



Tropentag, October 9-11, 2007, Witzenhausen

“Utilisation of diversity in land use systems:
Sustainable and organic approaches to meet human needs”

Application of the Endophyte *Piriformospora Indica* in Hydroponic Cultures

AHMAD FAKHRO¹, DIETMAR SCHWARZ², PHILIPP FRANKEN³, SUSANNE VON BARGEN⁴, MARTINA BANDTE⁵, CARMEN BÜTTNER⁶

¹*Humboldt-universität Zu Berlin, Institute for Horticultural Sciences, Department of Phytomedicine, Syria*

²*Institute for Vegetable and Ornamental Crops, Großbeeren/ Erfurt E.v., Plant Nutrition,*

³*Institute for Vegetable and Ornamental Crops, Großbeeren/ Erfurt E.v., Plant Nutrition,*

⁴*Humboldt-Universität Berlin, Institute for Horticultural Sciences, Germany*

⁵*Humboldt-Universität zu Berlin, Institute for Horticultural Sciences, Germany*

⁶*Humboldt-Universität zu Berlin, Institute for Horticultural Sciences, Section Phytomedicine, Germany*

Abstract

Piriformospora indica (Basidiomycota, Sebaciniales) is a root endophytic fungus with a broad host spectrum (Varma et al., 1999; Weiss et al., 2004). *P. indica* colonizes the cortex of roots, promotes plant development and induces resistance against fungal pathogens (Waller et al., 2005). In the present investigation it was aimed to analyse, if this endophyte also interferes with Pepino mosaic virus (PepMV) infection of tomato — a serious problem in soilless cultures world wide. However, all investigations for the influence of the fungus on plants have been up to now carried out in pot cultures where seedlings were inoculated upon planting. Because experiments using the model cultivar ‘Hildares’ showed that the time point of inoculation had only slight influence on the plant growth promoting effect, the application of *P. indica* could be examined in hydroponic cultures. Tomato plants were grown in a hydroponic system under standard conditions (Schröder et al. 1995) and inoculated after nine weeks with *P. indica* spores or hyphae from two different culture media. Colonisation of the roots was monitored after trypan blue staining and plant growth parameters were estimated. The experiments showed that the inoculum strongly influenced the spread of the fungus inside the root, but not the increase in root and shoot fresh weight. In a second set of experiments, the interaction between two isolates of PepMV and a number of tomato cultivars from Syria, Europe and USA were tested. Results revealed no difference in susceptibility indicating that the cultivar ‘Hildares’ can be used as model for further analyses of *P. indica* — PepMV - tomato interactions.

Schröder FG et al. (1995) *Gartenbauwissenschaft* 60: 294–297

Varma A et al. (1999) *Appl Environment Microbiol* 65: 2741–2744

Waller F et al. (2005) *Proc Natl Acad Sci USA* 102, 13386–13391

Weiss M et al. (2004) *Mycol Res* 108: 1003–1010

Keywords: Hydroponic, Pepino mosaic virus, *piriformospora indica*