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Metabolomic Changes in Grapevine Leaves of Resistant Varieties after Infection with *Plasmopora viticola*

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Cultivated grapevine is attacked by several fungi; the two most common are *Plasmopara viticola* (grapevine downy mildew) and *Erysiphe necator* (powdery mildew) that arrived in Europe in the 1800s. These fungi require several treatments and can reduce the production and crop quality significantly. Different forms of resistance to natural *Plasmopara viticola* in several wild species from different continents (North America and Asia) were shown. Up to now, the studies on the natural defense mechanisms of the different species have shown that the infection of grapevine results into the production of different metabolites, in particular in the group of polyphenols. In this study, different metabolites in the leaves of plants from different species resistant to downy mildew were defined with markers RPV 1: 3: 10; 12 and analyzed by using metabolomic approaches. The UHPLC/MS/MS methods were applied to study qualitative and quantitative changes of polyphenols (1) and lipids (2) and in grapevine leaves of four resistant varieties (Solaris, Bianca, Jasmine and BC4) induced by the infection with *Plasmopara viticola* pathogen inoculation after 0, 12, 48 and 96 hours. The primary aim of the work was to find early stage biomarkers and to explain differences in metabolomic changes due to different forms of resistance. The results show that the changes in metabolomic profiles after infection varies in the varieties included in the study. This means that resistance to *Plasmopara viticola* defined with different markers RPV 1: 3: 10; 12 results as a consequence of diverse changes of metabolism.

Keywords: *Vitis*, *Plasmopara viticola*, resistance, metabolomics, biomarkers

Reference: (1) Vrhovsek, U. et al. 2012. Journal of agricultural and food chemistry, 60:8831–8840. (2) Della Corte, A. et al, Talanta, <http://dx.doi.org/10.1016/j.talanta.2015.03.003>.

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