

## Arinto clones tolerant to climate change: in depth transcriptomic study of tolerant and sensitive genotypes

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### Abstract

Drought and heat waves deriving from climate change have been affecting grapevine plants and altering wine characteristics in the past years, and effects are expected to get worst. Innovative approaches to address this problem have been undertaken in several varieties, that consist in exploring intravarietal variability to identify genotypes that are tolerant to abiotic stress. Such is the case of the variety Arinto, where an experimental population of 165 clones installed according to a resolvable row-column design with 6 replicates, was scanned for several parameters, including surface leaf temperature (SLT). Linear mixed models were fitted to the data of the traits evaluated, and the empirical best linear unbiased predictors (EBLUPs) of genotypic effects for each trait were obtained as well as the coefficient of genotypic variation (CVG) and broad sense heritability. The genotypes were then ranked according to their level of tolerance to abiotic stress without loss of yield/quality. The results enabled the selection of a group of genotypes with increased tolerance to stress, and also to identify the group of genotypes that was more sensitive. Then, leaves of the ten most tolerant and the ten most sensitive genotypes were sampled for RNAseq analyses. Samples were taken prior to veraison, on conditions of intense environmental stress. This analysis enabled the characterization of the transcriptome of the sensitive and of the tolerant genotypes and several markers of tolerance were identified.

**Keywords:** abiotic stress, molecular markers, RNAseq, tolerant clones, sensitive clones.

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