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#253: Molecular mapping in capsicum annuum of the tomato ve2 gene

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Verticillium wilt is a fungal disease caused by two soil-borne pathogens: *Verticillium dahliae* and *Verticillium albo-athrum*. They are responsible for important yield and quality losses in many crops. Few strategies are at present available for the control of these pathogens. To date, tolerance to *Verticillium* wilt has been found in *Capsicum chinense*, *C. frutescens* and *C. baccatum* genotypes, while only reduced susceptibility have been identified in *C. annuum*.

In tomato, the genetic resistance is conferred by two independent genes: *Ve1* and *Ve2*, which have been mapped on the short arm of chromosome T9. We isolated sequences homologue to *Ve1* and *Ve2* in pepper, and identified their location in three previously developed intra-specific *C. annuum* maps: (i) F5 RILs 'Yolo Wonder' x 'Criollo de Morelos 334' (YC); (ii) doubled haploids 'Perennial' x 'Yolo Wonder' (PY); (iii) doubled haploids 'H3' x 'Vania' (HV).

Primers were designed on the tomato *Ve1* (AF272367) and *Ve2* (AF365929) gene sequences and applied for amplifications of pepper homologous cDNAs obtained from pepper leaves. PCR products were obtained only with *Ve2* primers. The amplified pepper 860-bp-sequence revealed 87% identity with the tomato *Ve2* gene. The full length of the pepper homologous *Ve2* gene (*CaVe2*) was then successfully isolated.

Primer pairs were designed for analyzing the allelic forms of *CaVe2* in the five parents of the 3 mapping populations. A SNP between 'Yolo Wonder' and 'Criollo de Morelos 334' was identified, and a specific co-dominant dCAPS marker developed. Another dCAPS marker was generated for PY population while a tetra-primer ARMS marker was obtained for HV population. Segregation analyses in the three mapping populations made possible to localize *CaVe2* locus on chromosome P9, in a position colinear to the tomato *Ve* loci.

Further studies are in progress to evaluate the role played by this gene in the pepper tolerance to *Verticillium*.