

Resistance to Yellowing Disease in Wild Relatives of Muskmelon

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Cultivation of greenhouse muskmelon on the south east coast of Spain is being seriously affected by a yellowing disease which might be related to others described in Japan (6) and France (5). The disease noticed in Spain causes the leaves to turn yellow except in the veins, coming either from an interveinal chlorotic spotting or from a golden yellow basal stain. There is a closed relationship between the whitefly (Trialeurodes vaporariorum West-Wood) and both the intensity and early appearance of the symptoms of the yellowing disease of muskmelon (2).

Adequate levels of resistance to the yellowing disease of muskmelon have not been found in Spanish land races. Although 'Nagagata Kim Makuwa', PI 161375 and PI 157084 have shown some tolerance (3), all of them display systemic symptoms. Therefore the susceptibility to yellowing disease has been evaluated in four accessions of Cucumis ficifolius, three of C. ancuria var. longipes, two of C. zeyheri and of C. myriocarpus and one accession of C. metuliferus, Citrullus colocynthis and Cucurbita martinezii under conditions of natural infection.

The test was made in the greenhouse under massive whitefly infestation. More than 1000 plants of Cucumis melo were grown in the same greenhouse and all of them showed high levels of susceptibility. The Cucumis species evaluated have been reported as more susceptible than muskmelon to whitefly by Kowalewski (4).

Citrullus colocynthis, all of the accessions of Cucumis ancuria var. longipes and C. zeyheri and one accession of C. myriocarpus showed a high level of resistance to yellowing disease. Cucurbita martinezii, three accessions of Cucumis ficifolius and one accession of C. myriocarpus were highly susceptible, and the first symptoms appeared early. Cucumis metuliferus and one accession of C. ficifolius displayed the first symptoms of the disease later (Table 1).

Several plants of two accessions of Cucumis ficifolius behaved as resistant to yellowing disease and they were more vigorous than the other plants of those accessions. Their fruits did not fully develop and had very few seeds. There were indications that these plants may have been the F₁ progeny of Cucumis ficifolius x C. ancuria var. longipes. This fact could indicate that a dominant inheritance pattern confers resistance to yellowing disease in Cucumis ancuria var. longipes.

If the observed resistances are confirmed, two ways for gene exchange between these resistant species and Cucumis melo can be used: protoplast fusion or by using both Cucumis africanus and C. metuliferus like a genetic bridge. In fact, Cucumis ancuria var. longipes, C. zeyheri, C. myriocarpus and C. africanus have been reported to cross among themselves. All of them are incompatible with Cucumis melo but C. metuliferus can be crossed with both C.

melo and C. africanus (1), although the crosses are quite difficult to make. We are studying the feasibility of this way.

Table 1. Susceptibility to yellowing disease and days elapsed between sowing and first symptoms.

Species	Accession	Susceptibility or resistance	Days between sowing and first symptoms
<u>Cucumis metuliferus</u>		susceptible	120
<u>C. myriocarpus</u>	A-1	susceptible	53
	A-2	resistant	-
<u>C. anguria var. longipes</u>	A-1	resistant	-
	A-2	resistant	-
	A-3	resistant	-
<u>C. zeyheri</u>	A-1	resistant	-
	A-2	resistant	-
<u>C. ficifolius</u>	A-1	susceptible	101
	A-2	susceptible	53
	A-3	susceptible	65
	A-4	susceptible	53
<u>Cucurbita martinezii</u>		susceptible	53
<u>Citrullus colocynthis</u>		resistant	-

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