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# Quality Parameters of Walnut (*Juglans regia*) Fruits from Kyrgyzstan as Affected by Abiotic Properties and Intraspecific Variability

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**Abstract**

The Kyrgyz walnut-fruit forests harbor a huge natural diversity, including *Juglans regia* and other underutilised wild plant species. Even though many of these biological resources are traditionally used by the local community and have been scientifically described in terms of their diversity, their full nutritional potential has not been thoroughly investigated. Especially the relative influence of abiotic factors, such as climatic conditions or soil properties and the intraspecific variability is unknown. The present study therefore aims at evaluating the influence of soil properties and altitude on intraspecific variability of physical and biochemical quality parameters of walnut fruits. 375 fruit and 30 soil samples have been collected from a total of 3 randomly selected sample plots differing with regard to altitude levels and exposition. Soil samples from a depth of 0–30 cm and 30–60 cm were analysed for micro- and macronutrients, soil organic matter (SOM), carbonate content, pH and electrical conductivity. For walnut fruit samples nut weight, sphericity, shell integrity, shell diameter, nut crackability, weight and colour of kernels were examined. Additionally, fruit samples were analysed for water, ash, total phenolic and total antioxidant content of composite kernel samples. Furthermore, micro- and macronutrient content, total lipid and protein content, peroxide value, as well as fatty acid and amino acid profiles of kernels will be analysed and presented. First results indicate differences between the three sites in pH, SOM and carbonate content. Results that describe the strength and direction of the relationship between site factors and physical and biochemical fruit characteristics are being presented. Conclusions refer to implications for the sustainable management of the Kyrgyz walnut-fruit forests and the necessity of future research.

**Keywords:** Abiotic factors, intraspecific variability, Kyrgyz forests, quality parameters, walnuts

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