

71. Development of novel SCAR markers to monitor two introgression events of the locus *Ty-1* (begomovirus resistance) from *Solanum chilense* into cultivated tomato

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Thus far, the locus *Ty-1* (introgressed from the wild species *S. chilense*) is the most important Begomovirus resistance/tolerance source for tomato (*Solanum lycopersicum*) breeding programs. The main objective of the present work was to identify novel and robust RAPD and/or SCAR markers linked to *Ty-1* that would be suitable for employment in distinct assisted-selection programs. Two segregating F₂ were employed for mapping the tomato chromosome 6 region encompassing *Ty-1* and other disease resistance factors. The population #1 was derived from a cross between two near isogenic lines (LAM 144-R x LAM 144-S), having only molecular markers associated with the *Ty-1* locus. The population #2 was derived from a cross between two near isogenic lines (LAM 162-Mi x LAM 162-Ty) that differ to a set of markers associated with two resistance loci (*Ty-1* and *Ty-3*) as well as for the *Mi* (*Meloidogyne incognita* resistance) gene. The four parental lines were initially evaluated with a panel of 520 RAPD primers. Six primers were selected due to the presence of polymorphic amplicons associated with the locus *Ty-1* exclusively in the population #1; fourteen primers were able to detect polymorphic amplicons exclusively in the population #2 and nine were able to detect polymorphic markers in both populations. These observed polymorphic patterns indicated that the two lines are most likely derived from distinct introgression events (probably from the *S. chilense* accessions 'LA-1969' and 'LA-2779'). A subgroup of RAPD markers was validated using a sample of 96 individuals of the population #1 after inoculation with the bipartite species Tomato severe rugose virus. Ten stable RAPD amplicons were gel-purified and sequenced aiming to generate SCAR markers. One SCAR amplicon (derived from RAPD OPC-19800) generated a marker with a peculiar heteroduplex and codominant pattern. The sequence analysis of SCAR OPC-19800 allowed us to anchor this marker in a physical region corresponding to that where *Ty-1* locus resides on tomato chromosome 6. This new collection of RAPD/SCAR markers might be important tools for the marker-assisted selection for monitoring the incorporation of the *Ty-1* locus in a wide range of tomato accessions.