

Control of *Penicillium digitatum* on Citrus Fruit Using Two Plant Extracts and Study of Their Mode of Action

Sissay B. Mekbib,^{1,2,*} Thierry J.C. Regnier¹ and Lise Korsten¹

Extracts from two plants from Ethiopia, *Withania somnifera* and *Acacia seyal*, were evaluated for their potential as natural biopesticides and to study their mode of action. Methanolic extracts of these plants were tested *in vivo* on citrus fruit for their efficacy to control *Penicillium digitatum* when applied on wounded or unwounded fruit surfaces. Relative to the control, 70% and 75% of wound – inoculated fruit did not develop decay symptoms for up to 21 days of storage at 25°C and >85% r.h. An increase in cell wall-bound phenolics was evident in wounded fruit treated with plant extracts and inoculated with a spore suspension of *P. digitatum*. Scanning electron microscopy revealed deposition of crystalline plant material sticking to the pathogen and around the wound site. The application of the plant extracts increased the epiphytic background total microbial population but decreased diversity.

KEY WORDS: Citrus fruit; postharvest diseases; natural compounds; plant phenolics; host resistance.

Received July 13, 2006; accepted Dec. 19, 2006; <http://www.phytoparasitica.org> posting May 7, 2007.

¹Dept. of Microbiology and Plant Pathology, University of Pretoria, Pretoria 0002, South Africa. *Corresponding author [Fax: +27-12-420-4588; e-mail: s23311194@tuks.co.za].

²Dept. of Plant Science, Alemaya University, DireDawa, Ethiopia.