

STUDIES ON THE FUNGI *PASCILOMYCES LILACINUS* (THOM.)
SAMSON AND *ARTHROBOTRYX CLADODES* DRESCH.
FOR THE CONTROL OF NEMATODES, *GLOBODERA*
ROSTOCHIENSIS WOLL. AND *MELOIDOGYNE*
INCOGNITA CHITWOOD

LUCIANA MARANAN VILLANUEVA

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ABSTRACT

VILLANUEVA, LUCIANA MARAHAN, University of the Philippines, April 1983. Studies on the Fungi Paecilomyces lilacinus (Thom.) Samson and Arthrobotrys cladodes Dreschs. for the Control of Nematodes Globodera rostochiensis Woll. and Meloidogyne incognita Chitwood.
Major Professor: Dr. Romulo G. Davide

A total of 14 isolates of fungi were obtained from M. incognita eggmasses and rabbit manure from which four were identified as Paecilomyces lilacinus (Thom.) Samson based on morphological characteristics. This fungus was found in isolates obtained from the Institute of Plant Breeding, Los Baños, Laguna and Brgy. Punta, Calamba, Laguna but not in eggmasses collected from La Trinidad, Benguet.

All isolates of P. lilacinus were capable of parasitizing M. incognita eggs, larvae and adults and reducing the egg hatching of root-knot nematode.

A preliminary test on the use of P. lilacinus isolates on the control of M. incognita on tomato in the greenhouse showed that the Philippine and Peruvian isolates gave 72-85% and 90.58-91% control, respectively.

Oatmeal agar was the best medium for sporulation and growth of P. lilacinus. The optimum temperature for all the isolates was 20-30°C, however, the best sporulation occurred at 30°C. In general, continuous darkness favored sporulation of P. lilacinus.

The fungus also grew abundantly in sterilized mashed potato, chopped waterlily plants, fresh and dried ipil-ipil leaves and corn grits. It also grows moderately well on rice hull and coir dust.

Laboratory test showed that Hemacur 10G and Furadan 3G had no significant effect on the growth and sporulation of the fungal isolates except isolate 4. Agri Difolatan, Delsene Ex and Brassicol fungicides had inhibitory effects on the growth of the different P. lilacinus isolates at 100, 500 and 1000 ppm. The other fungicides tested like Agri Captan, Curzate-M, Daconil, Dithane M-45, Agri Zincofol, Galben and Ridomil gave significant reduction in dry weight and sporulation only at 500 and 10000 ppm. Herbicides, Aflon and Sencor had also significant inhibitory effect on the growth and sporulation of the fungal isolates at higher concentration levels (500 and 1000 ppm)

Dipping potato tubers in fungal suspension for 10 minutes significantly reduced nematode infection in potato plants. No significant difference was observed between the different storage periods (0-4 weeks). In general, spores were better source of P. lilacinus inoculum than mycelia.

In the greenhouse test, only waterlily, coir dust and mashed potato substrates showed increase of tuber weight. With or without the fungus, all the substrates tested caused significant reduction in cyst nematode population both in the roots and soil.

Under field conditions, all P. lilacinus isolates, A. cladodes and chicken manure increased the yield of potato compared with the control. However, nematicide Nemacur 10G at 10 kg a.i./ha. gave significantly better control than P. lilacinus.

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INTRODUCTION

The increasing cost of nematocides in recent years has prompted some nematologists to study the potentials of microorganisms particularly fungi for the biological control of plant pathogenic nematodes. Various investigators abroad have comprehensively studied the possible use of nematode-trapping fungi for nematode control. However, in the Philippines the study of these fungi started only in 1968 when Cortado and Davide successfully isolated two nematode trapping-fungi identified as Arthrobotrys sp. and Dactylaria sp. from chicken manure and rice straw compost. A thorough study on the isolation, identification and nematode parasitism of these fungi was conducted by Reyes (1970). He found several species that have potentials against nematodes in the laboratory and greenhouse conditions, however, their potential in the field has yet to be fully evaluated. The work of Linford (1937) or those that followed him later showed that these nematode-trapping fungi could not be practically used under large scale farms (Mankau, 1961 and Pramer, 1964). Other workers have also explored the use of other microorganisms but none could be of practical value.