

## A Preliminary Investigation on Plankton in Retteri Lake in Madhavaram Tamilnadu

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### Abstract

The present investigation was made to study the plankton occurrence, abundance along with few physico-chemical parameter from Retteri lake. Fortnight sampling was carried out from January to July 2009. A total of 20 species of plankton were recorded. Protozoans and rotifers showed the dominance during the study. This faunistic survey is much essential to explore the plankton diversity from the Retteri lake which was highly influenced by various industrial activities and the studies were less explored.

**Key words :** Retteri lake, Plankton, Zooplankton, Water quality.

Lake Retteri is one of the biggest lake in Chennai, located in Madhavaram near Red hills Town in the Thiruvallur district of Tamilnadu. This is one of the largest water bodies in Thiruvallur district with a total ayacut of 523.48 hectares, use to supply water for irrigation, other human and domestic activities such as bathing, washing clothes and cattle wading. The catchment area is highly influenced by anthropogenic, industrial activities and human activities. There is an entry of drain carrying pollutants into the lake from paper and machine tool industry. Owing to its location adjoining to the city and National highways, the lake serves as a receptor of various pollutants of anthropogenic and industrial nature. The studies on Retteri lake were less explored and thereby a preliminary investigation was carried out to analyse the water quality and plankton parameters.

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### Methods

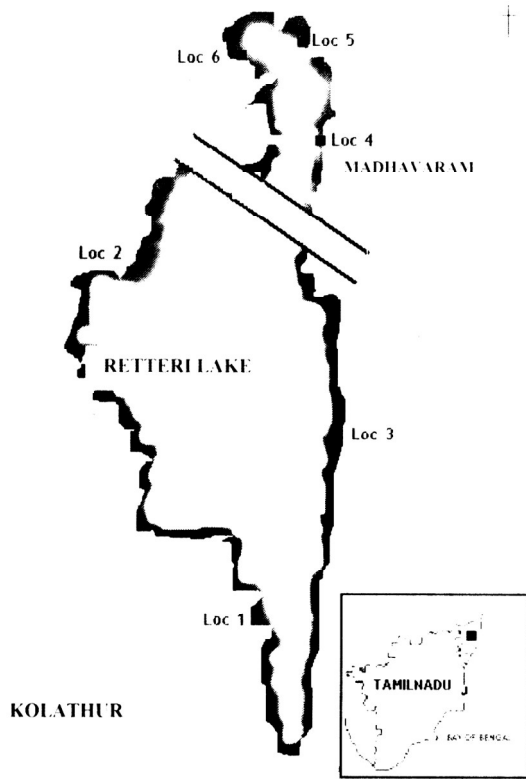
Investigations were carried out in six sampling locations (Loc<sub>1</sub>—Loc<sub>6</sub>) selected for the study (Fig. 1). Surface water samples were collected from January 2009 to June 2009. The samples were collected in a precleaned one liter polypropylene container for physico-chemical analysis. Samples of dissolved oxy-

gen analysis were fixed in the field itself. Water quality parameters like pH, temperature, salinity and dissolved oxygen were estimated by adopting the methods given in APHA et al. (1). Plankton samples were collected by filtering through 50 µm mesh size plankton net and were preserved in 4% formalin. Identification was made following Anand (2, 3), Battish (4), Dhanapathi (5) and Edmondson (6).

### Results and Discussion

#### *Physico-Chemical Parameters*

The pH values were fluctuated from 6.66 to 8.16. The highest value was recorded during January month at loc 4 and the lowest value observed during June month at loc 3. Water quality of Lake Retteri generally exhibited slightly acidic to an alkaline range from pH 6.66 to 8.16 and remained within the acceptable limit. The surface water temperature were ranged between 22C recorded during March at Loc 5 and 31C recorded during the month of January and February at location 1. Dissolved oxygen were ranged between 0.6 and 10.7 mg/liter. The higher value was recorded at location 2 in January and February. The lowest value was recorded at location 6 during January month. The concentration of salinity were ranged from 0.15 to 0.28 ppt. The maximum value of salinity 0.28 ppt was observed during January and February at all the loca-



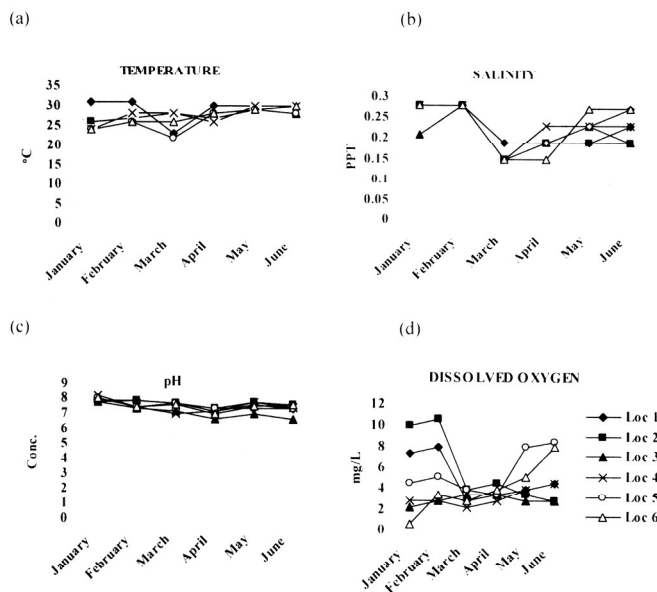
**Figure 1.** Study area showing the selected locations in Retteri lake.

value of salinity ( 0.15 ppt) was observed during the March at all the locations except location 1 (Fig. 2 a—d).

