

## Can alien invasive pathogen *Fusarium circinatum* threaten Turkish pine forests?

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**Abstract:** Invasive alien species are species whose spread outside their natural past or present distribution threatens biological diversity. Among these invasive alien species that change the functions and natural components of ecosystems, especially the ones that are carried by seeds and other plant material draw great attention. In Pathogens, carried by seeds, have a crucial role in spreading the diseases both domestically and across country borders. Among the important pathogens carried by seeds are a large number of *Fusarium* species. *Fusarium circinatum* (teleomorph: *Gibberella circinata*) is one of the most important pathogens of *Pinus* species, causing damping-off in nurseries and pitch canker in forests. This aggressive fungus may infect pine seeds and, therefore, can easily be spread long distances by the seed trade. It is a very significant threat to natural and planted pine forests, and to date it has invaded countries across five continents. At least 57 species of *Pinus* along with *Pseudotsuga menziesii* are susceptible to pitch canker to varying degrees. *F. circinatum* has recently been listed as a quarantine organism in numerous countries throughout the World. In Europe, it is currently included in the A2 list (present in the EPPO region but not widely distributed) of pests recommended for regulation as quarantine pathogens. Also in Turkey, it is among the organisms subject to quarantine. The importance of this microorganism is increasing day by day due to the large-scale losses to pine forestry in various parts of the World. For this reason, control measures against *F. circinatum* and all other invasive species should be taken and carried out without delay in the world. A thorough understanding of the epidemiology and ecology of the causal agent is an important prerequisite for managing this pathogen. Once alien invasive pests enter the country, they are usually extremely difficult to eradicate and may cause irreversible damage; hence, they set government back significant amount of money. In this study, an extensive search of literature dealing with *F. circinatum* was performed. In addition, the collaborations between Turkey and other countries were summarized.

**Keywords:** Fungi, *Fusarium circinatum*, Pitch canker, Pine diseases, Invasive alien species