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Rehmsa P

Environmental Biology Research
unit, Department of Zoology
Gulbarga University, Gulbarga –
585106, Karnataka.

M Rajashekhar

Environmental Biology Research
unit, Department of Zoology
Gulbarga University, Gulbarga –
585106, Karnataka.

K Vijakumar

Environmental Biology Research
unit, Department of Zoology
Gulbarga University, Gulbarga –
585106, Karnataka.

Correspondence

M Rajashekhar

Environmental Biology Research
unit, Department of Zoology
Gulbarga University, Gulbarga –
585106, Karnataka.

Meiofauna Diversity in Freshwater Lake, Kalaburagi District, Karnataka

Rehmsa P, M Rajashekhar, K Vijakumar

Abstract

A study on Meiofuna diversity of Sharanabasaveshwara Lake, Kalaburagi district, Karnataka, India were conducted during October 2013 to September 2014. A total of 19 species were recorded from 07 different families of Rotifera during the study period. Among these, Lecanidae family comprises of 05 species Brachionidae represented by 04 species, Lepadellidae family composed of 03 species, Trichocercidae contributed 03 species, Notommatidae family consist of 02 species, Filinidae and Synchaetidae families were contributed about each one of the species respectively. Few species of Rotifera group were present throughout the year. The analysis of seasonal variations among the meiofauna stated that, more occurrence of species was high in winter, followed by lower in southwest monsoon season was noticed.

Keywords: Meiofauna Diversity, Freshwater Lake, Notommatidae family, Synchaetidae family

1. Introduction

The most important phenomena of ecology is to understand the mechanisms that determine the density, diversity of organisms with relation to the other biological communities. The meiofauna are the microscopic organisms and exhibit several characteristics, like more diversity and high abundance, high adoptive radiation, high diversity in feeding and short generation times, (Hoess, Traunspurger & Zullini, 2006; Giere, 2009) ^[5, 6]. Due to these characters, the occupied an important position in freshwater ecosystem. The meiofauna are considering being major food resources for higher organisms and served as indicators of the ecosystem functions. The diversity and density of meiofauna always controlled by physico-chemical variables of ecosystem macrophytes (Rocha *et al.*, 1999; Neves *et al.*, 2003 and Mukherjee, 1997) ^[10, 12, 14].

Thus in any freshwater ecosystem, the small creatures not only involve in transferring food from one state of trophic to other level. The species composition and abundance of meiofauna is influenced by complexes of ecological factors and other seasonality. Very less research work has been made of ecology and diversity of meiofauna (Sinha and Islam, 2002; Singh *et al.*, 2002; Smita *et al.*, 2007) ^[21, 22, 23] Hence, the present work has been undertaken to know the species and abundance of Meiofauna in freshwater lake of Kalaburagi district.

2. Material and Methods

Kalburagi district is the Divisional headquarter of five revenue districts. It is situated in the northern part of Karnataka State 76°-04' to 77°-42' longitudes and 16°-12' to 17°-46' latitude located 454 meters above MSL. The Sharanabasaveshwara Lake is selected for the present investigation, which is situated in the heart of Kalaburagi city.

Water samples were collected randomly in different locations of the selected lake during an early hours of the day (7.30am to 10.30am) for a period of one year (October 2013 to September 2014) and such samples were pooled together to consider a final sample for analysis.

Monthly meiofauna collections were made employing a modified Haron –Trantor net with a square metallic frame of 0.0625 M² area. The net was handed for a distance of 15 meters collected samples were transferred to label PVC bottles containing 5% formaldehyde. The quantitative estimation of Meiofauna was carried out in the laboratory. Sedge wick- Rafter counting chamber was used for making sub samples and estimated quantitative meiofauna.

The identification of Meiofauna was done on the basis of existed literature provided by various authors (Edmondson, 1959; Needham and Needham, 1966; Sharma and Sharma 2000; Sharma, 1998) ^[4, 11, 18, 19].

