

## P9 – Phenotypes and genetic background of seedless grapevine varieties in Armenia

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### Abstract

Seedlessness is a highly valuable trait in the EU and global grape markets. Genotyping and phenotyping of seedless varieties are an efficient tool for assessing the genetic diversity, determining the type of seedlessness, and optimizing their use in table breeding programs. In this work, a total of 42 Armenian *Vitis vinifera* L. seedless grapevine accessions were sampled from the Armavir region, mainly from the grape collections at Etchmiadzin (ARM006) and Nalbandyan (ARM011). True-to-type genotyping was performed with seven nuclear microsatellite loci and the molecular profiles obtained were compared to those stored in the *Vitis* International Variety Catalogue (VIVC, [www.vivc.de](http://www.vivc.de)), and the Armenian *Vitis* database ([www.vitis.am](http://www.vitis.am)). Phenotypic analysis of berries and seeds was carried out according to OIV descriptors. Molecular analysis of seedlessness was performed by the targeted sequencing of *VviAGL11* MADS-box gene, responsible for embryo and endosperm development and seed coat lignification.

Genetic profiling identified 11 unique genotypes, namely 'Anush', 'Eskeri', 'Hrushaki', 'Karmir Kishmish', 'Karmir Yerevani', 'Kishmish Chernyi', 'Kishmish Khishrau', 'Kishmish Moldavskii', 'Parvana', 'Sultanina' and 'Ushahas Nazeli'. According to their pedigrees in the databases the majority of investigated varieties are genetically Sultanina derived: 'Karmir Yerevani', 'Eskeri', 'Hrushaki' and 'Kishmish Moldavskii' are offspring of Sultanina, while 'Anush' and 'Ushahas Nazeli' have a second-degree relationship. Phenotypic analysis revealed a wide variation in berry size, as well as in the formation of seeds (from very small, to large and noticeable). Mean berry size ranged between 10.5 mm and 20.1 mm in length, and 9.5 mm to 16.9 mm in width. Berries with ovule residues and small rudimental seeds were detected in 'Karmir Yerevani', 'Karmir Kishmish', 'Sultanina' and 'Hrushaki'. Plants of the rest of cultivars produced large, but empty floating seeds, and rarely up to 0.4 well-developed seeds per berry. By contrast, berries of 'Ushahas Nazeli' showed large size 1.5 well-developed potentially viable sinker seeds per berry. Targeted sequencing of *VviAGL11* gene revealed heterozygosity for the seedless dominant point mutation Arg-197Leu (A:C) in ten investigated seedless genotypes, which causes the stenospermocarpy in Sultanina-type seedless cultivars. The only exception was found for 'Ushahas Nazeli' which was homozygous for the seeded allele (C:C). We are currently investigating gametes viability, as well as endosperm and embryo development features, in order to integrate- phenotypic and genotypic data.

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