



First report of *Fusarium* wilt of eggplant caused by *Fusarium oxysporum* f. sp. *melongenae* in Iran

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In 2012, eggplant (*Solanum melongena*) production in several greenhouses and fields was surveyed in Iran. In Hormozgan and Semnan provinces, 15 and 12% of fields surveyed, respectively, were infected with an unknown disease. Those affected plants exhibited leaf chlorosis and slight vein clearing on the outer leaflets, slight yellowing of foliage and wilting of upper leaves and eventual death of the plant. Necrotic tissue fragments from discoloured vascular stem tissue were surface sterilised by soaking in 10% bleach solution for five minutes and plated on potato dextrose agar (PDA). Single-spore isolates were obtained and transferred to PDA and carnation leaf agar (CLA) to investigate culture characteristics and morphology (Nelson *et al.*, 1983). Twenty-six isolates were identified as *Fusarium*, including 12 isolates that were initially identified as *Fusarium oxysporum* due to production of characteristic three to five septate, sickle-shaped macroconidia with a foot-shaped basal cell, on branched conidiophores or on the surface of sporodochia. Three septate spores were more common. Microconidia were borne on simple phialides arising laterally and were abundant, oval-ellipsoid, straight to curved and non-septate in culture. A typical cream to pink colony developed, often with purple tinge, on PDA (Nelson *et al.*, 1983). After PCR amplification of genomic DNA using the specific primer PF02-3 (Baysal *et al.*, 2010), morphological identity was confirmed as *Fusarium oxysporum* f. sp. *melongenae* by the presence of a specific, characteristic band visible at around 70 bp. The other isolates were identified as *F. solani*.

Pathogenicity tests were performed twice for each of 12 isolates using a root-dip inoculation method (Baysal *et al.*, 2010). Wounded roots of nine *S. melongena* (cv. 'Pala') seedlings at the six-leaf stage were submerged for 15 min in a conidial suspension (1×10^6 conidia/ml in sterile water), while control plants were dipped in sterile tap water. Seedlings were transplanted into pots and maintained in a growth chamber. After 3-4 weeks, severity of wilt symptoms was assessed using a wilt index ranging from 0 (no symptoms) to 4 (plant death) (Morid *et al.*, 2012). All 12 isolates tested were pathogenic to eggplant with a wilt index ranging from 1.2 to 3.4 (average = 2.8). Symptoms observed on inoculated plants were similar to those in commercial greenhouses, including leaf chlorosis and necrosis and

eventual death. Control plants showed no symptoms, and two other members of the Solanaceae (tomato and pepper) tested with the same method displayed no symptoms. *Fusarium oxysporum* f. sp. *melongenae* was successfully re-isolated from the stems of disease-affected inoculated plants, thereby completing Koch's postulates. *Fusarium oxysporum* f. sp. *melongenae* is a major soil-borne pathogen and one of the causal agents of vascular wilt disease in eggplant. Occurrence of *F. oxysporum* on *S. melongena* has been reported in Japan, Korea, China, Italy, Greece, Spain, Turkey, the USSR, USA-Florida and Fiji (Yildiz *et al.*, 2012). This is the first report of *F. oxysporum* f. sp. *melongenae* in Iran. Previously, the causal agent of *Fusarium* wilt of eggplant in Iran was attributed solely to *F. solani* (Gerlach & Ershad, 1970).

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