Enzymatic differences between the endophyte Guignardia mangiferae (Botryosphaeriaceae) and the citrus pathogen G. citricarpa

A.S. Romão¹, M.B. Spósito², F.D. Andreote¹, J.L. Azevedo³ and W.L. Araújo¹

¹Departamento de Genética, Escola Superior de Agricultura “Luiz de Queiroz”, Universidade de São Paulo, Piracicaba, SP, Brasil
²Fundecitrus, Departamento Científico, Araraquara, SP, Brasil
³Laboratório de Biologia Molecular e Ecologia Microbiana, NIB, Universidade de Mogi das Cruzes, Mogi das Cruzes, SP, Brasil

Corresponding author: W.L. Araújo
E-mail: wellingtonluiz@umc.br

Received July 27, 2010
Accepted November 11, 2010
Published February 15, 2011
DOI 10.4238/vol10-1gmr952

ABSTRACT. The endophyte Guignardia mangiferae is closely related to G. citricarpa, the causal agent of citrus black spot; for many years these species had been confused with each other. The development of molecular analytical methods has allowed differentiation of the pathogen G. citricarpa from the endophyte G. mangiferae, but the physiological traits associated with pathogenicity were not described. We examined genetic and enzymatic characteristics of Guignardia spp strains; G. citricarpa produces significantly greater amounts of amylases, endoglucanases and pectinases, compared to G. mangiferae, suggesting that these enzymes could be key in the development of citrus black spot. Principal component analysis revealed pectinase production as the main enzymatic characteristic that distinguishes these Guignardia species. We quantified the activities of pectin lyase, pectin methylesterase and endopolygalacturonase; G. citricarpa and G. mangiferae were found to have significantly different pectin lyase and endopolygalacturonase activities. The pathogen G. citricarpa is more effective in pectin degradation. We concluded that...
there are significant physiological differences between the species *G. citricarpa* and *G. mangiferae* that could be associated with differences in pathogenicity for citrus plants.

**Key words:** Citrus black spot; Fungal-plant interaction; Pectinase; Hydrolytic enzymes; Endophyte; Citrus pathogen