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First Report of Rahnella Victoriana Associated with Walnut Decline

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Abstract : BACKGROUND AND OBJECTIVES Iran is the third producer of Persian walnut worldwide. However, its walnut trees have been under threat from decline during last decade. Walnut canker caused by B. nigrifluens and B. rubrifaciens was recorded in multiple regions of Iran. Furthermore, Brenneria rosae subsp. rosae and Gibbsiella quercinecans were recently recognized as responsible for walnut decline in northwestern Iran. This study aimed to identify the causal agent of walnut decline in Kermanshah and Isfahan. MATERIAL AND METHODS Symptomatic samples were collected from affected walnut trees of Kermanshah and Isfahan provinces. The pathogenicity of strains was proved on immature walnut fruits cv. 'Hartley' and young green twigs of two-year-old walnut seedling cv. 'Chandler'. Pathogenic strains were subjected to conventional phenotypic tests. 16S rRNA, gyrB, and infB genes were partially amplified and sequenced. RESULTS Irregular longitudinal cankers and dark lesions were observed in the outer and inner bark, respectively. Twenty-four strains were isolated on EMB-agar media. Fourteen strains were able to cause necrosis and a dark-colored region in the mesocarp and on young green twigs around the inoculation site 14 and 30 days post-inoculation, respectively. Strains were able to hydrolyze Tween 20, Tween 80, gelatin and esculin, however, did not produce indole or urease. Pairwise comparison, the 16S rRNA gene nucleotide sequences of strain I2 were 100% identical with those of Rahnella victoriana FRB 225T. Moreover, a phylogenetic tree reconstructed based on the concatenated sequences of two housekeeping gene fragments, gyrB (601 bp) and infB (615 bp), revealed that the strains I2, I5, and KE6 were clustered with R. victoriana FRB 225T. CONCLUSION To the best of our knowledge, this is the first report of R. victoriana in association with walnut decline. This result is necessary to find resistant genotypes.

Keywords : emerging pathogens, Iran, juglans regia, MLSA
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