

Title Antifungal activities of polyhexamethylene biguanide and polyhexamethylene guanide against the citrus sour rot pathogen *Geotrichum citri-aurantii* *in vitro* and *in vivo*

Author Linyan Feng, Fuwang Wu, Jing Li, Yueming Jiang and Xuewu Duan

Citation Postharvest Biology and Technology, Volume 61, Issues 2-3, August-September 2011, Pages 160-164

Keywords Polyhexamethylene biguanide; Polyhexamethylene guanidine; Citrus; *Geotrichum citri-aurantii*; Sour rot

Abstract

Polyhexamethylene biguanide (PHMB) and polyhexamethylene guanide (PHMG) are broad-spectrum antibacterial agents. Experiments were conducted to investigate the antifungal activities of PHMB and PHMG against a major citrus sour rot pathogen *Geotrichum citri-aurantii* both *in vitro* and *in vivo*. PHMG and PHMB treatments significantly inhibited arthroconidia germination and mycelial growth of *G. citri-aurantii* *in vitro*. PHMG and PHMB at 5 mg/L inhibited 97.8% and 95.8% of the germination of *G. citri-aurantii* arthroconidia, respectively. Observations by light microscopy, scanning electron microscopy (SEM) and transmission electron microscopy (TEM) further showed ultrastructural alterations caused by PHMG or PHMB treatments, including distortion, deformation and concave collapse in hyphae, plasma membrane disruption in both hyphae and arthroconidia, and cell wall damage in arthroconidia. Use of PHMG and PHMB significantly ($P < 0.05$) reduced sour rot development on artificially inoculated 'Shatang' mandarin fruit. Overall, PHMG and PHMB could be alternative means for control of postharvest sour rot of citrus fruit.