



Photos. L to R Chestnut orchard, Benambra, VIC; dead burr; perithecia immersed and erumpent in burr tissue; asci containing ascospores; chestnut flowers; kernel with chestnut rot symptoms. Scale: 200µm, 10µm. All images L.A. Shuttleworth.

Disease: Chestnut rot

Classification: K: Eumycota, D: Ascomycota, C: Sordariomycetes, O: Diaporthales, F: Gnomoniaceae.

Symptoms of chestnut rot occur as pale, medium and dark brown lesions occurring on the endosperm and embryo of the chestnut. The lesions occur as spotting, or with a clear margin at the styler end, hilum end, sides of the kernel, or a combination of these. *Gnomoniopsis smithogilvyi* was the organism most frequently isolated from rotten chestnut kernels, was overwintered in its teleomorph form as a saprobe on dead burrs and branches of *Castanea* sp. (*Fagaceae*), and was isolated as an endophyte from asymptomatic flowers, leaves, stems and developing fruit (Shuttleworth 2012; Shuttleworth et al. 2012).

The Pathogen: Shuttleworth (2012) found that ascospores of *G. smithogilvyi* infect chestnut flowers during summer after being released from dead burrs. An experiment was conducted at an orchard in Mullion Creek NSW with a Burkard Volumetric Spore-Trap. Ascospores of *G. smithogilvyi* were captured with the highest frequency between 7-9am and 8-10pm. Climatic factors such as rainfall, relative humidity, temperature, and wind likely affect ascospore release. After the floral infection, *G. smithogilvyi* was found to live as an endophyte throughout the development phase of the chestnut, causing chestnut rot symptoms at fruit maturity.

Distribution: In Australia, *G. smithogilvyi* is present in NSW and VIC. The species has also been isolated from chestnut blight cankers in India (Dar & Rai 2011), and has been documented as an endophyte and associated with rotten chestnuts in Italy (Tamietti et al. 2010; Shuttleworth et al. 2012). It has also been reported as occurring in New Zealand (Sogonov et al. 2008; Shuttleworth et al. 2012).

Host Range: In south-eastern Australia, perithecia of *G. smithogilvyi* are overwintered on dead burrs and branches of *Castanea sativa* and *Castanea crenata* x *C. sativa* hybrids. Chestnut rot was present in all 22 orchards surveyed across NSW and VIC. The perithecia of *G. smithogilvyi* were observed in NSW on the chestnut varieties Decoppi Marone, Purton's Pride and Red Spanish. The species was also reported occurring on *C. sativa* in India and Italy (Tamietti et al. 2010; Dar & Rai 2011), and *C. crenata* and *Castanea* sp. in New Zealand (Sogonov et al. 2008).

Impact: In 2010, the disease caused estimated losses to the Australian chestnut industry of \$5.2 million (Shuttleworth 2012).

Detection and control: Orchard sanitation is key to chestnut rot management. Burr removal or the placement of a layer of organic mulch over top of burrs are options. Growing a range of varieties is recommended to spread out the flowering times and reduce the risk of floral infection.

Further Reading: Shuttleworth LA, Liew ECY, Guest DI (2012) *Gnomoniopsis smithogilvyi* sp. nov. Fungal Planet **108**. Shuttleworth LA (2012) The biology and management of chestnut rot in south-eastern Australia. PhD Thesis. The University of Sydney, Faculty of Agriculture and Environment. <http://www.fungalplanet.org/content/pdf-files/FungalPlanet108.pdf>

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