International Journal of Agricultural Sciences
Volume 9 | Issue 1| January, 2013 | 14-23

RESEARCH PAPER

Morphological and biochemical characterization of antagonist *Pseudomonas* isolates

N. SRINIVASA[1], H. RYMBAI*, A.M. RAJESH[1], P. GANESHAMOORTHI[1], B. RAMANUJAM[2] AND K.R. YATHISH[3]

Deprtment of Fruit Science, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, NAVSARI (GUJARAT) INDIA (E-mail address: rymbaihort@gmail.com)

Abstract : The morphological and biochemical characterization of phylloplane and rhizosphere *Pseudomonas* isolates collected from different places were determined. The *Pseudomonas* isolates antagonistic activity against *Alternaria solani,* were also tested to determine their capacity to inhibit fungal infection on tomato. The result showed that among the seven isolates of *Alternaria solani* on potato dextrose agar, isolate HES AL-1 recorded maximum growth coupled with distinct sporulation and colony characteristics. Based on morphological and biochemical characterization of the twelve bacterial antagonists, ten genuses belong to *Pseudomonas* while two were of Flourescent *Pseudomonas.* It was also confirmed that the growth of all the seven isolates of *Alternaria solani* was significantly inhibited by the antagonists *Pseudomonas* in potato dextrose agar (PDA) conditions. Out of twelve *Pseudomonas* isolates, five isolates *viz.*, S4B7P (27.74), S1B8P (27.33), S2B10P (25.47), S3B3PF (23.07) and S1B1P (19.69) which showed higher mean inhibition percentage on all the isolates of *Alternaria solani* were identified as potential antagonistic against *Alternaria solani*. Further, in pot culture under green house conditions, among the five promising isolates of *Pseudomonas* isolates, S1B8P isolate and S3B3PF isolate expressed the minimum mean per cent disease incidence (PDI) in all the three methods of inoculation. While, among the three methods of inoculation tested, pre inoculation of *Pseudomonas* antagonists followed by *Alternaria solani* showed the minimum PDI (20.68). Therefore, foliar application of *Pseudomonas* antagonists before inoculation with pathogens may reduce the incidence of early blight in tomato.

Key Words : Morphological and biochemical characterization, *Pseudomonas* antagonists, *Alternaria solani,* Tomato

View Point Article : Srinivasa, N., Rymbai, H., Rajesh, A.M. Ganeshamoorthi, P., Ramanujam, B., Yathish, K.R. (2013). Morphological and biochemical characterization of antagonist *Pseudomonas* isolates. *Internat. J. agric. Sci.*, **9**(1): 14-23.

Article History : Received : 15.03.2012**; Revised :** 05.08.2012**; Accepted :** 04.10.2012

INTRODUCTION

Tomato (*Lycopersican esculentum* Mill) a native of South America, belongs to the family Solanaceae and is one of the most importance vegetables in the world. Among vegetables, tomato ranks next to potato in the world acreage and first among processing crop (Anonymous, 2012). In India, it occupies an area of about 8.6 lakh ha with an annual production of 165.2 lakh tones (Anonymous, 2011). The total global area under tomato annually is 45.82 lakh ha with production of 11505.1 lakh tones (Anonymous, 2011). However, this crop suffers from several diseases like damping off, wilts, leaf curl, leaf spots, early blight or fruit rot and buckeye rot (Balanchard, 1992). Among which, early blight and fruit rot caused by *Alternaria solani* (Ell and Martin) is the world's most catastrophic diseases incurring loss both at pre and post harvest stages of tomato. The disease appears at all stages of the crop and causing losses up to 50-86 per cent in fruit yield (Mathur and Shekawat, 1986). At present, the strategy for management of the disease is based mainly on fungicidal application. Chemical fungicides used in management of these diseases are not only costlier but also harmful to the environment, beneficial organisms and human beings. Hence, in order to minimize the fungicidal application,

*** Author for correspondence**
[1]Division of Plant Pathology, Indian Agricultural Research Institute, NEW DELHI, INDIA
[2]Plant Pathology, Project Directorate of Biological Control, Hebbal, BENGALURU (KARNATAKA) INDIA
[3]Directorate of Maize Researh, Indian Council Agricultural Research, NEW DELHI, INDIA