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ON SOME NEW RECORDS OF TESTATE AMOEBAE (PROTOZOA: RHIZOPODA) FROM MEGHAMALAI WILDLIFE SANCTUARY, WESTERN GHATS, TAMIL NADU, INDIA

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AUTHOR'S CONTRIBUTION

The sole author designed, analysed, interpreted and prepared the manuscript.

ARTICLE INFORMATION

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Short Communication

ABSTRACT

Testate amoebae are a group of unicellular free-living protozoa which are characterized by morphologically distinct shells ''(tests)'' which play an important role in the natural ecosystems as bio-indicators. So far no study has been made in Meghamalai Wildlife Sanctuary of Tamil Nadu, part of Western Ghats, India and this study was done from the moss samples of the sanctuary. The study resulted the reports of 25 species of testate amoebae new to the sanctuary and the results also show that the testate diversity of India has increased by 4species.

Keywords: Protozoa; testate amoebae; Meghamalai wildlife sanctuary; Tamil Nadu; new records.

1. INTRODUCTION

Studies are undergoing on the free living testate amoebae (Protozoa: Rhizopoda) fauna of India and the testate amoebae from moss habitats of Tamil Nadu have been inadequately studied and perusal of literature revealed that no available reports so far regarding the testate diversity from Western Ghats of Tamil Nadu. Testate amoebae have worldwide distribution and they inhabit in all the moist habitats. Various studies Mitchell et al. [1] suggest that moisture is the most important factor in controlling the distribution of testate amoebae species in micro habitats. They are known to be good indicators of several ecological parameters such as substrate moisture in soil and peat and water chemistry [2,3,4]. Temperature is also one of the important factors influencing the distribution of testate community since testate amoebae require a minimum temperature at a specific time of the year to reproduce successfully Medioli & Scott, [5]. Records of moss inhabited by testate amoebae are very scanty in India except for the studies of Penard [6], Nair and Mukherjee [7,8] and Chathopadhyay and Das [9], Bindu [10,11,12], Bindu and Jasmine [13,14]. Until present there are no records of moss dwelled by testate amoebae from Tamil Nadu and in the present communication the moss habitats of Meghamalai Wildlife sanctuary,

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Western Ghats of Tamil Nadu is studied for the occurrence of testate amoebae. The Meghamalai Wildlife sanctuary is a mountain range situated in the Southern Western Ghats of Theni district, Tamil Nadu between the geographical range of 9º31'-9º51' N and 77º10'-77º30'E and the altitude reaches up to 2000 m. The study aimed to explore the testate amoebae fauna of Meghamalai WLS.

2. MATERIALS AND METHODS

Moss samples for the study were collected during the survey conducted as a part of the Annual Programme of the southern Regional Centre of Zoological Survey of India, Chennai. Samples were collected by scraping the tree barks, walls and soil surfaces from different parts of the sanctuary stored in special polythene bags and brought to the laboratory. The samples were processed with non-flooded ''petri dish'' method by Foissner [15,16] and observed under the microscope (Nikon 50i) for the occurrence of rhizopods. Permanent slides were prepared and registered and all the slides were deposited in the National Zoological Collections of the Marine Biology Regional Centre, Zoological Survey of India, Chennai.

3. RESULTS AND DISCUSSION

A total of 25 species belonging to 14 genera of testate amoebae were identified and grouped under 10 families and 2 classes. The most abundant species of testate amoebae recorded belong to the family Centropyxidae followed by Hyalosphenidae. Table 1 shows the list of species recorded from the sanctuary. Of these four species are new records to India *viz*., *Arcella megastoma arcuata* Deflandre, 1928, *Nebela longitubulata* Gauthier-Lievre, 1953, *Nebela penardiana* Deflandre, 1936 and *Quadrulella variabilis* Kosakyan, 2016. Figs. 1 to 4 shows the new records of testate amoebae for India. This is only a preliminary report of the testate amoebae of Meghamalai WLS and it is definite that the diversity will increase if samples from a wider range are taken and more intensive studies are made. All the 25 species are recorded for the first time from Meghamalai WLS.

Table 1. Distribution of testate amoebae under different families in Meghamalai WLS

Name of species	Families
Phylum : Amoebozoa	
Class : Lobosea	
Order : Arcellinida	
1. Arcella artocrea Leidy, 1876	
2. *Arcella catinus* Penard, 1890	
3. *Arcella megastoma arcuata* Deflandre, 1928*	Arcellidae
4. Centropyxis aculeata (Ehrenberg,1832) Stein, 1857	Centropyxidae
5. Centropyxis aerophila Deflandre, 1929	
6. Centropyxis constricta Penard, 1902	
7. Centropyxis discoides Deflandre, 1929	
8. Centropyxis ecornis Ehrenberg, 1841	
9. Centropyxis minuta Bonnet, 1959	
10. Difflugia globulosa Dujardin, 1837	Difflugiidae
11. Difflugia oblonga Ehrenberg, 1838	
12. Trigonopyxis arcula Penard, 1912	Trigonopyxidae
13. Cyclopyxis arcelloides Deflandre, 1929	
14. Cyclopyxis eurystoma Deflandre, 1929	
15. Phryganella acropodia Hopkinson, 1909	Phryganellidae
16. Heleopera sylvatica Penard, 1890	Helioperidae
17. Hyalosphenia elegans Leidy, 1874	Hyalosphenidae
18. Nebela longitubulata Gauthier-Lievre, 1953*	
19. Nebela penardiana Deflandre, 1936*	
20. Quadrulella variabilis Kosakyan, 2016*	
21. Phryganella acropodia Hopkinson, 1909	Phryganellidae
22. Bullinularia indica Penard, 1907	
Class : Filosea	Assulinidae
23. Assulina muscorum Greef, 1888	
24. Trinema complanatum, Penard, 1890	Trinematidae
25.Trinema grandis Chardez, 1960	

