

Diseases of Tropical Forest Plants From West Bengal

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Occurrence of sixty different diseases were recorded on twentyseven tropical forest plants grown in red and lateritic, new-alluvial and coastal-saline tracts of West Bengal. A large majority of the diseases were fungal. In nursery, seedling diseases caused seedling mortality of *Dalbergia*, *Acacia*, *Leucaena* and *Sesbania*. A number of plants like *Leucaena*, *Acacia*, *Eucalyptus* and *Polyalthia* suffered from destructive wilt disease. *Ganoderma* was a damaging pathogen of *Acacia*, *Albizia*, *Casuarina*, *Dalbergia* and *Shorea*. Among the foliar diseases, powdery mildews of *Dalbergia* and *Morus* and rust of *Tectona* were present throughout the year causing appreciable damage. *Eucalyptus* was affected by leaf spot disease. Algal rust and Phanerogamic parasites were found to be wide-spread in occurrence but *Cuscuta* caused death of many *Millingtonia* plants.

Key words : Tropical forest plants, disease problems

INTRODUCTION

Decline of forest areas have been a problem over last 4-5 decades in different parts of the world. Major quantum of degradation of forest has been due to increased population pressure on the forest. However, pests, diseases and disorders have also assumed greater importance, particularly due to the perennial nature of the plant concerned. Recently great emphasis has been given on afforestation not only in degraded forests and waste lands but also in and within human habi-

agricultural tations, lands of marginal natures and man made road-sides, railway sidings, rivers and canal banks etc.

The plants involved in such afforestation programmes and also those growing naturally in forests suffer from a number of diseases. The losses due to these diseases have not yet been fully estimated excepting in some specific occasions (Bakshi, 1976). Efforts have been made to give an account of diseases reported on forest plants from time to time in India (Boyce, 1959; Browne, 1968; Bakshi, 1976). Very few reports of this kind from West Bengal are in records (Saccardo, 1883; Hector, 1927; Bagchee, 1953; Butler and Bisby, 1960; Bakshi, 1976; Banerjee *et al.*, 1991). In the present investigation, attempts were made to record the incidence of diseases of forest plants which were not previously recorded in West Bengal.

MATERIALS AND METHODS

Surveys for recording disease incidence have been conducted over the last four years (1987-1990) in three different agro-climatic zones, namely, in red and lateritic zone in Jhargram natural forest, in new alluvial zone on road-side and other social-forests at Kalyani and in coastal-saline zone under social-forests and road-side plantations in Bakkhali. The surveys were conducted in four seasons, namely monsoon, autumn, winter and spring, every year to record the incidence of diseases of forest plants. The symptoms of the diseases were recorded. The pathogens were studied under microscope and isolated in pure cultures for confirmation of pathogenicity whenever possible. Their characteristics were studied and they were identified and got confirmed from IMI, England.

RESULTS AND DISCUSSION

Altogether 60 different diseases have been recorded on 27 plant species coming under 24 genera and 15 families. A large majority (35) of the diseases were fungal, eight due to algal parasites like *Cephaleuros*, one each due to bacterial and *Mycoplasmal* and rest of unknown aetiology (Table 1).

In nursery, damping off, seedling blight and seedling wilt due to *Rhizoctonia*, *Pythium*, *Sclerotium* and *Fusarium* caused large number of seedlings mortality of *Dalbergia*, *Acacia*, *Leucaena* (Subabul) and *Sesbania*.

Four plant species namely *Leucaena*, *Acacia*, *Eucalyptus* and *Polyalthia* of varying age groups were found to suffer from wilt disease. Wilt disease of *Leucaena* is caused by *Geotrichum* sp. which appeared to be first record in the country. The fungus associated with wilt of *Acacia* was identified as *Fusicoccum*. Wilt pathogens of *Eucalyptus* and *Polyalthia* could not be identified due to their

