**Effect of water deficit on phenolic profile in four cultivar of *Vitis vinifera* at harvest**

Stefania Savoi\*a,b, Panagiotis Arapitsasa, Isabella Paladinob, Enrico Peterlungerb, Simone Diego Castellarinc and Fulvio Mattivia

aDepartment of Food Quality and Nutrition, Research and Innovation Centre, Fondazione Edmund Mach (FEM), Via E. Mach 1, 38010 San Michele all'Adige, Italy.

bDepartment of Agriculture and Environmental Science, University of Udine, Via delle Scienze 208, 33100 Udine, Italy.

cWine Research Centre, University of British Columbia, 2205 East Mall, Vancouver, BC, V6T 1Z4, Canada.

\*stefania.savoi@fmach.it

Grapevine is one of the major fruit crops cultivated in the world. Secondary metabolites strongly affect grape and wine quality. The accumulation of these metabolites is strongly under environmental control.

This study investigated the effect of water deficit on grape phenolic composition in four *Vitis vinifera* cultivars.

In 2011 and 2012, field experiments were conducted on Merlot, Pignolo, Tocai Friulano and Ribolla gialla vines at the University of Udine experimental farm (north-eastern Italy). From berry set to harvest, control vines were weekly irrigated and water deficit vines were not irrigated.

The analysis of the phenolic compounds were performed with an UHPLC-MS/MS instrument (Waters). Polyphenols extraction and analyses were carried out according to Ehrhard et al. [1].

Forty phenolic compounds were detected and quantified. They belonged to different classes: hydroxycinnamic acids, stilbenoids, monomeric and dimeric flavan-3-ols, and flavonols.

Phenolic profile varied among varieties. Pignolo accumulated more acid caftaric, coutaric, (+)catechin, (-)epicatechin, (+)gallocatechin and (-)epigallocatechin, procyanidin B1, procyanidin B3, procyanidin B2+B4, and isorhamnetin-3-rutinoside. Merlot grapes were rich in stilbenoids such as: *cis-* and *trans-*resveratrol, *cis-* and *trans-*piceid, pallidol, astringin, piceatannol and *trans*-ξ-viniferin. The white varieties, Tocai Friulano and Ribolla gialla, accumulated more flavonoids: kaempferol-3-*O*-glucoside and quercetin-3-*O*-glucoronide.

Water deficit also decreased flavan-3-ols and, in particular (+)catechin. On the contrary, water deficit increased the concentration of caftaric and coutaric. Interestingly, water deficit increased the concentration of several stilbenoids in Pignolo, while it decreased the stilbenoids concentration in Merlot.

Water deficit significantly affected the phenolic profile of the berry, however, the effect was not consistent among varieties.

**Reference**

[1] Ehrhardt C., Arapitsas P., Stefanini M., Flick G., Mattivi F. *J Mass Spectrom.*, 49 (2014) 860-869.