

PARASITIC FUNGI OF SOME FOREST PLANTS FROM TELANGANA STATE, INDIA

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A survey (2012-2014) of forest plant pathogenic fungi in Vikarabad, Narsapur, Manchippa, Bhadrachalam, Eturnagaram, Mannanoor, Adilabad and other areas revealed 20 pathogenic fungi. Among these eleven form new additions to the fungi of Telangana State besides being new host records.

Keywords : Forest plant, Fungi, Parasitic, Telangana.

Fungi are achlorophyllous living organisms, which has enforced them to live either as parasites or saprophytes. Though majority of fungi are important in industry, food processing, medicine, pharmaceuticals and others, few fungi like rusts, smuts, powdery mildews, Sooty molds, downy mildew, *Cercospora*, *Pestalotia*, species of *Phoma* and others have been destructive as pathogens of crops and forest plants. Around 29000 fungi have been reported from India against 1.5 Million estimate (Hawksworth 1999, Manoharachary *et al.* 2005). Out of 30000 plant pathogenic fungi reported from world, 5000 plant pathogens are known to exist in India (Butler and Bisby 1960, Mukerji and Juneja 1976, Bilgrami *et al.* 1979, 1981, 1991, Sarbhoy *et al.* 1975, 1980, 1986, 1996 and Jamaluddin *et al.* 2004). Further few pathogenic fungi colonizing forest plants have been reported by Manoharachary (1974). However there is little or no information available on forest pathogenic fungi from the State of Telangana. Present paper reports twenty pathogenic fungi and of which eleven as new additions to the forest pathogenic fungi of Telangana State, India.

Topography, Climate and Places of Collection : Telangana State is situated on the Deccan Plateau, in the central stretch of the eastern seaboard of the Indian Peninsula (Between 17°21'58"N 78°28'34"E / 17.366°N 78.476°E). The state has got 10 districts covering an area of 133,103 km². The most

important rivers of the province are Musi, Krishna, Manjira and Godhavari. It has become 29th state of India on 2nd June 2014. Dry deciduous, scrub Jungle forests and mixed forest types are distributed in Districts of Rangareddy, Khammam, Medak, Mahabubnagar, Warangal, Nizamabad and Adilabad. The forest localities investigated are Vikarabad, Narsapur, Manchippa, Adilabad, Bhadrachalam and Mannanoor.

The annual rainfall is between 900 to 1500 mm in Northern Telangana and 700 to 900 mm in Southern Telangana, from the southwest monsoons. Various soil types include chalkas, red sandy soils, dubbas, deep red loamy soils, and very deep black cotton Soil.

Telangana is a semi-arid area and has a predominantly hot and dry climate. Summers start in March, and reach peak in May with an average high temperatures to the 42 °C (108 °F) range. The monsoon arrives in June and lasts until September with about 755 mm (29.7 inches) of precipitation. A dry, mild winter starts in late November and lasts until early February with little humidity and an average temperatures of 22–23 °C (72–73 °F) range.

MATERIALS AND METHODS

The infected plant parts such as leaves, fruits, petioles, branches etc. were collected during 2012-2014 in fresh polythene bags. The samples are transported to laboratory.

The following observations are made :

- ◆ Symptoms are recorded by observing collected material under binocular microscope.
- ◆ The superficially attached pathogen has been removed and mounted in a drop of lacto-phenol and observed.
- ◆ Sooty molds are observed as per the technique of Hughes (1976).
- ◆ Squash was also prepared and observed under trinocular microscope.
- ◆ Cross-section of infected tissue was made with the help of a razor blade besides making microtome sections. These were observed carefully under trinocular microscope.
- ◆ Lacto-phenol and cotton blue mountants and strains were used respectively.

