

## **P68 – Dissecting the effect of soil on berry transcriptional plasticity in two Italian grapevine varieties (*V. vinifera* L.)**

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### **Abstract**

Grapevine (*Vitis vinifera* L.) is one of the oldest and most widely cultivated perennial fruit crops in the world. Its global socioeconomic importance is due to the high-quality attributes of berries, principally employed for wine production and fresh consumption. Grapevine is characterized by a pronounced phenotypic plasticity, as different wines can be produced from the same genotype when cultivated in different environmental conditions. The growing interest of the scientific community and wine producers on genotype *per* environment (GxE) interactions and the strictly related concept of *terroir*, which itself embodies one of the most evident examples of phenotypic plasticity, led to a boost in studies on this issue. Dissecting the weight of each single *terroir* component in the grapevine plastic response is a notable effort, given the difficulty of comparing the behavior of different plants grown in different areas blocking all variables except one. This was the challenge of the present study: trying to underlie the genetic and molecular mechanisms at the base of phenotypic plasticity in response to a single *terroir* factor and not to a combination of variables. To do this we conducted a field experiment where all the *terroir* variables, except for the soil, were kept as constant as possible and taking advantage of the high-throughput expression profiling technologies, we analyzed gene expression on a global scale, trying to investigate the berry skin and flesh transcriptional plasticity throughout maturation in two varieties of great interest at the national and international level: 'Glera' and 'Corvina'. Molecular results, together with phenological and physiological parameters measured during the whole seasonal cycle over 72 plants, suggest a specific effect of soil factor on grapevine plasticity and indicated specific gene networks related to *terroir* that could be object of further studies with the ultimate aim of implementing agricultural practices in order to i) obtain the desired fruit characteristics for every climate/cultivar combination, ii) lead to more efficient use of resources and better management of vineyards, iii) maximize the *terroir* effect on the grapevine to highlight the uniqueness of their vineyards ultimately increasing the industrial competitiveness.

**Keywords:** Phenotypic plasticity, GxE interactions, *terroir*, transcriptomics, gene expression, 'Glera', 'Corvina'