First report on *Pseudomonas viridiflava* causing bacterial leaf spot of curly lettuce in Turkey

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Abstract

During the winter growing season of 2016, bacterial leaf spot disease, characterized as water-soaked, dark-brown and irregular spots 2–8 mm in diameter, was observed on curly type lettuce (*Lactuca sativa* var. *crispa*) in greenhouses of Samsun province (Carsamba town) in the Black Sea Region of Turkey. Fluorescent colonies were further purified on KB to perform further tests with the reference isolate. Pathogenicity of isolates was confirmed on 30-day-old curly type lettuce plants, and they were identified as *Pseudomonas viridiflava* based on biochemical test results confirmed using PCR-amplification of the 16S rDNA gene and sequencing. This is the first report of *P. viridiflava*, the causal agent of curly type lettuce in Turkey.

Keywords *Lactuca sativa* var. *crispa* · *Pseudomonas viridiflava* · Bacterial leaf spot

During the winter growing season of 2016, bacterial leaf spot disease, characterized as water-soaked, dark-brown and irregular spots 2–8 mm in diameter, was observed on curly type lettuce (*Lactuca sativa* var. *crispa*) in greenhouses of Samsun province (Carsamba town) in the Black Sea Region of Turkey. Disease incidence ranged from 20% to 60% in the five surveyed fields. Infected tissue was macerated and extract was plated on King's medium B (KB; King et al. 1954). Fluorescent colonies were further purified on KB to perform further tests with reference isolate *Pseudomonas viridiflava* BT5X from cabbage. The obtained eight isolates and BT5X were Gram negative, catalase positive and oxidase negative, induced cabbage response in tobacco plants and hydrolyzed arginine, caused soft rot on potato tuber slices, and produced levan on 5% sucrose agar. They produced acid from mannose and xylose, but not from trehalose, rhamnose, raffinose and sorbitol. Partial 16S rDNA of three isolates was amplified by PCR (Weisburg et al. 1991) and sequenced. The partial 16S rDNA sequences of isolates TK11Y (GenBank accession No. MG149780), MA14

(MG149781), CD21 (MG149782) showed 100% similarity to the assembled genome of *P. viridiflava* strain CFBP 1590^T (LT855380.1). Further analysis was performed with *rpoD* gene. A partial 790 bp sequence of isolate TK11Y (MG520096) had 99% similarity to the *P. viridiflava* strain CFBP 2107^T (KF937692) at the nucleotide level. Pathogenicity tests were performed on lettuce plants (cv. Kislik Kivircik 051) by spraying bacterial suspension (10⁸ cfu/ml) of 48 h cultures grown in Luria Bertani broth (Merck, Germany). Similarly to reference isolate BT5X seven days after inoculation, water-soaked leaf spots on leaf and vein tissue appeared, as those on naturally infected plants. Reisolated colonies were fluorescent under UV light on KB and exhibited the same traits of the original cultures and reference isolate BT5X. This study describes the first occurrence of *P. viridiflava* on curly type lettuce in Turkey.

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References

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