

Title Protopectinase activity of polygalacturonases from pathogenic and nonpathogenic isolates of *Geotrichum candidum* governs their pathogenicity to citrus fruit

Author M. Nakamura, K. Nakamura and H. Iwai.

Citation Journal of Plant Pathology Volume 90 (2, Supplement) August 2008, Book of Abstract, 9th International Congress of Plant Pathology, August 24-29, 2008 Torino, Italy,. 507 pages.

Keywords citrus; *Geotrichum candidum*; sour rot

Abstract

Geotrichum candidum is a yeast-like fungus that causes diseases in humans, animals and plants. As a phytopathogen, the fungus causes sour rot, which is an important cause of postharvest loss of citrus fruit and has been reported from many areas in the world where citrus is grown. *G. candidum* is divided into two types based on pathogenicity to citrus fruit. The citrus type is pathogenic, and the non-citrus type is nonpathogenic. Morphologically, both types are indistinguishable. Both fungi secrete polygalacturonase (PG) which is thought to be a factor in pathogenicity. Thus, to elucidate whether PGs are really involved in pathogenicity, S31PG1 and S63PG1, derived from citrus and non-citrus types respectively were expressed in the fission yeast *Schizosaccharomyces pombe* and their PG and protopectinase (PP) activities were measured. S31PG1 showed high PG and PP activities, and severely degraded lemon peel, whilst S63PG1 showed only PG activity but none of PP, and did not degrade lemon peel at all. These results indicate that the different PP activities of the PGs are a key to the pathogenicity of *G. candidum* to lemon fruit. Interestingly, comparison of both PG structures predicted by the homology modelling method showed that the regions which sandwich the catalytic site differ significantly in the two PG proteins, suggesting that the different structures of the regions might influence the affinity to pectic substance (protopectin) in lemon peel and thereby determine binding.