3. Results and Discussion

During the study period, total 19 meiofauna species were identified which are belongs to Seven families of phylum Rotifera namely, Lecanida, Trichocercidae, Lepadellidae Brachionidae, Synchaetidae, Filinidae, Notommatidae.

The Lecanidae, a one of the family of the monogonot rotifers, are contributing significantly to the biogeography of the Rotifera (De Ridder, 1981; De Manuel, 1994; Dumont, 1983; Segers, 1993, 1995) [13, 8, 3, 16, 17]. Sharma (1991) [20] reported several species and studied their diversity and abundance in Indian fresh water ecosystems.

During the study period, Lecanidae family represented by maximum diversity of species and contributed five species. The species which are recorded from Lecanidae family i.e *L. (L) curvicornis* (Murray, 1913), *L. (I) ludwigi* (Eckstein, 1883), *L. (L) (M) pyriformis* (Daday, 1905), *L. (M) quadridentata* (Ehemberg, 1832), *L. (Monostyla) bulla* (Gosse, 1851) respectively.

The species from Brachionus family is considered to be as ecological indicators for presence of more amount of nutrient content in an aquatic ecosystem (Angeli 1976, Mageed 2008 and Uzma 2009) [1, 7, 25].

During the study period Brachionidae family is contributed high diversity and abundance of meiofauna species, the Brachionidae family is represented by four species i.e *Brachionus Patulus* (O F Muller, 1786), *B. quadridentatus* (Hermann, 1783), *B. angularis* (Gosse, 1851), *Keratella cochlearis* (Gosse, 1851).

Whereas, The Lepadellidae family composed of three species i.e *Lepadella Ovalis larga* (Sharma, 1978), *C. uncinata* (O.F. Muller, 1773), *L. patella* (O.F. Muller, 1773) during the study period.

The Trichocercidae family is represented by three species i.e *Trichocerca cylindrica* (Imhof, 1891) *T. elongata* (Murray, 1913) *T. pusilla* (Lauterborn, 1898) respectively.

The Notommatidae family is represented by two species, namely, *C. gibba* (Ehrenberg, 1832) *Scaridium longicaudum* (O.F. Muller, 1786), Synchaetidae family and Philodinidae family was represented by one of each species, namely *Asplanchna priodonta* (Gosse, 1850) and *Filinia opoliensis* (Zacharias, 1898) respectively.

It has been observed that Meiofauna density of freshwater ecosystems is increases in winter, summer seasons while decrease in rainy season. Several workers were reported similar type of observations in inland ecosystems of various parts of country. (Srivastava *et al.*, 1990) [24]. The Meiofauna density ranged between 28 to 178 number/liter at all the sampling stations. The seasonal variations affect the meiofauna population and their composition.

Meiofauna diversity was observed to be more in winter and summers might be due to the presence of higher amount of food materials and favorable conditions. All the families of the rotifera group showed numerical superiority over other families of same group. It is interesting to note that the rotifers have a high adaptive radiation capacity to thrive in different environments and as such they usually dominate among the other groups. Michael (1968), Saha *et al.*, (1971, Bahrua *et al.*, (1993) [2, 9, 15] were also reported about dominance of rotifera groups in various freshwater ecosystems.

