



## First report of bacterial canker of *Actinidia deliciosa* caused by *Pseudomonas syringae* pv. *actinidiae* in Portugal

G.M. Balestra\*, M. Renzi and A. Mazzaglia

Dipartimento di Protezione delle Piante, Università della Tuscia, 01100 Viterbo, Italy

\*E-mail: balestra@unitus.it

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Bacterial canker caused by *Pseudomonas syringae* pv. *actinidiae* is one of the most harmful diseases affecting kiwifruit plants. It was first isolated and identified in Japan on kiwifruit plants (*Actinidia deliciosa*) and was subsequently recorded in the most important world kiwifruit production areas, China, Korea and Italy, on the main species (*A. deliciosa* and *A. chinensis*) and cultivars of kiwifruit. A new serious outbreak of the disease was observed during the spring (March) 2010 on two-year-old plants of *A. deliciosa* cv. Summer, in kiwifruit orchards in Entre Douro and Miró provinces in Portugal. The symptoms were characterised by dark brown spots surrounded by yellow haloes on leaves, and cankers with copious reddish exudate production on twigs and stem (Fig. 1). Disease incidence could be as high as 30%.

Bacterial colonies were isolated from infected tissues on nutrient agar containing 5% sucrose. Six isolates obtained were Gram-negative, and negative for oxidase, potato soft rot, arginine dehydrolase, presence of tyrosinase and urease, nitrate and fluorescent pigment production. Moreover, they were positive for levan production, presence of catalase and for tobacco hypersensitivity (Lelliott & Stead, 1988). Pathogenicity was confirmed by artificial inoculation of ten healthy two-year-old *A. deliciosa* plants, cv. Hayward, with bacterial suspensions ( $10^7$  cfu/ml). The symptoms were observed within five and 14 days after inoculation on leaves and twigs, respectively. No symptoms were observed on control plants, and bacteria with morphological, biochemical and molecular characteristics identical to the original isolate were reisolated from tissue

showing symptoms. Four isolates (PSA346, PSA349, PSA352, PSA356) were chosen for molecular identification and analysed in comparison with *P.s.* pv. *actinidiae* reference strains (CFBP 7285, CFBP 7286, CFBP 7287). Identity as *P.s.* pv. *actinidiae* was confirmed by PCR amplification with two pairs of pathovar-specific primers (Koh & Nou, 2002; Rees-George *et al.*, 2010). This is the first report on the occurrence of this bacterial pathogen on *A. deliciosa* in Portugal.

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Figure 1

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