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DETECTION OF SENSITIVITY AND COMPATIBILITY OF AZOXYSTROBIN 25 SC FUNGICIDE WITH BIOCONTROL AGENTS

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Abtsract

The results conducted on the compatibility of Azoxystrobin 25 SC with Pf1 strain of P.fluorescensandBs1 of B.subtilis indicated that Azoxystrobin 25 SC was highly compatible with P. fluorescens and B.subtilis.The Streptomyces roschi is also compatible at all concentration when tested under poisoned food technique

***Key words**: Azoxystrobin 25 SC- Poisoned food technique- Bacterial Antagonist*

Introduction

Chilli (*Capsicum annum*) is the fourth most important vegetable crops in the world and first in Asia, with world production approximately 122.34 million tonnes of fresh chilli and 2.8 tones of dry chilli in 2010 (Indian Horticultural Database, 2011-2012). The most important producers and exporters of chilli include China, India, Mexico, Morocco, Pakistan, Thailand and Turkey. Demand for chilli in the world is increasing every year. Chilli is a very remunerative spice crop of the Indian subcontinent (Sharma et al., 2005) and occupies an area of about 0.81 million ha (Suthin and Christopher, 2009) which accounts for 25% of the world production (Chandra Nayaka et al., 2009). Azoxystrobin was produced by the Basidiomycetes fungus, *Strobilurustenacellus*having novel mode of action(Hewit, 1998). Its fungicidal activity results from the inhibiting mitochondrial respiration of higher fungi, which is achieved by the prevention of Electron transfer between cytochrome b and cytochrome c (Becker et al., 1981). Because of its novel mode of action, azoxystrobin is effective against pathogens which have developed reduced sensitivity to other fungicides. Azoxystrobin exhibits no cross-resistance to the ergosterol biosynthesis inhibitors, phenylamides, dicarboximades and benzimidazoles group of fungicides. Azoxystrobin shows a unique spectrum of disease control. It is active against the fungi belong to oomycetes, ascomycetes, basidiomycetes and deuteromycetes (Sauter et al., 1995). Since fungicides may have deleterious effects on the pathogen as well as antagonist, an understanding of the effect of fungicides on the pathogen and the

antagonist, would provide information on the selection of selective fungicides and fungicide resistant antagonist. The idea of combining biocontrol agents with fungicides is for the development or establishment of desired microbes in the rhizosphere (Papvizas and Lewis, 1981). Considering all these points the present study was undertaken to test the compatibility of Azoxystrobin 25 SC with biocontrol agents by Poisoned food technique .

Materials and Methods

Isolation of phylloplane microflora of chilli leaves

To estimate phylloplane microflora of chilli Modified leaf washing technique of Dickinson (1971) was adopted. Leaf samples were collected from five locations in Coimbatore district. Discs of 4 mm diameter were cut randomly from five leaves with sterile cork borer. Fifty discs were placed in 250 ml conical flask containing 100 ml sterile distilled water and shaken for 20 minutes to get a homogenous suspension of the microbial propagules. From this, one ml suspension was pipetted out separately into Nutrient agar medium, King's B agar and Kenknight's agar andpoured, and mixed thoroughly. The plates were incubated at room temperature (28 $\pm$ 2^0 C).

Identification of bacterial isolates

Characterization of the different cultures of bacteria was done according to the methods recommended in the laboratory guide for identification of plant pathogenic bacteria published by the American Phytopathological Society (Schaad, 1992) and for each test 24 to 48h old cultures were used.

Evaluation of different fungicides

A new formulation Azoxystrobin 25 SC w/w of United Phosphorus, Limited, Mumbai was used for all studies in the present investigation

Compatibility of bacterial antagonists with fungicide

Compatibility of biocontrol agents with Azoxystrobin 25 SC were tested by poison food technique(Schmitz, 1930). The three different concentrations of Azoxystrobin 100@ g a.i,Azoxystrobin @125 g a.i andAzoxystrobin@ 150 g a.i were prepared by mixing the required quantity in 100 ml of PDA medium. In the sterilized Petri plates the poisoned medium was poured @ 20 ml and allowed to solidify. Bacterial antagonists were streaked separately on the medium respectively and incubated at room temperature (28 + 2^0 C). The medium without addition of fungicide served as control. Three replications were maintained for each treatment at the rate of 3 plates per replication. Growths of antagonists were recorded after 24 hours and compared with control plates. (Anand,2005)

Compatibility of Azoxystrobin 25 SC with bacterial antagonists

The results conducted on the compatibility of Azoxystrobin 25 SC with Pf1 strain of *P.fluorescens*andBs1 of *B.subtilis* indicated that Azoxystrobin 25 SC was highly compatible with *P. fluorescens* and *B.subtilis.* The *Streptomyces roschi* is also compatible at all concentration when tested under poisoned food technique. The fungicide Azoxystrobin 25 SC even at the highest concentration 250 ppm did not exhibited any inhibition to the growth of both the bacteria.

This finding is in accordance with the other workers. The growth of bacteria (*P. fluorescens* and *B. subtilis*) in Tetraconazole amended broth was assessed by turbidomertic method. The bacterial growth was not suppressed by tetraconazole even at the highest concentration of 1000 ppm.(Mathiyazagan, 2007)Sendhil Vel *et al.* (2004) found that *P. fluorescens* and *Bacillus subtilis* (Ehrenberg) Cohn.growth were not affected by azoxystrobin at different concentrations of 100, 150, 200, 250 and 300 ppm. Anand *et al.* (2007) also

reported that the compatibility of *P. fluorescens* (Pf1) with azoxystrobin at different concentrations *viz.*, 100, 150, 200, 250 and 300 ppm revealed that it was compatible with all the concentrations of azoxystrobin tested and the growth of the bacterium was unaffected even at the maximum concentration of 300 ppm. Archana (2009) reported that the compatibility of *P. fluorescens* (Pf1) with azoxystrobin at different concentrations *viz.*, 100, 150, 200, 250 and 300 ppm revealed that it was compatible with all the concentrations of azoxystrobin 25SC tested and the growth of the bacterium was unaffected even at the maximum concentration.Sendil Vel *et al.*(2004) reported that turbidometric assay showed that the bacterial biocontrol agents(*P.fluorescens* and *B.subtilis*) growth in azoxystrobin-amended broth was not affected and is perfectly compatible with bacterial biocontrol agents.

Figure 1: Compatibility of Azoxystrobin25 SC with bacterial biocontrol Agents

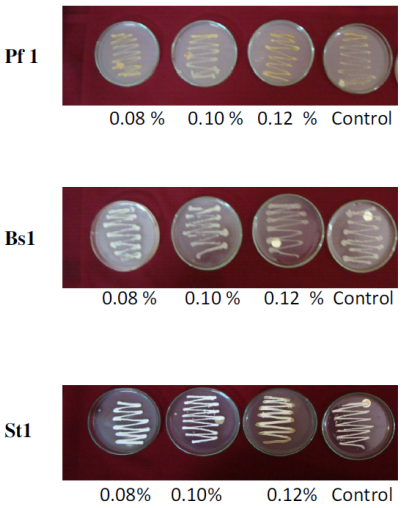

Table 1. sensitivity of biocontrol agents withAzoystrobin 25 SC

Bioagent	Azoxystrobin 25 SC			
	0.08	**0.10**	**0.12**	**control**
Pseudomonas fluorescens	+	+	+	+
Streptomyces roschi	+	+	+	+
Bacillus subtilis	+	+	+	+

+ = positive**, -** = negative

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