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TEMPERATURE CHANGES RESISTANCE OF CLONAL *EUCALYPTUS MARGINATA* TO *PHYTOPHTHORA CINNAMOMI*D HÜBERLI¹, IC TOMMERUP², GESTJ HARDY¹ and IJ COLQUHOUN³

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Background and objectives

Eucalyptus marginata (jarrah) varies in its resistance to colonization by the introduced pathogen, *Phytophthora cinnamomi*. This trait has been exploited to yield jarrah clones ranging in resistance to *P. ;cinnamomi* [1]. However, isolates of *P. ;cinnamomi* vary in their capacity to induce disease in resistant jarrah clones, with no association between pathogenicity levels and either A1 and A2 mating types or isozymes types [2]. We have shown that isolates differ in their capacity to colonize jarrah and marri (*E. ;calophylla*) tissue. Disease outbreaks in jarrah, other native vegetation and horticultural crops due to *P. cinnamomi* are more likely to occur in warm moist conditions. These factors raise questions about the interactions between the pathogen, hosts and temperature, and consequent disease development.

Materials and methods

To assess the durability of resistance in jarrah at different temperatures, development of disease caused by *P. ;cinnamomi* in three jarrah clones was measured at 15, 20, 25 and 30°C. Resistant and susceptible clonal trees were used. A pathogenic isolate of *P. ;cinnamomi*, selected on the basis of previous experiments using clones, was inoculated under the bark on the stem above the soil surface. Tree survival was monitored. Stems from dead plants (100% leaves permanently wilted) were plated onto a *Phytophthora*-selective agar medium to confirm the presence of *P. cinnamomi*.

Results and conclusions

At high temperatures (25 and 30°C), survival of all clones was low compared with that at low temperatures (15 and 20°C). The susceptible clone survived longer than both resistant clones at the high temperatures. At low temperatures there was no difference between the susceptible and one resistant clone; however, the other resistant clone survived longer than the susceptible one at 15 and 20°C. *P. ;cinnamomi* was recovered from all dead plants.

Temperature appears to have a direct effect on host resistance since susceptible clones survived longer than the resistant ones at high temperatures. Temperature is therefore a major factor for inclusion in the screening stage of programmes breeding and selecting for tree resistance to *P. ;cinnamomi*.

References

1. Stukely MJC, Crane CE, 1994. *Phytopathology* 84, 650-6.
2. Dudzinski MJ, Old KM, Gibbs RJ, 1993. *Australian Journal of Botany* 41, 721-32.