



First report of tar spot of *Toona (Toona ciliata)* in India

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Abstract: A new foliar disease of toona tree has been reported during continuous surveys conducted at Solan district of Himachal Pradesh during August, 2015 to December, 2015. On the basis of morphological characteristics of the fungus, the fungus was identified as *Rhytisma acerinum*, which produces symptoms on upper surface of the leaves as numerous small, superficial and blackish lesion which later gives the similar appearance as given by tar. Tar spot of the toona tree produces the ascomata whose size ranges from 14-16 μm with average of 15 μm , asci length varied from 60-80 x 9.5-10.2 μm and size of ascospores varied from 52-58 x 1.8-2.0 μm . Tar Spot disease of leaves of *Toona* in Himachal Pradesh is the first report of its occurrence and more work is needed so that the disease could remain in manageable level.

Keywords: Ascospores, *Rhytisma acerinum*, *Toona ciliata*, Tar spot

INTRODUCTION

Toona ciliata is a large forest tree in the mahogany family, native to Australia and Asia, but introduced elsewhere as a shade tree and highly valued for its fast-growing aspect and red timber. It is the tree of subtropical climate and can grow in moist localities such as ravines, banks of streams and even swamps. It grows best in fire-protected savannah, abandoned cultivation and in small gaps in forest, and does not do well on dry hill slopes (Weber, 2003; Wagner *et al.*, 1999). *T. ciliata* is mostly grown for its versatile timber, which is used for building houses and ships, and for high-value goods such as furniture, musical instruments, carvings, and numerous other uses. The flowers yield a reddish dyestuff, while the bark is used to tan leather or to produce string. Traditional medicine makes use of various parts of the plant, chiefly the bark and leaves (Lemmens, 2008). *T. ciliata* is commonly cultivated as an avenue tree and the leaves are widely used as an animal fodder in India (Edmonds, 1993; Edmonds, 1995) and as an ornamental and wayside tree throughout much of tropical Africa and Asia (Fenton *et al.*, 1977). Several species of insect attack and damage forest trees and young plantations. Similarly in some places, young saplings are attacked and even killed by the parasite *Loranthusscurrula*. Plantation material is susceptible to decay in fungi such as *Ganodermalucidum* causing root and butt rot which may be lethal, *Phellinus* spp., causing white rot of fallen timber or gaining access through wounds exposing dead sapwood, and *Trametesstraminea* (white stringy rot) usually saprophytic but also

act as wound parasite causing trunk rot (Orwa *et al.*, 2009). Other diseases which attack the toona plant are phytoplasma associated diseases such as witches' broom disease (Thakur *et al.*, 2007), showing witches broom symptoms, bacterial diseases of toona caused by *Xanthomonas* (Zacaroniet *al.*, 2011) and fungi *Cercospora* leaf spot are common (Silva *et al.*, 2016). In order to identify the diseases of toona in the growing plantation in the Dr. Y. S. Parmar University of Horticulture and Forestry continuous surveys from August, 2015 to December, 2015 were undertaken.

MATERIALS AND METHODS

The infected leaves of the toona tree were taken and brought to the laboratory for microscopic analysis. Morphological characteristics of the fungus was studied with help of microscope and perithecia, ascus and ascospores size were measured with micrometry as per the methods followed by Hou and Piepenbring, 2005; Wang *et al.*, 2009 and Lantz *et al.*, 2011.

RESULTS AND DISCUSSION

On upper surface of the leaves numerous small, superficial and blackish distinct tar like spot or lesion were recognised. The leaves exhibit yellow green spots generally in group the lesions continue to grow, and later stages form leaf spots that look like tar (Fig.1. A, B). These spots can grow up to 2-4 cm in diameter (Lantz *et al.*, 2011). A microscopic sign of the pathogen are the stroma, mats of hyphae found in the lesions. Later these lesions cause senescence of leaves. Ascospores are needle-shaped or elongated (Fig. 3. E).



Fig. 1. A and B. Symptoms of tar spot on leaves of *Toona ciliata*.

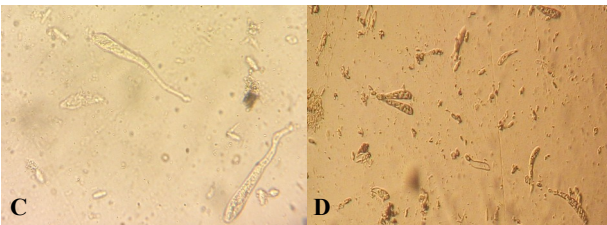


Fig. 2. C. and D. Asci of the *Rhytisma acerinum*.

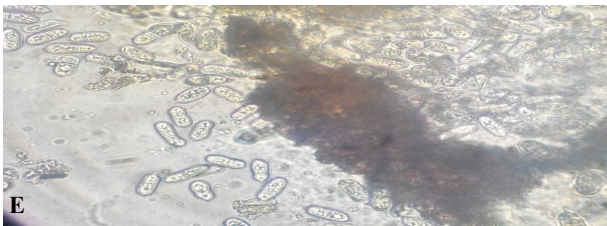


Fig. 3. E. Ascospores of the tar spot (*R. acerinum*) of toona emerging from perithecia.

The tar spot fungus produces the ascomata, asci (Fig.2. C, D) and ascospores whose size ranges from 14-16 μm with average of 15 μm , 60-80 x 9.5-10.2 μm and 52-58x1.8-2.0 μm (Hsiang and Tian, 2007), respectively. On the basis of morphological characteristics of the fungus such as the ascomata, asci and ascospores, pathogen was identified as *Rhytisma acerinum*. The scanning of literature revealed no record of this pathogen on *Toona ciliata* in India and elsewhere in world, thus this pathogen appears first time infecting the toona plantation in Solan province of Himachal Pradesh, India.

Conclusion

The pathogen (*R. acerinum*) was commonly reported to be infecting the leaves of maple tree. This is the first

report when this pathogen was found to be associated leaf spot disease of toona tree. The study would be helpful in identification and in management of the said disease.

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