First report of garlic soft rot caused by *Pectobacterium carotovorum* subsp. *carotovorum* in Iran

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Garlic, a commonly grown herb in the garden, is one of the most important and valuable products in Iran with a cultivation area of about 3000 ha. However garlic is also prone to several soil-born diseases. In 2014, a soft rot disease was observed on the bulb base of garlic in Hamadan province of Iran. Bacterial colonies were isolated from symptomatic bulbs and cloves. Twenty representative bacterial isolates were Gram-negative, facultative anaerobic, able to soften potato slices and to grow at 37 °C. They were negative for oxidase, urease and sensitivity to erythromycin, positive for catalase, lecithinase, gelatinase and utilization of malonate and citrate. Isolates produced acid from lactose, cellobiose, raffinose, trehalose, glucose, rhamnose and sucrose (Schaad et al. 2001). *Pectobacterium carotovorum* subsp. *carotovorum* (*Pcc*) ATCC 15713 was used as positive control. For pathogenicity tests, garlic cloves were surface sterilized by ethyl alcohol 70%, washed with sterilized distilled water, and inoculated with 20 µl of 10⁸ CFU ml⁻¹ suspensions of seven representative strains which were grown for 48 h on nutrient agar (NA) medium at 26 °C. Symptoms occurred on bulbs 3 to 5 days after inoculation and appeared similar to those occurring on

naturally infected plants, but the control samples, inoculated with sterilized distilled water, remained healthy. To further identify these pectolytic strains, a multi locus sequence typing (MLST) approach was employed. To this end, partial nucleotide sequences of the housekeeping genes, *mdh* (GenBank accession No. MG421001), *recA* (MG421002), *gapA* (MG421003) and 16S rRNA (MG388299) showed 99, 99.2, 98.9 and 99.8% similarity to the *Pcc* ATCC 15713 reference strain, respectively.

Based on phenotypic and genotypic characteristics the bacterium that causes soft rot of garlic bulb was identified as *Pcc*. To our knowledge, this is the first report of soft rot caused by *Pcc* on garlic from Iran.

Reference

Schaad NW, Jones JB, Chun W (2001) Laboratory guide for identification of plant pathogenic bacteria, 3rd edn. American Phytopathological Society Press, Minnesota

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