

Department of Nematology, Haryana Agricultural University - Hisar 125004, India

IN VIVO PARASITISM OF MELOIDOGYNE JAVANICA BY AN OVIPARASITIC FUNGUS, PAECILOMYCES LILACINUS

by
F.A. ZAKI¹ and D.S. BHATTI

Summary. Observation on *in vivo* parasitism of *Meloidogyne javanica* by *Paecilomyces lilacinus* revealed that the fungus infected the egg masses, engulfed the eggs, penetrated and proliferated within them by consuming the egg contents of the nematode.

Paecilomyces lilacinus (Thom) Samson is a soil hyphomycete widely distributed throughout the world (Domsch *et al.*, 1980) that has received much attention because of its biocontrol potential against several plant parasitic nematodes. Natural parasitism of *Meloidogyne incognita* by this fungus has been reported in Peru (Jatala *et al.*, 1979) and Dunn *et al.*, (1982) has studied the *in vitro* mode of parasitism. The ultrastructural details of the host-parasite relationship and pathology of nematode eggs by this fungus has been observed by Morgan-Jones *et al.*, (1984). This note describes the *in vivo* mode of parasitism of *Meloidogyne javanica* (Treb) Chitw. by *P. lilacinus*.

Thirty five day old tomato seedlings (Cv. HS-101) were transplanted into pots of steam sterilized soil. Ten egg masses of *M. javanica* and 4 g of the fungus cultured on gram seeds (Zaki and Bhatti, 1988) were inoculated simultaneously around the root zone. Egg masses from the inoculated plants were collected 42 days after planting and fixed in 4 per cent formalin. Each egg mass was treated in sodium hypochlorite solution for 2-3 minutes and put on a glass slide under a cover slip in a drop of cotton blue.

Microscopic observation revealed that the fungus infected egg masses and destroyed the eggs of *M. javanica in vivo*. The pattern of events leading to egg destruction appeared to be the same as observed *in vitro* by Dunn *et al.*, (1982), Morgan-Jones *et al.*, (1984), and Jatala (1986) for *M. incognita*. The fungus proliferated within egg mass, probably by feeding on the gelatinous matrix. Later, eggs were engulfed by the fungal hyphae (Fig.1) and subsequently penetrated by the infective hyphae (Fig.2). The infective hyphae appeared to be broader than vegetative hyphae observed on artificial medium (PDA). Such a difference in the breadth of hyphae has been observed for *P. lilacinus* (Morgan-Jones *et al.*, 1984), *Dactylaria candida*

(Dowsett and Reid, 1977) and *Rhopalomyces elegans* (Baron, 1973). The fungus consumed the egg contents and proliferated within it (Fig.3). Conidial formation occurred both within or outside the egg (Fig.4). Some abnormality in shape and size of affected eggs was observed as recorded by Jatala (1986).

The authors are grateful to Dr. Narender Singh, National Fellow L.P.M., College of Animal Sciences H.A.U. Hisar for providing the photographic facilities. The Senior author acknowledges the Indian Council of Agricultural Research for the award of Senior fellowship and the Vice-Chancellor, SKUAST, (J&K) for deputing him for Ph.D research at H.A.U., Hisar.

Literature cited

- BARRON G.L., 1973 — Nematophagous fungi. *Rhopalomyces elegans*. *Can. J. Bot.*, 51: 2505-2507.
- DOMSCH K.H., GAMS W. and ANDERSON T.H., (Eds.), 1980 — Compendium of Soil Fungi, Vol. 1: 530-532. London, Academic Press.
- DOWSETT J.A. and REID J., 1977 — Light microscopic observation of the trapping of nematodes by *Dactylaria candida*. *Can. J. Bot.*, 55: 2956-2962.
- DUNN M.T., SAYRE R.M., CARRELL A. and WERGIN W.P., 1982 — Colonization of nematode eggs by *Paecilomyces lilacinus* (Thom) Samson as observed with SEM. *Scanning Electron Microscopy*, 3: 1351-1357.
- JATALA P., 1986 — Biological control of plant parasitic nematodes. *Ann. Rev. Phytopath.*, 24: 453-489.
- JATALA P., KALTENBACH R. and BOCANGEL M., 1979 — Biological control of *Meloidogyne incognita acrita* and *Globodera pallida* on potatoes. *J. Nematol.*, 11: 303 (Abstr.).
- MORGAN-JONES G., WHITE J.F. and RODRIGUEZ-KABANA R. 1984 — Phytonematode Pathology: Ultrastructural studies II. Parasitism of *Meloidogyne arenaria* eggs and larvae by *Paecilomyces lilacinus*. *Nematropica.*, 14: 57-71.
- ZAKI F.A. and BHATTI D.S., 1988 — Economical method for mass culturing of *Paecilomyces lilacinus* (Thom) Samson. *Curr. Sci.*, 51: 153.

