Allele-specific PCR detection of sweet cherry self-incompatibility alleles S_3, S_4 and S_9 using consensus and allele-specific primers in the Czech Republic

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Prunus avium species of the Rosaceae family exhibit gametophytic self-incompatibility. Determination of the self-incompatibility genotype of individuals is essential for genetic studies and the development of informed management strategies. The PCR-based detection of S-allele helps to promote and speed up traditional breeding activity and hence molecular analysis of the perspective genotypes has become more intensive in all cherry growing countries. The alleles S_3, S_4 and S_9 from 34 accessions of Czech collections were determined using the polymerase chain reaction (PCR) method. Initially, DNA extracts were amplified with consensus primers that amplify across the first, second, or both introns of the S-ribonuclease gene which shows a considerable length polymorphism. The new allele specific primers were designed with the goal to overcome some occurring difficulties in the detection of expected alleles by previously published allele specific primers. S-alleles fragments of standard cultivars used in this study were PCR amplified, sequenced to validate the designed primers. The study demonstrates the advantage of newly designed primers application in testing of sweet cherry genotypes.

Keywords:

Prunus avium; S-alleles; allele-specific primers; consensus primers

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