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Protozoa as Bioindicators of Aquatic Ecosystem Health within Sustainable Development Frameworks

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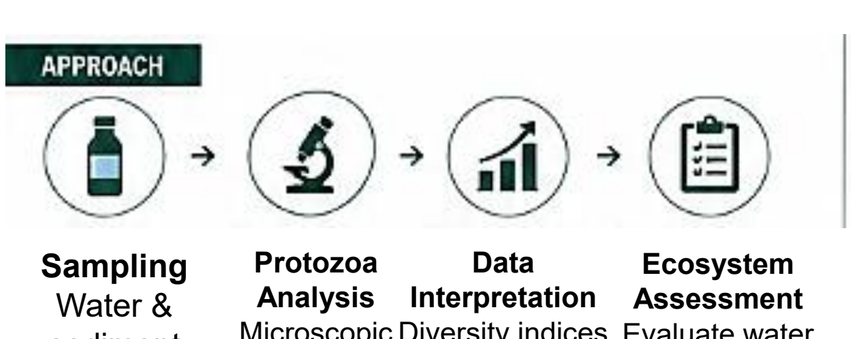
WHY PROTOZOA?

Ubiquitous and diverse in aquatic habitats
Short generation time and rapid response
Sensitive to pollution, eutrophication, and climate change
Reflect both microbial and ecological food-web dynamics
Cost-effective and efficient monitoring tools

EXPECTED OUTCOMES

Establish a protozoa-based bioindicator framework for aquatic ecosystems
Provide baseline data for long-term ecosystem monitoring
Support evidence-based decision making for conservation
Enhance understanding of microbial roles in ecosystem health
Contribute to national and global sustainability goals



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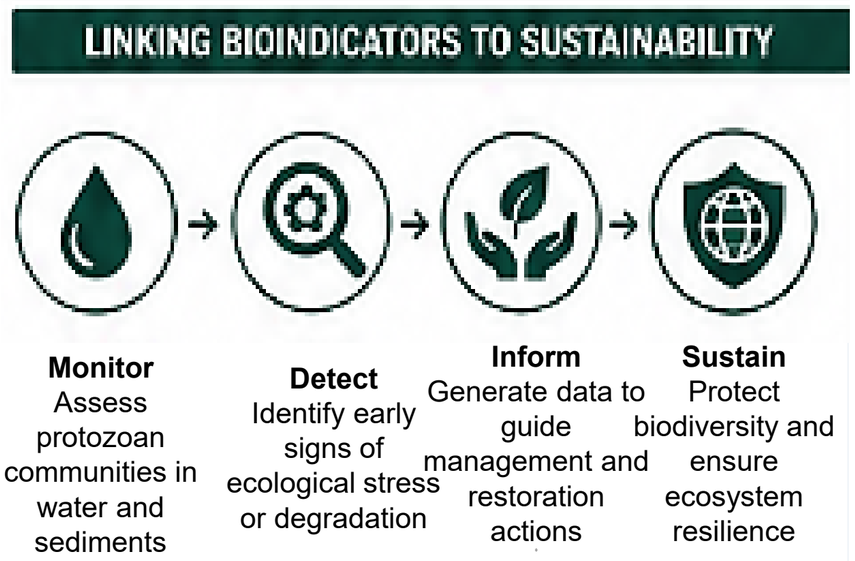
ABSTRACT
Protozoa are integral components of aquatic ecosystems and serve as sensitive bioindicators of environmental change. Their diversity, abundance, and community structure reflect water quality, habitat integrity, and ecological balance. This study highlights the potential of protozoa to assess the health of aquatic systems and support sustainable development goals. By integrating protozoan monitoring within ecosystem-based management and biodiversity conservation frameworks, we enhance early detection of anthropogenic impacts, inform conservation strategies, and promote the long-term resilience of aquatic ecosystems.

Keywords

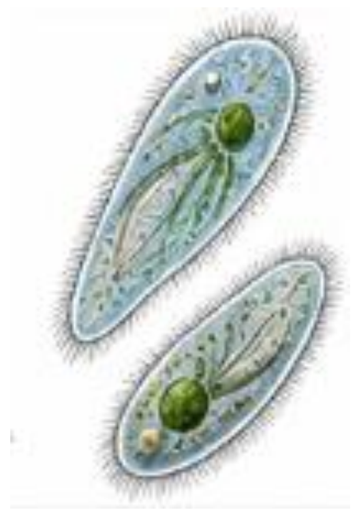
Protozoa; Bioindicators; Aquatic ecosystems; Water quality; Biodiversity; Sustainable development; Monitoring

KEY INTEREST AREAS

Protozoan diversity and community structure in aquatic ecosystems
Protozoa as indicators of pollution and eutrophication
Impacts of climate change on microbial eukaryotes
Microbial food webs and ecosystem functioning
Development of protozoan-based bioassessment indices
Integration of bioindicators into sustainable management strategies



Science for a Sustainable Future
Using tiny organisms to make a big impact on ecosystem conservation.



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