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Investigation of Physiochemical Characteristics of Wild Fruits and Berries from the Walnut-Fruit Forests of Southern Kyrgyzstan

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Abstract

The physicochemical properties and nutritional value of wild fruits and berries commonly growing in the walnut-fruit forests of southern Kyrgyzstan were determined to evaluate the capacity for use in the food processing industry. The investigated species were selected based on their reported nutritional aspects and medical properties and included apple (*Malus sieversii* var. *kirgizorum*), barberry (*Berberis oblonga*), cherry-plum (*Prunus divaricata* black, red, yellow), dog-rose (*Rosa canina*), hawthorn (*Crataegus songorica*), pear (*Pyrus korshinskyi*), and sea buckthorn (*Hippophae rhamnoides*). The fruits were collected from the natural walnut-fruit forests in the communities of Arslanbob (N 41°22'8.33", E 72°3'45.974", Altitude: 1300 m) and Kyzyl-Unkur (N 41°18'20.903", E 72°57'48.209", Altitude: 1466 m) in September 2017. The nutritional value of the samples was determined in terms of moisture, carbohydrates, alimentary fiber, vitamin, ash, titratable acidity, total polyphenols (TPC), total antioxidants, and total anthocyanins. The results of the analysis showed that the investigated fruits and berries have a moisture content ranging between 59.52 % (*Berberis oblonga*) and 85.14 % (*Malus sieversii* var. *kirghisorum*), carbohydrates ranging from 0.50 % (*Hippophae rhamnoides*) to 10.29 % (*Pyrus korshinskyi*), alimentary fiber ranging from 0.73 % (*Prunus divaricata* yellow) to 13.19 % (*Berberis oblonga*), vitamin ranging between 7.39 mg/100 g (*Prunus divaricata* yellow) and 492.35 mg/100 g (*Berberis oblonga*), and ash content ranging between 0.30 % (*Malus siversii* var. *kirghisorum*) and 2.70 % (*Rosa canina, Berberis oblonga*). Among all the samples analyzed, the *Berberis oblonga* revealed the highest TPC at 2578 mg gallic acid equivalents/L followed by *Rosa canina* (2144 mg GAE/L). Between the samples, the lowest TPC value was found for Prunus divaricata yellow (611 mg GAE/L). All the studied fruits and berries can serve as a good source of bioactive compounds in the human diet. From the view of the phenolic content and antioxidant activity, barberry can be regarded as a good raw material for the production of healthy and/or functional foods.

The study was conducted within the SUSWALFOOD project.

Keywords: Berries, fruits, Kyrgyzstan, physio-chemical properties, total anthocyanins, total antioxidants, total polyphenols, walnut-fruit forest

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