Abstract

*Ralstonia solanacearum* causes a lethal bacterial wilt disease in many different plants. The bacterium has been reported from four continents such as Asia, Africa, South America and North America. The bacterium is now known as the second most plant pathogenic bacterium. The objective of this thesis is to standardize various molecular genetic techniques in the laboratory to address different questions relating to pathogenesis of the bacterium. The present thesis has four major chapters excluding the conclusion and future aspects.

In chapter 1, a brief introduction to *R. solanacearum* has been given. In this section different ongoing research activities in *R. solanacearum* has been mentioned briefly. This follows the objectives of the PhD work that has been undertaken for the study. Lastly review corresponding to the objectives, present status has been written under the section review of literature.

In chapter 2, different methodologies and strategies followed while collecting, isolating, identifying and molecular characterization of a *R. solanacearum* strain named as F1C1 from nearby Tezpur University campus, Tezpur, India have been discussed. The strain has been identified as a Phylotype I representative of *R. solanacearum*.

In chapter 3, standardization of an infection methodology to study pathogenicity due to *R. solanacearum* using tomato seedlings as host has been discussed. This methodology has important aspects with respect to reduced time, space consumption and economics. It is expected to supplement the earlier methodologies followed in several ways, ignoring the shortcomings.

In chapter 4, the characterization of two hemagglutinin adhesion functions namely RSc0887 and RSp0540, has been described. Insertion mutations in these two genes are created by antibiotic resistant Ω cassette. Expression of these two genes were studied by reporter gene fusion and quantitative PCR.

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1 Rahul Kumar  
*Ph. D. Thesis, Tezpur University,*
During the course of this PhD research several interesting questions relating *R. solanacearum* pathogenesis have come to our notice. These questions have been included in conclusion and future aspects sections.