



Thesis Abstract

Antagonistic Bacteria for Controlling Fusarium Wilt of Tomato Caused by *Fusarium oxysporum* f. sp. *lycopersici*

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Four bacterial isolates, namely: *Serratia marcescens*, *Burkholderia cepacia*, *Pseudomonas aeruginosa* 1, and *P. aeruginosa* 2 obtained from the rhizosphere of tomato plants in the field which were antagonistic to the growth of *F. oxysporum* f sp. *lycopersici* *in vitro*, were evaluated for their ability to suppress Fusarium wilt disease of tomato in the glasshouse. The tomato plants were planted in growth media consisting of Holland RHP[®] peat grow, coconut peat, and perlite in the ratio of 1:1:1 (v/v). Tomato plants were watered using the drip irrigation system for distribution of hydroponics fertilizer solution. Repeated applications of 10 ml of bacterial suspension were applied at 10 days and 20 days after sowing at a concentration of 1×10^8 cfu ml⁻¹.

Plant inoculated with all four antagonistic bacteria, individually and in mixture showed increasing plant growth. Application of these bacteria significantly increased fresh weight, dry weight, plant height, and initial flowering of tomato plants. *B. cepacia* and *P. aeruginosa* 1 were found to suppress disease severity up to 100 percent, both at seedling stage and standing crops.

Plants treated with mixture of *B. cepacia*, *P. aeruginosa* 1, and *P. aeruginosa* 2 significantly increased the marketable fruit yield in artificially infected plants compared to the control, although there was no significant difference as between the single treatments of the four bacterial isolates.

The experiment carried out in this study indicated that the four antagonistic bacteria functioned as plant growth promoters as well as biological control agents for Fusarium wilt of tomato.