

The Antioxidant Activity of Grape Chkhaveri and Its Wine Cultivated in West Georgia (Adjara)

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Abstract : Modern scientific world studies chemical components and antioxidant activity of different kinds of vines according to their breed purity and location. To our knowledge, this kind of research has not been conducted in Georgia yet. The object of our research was to study Chkhaveri vine, which is included in the oldest varieties of the Black Sea basin vine. We have studied different-altitude Chkhaveri grapes, juice, and wine (half dry rose-colored produced with European technologies) and their technical markers, qualitative and quantitative composition of their biologically active compounds and their antioxidant activity. We were determining the amount of phenols using Folin-Ciocalteu reagent, Flavonoids, Catechins and Anthocyanins using Spectral method and antioxidant activity using DPPH method. Several compounds were identified using HPLC-UV-Vis, UPLC-MS methods. Six samples of Chkhaveri species- 5, 300, 360, 380, 400, 780 meter altitudes were taken and analyzed. The sample taken from 360 m altitude is distinguished by its cluster mass (383.6 grams) and high amount of sugar (20.1%). The sample taken from the five-meter altitude is distinguished by having high acidity (0.95%). Unlike other grapes varieties, such concentration of sugar and relatively low levels of citric acid ultimately leads to Chkhaveri wine individuality. Biologically active compounds of Chkhaveri were researched in 2014, 2015, 2016. The amount of total phenols in samples of 2016 fruit varies from 976.7 to 1767.0 mg/kg. Amount of Anthocyanins is 721.2-1630.2 mg/kg, and the amount of Flavonoids varies from 300.6 to 825.5 mg/kg. Relatively high amount of anthocyanins was found in the Chkhaveri at 780-meter altitude - 1630.2 mg/kg. Accordingly, the amount of Phenols and Flavonoids is high- 1767.9 mg/kg and 825.5 mg/kg. These characteristics are low in samples gathered from 5 meters above sea level, Anthocyanins-721.2 mg/ kg, total Phenols-976.7 mg/ kg, and Flavonoids-300.6 mg/kg. The highest amount of bioactive compounds can be found in the Chkhaveri samples of high altitudes because with rising height environment becomes harsh, the plant has to develop a better immune system using Phenolic compounds. The technology that is used for the production of wine also plays a huge role in the composition of the final product. Optimal techniques of maceration and ageing were worked out. While squeezing Chkhaveri, there are no anthocyanins in the juice. However, the amount of Anthocyanins rises during maceration. After the fermentation of dregs, the amount of anthocyanins is 55%, 521.3 gm/l, total Phenols 80% 1057.7 mg/l and Flavonoids 23.5 mg/l. Antioxidant activity of samples was also determined using the effect of 50% inhibition of the samples. All samples have high antioxidant activity. For instance, in samples at 780 meters above the sea-level antioxidant activity was 53.5%. It is relatively high compared to the sample at 5 m above sea-level with the antioxidant activity of 30.5%. Thus, there is a correlation between the amount Anthocyanins and antioxidant activity. The designated project has been fulfilled by financial support of the Georgia National Science Foundation (Grant AP/96/13, Grant 216816), Any idea in this publication is possessed by the author and may not represent the opinion of the Georgia National Science Foundation.

Keywords : antioxidants, bioactive content, wine, chkhaveri

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