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International Journal of Current Research
Vol. 7, Issue, 12, pp.23526-23528, December, 2015

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

DIVERSITY OF ZOOPLAKTON AT VADGAON FRESHWATER RESERVOIR FROM KOLHAPUR DISTRICT OF MAHARASHTRA (INDIA)

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ARTICLE INFO

Article History:
Received 15th September, 2015
Received in revised form
17th October, 2015
Accepted 29th November, 2015
Published online 21st December, 2015

Key words:

Zooplankton, diversity,
Quality, quantity,
Vadgaon reservoir.

ABSTRACT

The present attempt has made to study the diversity of zooplankton with special reference to quality and quantity from vadgaon freshwater reservoir from Kolhapur district of Maharashtra, India. The study revealed that 16 species of zooplankton were noted belonging to 4 groups namely, rotifers, cladocers, copepodes and ostracods. Qualitatively, roifers and cladocers were observed dominant while quantitatively rotifers were dominant. All four groups have shown monthly variation during both the years and noted lower during monsoon season while higher during winter as well as summer season. Cladoceran group was an only exhibited its presence throughout the study period. Based on the present investigation it can be concluded that the water from the reservoir is clear and pollution free.

***Citation*:** Manjare, S. A., 2015. "Diversity of zooplakton at vadgaon freshwater reservoir from kolhapur District of Maharashtra (India)", *International Journal of Current Research*, 7, (12), 23526-23528.

INTRODUCTION

Wetlands are life supporting systems for millions of biotic entities. India is one of the most known for its water resources over world. Most of the civilization in India settled to periphery of major rivers and remaining near small rivers and wetlands. Since pollution status at the wetlands are considerably alarming and influencing diversity of biotic factors in and around these wetlands. Zooplankton are an important biotic entity which are directly affected by anthropogenic activities (Patil *et al.,* 2015). According to Rao (2005), zooplankton incorporates primary and partly secondary micro faunal consumer operative system. This serves the functional biomass on the detritus spectrum in water. Purushothama *et al.* (2011) highlights that zooplankton are sensitive to their environment, variation in zooplankton density can indicate a subtle environmental change. Jeje and Fernando (1986) emphasize that the distribution of zooplankton is influenced by interaction of biotic and abiotic factors such as temperature, dissolved oxygen, salinity and other physico-chemical characteristics.

MATERIALS AND METHODS

Study Area

Vadgaon tank was constructed in year 1980 (Zilla Parishad, Kolhapur). It is situated at 6 km North-East to Shiroli and Nagaon village. It is basically used as sources of drinking water and secondarily for fishery purpose. It is perennial tank covering maximum area of about 106 ha, with an average water spread area of about 12.5 ha. Vadgaon tank was characterized by presence of submerged vegetation, in this tank little anthropogenic activities and little fluctuating trend in its water level were noticed during the study period. For fishery purpose the tank is auctioned on lease for the period of 3-5 years to local fishermen communities. The fishing activities including release of seedling and harvesting were conducted by private parties or stake holders (Manjare, 2015).

Zooplankton Analysis

The present study was carried out from January 2011 to December 2012. The water samples were collected by filtering 100 liters of water monthly through plankton net made up of bolting silk with pore size of 50 µ for the analysis of plankton and brought to laboratory and 4% formalin was added.

Qualitative and quantitative analysis of zooplankton was carried out in the laboratory by using Sedgwick- Rafter cell counting chamber as suggested by Adoni *et al.* (1985) and Trivedy and Goel (1984). Identification of plankton were carried out by using keys by Needham and Needham (1962), Adoni *et al.* (1985), Michael (1984) and Tonapi (1980).

