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ANTAGONISTIC EFFECTS OF BIOCONTROL AGENTS AGAINST *Phytophthora infestans* AND GROWTH STIMULATION IN TOMATOES

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ABSTRACT

Late blight disease is a major cause of economic losses in tomato (*Lycopersicon esculentum* L.) production in eastern Africa. The objective of this study was to evaluate the efficacy of *Trichoderma* species in controlling late blight disease and their role on the growth of tomato. *Trichoderma asperellum* and *T. harzianum* were isolated from two commercial products containing the antagonistic species. Culture-based and molecular approaches, genomic DNA isolation and amplification, using ITS1 and ITS4 universal primers, and sequencing, were used to characterise the products. *Trichoderma* antagonistic effects against *Phytophthora infestans* (causative of tomato late blight) experiments were conducted *in vitro* and in the greenhouse. The greenhouse experiment had five treatments; namely, a negative control, Metalaxl-M, *T. asperellum*, *T. harzianum* and mixture of the two biocontrol agents, laid out in a randomised complete block design. The experiment was carried out for 12 weeks, with 3 weeks measurements intervals. Morphological and molecular characterisation confirmed the organism in most of the commercial products as *T. harzianum* and *T. asperellum*. An inhibiting action was observed on the *P. Infestans* mycelial growth, by the effect of *T. asperellum* (30.7%), and *T. harzianum* (36.9%). *Trichoderma* spp. suppressed late blight disease in the greenhouse experiment. These effects were specific to soil type, with the higher effectiveness realised in Ferralsols (27% disease severity) and least in Nitisols (36% disease severity). *Trichoderma harzianum* and *T. asperellum* resulted in higher above ground biomass of tomato of 31 and 19% increase over the control, respectively. There is potential of biocontrol agents in reducing *P. infestans* effects in tomatoes and in stimulating growth.

Key Words: Ferralsols, *Lycopersicon esculentum*, Metalaxl-M, *Trichoderma asperellum*

RÉSUMÉ

La maladie du mildiou est une cause majeure de pertes économiques dans la production de tomate (*Lycopersicon esculentum* L.) en Afrique de l'Est. L'objectif de cette étude était d'évaluer l'efficacité des espèces de *Trichoderma* dans la lutte contre le mildiou et leur rôle sur la croissance de la tomate.