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Seasonal Succession of Rotifer Population in a Fresh water Pond at Ranchi

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Abstract. The seasonal fluctuation in the population of some rotifers in a fresh water pond of Ranchi located at 83°-20'E Long. 25°-15'N Lat. has been described. A bimodel distribution has been observed for most of the species. Certain physico-chemical factors have also been discussed affecting rotifer distribution.

Introduction

Zooplankton due to their lower position in food chain occupy an important place in the trophic dynamics of a water body (Lewis, 1979). As they constitute a major portion of fish food, the study of variation in their seasonal abundance is of great importance.

The present communication records the seasonal variations in rotifer populations of a fresh water pond located at 25°15'N Lat. 83°20'E Long at Ranchi.

The pond has a surface area of 4 hectare and a mean depth of 2.5 M. Besides *Azolla* sp a free floating plant, the pond has only *Juncus* sp and *Nymphaea* sp on its margins.

Methods

Monthly observations were made for one year (July 1981 to June 1982) at six fixed spots in the pond. 20 litres of water drawn from the surface were filtered through a conical plankton net (made of bolting cloth, No. 25) at each sampling. The samples were preserved in 4% formalin. The rotifers were counted by Sedgwick-Rafter counting cell. pH and dissolved oxygen content were determined by APHA methods in the field Temperature was recorded by a mercury thermometer.

Results

Physico-chemical parameters

The data recorded have been shown in Fig. 1. The maxima of air and water temperature (33.1°C and 31.7°C respectively) and the minima (15.2°C and 14.3°C respectively) were recorded in June 1982 and December 1981, respectively.

The pH of water ranged from 8.4 (August 1981) to 6.1 (February 1982). The pH remained in acidic range from January to May and in the alkaline in the remaining period.

The dissolved oxygen content varied from 5.1 ppm (February 1981) to 9.3 ppm (September 1982).

Rotifers

The rotifers were dominated by crustacean zooplankton. The fluctuation in rotifer population was slightly deviated from the general trend of the total zooplankton

population, the former being relatively more in cooler part of the year with slight increase in December '81 apart from bimodal peaks.

Fvie genera namely *Brachionus, Keratella, Asplanchna, Pompholyx* and *Triarthra* were recorded with frequency indices of occurence 1.00, 1.00, 0.5, 0.3 and 0.2 respectively. The seasonal variation in rotifer population has been illustrated in the Fig. 2. Four species of *Brachionus, B. blicatilis, B. quadridentata, B. caudatus* and *B. calyciflorus* were recorded of which *B. plicatilis* occurred throughout the year and outnumbered other species. Only one species of *Keratella, K. tropica* was recorded. The other genera were very scanty both qualitatively and quantitatively (Fig. 2).

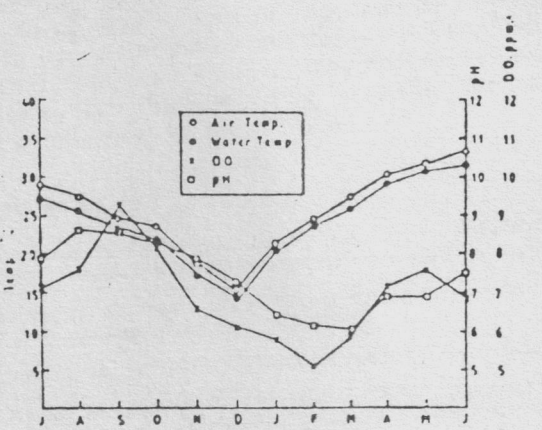

Fig. 1

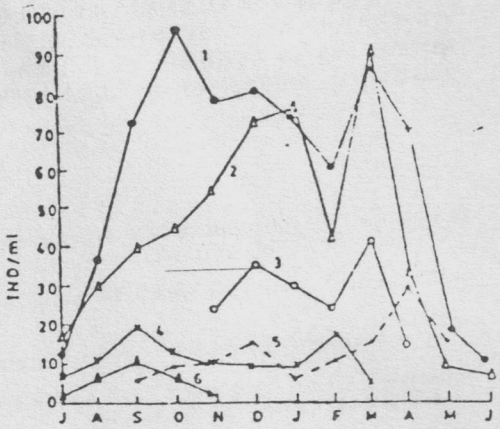

Fig. 2

Fig. 1. Seasonal variation of temperature (air & water) pH and dissolved oxygen.

Fig. 2. Seasonal variation in rotifer population

1 - *Brachionus* sp. 2 - *Karatella* sp. 3 - *Asphanchna* sp.
4 - *Pompholyx* sp. 5 - *Triarthra* sp. 6 - Damaged hence unidentified rotifers

Discussion

As reported by Pennak (1949), Das and Shrivastava (1956), Krishnamoorthy and Visvesvaria (1966), and Vasisht and Sharma (1976) a regular periodicity in abundance of rotifer population was not observed during the present investigation which is in contradiction to Moitra and Bhowmick (1968) who reported a regular succession of rotifer species in some ponds of West Bengal. Further, the peak periods of abundance of rotifers were different from the reports of George (1966) Michael (1968) and Vasisht and Sharma (1976). Based on the present study and review of literature, the authors support the conclusion drawn by Reid (1965) that neither in ponds nor in lakes the rotifers population follow a predictable pattern.

During the investigation, out of four species of *Brachionus* only one *i. e. B. plicatillis* was found dominating throughout the period. Similar observation has been made by Pennak (1949), who pointed out that when two species of the same genus occurred in water body only one species was more abundant than the other. The present record also supports William (1964) who found that rotifers more than one genus often dominated the same sample but each dominant genus tended to have only one dominant species.

Nayar (1970) reported from Pilani in Rajasthan that *Keratella tropica* was found throughout the year and peak of population was observed from January to March.

Our observation confirms the finding of Nayar (1970) but contradicts Vasisht and Sharma (1976) who reported its absence from July to October from a similar water body having similar conditions as under investigation.

George (1966) found abundance of *Brachionus* and *Keratella* at pH above 8.0, while Vasisht and Sharma (1976) reported abundance at pH 7.0-7.3. In our study abundance is noted when pH ranged from 6.1 to 8.6. The authors agree with Arora (1966) who reported pH as a limiting factor for rotifer population which can survive in range between 5.5 to 11.5.

Nayar (1965) and Vasisht and Dhir (1970) got a corresponding rise and fall in dissolved oxygen content with that of rotifer population which is not in agreement with our investigation but the amount of dissolved oxygen recorded was always higher than their results. The absence of rise and fall in dissolved oxygen content with rotifer population was probably due to very high phytoplankton population in comparison to zooplankton.

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