''Asterisk points out the new reports of species from India''

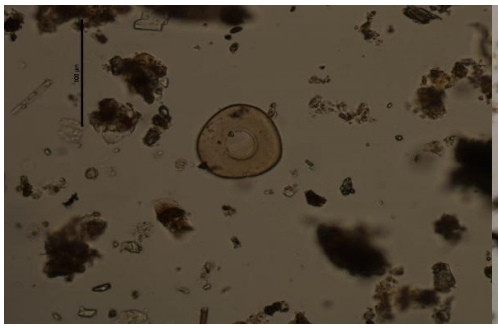

Fig. 1.
Arcella megastoma arcuata Deflandre, 1928

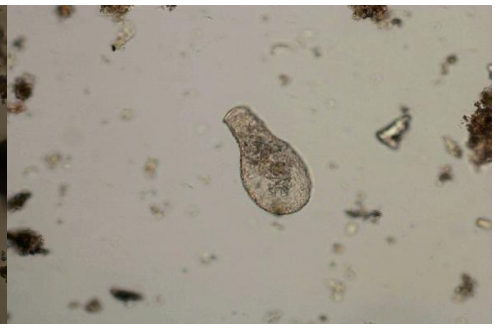

Fig. 2.
Nebela longitubulata Gauthier-Lievre, 1953

Fig. 3.
Nebela penardiana Deflandre, 1936

Fig. 4.
Quadrulella variabilis Kosakyan, 2016

4. CONCLUSION

The study provides the preliminary report of 25 species of testate amoebae of Meghamalai WLS, Western Ghats, Tamil Nadu; many species are still to be explored and can be well revised in the light of future thorough research. The highlight of the study is the extended distribution of four species of testate amoebae to Indian testate fauna of the families Arcellidae and Hyalospenidae.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Mitchell EAD, Buttler AJ, Warner BG, Gobat JM. Ecology of testate amoebae (Protozoa: Rhizopoda) in sphagnum peatlands in the Jura mountains, Switzerland and France. Ecoscience. 1999;6:565-576.
2. Charman DJ, Warner BG. Relationship between testate amoebae (Protozoa: Rhizopoda) and microenvironmental parameters on a forested peatland in Northeastern Ontario. Can. J. Zool. 1992;70: 2474-2482.
3. Charman DJ. Biostratigraphic and palaeo-environmental applications of testate amoebae. Quart. Sci. Rev. 2001;20:1753-1764.
4. Mitchell EAD, Charman DJ, Warner BG. Testate amoebae analysis in ecological and paleoecological studies of wetlands; past, present and future. Biodiversity and Conservation. 2008;17:2115-2137.
5. Medioli FS, Scott DB. Lacustrine thecamoebians (mainly Arcellaceans) as potential tools for palaeolimnological interpretatations. Paleogeography, paleo-climatology, Paleoecology. 1988;62:361-386.
6. Penard E. On some rhizopods from the Sikkim Himalaya. J. Roy. Micr. Soc London. 1907;274-278.
7. Nair KN, Mukherjee RN. On a new species of testaceans rhizopod (Protozoa: Euglyphidae) from India. J. Zool. Soc. India. 1968a;20:124-127.

8. Nair KN, Mukherjee RN. On some testacean rhizopods (Protozoa: Sarcodina) of the ground and tree mosses from Calcutta and its environs. Proc. Nat. Acad. Sci., India. 1968b;38(B):185-192.
9. Chattopadhyay P, Das AK. Morphology, morphometry and ecology of moss dwelling testate amoebae (Protozoa: Rhizopoda) of north and north-east India. Mem. Zool. Surv. India. 2003;19(4):1-16.
10. Bindu L. On some testacids (protozoa) of Melghat wildlife sanctuary, Maharashtra, India. J. of Threatened Taxa. 2010;2(4):789-848.
11. Bindu L. Protozoa in faunal diversity of Pangi Valley, Chamba District (Himachal Pradesh), Himalayan Ecosystem Series, pls. V-VI (Published by Director, Zool. Surv. India, Kolkata). 2013;3:13-30.
12. Bindu L. Protozoa: Rhizopoda: Faunal resources of Cold Desert Spiti Valley and Chandertal Lake, Himalayan Ecosystem Series, Zool. Surv. India. 2018;4:13-19.
13. Bindu L, Jasmine Purushothaman. New records of testate amoebae (Protozoa: Rhizopoda) of the genera *Arcella* and *Difflugia* from India. J. New Bio. Rep. 2016;5(1):7-9.
14. Bindu L, Jasmine P. Protozoa (Rhizopoda): Zool. Surv. India: Current status of freshwater faunal diversity in India. 2017;27-35.
15. Foissner W. Soil Protozoa: Fundamental problems, ecological significance, adaptations in ciliates and testaceans, bioindicators and guide to the literature. Progr. Protistol. 1987;2: 69-212.
16. Foissner W. Estimating the species richness of soil protozoa using the non-flooded petri dish method. In *Protocols* in *Protozoology*. Lee, J.J. and Soldo, A.T.(eds.), Allen Press, Lawrence, Kanas. 1992;B-10.1-B-10.2.