

Selection of spontaneous autotetraploid plants from *Citrus* polyembryonic cultivars

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ABSTRACT: Seedlessness is one of the most important characteristics for mandarin fresh fruit market. Mandarin triploid hybrids allow implementing this trait in commercial varieties. Indeed triploids plants are generally sterile and they do not pollinate other varieties. Triploid plants can be recovered by crossing diploid and tetraploid parents. Most citrus genotypes are apomictic. The origin of apomixis is determined by adventitious embryony in polyembryonic seeds (Koltunow, 1996). The adventitious embryos originate from nucellar cells (Kobayashi et. al., 1981). Tetraploid plants are found with variable frequency in seedling populations of polyembryonic citrus genotypes. This allows the recovery of citrus tetraploid genotypes that can be used for triploid breeding. In the framework of the IVIA triploid breeding program (Navarro et. al., 2002), we have searched for tetraploids plants in seedling populations of 'Anana', 'Fairchild', 'Kara', 'Page', 'Salteñita', 'Simeto', 'Sunburst' and 'Tardivo di Ciaculli' mandarins, 'Afourer', 'Murcott' and 'Ortanique' tangors, 'Mapo' and 'Minneola' tangelos, 'Duncan' and 'Star Ruby' grapefruits and 'Sanguinelli' orange. Determination of ploidy level was made by flow cytometry and genetic analysis to confirm their genetic origin with 31 SSRs markers. Tetraploid plants were found in all genotypes analyzed, except 'Salteñita' and 'Simeto' mandarins, but the frequency of tetraploids varied with the genotype. 'Kinnow' mandarin produced the larger number of tetraploids plants (9,7%), whereas 'Page' mandarin produced the smaller percentage (0,5%). All the tetraploid plants showed the same ploidy level in all parts of the plant, indicating that they were not chimeras. They presented the same molecular profile as their maternal parents for all *loci* analyzed, thus indicating that these plants originated as a result of the duplication of the chromosome number in nucellar cells. The new tetraploid plants have been included in the collection of tetraploid genotypes of the IVIA Germplasm Bank for their use as male parents in the triploid breeding program.

References

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