Research Article

Histopathology of Neem Shoot Naturally Infected with *Phomopsis azadirachtae,* The Die-back of Neem Pathogen

K Girish[1], S Shankara Bhat[2] and Syeda Kousar Fathima[1]

[1]Postgraduate Department of Microbiology, Maharani's Science College for Women, JLB Road, Mysuru - 570 005, India; [2]Department of Studies in Microbiology, University of Mysore, Mysuru 570 006, India (formerly). E-mail: salmakheel@gmail.com

Abstract

Phomopsis azadirachtae Sateesh, Bhat and Devaki, the incitant of die-back of neem is a deuteromycetous fungus which infects the neem trees of all ages and sizes. The chief symptoms of the disease are twig blight, inflorescence blight and fruit rot. In the present study histopathological studies of die-back infected neem shoots were carried out. Neem shoots showing twig blight symptoms were considered for the study. Healthy neem shoot served as control. The sections showed abundant colonization of inter- and intra-cellular hyphae in bark, cortex, vascular tissues and central pith. The histopathological investigations suggest that the die-back pathogen is heavily colonized in the infected tissues and seems to have greater penetration capacity.

Key words: *Azadirachta indica*, die-back, neem shoots, histopathological studies, *Phomopsis azadirachtae*

Citation: Girish K, Bhat SS and Fathima SK. 2019. Histopathology of neem shoot naturally infected with *Phomopsis azadirachtae,* the die-back of neem pathogen. *J Mycol Pl Pathol* 49(2): 204-210.

The colonization of a fungal pathogen in a host plant tissue can be detected by various techniques such as plating of host explants, tissue clearing, histopathology, fluorescence microscopy and so on (Sass 1958; Bermingham et al 1995; Dhingra and Sinclair 1995; Agrios 2004). Histopathological studies of infected plant parts offer many advantages while studying the host-pathogen interactions, site of infection, resistance of host and virulence of the pathogen (Oh and Hansen 2007; Knight and Sutherland 2013). It helps to know the initial site of infection, penetration, spread of the pathogen in various tissues and its colonization (Pandey et al 2012; Sarria et al 2016). Histopathological studies are also carried out to study the invasion mechanism of the pathogen (Oh and Hansen 2007; Pandey et al 2012; Knight and Sutherland 2013).

Neem (*Azadirachta indica* A Juss) is an important medicinal plant native to India. This tree is presently suffering from a devastating disease called die-back caused by a deuteromycetes fungus *Phomopsis azadirachte* Sateesh, Bhat and Devaki (Sateesh et al 1997). The disease is spreading at an alarming rate and in severely affected trees it results in almost 100 per cent loss of fruit and seed production, a highly valuable source of botanical pesticide (Girish and Shankara Bhat 2008). Further, the infection leads to a significant reduction in the green canopy of this evergreen tree. Histopathological investigations of naturally infected neem seeds with *P. azadirachtae* were carried out to know the colonization and location of the pathogen in the seed tissues (Fathima et al 2004). The literature on histopathology of neem shoot naturally infected with *P. azadirachtae* is lacking. In the present work, histopathological study of the die-back infected neem shoot was carried out with a view to find out the anatomical changes taking place following infection and colonization of the pathogen when compared with healthy tissue to get some knowledge regarding the host parasite relationship.

Materials and Methods

Collection of infected neem twigs. The twigs showing characteristic die-back symptoms were collected from neem trees severely infected with die-back from different agroclimatic regions of