International Journal of Pure and Applied Researches http://ijopaar.com; 2017 Vol. 3(1); pp. 38-42, ISSN: 2455-474X

Taxonomy of Soil Fungi Isolated from Muddy Soil of Lucknow

***Anshul Pant**

Department of Botany, Lucknow University, Lucknow.

Email: pantanshul@rediffmail.com

J. K. Misra

SLM Bhartiya Vidhya Bhawan Girls Degree College, Lucknow.

Abstract

A total of 58 fungi belonging to different groups were isolated. Of these, 9 belongs to Zygomycetes, 10 to Ascomycetes (Including ascosporic Aspergilli and Penicilli) and the rest belong to the dominant class of Deuteromycetes. Six genera viz., Absidia (2 species), Circinella (1 species), Cunninghamella (2 species), Mucor (2 species), Rhizopus (1 species) and Syncephalastrum (1 species) were of Zygomycetes. The members of Ascomycetes recovered belong to 6 genera and 10 species of fungi and that were: Chaetomium (2 species), Emericella (1 species), Eurotium (1 species), Sordaria (2 species), Talaromyces (2 species) and Thielavia (2 species). The class Deuteromycetes which dominated the fungal flora of the sites studied was represented by 39 species belonging to 17 genera viz., Alternaria (1 sp.), Aspergillus (14 spp.), Cephalosporium (1 sp.), Cladosporium (2 spp.), Curvularia (1 sp), Fusarium (5 spp.), Helminthosporium (1 sp.), Humicola (1 sp.), Monilia (1 sp.), Nigrospora (1 sp.), Paecilomyces (2 spp.), Penicillium (4 spp), Scopulariopsis (1 sp.), Stachybotrys (1 sp.), Trichoderma (1 sp.), Trichothecium (1 sp.) and Rhizoctonia sp. only were isolated. Among the Deuteromycetes, species of the genus Aspergillus dominated the myco-flora of the habitat followed by Fusarium. Penicillium ranked next to Fusarium in order of dominance.

Keywords: Soil Fungi, environment, organic matter, ubiquity, terrestrial, mycoflora.

1. Introduction

While, taxonomic and ecological investigations on the fungi inhabiting different soils have been made in the past (Tresner, *et al,* 1954), (Misra, 1980, 1983), (Torsuik & Ovreas, 2002), (Fierer & Jackson, 2006), (Buee, *et al.*, 2007), (Taylor, 2014) such studies on fungi from muddy soils, which receive sewage and other pollutants and thus provide different environment to the microorganisms abounding them, remained untouched. The present investigation was, therefore, undertaken to isolate various micro-fungi occurring in such muddy soils.

This paper describes soil fungi recovered from mud samples of five aquatic habitats in Lucknow.

2. Materials and Methods

Composite mud samples were aseptically collected twice in a month for a year, from five different sites situated in Lucknow City. The samples so collected in a sterilized polythene bags were brought to the laboratory and subjected to micro fungal analysis using Dilution-plate and Soil-plate methods. Czapek-Dox agar was used as medium for plating. Culture plates were incubated at 28±1°C for 3 to 7 days. Colonies were counted from 3rd to 7th day of plating and subcultures were made in tubes having appropriate medium.

3. Results and Discussions

During the study a total of 58 fungi belonging to different groups were isolated which are listed in Table 1. Of these, 9 belongs to Zygomycetes, 10 to Ascomycetes (Including ascosporic Aspergilli and Penicilli) and the rest belong to the dominant class of Deuteromycetes.

Out of 58 forms isolated from muddy soils studied, many have been recorded from other soil types as well. This indicates the ubiquity and plasticity of fungi to adapt to varying conditions prevailing in the present as well as in other habitats. The fact, that microorganisms develop certain degree of adaptability and ecological specialization in relation to their habitat is well documented for the micro fungi native to saline – alkali (Usar) soils by Rai & Mukerji, (1959), Rai *et al*. (1968, 1971).

4. Conclusion

The occurrence of such a number of terrestrial fungi showing a wider spectrum of genera and species in the muddy soils of the sites studied may be due to the fact that the fungal propagules are brought into the sites by the run – off of water along with the soil particles and organic detritus. These fungi settle at the bottom of the ponds and become a part of the benthic population in spite of adverse conditions prevailing there. The presence of good amount of high organic matter in the muddy soils of the sites appears to be a factor of significance in getting these fungi adapted and established as a native mycoflora of such sites.

5. Acknowledgement

The authors are grateful to Dr. R. R. Singh, Department of Botany, Lucknow University and Dr. Sushil Kumar Singh, Department of Physics, Heera Lal Yadav Balika Degree College, Lucknow, for their keen interest in the subject and invaluable suggestions and guidance during the course of study.

