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Role Of Fresh Water Free Living Protozoans As Bioindicators And Bioremediation Tools In Vembanadu Lake, Kerala, India: An Important Ramsar Site

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The use of the free living protozoan communities has benefited in perfectly characterizing and monitoring the prevailing environmental conditions of aquatic habitats that are typically found at marginal freshwater regions. A particular community of organism may be useful as an environmental indicator due to many reasons. Some may have sensitivity to low levels of anthropogenic contaminants, yet some others may tolerate and survive in the hardy and extreme conditions, and others also may react quickly to change in environment. Thus they tend to become a unique biotic tool to understand the ecological status of an aquatic habitat. Vembanad Lake and its adjacent kol lands has acclaimed international recognition as a Ramsar site. This lake is a biological niche of a multitude of organisms and it is intricately woven with the lives of the resident communities of its banks. The lake has also been facing severe environmental crisis during the last 3 decades due to anthropogenic influences. Presently, 19 species of free-living protozoans have been identified and characterised from this lake. A total of 15 testacid rhizopods belonging to 2 orders, 6 families and 9 genera were recorded. And the ciliates of 3 orders, 3 families were recorded. Among the testaceous rhizopods 1 species from Arcellidae family, 5 from Centropyxidae, 1 species from Nebelidae, 6 from Diffugiidae belonging to the Class Lobosea and 2 species from the Class Filosea belonging to Cyphoderiidae and Euglyphidae families were identified. Some of these free-living forms have given certain insights of the prevailing ecological conditions of this lake thus acting as perfect Bioindicators. *Euglypha tuberculata* reported in the present study is a species of wide tolerance and survives in diverse habitats. Similarly *Cryptodiffugia oviformis* which was reported for the first time in India in this study prefers dryer environments. Due to its small size, this species mainly feeds on bacteria and yeasts, their high abundance explains active decomposition process in the area. The diversity of the free-living ciliates in the study area included species belonging to 3 genera namely *Euplotes*, *Tachysoma* and *Coleps* and they were pollution indicators possessing the property of heavy metal uptake. The water quality analysis and heavy metal analysis also proved the waters of the lake polluted with heavy metal concentrations. Thus the present study draws our attention to the possibility of using these dominant ciliate species for bioremediation of aquatic pollutants in this lake. Thus these freshwater free living protozoans serve as good bioindicators reflecting the natural ecological conditions prevailing in the Vembanad Lake. They can also be effective bioremediation tools that can be applied to solve the heavy metal pollution crisis of the lake.

Biography

Vasu Jayaprakas, working as Professor, has a long period (40 years) of teaching and research experience in fisheries and aquaculture. Developed Formulated supplementary protein diets for whiteprawn, pearlspot and tilapia culture and developed low-cost production technology for cage culture of murels, *Channa* spp. Evolved optimum stocking density and best supplementary feed for cage culture of Tilapia, *Oreochromis mossambicus*. Developed broodstock feed for *Oreochromis mossambicus*. Evolved optimum dosages of commercial grade growth promoters and feed additives for the culture of fresh water fishes and marine shrimps. Developed supplementary diets for optimizing reproductive potential of ornamental fishes., blue gourami, *Pseudosphromenus cupanus* and *P. dayi*.

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