Title Effects of sodium bicarbonate on pathogenicity of *Colletotrichum musae* and potential for controlling postharvest diseases of banana

Author D.M. De Costa and H.M.D.M. Gunawardhana

Citation Postharvest Biology and Technology. Volume 68, June 2012, Pages 54–63

Keywords Biological control; *Colletotrichum musae*; *B. spinosa*; GRAS compounds; Fruit peel characters

Abstract

The effects of sodium bicarbonate ($NaHCO_3$) on pathogenicity of *Colletotrichum musae* and its potential to control postharvest diseases of bananas were determined. Addition of $NaHCO_3$ reduced mycelial growth, spore production, spore germination and appressoria production of *C. musae*, in vitro by increasing pH (from 6.9 to 8.7) of the culture medium (PD broth). The pH of 8.59, created by 100 mM $NaHCO_3$ completely inhibited spore production. Postharvest dip treatment in 300 mM $NaHCO_3$ for 10 min reduced the lesion area of anthracnose on artificially inoculated banana fruit. Natural infections of anthracnose, crown rot and blossom end rot were also reduced significantly in fruit that were treated with 300 mM $NaHCO_3$ for 10 min. Efficiency of integrating $NaHCO_3$ with a bacterial antagonist, *Burkholderia spinosa* for controlling postharvest diseases of bananas was also determined. Dipping banana fruit in 300 mM $NaHCO_3$ solution for 10 min followed by dipping in *B. spinosa* suspension in nutrient broth (cell concentration 1×10^8 cfu/mL) effectively controlled anthracnose, crown rot and blossom end rot of bananas (var. Kolikuttu). Dipping bananas in 300 mM $NaHCO_3$ increased pH, total soluble solids and thickness of the fruit peel which may have an indirect or cumulative effect on the reduction of postharvest disease development in bananas.