Dry Mycelium of *Penicillium chrysogenum* Protects Cucumber and Tomato Plants against the Root-knot Nematode *Meloidogyne javanica*

Dror Gotlieb,[1] Yuji Oka,[2] Bat-Hen Ben-Daniel[3] and Yigal Cohen[1,*]

Incorporation into soil of dry mycelium of *Penicillium chrysogenum*, a waste product of the pharmacological industry, enhanced plant growth and reduced root galling caused by the root-knot nematode *Meloidogyne javanica* in cucumber and tomato plants. Incorporation into sandy loam soil in pots of dry mycelium at a concentration of 0.25% (w/w) resulted in complete protection of cucumber plants from the nematode. The number of juveniles recovered from soils containing dry mycelium was greatly reduced even at a concentration of 0.1% (w/w). In microplot studies conducted at two sites in two seasons, with three or four doses, dry mycelium caused a dose-dependent reduction in root galling index (GI) and promotion of plant growth of cucumber and tomato plants. In *in vitro* studies, the water extract of dry mycelium immobilized nematode juveniles and reduced the egg hatching rate, but these effects were partly reversible after a rinse in water. Soil-drenching of cucumber and tomato seedlings with water extract of dry mycelium did not reduce GI or number of root-invading juveniles. The results show that dry mycelium promotes plant growth and protects plants against nematode infection. Protection, however, does not operate *via* induced resistance.

KEY WORDS: *Meloidogyne javanica*; *Penicillium chrysogenum*; root-knot nematode; soil amendment.

INTRODUCTION

Plant-parasitic nematodes have been controlled mainly by chemical nematicides, but several effective nematicides and fumigants have been withdrawn from the market because of their deleterious effects on human health and the environment. In particular, the reduction in use and phasing out of methyl bromide in recent years have made nematode control more difficult (18). Cultural practices such as use of resistant varieties, crop rotations and soil amendments are often integrated into nematode control strategies. Organic soil amendments, especially those with low C/N ratios, have been reported to have nematicidal effects (25). Crab shell-based products and chitin, which is found in the exoskeletons of insects and crustaceans, and in cell walls of certain fungi as polymers, have been studied extensively for their effects on nematode and fungal pathogen control (2,26,27). These amendments in soil are subjected to microbial decomposition, and several volatiles with nematicidal activity, especially ammonia, are released (20,26).

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[1]Faculty of Life Sciences, Bar-Ilan University, Ramat Gan 52900, Israel. *Corresponding author [Fax: +972-3-5354133; e-mail: coheny@mail.biu.ac.il].
[2]ARO, Gilat Research Center, M.P. Negev 85280, Israel
[3]Agrogene Ltd., Kibbutz Keramim, M.P. Negev 84963, Israel.