

COMPARISON OF 'SAPROPHYTIC' AND 'PATHOGENIC' ISOLATES OF *GUIGNARDIA CITRICARPA* USING SEQUENCE ANALYSIS

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The disease citrus black spot is caused by the fungus *Guignardia citricarpa*. In New Zealand *G. citricarpa* is a biosecurity risk because citrus black spot has not been recorded, and if present would cause market access problems for exported citrus fruit. *Guignardia citricarpa* is closely related to a saprophytic fungus, *Guignardia mangiferae*. There is a record of *G. citricarpa* isolated from citrus fruit in New Zealand. This isolate was identified on the basis of morphological features. It has recently been shown by other workers that the saprophytic and pathogenic species of *Guignardia* cannot be morphologically distinguished. Based on analysis of sequence data, the results presented here show that the fungus previously identified as *Guignardia citricarpa* in New Zealand is *Guignardia mangiferae*, a saprophyte that does not constitute a market access problem for exported citrus.

TRANSFORMATION OF ONION (*ALLIUM CEPA* L.) WITH A GENE ENCODING AN ANTIMICROBIAL MAGANININ PEPTIDE TO ENHANCE DISEASE RESISTANCE

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Allium white rot (AWR), caused by the soil-borne fungus *Sclerotium cepivorum* (Berk.), is the predominant disease of onion crops worldwide. This disease is difficult to control using conventional methods due to the resilience and longevity of soil-borne sclerotia. No naturally occurring source of genetic resistance has been identified. Therefore, the development of onions, which express traits with the potential to confer resistance to pathogenic microbes, would be a major advance for onion breeding. The aim of this research was to create disease resistant onions transformed with a synthetic antimicrobial magainin II peptide (*mgd*) from the African Clawed Frog (*Xenopus laevis*) using *Agrobacterium*-mediated transformation. The *mgd* gene was inserted into binary vectors containing the green fluorescent protein visual selection marker (*gfp*) and either the phosphomannose isomerase (*pmi*) selection gene or the neomycin phosphotransferase II (*nptII*) gene. Approximately 13,000 immature onion embryos were transformed with the *mgd* gene construct, from which four lines of onions have been successfully ex-flasked from tissue culture to the GMO containment glasshouse. Two transgenic lines containing the *mgd* gene were identified by PCR and Southern analyses. These plants will now be assessed for expression of the antimicrobial peptide and improved disease resistance.