



First report of *Verticillium dahliae* causing wilt of goji (*Lycium barbarum*) in Italy

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Goji (*Lycium barbarum*) is a newly introduced crop in Italy. In June 2016, one- to two-year-old goji plants with symptoms of wilt were observed in commercial fields in Calabria, southern Italy. Approximately 10% of plants were affected. Symptoms consisted of wilting, stunting, leaf yellowing, blight of leaves and branches and browning of the basal stem vascular tissues.

Isolations were performed from discoloured vascular tissues of the stem. Stems were surface disinfected by dipping in a 10% hypochlorite solution for 6 minutes, rinsing with sterile water and blotting dry with sterile paper. The bark was removed using a sterile scalpel and small pieces of inner wood (approximately 2 mm) were transferred on potato dextrose agar (PDA; Difco Laboratories, USA) amended with ampicillin (0.25 mg/l) and streptomycin (0.25 mg/l). Dishes were incubated at 25°C in the dark and pure cultures were obtained by single hyphae transfers onto PDA. A fungus with a white cottony mycelium was consistently isolated. It produced hyaline, verticillate conidiophores with 3-4 phialides at each node and hyaline, single-celled, ellipsoidal conidia (2-8 × 1-3 µm). Older cultures formed dark brown to black torulose microsclerotia (15-100 µm). The ITS region of rDNA of five representative isolates was amplified and sequenced using the ITS5 and ITS4 universal primers. All isolates had identical ITS sequences and a BLAST search showed 100% sequence identity with reference sequences of *Verticillium dahliae* (e.g. Genbank Accession Nos. HE972025 and HE972031). The ITS sequence of an isolate from goji was deposited in Genbank (KY750320).

To fulfil Koch's postulates, fifteen 21-month-old plants of goji, grown in 500 ml pots (one plant per pot), were inoculated in the soil with 2 g of wheat kernels artificially infested with the fungus (Ruano-Rosa & López-Herrera, 2009). Non-infested wheat kernels were added to control plants.

After 14 days incubation at 20±2°C in a greenhouse, initial symptoms of wilting were observed and after 30 days all inoculated plants showed symptoms of wilting, leaf yellowing (Fig. 1) and discolouration of vascular tissues of the stem (Fig. 2) similar to those observed on naturally infected plants. Control plants remained healthy. The pathogen was re-isolated only from symptomatic plants.

Verticillium dahliae is a vascular pathogen with a wide host range (Inderbitzin *et al.*, 2011). The cultivation of goji in new areas is posing several phytosanitary problems. Major fungal diseases include root rot and wilt caused by *Fusarium* spp., anthracnose caused by *Colletotrichum* spp. and gummosis caused by *Cephalosporium acremonium* (Yanting & Jianli, 2014). Recently, wilt symptoms caused by *V. dahliae* have been reported in Turkey (Özer & Bayraktar, 2016). This is the first report of *V. dahliae* on *Lycium barbarum* in Italy.

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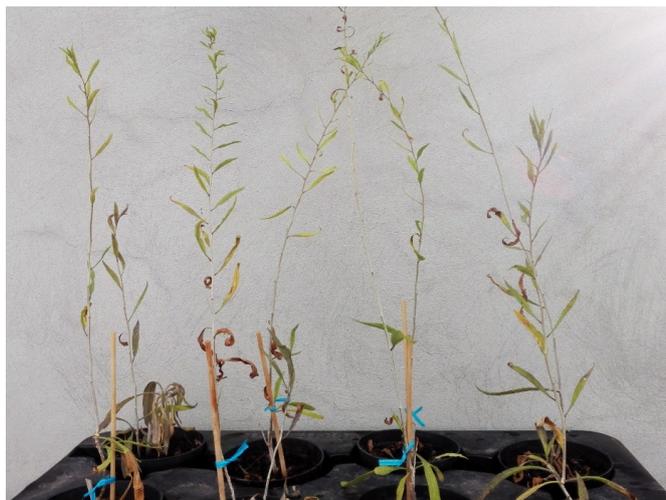


Figure 1



Figure 2

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