



Copepod Diversity from Seasonal Wetland in Ambajogai of Beed District, Maharashtra, India

VB Sakhare^{1*} and SG Jetithor²

¹Post Graduate, Department of Zoology, Yogeshwari Mahavidyalaya, India

²Department of Fishery Science, Yashwantrao Chavan College, Tuljapur, India

*Corresponding Author: VB Sakhare, Post Graduate, Department of Zoology, Yogeshwari Mahavidyalaya, India.

Received: August 23, 2021

Published: September 23, 2021

© All rights are reserved by VB Sakhare and SG Jetithor

Abstract

A systematic investigation on diversity and dynamics of copepods from seasonal wetland of Ambajogai town of Beed district (Maharashtra, India) was carried out for a period of one year (from October 2018 to September 2019). The present investigation revealed the occurrence of 7 species of copepods. The copepod diversity fluctuated seasonally and the maximum number of 215 organisms/liter was recorded during month of March and minimum number of 75 organisms/liter during the month of August.

Keywords: Copepod Diversity; Seasonal Wetland; Maharashtra; India

Introduction

Copepods occur in all freshwater habitats from the largest ancient lakes to subterranean waters, from pools of glacial melt water to hot spring, and from hypersaline lakes to phytotelmata. They are extremely abundant in freshwater and comprise a major component of most planktonic, benthic and groundwater communities.

Copepods are claimed to be numerically the most abundant metazoans on earth and conservative estimations revealed that they likely outnumber the abundance of insects [1,2].

Copepods are minute (0.3 to 2.5 mm) crustaceans with simple median eye. The body is elongated, segmented and divided into a broad appendage bearing part called the 'metasoma' and posterior 'urosoma' separated by a major articulation. The urosome ends in a caudal furca. Of the antennae, the first are often longer and uniramous. The maxillipeds are the first thoracic appendages, followed by four biramous swimming legs with the fifth leg reduced

and uniramous. Gravid females carry eggs in one or two egg sacs. Copepods pass through a series of nauplii and copepodite stages during their development [3].

Copepods are the important members of the zooplankton for their role in the trophic dynamics and energy transfer in the aquatic ecosystem. Among the all zooplankton, copepods have the toughest exoskeleton and the longest and the strongest appendages which help them to swim faster than any other zooplankton.

Copepods constitute more than 50% of the planktonic diversity in majority of freshwater lakes of the world [4]. On the contrary, a change in the number of copepods with seasonal occurrence in the different Indian lakes and reservoirs has been reported [5-22].

The present investigation was carried out on a seasonal wetland near Swami Ramanand Teerth Rural Medical College and Hospital of Ambajogai town with GPS coordinates of 18°43'37.6860" N and 76°22'51.9168"E.

Materials and Methods

The studies on the copepod diversity were carried out for a period of one year (October 2018-September 2019) from seasonal wetland in Ambajogai town of Beed district, Maharashtra. Copepods were collected with the help of plankton net made of bolting cloth of 25 μ from different zones of wetland. Approximately 50 liters of water was filtered through the net, both from littoral and open water zones. Samples were transferred to a small enamel tray. The inside of the net was washed so as to collect any sticking plankton. Few drops of formalin were put to narcotize the animals and when they became motionless, and settled down, the supernatant water was discarded slowly and concentrated samples were collected. All samples were preserved in 5 % formalin solution.

Preserved samples were examined under a binocular microscope with different magnifications. Detailed taxonomic identification was carried out following standard keys available for fresh water copepod identification [23,24]. Drop count method of Trivedy and Goel [25] was followed for enumeration of copepods and expressed as organisms per liter.

