

# Assessment of antifungal activities of a biocontrol bacterium BA17 for managing postharvest gray mold of green bean caused by *Botrytis cinerea*

Yonggang Li, Yanan Cai, Yanbo Liang, Pingsheng Ji and Lankun Xu

Postharvest Biology and Technology, Volume 161, March 2020, 111086

---

## Abstract

Gray mold incited by *Botrytis cinerea* is one of the most important postharvest fungal diseases of green bean that causes significant loss in the production, processing, storage, and transportation of green bean worldwide. Management of the disease relies on chemical fungicides that have detrimental effects on the environment and human health. In this study, a bacterial strain BA17, identified as *Bacillus amyloliquefaciens*, exhibited strong antifungal effect against *B. cinerea*. Filtrate of BA17 liquid culture, when applied at 1 %, 5 % and 10 %, reduced spore germination, spore production and mycelial growth of *B. cinerea* significantly. Mycelium treated by BA17 filtrate appeared swelling and dehydrated malformation, protoplasm aggregation, and mitochondria became bigger and more numerous with defective cell walls. Assessment of activities of intrasporic and extrasporic antagonistic substances of BA17 indicated that active substances were primarily produced outside the bacterial cell. The active substances produced by BA17 were sensitive to heat, had optimum efficacy at pH 8.0, and were relatively resistant to ultraviolet irradiation. Inhibitory effect of BA17 was not different significantly when stored at 4 or 25 °C for 120 d. BA17 filtrate, when applied at 10 %, reduced gray mold on green bean by more than 90 % in repeated experiments. It also provided significant preservative effects on green bean by reducing decay rate and rust spots and maintaining better hardness and color. The biocontrol agent BA17 has great potential for control of postharvest gray mold on green bean and improvement of green bean quality in practical production.