Wild cherry triploids: a chance for breeders

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Polyploidization is a natural phenomenon that plays an important role in origin and evolution of plants. Polyploids are generally bigger and more robust than their diploid parents, so polyploidization can be a powerful tool for genetic improvement. Spontaneous triploids found in some tree species revealed superior qualities for timber production. *P. avium* is a diploid species (2n=2x=16) but triploidy can occur spontaneously. The wild cherry improvement program of INRA led to the phenotypic selection of 403 'plus trees'. Within this collection we found some triploids in the past; we further seek systematically spontaneous triploids, in order to test if triploidy is a valuable way for wild cherry improvement.

12 SSRs and the incompatibility S system were assessed. Genotyping triploids with one or three alleles was obvious, but a method was developed to quantify the doubled allele when two alleles were assessed. Eleven triploids were first detected as 3 alleles were seen for 3 to 8 markers out of 13. All the alleles found in triploids are present in diploids. Flow cytometry results confirmed the triploidy, excluding the hypothesis of aneuploidy that our SSRs data could not dismiss. The triploids are distributed evenly in several French regions most densely sampled. They represent 3 % of the French collection whereas none was detected in 6 French and in several other European wild cherry populations, all explored with SRRs. The fact we found so many triploids in the collection and none elsewhere leads us to suspect triploids to be a valuable source of superior material.

Growth and resistance to leaf spot were scored in four clonal plantations (of age 6 to 14), where six triploids were planted. Increase in circumference is significantly different between triploids and diploids in the 4 trials, triploids exceeding diploids by 134 %. The average increase in height of triploids represents 121 % of diploids' values. Triploids were particularly not very sensitive to leaf spot. With such growth potential, triploids appear to be interesting for wood production.

Morphological measurements of leaves and petals were achieved for the 11 triploids (9 for the petals) and for 20 randomly selected diploids. Triploids have significantly broader leaves, with a 17 % increase compared with diploids, but these differences are not enough important to discriminate with certainty triploids from diploids. Triploids have petals 42 % broader and 30 % longer than diploids and this difference in size is sufficiently discriminating to distinguish triploids from diploids by this only criterion.

Experimental data showed that triploids are interesting for improvement programs thanks to their growth potential, but their form is not always ideal. Only 3 of them could have been selected and introduced in varieties and we wish to find more. We discuss ways to find or produce some more.