

A RECORD OF SEEDLING DISEASES FROM RASULPUR FOREST NURSERY, MODHUPUR

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Diseases of 6 to 12 month old seedlings of Bokul, Debdaru, Jam, Kajubadam, Kumvi, Mohua, Sal and Shimul were recorded from Rasulpur Forest Nursery, Modhupur in 1974. Symptoms of the diseases have been briefly noted. Fungi were isolated from diseased seedlings, pathogenicity tests carried out *in vitro* on detached young leaves were the basis for ascertaining seven fungal and one algal pathogens. The extent of occurrences of the diseases was also recorded.

INTRODUCTION

Programmes for extensive plantation forestry have been taken by the Government of Bangladesh to sustain the adequate supply of forest products and to maintain a balanced ecological condition of the country. Large numbers of healthy seedlings are required for successful plantation programme. Among the various factors which threaten the production of healthy seedlings, diseases play an important role. Complaints regarding damage of seedlings in the nursery by various diseases are quite frequent. The present investigation had been undertaken to study the seedling diseases of eight tree species

which were grown in Rasulpur Forest Nursery, Modhupur.

MATERIALS AND METHODS

Periodic observations were started when the seedlings were 6 months old and continued for 6 months. The tree species present in Rasulpur Nursery were Bokul, Debdaru, Jam, Kajubadam, Kumvi, Mohua, Sal and Shimul.

Among the species Bokul, Kajubadam, Kumvi, Mohua and Sal were raised in polyethylene bags under shade, while the remaining three were grown in 15m x 1m

beds. All the seedlings grown in polyethylene bags were included in the programme and three beds were selected at random for each of the remaining species.

In the course of examination of the above-ground parts of the seedlings, all kinds of abnormalities were recorded in detail. Fungi associated with diseased parts were isolated in Potato Dextrose Agar (PDA) medium, after surface sterilization with 1 : 1000 mercuric chloride solution in water. The fungi were identified by consulting the appropriate key books and by sending some of the cultures to Commonwealth Mycological Institute, England.

Pathogenicity of the associated fungi was tested by artificial inoculation of healthy leaves. Two young leaves, detached from 7 to 9 month old seedlings of each tree species, were inoculated with 1 mm diameter mycelial agar block from PDA culture and spore suspension of 7-day old pure culture of each of the test fungi at two separate spots on the same leaf. The leaves were placed in sterilised petridishes with moist filter paper. Three replicate plates were used for each fungus. One set of leaves was injured by pricking with a fine sterilised needle prior to inoculation and another set was inoculated without pricking. Equal number of leaves were kept in moist chamber as control where the leaves were pricked and they were sprayed only with sterilized water. After inoculation the petridishes with leaves were incubated on the laboratory table at room temperature (20° to 32°C). The leaves were examined after every 24 hours for any appearance of visible symptoms and observations were continued for two weeks. The inoculated pathogen was reisolated from the infected leaves where the inoculated fungus developed the typical symptoms.

All the abnormalities in the above-ground parts of the seedlings were recorded to count the percentage of seedlings diseased.

RESULTS

Symptoms were recorded from field observations. Isolation of fungi from various diseased materials followed by *in vitro* pathogenicity test, though of limited value, were the basis for determining the pathogens. The following diseases were recorded :

- (i) Disease - Anthracnose of Bokul
(*Mimosa elengi* Linn.)

Pathogen-*Collecotrichum dematium* (Pers. ex fr. Grove.

Symptoms : Irregular spots originated from the tip or the margin and advanced inward ; the older lesions grayish white and the leaf surface covered with numerous acervuli (Fig. 1).

