

ON THE ECOBIOLOGICAL FEATURES OF VELACHERY LAKE ON A LUNAR ECLIPSE DAY

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The effect of lunar eclipse on ecobiological features of Velachery lake, Chennai, was studied on 16th July 2000. The zooplankton species count revealed the dominance of *Mesocyclops* sp. among the identified forms.

INTRODUCTION

In recent times there is an increasing awareness on the knowledge of fresh water bodies, since they constitute ideal models of biotope for studies on microecology. Many studies have been made during solar eclipse period both in estuarine and coastal waters (Srinivasan & Raghunathan, 1981; Srinivasan & Krishnan, 1985). But such studies are lacking during lunar eclipse day. The ecological features of hydroecosystem are known to reveal the operation of various factors in a species population such as diurnal variation, seasonal variation, periodicity and also the relative abundance of individuals of different species (Moitra & Bhowmia, 1968). Plankton forms an important member in the food chain as a primary consumer. The occurrence of lunar eclipse is a rare astronomical phenomenon which will have a bearing on the activities of organisms on the ecosystem. Information of ecobiological features during lunar eclipse day is wanting. In the present study some of the hydroecological parameters and the plankton species available have been determined on a normal and eclipse time on the same day in Velachery lake located at 100' Road, Velachery, Chennai.

Velachery lake : The Velachery lake selected for ecobiological study is a natural perennial located near 100' road Velachery, Chennai, covers approximately 75 acres area. It represents the biggest lake within the city limit of Chennai. The bottom of the lake is composed of clay (30%), silt (30%), sand (40%) and dead planktonic organisms, fishes and other wind-blown materials.

Lunar eclipse : In Chennai on 16th July 2000, the lunar eclipse commenced at 18.30 hours and ended at 20.40 hours.

MATERIALS AND METHODS

The observations were initiated by collecting water and plankton samples on 16th July before and at the time of eclipse period. The first set samples (6 numbers) were collected on 16th July 2000 between 15.30 and 16.30 hours. The second set samples (6 numbers) were collected during the lunar eclipse period *i.e.* from 18.30 to 20.30 hours. Air and water temperature values were recorded. Salinity, DO and other parameters were determined following APHA (1981) method. The plankton samples were collected by a plankton net. The collected samples were fixed in 5% formalin and made up to 250 ml. From this 2 ml of the sample was studied for enumeration purposes in a Sedgewick-rafter cell counter.

RESULTS AND DISCUSSION

No significant difference with reference to salinity, pH, total free carbon dioxide and carbona-

tes were noticed in the samples taken on two different times on the same day (Table I). The influence of pH and DO content and salinity on the occurrence and survival of plankton population have been demonstrated already in seasonal studies as well as by controlled laboratory tests (Latimer *et al.*, 1975; Ramalingam & Raghunathan, 1981).

The surface zooplankton identified in the present study includes four species namely *Mesocyclops leucarti* (Claus), *Daphnia carinata*, *Moina dubia* and some Rotifers. The interesting fact noted during the investigation was the presence of Rotifers during eclipse time. Rotifers constituted the least available group. *Moina dubia* and *Daphnia carinata* showed ten fold greater abundance than the Rotifers. Both males and females of *M. leucarti* represented the predominant species in the total plankton population.

The results reveal that from the collected specimens of plankton *M. leucarti* represents the hardy species which could withstand the adverse hydrological factors that may be caused due to human interaction and intervention. The abundance also suggests that the species might have been obtained during their vertical migration on the lunar eclipse hours.

Though comparable results on lunar eclipse and its influence over the lentic system are not available, few studies on solar eclipse and its influence on the estuarine (Adyar estuary) and marine coastal waters have been made (Srinivasan & Raghunathan, 1980; Srinivasan & Krishnan, 1985). In their study they have also reported the dominance of some planktonic forms namely, *Pseudodiaptomus* sp. and *Brachionus* sp. at Adyar estuary (Srinivasan & Raghunathan, 1980) and *Chaetognathus* at coastal waters of Puri (Srinivasan & Krishnan, 1985). Hence it may be suggested that lunar eclipse may be responsible for the difference in the abundance among the plankton species.

Table I : Ecobiological features of Velachery lake.

Parameters	First Set Sample (6 Nos.) (15.30 & 16.30 hrs)	Second Set Sample (6 Nos.) (18.30 & 20.30 hrs)
Oxygen content	0.2538 ppm	0.1695 ppm
Ambient temperature	31 ⁰ C	30 ⁰ C
Surface water temperature	32 ⁰ C	29 ⁰ C
Bottom water temperature	30 ⁰ C	28 ⁰ C
Turbidity	12.9	12.2
TD Solids	1540	1560
Electrical conductivity	2199	2228
pH	8.4	8.41
Total hardness	600	550
Total free Carbon dioxide	8 ppm	10 ppm
Salinity	0.104%	0.105%
Bicarbonates	66 ppm	64 ppm
Gross productivity	0.2539 g / carbon	-
Net productivity	0.0851 g / carbon	-
Plankton volume	2 ml/l	4 ml/l
Rel. abundance		
<i>Mesocyclops leucarti</i>	950/l	1508/l
<i>Moina dubia</i>	102/l	132/l
<i>Daphnia carinata</i>	81/l	110/l
<i>Rotifer</i> spp.	Nil	10/l

Though the vertical movement of plankton species in lentic system has been ascribed to such factors as light in general, the reason for the differential movement and abundance of species has not been adduced. Hence eclipse of moon besides the normal diurnal changes in light intensity influencing specific plankton species and their activity may not be ruled out. The observations of both males and females of *M. leucarti* also suggest the influence of the eclipse timing and normal diurnal change in light intensity towards their reproduction. Such influences of light in general and of eclipse phenomenon in particular on the activity and drifting of insects and other invertebrates are already reported (Backus *et al.*, 1965; Elliot, 1965; Holt & Walters, 1967; Chaston, 1968; Bishop, 1969).

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