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Folicolous Fungi of Medicinal Plants in North Western Tarai region of Uttar Pradesh

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Abstract

The North Western Tarai belt of U.P. is next only to Eastern & Western ghats as one of the hot spots of Biodiversity in general and the diversity of fungal organisms inhabiting plant leaves in particular. Keeping the above view in mind a survey trip was organized for Bhinga forest range, Shrawasti on Oct 29, 2006 and Dudwa Tiger Reserve, Kheri Lakhimpur on Nov 23 and 24, 2006 for collection and documentation about ethnomedicinal plants as well as Folicolous fungi infecting the medicinal plants. During the survey more than fifty five ethnomedicinal plants were collected. Out of these plants about 25 plants species represented by 20 Genera of sixteen families have been found infected with sixteen different fungal species. *Cercospora* sp. and *Stenella* sp. are recorded to infected four plants each. *Cercospora* was recorded on *Cassia fistula, Momordica* sp., *Clerodendron* and *Lagerstraemia* where as *Stenella* sp. was recorded on *Celastrus paniculatus, Litisea grutinosa, Teliocora acuminata, Ficus sacra. Phoma* sp. was found on *Glycosmis pentaphylla, Teliocora* sp. and *Mallotus philipinsis. Zygosporium* was recorded on *Mallotus philipinsis* and *Sterculia balen* Remaining fungus were recorded only on single host viz. *Leptozyphium* on *Diosphros; Stenella cassiae* on *Cassia fistula; Alternaria* sp. on *Ichnocarpus frutiscens; Sirosporium* on *Carica carandas*; *Passalora* sp. on *Calotropis procera;* uredial stage of rust on *Tectona grandis; Pseudocercospora* on *Ziziphus; Meliola* sp. on *Mallotus philipinsis; Acremonium zonatum* on *Teliocora* sp; *Fuligomyces* on *Litisea chinensis; Cladosporium* on *Ficus carica* and *Cephaloros* sp on *Justicia* sp. *Teliocora* sp. had been recorded to be infected by three different fungus viz *Phoma* sp., *Stenella* sp. and *Acremonium zonatum* where as *Mallotus philippinsis* was found infected with *Zygosporium, Phoma* sp. and *Meliola* sp.

Keywords: *Folicolous fungi, Medicinal plants, Ethnomedicine,*

Introduction

India is inhabited a wide variety of about 563 tribal communities who dwell in forest areas and depend on surrounding resources for their livelihood. Plants with medicinal properties enjoyed the highest reputation in the indigenous system of medicines all over the world. The state of Uttar Pradesh is a rich repository of ethnomeidicinal plants diversity having large number of tribal communities, inhabiting in remote village and mostly in village of forest areas. Though there is nothing in this universe, which is non-medicinal, which can not be made use for many purposes and by many modes, Shankar *et al*., 2000. In tribes since the information about plants is passed from one generation to another orally as well as they have their own names for all the plants they recognize, it is necessary to document the names of the plants and their way of uses. The leaves provide a very suitable habitat for the growth and development of endophytic fungal pathogens by providing ample surface area and nutrient supply. Such leaf inhabiting fungi are known as "Folicolous" or "Foliar" and the invaded areas of the leaf as leaf spot or leaf lesions. The fungi interfere with the physiology of the host and develop a characteristic spot and produce toxins.

The North-Western Tarai belt of U.P. is next only to Eastern & Western Ghats as one of the hot spot for Bio diversity in general and the diversity of fungal organisms inhabiting plant leaves in particular.

Keeping the above views in mind a survey trip was organized for Bhinga Forest Range, Shrawasti on Oct 29, 2006 and Dudwa Tiger Reserve, Kheri Lakhimpur on Nov 23 and 24, 2006 for collection and

documentation about ethnomedicinal plants as well as Folicolous fungi infecting the medicinal plants.

Materials and Methods

Method of collection of ethnomedicinal plant and recording its data was followed as described by Jain, 1989. The selected specimens were pressed and dried by routine herbarium technique as described by Jain and Rao (1978). The specimens were processed and given a field note number and field note data showing name of the plant with family, local name, locality of collection, the plant parts used in different ailment, route of administration, form of medicines, mode of administration and any other special feature regarding ethnomedicinal uses and date of collection. Plants were identified with the help of different flora available in the Departmental library. The laboratory processing for fungus were done by scrap mount, Collodion preparation, Squash preparation and Hand cut section preparation. For identification of foliar fungi collected, a thorough survey of literature was done by going through publication made all over the world and consulting the different Mycological papers, Mycological Memoirs and other relevant Mycological monographs.

Result and Discussion

During the survey more than fifty ethnomedicinal plants were collected. Out of these plants about 25 plants species represented by 20 genera of 16 families have been found infected with sixteen different fungal species (Table1).

