankters and their interactions in nature. This explains the variations in plankters during the present study. The concentration of phytoplankton was more in Agatti than at Bangaram and the reverse was true for the zooplankton during the study period. This inverse relationship between phytoplankton and zooplankton was also recorded by Aziz et al. (2006) in Egyptian waters. As there is no recent reports on plankters available from Agatti and Bangaram lagoons of Lakshadweep, the present study is important. However, further studies based on regular collections on plankters along with environmental characteristics have to be carried out in these ecosystems to arrive at more meaningful conclusions.

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