

# Soil Protozoa, a Microbial Indicator of Soil Health: A Review



**Chitra Jayapalan\***

*Soil Zoology Section, Zoological Survey of India, India*

**Submission:** September 06, 2017; **Published:** October 24, 2017

**\*Corresponding author:** Chitra Jayapalan, Soil Zoology Section, Zoological Survey of India, M-Block New Alipore Kolkata-700 053, India,  
Email: [chitrajayapalan@gmail.com](mailto:chitrajayapalan@gmail.com)

## Introduction

One of the restricted group of organisms studied among protists are soil protozoa recently. Their rich diversity of protozoans among the soil habitats are immense. Amoebae (testate and naked), ciliates and flagellates are the three major groups of protozoans found highly abundant in Soil. Numerous heterotrophic flagellates and naked amoebae are available in agricultural soils, grassland, forest soil, bottom sediment of freshwater, coastal and marine waters. They are influenced by living roots or by dead organic material; occasionally they would reach to a higher population as several millions per gram of soil [1]. Soil health is important to maintain where the soil organisms are the main biological elements influences with the physical and chemical properties of soil. The population of the microbial habitat depicts the early warning or sign on soil degradation and health [2].

## Role of protozoa

Protozoans play an important role in terrestrial ecosystem as bacterial consumers, and to a minor extent as consumers of fungi leads to mineralization of organic soil nitrogen in form of ammonium which are being taken by the plants. Based on their size and flexibility they are able to graze bacteria which occurs in small pores in the soil. And the population differs in soil according to the water potential, soil texture and soil structure [1]. Mastigophorans (flagellates) tend to dominate in drier soils while ciliophorans (ciliates) are abundance in moist soil. Cultivated soil and clay soil are predominated by flagellates and amoebae while soil of coarse texture consists of large flagellates, testaceans and ciliates. Protozoans mainly for their food source they compete with nematodes, regulates bacterial and algal population and act as feed for nematodes, rotifers etc., which dwells in soil environment [3]. Their consumption of bacterial productivity leads to enhance the nutrient cycles and the energy flow to the microorganisms, plants and animals which indicate the powerful tool to assess and monitor the changes in biotic and

abiotic environment [4]. They play as bio indicators or biomonitors in peatland, saltmarshes, mangroves sediments of lakes, reservoirs, ponds, wetlands, agriculture lands etc., even several protected forest floor's health is related to the status of protozoans correlate with the soil moisture levels, acidic status and also helps to assess in alteration in the long term ecology. Few testate amoebae were act as indicators in the determination of biostratigraphic and palaeo environmental applications [5-7].

## Conclusion

Soil microbes especially protozoan diversity can be signified as main component of terrestrial ecosystem. They are highly involved in habitat and ecological changes and also act as indicators of soil health. Their diversity, population and role in food chain plays a crucial management in soil. Although the significant role of soil protozoans are known world wide and in terms of conservation, soil health and diversity still more intense studies on soil protozoa to be carried out. Taxonomic and experimental studies along with Long term monitoring would leads to discovery of protozoans in this field.

## Acknowledgement

The author sincerely acknowledges Dr. Kailash Chandra, The Director Zoological Survey of India for the constant encouragement and support.

## References

1. Ekelund F, Ronn R (1994) Notes on Protozoa in agricultural soil with emphasis on heterotrophic flagellates and naked amoebae and their ecology. *FEMS microbial Rev* 15(4): 321-353.
2. Nielsen MN, Winding A (2002) Microorganisms as Indicators of Soil Health. National Environmental Research Institute, Denmark. Technical Report No. 388, pp. 1-85.
3. Hoorman JJ (2011) The role of soil protozoa and nematodes. Fact Sheet, Agricultural Natural Resources, The Ohio State University extension SAG 15-11: 1-5.

4. Foissner W (1999) Soil Protozoa as bioindicators: pros and cons, methods, diversity, representative examples. *Agriculture, Ecosystems & Environment* 74(1-3): 95-112.
5. Charman DJ (1999) Biodiversity and fossil testate amoebae. *Journal of Biogeography* 26(1): 89-96.
6. Charman DJ (2001) Biostratigraphic and palaeo environmental applications of testate amoebae. *Quaternary Science Reviews* 20(16-17): 1753-1764.
7. Sherman JM (1916) Studies on soil protozoa and their relation to the bacterial flora. *J Bacteriol* 1(1): 35-66.



This work is licensed under Creative Commons Attribution 4.0 License  
DOI: [10.19080/AIBM.2017.06.555700](https://doi.org/10.19080/AIBM.2017.06.555700)

### Your next submission with Juniper Publishers will reach you the below assets

- Quality Editorial service
- Swift Peer Review
- Reprints availability
- E-prints Service
- Manuscript Podcast for convenient understanding
- Global attainment for your research
- Manuscript accessibility in different formats  
**( Pdf, E-pub, Full Text, Audio )**
- Unceasing customer service

Track the below URL for one-step submission

<https://juniperpublishers.com/online-submission.php>