This acidic range of pH indicates the decomposition of organic matter contributed by industrial and human waste has not suppressed the pH all along the study area (7). The high value of the pH might be due to high photosynthetic activity in water (8) and excess human activities. Higher temperature of lake water during January and February at location 1 appears to be due to greater heating and insolation from the sun. The temperature may not be more important in pure water because of the wide range of temperature tolerance in aquatic life, but in the polluted water it profound effects on the dissolved oxygen (7). The wide range of DO values were observed may be due to aeration, organic matter elimination or addition from sediments, algal activities and point and non-point sources from its catchment area (7, 9).

*Biological Parameters*

A total of 36 plankton samples were collected from six locations during the stipulated period January and June 2009. Zooplankton were classified into



**Figure 2.** (a—d) Physicochemical parameters of Retteri lake.

**Table 1.** List of plankton encountered in Retteri lake (Jan—Jun 2009). Occurrence of species (+lesser, ++ moderate, +++ higher) in abundance.

Plankton	Jan	Feb	Mar	Apr	May	Jun
<b>Zooplankton</b>						
<b>Protozoa</b>						
1 <i>Arcella discoidea</i> Ehrenberg, 1871	++	+++	++			+++
2 ( <i>Centrophyxis aculeata</i> Ehrenberg, 1832)	+++	+++	+++	+	+++	+++
3 <i>Euglypha</i> sp.	+++	++				
4 <i>Euplotes</i> sp.	+++	+++			++	
<b>Rotifera</b>						
5 <i>Asplanchna brightwelli</i>	+			++		
6 <i>Lepadella crestata</i>		++				
7 <i>Monstyla bulla</i> Gosse, 1851	+++	++				+++
8 <i>Trichocerca</i> sp.	+					
<b>Cladocera</b>						
9 <i>Bosmina longirostris</i>	++	++				
10 <i>Chydorus</i> sp.		+++		+	++	
11 <i>Moina micrura</i>		++				
<b>Copepoda</b>						
12 Calanoid copepodite	+	+	++	+	+	++
13 Cyclopoid copepodite		++			+	+++
14 <i>Mesocyclops hyalinus</i> female					++	+
15 <i>Paradiaptomus greeni</i>				+	+	++
<b>Ostracoda</b>						
16 <i>Cypris subglobosa</i>						
Phytoplankton	+					
<b>Bacillariophyceae</b>						
17 <i>Cymbella tumida</i>		++				
18 <i>Navicula</i> sp.		+	++			
19 <i>Nitzschia palea</i>		++				
20 <i>Pleurosigma</i> sp.		+				
<b>Chlorophyceae</b>						
21 <i>Pediastrum simplex</i>	++	+++				+++
<b>Dinophyceae</b>						
22 <i>Gymnodinium</i> sp.		++				

five major groups viz., Protozoa Rotifera, Cladocera, Copepoda and Ostracoda phytoplankton into three major orders Bacillariophyceae, Chlorophyceae and Dinophyceae in the study. A total 20 species of plank-

ton were encountered among zooplankton were Protozoa (4), Rotifera (4), Cladocera (3), Copepoda (2) along with copepodites and Ostracoda (1) and among phytoplankton were Bacillariophyceae (4),

Chlorophyceae (1) and Dinophyceae (1). The major contribution of taxa among phytoplankton (6) and zooplankton (9) were recorded during February month and lower species occurrence were observed during March. Few organisms from Protozoa (*Arcella discoides* Ehrenberg, 1871. *Centrophyxis aculeata* (Ehrenberg, 1832), Rotifera (*Monstyla bulla* Gosse, 1851), and phytoplankton (*Pediastrum simplex*) represented higher in abundance. *Cypris subglobosa* (Ostracoda) during April and *Trichocerca* sp. (Rotifera) during January were witnessed rarely in the investigation (Table 1).

Armengol (10) and Marneffe et al. (11) were reported that rotifers are the major group among the zooplankton found in the majority of freshwater communities. The diversity of zooplankton directly related with physico-chemical parameters and trophic state of freshwater bodies (12). The lower diversity and abundance found in this study might be due to the presence of planktivorous fishes, though fish abundance was not a part of this study. Enormous fish scales were observed during the present investigation. Hydrobiological processes are thus the primary factor controlling not only the plankton abundance but also the limnological features and food resources, which are commonly used to explain variations in plankton abundance. Our results also indicate that future investigation to contribute to better understanding of plankton assemblage in Retteri lake, should include detailed seasonal observation of biological and ecological responses of the plankton with

some important environmental variables.

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