

## RESEARCH ARTICLE

# New record occurrence of mycosphaerella leaf spot of eucalyptus in Himachal Pradesh

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### SUMMARY

A study on occurrence and distribution of *Mycosphaerella* leaf spot of *Eucalyptus* was conducted at Solan district of Himachal Pradesh during August, 2015 to December, 2015. On the basis of the morphological characteristics, the fungus was identified as *Mycosphaerella cryptica* and *Mycosphaerella marksii* which produced symptoms like necrotic spots and patches on leaves and presence of crinkled and distorted foliage. Ascospores of *M. cryptica* and *M. marksii* are hyaline, with one septum, fusiform to tunecate and whose size varies from 12-16 x 2-4  $\mu\text{m}$  and 11-14 x 2-3  $\mu\text{m}$ , respectively.

**Key Words :** *Mycosphaerella* spp., *Eucalyptus*, Conidia

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**E**ucalyptus are highly favoured plantation species as they are fast growing and easy to cultivate. Its timber is an important source of fibre to the international pulp and paper industry. The plant is also used for the control of various weeds, tolerant to air pollution, insect pests and plant fungal diseases (Vaid *et al.*, 2010; Thakar and Mishra, 2010 and Bisht *et al.*, 2013). A number of foliar plant pathogens have been reported to impact on yields in plantations of *Eucalyptus* species in Asia including *Mycosphaerella* spp., *Phaeophleospora* spp., *Cryptosporiopsis* spp. and

*Cylindrocladium* spp. (Old *et al.*, 2003 and Barber, 2004). Among these, *Mycosphaerella* spp. are most prominent leaf spot encountered in various eucalyptus plantations. The losses estimated to be 25 per cent from the foliar pathogens (Balmelli *et al.*, 2012). The evidence of leaf spots losses was apparent during the routine surveys conducted which resulting into high magnitude of losses in Nauni, Baddi and Nalagarh region of district Solan of Himachal Pradesh. Therefore, the present study was conducted to study the symptoms to ascertain the cause of the leaf spot pathogen by proving the pathogenesis of the same (Park *et al.*, 2000). The genus *Mycosphaerella* as observed on *Eucalyptus* is well defined and its several distinct anamorphic states were also listed by various workers (Crous and Wingfield, 1996; Crous *et al.*, 1993; Dick and Gadgil, 1983 and Dick and Dobbie, 2001). *Mycosphaerella* leaf spot diseases were detected by presence of necrotic spots or patches and pseudothecia on leaves and presence of

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crinkled and distorted foliage (Dick and Dobbie, 2001). The pathogen *M. marksii* Carnegie and Keane, a species first described in Australia (Carnegie and Keane, 1994) was reported in 1995 causing a leaf spot on *E. camaldulensis* from Vietnam. *M. cryptica* infects both juvenile and adult leaves of a wide range of eucalyptus. This pathogen in severe cases produces large, straw-coloured necrotic areas. Many variations in symptom development are associated with *Mycosphaerella* infections resulting in different combinations of lesion size, colour and morphology. Affected trees suffer premature defoliation and severe disease can cause stunting of trees (Carnegie and Keane, 1994; Carnegie, *et al.*, 1997; Park and Keane, 1982; Park and Keane, 1987 and Park 1988). Objective of this study was to know the occurrence of the foliar diseases infecting eucalyptus in Himachal Pradesh and monitoring their occurrence, so that in future this disease could be manageable, if become severe.

## MATERIAL AND METHODS

In order to record the symptom of leaf spotting fungi the eucalyptus plantations were regularly surveyed from August, 2015 to December, 2015 of different regions in district Solan of Himachal Pradesh. The characteristic symptoms were observed and the infected leaves of the eucalyptus tree were collected in polythene bags and brought to the laboratory for microscopic examination. Morphological characteristics of the fungus were studied with help of light microscope and conidial size was measured with micrometry (Park *et al.*, 2000) (Fig. A and B).



Fig. A : Symptoms of *Mycosphaerella cryptica* on eucalyptus leaves.



Fig. B : Symptoms of *Mycosphaerella cryptica* on eucalyptus leaves

## RESULTS AND DISCUSSION

During the continuous surveys of different regions of the Solan district of Himachal Pradesh eucalyptus plantation was predominated with leaf spotting pathogens which were identified as *Mycosphaerella cryptica* and *Mycosphaerella marksii*. The pathogens *Mycosphaerella cryptica* infected young as well as older foliage of eucalyptus trees, resulting in necrotic spots or patches, pseudothecia formation on leaves and presence of crinkled and distorted foliage whereas *Mycosphaerella marksii* is commonly associated with older juvenile leaves (Carnegie and Keane, 1994). Pathogenicity of the fungi isolated was proved by artificially inoculating the spores/conidia on the leaf surfaces by covering the eucalyptus seedlings with perforated polythene sheets and separately moistened for 15 days. Initially the symptom observed were red-brown colour lesions (often with a purple margin) later becoming grey-brown. These were round or irregular in shape and present on both sides of the leaves. Ascospores of *M. cryptica* and *M. marksii* were hyaline, with one septum, fusiform to tunecate and whose size varied from  $12-16 \times 2-4 \mu\text{m}$  and  $11-14 \times 2-3 \mu\text{m}$  (Fig. 1) as reported by Park, (1988) and Carnegie and Keane (1994), respectively.



Fig. 1: Ascospores of *Mycosphaerella cryptica*

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