

Effect of Climate Change on Status of Foliicolous Fungi from Bahraich U.P. India

T. P. Mall*, Ajay Kumar*

Postgraduate Department of Botany Kisan P.G. College, Bahraich- 271 801 (U.P.) India.

Abstract

The present report elucidates a rich and unique profile of Mycobial as well as Phytodiversity of research area surveyed with forty three Angiospermices host plants representing forty one genera and twenty four families being parasitized by thirty five fungal species representing sixteen fungal genera.

Keywords: Foliicolous Fungi; Bahraich; Susceptible Hosts; U.P.

Introduction

The leaves provide a very suitable habitat for the growth and development of fungal pathogen by providing ample surface area and nutrient supply. Such leaf inhabiting fungi are known as foliicolous and the invaded area of the leaf appears as leaf spot or leaf lesion. The weed and forest plants serve as reservoir of leaf spot pathogen which on getting opportunity may spread to agriculture & horticulture plants.

India is the one of the twelve mega biodiversity countries of the world, has two of the worlds eighteen biodiversity hot spots located in the Western ghats and in the Eastern Himalayas. In north the Himalayas rise as a virtual wall beyond the snow line. Above the alluvial plain lies the Tarai strip, a seasonally marshy zone of sand and clay soils. Since Bahraich belongs to Northern Tarai Region which has higher rainfall than the plains, and the downward rushing rivers of the Himalayas slow down and spread out in the flatter Tarai zone depositing fertile silt and reproductive means during the manson season and receding in the dry season. The Tarai, as a result has high water level and is characterized by moist sub tropical conditions and a luxuriant turn over of green

vegetation all the year around. The climatological and topographical conditions favor the luxuriant growth and development of foliar fungi. Bahraich which represents a part of North Tarai Region of U.P. is next only to Eastern and Western ghats, as one of the hottest spots for Biodiversity in general and the diversity of fungal organism inhabiting plant leaves in particular offers an ideal opportunity for the morphotaxonomic exploration of fungal organism in general and foliicolous fungi in particular. Keeping it in view, the authors surveyed the locality of Bahraich during July, 2012 to June, 2014.

Materials and Methods

During collection, infected leaf samples were taken in separate polythene bags. Suitable mounts of surface scrapping and hand cut sections were prepared from infected portions of the leaf samples. Slides were prepared in cotton-blue lactophenol mixture & were examined. Camera Lucida drawing were made and the morpho-taxonomic determination of taxa was done using available literature and with the help of resident's expertise available. All the fungal taxa were identified using microscopic preparation. The fungal holotype specimen has been either deposited for allotment of accession number from HCIO or is in process. Literature cited in the text has been provided with their wave links.

Corresponding Author: T. P. Mall, 119, Sufipura, Huzoorpur Road, Bahraich 271 801 (U.P.).
E-mail: drtpmall@rediffmail.com

Results and Discussion

The authors surveyed periodically the diversified habitats of Bahraich during July 2012 to June 2014 so as to collect and document Foliicolous fungi. The

authors collected with forty three Angiospermices host plants representing forty one genera and twenty four families being parasitized by thirty five fungal species representing sixteen fungal genera. The host plants and their parasites are enumerated below-

