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Novel Technology of Free-Living Protozoans as Bioindicators and Bioremediation Tools in the Coastal Zone of South West Coast of India

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Abstract

The use of free-living protozoan communities has benefited in perfectly characterizing and monitoring the prevailing environmental conditions of aquatic habitats and a particular community of organism may be useful as an environmental indicator due to many reasons..In the present study, 19 species of free-living protozoans have been identified and characterised from this Coastal zone. 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 1species from Arcellidae family, 5 from Centropyxidae, 1 species from Nebelidae, 6 from Difflugidae 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 coastal area thus acting as perfect Bioindicators. Euglypha tuberculata reported in the present study is a species of wide tolerance and survives in diverse habitats. Similarly, Cryptodifflugia 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 this coastal area are highly polluted with heavy metal concentrations. These free-living protozoans serve as good bioindicators reflecting the natural ecological conditions prevailing in this coastal zone. They can also be effective bioremediation tools that can be applied to solve the heavy metal pollution crisis of the marine water