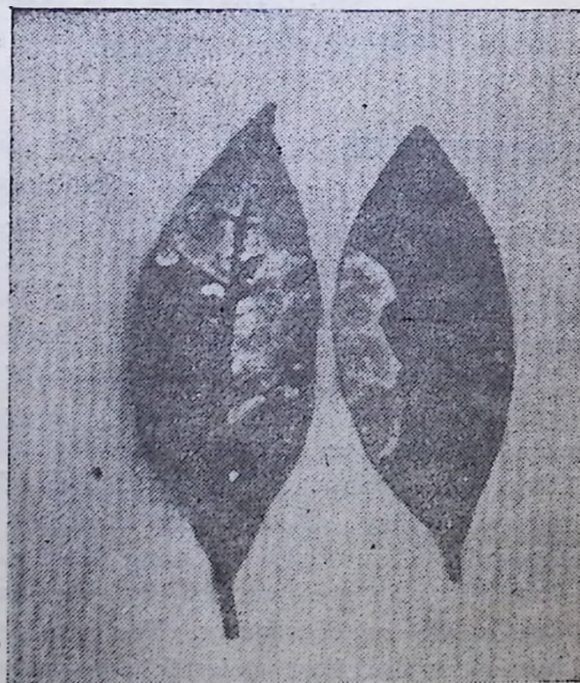


Fig. 1. Anthracnose of Bokul caused by *Collecotrichum dematium*

(ii) Disease : Leaf spot of Debdaru (*Polyalthia longifolia* Benth. Hook. f)

Pathogen : *Fusarium equiseti* (Corda) Sacc.

Symptoms : Irregular light brown spots surrounded by bright dark brown zone on the leaves.

(iii) Disease : Red rust of Jam (*Eugenia jambolina* Lamk.)

Pathogen : *Cephaleuros viriscens*, Kunze.

Symptoms : Leaf blade covered with raised brownish superficial algal growth on the dorsal surface; lesions of various sizes scattered on the surface.

(iv) Disease : Leaf blight of Kajubadam (*Anacardium occidentale* Linn)

Pathogen : *Beltrania* sp.

Symptoms : Withering of leaves started from the tip; the blighted area was dark brown in colour and surrounded by a pinkish border merging into the healthy part (Fig. 2).

(v) Disease : Leaf blight of Kumvi (*Careya arborea* Roxb)

Pathogen : *Coniella diplodiella*

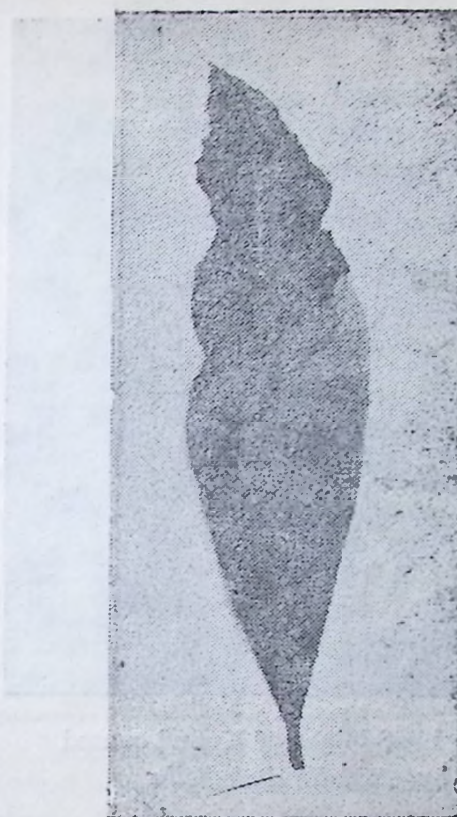


Fig. 2 Leaf blight of Kajubadam caused by *Beltrania* sp.

Symptoms : The blighted areas developed concentric rings; the light greyish areas of the rings covered with black pycnidia developing on the dorsal surface (Fig. 3).

(vi) Disease : Leaf spot of Mohua (*Bassia latifolia* Roxb.)

Pathogen : *Pestalotia paraguariensis* Maubl.

Symptoms : Spots oval, sometimes irregular and brick red in colour; black fruit bodies scattered on the lesion surface.

