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An invasive fungal pathogen threatening plane trees in Turkey; *Ceratocystis platani*

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Abstract: *Ceratocystis platani* (*C. fimbriata* f. *platani*), is a wound pathogen causing canker stain that leads to wilting and eventually death of plane (*Platanus* spp.) trees. *Platanus occidentalis* is more resistant to the fungus than *P. orientalis* and their hybrid *P.* x *acerifolia*. Infected trees die within 3 to 7 years. *C. platani*, which originates from United States, caused serious damage and deaths on *P. acerifolia* along the Atlantic coast. The disease was introduced into European ports in wood or wooden packaging material during the Second World War. Canker stain of plane was detected in mainland Italy and France in 1940s, in Switzerland in 1983, in Sicily and Armenia in 1994, in Greece in 2003, in Spain, Turkey and Albania in 2010, 2011 and 2014, respectively. However, the disease is stated to have been eradicated from Spain. In the spread of the disease agent, injuries in branches or the trunk of the tree play an important role. Pruning of the diseased trees can initiate infection in neighboring healthy trees, even if only very small quantities of wood dust reach injured trees. The fungus in soil, contaminated pruning tools, or any machinery and equipment used in the transfer of trees are among the elements that spread the disease. In addition, the fungus is known to pass from one tree to another via root grafts. Also the fungus is transported long distances in infected seedlings and wood. In some studies it was shown that canker stain becomes epidemic principally in areas where plane trees require human tending. Once the fungus has grown into the wood via a wound, it quickly invades the heartwood. The first symptoms are the rapid wilting and death of the affected branch or the foliage in general. Crown infection proceeds from the top of the crown towards the lower branches resulting in a dieback that spans the entire tree. Crown of diseased trees is sparse, and have yellow leaves in the spring. The fungus, causes long, oblong cankers, which affects and prevents water transfer. These can be recognized on the bark. In addition, vector insects have significant effect on spreading of the pathogen. The ambrosia beetle *Platypus cylindrus* was very common in stands of *P. orientalis* trees in Greece, infesting trees already infected by *C. platani*. In most of the cases, the beetles had bored tunnels in the stem, where abundant perithecia of *C. platani* were observed. *P. cylindrus* adults regularly visited artificially wounded *P. orientalis* trees in a natural stand. Although this ambrosia beetle normally infests stressed or dead trees, it appears to play a role as a vector of *C. platani*. It is probable that *P. cylindrus* is involved in transmission of *C. platani* on plane trees in Istanbul where the disease was detected in 2011. The aim of this study was to diagnose one of the alien invasive species, to reveal the effective conditions of transmission of plane canker, to prevent national and international spread of the disease and emphasize the importance of controlling the disease.
Keywords: *Platanus* spp., Plane canker, Alien invasive species, Canker stain of plane, Disease epidemic