



Tropentag, October 5-7, 2011, Bonn

“Development on the margin”

Pathogenicity of Soft Rot Bacteria from Potato on Tomato Plants, and Rapid Identification and Differentiation of the Pathogens by Restriction Fragment Length Polymorphism

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Abstract

Out of 63 soft rot causing bacterial strains collected from potato fields in Syria and reference strains, 28 *Pectobacterium* and two *Dickeya* strains were subjected to a pathogenicity test on tomato (*Lycopersicon esculentum*) plants genotype L390. Twofold stem inoculation on 25 day-old tomato plants using 10 μ l of 2.4×10^8 CFU ml⁻¹ suspensions of bacterial cells was performed by injection into stems at the third and fourth axial leaf basipetal. Disease severity was scored in six classes in two day intervals. Additionally, the pathogenicity of strains was tested by soil drenching with bacterial suspension (0.1 ml bacterial suspension per 1g substrate). The results confirmed that all *Pectobacterium* and *Dickeya* strains have the ability to cause soft rot disease on tomato stems. *Pectobacterium carotovorum* strains evoked severe symptoms, without significant differences between strains. *P. atrosepticum* strains showed a lower disease severity compared to each *Pectobacterium* and *Dickeya* strains. *Pectobacterium* strains were not pathogenic in soil inoculation, while both *Dickeya*'s strains were soil pathogens.

Different sequence-based fingerprinting methods can properly assign strains to the appropriate species. Such studies require using different genes and an intensive statistical analysis. Restriction Fragment Length Polymorphism (RFLP) based on the information of one gene as a simple, rapid, accurate and inexpensive method was investigated for strain identification. In an *in silico* approach we identified a potential discrimination on basis of the malate dehydrogenase gene (*mdh*) to assign strains of each of the soft rot causing pathogens *Dickeya* spp., *P. wasabiae*, *P. c. spp. odoriferum*, *P. betavascularum*, *P. atrosepticum* and *P. c. spp. carotovorum* to the appropriate species. Two steps RFLP-*mdh* study produced specific and homogeneous banding profiles within the respective species and subspecies and was capable to differentiate 63 strains of *Pectobacterium* and *Dickeya*.

Keywords: , *Dickeya*, Pathogenicity, *Pectobacterium*, RFLP , soft rot