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Resistance against melon chlorotic mosaic virus and tomato leaf curl New Delhi virus in melon

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ABSTRACT

Cucurbit diseases caused by begomoviruses (genus *Begomovirus*, family *Geminiviridae*) are a new threat to cucurbit production worldwide. Some begomoviruses have a narrow geographic distribution despite a high local prevalence and agronomic impact, like the New World World begomovirus melon chlorotic mosaic virus (MeCMV) observed only in Venezuela so far; others have a larger geographic range. The Old World tomato leaf curl New Delhi virus (ToLCNDV), first described in India, was more recently reported in Europe and in Northern Africa where it has rapidly become a major agronomic problem. Control of begomoviruses relies on the limitation of their vector *Bemisia tabaci*—mostly by intensive insecticide treatments—, and on genetic resistance when available. Considering the frequent emergence of highly damaging begomoviruses, breeding for resistance is a key factor for a durable control, particularly if broad-spectrum resistances effective against several viruses at once can be found.

Thirty-one melon accessions were screened for resistance to MeCMV and ToLCNDV. Five accessions presented nearly complete resistance to both viruses. Accession IC-274014, showing the highest level of resistance to both viruses, was crossed with the susceptible cultivar Védrantais. The F₁, F₂, F₃/F₄ and both back-cross progenies were mechanically inoculated with MeCMV. Plants without symptoms nor virus detection by ELISA and/or PCR were considered as resistant. The segregations were compatible with two recessive and one dominant independent genes simultaneously required for resistance. Inheritance of resistance to ToLCNDV in the F₂ was best explained by one recessive gene and two independent dominant genes simultaneously required. Some F₃ and F₄ families selected for resistance to MeCMV were also resistant to ToLCNDV, suggesting that common or tightly linked genes were involved in resistance to both viruses.

Our results suggest that although some resistance factors to begomoviruses are specific, common broad-spectrum resistance genes may be present in melon germplasm and could constitute interesting tools for breeders.



President: Stuart Knight



Presentation of Crea-dc
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EMERAMB

Emergent viruses and virus
vectors in Mediterranean Basin
crops, an ARIMNet2 project
Coordinator Miguel A. Aranda,
CSIC, Spain



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