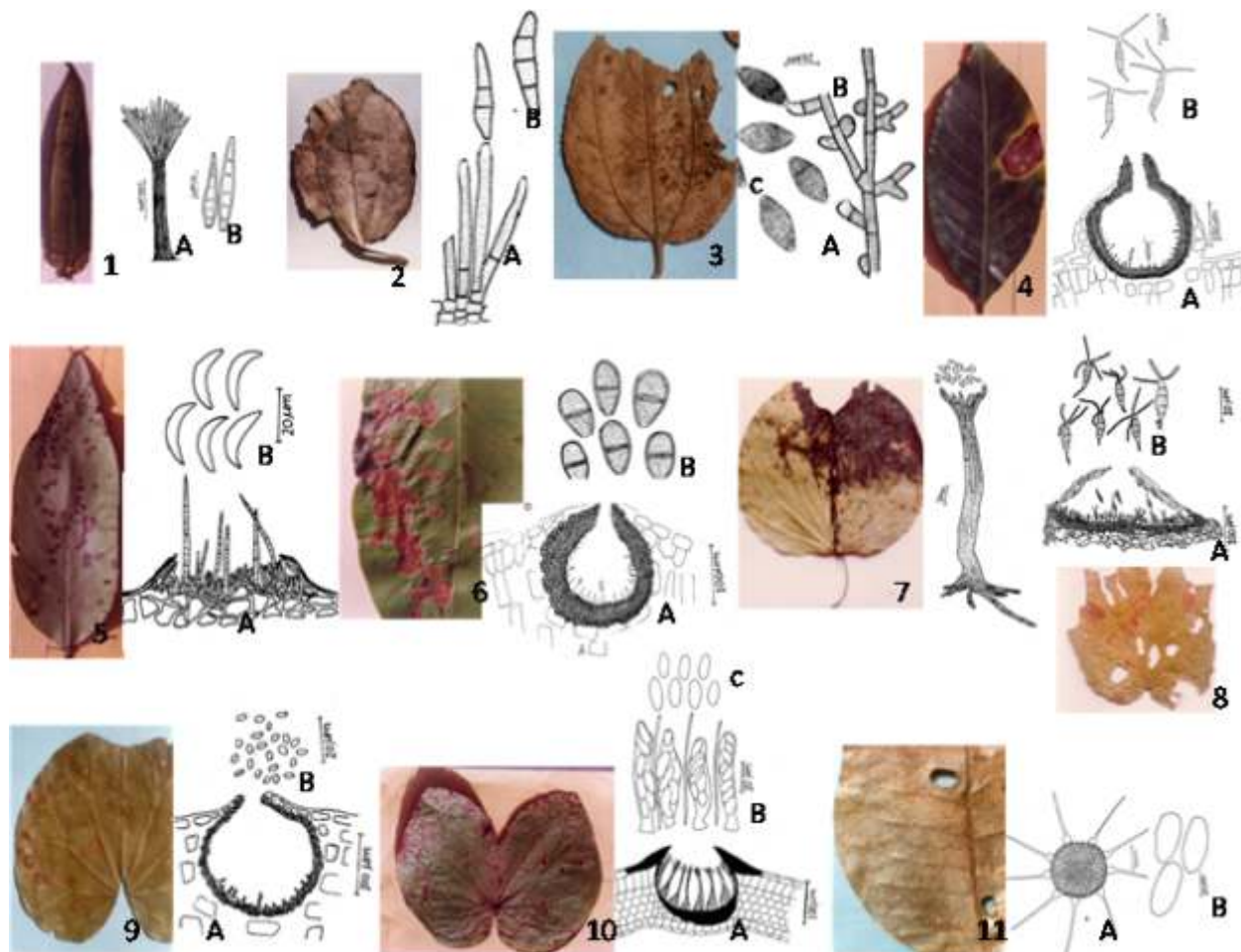


Plate 1 (Figures 1-11) : Parasitic Fungi on Forest Plants

1 (A-B). Sooty mold on *Saccharum munja* Roxb. by *Annellophragmia coonoorensis* Subram **A.** Synnemata, **B.** Conidia. **2 (A-B).** Sooty mold on *Ziziphus jujuba* Lam. by *Cercosporidium ziziphi* Manohar *et al.* **A.** Stroma **B.** Conidia. **3 (A-C).** Sooty mold on *Ziziphus marutiana* Lam. by *Mitteriella minuta* Renusingh & Pandey **A.** Mycelium **B.** Conidiophore **C.** Conidia **4 (A-B).** Leaf spot on *Murraya exotica* Linn. by *Bartalinia robillaroides* Tassi **A.** T.S of Conidiomata **B.** Conidia. **5 (A-B).** Leaf spot on *Cassia fistula* Linn. by *Colletotrichum dematium* (Pers. ex Fr.) Grove **A.** T.S of Conidiomata **B.** Conidia. **6 (A-B).** Leaf spot on *Murraya exotica* Lin. by *Diplodia ionicerae* Fuckel **A.** T.S of Conidiomata **B.** Conidia. **7.** Sooty mold on *Bauhinia accuminata* Linn. by *Leptoxyphium axillatum* (Cooke) Hughes **A.** Synnema with Phialoconidia **8(A-B).** Leaf spot on *Lycium europaeum* by *Pestalotiopsis guepinii* (Hansf.) Walker **A.** T.S of Conidiomata **B.** Conidia. **9(A-B).** Leaf spot on *Bauhinia variegata* Linn. by *Phoma herbarum* Westd **A.** T.S of Conidiomata **B.** Conidia. **10(A-C).** Leaf spot on *Bauhinia variegata* Linn. by *Phyllachora bauhiniae* (Wint) Theiss **A.** T.S of Ascomata **B.** Asci **C.** Ascospores **11(A-B).** Powdery mildew on *Buchanania latifolia* Roxb. by *Phyllactinia guttata* (Wallr. Fr.) Lev. **A.** Cleistothecium with appendages **B.** Ascospores

Identification of pathogenic fungi has been done using standard manuals (Barnett and Hunter 1972, Chupp 1953, Ellis 1971, 1976, Ellis and Ellis 1998 Nagamani *et al.* 2006, Sutton 1980). Many fungi could not be cultured on artificial media under laboratory conditions; Pathogenicity of the test

pathogens reported in this paper was proved as per the techniques of Simmonds (1960) and Wheeler (1969). Percentage of disease was calculated as per the following formula.

$$\text{Percentage of Disease} = \frac{\text{No of Diseased parts/ laves recorded}}{\text{Total no. of plant parts/ leaves observed}} \times 100$$