Cercospora sp. and *Stenella* sp. are recorded to infected four plants each. *Cercospora* was recorded on *Cassia fistula, Momordica* sp., *Clerodendron* and *Lagerstraemia* where as *Stenella* sp. was recorded on *Celastrus paniculatus, Litisea grutinosa, Teliocora acuminata, Ficus sacra. Phoma* sp. was found on

Table 1: Ethnomedicinal Plants infected with Folicolous Fungi

Sl. No.	Name of Ethnomedicinal Plant	Family	Name of Foliicolous Fungus
1-	*Carisa carandas L.*	Apocynaceae	*Sirosporium sp.*
2-	*Cassia fistula L.*	Caesalpinaceae	*Stenella cassia sp.*
3-	*Calotropis procera R.Br.*	Asclepiadaceae	*Passalora sp.*
4-	*Clerodendron sp. Linn.*	Verbenaceae	*Corenospora sp.*
5-	*Celastrus paniculatus willd.*	Apocynaceae	*Stenella sp.*
6-	*Diosphyros gurke*	Ebenaceae	*Leptozyphium sp.*
7-	*Dolichos lablab Linn.*	Fabaceae	*Cercospora sp.*
8-	*Ficus sacra*	Moraceae	*Stenella sp.*
9-	*Ficus carica Linn.*	Moraceae	*Cladosporium sp.*
10-	*Glycosmis pentaphylla Correa.*	Rutaceae	*Phoma/Phomopsis sp.*
11-	*Ichnocarpus frutiscens R. Br.*	Apocynaceae	*Alternaria sp.*

12-	*Justicia sp. Linn.*	Acanthaceae	*Cephaloros sp.*
13-	*Lagerstroemia paruiflora Linn.*	Lythraceae	*Cercospora sp.*
14-	*Litisea grutinosa Lamk.*	Lauraceae	*Stenella sp.*
15-	*Litisea chinensis Lamk.*	Lauraceae	*Fuligomyces. sp.*
16-	*Mallotus philippinsis Mull Arg.*	Euphorpiaceae	*Phoma sp.*
17-	*Mallotus philippinsis Mull Arg.*	Euphopiaceae	*Zygosporium sp.*
18-	*Mallotus philipinsis Mull Arg.*	Eupharbiaceae	*Meliola sp.*
19-	*Momordica sp. Roxb.*	Sapotaceae	*Cercospora sp.*
20-	*Sterculia balen L.*	Sterculiaceae	*Zygosporium sp.*
21-	*Tectona grandis Linn.*	Verbenaceae	*Uredo sp.*
22-	*Teliocora sp. Coleber*	Menispermaceae.	*Phoma sp.*
23-	*Teliocora acuminata Coleber*	Menispermaceae	*Stenella sp.*
24-	*Teliocora sp. Coleber*	Menispermaceae	*Acremonium zonatum*
25-	*Ziziphus sp. L.*	Rhamnaceae	*Pseudocercospora sp.*

Glycosmis pentaphylla, Teliocora sp. and *Mallotus philippinsis. Zygosporium* was recorded on *Mallotus philipinsis* and *Sterculia balen* Remaining fungus were recorded only on single host viz. *Leptozyphium* on *Diosphros; Stenella cassiae* on *Cassia fistula; Alternaria* sp. on *Ichnocarpus frutiscens; Sirosporium* on *Carica carandas*; *Passalora* sp. on *Calotropis procera;* uredial stage of rust on *Tectona grandis; Pseudocercospora* on *Ziziphus; Meliola* sp. on *Mallotus philipinsis; Acremonium zonatum* on *Teliocora* sp; *Fuligomyces* on *Litisea chinensis; Cladosporium* on *Ficus carica* and *Cephaloros* sp on *Justicia* sp. *Teliocora* sp. had been recorded to be infected by three different fungus viz *Phoma* sp., *Stenella* sp. and *Acremonium zonatum* where as *Mallotus philippinsis* was found infected with Z*iygosporium, Phoma* sp. and *Meliola* sp.

The ethnic and rural people of India have preserved a large bulk of traditional knowledge of medicinal use of plants growing around them. India is one of the twelve mega biodiversity countries of the world having vegetation with a wide variety of plants with medicinal value. Herbal medicines have good value in treating many diseases including infectious diseases. Ethnomedicinal knowledge can not only save lives of many, it is also important from humanitarian point of view in that in long run this knowledge may help to identify important medicinal uses that can help in curing health care around the world. So it is important to protect the traditional knowledge from disappearing and documenting the indigenous knowledge.

The folicolous fungal pathogens interfere with the manufacturing rate of food and other valuable substances by damaging the photosynthetic elements of living leaves; bringing about qualitative and quantitative dearangements in the living tissue of the host in various ways. Several leaf spot pathogens are known to produce toxins of various kinds, some of which are host specific. When the leaf spots are numerous or are large, there is a considerable reduction in the photosynthetic area of the leaf. In addition some times rapid defoliation occurs due to such infections. As such the productivity of the host plants is substantially reduced. The weeds and forest plants serve as reservoirs of leaf spot pathogens which on getting

opportunity may spread to agricultural and horticultural plants. The destruction caused by these enemies of leaves is a serious problem before us.

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