

Chlorogenic acid induces ROS-dependent apoptosis in *Fusarium fujikuroi* and decreases the postharvest rot of cherry tomato

Kai Kai, Rui Wang, Wanling Bi, Zhitao Ma, Wei Shi, Yingwang Ye and Danfeng Zhang

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Abstract

Chlorogenic acid is a plant polyphenol with antioxidant and antimicrobial activities. *Fusarium fujikuroi* is a fungal pathogen that causes many vegetables and fruits, including tomato, to rot. The effects of chlorogenic acid on the development of *Fusarium* rot of cherry tomato fruit were examined in the present study. Results showed that conidial germination, germ tube elongation, cell viability, and mycelial growth of *F. fujikuroi* were all significantly inhibited by chlorogenic acid. Chlorogenic acid stimulated the accumulation of reactive oxygen species (ROS), leading to cell apoptosis in *F. fujikuroi*. The addition of N-acetylcysteine partially recovered the mycelial growth, implying the antifungal activity of chlorogenic acid is related to a ROS burst. The application of chlorogenic acid decreased disease incidence and severity in cherry tomato fruit in a concentration-dependent manner. Taken together, these results suggest that chlorogenic acid inhibits the postharvest rot of cherry tomato fruit caused by *F. fujikuroi* by inducing cellular oxidative stress in the pathogen.