

**Letter to the Editor**  
**Taxonomic Status of *Fusarium oxysporum***  
**Causing Foot and Root Rot of Tomato**

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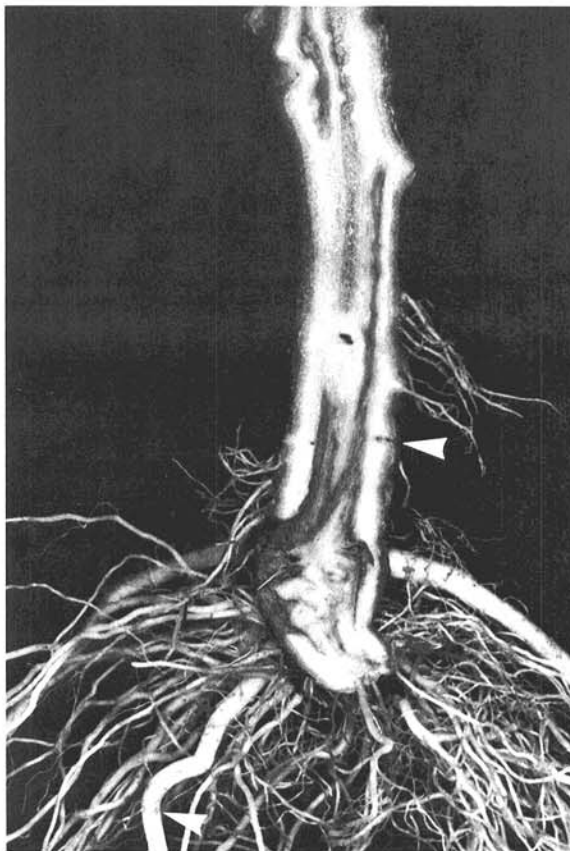
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A foot and root rot disease of greenhouse and field tomatoes which is caused by *Fusarium oxysporum* Schlecht. has been reported from Canada (7), California (8), Florida (12), Ohio (3), and Japan (11,15). Collected isolates have been compared in Ohio (Rowe, *personal communication*); all induced similar symptoms in tomato. Sato and Araki (11) and Yamamoto et al (15) considered the causal fungus to be a new race, J3, of *F. oxysporum* f. sp. *lycopersici* (Sacc.) Snyder & Hans.; this race would be race 2 sensu Gabe (4). However, although the fungus is restricted to hosts in the genus *Lycopersicon* (6,15) except for some slight pathogenicity to *Solanum melongena* L. and *Capsicum frutescens* L. by some isolates (15) (Rowe, *personal communication*), the symptoms it causes are clearly distinct from those caused by *F. oxysporum* f. sp. *lycopersici* (13).

The fungus enters the cortical tissues of roots and hypocotyl by way of the wounds caused by emerging secondary and adventitious roots, respectively (Fig. 1; Jarvis and Thorpe, *unpublished*), and causes a chocolate-brown lesion that extends into the vascular system. Vascular discoloration usually extends no more than about 25 cm above the root-stem transition zone, and the fungus can be isolated only 1-2 cm beyond the discoloration. Though young seedlings can be killed by the fungus (6,10), the infected plant in commercial conditions usually does not wilt until it is in the first full fruiting condition. If fruit is removed then, or if atmospheric and other conditions reduce transpiration, there may be some remission of symptoms. The disease is essentially one that occurs at cool (18 C) soil temperatures (6,11,12,15), thus differing from the wilt caused by *F. oxysporum* f. sp. *lycopersici* which is most severe at soil temperatures of about 27 C (13). The pathogen is readily dispersed by means of microconidia (9).

There is no doubt that the new pathogen is morphologically *Fusarium oxysporum* Schlecht., as interpreted by Booth (2) and Gordon (5), but clearly it is not a vascular wilt pathogen as are races 1 and 2 of *F. oxysporum* f. sp. *lycopersici* because of the different symptoms it causes and the different temperature optima for disease development. Because the fungus is specific, or very nearly so, to the genus *Lycopersicon*, it seems sensible to retain an epithet that denotes this, but it is also necessary to recognize the difference between this pathogen and *F. oxysporum* f. sp. *lycopersici*. Accordingly it is proposed to designate the fungus *Fusarium oxysporum* Schlecht. f. sp. *radicis-lycopersici*

n.f.sp. This designation follows the precedent of Weimer (14) who named the fungus causing remarkably similar symptoms in *Lupinus* spp. as *F. oxysporum* f. sp. *radicis-lupini*, to differentiate it from a previously named wilt-causing fungus, *F. oxysporum* f. sp. *lycopersici*. Extension of the race series in *F. oxysporum* f. sp. *lycopersici* is inappropriate because race designation (as in *F. oxysporum* f. sp. *pisi*) depends entirely on a differential host series (1). It attacks all cultivars tested and many species of *Lycopersicon*. The pathogen is designated more appropriately as a new forma specialis distinct from f. sp. *lycopersici*.



**Fig. 1.** Foot and root rot caused in a plant of tomato cultivar MR13, by *Fusarium oxysporum* f. sp. *radicis-lycopersici*. The chocolate-brown discoloration extends no more than about 25 cm up the stem. Invasion occurs in the stem base at the points where adventitious roots emerge (arrow). Note incipient root lesions at the point of emergence of secondary roots (arrow).

*Fusarium oxysporum* f. sp. *radicis-lycopersici* n.f.sp.

Indistinguishable from other isolates of *Fusarium oxysporum* on either morphology, or on characteristics of colonies in pure culture, the distinctive features of the new forma specialis are: attacks all species of the genus *Lycopersicon* tested and all cultivars of *L. esculentum* tested; causes a brown rot of cortical and vascular tissue of hypocotyl and roots that extends upward not more than 25 cm in the stem; can kill young seedlings, but usually causes wilt as a result of stem girdling at first fruiting of tomatoes; favored by cool (18 C) temperatures.

Collections: (The DAOM numbers that follow refer to dried specimens in the National Mycological Herbarium [acronym DAOM] and to cultures in the National Mycological Culture Collection, Biosystematics Research Institute, Saunders Building, Central Experimental Farm, Ottawa, Ontario, K1A 0C6, Canada). DAOM 161807—*Lycopersicon esculentum* Mill. 'MR13', Ruthven, Ontario, Canada, March 1975, W. R. Jarvis 1/75, "Type". Other collections all on *Lycopersicon esculentum* at Leamington, Ontario, Canada; DAOM 161808—cultivar WR25, April 1974, H. J. Thorpe 8; 147468—cultivar WR25, April 1974, H. J. Thorpe 1A; DAOM 147469—cultivar WR25, April 1974, H. J. Thorpe 8A; DAOM 161812—cultivar MR13, October 1975, B. H. MacNeill 213A; DAOM 161811—October 1975, B. H. MacNeill 213-20.

Even though formae speciales are currently exempt from the Code of Nomenclature, we wish to follow the principle of typification and designate culture DAOM 161807 as the type of the name.

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