

Nutritional phenolic compounds in red wines determined by HPLC-DAD-ESI-MS and MS/MS technique

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Red wine is a rich source of bioactive and nutritional phenolic compounds which show antioxidant properties, present potential health effect, exhibit a free radical scavenging activity as well as a protective activity against arteriosclerosis, coronary heart disease or inhibit the cancer cell growth. In this study, the detailed phenolic profile of Macedonian red wines Vranec, Merlot and Cabernet Sauvignon, was determined. For that purpose, a high-performance liquid chromatography coupled with diode array detector and on line electrospray ionization mass spectrometry (HPLC-DAD-ESI-MS and MS/MS) was used for determination of the individual nutritional phenolic compounds in the wines. For analysis of anthocyanins and other pigments, wines were only diluted with 0.1M HCl (1:4). A solid-phase extraction with Oasis MCX cartridges was applied for separation of flavonols, phenolic acids and stilbenes [1,2]. ESI-MSⁿ analysis were performed in positive ionization mode for identification of anthocyanins, flavonols and flavan-3-ols, and for gallic acid, hydroxycinnamic acid derivatives and stilbenes determination, ESI operated in negative ionization mode [3]. Complex phenolic profile was revealed for all wines composed of anthocyanins, vitisins, hydroxyphenyl-pyranoanthocyanins, flavonols, hydroxycinnamic acid derivatives, flavan-3-ols and stilbenes. Vranec wine was richest in all phenolics, especially anthocyanins that make it deeply colored, fresh and stable, appropriate for production of high quality red wines [4].

References:

- [1] N. Castillo-Muñoz, S. Gómez-Alonso, E. García-Romero, I. Herмосín-Gutiérrez, *J Agr Food Chem*, 2007, 55, 992–1002.
- [2] N. Castillo-Muñoz, S. Gómez-Alonso, E. García-Romero, M.V. Gómez, A.H. Velders, I. Herмосín-Gutiérrez, *J Agr Food Chem*, 2009, 57, 209–219.
- [3] V. Ivanova-Petropulos, I. Herмосín-Gutiérrez, B. Boros, M. Stefova, T. Stafilov, B. Vojnoski, A. Dörnyei, F. Kilar, *J Food Compst Anal*, 2015, 41, 1-14 .
- [4] V. Ivanova-Petropulos, A. Ricci, D. Nedelkovski, V. Dimovska, G.P. Parpinello, A. Versari, *Food Chem*, 2015, 171, 412-420.