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RESULTS AND DISCUSSION

During the tenure of study from January 2011 to December 2012, 16 species were identified. These species are belonging to 4 major groups i.e. Rotifera, Copepoda, Cladocera and Ostracoda. Among all the four major groups 7 species of Rotifers (*Brachionus calciflorus, Brachionus forficula, Brachionus quadrientata, Brachionus falcatus, Keretella tropica, Keretella quadrata* and *Tricholera longiseta*), 4 species of copepods (*Encyclop sprinophorus, Mesocyclops luckart, Nauplius sp.* and *Paracyclops sp.*), 3 species of Cladocers (*Daphnia carinata, Monia brachiate* and *Cyprissub globusa*) and 2 species of Ostracodes (*Cypris sp. and Stenocypris sp.*) were identified in this study.

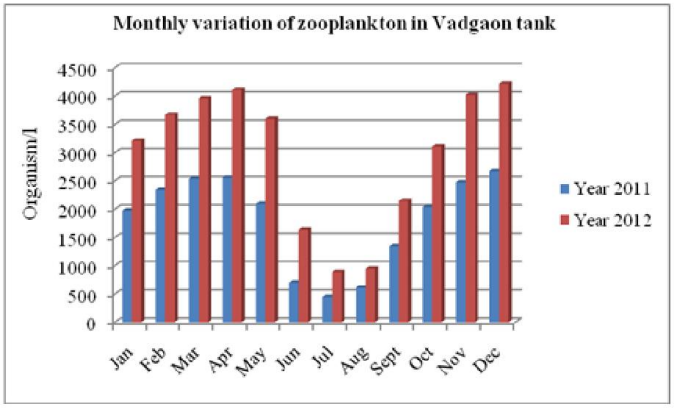

Figure 1. Mothly variation of zooplankton in Vadagaon tank during 2011 and 2012

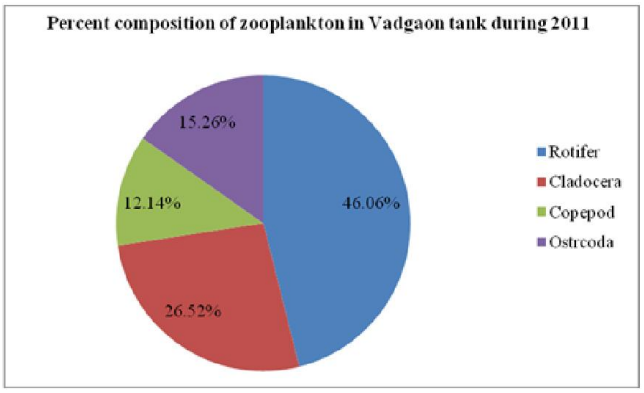

Figure 2. Percent composition of zooplankton in vadgaon tank during 2011

The total number of zooplankton were ranged between 448 org/l and 2674 Org/l during 2011 and 888 Org/l to 4217 Org/l during 2012 (Figure 1). The percent composition of zooplankton indicated 46.06% of rotifers, 26.52% of cladocers, 12.14% of copepods and 15.26% of ostracodes during 2011 (Figure 2). However, the percent composition of zooplankton during 2012 (Figure 3) was rotifers with 30.03%, cladocers with 36.47%, copepods with 15.05% and ostracodes with 18.49%. Based on percent composition rotifers were observed dominant during 2011 while cladocers were dominant during 2012. During the year 2011 (Figure 4), the number of rotifers fluctuated from 0 org/l to 1274 org/l. However, year 2012 (Figure 5) exhibited the rotiferan organisms from 0 org/l to 1422 org/l. The number of rotifers was noted lower in the month of June during both the years while these were higher in the month of April during both the years.

