

## DISEASE NOTE

## RECORDS OF *PSEUDOMONAS SYRINGAE* pv. *ACTINIDIAE* ON *ACTINIDIA* spp. IN TRENTO (NORTH-EAST ITALY)

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During 2012-2015, extensive field surveys were performed in new and old kiwifruit orchards located in the province of Trento (North-East of Italy). Symptoms resembling those incited by *Pseudomonas syringae* pv. *actinidiae* (Psa) (i.e. leaf spotting, twig wilting) were observed mainly on *Actinidia deliciosa* cv. Hayward and in a new orchard planted with *A. chinensis* cv. Soreli. The incidence of the disease ranged from 1% to 80%, and some old Hayward orchards (i.e., 35 years old) resulted severely damaged. From all infected orchards, samples were collected and, subsequently, processed in the laboratory for isolation by following routinely procedures (Ferrante and Scortichini, 2009). Bacterial isolates were obtained from all infected kiwifruit orchards; they were identified according to the techniques described by Ferrante and Scortichini (2010). Upon repetitive-sequence PCR using BOX, ERIC and REP primer sets, their fingerprint pattern perfectly matched that shown by the pandemic Psa 3 strain CRA-FRU 8.43. In addition, with isolates representative of all the sites from where the samplings were obtained, pathogenicity tests were carried out by artificially inoculating one-year-old, pot-cultivated *A. deliciosa* cv. Hayward plants according to the techniques described by Ferrante and Scortichini (2009, 2010). All the isolates induced, upon 10-15 days from the inoculation, the leaf spot and wilting symptoms. On the basis of these results, we conclude that *P. s.* pv. *actinidiae* was the causal agent of the field symptoms observed in green-fleshed and yellow-fleshed kiwifruit orchards located in Trentino. This is the first record of the disease in this region.

Ferrante P., Scortichini M., 2009. Identification of *Pseudomonas syringae* pv. *actinidiae* as causal agent of bacterial canker of yellow kiwifruit (*Actinidia chinensis* Planchon) in central Italy. *Journal of Phytopathology* **157**: 768-770.

Ferrante P., Scortichini M., 2010. Molecular and phenotypic features of *Pseudomonas syringae* pv. *actinidiae* isolated during recent epidemics of bacterial canker on yellow kiwifruit (*Actinidia chinensis*) in central Italy. *Plant Pathology* **69**: 954-962.

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## FIRST REPORT OF BACTERIAL PITH SOFT ROT CAUSED BY *PECTOBACTERIUM CAROTOVORUM* subsp. *ODORIFERUM* ON CAULIFLOWER IN ITALY

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In the late summer of 2014, two weeks after a heavy rain, severe soft rot symptoms, especially in flooded areas, were observed on cauliflower (*Brassica oleracea* L. var. *botrytis*) cultivars Littoral F<sub>1</sub> (Clause) and Terzolo F<sub>1</sub> (Enza Zaden) grown in a 5 ha-field located in Potenza province (Basilicata, Southern Italy). Symptoms consisted of a progressive yellowing and withering of basal leaves, dark green to brown and then white creamy soft rot of pith followed by totally hollow stem and wilting of the whole plant.

Three of the bacterial isolates that produced typical deep cup-shaped cavities on crystal violet pectate (CVP) agar medium were designated DiSSPA 42, DiSSPA 45 and DiSSPA 46 and identified by biochemical and physiological assays (Schaad *et al.*, 2001). They were Gram-negative, oxidase-negative, able to degrade pectin and to produce reducing substances from sucrose, acids from  $\alpha$ -methyl-glucoside, sorbitol, D-arabitol, palatinose and maltose but not from acetic acid, D,L-lactic acid and dextrin. They utilized citrate, but did not produce indole, and induced hypersensitive reaction on tobacco leaves. Species identification of one isolate, DiSSPA 42, was also confirmed by multi-locus sequence analysis (MLSA) using the genes *Glyceraldehyde-3-phosphate dehydrogenase A* (*gapA*; primers gapA326F/gapA845R) and *Malate dehydrogenase* (*mdh*; primers mdh2/mdh4) (Onkendi and Moleleki, 2014). MLSA indicated DiSSPA 42 belonging to *Pectobacterium carotovorum* subsp. *odoriferum*. Its nucleotide sequences were deposited in GenBank under accession Nos. KX346907 and KX346908. The three isolates incited stem soft rot symptoms at 26  $\pm$  1°C three days after inoculation on four weeks old cauliflower plants cv. Littoral F<sub>1</sub>.

To the best of our knowledge, this is the first report of stem soft rot on cauliflower in Italy, and Europe, caused by *P. carotovorum* subsp. *odoriferum*.

Onkendi E.M., Moleleki L.N., 2014. Characterization of *Pectobacterium carotovorum* subsp. *carotovorum* and *brasiliense* from diseased potatoes in Kenya. *European Journal of Plant Pathology* **139**: 557-566.

Schaad N.W., Jones J.B., Chun W., 2001. Laboratory guide for identification of plant pathogenic bacteria. 3<sup>rd</sup> Ed. APS Press, St. Paul, MN, USA.

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