



Research Article

Screening of *Bacillus* isolates against *Aspergillus niger* causing collar rot of groundnut

■ G. PRABAKARAN^{1*} AND T. RAVIMYCIN²

¹P.G. and Research, Department of Botany, Government Arts College, DHARMAPURI (T.N.) INDIA

²Ecology and Environment Lab, Department of Botany, Annamalai University, ANNAMALAINAGAR (T.N.) INDIA

ARTICLE INFO

Article Chronicle :

Received : 08.12.2011

Revised : 10.12.2011

Accepted : 28.02.2012

Key words :

Antagonism, Collar rot, *Bacillus*,
Aspergillus niger, Dual culture

*Corresponding author:

gpbiotek@gmail.com;

gpbiotek@yahoo.co.in

ABSTRACT

The investigation was carried out on the biocontrol of common collar rot of groundnut caused by *Aspergillus niger* by using isolates of *Bacillus*. The four isolates of *Bacillus* were isolated from the groundnut rhizosphere soil. Each isolate was characterized and identified and designated as B1 to B4. *A. niger* was isolated from rhizosphere soil of groundnut. The B1 isolate showed medium inhibitory activity (45.73%) on radial growth of *A. niger* on 96 hours incubation in dual culture method. Maximum per cent inhibition of radial growth of fungi was observed with isolates of B-1 (48.98%) in volatile method. Groundnut seed inoculated with bioisolate showed highest percentage of seed germination and B₂, B₃ and B₄ isolates produced 66.66 per cent, 57.98 per cent and 50.15 per cent mortality, respectively.

How to view point the article : Prabhakaran, G. and Ravimycin, T. (2012). Screening of *Bacillus* isolates against *Aspergillus niger* causing collar rot of groundnut. *Internat. J. Plant Protec.*, **5**(1) : 111-115.

INTRODUCTION

Plant diseases need to be controlled to maintain the quality and abundance of food, feed, and fiber produced by growers around the world. Different approaches may be used to Control plant diseases, Such as chemical fertilizers and pesticides. The environmental pollution caused by excessive use and misuse of agrochemicals some pest management have focused their efforts on developing alternative inputs to synthetic chemicals for controlling pests and diseases. Among these, alternatives are those referred to as biological control. Members of the U.S. National Research Council took into account modern biotechnological developments and referred to biological control as the use of natural or modified organisms, genes, or gene products, to reduce the effects of undesirable organisms and to favor desirable organisms such as crops, beneficial insects, and microorganisms”, but this definition spurred much subsequent debate and it was frequently considered too broad by many’ scientists who worked in the field (US Congress, 1995). The use of a gram-positive *Bacillus* species as a biocontrol agent is relatively rare, and has received less intensive study than the use of gram-negative bacteria. The antagonists studied have been mainly *Bacillus subtilis* and occasionally *B. megaterium*, *B.*

cereus, *B. pumilus*, and *B. polymyxa* (Utkhede, 1984). As *Bacillus* spp. have the characteristics of, being widely distributed in nearly all agricultural soils and in other environments, having high thermal tolerance, showing rapid growth in liquid culture, and readily form resistant spores. Moreover, they are considered safe biological agents, and their potential as Bio-control agents is considered to be high. However, the evaluation of bacteria has focused primarily on disease suppression (Siala and Gray, 1974).

Bacillus spp. can be used as biological control agent for bacteria and fungal diseases like gray mold, powdery mildews, early and late blight, bacterial spot and walnut blight through production of antimicrobial proteins namely bacteriocin, chitinase, glucanase etc and antibiotics as well as antifungal synthesized by secondary metabolism pathways.

MATERIALS AND METHODS

Isolation of *Bacillus* isolates:

Rhizosphere soil samples obtained from agriculture fields cultivated with groundnut from several location of Dharmapuri district and brought to laboratory in polythene bag. For isolation of *Bacillus* species, each gram of soil sample was suspended in 99ml of sterile distilled water and shaken