

RESEARCH ARTICLE

Rotifers response to alkalinity and hardness of Pandu lake Bodhan

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Manuscript details:	ABSTRACT
<p>Received: 10.08.2015 Revised : 18.08.2015 Accepted: 02.09.2015 Published : 10.10.2015</p> <p>Editor: Dr. Arvind Chavhan</p> <p>Cite this article as: Solanki VR, Lingampally Vasudha, Uma Sundari U and Raja Sabita S (2015) Rotifers response to alkalinity and hardness of Pandu lake Bodhan, <i>Int. J. of Life Sciences</i>, 3(3): 245-248.</p> <p>Copyright: © 2015 Author(s), This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.</p>	<p>Rotifers being an important food resource for fishes, act as an indicator of trophic status besides water quality of an aquatic ecosystem. The impact of alkalinity and hardness on Rotifer diversity of Pandu lake was evaluated for a period of two years, August 2002 to July 2004. The total alkalinity and total hardness was above the permissible limits and the rotifers were found throughout the study period indicating the eutrophic status of Pandu lake.</p> <p>KEYWORDS: Alkalinity, Hardness, Rotifers, Pandu lake</p> <p>INTRODUCTION</p> <p>Zooplankton occupies an important position in the trophic structure and plays the major role in the energy transfer in an aquatic ecosystem. Rotifers commonly known as wheel animalcules are the most important soft-bodied metazoans having a very short life cycle among the plankton (Jagadeeshappa et al., 2013). Rotifers inhabiting lake ecosystems constitute the major component of zooplanktons. They are consumers of microorganisms such as bacteria, algae, and ciliates. Some species are detritivorous. Thus rotifers play an important role in the trophic structure in freshwater ecosystems. Some rotifer species are also used as indicators of water trophy (Sulehria et al., 2009). Alkalinity is a measure of buffering capacity of water and is important for aquatic life in a fresh water system because it equilibrate the pH ranges that occur as a result of photosynthetic activity of plants in water (Kaushik and Saxena, 1999). Hardness of water is mainly due to the presence of calcium and magnesium ions and is an important indicator of</p>

toxic effect of poisonous elements present in water (Tiwari, 2001). The objective of present study is to investigate the impact of total alkalinity and hardness on rotifer diversity of Pandu lake.

4% formalin. Identification of Rotifers was done with the help of fresh water biology Edmondson (1965) Counting of organisms was done using Sedgwick- Rafter counter and the dilution technique and the population density of Zooplankton is represented per liter of water.

MATERIAL AND METHODS

Bodhan town is spread 21.36 km². The town Bodhan is located at latitude 18°39' 36" N and longitude 77°52' 47" E. The present lake Pandu is located on the North side of Bodhan town near residential localities. Free catchment area of the lake is 1.65 square miles. The total capacity of Pandu Lake is 9.44 Mcft. Total spreading area of Pandu Lake is 109.22 ha. The depth of Pandu Lake is 7 ft .Alkalinity and Hardness of water samples estimated by standard methods (APHA 1989). Zooplankton samples were obtained by passing 50 l water through plankton net in each depth. Zooplankton samples were preserved in

RESULTS AND DISCUSSION

The total alkalinity ranged from 212 mg/l to 350mg/l (Fig. 1). The lowest value noted during September 2002 and maximum during March 2003. High alkalinity values are indicative of the eutrophic nature of Pandu Lake. Munawar (1970) also observed high alkalinity in the eutrophic waters. Higher values of total alkalinity might be due to the presence of excess of CO₂ produced as a result of decomposition processes coupled with mixing of sewage and industrial effluents. Similar observations were recorded by Palharya et al (1993).

