



Fig. 1. *Phytophthora inundata*; isolation from waterways using leaf baits (a); sporangium (b); hyphal swellings (c); and stellate colony type on agar (d). Photo credits: D. Hüberli (a), V. Parkunan (b, c) and C. Brasier (d).

Disease: Phytophthora root and collar rot

Classification: K: Stramenopila, C: Oomycota, O: Peronosporales, F: Pythiaceae

Phytophthora inundata (Fig. 1) was the most frequently isolated *Phytophthora* spp. from waterways across the southwest of WA. It has also been found in soil associated with dying native plant species within this region. It is reported as a pathogen of shrubs and trees in Europe and South America, especially after flooding or in waterlogged soils. Further work needs to determine the role of this species in disease and its pathogenicity on native plants.

Morphology: *P. inundata* forms non-papillate sporangia, large oogonia with thick walled oospores, amphigynous antheridia, and a stellate colony type (1). *P. inundata* is partially heterothallic. It has a fast growth rate with a high optimum temperature of 28–30°C. Analysis of the ITS sequence is recommended to confirm identity.

Distribution: *P. inundata* has been isolated from Dandaragan to Esperance and inland to Tambellup from soil/root samples only (6). It appears to be widespread in waterways in the southwest of WA (4). It has been reported in Vic, South America, northern Europe (UK, France, Denmark), and southern Europe (Spain and Italy) (1, 3, 5, 6). The extent of its distribution in Australia is not known.

Host Range: In WA, *P. inundata* has been isolated frequently from waterways in the southwest WA (1). It has also been isolated from soil beneath dying *Adenanthos cuneata*, *Banksia littoralis* and *Xanthorrhoea preissii* (2, 6). In Vic, it has been found on latent infections of *Viburnum* and from soil in carrot and parsley crops, but not associated with disease (3, 5).

In Europe and South America, it is associated with root and collar rots of ornamental and horticultural shrubs and trees (*Aesculus*, *Olea*, *Salix*, *Nicotiana tabacum*, *Prunus* and *Viburnum*), particularly during flooding, and from alfalfa roots (1, 5). It has been recovered from river water and debris, and is very pathogenic on young olive trees (1).

Impact: Currently, the pathogenicity of *P. inundata* to native Australian flora has not been determined. Additionally, it may pose a threat to commercially cultivated spp. under conducive conditions, based on its known host range. That *P. inundata* is apparently widespread in southwest WA waterways is a concern. Research needs to determine whether *P. inundata* is an opportunistic, endemic pathogen that arrives from local river systems during flooding, or whether it is an introduced and spreading alien organism (1).

Control: *P. inundata* can be detected from soil and waterways by baiting. As with other *Phytophthora* spp., appropriate water treatment and propagation hygiene are recommended in cultivations of known hosts where the pathogen is present. Control measures such as phosphite application may offer some protection, but this needs to be investigated.

References:

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