

Variation of Biologically Active Compounds and Antioxidancy in the Process of Blueberry Storage

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Abstract : Cultivation of blueberry in Georgia started in 21st century. There are more than 20 species of blueberry cultivated in this region from all other the world. The species are mostly planted on acidic soil, previously occupied by tea plantations. Many of the plantations have pretty good yield. It is known that changing the location of a plant to a new soil or climate effects chemical compositions of the plant. However, even though these plants are brought from other countries, no research has been conducted to fully examine the blueberry fruit cultivated in Georgia. Shota Rustaveli National Science Foundation Grant FR/335/10-160/14, gave us an opportunity to continue our previous works and conduct research on several berries, among them of course the chemical composition of stored Blueberry. We were able to conduct the first study that included examining qualitative and quantitative features of bioactive compounds in Georgian Blueberry. This experiments were held in the 'West Georgia Regional Chromatography center' (Grant AP/96/13) of our university, that is equipped with modern equipment like HPLC UV-Vis, RI-detector, HPLC-conductivity detector, UPLC-MS-detector. Biochemical analysis was conducted using different physico-chemical and instrumental methods. Separation-identification and quantitative analysis were conducted using UPLC-MS (Waters Acquity QDa detector), HPLC (Waters Brceze 1525, UV-Vis 2489 detectors), pH-meters (Mettler Toledo). Refractrometer -Misco , Spectrometer -Cuvette Changer (Mettler Toledo UV5A), C18 Cartridge Solid Phase Extraction (SPE) Waters Sep-Pak C18 (500 mg), Chemicals - stability radical- 2,2-Diphenil-1-picirilhydrazyl (Aldrich-germany), Acetonitrile, Methanol, Acetic Acid (Merck-Germany), AlCl₃, Folin Ciocalteu reagent (preparation), Standarts -Callic acid, Quercetin. Carbohydrate HPLC-RI analysis used systems acetonitrile-water (80-20). UPLC-MS analysis used systems- solvent A- Water +1 % acetic acid and solvent -B Methanol +1% acetic acid). It was concluded that the amount of sugars was in range of 5-9 %, mostly glucose and fructose. Also, the amount of organic acids was 0.2-1.2% most of which was malic and citric acid. Anthocians were also present in the sample 200-550mg/100g. We were able to identify up to 15 different compounds, most of which were products of delphinidine and cyanide. All species have high antioxidant level(DPPH). By rapidly freezing the sample and then keeping it in specific conditions allowed us to keep the sample for 12 months.

Keywords : antioxidants, bioactive, blueberry, storage

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