

Temperature and pH Effects on *Paecilomyces Lilacinus* for *Meloidogyne Incognita*

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Abstract

Paecilomyces lilacinus is an important biological control fungus with potential for managing root-knot nematodes, particularly *Meloidogyne incognita*, a major plant-parasitic nematode responsible for significant yield losses in many agricultural crops. The present study focuses on evaluating the effects of temperature and pH on the growth, sporulation, and biocontrol potential of *P. lilacinus* against *M. incognita*. The fungal isolate was evaluated under different temperature regimes and pH conditions to determine the environmental conditions most favorable for mycelial growth and conidial production. Variations in temperature and pH were found to influence fungal development and, consequently, its potential to suppress nematode populations. The fungus showed better growth and sporulation under moderately warm temperature conditions and a slightly acidic to neutral pH range, whereas extreme temperature and pH conditions reduced fungal development. The effectiveness of *P. lilacinus* against *M. incognita* was associated with its ability to establish and produce infective propagules under suitable environmental conditions. These findings highlight the importance of optimizing temperature and pH conditions for improving the efficacy of *P. lilacinus* as a biological control agent. Understanding these environmental requirements can contribute to the development of effective, sustainable, and environmentally friendly strategies for the management of *M. incognita* and reduction of nematode-induced crop damage.

Keywords: *Paecilomyces lilacinus*, *Meloidogyne incognita*, root-knot nematode, temperature, pH, fungal growth, sporulation, biological control, biocontrol agent.

