

# Evaluation of the effects of earthworm *Eisenia fetida*-based products on the pathogenicity of root-knot nematode (*Meloidogyne javanica*) infecting cucumber

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## Abstract

**Background** Biocontrol of nematode agents to decrease the hazardous impacts of chemical pesticide application including problems of public health and environmental pollution is a priority. In this study, solid (Vermicompost) and liquid products (Liquid Vermicompost, Vermiwash and Coelomic fluid) of the earthworm species *Eisenia fetida* were tested against root-knot nematode, *Meloidogyne javanica* in vitro and greenhouse conditions.

**Results** Results showed that Liquid Vermicompost, Coelomic fluid and Vermiwash had the greatest effect on egg hatching inhibition, respectively, and Coelomic fluid, Vermiwash and Liquid Vermicompost had the highest effect on mortality of larvae ( $J_2$ ), respectively, in vitro. All earthworm-based products were added to the cucumber pots and then a root-knot disease as well as plant growth indices was recorded. Results showed that all products could reduce the number of nematode juveniles and gall index in greenhouse conditions. The best combination for controlling disease was Vermicompost + 10 % Liquid Vermicompost and the highest rates of growth related to plants were treated with Vermicompost + 10 % Vermiwash.

**Conclusions** It is concluded that earthworm products have a remarkable potential as control agents against root-knot nematode and improving host plant health.

**Keywords** *Eisenia fetida* · *Meloidogyne javanica* · Liquid Vermicompost · Coelomic fluid · Vermiwash · Vermicompost

## Abbreviations

VC Vermicompost  
LVC Liquid Vermicompost  
VW Vermiwash  
CF Coelomic fluid