Regulation of inducible enzymes and suppression of anthracnose using submicron chitosan dispersions

ABSTRACT

The mechanism of suppression of Colletotrichum gloeosporioides was studied by using submicron chitosan dispersions. In vitro and in vivo experiments showed that mycelial growth and disease incidence/ severity were significantly ($P < 0.05$) suppressed in 600 nm submicron chitosan dispersion at 1% chitosan concentration. Field trials showed that host resistance was stimulated in dragon fruit plants at all the submicron chitosan dispersions (SCD) used. Results showed that the application of SCD significantly enhanced the production of plant-defense related enzymes such as PO, PPO and PAL. A further increase in inducible compounds and PR proteins was observed in plants inoculated with C. gloeosporioides. Increase in inducible compounds and delayed symptoms of anthracnose indicated the possible mechanism of induced resistance. However, the resistance decreased with the passage of time which could be due to highly stressed environment of the plants. Therefore, it is suggested that the plants should be sprayed with SCD to sustain the absolute effect.

Keywords: Disease incidence; Dragon fruit plants; Peroxidases; PO; PAL