A Proposed Nomenclature of Fusarium oxysporum f. sp. melonis Races and Resistance Genes in Cucumis melo

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ABSTRACT


Based on Black's system of classification of races, the authors propose a new nomenclature for races of Fusarium oxysporum f. sp. melonis and for resistance genes in Cucumis melo: races 0, 1, 2, and 1,2, and genes Fom 1 and Fom 2.

Additional key words: muskmelon, disease resistance. Fusarium wilt of muskmelon.

Confusion in the naming of races of Fusarium oxysporum f. sp. melonis (Leach & Currence) Snyder & Hansen, which causes Fusarium wilt of muskmelon Cucumis melo L., and genes for resistance in the host has developed in recent years (1, 3, 4, 5, 6). Table 1 summarizes a proposed nomenclature commensurate with independent research findings in our separate laboratories.

Therefore two known specific resistance genes, Fom 1 in Doublon and Fom 2 in CM 17187, and four races; race 0, attacking only a cultivar (e.g. Charentais T), which lacks specific resistance genes; race 1, overcoming Fom 1; race 2, overcoming both Fom 1 and Fom 2; and race 1,2, overcoming both Fom 1 and Fom 2. Race 1,2 is further subdivided into race 1,2a which strain and race 1,2b yellows strain.

Race differentiation began by comparative study of the reaction of three muskmelon cultivars, Charentais T, Doublon, and CM 17187, to various isolates. In 1965, Risser and Mas (5) classified French isolates of Fusarium oxysporum f. sp. melonis into three races according to their reactions to these cultivars. In Doublon, resistance to race 1 was found to be controlled by a dominant gene found in some populations of the old French cultivar Cantaloup Charentais (3). In 1973, Risser named this gene Fom 1 (4). Resistance of CM 17187 to both races 1 and 2 was attributed to another dominant gene, independent of Fom 1 and designated as Fom 2.

In 1968, Banihashemi (1) showed that American isolates of Fusarium oxysporum f. sp. melonis from Michigan differed from the above races by attacking CM 17187 but not Doublon. Later Davis (unpublished) found the same result with isolates from Minnesota. Banihashemi (1) designated this as a new race: race 4. Unfortunately Risser et al., in 1969 (6) used this designation for isolates which, similar to race 3, were able to attack all three differential cultivars but which, in contrast to race 3, induce yellows symptoms instead of wilt.

The nomenclature summarized in Table 1 follows the system of Black et al. (2) for Phytophthora infestans races and potato cultivars. Resistance genes in C. melo are numbered according to the order of discovery and Fusarium oxysporum races are named according to the resistance genes they can attack. Although the modified nomenclature would appear to be useful and timely, we recognize that it may not prevent the occurrence of further nomenclature confusion in the future if additional races are discovered.

LITERATURE CITED

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