

Occurrence of *Fusarium equiseti* on *Raphanus sativus* Seedlings in Italy

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DISEASE NOTES

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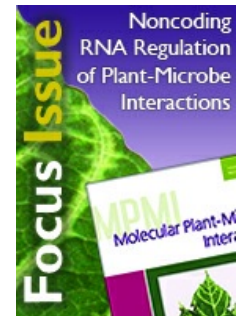
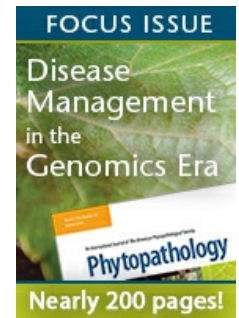
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ABSTRACT

Radish (*Raphanus sativus* L.) is an important brassica crop with high nutritional value. During a survey carried out in a nursery in Piedmont in 2015, seedlings of the cultivar Ravanello Grande Punta showed an uncommon foliar disease. Starting from the month of July, plants at the cotyledon stage showed grayish brown to dark brown circular lesions (from 1 to 5 mm), with a round or irregular shape, sometimes surrounded by a yellow halo. Leaf necrosis were also observed on oldest plants (3rd true leaves). The leaf necrosis generally enlarged to the entire affected leaf that eventually died, while no dead seedlings or plants were observed. The incidence of seedlings affected ranged from 5 to 15% in the sector of the greenhouse with the highest relative humidity (85 to 95%) at 20 to 25°C. Isolations were carried out from symptomatic leaf tissues (each 1 mm²) dipped in 1% sodium hypochlorite for 1 min, then rinsed in sterilized water, and placed onto potato dextrose agar (PDA) amended with 25 mg/liter of streptomycin sulfate. An orange-brown colony with characteristics of *Fusarium* was consistently recovered after 5 days at 23°C ([Leslie and Summerell 2006](#)). One representative isolate was subcultured on PDA and



single-spore cultures were obtained. On carnation leaf agar (CLA), hyaline macroconidia (4 to 6 septate) with a pronounced dorsoventral curvature of 20.3 to 28.6 × 2.3 to 3.6 µm (mean 24.1 × 2.9 µm) were produced in orange sporodochia from monophialides on branched conidiophores. Abundant chlamydospores developed in a 21-day-old culture grown on CLA: either terminally or intercalary (6.7 to 11.9, mean 9.1 µm). Such characteristics are typical of *Fusarium equiseti* (Corda) Sacc. (Leslie and Summerell 2006). Amplification of the elongation factor 1 alpha gene (EF1α) with primers EF1/EF2 (O'Donnell et al. 1998) yielded a 678 bp amplicon (GenBank accession no. KY688192). BLASTn analysis of the sequence obtained showed a 99% homology with *F. equiseti* isolate Agrorocketbis from rocket (JN127347), and a 97% homology with *F. equiseti* isolate Feq 12-14 from lettuce (KT149290). To confirm the pathogenicity of the isolate IT26 of *F. equiseti*, radish seeds of cv. Ravanello Grande Punta, surface-disinfected by immersion for 5 min in 1% NaOCl, then rinsed in sterile water, were sown in 12-liter pots filled with a steamed peat substrate. About 100 seedlings/pot at the cotyledon stage were sprayed with a suspension of the isolate IT26 at 1 × 10⁶ conidia/ml. The same number of seedlings were sprayed with sterile distilled water. Inoculated and noninoculated seedlings (three pots/treatment) were kept in a greenhouse at 24 to 26°C under a plastic support (100 × 100 × 50 cm) covered with transparent polyethylene film, in order to keep the relative humidity at 85 to 95%. A leaf spot was observed on 40 to 55% of radish seedlings 10 to 14 days after sowing. Control seedlings remained symptomless. A fungus morphologically identified as *F. equiseti* was consistently reisolated from all the symptomatic plants as previously described. The pathogenicity test was conducted twice showing the same results. This is the first report of *F. equiseti* on *R. sativus* seedlings in Italy as well as worldwide. Since *F. equiseti* is a seed-borne pathogen (Neergaard 1979), the possible contamination of radish seeds by this pathogen needs to be further investigated.



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