ECOLOGICAL STUDY OF ROTIFERS FROM KOLAR RIVER, SAONER, DIST. NAGPUR (M.S.), INDIA

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ABSTRACT
In the present study, water samples from 1 station of Kolar river were analysed for seasonal fluctuation of physico-chemical parameters i.e., temperature, DO, BOD, total hardness, pH, alkalinity, TDS and. Effect of physico-chemical parameters on surface water density of rotifers was also studied. During one year study 13 species of rotifers were recognised from June 2011 to May 2012. Maximum population density belongs to Branchionus species. The higher concentration of rotifers was found during winter season and minimum during rainy season. An inverse relationship between the population density rotifer and the water current as well as direct relationship between the water temperature and the population density of rotifers was observed in sampling station throughout the study period.

INTRODUCTION
Adequate knowledge of zooplankton communities and their population dynamics is a major requirement for better understanding of life processes in a freshwater body since eutrophication influences both the composition and productivity of zooplanktons (Bhora and Kumar, 2004). Zooplanktons have long been used as indicators of the eutrophication (Webber et al., 2005; Aoyagui and Bonecker, 2004, Ayodele and Adeniyi, 2006 and Contreras et al., 2009). Zooplankton density has also been reported to vary depending on the availability of nutrients and the stability of the water (Redmond, 2008). Equally, results of several studies have shown that physical and chemical condition of aquatic ecosystems determine the occurrence, diversity and density of both flora and fauna in any given habitat, which may change with season of the year. Zooplanktons are often an important link in the transformation of energy from producers to consumers, due to their large density, shorter life span, drifting nature, high group or species diversity and different tolerance to the stress. Zooplankton is being used as indicator organisms for the physical, chemical and biological process in the aquatic ecosystem. Pawar and Sharma (2001) stated that the species richness and evenness were inversely related to the zooplankton biomass.

MATERIAL AND METHODS
Zooplankton, the microscopic free swimming animal components of aquatic systems, are represented by a wide array of taxonomic groups communities of zooplanktons are studied by estimating the appropriate quantity of samples. For enumeration of zooplanktons 50 litre of water sample was filtered through plankton net made of bolting silk cloth No. 25 with mesh size 63μm and 30 cm diameter. The samples were preserved by adding 2ml of 4% formalin. The quantitative analysis of zooplankton was done by using Sedgwick-Rafter counting cell was used to implement the technique delineated by Welch (1948). Zooplankton examined under binocular microscope with different magnification. All the zooplankton in the counting chamber was observed and identified using various standard keys (Dhanapathi 2000 and Altaf 2004). The no of organism was expressed in units/1 using the formula. 

RESULT AND DISCUSSION
Zooplankton constitutes an important link in food chain as grazers (primary and secondary consumers) and serves as food for fishes directly or indirectly. Therefore any adverse effect to them will be indicated in the wealth of the fish populations. Thus, monitoring them as biological indicators of pollution could act as a forewarning for the fisheries particularly when the pollution affects the food chain. Thus, the use of zooplankton for ecological biomonitoring of the water bodies helps in the analysis of water quality trends, development of cause-effect relationships between water quality and environmental data and judgement of the adequacy of water...
quality for various uses. The connection between the physico-chemical parameters such as pH, nitrate and phosphate and zooplankton was revealed by Das et al., (1996). The availability of nutrient impacts on the richness of copepoda and rotifer (Kumar et al., 2004). Sarkar and Chaudhuri (1999) had observed that the fluctuation of abiotic factors as temperature, pH, dissolved oxygen, phosphate, and nitrogen can influence the growth of zooplankton. Water temperature between 10–29 °C is suitable for zooplankton progression (Kaushik et al., 1992). Zooplankton is an integral component of aquatic ecosystem and comprises of microscopic animal life that passively float or swim freely. Major components of zooplankton are represented by Protozoa, Rotifera, Cladocera and Copepoda. Zooplankton incorporates primary and partly secondary micro faunal consumer’s operating system. This serves the functional role of harvesting primary production and grazing the bacterial biomass on the detrital spectrum in water (Seshgiri Rao 2005). Branchionus species showed dominance in rotifers. The presence of multiplicity of Branchionus sp., are the estimate of stimulus of pollutants as well as domestic sewage discharges (Sharma and Mankodi 2011). Mahesh et al., (2015) had observed rotifers population is recorded high in Kandlapallylake, Jagtial, Telangana. The rotifers are abundance at station S-1 during winter season was 477 No./L. due to favourable temperature and availability of abundant food in the form of bacteria, nanoplankton and suspended detritus. Somani and Pejavar (2003) stated that Rotifera is quite a diverse group of organism and large generic variety is observed in various lentic environments all over India. Pande et al., (2007) reported that Rotifera occurs more predominantly than Cladocerans and Copepodes. Edmondson (1965) observed that high Rotifer population in winter could be attributed with the favourable temperature and availability of abundant food in the form of bacteria, nanoplankton and suspended detritus. Radwan (1980) stated that abiotic factors have a weak influence on the abundance and fertility of pelagic rotifers. According to Pennak (1989) the extensive growth of Potamogeton was said to inhibit the development of Rotifers.

| Table 1. Population Density of Rotifers (Monthly Variation) of Kolar river during June 2011- May 2012 (Units/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
| 09 | 18 | 23 | 44 | 69 | 77 | 57 | 47 | 45 | 35 | 31 | 22 |

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| Table 2. Seasonal Mean value of Rotifers of Kolar river during June 2011- May 2012 (Units/l) |
|---|---|---|---|---|
| Monsoon | Winter | Summer | Annual |
| Mean | S.D. | Mean | S.D. | Mean | S.D. | Mean | S.D. |
| 23.5±14.84 | 62.5±13.20 | 33.25±9.54 | 39.75±20.30 |

| Brachionusangularis | Branchionusquadridentatus | Brachionusfalcatus |
Conclusion

Zooplanktonic study of Kolar river was done during the year 2011-2012 station 1 under four groups viz. Rotifera, Cladocera, Copepoda, and Ostracoda behind this Nauplius larvae in normal range. Rotifers were found to subsidize to the zooplankton abundance of the river accounting 13 species. The higher concentration of Rotifers was found during winter season and minimum during rainy season.

REFERENCES

Welch P. S. 1948. In: Limnological Methode (Blackston Co, Philadelphia) 381.