Title Antifungal activity of extracts of extremophile plants from the Argentine Puna to control citrus postharvest pathogens and green mold

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Abstract

A main constraint on the citrus industry is the management of postharvest diseases, mostly of fungal origin. The fungicides used to control these diseases: (1) leave persistent residues that raise some dietary concerns; (2) cannot be used on fruit produced under 'organic' rules; and, (3) have experienced resistance to them become widespread within citrus packinghouses. Consequently, the development of management strategies to supplement or replace the use of synthetic fungicides by the utilization of microorganisms or natural bioactive products is desirable. The aim of this work was to screen extremophile plants from the Argentine Puna in order to select species with antifungal activity against *Penicillium digitatum* and *Geotrichum citri-aurantii*, two very important fungal species causing citrus postharvest disease. Plant aqueous extracts obtained from *Chuquiraga atacamensis*, *Parastrephia phyliciformis* and *Parastrephia lepidophylla*, were able to inhibit *in vitro P. digitatum* growth, while *P. lepidophylla* extract was active against *G. citri-aurantii* cultures. *P. lepidophylla* aqueous formulations showed MIC_{100} values of 300 mg/L against both *P. digitatum* and *G. citri-aurantii* strains. MFC values of *P. lepidophylla* extracts were similar to MIC_{100} values. *In vivo* tests showed that the *P. lepidophylla* aqueous formulations (600 mg/L) exert curative and protective effects on the fruit against infection by a *P. digitatum* wild strain.