

RESEARCH ARTICLE

# Biological control of phytophthora foot rot (*Phytophthora capsici*) of black pepper (*Piper nigrum* L.) in Central-Western ghats

■ M. S. LOKESH\*<sup>1</sup>, S. V. PATIL<sup>2</sup>, S.B. GURUMURTHY<sup>2</sup>, M.G. PALAKSHAPPA<sup>3</sup> AND M. ANANDARAJ<sup>4</sup>

<sup>1</sup>AICRP on Spices, Horticulture Research Station (U.H.S.) Sirsi, UTTARA KANNADA (KARNATAKA) INDIA

<sup>2</sup>College of Horticulture (U.H.S.) Sirsi, UTTARA KANNADA (KARNATAKA) INDIA

<sup>3</sup>AICRP on Sesame and Niger, University of Agricultural Sciences, DHARWAD (KARNATAKA) INDIA

<sup>4</sup>Indian Institute of Spices Research, CALICUT (KERALA) INDIA

## ARTICLE INFO

Received : 09.11.2012

Accepted : 30.03.2013

## Key Words :

Black pepper, *Trichoderma viride*, *T. harzianum*, *Laetisaria arvalis*, *Bacillus subtilis*, Foot rot

\*Corresponding author:  
lokeshsirsi@rediffmail.com

## ABSTRACT

Phytophthora foot rot (*Phytophthora capsici*) of black pepper (*Piper nigrum* L.) is most devastating disease in Uttara Kannada district of Karnataka which is situated in Central Western Ghats. The antagonistic organisms viz., *Trichoderma viride*, *T. harzianum*, *Laetisaria arvalis*, and *Bacillus subtilis* were tested against *P.capsici* in pot culture by adding infected material to healthy vine. Among the four bioagents tried, *Trichoderma viride* and *T. harzianum* were effective in reducing the incidence of the disease as compared to *Laetisaria arvalis*, and *Bacillus subtilis*. The disease incidence was maximum in untreated vines.

**How to view point the article :** Lokesh, M.S., Patil, S.V., Gurmurthy, S.B., Palakshappa, M.G. and Anandaraj, M. (2013). Biological control of phytophthora foot rot (*Phytophthora capsici*) of black pepper (*Piper nigrum* L.) in Central-Western ghats. *Internat. J. Plant Protec.*, 6(1) : 139-141.

## INTRODUCTION

Black pepper (*Piper nigrum* L.) spice native to Western Ghats is cultivated in arecanut gardens under multistoried cropping system in Uttara Kannada district of Karnataka which is situated in Central Western ghats. The vines are trained on the trunks of arecanut as standards to generate additional income and effective utilization of natural resources like soil, water, sunlight, nutrients etc. Black pepper is one of the heritage spice crops used in culinary and preparation of Ayurvedic medicines.

The Phytophthora foot rot of black pepper (*Phytophthora capsici* Leonion) was first reported in India as *Phytophthora palmivora* (Butler) Butler in pepper gardens of Kerala by Sam Raj and Jose (1966). In the years 1978 to 1979 the disease appeared in epiphytotic form and resulted in huge loss in the form of destruction of vines in the pepper belt of Uttara Kannada (Sastry and Hegde, 1980). The soil borne

pathogen, *P. capsici* infects all parts of vine viz., leaves, stem, collar, inflorescence, spike, roots and results in leaf rotting, yellowing, defoliation, wilting and finally leads to death of the vines. The disease starts with the onset of South West monsoon (June) with symptoms on lower leaves of the vine as brown circular with fimbriate margins. Disease becomes severe during middle of the monsoon (July to October) with leaf rotting, inflorescence and spike dropping, rotting of collar region which result in sudden wilting of the vine. During end of the monsoon (November and December) root rot results in yellowing, drooping of leaves, defoliation, followed by wilting and death of the vine.

As the pathogen is soil borne, it is very difficulty to manage the disease with fungicide alone. As the produce is export oriented in recent years, clean produce is preferred to fetch high price in the international market. It is possible with the use of effective biocontrol agents with longer lasting effect