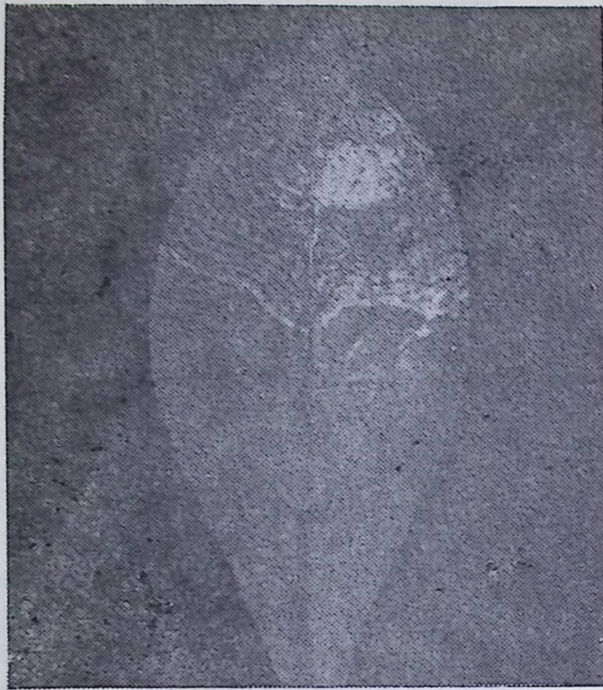


Fig. 3 Leaf blight of Kumvi caused by *Coniella diplodiella*

(vii) Disease : Leaf blight of Sal (*Shorea robusta* Gaertn. f.)

Pathogen : *Fusarium* sp.

Symptoms : Irregular, reddish brown blighted areas started at the edges of leaves sometimes scattered lesions developed on the lamina (Fig. 4).

Disease : Die-back of shimul (*Sal-malia malabarica* DC)

Pathogen : *Botrydiploia theobromae* Pat.

Symptoms : Death of shoots started from the tip and progressed downwards.



Fig. 4 Leaf blight of Sal caused by *Fusarium* sp.

Intensity of disease incidence was determined by counting the number of seedlings showing infection (Table 1). Die-back of Shimul caused by *B. theobromae* had the highest percentage of infected seedlings.

DISCUSSION

The results indicated a serious problem for raising healthy seedlings in the nursery. Such a high incidence of disease may be attributed to the dense population of the seedlings and the hot and humid weather of the monsoon season. In the present study a number of leaf diseases is reported.

The fungi found to be pathogenic in the present study have also been reported to be pathogenic on other plants. *C. dematium* is known to cause leaf spot

Table 1. Percentage of seedlings of eight tree species found diseased in Rasulpur Forest Nursery during 1974

Host tree species	Total number of seedlings observed	Per cent of seedlings diseased
Bokul	120	60
Debdaru	3025	59
Jam	6520	20
Kajubadam	70	30
Kumvi	150	30
Mohua	60	50
Sal	204	48
Shimul	75	73

disease of *Salmalia malabarica* and *Porana paniculata* in India (Ghosh 1966). In Europe and U. S. S. R. *F. equisiti* causes stem rot of maize, and a root rot on wheat. In Israel the fungus has been found to be pathogenic on cucurbits and Avocado (Booth 1971).

C. virisceus has been reported to cause leaf spot of *Albizia lebbek*, *Pecan*, *Cinnamomum camphora*, *Magnolia grandiflora* in Florida and other parts of USA (Westcott 1960). *P. paraguariensis* has been reported to cause leaf spots of *Ilex paraguariensis* in Brazil (Guba 1961). *B. theobromae* is reported to cause dieback of *Albizia falcata* and *A. sumatrana* in Indonesia (Angremond 1948) and in India (Venkata Ram 1960) *Artocarpus integrifolia* in Chittagong (Rahman *et al* 1984) and *Aurocaria heterophylla* (Kliejunas 1976).

The incidence of the diseases in the present study has been quite high, but the severity and impact of individual diseases on the survivability of the seedlings could not be worked out. In case of subsequent incidence of any of these diseases, detailed study should be undertaken to describe the stages in stymptom development, isolation of fungi, pathogenicity in its true sense, etiology of infection and epidemiology of disease severity so that appropriate preventive and/or control measures may be worked out.

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