ZOOPLANKTON ABUNDANCE IN AMINI AND KADMAT ISLANDS OF LAKSHADWEEP

Molly Varghese[*], Rani Mary George[1], S. Jasmine[1], P. Laxmilatha, K. R. Sreenath[2], P. R. Behera[3], V. J. Thomas and J. Kingsley[1]

Central Marine Fisheries Research Institute, Kochi – 682 018, Kerala, India

[1]Vizhinjam Research Centre of CMFRI, Thiruvananthapuram - 695 521, Kerala, India

[2]Veraval Regional Centre of CMFRI,Veraval-362 269, Gujarat, India

[3]Visakhapatnam Regional Centre of CMFRI, Visakhapatnam–530 003, Andhra Pradesh, India

Correspondence e-mail: mollykandathil@hotmail.com

Introduction

Zooplankters play an important link in the food chain of marine ecosystems. In coral reef ecosystems, they serve as food for corals, a variety of other invertebrates and reef fishes. As the plankters play an important role in the health of an aquatic ecosystem, the study on these resources in the productive aquatic systems of Lakshadweep is important. While searching through the literature, we can see that not much work was carried out on plankters of Lakshadweep ecosystems. Pratap *et al.* (1977) studied zooplankton at Kavaratti, Agatti and Suhelipar, while, Achuthankutty *et al.* (1989) dealt with zooplankton composition of Kalpeni and Agatti atolls. Girijavallabhan *et al.* (1989) studied zooplankters of Kadmat, Kiltan, Chetlat, Agatti, Kalpitti, Bangaram, Bitra, Kavaratti, Suhelipar, Androth, Minicoy and Kalpeni. Goswami and Goswami (1990) gave an account on diel variation in zooplankton of Minicoy lagoon and Kavaratti atoll. In 1997, Suresh and Mathew studied on zooplankton in Kavaratti atoll while Nasser *et al.* (1998) worked on zooplankton at Minicoy lagoon. Casanova and Nair (1999) gave an account on *Sagitta* from Agatti lagoon while, Bhalla *et al.* (2007) made a review on foraminiferal studies in Laccadives Islands. Jose *et al.* (2010) made a hierarchical analysis of zooplankton assemblages over semidiel pattern in the lagoon of Kavaratti atoll. Recently, Robin *et al.* (2012) studied planktonic communities and their trophic interactions in Kavaratti waters. Eventhough a very few studies were undertaken on zooplankters of Kadmat, no studies were carried out on zooplankton from Amini so far. Hence, an attempt is made here to study the qualitative and quantitative abundance of zooplankters in Amini and Kadmat lagoons of Lakshadweep and this is the first report on zooplankton from lagoon of Amini Island.

Material and methods

Zooplankton samples were collected from different stations in the lagoon areas of Amini and Kadmat Islands of Lakshadweep during January – February, 2014. Collections were made using a conical net having a mesh size of 400 microns by towing the net by a boat for 10 minutes. The collected samples were preserved in 4% formaldehyde solution and examined under a stereozoom microscope for identification and enumeration. Both qualitative as well as quantitative estimations were made. Plankters were identified upto group level and expressed as numbers per 100 m^3 of water. The abundance of zooplankters in Amini and Kadmat Islands are presented.

Results and discussion

Qualitative and quantitative abundance of different groups of zooplankters in Amini and Kadmat lagoons revealed the occurrence of twentyone groups viz. Copepods, Crab larvae, Ostracods, Prawn larvae, Fish eggs, Chaetognaths, Polychaete larvae, *Lucifer* sp., Medusae, Doliolids, Mysids, Tintinnids, Molluscan larvae, Euphausiids, Appendicularians, Siphonophores, Cladocera, Amphipods, Squilla larvae, Isopods and Fish larvae. The abundance and distribution of these groups in the lagoons of Amini and Kadmat Islands are presented.

Abundance of zooplankters in Amini

The displacement volume of zooplankton collected was estimated as 58.35 ml per 100 m^3 of water. Groupwise studies indicated the availability of fifteen groups viz. Copepods, Crab larvae, Euphausiids, Ostracods, Prawn larvae, Fish eggs, Chaetognaths, Polychaete larvae, *Lucifer* sp., Medusae, Doliolids, Mysids, Appendicularians, Tintinnids and Molluscan larvae and their distribution in Amini lagoon is depicted in Fig. 1.

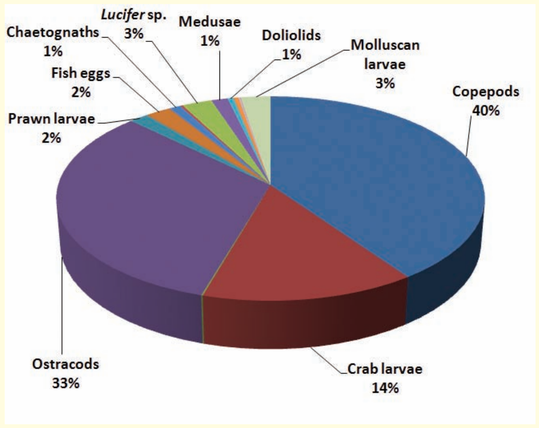

Fig. 1. Distribution of zooplankters in Amini

A total of 64480 numbers of zooplankters were observed per 100 m^3 of water in Amini. Among the 15 groups of zooplankters recorded, copepods were found to be the most dominant group with a share of 40%. This was followed by ostracods (33%), crab larvae (14%), and rest of the groups contributed only less than 5% each. Among the copepods, calanoid copepods were found to dominate with 71%, followed by cyclopoids (27%) and harpacticoids (2%). Swarming of ostracods was observed in this area. The dominance of copepods among zooplankton to the tune of 53.77% from the lagoon of Agatti was noticed by Pratap *et al.* (1977).