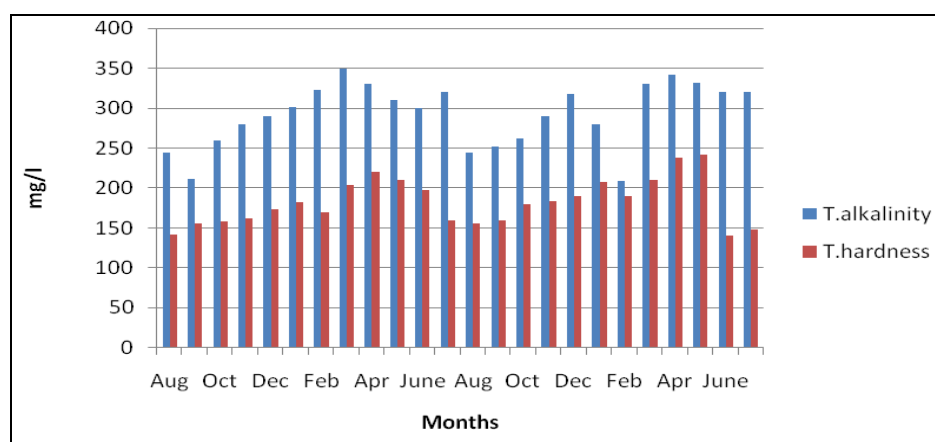


Fig. 1. Monthly Variations of Total Alkalinity and Total Hardness (mg/l) of Pandu lake

