Short Report

EPIPHYTIC SURVIVAL OF *Pseudomonas viridiflava* AND RELATED STRAINS,THE INCITANTS OF OR ASSOCIATED WITH THE CITRUS BLAST DISEASE ON PREDOMINANT WEEDS IN CITRUS GROVES IN MAZANDARAN

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Citrus blast is one of the important diseases of citrus in north of Iran. The disease causes considerable damage during and immediately after the cold seasons. The causal agents have epiphytic survival on diverse weeds during spring and summer. During 2009-2010, samples were collected from several candidate weed plants including: *Poa annua*, *Phalaris canariensis*, *Sorghum halepense*, *Cynodon dactylon*, *Setaria viridis*, *Acalypha* sp., *Aegilops ovate*, *Lolium* sp. and *Amaranthus retroflexus*. A rod- shaped, gram negative, aerobic, fluorescent bacterium was isolated from all samples. The bacterium possessed several polar flagella. Strains were negative in oxidase and arginine dihydrolase but positive in catalase and urease tests and tolerated 5% NaCl. They were variable in production of levan from sucrose and rotting potato tuber slices. All strains hydrolyzed gelatin,casein and Tween 80. Nitrate was not reduced to nitrite, and production of reducing substances from sucrose was variable. All strains produced a hypersensitive reaction in geranium (*Pelargonium X hortorum* Baily). Glucose, fructose, xylose, mannitol, raffinose, glycerol, alanin, leucin, asparagine, tryptophane, fumarate, pyruvate, D- and L- tartrate,citrate and malate were utilized as carbon sources by all strains; none could utilize arabinose, dulcitol, ethanol, propanol, tyrosine, methionine, and oxalate. They were variable in utilization of sucrose, esculin and pectate. Pathogenicity of most of strains on citrus was confirmed 5-7 days after inoculation.Based on The protein profile strains were devided into four groups . The first group consisting of isolates from *Poa annua*, *Phalaris canariensis*, *Sorghum halepense*, *Setaria viridis* and *Lolium* sp. were between *Pseudomonas viridiflava* (*Pv.*) and *P. syringae* pv. *syringae* (*Pss.*) . The second group consisted of *Acalypha* sp. which was different from *Pv*. and *Pss*. In the third group, the isolate from *Amaranthus retroflexus* was similar to *Pss*. The isolates of the fourth group including those from *Aegilops ovate* and *Cynodon dactylon* resembled *Pv*. Polymerase chain reaction (PCR) assays with *gyr B* and *rpo D* primers, the specific fragments of 850 bp and 1200 bp long respectively, were amplified from most strains. Multiple sequence alignment was performed using ClustalW software, with sequences of this region of all *Pseudomonas* species in GenBank (NCBI). The phenotypic tests and PCR assays results showed that the strains belonged to Pseudomonas .The strains isolated from *Aegilops ovate* and *Cynodon dactylon* belonged to *Pv*. and the strains from *Amaranthus retroflexus* belonged to *Pss*. Isolates collected from *Poa annua*, *Phalaris canariensis*, *Sorghum halepense*, *Setaria viridis* and *Lolium* sp. had some characteristics half way between *Pseudomonas viridiflava* (*Pv.*) and *P. syringae* pv. *syringae* (*Pss*.)