Table 1. Parasitic fungi on some forest plants from Telangana

Sl. No	Parasitic fungus	Host	Disease	Disease Incidence	Infected plant part	Locality	Accession No.
1.	* <i>Annellophragmia coonoorensis</i> Subram	<i>Saccharum munja</i> Roxb	Sooty mold	100%	Leaf	Vikarabad	OUFHP 15
2.	* <i>Cercospora chloroxylii</i> Ramakrishna & Reddy	<i>Chloroxylon swietenia</i> DC	Leaf spot	65%	Leaf	Vikarabad	OUFHP 16
3.	* <i>Cercosporidium ziziphi</i> Manohar et al.	<i>Ziziphus jujuba</i> Lam.	Sooty mold	70%	Leaf	Bhadrachalam	OUFHP 17
4.	* <i>Mitteriella minuta</i> Renu Singh & Pandey	<i>Ziziphus maritima</i> Lam.	Sooty mold	90%	Leaf	Adilabad	OUFHP 18
5.	<i>Tripospermum juglandis</i> (Thumen) Hughes	<i>Legerstromia parviflora</i> Roxb.	Sooty mold	80%	Petiole	Narsapur	OUFHP 19
6.	* <i>Bartalinia robillaroides</i> Tassi	<i>Murraya exotica</i> Linn.	Leaf spot	70%	Leaf	Mannanoor	OUFHP 20
7.	* <i>Colletotrichum dematium</i> (Pers. ex Fr.) Grove	<i>Cassia fistula</i> Linn.	Leaf spot	60%	Leaf	Eturnagaram	OUFHP 21
8.	* <i>Leptoxylum axillatum</i> (Cooke) Hughes	<i>Bauhinia accuminata</i> Linn.	Sooty mold	90%	Stem/ Petiole	Manchippa	OUFHP 22
9.	<i>Microxyphium fagi</i> (Persoon) Hughes	<i>Chisocheton paniculatus</i> Hieron	Sooty mold	90%	Leaf	Narsapur	OUFHP 23
10.	* <i>Phoma herbarum</i> Westd.	<i>Bauhinia variegata</i> Linn.	Leaf spot	70%	Leaf	Vikarabad	OUFHP 24
11.	<i>Capnodium eugeniarum</i> Cooke	<i>Eugenia jambolina</i> Lam.	Sooty mold	60%	Leaf	Narsapur	OUFHP 25
12.	* <i>Pestalotopsis gneptinii</i> (Hansf.) Walker	<i>Lycium europaeum</i> Linn.	Leaf spot	65%	Leaf	Adilabad	OUFHP 26
13.	<i>Septoria cytisi</i> Desm	<i>Zinnia angustifolia</i> H.S at K	Leaf spot	60%	Leaf	Mannanoor	OUFHP 27
14.	<i>Parodiella spegazzinii</i> Theiss et Syd.	<i>Crotalaria orixensis</i> Willd.	Black mold	40%	Stem/ Petiole	Adilabad	OUFHP 28
15.	<i>Phyllachora setariaecola</i> Speg.	<i>Setaria glauca</i> Beauv	Tar spot	75%	Leaf	Adilabad	OUFHP 29
16.	* <i>Phyllachora bauhiniae</i> (Wint)Theiss.	<i>Bauhinia variegata</i> Linn.	Tar spot	50%	Leaf	Adilabad	OUFHP 30
17.	* <i>Phyllactinia guttata</i> (Wallr. Fr.) Lev.	<i>Buchanania latifolia</i> Roxb.	Powdery mildew	80%	Petiole/ Leaf	Adilabad	OUFHP 31
18.	<i>Uncinula necator</i> (Sahw.) Barr	<i>Nyctanthes arbotristis</i> Linn.	Powdery mildew	70%	Petiole / Leaf	Adilabad	OUFHP 32
19.	* <i>Diplodia ionicerae</i> Fuckel	<i>Murraya exotica</i> Linn.	Leaf spot	60%	Leaf	Narsapur	OUFHP 33
20.	<i>Gleosporium filiae</i> Oudem	<i>Datura metel</i> Linn.	Blight	60%	Leaf	Narsapur	OUFHP 34

Note : OUFH-P= Osmania University Fungal Herbarium-Pathogen

*= Reported for the first time from Telangana State

RESULTS AND DISCUSSION:

Altogether 20 parasitic fungi colonizing diversified forest plants are recorded. Out of these twenty, seven fungi belong to sooty molds, seven fungi cause leaf spots and remaining six being of varied symptoms. Survey of pertinent literature indicates that (Butler and Bisby 1960, Mukerji and Juneja 1976, Bilgrami *et al.* 1979, 1981, 1991, Sarbhoy *et al.* 1975, 1980, 1986, 1996 and Jamaluddin *et al.* 2004) 11 parasitic fungi reported not only form new additions to the fungi of Telangana State but also all the hosts are new records. Among the parasitic fungi reported sooty molds cause 70-90% of disease incidence. Among infected plant parts, leaves have been most vulnerable and showed greater percentage of disease incidence on an average. Among forest localities investigated, Adilabad has recorded seven parasitic fungi followed by Narsapur forest and Vikarabad.

Among the pathogenic fungi recorded six fungal species represent Ascomycotina, seven pycnidial fungi, five Hyphomycetes and two acervulous fungi, respectively. Dicotyledonous host plants were infected by varied pathogenic fungi than members of monocotyledonous hosts.

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