¹ Associate professor, Division of Entomology, SKUAST, Jhalimar, Srinagar 191121 — Kashmir

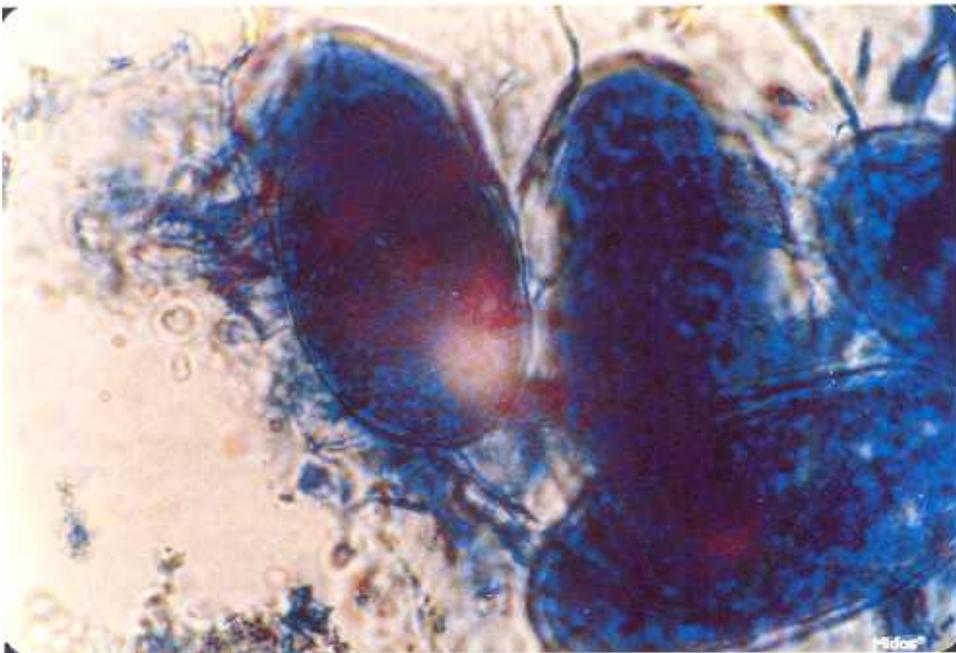


Fig. 1 - Eggs of *Meloidogyne javanica* engulfed by the hyphae of *Paecilomyces lilacinus*.



Fig. 3 - Proliferating hyphae of *P. lilacinus* within the egg of *M. javanica*.

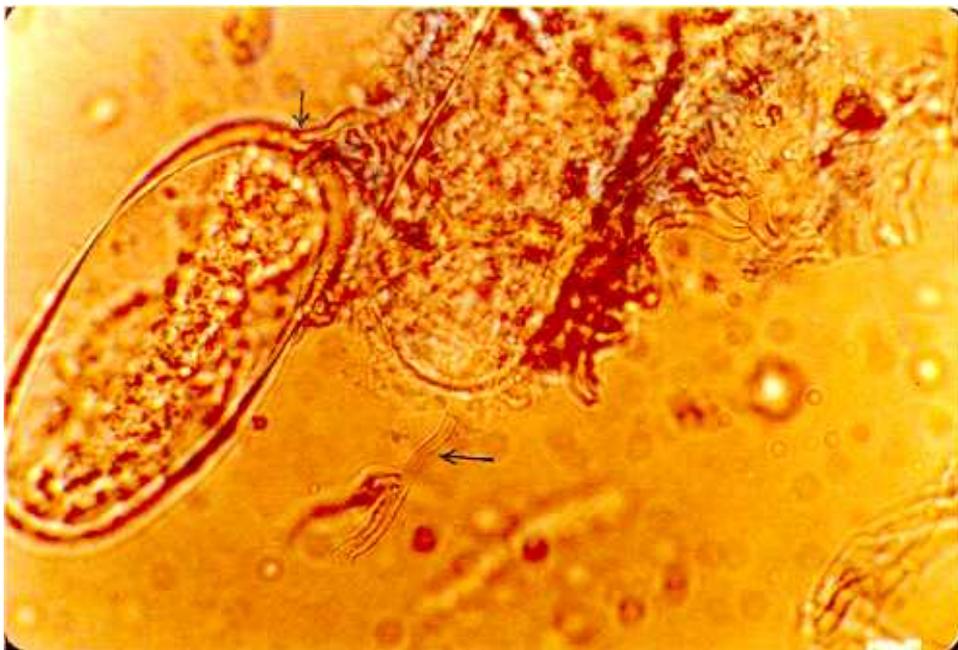


Fig. 2 - Eggs being penetrated by the infective hyphae of *P. lilacinus*.



Fig. 4 - Conidial formation by *P. lilacinus* outside the egg of *M. javanica*.