

Cryphonectria parasitica (Murrill) Barr



Fig. Symptoms of orange stromata containing fruiting bodies of *C. parasitica*; stromata associated with a trunk wound; trunk cankers with swelling and cracking (images courtesy of David Smith, DPI Victoria)

Disease: Chestnut blight, chestnut canker; Causal agent: *Cryphonectria parasitica*

Classification: K: Fungi, P: Ascomycota C: Sordariomycetes, O: Diaporthales F: Cryphonectriaceae

Chestnut blight is a serious fungal disease of chestnut (*Castanea* spp) caused by *Cryphonectria parasitica*. The pathogen is a wound parasite originating in Asia which caused severe epidemics in endemic populations of American and European chestnuts in North America and Europe, respectively. The pathogen can cause cankers, blighting and tree death and is readily spread via trade in infected chestnut propagating material and other host tissue. An outbreak of the disease in north-east Victoria, Australia is the subject of a national eradication response which began in 2010.

Biology and Ecology: Splashed conidia and wind blown ascospores can infect wounds in the bark of trees. Cankers form and may girdle branches causing blighting of shoots above the infection. Orange-red stromata form on cankers and produce pycnidia and, less often, perithecia.

The pathogen can survive and sporulate on dead wood for 1-2 years, and although roots appear to be resistant, some reports indicate survival on the underground stumps of infected trees.

Disease is favoured by a humid temperate climate, whereas dry conditions slow its development and spread.

Distribution: The disease was first reported from North America in 1904 and Europe in 1938, but originated in eastern Asia. Australasia, South America, most of Africa and parts of northern Europe are still free of this pathogen.

Host Range: Chestnut and oak are the major hosts, although a number of other unconfirmed hosts have been reported.

Disease Impact: The accidental introduction of *C. parasitica* into North America in the late nineteenth century initiated a major ecological disaster in forests in eastern USA, reducing an estimated 3.5 billion American chestnuts (*C. dentata*) from a dominant forest tree to a minor understory component. In Europe the impact on planted and forest chestnuts (*C. sativa*) although serious was less significant. This is possibly due to *C. sativa* being slightly more resistant than *C. dentata*, and also due to the presence of hypovirulent strains of the pathogen which can induce healing of cankers caused by virulent strains. Asian species of chestnut are less affected although disease can be severe even in these trees. Under favourable conditions, tree death of susceptible species can occur within four years. The pathogen can kill some oak species, but generally oaks are less susceptible than chestnuts.

Disease Management: Quarantine, use of hypovirulence as a biocontrol, resistance breeding, and eradication are all useful management practices. Fungicides are generally ineffective against this disease.

Further Reading: Anagnostakis (2000) APSnet features online. Gryzenhaut *et al* (2009) APS Press. Liberato and Robin (2006) PaDIL (online).

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