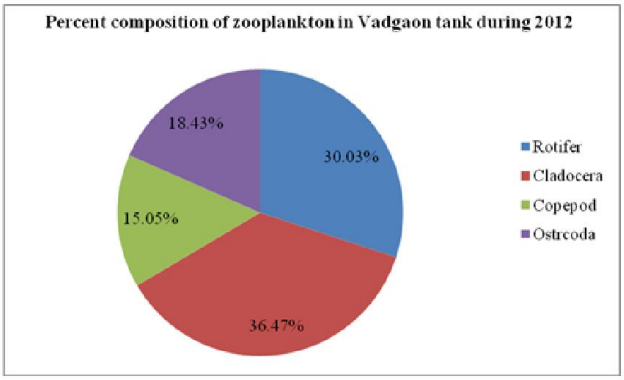

Figure 3. Percent composition of zooplankton in vadgaon tank during 2012

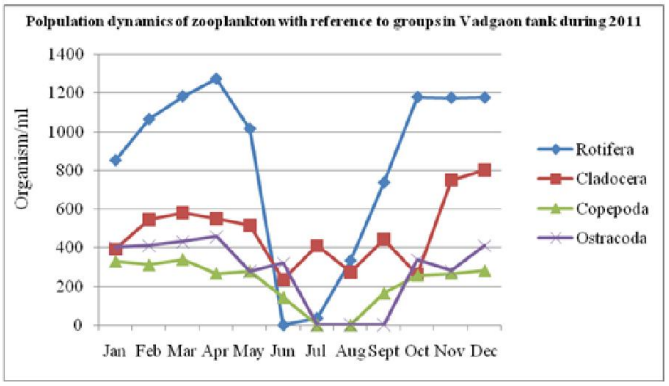

Figure 4. Population dynamics of zooplanktons with reference to groups during 2011

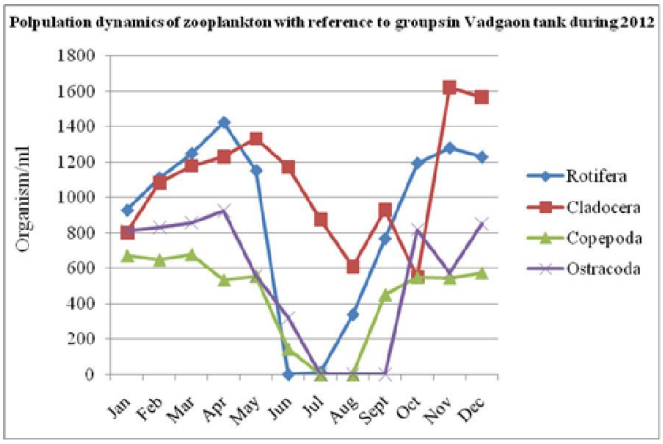

Figure 5. Population dynamics of zooplanktons with reference to groups during 2012

Probably, the number of rotifers decreased during monsoon months and increased during summer months directly inter-relate with light penetration and consequently phytoplanktonic growth. Rotiferans are considered as a significant component of the zooplanktons and exhibit a very wide range of morphological variations and adaptations. Among the zooplankton rotifers respond more quickly to the environmental changes and used as a change in water quality (Gannon and Stemberger 1978). Rotifers are regarded as Bio-

indicators of water quality. The present study exhibited monthly variation in the number of rotiferan organisms.

The number of copepods were varied from 0 org/l (July and August) to 340 org/l (March) during 2011 (Figure 4). The number of copepods were varied from 0 org/l (July and August) to 678 org/l (March) during 2012 (Figure 5). Copepods are considered as important food item for various kinds of fish, play a key role in the energy transformation at different trophic levels. As a nature of copepod they prefer Eutrophication environment to grow in high number. The species diversity and dominance among Copepoda have been reported by several investigators, Gouder and Joseph, (1961) and Rajashekar et al., (2010). Khan *et al.,* (1986) observed the seasonal change of the copepods in sewage fed ponds of Aligarh.

