



Research Note

Compatibility of *Fusarium pallidorozeum* with insecticides

D. MONGA*, KISHOR CHAND KUMHAR and RISHI KUMAR

Central Institute for Cotton Research, Regional Station, Sirsa 125 055, Haryana, India

*Corresponding author E-mail: dmonga2009@gmail.com

ABSTRACT: *Fusarium pallidorozeum* was tested for compatibility with commonly used insecticides to include as one of the components of IPM for developing management strategy for cotton mealybug, *Phenacoccus solenopsis* Tinsley. *In vitro* compatibility studies of *F. pallidorozeum* with insecticides showed minimum inhibition of 17.9% with imidacloprid 17.8 SL (Confidor), followed by 32.4% with fipronil (Regent) and 36.0% with imidacloprid 24% flowable (Admire), while profenofos (Celcron) showed maximum inhibition (86.3%). The study indicated that imidacloprid (both formulations – SL and FS) and fipronil can be used for the management of the mealybug as these were relatively safer to *F. pallidorozeum*.

KEY WORDS: Mealybug cadavers, *Fusarium pallidorozeum*, insecticides, compatibility

(Article chronicle: Received: 24.08.2010; Sent for revision: 10.10.2010; Accepted: 02.11.2010)

Cotton is a major insecticide consuming crop, wherein numerous insecticides of various groups are used to provide protection against sucking pests and bollworms. In the recent years, the mealybug, *Phenacoccus solenopsis* Tinsley, has become one of the major pests of cotton in northern India (Monga *et al.*, 2009). Various insecticides like thiamethoxam, profenofos, imidacloprid, acephate, etc. are effective for its management (Gulsar Banu *et al.*, 2010; Suresh *et al.*, 2010), but sole dependency on insecticides for the management of pest complex may lead to pest resurgence, new pest problems, environmental pollution, resistance to pesticides, pest outbreaks due to disturbance of ecosystem, etc. To manage insect pests and minimize such problems, IPM approach is considered suitable, which encompasses available techniques including biopesticides as an alternative method. In the present investigation, *Fusarium pallidorozeum*, a mealybug entomopathogen, was tested for compatibility with commonly used insecticides so as to include them as one of the components of IPM against *P. solenopsis*.

Compatibility studies of mealybug cadaver isolate *Fusarium pallidorozeum* with insecticides

The compatibility of *F. pallidorozeum* with insecticides like thiamethoxam, profenofos, imidacloprid and acephate, which are effective against the mealybug (Gulsar Banu *et al.*, 2010 and Suresh *et al.*, 2010) was studied using

poison food inhibition technique under laboratory conditions. Recommended dosages of insecticides (g/ml l⁻¹) – profenofos 2.5, imidacloprid (17.8 SL) 0.5, fipronil 3.0, buprofezin 3.0, spirotetramat 3.0, clothianidin 0.4, imidacloprid (24 FS) 0.4 and thiamethoxam 0.4 were added to molten PDA before pouring it into 9.0 cm petri dishes. Five mm discs of *F. pallidorozeum* culture were then inversely placed in the centre of solidified medium on these plates under aseptic conditions. Three plates were kept for each treatment. A control without addition of insecticide was maintained. The inoculated plates were incubated at 28±2°C in a BOD incubator and observation on radial growth was recorded at 24 h interval till there was complete growth in control plates. Per cent fungal inhibition due to different treatments was calculated and the data was statistically analyzed after angular transformation. Per cent mycelial growth inhibition was calculated with the help of the following formula –

$$\% \text{ inhibition} = \frac{C - T}{C} \times 100$$

where C = Colony diameter in control and T = Colony diameter in treatment.

Results of the compatibility study (Table 1) revealed significant inhibition of mycelial growth by different insecticides. Profenofos showed maximum inhibition (86.3%) of *F. pallidorozeum* after one week of inoculation

Table 1. Compatibility of *Fusarium pallidorozeum* (in vitro) with insecticides

Treatment	Insecticide	Trade name	Per cent mycelial growth inhibition after one week*
T1	Fipronil	Regent	32.4 (34.7)
T2	Buprofezin	Applaud	58.9 (50.0)
T3	Imidacloprid 17.8 SL	Confidor	17.9 (25.0)
T4	Imidacloprid 24% flowable	Admire	36.0 (36.9)
T5	Clothiadinin	Dentop	69.4 (56.4)
T6	Thiamethoxam	Actara	40.1 (39.3)
T7	Spirotetramat	Movento	75.7 (60.6)
T8	Profenofos	Celcron	86.3 (68.3)
CD at 5%			4.33

*Mean of 3 replications; figures in parantheses are angular transformed values

followed by spirotetramat (75.7%) and clothiadinin (69.4%). Minimum inhibition as compared to other insecticides was observed in the treatment with imidacloprid-SL (17.9%), followed by fipronil (32.4%) and another formulation of imidacloprid-FS (36.0%). In an earlier investigation, imidacloprid, thiadicarb and acephate were found to be least inhibiting *F. pallidorozeum* (Monga *et al.*, 2009). Compatibility of entomopathogenic microorganisms such as *Beauveria bassiana*, *Metarhizium anisopliae*, *Nomuraea rileyi* and *Verticillium lecanii* with insecticides has been documented. Thiomethoxam was observed to be compatible, whereas endosulfan, monocrotophos and deltamethrin were incompatible (Batista Filho *et al.*, 2001). The susceptibility of the entomopathogenic fungi to chemical products varies widely among the pesticides (Roberts and Campbell, 1977). The present investigation indicated that use of insecticides like imidacloprid (both formulations, SL and FS) and fipronil, which are recommended for mealybug management, is relatively safer to *F. pallidorozeum*.

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