S.N.	Name of the family with Host Names	Name of the fungus with Author Name
1.	<p>Malvaceae Abelmoschus esculentus (L.) Moench . Bombax ceiba Linn. Hibiscus mutabilis Linn . Malva sylvestris Linn . Sida acuta Burm. F.</p>	<p>Cercospora abelmoschi Ell. & Ev. Meliola sp. Fr. Alternaria dianthi Stev. & Hall. Meliola sp. Fr Cercospora sp. Fres.</p>
2.	<p>Araceae Alocasia indica Schott. Amorphophallus companulatus Decne. Caladium bicolor (Aiton) Vent Colocasia esculenta L.(Schott).</p>	<p>Alternaria tenuissima (Nees ex Fr.) Wiltshire. Cercospora chevalleri Sacc. Alternaria dianthicola Neergaard. Cladosporium colocasiae Sawada.</p>
3.	<p>Arecaceae Dypsis lutescens (H.Wendi). Beentje & J. Drenst. Karachi palm, Robis palm Livistona chinensis R.Br.</p>	<p>Meliola sp. Fr. Alternaria sp. Nees. Curvularia fallax B. Oedijn.</p>
4.	<p>Papilionaceae Dalbergia sissoo Roxb. Dolichos lablab Linn. Vicia faba Linn.</p>	<p>Circinotrichum poonense Pirozynski & Patil. Cercospora dolichii Ell. & Ev. Cercospora zonata Wint.</p>
5.	<p>Cucurbitaceae Coccinia cordifolia Linn. Cucurbita maxima Duchesne. Lagenaria vulgaris Ser</p>	<p>Curvularia trifolii var. galdioli Parmelu & Luttrell Cercospora cirtullina Cooke. Cercospora lagenariae Salam & Rao.</p>
6.	<p>Asparagaceae Agave sp.Linn. Dracaena draco (L.) L. Dracaena reflexa Lam.</p>	<p>Cercospora sp. Fres. Alternaria sp. Nees. Periconia venezuelang Ellis.</p>
7.	<p>Poaceae Cymbopogon jwarancusa (Jones Schutt). Saccharum spontaneum Linn.</p>	<p>Cercospora scipicola (Fuckel) Van Zinderen Bakker. Alternaria sp. Nees. Meliola sp. Fr.</p>
8.	<p>Acanthaceae Andrographis peniculata (Burm.f.) Wall ex Nees. Justicia brandegeana Linn.</p>	<p>Synchytrium lepidagathis Mundkar & Mhatre. Meliola sp. Fr.</p>
9.	<p>Apocynaceae Alstonia scholaris R.Br . Carissa carandas Linn.</p>	<p>Cercospora alstoniae Mall & Kumar. Pseudocercospora carissae Singh & Mall.</p>
10.	<p>Lythraceae Lagerstroemia indica Linn. Lagerstroemia floribunda Linn.</p>	<p>Acrococoniidiellina chlorodis Ellis. Meliola sp. Fr. Meliola sp. Fr.</p>
11.	<p>Anacardiaceae Mangifera indica Linn.</p>	<p>Meliola mangiferae Earle. Ascochyta mangiferae Batista.</p>

12.	Xanthorrhoeaceae Aloe vera (L.) Burn.f	Phoma sorghina (Sacc.) Stigmina caffra (Wakefield) Ellis .
13.	Rubiaceae Anthocephalus cadamba Miq.	Alterenaria sp. nov. Nees. Stenella litseae Singh D.P.
14.	Asclepiadaceae Calotropis procera R.Br.	Alternaria alternata (Fr.) Keissler. Alternaria dianthicola Neergaard.
15.	Caesalpinaceae Cassia fistula Linn.	Alternaria tenuis Nees. Stenella cassicae Abbasi & Shukla .
16.	Oleaceae Jasminum sambac (L) Aitton.	Meliola sp. Fr.
17.	Moraceae Ficus religiosa Linn.	Cercospora fici -religiosae Chiddarwar.
18.	Euphorbiaceae Codieium variegatum (L.) A Juss.	Alternaria alternata (Fr.) Keissler.
19.	Sapindaceae Litchi chinensis Sonn.	Alternaria alternata (Fr.) Keissler .
20.	Amaryllidaceae Crinum latifolium Linn.	Aspergillus sp. Mich. Ex Fr.

The perusal of the list reveals that twenty four families can be divided in five categories depending upon the number of host plant infected. The most susceptible family was found to be Malvaceae which represent five infected host plant species followed by Araceae with four plants where as Arecaceae, Papilionaceae, Cucurbitaceae, Asparagaceae, with tree plants; Poaceae, Acanthaceae, Apocynaceae and Lythraceae with two plants; Anacardiaceae, Xanthorrhoeaceae, Rubiaceae, Asclepiadaceae, Caesalpinaceae, Oleaceae, Moraceae, Euphorbiaceae, Sapindaceae, Amaryllidaceae, Cannaceae, Iridaceae, Lamiaceae, Menispermaceae with single infected host species only.

The literature Bilgrami *et al.*, 1979, 1981, 1991; Carmichael *et al.*, 1980; Ellis 1971, 1976; Ellis and Ellis, 1997; Hosagaudar *et al.*, 1996, 2006; Jamaluddin *et al.*, 2004; Mukerji *et al.*, 1974; Sarbhoy *et al.*, 1986, 1996; Singh and Mall, 2007; Verma *et al.*, 2008 reveals that the fungal taxa mentioned above are hitherto unexplored from Bahraich. Hence are the new records for Indian mycoflora from Bahraich.

