

Determination of in vitro Antagonistic Activity of *Burkholderia ambifaria* against Fungal Storage Diseases in Citrus Fruits

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Abstract

Postharvest fungal diseases in mandarin fruits cause significant economic and nutritional losses during transport and storage. The control of postharvest diseases in citrus fruit involves frequent and large amounts of chemical fungicides. Increasing concerns about health hazards and environmental pollution caused by the use of chemicals have necessitated the development and use of environmentally friendly control strategies as an alternative to chemicals for the control of post-harvest diseases in citrus fruits. The bacterial isolates as biological control agents (BCAs) are one of the most suitable alternatives to synthetic fungicides, which are banned or restricted for use in post-harvest disease management. Fungal diseases such as black mould (*Aspergillus niger*), blue mould (*Penicillium italicum*), green mould (*Penicillium digitatum*), sour rot (*Geotrichum citri-aurantii*), and anthracnose (*Colletotrichum gloeosporioides*) cause the most significant postharvest losses in citrus fruit. The BCA bacterial isolate used in this study was isolated from healthy mandarins and identified as *Burkholderia ambifaria* by Matrix Assisted Laser Desorption Ionisation Time of Flight-Mass Spectrometry (MALDI TOF MS; MicroFlex LT, Bruker Daltonics, Bremen, Germany) analysis. In this study, the antagonistic activity of *B. ambifaria* on the inhibition of mycelial growth of *A. niger*, *P. italicum*, *P. digitatum*, *G. citri-aurantii* and *C. gloeosporioides* isolated from mandarin fruits was determined *in vitro* conditions. In dual culture tests, the BCA *B. ambifaria* isolate inhibited the mycelial growth of *C. gloeosporioides* by 66.67%, *A. niger* by 69.40%, *G. citri-aurantii* by 73.33%, *P. italicum* and *P. digitatum* by 77.78%. The high level of antagonistic activity of the bacterial isolate in inhibiting the mycelial growth of fungal pathogens showed that the *B. ambifaria* has the potential to be used as a BCA against diseases occurring during post-harvest storage.

Key Words: Citrus; Biological control; *Burkholderia ambifaria*, MALDI TOF MS