4. References

1. Angeli N. Influence de la pollution sur les elements du plancton. In: Pesson P. (ed.), La Pollution Oles Eaux Continentales, Ed. Gauthier-Villars 1976; 97:133-192.
2. Bahura CK, P Bauhra, Saxena MM. Zooplanktonic community of Shivabari temple tank, Bikner. J Ecobiol. 1993; 5(1):5-8.
3. Dumont HJ. Biogeography of rotifers. *Hydrobiologia* 1983; 104:19-30.
4. Edmondson WT. Freshwater Biology (2nd edition). John Wiley & Sons, New York, 1248
5. Giere O. Meiobenthology: The Microscopic Motile Fauna of Aquatic Sediments. Springer Verlag, Berlin 1959-2009.
6. Hoess S, Traunspurger W, Zullini A. Freshwater nematodes in environmental science. In: Freshwater Nematodes: Ecology and Taxonomy (Eds E. Abebe, W. Traunspurger & Andra'ssy) CABI Publishing, Oxfordshire 2006; 1:144-162.
7. Mageed A. Distribution and long term historical changes of zooplankton assemblages in Lake Manzala (south Mediterranean Sea, Egypt). Egyptian Journal of Aquatic Research. 2008; 33(1):183.
8. Manuel De J. Taxonomic and zoogeographic considerations on Lecanidae (Rotifera: Monogononta) of the Balearic archipelago, with description of a new species *Lecane margalefi* n. sp. *Hydrobiologia* 1994; 288:97-105.
9. Michael RG. Studies on zooplankton of tropical fish pond. *Hydrobiologia* 1968; 32(1-2):47-60.
10. Mukherjee B. Environmental Biology, Tata McGraw Hill Publishing Company Limited, New Delhi.
11. Needham JG, Needham PR. A guide to the study of fresh water biology (5th eds.), Holden Day in Francisco, California. USA, 1966, 104.
12. Neves, IF., Rocha, O., Roche, KF. and Pinto, AA., Zooplankton community structure of two marginal lakes of the river Cuiabá (Mato Grosso, Brazil) with a analysis of Rotifera and Cladocera diversity. *Revista Brasileira de Biologia Brazilian Journal of Biology*, 2003; 63(2)329-343.
13. Ridder De M. Some considerations on the geographical distribution of rotifers. *Hydrobiologia* 1981; 85:209-225.
14. Rocha O, Matsumura-Tundisi T, Espindola ELG, Roche KF, Rietzler AC. Ecological theory applied to reservoir zooplankton. In: Theoretical reservoir ecology and its application (Eds: J.G. Tundisi and M. Straskraba). Internat. Inst. Ecol., Sao Carlos, 457-476
15. Saha GN, Sehagal KL, Mitra E, Nandy AC. Studies on the seasonal and diurnal variation in physico-chemical and biological condition of perennial freshwater pond. J Inland. Soc. India. 1971; 3:79-102.
16. Segers H. Rotifera 2: The Lecanidae. Guides to the identification of the Microinvertebrates of the Continental waters of the World: 1-226. H.J. Dumont & T. Nogrady (eds), SPB Academic Publishing bv. Amsterdam, the Netherlands, 1995.
17. Segers H. Rotifera of some lakes in the floodplain of the River Niger (Imo State, Nigeria). I. New species and other taxonomic considerations. *Hydrobiologia* 1993; 250:39-61.
18. Sharma BK, Sharma S. Freshwater Rotifers (Rotifera: Eurotatoria) In: State Fauna Series Fauna of Tripura Zoological Survey of India, Calcutta 2000; 7(4):163-224
19. Sharma BK. Rotifera. In: Faunal Diversity in India. Eds. J. R. B. Alfred, A. K. Das and A.K. Sanyal Zool. Survey of India, 1998, 57-70
20. Sharma, B.K.: Animal Resources of India. Protozoa to Mammalia. State of the Art. Zoological Survey of India, Calcutta. 1991. Rotifera. pp. 69-88.

21. Singh SP, Pathak D, Singh R. Hydrobiological studies of two ponds of Satna (M.P), India Cons 2002; 8:289-292.
22. Sinha B, Islam MR. Seasonal variation in zooplankton population of two lentic bodies and Assam State Zoo cum Botanical garden, Guwahati, Assam Environ. Cons 2002; 8:273-278
23. Smitha PG, Byrappa K, Ramaswamy SN. Physico chemical characteristics of water samples of bantwal Taluk, South-estern Karnataka, India. J Environ. Biol., 2007, 595.
24. Srivastava KN, Srivastava P, Sinha AK. Zooplankton studies of Ganga River between Kalakankar (Pratapagarh) Phaphamau (Allahabad) (U.P). Recent trends in Limnology, 1990, 129 -133
25. Uzma A. Studies on plankton communities of some eutrophic water bodies of Aligarh. M.Sc. Thesis, Fisheries and Aquaculture Unit, Department of Zoology, Aligarh Muslim University (AMU), Aligarh, India, 2009.