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## Efficacy of Commercial and Non-Commercial Fungal Isolates for Suppression of Root-Knot Nematode on Pineapple

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### Abstract

Kenya ranks among the top five pineapple exporters in the world. Canned pineapple is the largest single manufactured export in Kenya making pineapple an important commodity in monetary terms. Pineapples are hosts to one or more species of plant-parasitic nematodes and are responsible for considerable yield losses. The presence of *Meloidogyne javanica* in root or soil samples has been associated with crop losses. To secure yield and profits, the extensive use of soil fumigants is currently unavoidable for the management of these plant-parasitic nematodes. However, the adverse impact of these pesticides on human health and the environment is evidently a major concern and alternatives that are economically competitive are urgently needed. Biological control is being considered as part of an integrated strategy for the management of plant parasitic nematodes in Kenya. Several native commercial and non-commercial biological control products that possibly meet these criteria have been identified. The work presented evaluates the efficacy of endophytic and saprophytic native fungal isolate against *Meloidogyne javanica* on pineapple. *Trichoderma asperellum* M2RT4 (ICIPE), *Purpureocillium lilacinum* (dudutech), *Trichoderma asperellum* (dudutech), *Purpureocillium lilacinum* (KBL) were tested. Two approaches were adopted to evaluate the efficacies of the selected fungal isolates, (1) an *in vitro* assay to investigate the effect of culture filtrate of selected fungal isolates on egg hatching and juvenile mortality, and (2) the effect of the selected fungal isolates on nematode development was studied in pot trials. Rooted pineapple plants were drenched with a conidial suspension of  $1 \times 10^8$  conidia ml<sup>-1</sup> of each fungal isolate and then infected with *Meloidogyne javanica*. After 12 weeks, plants were uprooted and evaluated for efficacy of the products. Of the four fungal isolates tested *in vitro*, *Trichoderma asperellum* isolate M2RT4 provided the best biocontrol efficacy *in vitro*, It reduced root-knot nematode egg hatching 100% as compared to other fungal isolates, the same isolate causes 100% second stage juvenile paralysis 5 hours after fungal filtrate application with 97% recovery when transferred into distilled water. Pot assay fails to demonstrate the ability of fungal isolates to successfully reduce nematode penetration, galling and reproduction of *Meloidogyne javanica*. This study provide the potential of *Trichoderma asperellum* M2RT4 for use against *Meloidogyne javanica* as an egg pathogen. These results indicate that most fungal biocontrol agents can cause total nematode paralysis not necessarily mortality with nearly 100% nematode recovery after 7 – 9 days.

**Keywords:** Biological control, pineapple, root knot nematodes

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