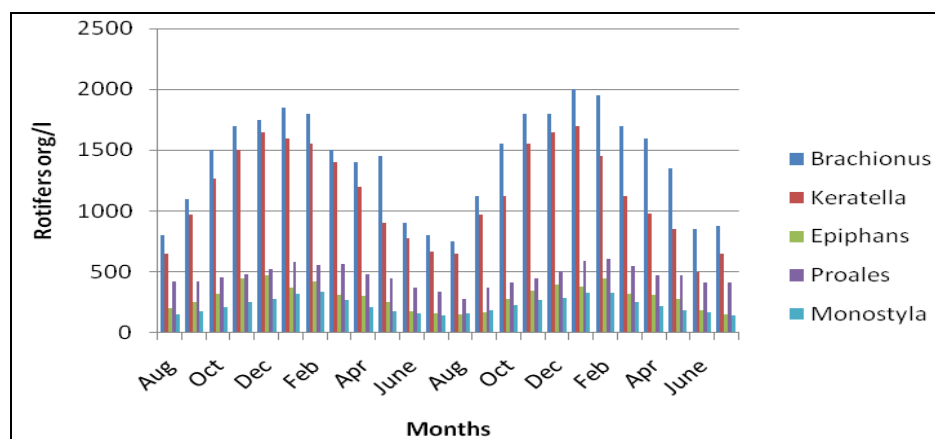


Fig. 2. Monthly Variations of Rotifers (org/l) of Pandu lake

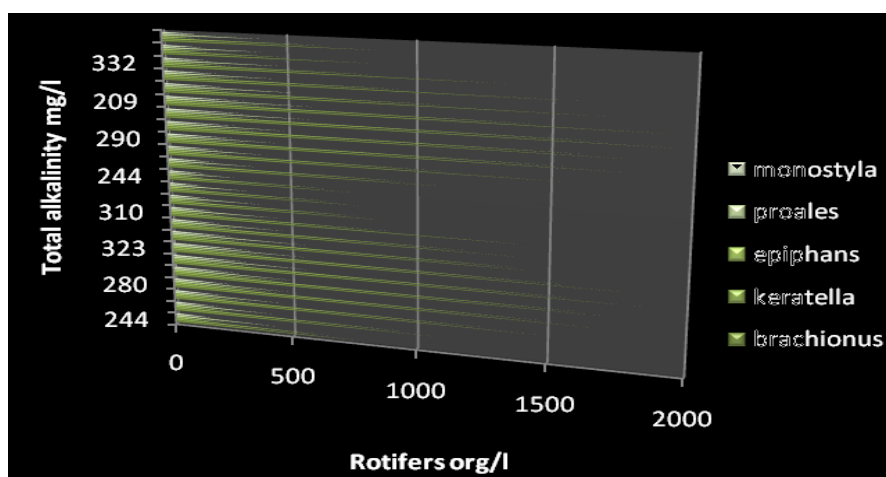


Fig. 3. Total alkalinity Vs Rotifers

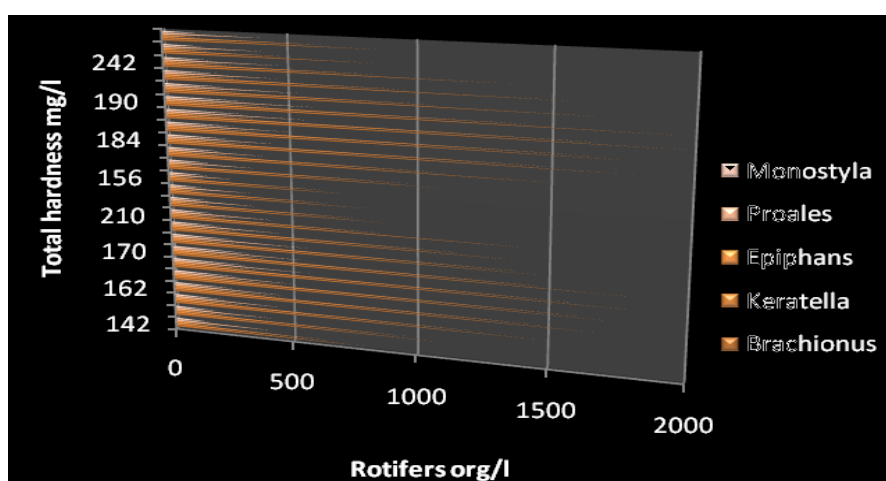


Fig. 4. Total hardness Vs Rotifers

The total hardness varied between 140 and 254 mg/l (Fig.1). The values of total hardness suggest besides leaching of rocks, evaporation of water and regular addition of large quantities of sewage and detergents into the lake from nearby residential localities. Water with hardness values more than 180 mg/l is very hard; in this respect water of Pandu is very hard. WHO (1984) permissible limit for total hardness is 200mg/l and ISI limit is 300mg/l. Todd (1995) suggested that the values between 150 to 300 mg/l of total hardness means water is very hard and value greater than 300 mg/l means water is extremely hard. From the above discussions the hardness of Pandu Lake is higher than permissible limit.

The population of rotifers was found to be present in the lake water during almost every month (Fig. 2) suggesting that rotifers could tolerate organic pollution of sewage origin.

Rotifers observed were Brachionus, Keratella, Epiphans, Monostyla, and Proales. Brachionus was found to be present throughout the study period. Its density was found to be more in January to May. The population of rotifers was found high from November to January and showed a single peak in April. This confirms findings of summer periodicity of rotifers as also observed by Sinha and Sinha (1993). Balkhi et al., (1984) found rotifers in water where the temperature was as low as 5°C while Sharma and Shrivastava (1986) recorded rotifers at temperature as high as 35°C. Both the temperature and dissolved oxygen of this lake were found to be nominal for the growth of rotifers. Rotifers have no effect on abiotic factors as the population density of proales and they were highly abundant same thing expressing themselves in the form of blooms. Rotifers population indicates pollution from inorganic

matter due to the direct entry of untreated domestic sewage into the lake.

Monostyla exhibited no significant correlation with alkalinity and hardness. Keratella and Proales are positively correlated with total alkalinity and no significant correlation with the total hardness. Brachionus poorly correlated at insignificant levels and Epiphans are positively correlated with total alkalinity and hardness (Fig. 3 and 4).

CONCLUSION

The present study reveals that Brachionus is the dominant genus throughout the investigation period indicating the eutrophic status of the Pandu lake.

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