The year 2011 (Figure 4) exhibited cladocers as 236 org/l (minimum) in the month of June and 803 org/l in the month of December (maximum). However, year 2012 (Figure 5) exhibited the cladoceron organisms from 550 org/l to 1620 org/l. The number of cladocers were noted lower in the month of October and higher in the month of November during 2012. Cladocers was an only group which exhibited its occurrence throughout the year. From the ecological point of view Cladocerans considered to be most important components of zooplankton community. As the Cladocers are prefer to live in clear waters, the diversity revels that the lake water is good environmental condition and less anthropogenic activity Similar results found by Ndebele Murisa (2012). The number of ostracods ranged between 0 org/l to 458 org/l during 2011 (Figure 4) and 0 org/l and 926 org/l during 2012 (Figure 5). The minimum number of ostracodes were noted in the months of July, August and September during both the years while maximum in the month April during both 2011 and 2012. The Ostracods are the entomostracans crustaceans having the bivalve carapace enclosing the laterally compressed body. They inhabit all kinds of fresh and marine water.

Conclusion

The present study concludes that quantitatively rotifers were dominant during both the years and occupies top position among other groups of zooplankton. Hence, Environmetal changes were minimum. Qualitatively, rotifers as well as cladocers were dominat. It indicates the water is clear and pollution free.

REFERENCES

Adoni, A. D., Gulwant, J., Chourasia, S. K., Vaidya, A. K., Yadav, M. and Verma, H. G. 1985. Work book of Limnology, Prabha Publishers, C-10, Gour Nagar, Sagar (India).

Gannon, J. E. and R. E. Stemberger 1978. Zooplankton (especially crustaceans and rotifers) as indicators of water quality. *Trans. Am. Micros. Soc.*, 97: 16-35.

Gouder, B. Y. M. and K. J. Joseph 1961. On the correlation between the natural population of freshwater zooplankton (cladocera, copepoda and rotifera) and some ecological factors. *J. Kar. Univ. Sci*., 6: 89-96.

Jeje, C. V. and C. K. Fernando 1986. A practical guide of Identification of Nigeria zooplankton, Kainji Lake Institute. pp 89-99.

Khan, M. A., S. A. Raza, S. A. Iqbal, T. S. Chaghtai, and I. Hussain 1986. Limnochemistry and water quality aspects of the Upper lake of Bhopal during winter season. *Ind. J. Appl. Pure Biol.,* 1(1): 47-50.

Manjare S. A. 2015. Status of phytoplankton diversity at Vadgaon freshwater tank of Maharashtra, India. *Biolife,* 3 (4): 854-858.

Michael, R. G. 1984. Ecological methods for laboratory and field investigations.Tata McGraw Hill publishing Company Ltd. New Delhi. PP. 4-11.

Ndebele M. M. R. 2012. Biological monitoring and pollution assessment of theMukuvisi River, Harare, Zimbabwe. *Lakes and Reservoirs: Research and Management,* 17: 73–80.

Needham, J. G. and Needham, P. R. 1962. A guide to freshwater biology.Holden Day Ins., San Francisco (USA).PP. 108.

Purushothama, R., H. A. Sayeshwara, Mahesh AnandGuodar and K. Harish Kumar 2011. Physico-chemical profile and zooplankton community composition in Brahmana Kalashi tank, Sagara, Karnataka, India. *The Ecoscan.*5 (1 and 2): 43-48.

Rajashekhar, M., Vijaykumar K. and Zeba Paerveen 2010. Seasonal variations of zooplankton community in freshwater reservoir Gulbarga District, Karnataka, South India. *International Journal of Systems Biology*,

Rao, S. I. 2005. Zooplankton limnology in the Indian subcontinent, Ukaaz Publication, Hyderabad. PP 209-277.

Sachinkumar R. Patil, S. S. Patil and T. V. Sathe 2015. Temporal and Spatial Changes in Zooplankton diversity from Wetlands of Ajara Tahsil, Maharashtra, India. *IJISET,* 2 (1): 130-143.

Tonapi, G. T. 1980. Freshwater animals of India an ecological approach. Oxford and IBH Publishing Company, New Delhi. PP 314-315.

Trivedi, R. K. and Goel, P. K. 1984.Chemical and Biological methods for water pollution status. Environmental publication, Karad (India).

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