

FUNGAL DISEASES OF TEAK IN NURSERY, PLANTATION AND NATURAL FOREST IN THE JALGAON DISTRICT (M.S.) INDIA

S.A. FIRDOUSI

H.J.Thim college of Arts and Science,

MEHRUN, JALGAON(M.S.)

Email : shakeeltalk@gmail.com

Received : 11.10.2018; **Accepted :** 01.11.2018

ABSTRACT

A frequent survey was conducted in order to study the fungal disease of teak of natural forest, plantation and nursery of Jalgaon. About five severe fungal diseases of nursery of social forestry department, plantation and natural forest of Jalgaon were studied. Five pathogens were identified with the help of available literature and confirmed by experts. Pathogens were *Uncinula tectonae*, *Olivea tectonae*, *Rhizoctonia solani*, *Armillaria mellea* and *Phellinus sp.* The control measure for the diseases were suggested.

Figure : 00

References : 05

Table : 01

KEY WORDS : Fungal diseases, Jalgaon, Teak.

Introduction

Forest is one of the most important renewable natural resources. Obviously, they play an important role in the country ecosystem development and growth in various ways and maintain the ecological balance and stability of nature. The forest serves as a source for timber, fuel, fodder and minor forest produce to human along with conserving soil and water, moderating climate, offering food and shelter for wildlife and adding to the aesthetic value and recreational needs of man. There is a close relationship between plants and the environment.

Tectona grandis is one of the most valuable timber trees in India due to excellent wood properties. The wood is durable, has sound dimensional stability and attractive natural colour and valuable for high quality furniture and interior finishing. It belongs to the family verbenaceae and it gets maximum height.

The preliminary survey was conducted throughout the year in the selected site of Jalgaon forest.

Study site

1. Natural forest
Manudevi forest, Pal forest, Haripura Forest, Aghghera forest
2. Plantation-Aurangabad road, Dhule road, Social forestry Plantation etc.
3. Nursery-I, Nursery of Social Forestry, Jalgaon.ii. Nursery of Forest Department, Yawal.

Material and Method

Collection and Identification

1. A survey was conducted in natural forest, nursery of

Social forestry department. J. K. Park Jalgaon and plantation during year 2016-17 and 2017-18.

2. The symptomology and other informations such as place of collection, locality, local names of the plant and date of collections were noted.
3. The sample was kept in the polythene bag and brought in the laboratory.
4. In the laboratory, host name was confirmed with the help of herbarium, Dept of Botany, H. J. Thim College of Arts and Science, Mehrun, Jalgaon
5. Tentative identification was done with the help of monographs and references.

Description of Diseases

1 Powdery mildew of Teak,

Fungus attacks on the upper surface of the leaf gradually spread over upper surface it looks as outer coating and chlorophyll disappears. *Uncinula* is an obligate hemiendoparasite fungus causing powdery mildew of teak. Young cleistothecia are orange to yellow coloured, round bodies which become black on maturity. The leaves become dry and ultimately fall on the ground.

The fungus forms white powdery coating on the undersurface of teak leaves and later develops dark coloured cleistothecia over the white fungus web. *Uncinula tectonae* is restricted to the upper leaf surface and the infected leaves are coated with a dull white mycelium and conidia borne on conidiophores. Conidiophores are formed singly and never in chain. Conidiophore may be thin walled or even somewhat twisted at the place of surface of its origin. Conidia are thin walled and typically slipper -shape or club shape changes in

TABLE -1 : Relation of disease with pathogen and duration

S.N.	Host	Diseases	Pathogen	Duration	Locality
1	<i>Tectona grandis</i> . (L.F)	Powdery mildew	<i>Uncinula tectonae</i>	February to April	Nursery, Plantation, Natural Forest
2	<i>Tectona grandis</i> . (L.F)	Leaf rust	<i>Olivea tectona</i>	January to April	Nursery, Plantation, Natural
3	<i>Tectona grandis</i> . (L.F)	Leaf blight	<i>Rhizoctonia solani</i> .	September to February	Nursery, Plantation
4.	<i>Tectona grandis</i> . (L.F)	Leaf spot	<i>Alternaria alternata</i>	August to March.	
5.	<i>Tectona grandis</i> . (L.F)	Root rot	<i>Armillaria melleae</i>	September to February	
6.	<i>Tectona grandis</i> . Mellae	Basal root rot	<i>Phellinus sp</i>	Septemer to February	

plants take place which lead to drying of infected leaves. Conidia are disseminated easily by wind and germinate by producing new hyphal branches.

Causal organism- *Uncinula tectonae*

Control Measure :

Sulphur dust is most effective in controlling powdery mildew in two year old seedlings followed by Baycor, Mortesan and Calixin.

2. Leaf blight:

This is caused by *Rhizoctonia solani*.

Symptoms:

The infected plants show water soaked grayish brown patches that enlarge rapidly and cover a large part or the entire lamina. The blighted leaves often show holes in the infected portion as a result of shedding of infected tissues during heavy rains. The infected leaves dry up and are eventually shed. The disease spreads laterally in the nursery through overlapping foliage of the adjoining seedlings often resulting in group blighting of seedlings. In each case of severe infection, defoliation is high.