References

1. Buee, M, Courty, P. E, Mignot, D & Garbage, J. (2007). Soil niche effect on species diversity and catabolic activites in an ectomycorrhizal fungal community. Soil Biology and Biochemistry. Elsevier.
2. Fierer, N, Jackson, R.B. (2006). The diversity and biogeography of soil bacterial communities. National Acad Sciences.
3. Misra, J. K. (1980). *Ph.D Thesis*, Lucknow University, Lucknow.
4. Misra, J. K. (1983). *Bibliotheca Mycologica* 91:425-455.
5. Rai, J. N. & Mukerji, K. G. (1959). A quantitative study of the micro organic population of "Usar" soil with special reference to the soil pH and seasonal variations. *Proc. Indian Microbiol. Assoc. 1*: 3.
6. Rai, J. N, Agarwal, S. C. & Tewari, J. P. (1968). *Cunninghamella brunnea sp*. nov. A possible product of ecological specialization. *J. gen. appl. Microbiol. Tokyo. 14*: 443-446.
7. Rai, J. N. & Agarwal, S. C. & Tewari, J. P. (1971). Fungal microflora of Usar soils of India. *J. Indian bot. Soc. 50*: 63-74.
8. Taylor, D. L., Hollingsworth, T. N. (2014). A first comprehensive census of fungi in soil reveals both hyperdiversity and fine scale niche partitioning. Wiley Online Library.
9. Torsuik, V, Ovreas, L. (2002). Microbial diversity and function in soil. From genes to ecosystems. Current opinion in microbiology. Elsevier.
10. Tresner, M. D, Backus, M. P. & Curtis, J. T. (1954). Soil microfungi in relation to the hard wood forest continuum in S. Wisconsin. *Mycologia, 46*: 314-333.

Table-1. List of fungi isolated from mud of five sites.

Zygomycetes	Ascomycetes	Deuteromycetes
1. Absidia blakesleeana Lendner 2. A. corymbifera(Cohn) Sacc. & Trotter 3. Circinella muscae (Sorakine) Berl. & de Toni 4. Cunninghamella blakesleeana Lendner 5. C. echinulata Thaxter	1. Chaetomium globosum kunze 2. C. nigricolor Ames 3. Emericella nidulans var lata (Thoms & Raper) Subramanian 4. Eurotium amstelodami Mangin 5. Sordaria humana (Fuckel) Winter	1. Alternaria tenius Nees 2. Aspergillus flavus Link 3. A. fumigatus Fres. 4. A. japonicus Saito 5. A. nidulans (Eidam) Wint. 6. A. niger van Tieghem 7. A. niveus Bloch. 8. A. ochraceus Wilhelm

6. Mucor fragilis Bainier 7. M. racemosus Fres 8. Rhizopus arrhizus Fischer 9. Syncephalastrum racemosum (Cohn.) Schroeter	6. S. fimicola Ces. & de Not. 7. Talaromyces stipitatus Thom ex Emmons 8. T. wortmanii klocker 9. Thielavia sepedonium Emmons. 10. T. terricola (Gilman & Abbott) Emmons	9. A. sclerotiorum Huber 10. A. sulphureus (Fres) Thom & Church 11. A. sydowi (Bain & Sart.) Thom & Church 12. A. tamarii kita 13. A. terreus. Thom. 14. A. ustus (Bain) Thom & Church 15. A. versicolor (Vuill.) Tiraboschi 16. Cephalosporium zonatum Sawada 17. Cladosporium cladosporiodies (Fres.) Devries 18. C. oxysporum Berk. & Curt 19. Curvularia lunata (Wakker) Boedijn 20. Fusarium merismoides Corda 21. F. moniliformis Sheld 22. F. oxysporum Schlecht. ex Fr. 23. F. semitectum Berk. & Rev. 24. F. solani (Mart.) Sacc.

		25. Helminthosporium hawaiiense Bugn. 26. Humicola fuscoatra Trasen 27. Monilia sitophila (Montagne) Sacc. 28. Nigrospora sphaerica (Sacc.) Mason. 29. Paecilomyces fusisporus Saksena. 30. P. varioti Bain 31. Penicillium chrysogenum Thom. 32. P. citrinum Thom. 33. P. cyclopium Westling 34. P. funiculosum Thom. 35. Rhizoctonia sp. 36. Scopulariopsis brevicaulis (Sacc.) Bain 37. Stachybotrys atra Corda 38. Trichoderma lingorum (Tode) Harz. 39. Trichothecium roseum Link.