Results, Discussion and Conclusion

The present investigation revealed the presence of 7 species of copepods. The copepods recorded during the present study include *Heliodiaptomus contortus*, *Heliodiaptomus viduus*, *Phyllodiaptomus annae*, *Diaptomus orientalis*, *Mesocyclops hyalinus*, *Mesocyclops leuckarti* and *Cyclops viridis*. During present investigation well marked seasonal variations were recorded in the copepod population (Table 1). The copepod diversity fluctuated seasonally. The maxima was 215 organisms/Liter during March 2019 and minima was 75 organisms/Liter during August 2019. *Heliodiaptomus contortus*, *Heliodiaptomus viduus*, *Mesocyclops hyalinus*, *Mesocyclops leuckarti* and *Cyclops viridis* were recorded throughout the study period.

Phyllodiaptomus annae was absent in two months i.e., November and August. *Diaptomus orientalis* was absent in month of September. Most of the copepods occurring in this wetland were abundant in lentic and shallower areas having thick vegetation. The minimum diversity during rainy season may be due to rainfall and heavy floods, poor water quality and less food availability [26]. Chakrabarti [27] observed maximum copepod density in summer and minimum in monsoon season. This observation corroborate

with present findings on copepods from seasonal wetland in Ambajogai.

The results of the present investigation highlighted that the copepods are abundant and showed high biomass in the wetland. Our copepod survey also provided an add on data source on copepod diversity which serve as a prime food source for fish fingerlings.

A similar study was carried out in 2014 [28] on planktonic diversity and related ecological parameters of some lentic water bodies of Hoflong (N. E. India), described 3 species of copepods: *Cyclops* sp, *Mesocyclops* sp and *Diaptomus* sp.

Joshi [29] reported 6 genera of copepods from Rajura Lake of Buldhana district and observed a peak in summer followed by winter and the lowest numbers were present in the monsoon season. During present investigation copepod peak was observed during summer season, followed by winter and monsoon (Table 1).

Arak and Mokashe [30] reported 5 species of copepods from Tembhapury lake of Aurangabad region of Maharashtra. On similar lines Bhandarkar and Paliwal [31] identified 9 species of copepods from different water bodies from Lakhani (Maharashtra), out of which three species (*Heliodiaptomus viduus*, *Mesocyclops hyalinus* and *Mesocyclops leuckarti*) were recorded during present investigation.

Conflict of Interest

There is no financial interest or any conflict of interest.

Bibliography

1. Chang *et al.* "Abundance, distribution and community structure of planktonic copepods in surface waters of a semi-enclosed embayment of Taiwan during monsoon transition". *Zoology Studies* (2010): 735-748.
2. Schminke HK. "Entomology for copepodologist". *Journal of Plankton Research's* (2007): 149-162.
3. Battish SK. "Freshwater zooplankton of India", Oxford Publishing Co. Pvt, Ltd., New Delhi (1992): 233.
4. Khan RA. "Faunal diversity of zooplankton in freshwater wetlands of southeastern West Bengal". *Zoological survey of India, Kolkata, Occasional paper No.204* (2003): 107.

