

ID 72

**Molecular identification of two local *Trichoderma* isolates and evaluating the efficacy of several *Trichoderma* preparations to manage Root-knot Nematodes (*Meloidogyne* spp.)**

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**Abstract**

Root-knot nematodes (*Meloidogyne* spp.) are sedentary, endoparasites that severely affect the yield of a wide range of crops grown in Sri Lanka. In the integrated management of root-knot nematodes, biological control by locally-available antagonists is encouraged. *Trichoderma* spp. is a widely available biological control agent in many agricultural habitats in the country and has been identified as a potential biocontrol agent against root-knot nematodes. However, studies on the formulation of the local isolates of *Trichoderma* as a bionematicide using low-cost agricultural material as organic carriers are scarce. Hence, this study aimed to identify two local isolates of *Trichoderma* by molecular methods and to evaluate the efficacy of different agro-based preparations of the above *Trichoderma* isolates to control *Meloidogyne* spp. infecting tomato. The two *Trichoderma* isolates were identified as *Trichoderma erinaceum* (TI) and *Trichoderma koningiopsis* (TII) using *ITS1* and *ITS4* molecular marker-based sequence analysis. Seven different preparations of the *Trichoderma* isolates were bio-assayed on second-stage juveniles (J2s) of *Meloidogyne* spp. for mortality. Using a pot experiment, the efficacy of seven preparations was evaluated on nematode infestation ability based on root gall index, egg mass and root-knot formation ability. In general, liquid-based and compost-based preparations of *Trichoderma* performed better in laboratory bioassays and increased the percentage mortality of J2s. The highest percentage J2 mortality at the 24<sup>th</sup> h after treatment resulted in T2 (molasses-based liquid preparation) and T6 (Tricho-compost) treatments of *T. erinaceum* and T4 (mixture of compost and fungi-maize grain powder) of *T. koningiopsis*. A maize grain powder-based T1 (*T. erinaceum*), showed higher performances when applied as a soil treatment by reducing egg mass and root-knot production which was on par with the recommended nematicide application. The present study revealed the potential of using the locally-isolated *T. erinaceum* and *T. koningiopsis* for the control of *Meloidogyne* spp., infecting tomatoes by targeting J2 mortality and infection to tomato roots by J2s. Further investigations on the field efficacy of the selected preparations are needed to introduce these biopreparations as bionematicides.

**Keywords:** Biocontrol agent, Bioformulation, *ITS 1*, and *ITS 4*

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