stable genotype and appears to be highly suitable for use in fluctuating environments.

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Pathology

Parasitism of *Meloidogyne javanica* Juveniles by *Phoma glomerata* and *Curvularia* spp

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Biocontrol agents isolated from local soils generally adapt much better than the exotic introductions. For example, among several nematode antagonistic fungi, *Paecilomyces lilacinus* has been reported from several countries as having field potential for control of root-knot nematodes (Zaki and Maqbool 1991; Siddiqui and Mahmood 1993). As *Meloidogyne javanica* is an important nematode pest of pigeonpea, isolation of natural enemies of *M. javanica* is an important research area of ICRISAT. The present study reports on the isolation and pathogenicity of selected fungi on *M. javanica.*

Twelve soil samples were collected from sorghum and pigeonpea growing plots on a black watershed field (BW 2) at ICRISAT-Patancheru. Soil samples were processed by modified Cobb's Sieving technique for extraction of nematodes. Inactive and diseased larvae of the pigeonpea cyst nematode *Heterodera cajani* and root-knot nematode *Meloidogyne javanica* were noticed. The number of such diseased larvae ranged from 250 to 400 per 100 cm^3 of soil and their occurrence within a sample ranged from 50 to 75% indicating the prolific activity of nematode pathogen(s).

Diseased nematodes were surface sterilized using 0.5% sodium hypochlorite (Clorox®) and washed with sterile water, then placed on potato dextrose agar (PDA) at the rate of 5 nematodes (petri dish)$^{-1}$ (Southey 1985). The plates were sealed with parafilm and incubated at 22±2°C for 7 days for fungal growth. Among the isolates, *Curvularia* sp, *Curvularia pallescens*, and *Phoma glomerata* were most common; they were subcultured and maintained on PDA slants. The pathogenic effects of these fungi were studied on *M. javanica.*

M. javanica eggs were extracted from infected pigeonpea roots using 0.5% NaOCl for 3 min (Hussey and Barker 1973) and collected in a petri dish containing sterile water that was sealed with parafilm and then kept at room temperature for hatching. One milliliter of nematode suspension containing 40 nematode juveniles was added under aseptic conditions in a laminar flow to each of the 20-day-old fungal culture tubes in the following regimes: treatment 1 = *Curvularia* sp + *M. javanica*; treatment 2 = *C. pallescens* + *M. javanica*; treatment 3 = *P. glomerata* + *M. javanica*; and a control (*M. javanica* alone). All the treatments were replicated three times. PDA slants were kept after inoculation in a slanted position at room temperature (25±2°C) for 7 days after which 10 ml of sterile water was added to each slant with glass beads and a magnet. The slants were kept on a magnetic stirrer for 5 min. The resultant suspension was collected in a counting dish for enumeration. About 80–90% of the nematodes inoculated were recovered by this method. All the nematodes recovered in treatments 1–3 were immobile even after 24 h of recovery, while nematodes recovered in the control (*M. javanica* alone) remained active. Microscopic examination showed that the nematodes recovered from treatments 1–3 were infected with the fungi, and they were again transferred onto PDA slants separately for each treatment after surface sterilization with NaOCl (0.5%) for 2 min. *Phoma glomerata* colonies readily developed from the nematodes recovered from treatment 3. The fungus was subcultured and its identity confirmed with the original fungal culture. However, *Curvularia* spp could not be isolated from the immobile nematodes recovered from the treatments 1 and 2, perhaps because these may require specific media for growth such as Sach's agar with rice straw media.

The mode of action of these antagonistic fungi has not been studied. *P. glomerata*, a seedborne fungus, may affect seed viability and cause leaf spots. *Phoma exigua, P. exigua* var *nonoxydabilis*, and *P. andinum* have been reported as antagonistic to the potato cyst nematode, *Globodera pallida* (CIP 1978). This is the first report on *Phoma glomerata* being antagonistic to *M. javanica.*

Acknowledgment. The authors acknowledge the help of V G Rao, Scientist-in-Charge, Mycology group, Agharkar Research Institute, Pune, Maharashtra, India, for confirmation of fungal species identification. The authors are grateful to A M Ghanekar, Chief Plant Quarantine Officer, ICRISAT-Patancheru for the facilities and encouragement.

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Entomology

A Note on Off-season Host Plants of the Pod Fly *Melanagromyza obtusa* (Malloch)

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The pod fly, *Melanagromyza obtusa* Malloch (Diptera: Agromyzidae) is one of the most destructive pests of pigeonpea in northern and Central India. It is more prevalent on late-maturing cultivars than on early-maturing pigeonpea. Among cultivated plants, pigeonpea appears to be the only reported host. Lal and Katti (1997) were of the opinion that reports of occurrence of pod fly on such host plants as bhendi (*Abelmonschus esculentus*), various species of *Vigna*, and a few other nonleguminous crops seem to be cases of wrong identification. However, little information is available on its off-season survival and alternate host plants. The pod fly has been reported to thrive on 21 species of host plants belonging to four families; the majority are wild relatives of pigeonpea (Lal and Katti 1997). ICRISAT (1982) reported it to be surviving on a number of wild relatives of pigeonpea in South India. Khokhar et al. (1985) made a detailed study and reported *Rhynchosia minima* Linn. was the alternate host plant on which the pest survived during May–February with peaks during July–August at Hisar, Haryana. They reported pod fly as the pest on pigeonpea of different maturity groups between September to May. Sithanantham and Sehgal (1985) found a population of *M. obtusa* supported on *Flemingia congesta* Rox growing in deep forest up to 1000 m above the cultivated plain area near Pantnagar during the off season.

During the studies carried out at the Indian Institute of Pulses Research (IIPR), Kanpur, on various leguminous plants grown by the Biotechnology Unit for hybridization purposes, the pod fly was found to feed on five leguminous weeds that are close relatives of pigeonpea: *Cajanus lanceolata* (w.v. Fitzg.) van der Maesen; *Cajanus scarabaeoides* (L.) Thouars; *Rhynchosia bracteata* Benth; *Rhynchosia minima* (Linn.); and *Rhynchosia rothi* Benth.

The pest population was low on these plants except for *R. minima,* which harbored the maximum pest population. *R. minima* occurs on the farm premises of IIPR as a common weed. It grows on wasteland, near hedges and fences, and climbs on railings and other available supports. It is a hardy and quick growing, short-duration plant, producing flowers and fruits for most of the year. The pods are small in size with 2–3 seeds, and similar in appearance to lentil (*Lens culinaris*).

Detailed observations were recorded throughout 1995/96 on the extent of infestation to pods of *R. minima* and other leguminous weeds (Table 1). It was observed that during April–September, when pigeonpea pods were not available in the field, *R. minima* served as the most preferred alternate host plant for *M. obtusa* to tide over the adverse period of hot weather from May–June through the vegetative growth stage of pigeonpea. Pod fly did not infest *R. minima* during October to March when pods of pigeonpea were available in the field, indicating that the pod fly used *R. minima* and other wild leguminous plants as an alternate season host