



First report of Fusarium wilt caused by *Fusarium oxysporum* on *Cyclamen persicum* in Turkey

Mehmet Akif Gültekin¹ · Zühtü Polat¹ · Gülsüm Palacioğlu² · Harun Bayraktar²

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Cyclamen persicum is a flowering species, widely cultivated as an ornamental plant worldwide. In May 2021, symptoms of Fusarium wilt, including wilting of leaves, root rot, vascular discoloration and plant death were observed in 30% of *C. persicum* plants, grown in a 5 decares greenhouse in Bursa province, Turkey. Symptomatic tissues from 10 plants were surface-sterilized with 1% NaOCl solution for 3 min and placed onto potato dextrose agar (PDA). The colonies developed were pale white to pink, floccose with abundant aerial mycelia. Conidiophores from the aerial mycelia often had single phialides. Macroconidia produced in sporodochia were hyaline, slightly curved, 3 to 5 septate and $29.5\text{--}41.2 \times 7.3\text{--}9.8 \mu\text{m}$ ($n=30$) with basal foot cells shaped to pointed and apical cells tapered and curved. Microconidia [$7.4\text{--}14.8 \times 3.9\text{--}5.8 \mu\text{m}$ ($n=30$)] formed on short monophialides in false-heads were aseptate, elliptical or kidney shaped. Chlamydo-spores were terminal or intercalary in position and $7\text{--}12 \mu\text{m}$ in size. These characteristics were consistent with the description of *F. oxysporum* by Leslie and Summerell (2006). Also, RPB2 and EF1- α genes of the reference isolate Foc4 were sequenced with primers RPB2for/RPB2rev and EF1/EF2 and deposited in GenBank (accession Nos. MZ676956 for RPB2 and MZ676955 for EF1- α) (O'Donnell et al. 2010; Staats et al. 2005). BLAST analysis showed 99.9–100% similarity to those (RPB2: LN828096, EF1- α : FJ985420) of *F. oxysporum* in GenBank. Also, EF1- α sequence shared 99.82% homology with known *F. oxysporum* f. sp. *cyclaminis* isolate MIAE01686 (accession No. KU128940). The phylogenetic analysis results showed the close genetic relationship of Foc4

with other strains of *F. oxysporum*. Pathogenicity tests were performed on 5–6 leaf seedlings of *C. persicum*. Six seedlings were inoculated by dipping their wounded roots for 30 min in a spore suspension of 10^6 spore/ml. Control plants were inoculated with sterile distilled water. The plants were transplanted into pots and placed at $23 \pm 1^\circ\text{C}$ in 12 h photoperiod. After 3 weeks, typical wilt symptoms were observed on inoculated plants, but no symptoms were observed on control plants. *Fusarium oxysporum* was re-isolated from the inoculated seedlings, thus fulfilling Koch's postulates. To our knowledge, this is the first report of *F. oxysporum* as the causal agent of Fusarium wilt on *Cyclamen persicum* in Turkey.

Declarations

Ethical statement This article does not contain any studies with human participants or animals.

Conflict of interest All authors declare that they have no conflict of interests.

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✉ Harun Bayraktar
bayrakta@agri.ankara.edu.tr

¹ Atatürk Central Horticultural Research Institute,
77102 Yalova, Turkey

² Department of Plant Protection, Faculty of Agriculture,
Ankara University, 06110 Ankara, Turkey