

Cell to Cell Communication Found to Regulate Pathogenesis in *Pectobacterium carotovorum* pv. *carotovorum* for Soft Rot in Tomato

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Abstract

Gram-negative bacteria regulate specific gene expression in a population density dependant manner by sensing level of acyl-homoserine lactone (AHL) signal molecules which they produce (also called Autoinducer) and liberate to the environment, termed as Cell to cell communication or Quorum sensing (QS). In the present experiment bioreporter strain (*Agrobacterium tumefaciens*-NTL4 and *Chromobacterium violaceum* -CV026) mediated assay were used for detection and quantification of quorum sensing signals. The isolated strain of *Pectobacterium carotovorum* pv. *carotovorum* (*Pcc*) (Gene Bank Accession Number: GU590785), a soft rot causing plant pathogenic bacteria found to produce three different signal molecules for pathogenesis in tomato plant which were chemically confirmed as 3-oxo-hexanoyl homoserine lactone (C6-OHHL) and 3-unsubstituted hexanoyl homoserine lactone (C6-HHL) and C10-3-undecanoyl homoserine lactone. A mutant strain of *Pcc* (JBC1, cryptic in QS signal production) was found completely avirulent. The isolated strain which was found to produce multiple signal molecules and also found more virulent while compared with standard *Pcc* (MS1) under optimum growth conditions in laboratory. Therefore, we speculate that production of multiple autoinducers allows a growing population of bacterial cells to induce and produce more virulent factors, hence, to result in intensive pathogenesis.

Keywords: Cell to cell communication, Pathogenesis, Quorum sensing