

W702

Major Cause of Somatic Polymorphism in Clonal Grape Cultivars

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Clonal variation is considered as an effective contribution to breeding programs of vegetatively propagated species with major agronomical interest such as banana, coffee and grape. After several propagation cycles, stable and heritable phenotypic variations appear giving rise to a phenotypic variation known as “clonal diversity”. Clonal diversity is very important for wine-growers because it allows preserving cultivars identity in the strict respect of Appellation wines specifications. The most parsimonious hypothesis explaining clonal diversity is the accumulation of somatic mutations. Using the power of NGS, we provided the first broad description of polymorphism in different clones of a single grapevine cultivar (Pinot) and then compared the clonal polymorphism in 4 different cultivars: Pinot, Syrah, Grenache and Sultanine. Three types of polymorphism (SNPs, Indels, mobile elements) were observed. As expected, the polymorphism at cultivars level was much higher than at clonal level. The insertion polymorphism generated by mobile elements represented the highest mutational event with respect to clonal variation while SNP and indel polymorphisms were of higher importance for cultivar diversity. Among mobile element with a high polymorphism level, four were analyzed and polymorphisms were confirmed at different diversity levels: inter-species, inter-cultivars, inter-clones and between organs/tissues of a single individual. We confirm the high instability of these elements between clones and between tissues in single individuals.

Clone identification through molecular methods would be of high significance for the wine industry. SNP or small indels mutations are less frequent but more stable than structural variation and could have much potential for accurate identification.