Abundance of zooplankters in Kadmat

The displacement volume of zooplankton collected was estimated as 15 ml per 100 m^3 of water. Groupwise studies indicated the availability of nineteen groups viz. Copepods, Crab larvae, Ostracods, Prawn larvae, Fish eggs, Chaetognaths, Polychaete larvae, *Lucifer* sp., Medusae, Doliolids, Mysids, Tintinnids, Molluscan larvae, Siphonophores, Cladocera, Amphipods, Squilla larvae, Isopods and Fish larvae. In another study conducted by Integrated Coastal and Marine Area Management (ICMAM, 2001) during 1998-99 also recorded nineteen groups of zooplankters from Kadmat which is in agreement with the present study. Groupwise distribution of zooplankters in Kadmat lagoon is depicted in Fig. 2.

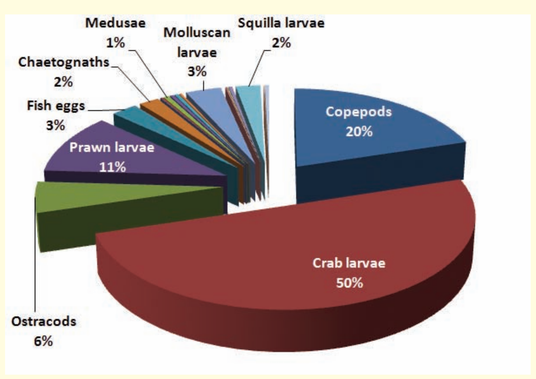

Fig. 2. Distribution of zooplankters in Kadmat

A total of 47726 numbers of zooplankters were recorded per 100 m^3 of water in the lagoon of Kadmat. In another study conducted by ICMAM (2001), a maximum of 32600 numbers of zooplankters per 100 m^3 of water was reported from Kadmat. Among different groups observed, the maximum was contributed by crab larvae (50%), followed by copepods (20%), prawn larvae (11%), ostracods (6%) and the rest of the groups contributed only less than 5% each. Very high share of crab larvae to the tune of 50% was due to a swarm of crab larvae noticed at station 2 (Fig. 3). At station 2, 69281 numbers of crab larvae were noticed per 100 m^3 of water, while, in other two stations crab larvae observed were 333 and 2267 numbers per 100 m^3 of water. The abundance of decapod larvae in lagoon area of Kadmat was also recorded by Girijavallabhan *et al.* (1989). They have reported the dominance of decapod larvae (59.46%) and share of copepods as 13.6%. In the present study also decapod larvae dominated with 61% and share of copepods as 20% which indicate that the ecosystem remains rich even after 25 years. Meroplankton as an important component of zooplankton was also reported by Goswami and Goswami (1990) from Minicoy lagoon and by Achuthankutty *et al.* (1989) from lagoons of Kalpeni and Agatti. Among the copepods, calanoids formed major share (81%), followed by cyclopoids (14%), harpacticoids (2%) and nauplii of copepods formed 3%. In a study conducted by ICMAM (2001) with respect to number of species of copepods, maximum numbers of species among the copepods were recorded under Calanoida.

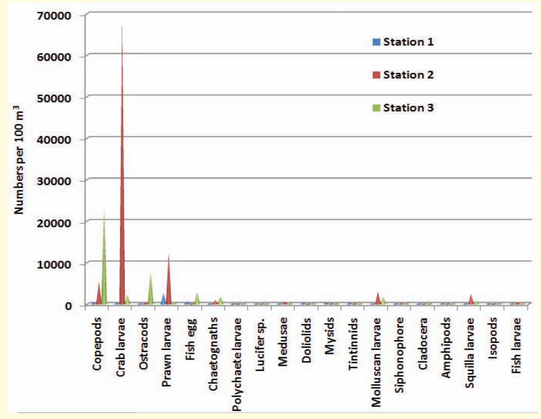

Fig. 3. Stationwise distribution of zooplankters in Kadmat

The composition of different zooplankton groups in Amini and Kadmat showed considerable variations and their comparison is illustrated in Fig. 4.

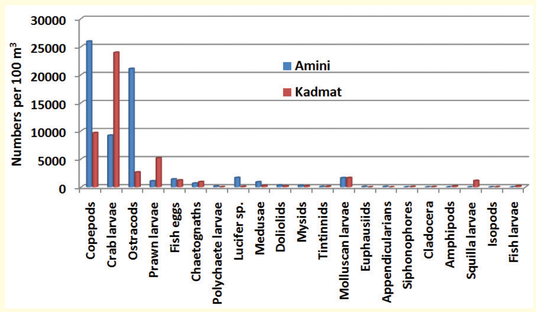

Fig. 4. Distribution of zooplankters in Amini and Kadmat - a comparison

When compared to Kadmat, the concentration of zooplankters was more in Amini and the numbers per 100 m^3 of water were 47726 and 64480 in Kadmat and Amini respectively. Volume of zooplankton recorded was also more in Amini than in Kadmat. Groupwise studies indicated the dominance of mainly copepods and ostracods in Amini, while crab and prawn larvae dominated in Kadmat. The abundance of both crab and prawn larvae in Kadmat is an indication of the availability of rich crustacean resources in Kadmat. This is supported by the fact that all the 89 species of crustacean resources occurring in Lakshadweep are available in Kadmat also (ICMAM, 2001).

As there is no recent reports on zooplankters are available from Kadmat and no previous report from Amini, the present study is important. As this study is based on a survey, further studies based on regular collections have to be carried out in these ecosystems to arrive at more meaningful conclusions.

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