Table 1. Disease situation of some forest plants in West Bengal

Plant / Disease	Causal organism	Prevalent in parts of the year		Location
1	2	General	Peak	5
Mimosae				
<i>Acacia auriculiformis</i> A. Cunn				
a. Wilt	<i>Fusicoccum</i> sp** (337674***)	Winter	—	K, J
b. Seedling wilt	<i>Fusarium salani</i> (Mart.) Sacc (329516)	Spring & Monsoon	—	K, J, B
c. Damping off & seed- ling blight	<i>Rhizoctonia solani</i> Kuhn (329427)	do	—	K, J, B
d. Powdery mildew	<i>Oidium</i> sp.	Winter & Spring	Jan. Feb.	K
e. Phanerogamic parasite	<i>Cuscuta</i> sp.	Throughout the year	—	K
<i>Acacia arabica</i> Willd.				
a. Root rot	<i>Ganoderma lucidum</i> (Leyss.) Karst.	—	—	K, J
b. Phanerogamic parasite	<i>Cuscuta</i> sp.	Throughout the year	—	K
<i>Acacia catechu</i> Willd.				
a. Root rot	<i>Ganoderma lucidum</i> (Leyss.) Karst.	—	—	J
* Major disease of the plant worked out	** Pathogenicity not confirmed I = Jhargram K = Kalyani B = Bakkhali	*** IMI herbarium number	—	'—' = peak not

* Major disease of the plant worked out K = Kalyani

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J = Jhargram B = Bakkhali

— = peak not

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1	2	3	4	5
<i>Albizia Chinensis</i> (Osback) Merr.				
a. Rust	<i>Ravenelia sessilis</i> Berk.	Autumn & Winter	Nov, Dec	J, K
<i>Albizia lebbek</i> Benth.				
a. Rust	Unidentified	do	do	J, K
b. Root rot	<i>Ganoderma lucidum</i> (Leyss.) Karst.	—	—	K, J
<i>Inga dulcis</i> Willd.				
a. Phanerogamic parasite	<i>Cuscuta</i> sp.	Throughout the year	—	K
<i>Leucaena leucocephala</i> (Lam.) de Wit.				
a. Damping off & Seed- ling blight	<i>Rhizoctonia solani</i> Kuhn. (329412)	Spring & Monsoon	—	K, J, B
	<i>Pythium aphanidermatum</i> (Edson) Fitzpatrick. (337676)	do	—	K, J, B
b. Wilt*	<i>Geotrichum</i> sp. (329408)	Throughout the year	Nov, Dec	K
c. Powdery spot	<i>Camptomeris leucaenae</i> (F. Stev & Dalbey) H. Sydow.	Winter	Dec.	K

1	2	3	4	5
Papilionaceae				
<i>Dalbergia sissoo</i> Roxb.				
a. Seedling wilt	<i>Fusarium solani</i> (Mart.) Sacc (329414)	Spring & Monsoon	—	K, J, B
b. Damping off & seedling blight	<i>Rhizoctonia solani</i> Kuhn. (329413)	Spring & Monsoon	—	K, J, B
c. Powdery mildew*	<i>Pythium</i> sp. <i>Phyllactinia dalbergiae</i> Piroz. (329428)	Throughout the year	Nov, Dec	K, J, B
d. Rust	<i>Uredo sissao</i> H. Sydow, Sydow & Butler. (329429)	Throughout the year except Spring	Oct, Nov	K, J
e. Leaf blight	<i>Colletotrichum gloeosporioides</i> (Penz.) Penz. & Sacc.	Mainly Autumn & extended upto Winter	July, Aug	K, J
f. Leaf blight	(329415) <i>Phomopsis dalbergiae</i> Sahní (329433)	do	—	K, J
g. Tar spot	<i>Phyllachora vivantis</i> (Cooke) Sacc. (329432)	Throughour the year	July, Aug	K, J, B
h. Root rot	<i>Ganoderma lucidum</i> (Leyss.) Karst.	—	—	K, J
i. Algal rust	<i>Cephaleuros</i> sp.	Autumn & Winter	Dec	K

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1	2	3	4	5
<i>Eucalyptus</i> sp.				
a. Wilt*	Unidentified	Winter		K, J
b. Leaf spot	<i>Cylindrocladium scoparium</i> Morgan. (329417)	Monsoon, Autumn & Aug. Sept		J
c. Leaf spot	<i>Cercospora eucalypti</i> Cooke & Massee.	First part of Winter		J
d. Leaf blight	<i>Cytospora eucalyptina</i> Speq. (329425 a)	Autumn		J
e. Leaf blight	<i>Pestalotiopsis</i> sp. (329425 b)	Monsoon & Autumn		J
f. Gummosis	Unidentified	—	—	J
g. Stem & Twig canker	Unidentified	—	—	J
h. Algal rust	<i>Cephaleuros</i> sp.	—	—	J
i. Phanerogamic parasite	<i>Dendrophthoe</i> sp.	—	—	J
Casuarinaceae				
<i>Casuarina equisetifolia</i> Forst.				
a. Root Pot	<i>Ganoderma lucidum</i> (Leyss.) Karst.	—	—	K
b. Phanerogamic parasite	<i>Cuscuta</i> sp.	Throughout the year	—	K
Verbenaceae				
<i>Gmelina arborea</i> Roxb.				
a. Leaf spot	Unidentified	—	—	J, K