Acknowledgements

The authors are thankful to the Principal, Kisan P.G. College, Bahraich for providing facilities.

References

Literature Cited

1. Bilgrami, K.S., Jamaluddin and Rizwi , M.A. Fungi of India, Part- II. List and references. Today and Tomorrow's Printers and Publishers. New Delhi, 1979; pp. 467. <http://www.threatenedtaxa.org/ZooPrintJournal/2011/June/0262226vi111872-1874.pdf>.
2. Bilgrami, K.S., Jamaluddin and Rizwi, M. A. Fungi of India, Part-II. Host Index and Addenda. Today and Tomorrow's Printers and Publishers, New Delhi, 1981; pp 467. <http://www.iisc.ernet.in/currsci/Jul102005/58.pdf>.
3. Bilgrami, K. S., Jamaluddin and Rizwi, M. A. Fungi of India, Part-III. List and References. Today and Tomorrow's Printers and Publishers, New Delhi, 1991; pp.778. <http://www.Jurnal.Pasca.uns.ac.id/index.php/nubios/article/download/61/61>.
4. Carmichael, J. W., Kendrick, W. B, Connors, I. L. and Siegler, L. 1980. Genera of Hyphomycetes. The Univ. of Alberta press, Alberta Canada. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3317363/>.
5. Ellis, M. B., Dematiaceous Hyphomycetes. CMI, Kew, U. K. 1971; pp. 608. <http://www>.

- landmuseum.at/pdf_frei_remote/Sydowia_34_0115-0117.pdf.
6. Ellis, M. B. More Dematiaceous Hyphomycetes. CMI, U. K. 1976; pp. 507. <http://www.crenetbase.com/doi/abs/10.1201/EBK/1439804193-b1>.
 7. Ellis, M.B. and Ellis, J.P. Microfungi on Land Plant: An Identification Hand Book Richmond Publishing Co. Hand Book 2nd Edition. Dec. 1997; 868: pp.213 plates 66500 ISBN. 0855462469 http://www.nhbs.com/microfungi_on_land_plants_tefno_22999.html.
 8. Hosagoudar, V. B. Meliolales of India. Botanical Survey of India, 1996; pp. 363. <http://www.threatenedtaxa.org/ZooPrintJurnal/2010/July/hosag.htm>.
 9. Hosagoudar, V.B., Biju, H. and Anu Appaiah, K. A. Studies on foliicolous fungi –xx. Microfungi of Coorg, Karnataka . J. Mycopathol. Res. 2006; 44: 1-25. http://www.mycosphere.org/pdfs/MC2-6_NO.1.pdf.
 10. Jamaluddin, Goswami, M. G. and Ojha, B. M. Fungi of India, (1989-2001). Scientific Publishers India, Jodhpur. 2004; 326 pp. <http://scialert.net/fulltext?doi=ppj.2012.68.72&0rg=11>.
 11. Mukerji, K. G. and Juneja, R. C. Fungi of India. (1962-72) Emkay publ. Delhi. 1974; pp. 224. http://www.mycosphere.org/pdfs/MC2_4_No.8.pdf.
 12. Sarbhoy, A. K., Agarwal, D. K. and Varshney, J. L. Fungi of India (1977-81). Associated publ. Co. New Delhi. 1986; pp. 350. <http://www.sciencedirect.com/science/article/pii/S0953756209808101>.
 13. Sarbhoy, A. K., Varshney, J. L. and Agarwal, D. K. Fungi of India (1982-92). CBS Publishers and Distributers New Delhi. 1006; pp.274. <http://Journal-phytology.com/index.php/phyto/article/viewfile/6071/3110>.
 14. Singh, D. P. and Mall, T. P. Foliicolous Fungi of Medicinal Plant in North Western Tarai Region of Uttar Pradesh. Environmental Conservation Journal, 2007; 8: 13-16. http://www.niscair.res.in/sciencecommunication/abstracting_journal/isa2k8/isa_1sep08.asp.
 15. Verma, R. K., Sharma, Nidhi, Soni, K. K. and Jamaluddin. Forest Fungi of Central India. International Distributing Co. Lucknow . 2008; 418 pp. <http://www.riddhionline.com/collections/forestry-books/products/forest-fungi-of-central-india>.
-