



Tropentag, October 7-9, 2008, Hohenheim

“Competition for Resources in a Changing World:  
New Drive for Rural Development”

## Isolation and Screening of *Pseudomonas fluorescens* Isolates from Indonesian Soils against *Fusarium oxysporum* Schlecht f. sp. *radicis-lycopersici* Jarvis and Shomaker

YUSRAN YUSRAN, MARKUS WEINMANN, GÜNTER NEUMANN, VOLKER RÖMHELD, TORSTEN MÜLLER

*University of Hohenheim, Institute of Plant Nutrition, Germany*

### Abstract

The application of antagonistic microorganisms for biological control of root diseases in agriculture is an increasingly important alternative or supplement to chemical pesticides. Fluorescent pseudomonads have several advantages compared to other biocontrol agents and attracted particular attention among scientists. Strains of *Pseudomonas* spp. isolated from the rhizosphere are promising as seed inoculants in innovative agriculture to promote plant growth and crop yield and reduce various plant diseases. In the present study, *Pseudomonas* isolated from Indonesian soils have been investigated with respect to their biochemical and physiological characteristics and their effectiveness against *Fusarium oxysporum* Schlecht f. sp. *radicis-lycopersici* Jarvis and Shomaker (FORL 11r).

From four soil samples, collected from the rooting zone of tomato, maize, peanut and cacao at farmer's field in Banda Aceh, Aceh and in Palu, Central Sulawesi, Indonesia, altogether 28 pseudomonads strains were isolated and selected for biochemical and physiological characterisation. Therefore the soil samples were serially diluted up to 10<sup>-9</sup>, plated on King's B (KB) agar medium and incubated at room temperature (27±2°C) for 48 h. Distinct colonies showing fluorescence under UV light at 360 nm were picked and streaked on KB agar medium to check the purity. The isolates exhibited a wide variation in production of several considered substances as biocontrol factors such as: siderophores, cyanide, chitinase, protease, proteinase and arginine dihydrolase. Antagonistic growth inhibition of FORL by the pseudomonads strains was tested by coinubation on KB medium. All isolates inhibited the mycelium growth of FORL but five isolates showed superior antagonistic efficacy over the other isolates. These five isolates were selected for further studies on their effect in improving mycorrhisation and suppressing soil-borne pathogen under greenhouse conditions.

**Keywords:** Biocontrol, FORL, isolate, *Pseudomonas fluorescens*, Soilborne pathogens, *Fusarium oxysporum*, Indonesia