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1	2	3	4	5
<i>Tectona grandis</i> L. f.				
a. Rust	<i>Olivea tectonae</i> (T.S. & K. Ramakar) Mulder (329435)	Throughout the year	Dec, Jan	K, J
Lythraceae				
<i>Lagerstroemia speciosa</i> Pers.				
a. Rust	Unidentified	Winter & Spring	—	K
b. Algal rust	<i>Cephaleuros</i> sp.	Autumn, Winter & Spring	—	K
Anonaceae				
<i>Polyalthia longifolia</i> Benth. & Hook. f.				
a. Wilt*	Unidentified	—	—	K
Moraceae				
<i>Morus alba</i> L.				
a. Powdery mildew*	<i>Phyllactinia corylea</i> (Pers) Karst.	Throughout the year	Nov, Dec	K, J
b. Rust	<i>Aecidium mori</i> Barcl.	Autumn & Winter	—	K
c. Shooty spot	<i>Cercospora</i> sp.	Autumn & Winter	Nov.	K
d. Bacterial blight	<i>Pseudomonas</i> sp.	Monsoon & Autumn	—	K
Meliaceae				
<i>Swietenia mahagoni</i> L.				
a. Algal rust	<i>Cephaleuros</i> sp.	—	—	K

1	2	3	4	5
<i>Toona ciliata</i> Roem.				
a. Witches' broom*	<i>Mycoplasma</i> like organism	—	—	K
b. Phanerogamic parasite	<i>Dendrophthoe</i>	—	—	K
Bignoniaceae				
<i>Tecoma stans</i> L.				
a. Phanerogamic parasite:	<i>scut a sp.</i>	Throughout the year	—	K
<i>Millingtonia hortensis</i> L. f.				
a. Phanerogamic parasite	<i>Cuscuta sp.</i>	do	—	K
<i>Spathodea campanulata</i> Beauv.				
a. Phanerogamic parasite	<i>Cuscuta sp.</i>	do	—	K
Combretaceae				
<i>Terminalia arjuna</i> W. & A.				
a. Rust	<i>Uredo sp.</i> (335115)	Winter & Spring	Dec	K
Dipterocarpaceae				
<i>Shorea robusta</i> Gaertn, f.				
a. Root rot	<i>Ganoderma lucidum</i> (Leyss.) Karst.	—	—	J
b. Algal rust	<i>Cephaleuros sp.</i>	—	—	J
Euphorbiaceae				
<i>Putranjiva roxburghii</i> wall.				
a. Algal rust	<i>Cephaleuros sp.</i>	Monsoon, Autumn & Winter	—	K

non-sporulating nature in the culture medium. Mortality of the plant species due to this disease were high in winter months.

Ganoderma lucidum was a damaging pathogen of *Acacia*, *Albizia*, *Casuarina*, *Dalbergia* and *Shorea*.

Rust due to *Ravenelia*, *Uredo*, *Olivea* and *Accidium* was observed on *Albizia*, *Dalbergia*, *Terminalia*, *Tectona* and *Morus* respectively. The rust disease of all the plant species was present mainly in autumn and winter with highest intensity in winter excepting rust of *Tectoma* which was present throughout the year. Two other unidentified rust pathogen were recorded on *Albizia* and *Lagerstroemia*.

Occurrence of powdery mildew disease was recorded on *Dalbergia* (*Phyllactinia*), *Morus* (*Phyllactinia*) and *Acacia* (*Oidium*). The disease was present throughout the year with maximum incidence in winter. In *Acacia* the disease appeared at the end of December and lasted upto February.

Among the leaf spot pathogen, *Cylindrocladium* and *Camptomeris* caused severe defoliation of *Eucalyptus* and *Leucaena* respectively.

Colletotrichum caused severe leaf blight of *Dalbergia* and *Bauhinia*. The disease appeared in autumn and winter months.

A number of *Toona* plants died in established plantation in road-sides due to *Mycoplasma* like organism.

Algal rust due to *Cephaleuros*, generally not so destructive was observed on four tree plants like *Dalbergia*, *Lagerstroemia*, *Callistemon* and *Putranjiva* during winter months.

Phanerogamic parasites namely *Dendrophthoe* on *Toona* and *Eucalyptus* and *Cuscuta* on various plant species were recorded. A number of *Millingtonia* plants died due to severe *Cuscuta* infestation.

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