Control Measures:

Immediate removal of infected plants helps to prevent the disease spread. Application of Dithane M-45 (0.1%) is found effective in controlling disease.

3. Leaf rust:

This disease is caused by *Olivea tectonae*.

Symptoms:

The infected leaves are almost plastered with

yellowish brown fruit bodies of the fungus. The upper leaf surface presents a grey appearance due to the formation of flecks, which correspond to the position of sori on the lower surface. Infected leaves fall off prematurely resulting in retardation of plant growth. The disease is common in nursery and young plantations.

Control Measures:

The infected seedlings can be segregated and kept in isolation. Severely infected and dead seedlings can be burnt away from the nursery to prevent the spread of the disease. The disease may be controlled in the nursery by the application of sulphur based fungicide (Sulfax) on both sides of the leaves.

3. Leaf spots:

- Leaf spot diseases are caused by different fungal and bacterial pathogens on teak.

Symptoms:

The symptoms are brown to greyish brown, which develop near the tip and along the margin of the leaves. The disease spreads laterally in the nursery through overlapping foliage of the adjoining seedlings often resulting in group blighting of seedlings.

Control Measures:

Immediate removal of infected plants helps to prevent the disease spread.

- Leaf spot diseases by *Alternaria alternata*.

The disease symptoms on leaves initially appeared as round dark brown necrotic lesions ranging from 2 to

10 cm in diameter, which were surrounded by yellow haloes. Later, these lesions coalesced and developed into larger circular or irregular spots. For severe infections, infected leaves dried and eventually dropped. The average disease incidence was greater than 20% on plantations and tree growth was diminished. Leaf tissues excised from the margin of lesions were surface.

Control Measures:

Immediate removal of infected plants helps to prevent the disease spread.

4-Root rot by *Armillaria melleae*

The disease is serious as it shows rotting of roots and stem. Symptoms include poor growth, loss of healthy plant. There is appearance of dark brown discoloured wood at the base of stem for several inches above the soil line and loosening and separation of dead lower bark. Infected plant material often has slowed growth, smaller than normal plant. White fans of fungal growth and dark brown shoestring like thread called rhizomorph.

Control measures.

Eradication of infected plants is good method.

Avoid damage from improper pruning. Lawn mowers. Avoid planting trees and shrubs in poorly drained compact soils or in low areas where water collects.

2% Tillex spray on infected trees. The disease in proposed plantation by care site selection and pre-treatment of stumps left behind after land clearing.

5. Basal root rot of teak by *Phellinus* sp

Basal root rot of teak was first reported from the disease on teak in Peninsular Malaysia. The fungus found associated with the disease was *Phellinus noxious*. The

disease aggressively killed its host irrespective of the host health status. Bark depression at the root collar which was visible from a distance was the characteristic symptom and the main indicator in identifying the disease in the plantation since above ground symptoms of the canopy could not be differentiated from crowns of healthy trees. However, although above ground symptoms were not easily discernible, the disease was already advanced and the trees mostly beyond treatment; 3.4 % of the trees in the plantation were affected and the disease occurred both on solitary trees and in patches. Below ground, infected trees had rotted root systems, mainly below and around the collar region with brown discoloured wood and irregular golden-brown honeycomb-like pockets of fungal hyphae in the wood.

Control measure

Eradication is the best method of control of disease.

Result and Discussion

A frequent survey was conducted in order to study the disease of teak and disease of Jalgaon city during year 2015-16, 2016-17. About 5 diseases of teak tree plant were effected seriously in the different place of Jalgaon. Five pathogens i.e *Olivea tectona*, *Rhizoctonia solan*, *Alternaria alternate*, *Armillaria melleae*, *Phellinus* sp. were identified with the help of available literature^{1,2,4,5} and experts. Mostly, there were as pathogenic. Some of the plants of teak were completely killed by root rot and wood rot. These fungi cause leaf spot, leaf blight, rust etc wood rot, basal rot, root rot and heart rot. No satisfactory control measure were found out to control the diseases. Only eradication and trenching have suggested by the scientist, by root rot.

References

1. Agarwal GP, Gupta S, Pandey AK. Saprophytic fungi from Jabalpur, New additions. *Journal of Economic and Taxonomic Botany*. 1993; **17** : 79–87.
2. Bakshi BK. Forest Pathology, Principal and Practice Forestry Controller of Publication. New Delhi. 1976.
3. Firdousi SA, Khan TA. Two new fungal disease of trees of Manudevi Forest, Jalgaon Districts, *Flora and Fauna*. 2015; **21** (2) : 158-160.
4. Gibson IAS. Diseases of forest trees widely planted as exotics in the tropics and southern hemisphere in part -1 deptt of forestry, Oxford University and com. Mycol. Ins. Kew England. 1975.
5. Jamaluddin Rizvi, Bilgrami. Fung of India, Index and addenda Bisan Pal Singh, Publication, Dehradun. 2008.