**Deutscher Tropentag, October 9-11, 2002, Witzenhausen**

"Challenges to Organic Farming and Sustainable Land Use in the Tropics and Subtropics"

# Does HCN from *Pseudomonas fluorescens* Isolate T58 Contribute in Biocontrol of *Fusarium oxysporum* f. sp lycopersici?

Francis Maina Mwangi[1], Rüdiger Hauschild[1], Richard A. Sikora[1], Eunice Mutitu[2]

[1] *University of Bonn, Institute for Plant Diseases, Germany*
[2] *University of Nairobi, Department of Crop Protection, Kenya*

**Abstract**

*Fusarium sp.* pathogens are a major cause of vascular wilt diseases on many cultivated crop plants. In the search for methods to control these diseases biological control using rhizobacteria is increasingly attracting favourable attention. In this study several bacterial isolates were screened for activity against *Fusarium* infection on tomato in the greenhouse. Plants treated with *Pseudomonas fluorescens* isolate T58 before inoculating with *Fusarium* had less infection and higher shoot mass as compared to the plants treated with *Fusarium* alone. Induction of resistance in the tomato against *Fusarium* was determined to be one of the mechanisms-of-action of this bacterial isolate. Additional *in vitro* tests showed that isolate T58 produces HCN, a volatile metabolite which is thought to play a role in biological control of some soilborne diseases. An objective was set to investigate the effect of volatile metabolites produced by *P. fluorescens* isolate T58 on growth of *Fusarium* spores and mycelia *in vitro*, and to investigate the effect of the volatile metabolites on plant metabolic processes which may contribute to induction of resistance. Results obtained showed that the volatile metabolites from isolate T58 suppress germination of *Fusarium* spores but do not reduce growth of mycelia although changes in pigment production in the mycelia were observed in the presence of the metabolites. Exposing tomato plants to the volatile metabolites caused a significant increase in peroxidase activity but there were only minor changes in the ß-1.3-glucanase and chitinase activity and total protein content. Changes in peroxidase activity due to the presence of either a pathogen, biocontrol agent or resistance inducing chemicals have been associated with induced resistance. We have concluded that volatile metabolites from *P. fluorescens* T58 possibly contribute to biocontrol of *Fusarium* wilt on tomato through a direct effect on the pathogen and indirectly by triggering metabolic changes in the plant that contribute to induction of resistance.

**Keywords:** Biocontrol, *Fusarium*, rhizobacteria, tomato, volatile metabolites

**Contact Address:** Rüdiger Hauschild, University of Bonn, Institute for Plant Diseases, Nussallee 9, 53115 Bonn, Germany, e-mail: r.hauschild@uni-bonn.de