**Methodology of the measurement**

**Determination of total phenolic content**

A simple spectrophotometric method (Lapornik et al., 2005) was used for the determination of total phenolic substances content in the colorless extracts of berries. This analytical technique is based on the reaction between Folin-Ciocalteau reagent with hydroxyl groups of phenolic substances in the sample forming a mixture of blue oxidation products at pH of 10. Due to high value of pH signal is not influenced by another reducing species e.g. ascorbic acid and depends only on the concentration of polyphenols in the sample (Lapornik et al., 2005; Olgun et al., 2014). The total content of phenolic species was calculated from linear calibration dependence, constructed from the absorbance values measured at 765nm wavelength of variously concentrated solutions of gallic acid which was used as a standard (Ignat et al., 2011).

The total phenolic content calculated from calibration curve equation was also expressed as equivalents of gallic acid in mg/100 g fruit weight (mg GAE/100 g FW).

**Determination of total flavonoid content**

The total flavonoid content was determined also according to relatively simple spectrophotometric procedure (Marinova et al., 2005; Jia et al., 1999). The principle of this method is the formation of red oxidation products in the solution containing NaNO2, AlCl3 and NaOH in the presence of flavonoids. The color intensity, expressed by absorbance measured at 510nm wavelength, depends only on concentration of flavonoids. Similarly, as in the case of determination of total phenolic content total flavonoid content was calculated from the equation of calibration curve, but catechin was used as standard. Total flavonoid content was also expressed as equivalents of catechin in mg/100 g of fruit weight (mg CE/100 g FW) (Prasain et al., 2004).

 Before spectrophotometric measurements the students prepared samples according to a procedure published in the literature (Lapornik et al., 2005) resp. (Marinova et al., 2005) (weighting, extraction, filtration), and also, they prepared the gallic acid and catechin solutions. Further, they conducted spectrophotometric measurements of fruit samples and standard solutions (including blank).

# References

1. Ignat, I., Volf, I. & Popa, V. I. (2011). A critical review of methods for characterisation of polyphenolic compounds in fruits and vegetables. *Food Chemistry*, 26*,* 1821–1835.
2. Jia, Z.S., Tang, M.C. & Wu, J.M. (1999). The Determination of Flavonoid Contents in Mulberry and Their Scavenging Effects on Superoxide Radicals. *Food Chemistry* 64, 555-559.
3. Lapornik, B., Prosek, I. & Golc, W., A. (2005). Comparison of extracts prepared from plant by-products using different solvents and extraction time. *Journal of Food Engineering,* 71, 214–222.
4. Olgun, F.A.O., Ozyurt, D., Berker, K.I., Demirata, B. &Apak, R. (2014). Folin-Ciocalteu Spectrophotometric Assay of Ascorbic Acid in Pharmaceutical Tablets and Orange Juice with pH Adjustment and Pre-Extraction of Lanthanum (III) - Flavonoid Complexes. *Journal of the Science of Food and Agriculture* 94, 2401-2408.