5. Sehgal KL. "Studies on Indian freshwater copepod.1.On a new species of *Heliodiaptomus Brehm* (Calanoida Diaptomidae) from Orissa". *Journal of the Zoological Society of India* (1960): 243-248.
6. Sehgal KL. "Studies on Indian freshwater copepod.2.On calanoid copepods occurring in fish ponds of Orissa". *Journal of the Zoological Society of India* (1967): 53-76.
7. Reddiah K. "The copepod fauna of Assam (India),1. *Neodiaptomus kamakhiae* n.sp. from Kamarup district". *Crustaceana* (1964): 174-180.
8. Reddiah K. "The copepod fauna of Assam (India) 2: Description of *Tropodiaptomus lakhimpurensis* n.sp". *Crustaceana* (1965a): 254-258.
9. Reddiah K. "The copepod fauna of Assam (India),3.Two new Arctodiaptomus species from Khasi and Jaintia Hills". *Crustaceana* (1965b): 26-38.
10. Ranga Reddy Y. Studies on systematics and ecology of free living freshwater copepods of Guntur and its environs (Andhra Pradesh, India). Ph.D. thesis, Nagarjuna University. (1977): 462.
11. Ranga Reddy Y. "A taxonomic revision of the genus *Megadiaptomus kiefer* (Copepoda, Calanoida), including the description of a new species from India". *Crustaceana* (1987): 113-134.
12. Ranga Reddy Y. "*Neodiaptomus prateek* n. sp. A new freshwater copepod from Assam, India, with critical review of generic assignment of *Neodiaptomus* spp. and a note on diaptomid species richness (Calanoidea: Diaptomidae)". *Journal of Crustacean Biology* (2013): 849-865.
13. Roy T. "Studies on Indian copepods". Ph.D. Thesis, Calcutta University, Calcutta (1978).
14. Ranga Reddy Y and Radhakrishna, Y. "The calanoid and cyclopoid fauna (crustacean copepod) of lake Kolleru, South India". *Hydrobiologia* (1984): 27-48.
15. Sivakumar K and Altaff K. "Ecological indices of freshwater copepods and cladocerans from Dharmapuri district, Tamil Nadu". *Zoos' Print Journal* (2004): 1466-1468.
16. Majagi Shashikanth and Vijaykumar K. "Ecology and abundance of zooplankton in Karanja reservoir". *Environmental Monitoring and Assessment* (2009): 451-458.
17. Sharma BK. "Zooplankton communities of Deepor Beel (a Ramsar site), Assam (N.E. India) Ecology, richness and abundance". *Tropical Ecology* (2011): 293-302.
18. Sharma BK and Sharma S. "Zooplankton diversity of Loktak Lake, Manipur, India". *Journal of Threatened Taxa* (2011): 1745-1755.
19. Kadam CP, et al. "Biodiversity of zooplankton in Pillowa reservoir district Morena, Madhya Pradesh, India". *International Journal of Life Sciences* (2014): 263-267.
20. Ramnibai Ravichandran and Gomathi Jeyam M. "Copepods from few freshwater bodies of periurban areas of south Chennai". *The International Journal of Engineering and Science* 3.4 (2014): 51-53.
21. Sakhare VB, et al. "Diversity and dynamics of copepod in Bhatgaon reservoir of Hingoli district, Maharashtra". *Ecology and Fisheries* (2014): 25-30.
22. Rama Rao K. "Zooplankton diversity and seasonal variations in Thandava reservoir, Viskhapatnam, India". *International Journal of Fisheries and Aquatic Studies* (2017): 90-97.
23. Ward HB and Whipple GC. "Freshwater Biology", McGraw Hill and Co. New York (2019).
24. Sehgal KL. "Planktonic copepods of freshwater ecosystems". Interprint, New Delhi (1983): 169.
25. Trivedy RK and Goel PK. "Chemical and Biological Methods for Water Pollution Studies". Environmental Publication, Karad (India) (1984).
26. Sharma Shailendra, et al. "Distribution and diversity of zooplanktons in Madhya Pradesh, India". *International Journal of Advanced Research* (2013): 1621.
27. Chakrabarti Summen. "Copepod density, percentage composition and their seasonal variations in a macrophyte infested pond of Tripura, India in relation to physico-chemical factors". *International Journal of Recent Scientific Research* (2019): 36617-36621.

28. Das Gautam Kr and Thapa Nikita. "A preliminary survey of the planktonic diversity and related ecological parameters of some lentic waterbodies of Haflong, N.E. India". *The Science Probe* (2014): 1-10.
29. Joshi PS. "Studies on Zooplanktons of Rajura Lake of Buldhana district, Maharashtra, India". *Science Research Reporter* (2011): 132-137.
30. Arak GV and Mokashe SS. "Copepod diversity of Tembhapury Lake Aurangabad region, M.S., India". *International Journal of Science and Research* (2014): 976-979.
31. Bhandarkar SV and Paliwal GT. "Diversity of copepods in different water bodies from Lakhani Maharashtra (India)". *Environment Conservation Journal* (2010): 81-83.

Volume 3 Issue 11 November 2021

© All rights are reserved by VB Sakhare and SG Jetithor.