

Transnational Access Report

1. General Information

Project Acronym (ID):	VOC5VAS
Project Title	Phenotyping of BVOC emissions from four <i>Vitis vinifera</i> cultivars under abiotic and chemically-induced stresses
Name of Group Leader	Luca Cappellin
Name of organization	Fondazione Edmund Mach

2. Duration of access

Begin of the project	End of the project
6 th July 2015	8 th August 2015

3. Project summary (max. 250 words)

The purpose of the project was to study the response of four different grapevine (*Vitis vinifera* L.) cultivars to a set of stresses, including chilling stress, heat stress and chemical stress. Grapevine cultivars were selected among varieties of red and white grapes typically grown in north Italian regions. Two of the cultivars (Riesling and Pinot Noir) have their origin in Central Europe and the other two (Garganega and Barbera) in the Italian-Greek-Balkan area. Besides their origin, they also differ in the grape color: Riesling and Garganega have white grapes while Barbera and Pinot Noir have red colored grapes. We took measurements with different instruments (MiniPAM, Dualex, GC-MS and PTR-ToF-MS) in order to find relationships between plant stress and volatile compound emission. By confronting the different measurements of the four grapevine cultivars under the stresses, differences could be identified mainly in the emission of monoterpenes. This preliminary results and further experiments could lead to develop new breeding strategies to obtain grapevine cultivars naturally resistant to adverse conditions.

4. Main achievements (max. 250 words)

During the heat stress cultivar dependent differences in the VOC emissions could be observed with the PTR-ToF-MS. Despite the low leaf emissions that are characteristic of the *Vitis vinifera* L. species we could observe changes in monoterpene emission. These terpenes and possibly other terpenoids (to be confirmed by the GC-MS data) are emitted only by the two white grape varieties (Riesling and Garganega). Other interesting findings are the remarkable increase of methanol emission on the first day of stress or the emission of green leaf volatiles by all four cultivars. The data obtained with the MiniPAM shows differences in photosynthesis response to heat, although not as pronounced as with the cold stress. Not significant changes in the leaf pigmentation could be measured by the Dualex.

In the case of chilling stress, the MiniPAM and ion leakage did show differences on stress responses by the different cultivars. Not significant changes in the leaf pigmentation were measured by the Dualex. Moreover, no conclusive results with the PTR-ToF-MS could be made in the case of the chilling stress since the instrument had major problems just when the stress was starting to be applied. As a replacement, a quadrupole PTR-MS was connected to the measurements but no reliable conclusions can be drawn from joining together the two instrument data because their sensitivities and resolutions are different. On the other hand, the GC-MS data

is still to be analyzed so no statements can be done yet.

Lastly, the salicylic acid stress treatment, unexpectedly, did not produce any reaction by the plants, at least regarding VOC emissions, photosynthesis and pigments.