TG183, 42 cM, Chromosome 7
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Introduction

The goal for this research was to develop a co-dominant CAPS or SCAR marker for the \textit{I3} gene, which corresponds to resistance to \textit{Fusarium oxysporum} f. sp. \textit{lycopersici} race 3. PCR primers for markers in the chromosomal region between the molecular markers CT226 and TG572 (Hemming et al., 2004) were evaluated on homozygous susceptible, and homozygous resistant tomato inbred lines as well as heterozygous F1 hybrids obtained from J. W. Scott, University of Florida, R. Gardner, North Carolina State University or commercial hybrids. The TG183 primers were co-dominant with some resistant lines and with other resistant lines these primers gave the \textit{S. lycopersicum} size PCR fragment. This is because different resistant tomato lines have different length of introgressions from \textit{S. pennellii} (Hemming et al., 2004).

Reference:


Primers

Table 1. PCR primers from Hemming et al., 2004

<table>
<thead>
<tr>
<th>Primer Name</th>
<th>Primer Sequence (5'-3')</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTG183F1</td>
<td>CTACTTTGTCTGCAAGGATTAC</td>
</tr>
<tr>
<td>PTG183R2</td>
<td>CGTGCCGTTCAAGAAGAGTG</td>
</tr>
</tbody>
</table>

*PCR at an annealing temperature of 53°C (TGEN53), ~1090 bp fragment.

Sequence

Purple Russian, i3/i3 (Partial Sequence); Purple Russian is a heritage tomato (OP) from Seed Savers Exchange, Decorah, Iowa

\textsc{Genbank Accession Number: EU926657}

1  CAATTTACTC TATTGAAAA ATTGTATAGA GGTAAAGCCA ATGGAATAGA TGAGGGGAAT
61  CTTATTAGAC AACTTCCATG GATTGGATG TGAAGATATG CTATCAACAT GTCTACTTAT
121  ATTTTACCTA TGAGGTGGAC TATAACCATG TCTCTCTCAAA AGAATTGTG TGAAATTTGA
181  AATACCCCTAT GAAATACTCT AAGTGAGATTG CGAATTTCAA ACCTGATGAG GAACATCTCA
241  TAGCCCCGTT GCTGATCTTGA TCTACACAGA TAACTCCACTA ATGGATAGG ACGCTCAGTAA
301  TTCCCAAAAT AATGAAATCT GTGTAAATGT TGCTAAAGTT AAGTGACAAA TAGATCTCTA
361  TAAGCGAAGA TCAGATAAAA ATCCGTTGAG ATTTCCAGAG TCTGAAGATCG
421  CTAGTTGGGT ACTAAAAAGGT ATGAAAAAGT ACAAGATATG AGTCTTTATT GCAATATCTAA
481  AGGCCATCTCC GAATCTCAAG GCAAGAACAA AGCAAAGGAG GACAAAGTGA AAGCTCAAAG
541  GGAAGAAGAT AACTGAAAG AAAAAAGG ATGAAAAAGT ACAAGATATG AGTCTTTATT GCAATATCTAA
601  TTGTGGACATA TAAGAGAATG TACAGAGCTT CATTCTCTAT CATTAGGACA
NC EBR-8, I3/I3 (Partial Sequence), inbred from R. Gardner

GENBANK ACCESSION NUMBER: EU926656

NC123S, I3/I3 (Partial Sequence)

GENBANK ACCESSION NUMBER: FJ004839
### Comparison of Purple Russian (top sequence) with NC EBR-8 (middle) and NC123S (bottom sequence)

<table>
<thead>
<tr>
<th>Sequence</th>
<th>PURPLE_RUSSIAN</th>
<th>NC EBR-8</th>
<th>NC123S</th>
<th>Consensus</th>
</tr>
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<tr>
<td><strong>Top sequence</strong></td>
<td>GAGGGAAGTCTTATGAGAGT</td>
<td>GAGGGAAGTCTTATGAGAGT</td>
<td>AAGGGAAGTCTTATGAGAGT</td>
<td>gggaagttcttattgaaaa ttgtat agaggtaagcctaatggatgagat</td>
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<tr>
<td><strong>Middle sequence</strong></td>
<td>GGCCCCAGATGCAATTTACTCTTATTGAAAAATTGTAT AGAGGTAAGCCTAATGGATGAGAT</td>
<td>GGCCCCAGATGCAATTTACTCTTATTGAAAAATTGTAT AGAGGTAAGCCTAATGGATGAGAT</td>
<td>GGCCCCAGATGCAATTTACTCTTATTGAAAAATTGTAT AGAGGTAAGCCTAATGGATGAGAT</td>
<td>ggcctttacttattgaaaa ttgtat agaggtaagcctaatggatgagat</td>
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<tr>
<td><strong>Bottom sequence</strong></td>
<td>AAGGGAAGTCTTATGAGAGT</td>
<td>AAGGGAAGTCTTATGAGAGT</td>
<td>AAGGGAAGTCTTATGAGAGT</td>
<td>ggcctttacttattgaaaa ttgtat agaggtaagcctaatggatgagat</td>
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### Consensus

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<td>ggcctttacttattgaaaa ttgtat agaggtaagcctaatggatgagat</td>
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### Summary

The comparison shows high similarity between the sequences, with only minor variations. The **Consensus** sequence highlights the general alignment and similarities across all three sequences.
Comments

Partial sequence was obtained for four samples, Purple Russian, F2 plant of Llanero, NC EBR-8, and NC123S. Sequences of Purple Russian and NC EBR-8 were identical, as well as to L40, an F2 plant from Llanero. Therefore, only NC123S has an introgression from *S. pennellii* in that chromosomal region.

For the sequence of Purple Russian and NC EBR-8, there was a 77% nt identity with clone LE_HBa-53M2 (chromosome 4) and at 82% nt identity with clones C08HBa0034F03 and C08HBa0091A10 (chromosome 8) for sequences at GenBank site. NC123S also matched with clone LE_HBa-53M2 at 69% nt identity, and with clones C08HBa0034F03 and C08HBa0091A10 at 77% nt identity. Purple Russian also matched with clone LE_HBa0073G16_SP6_16830 (DU034689) at 99% nt identity. NC EBR-8 matched the same clone with a 98% nt identity, as well as NC123S with a 97% nt identity.