

Extended Abstract

# The Content of Phenolic Compounds and Flavonoids in Medical Herbs Depending on the Area of Growth †

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**Keywords:** medical herbs; phenolic compounds; flavonoids; highland

**Background:** The aim of this study was to investigate the process of accumulation of antioxidants in the herbal extracts depending on the stage of the herbal vegetation and the natural conditions of the growth.

**Materials and methods:** A spectrophotometric analysis based on the complex creation of flavonoids with aluminum ion was performed. Previously, the calibration curves were designed for rutine (to measure the content of flavonoids) and for gallic acid (to measure the overall content of phenolic compounds). Moreover, the following formula was used to calculate the content of flavonoids and phenolic compounds. We investigated herbs growing in the Goris region of Armenia (1370 m above sea level) and herbs growing in the Central Botanic Garden of Minsk, Belarus (220 m above sea level). The optic density of the solutions was measured by SPECTRO UV-11. Flavonoids were detected by 410 nm waves and phenols were detected by 760 nm waves.

**Results:** From the 5 investigated herbs (*Fragaria vesca* L., *Artemisia vulgaris* L., *Trifolium paratense* L., *Cichorium intybus* L., and *Taraxacum officinale*), extractions of the first four ones contained more phenols and flavonoids while growing in the Goris region of Armenia compared to those from Belarus. The exception was *Taraxacum officinale*, the content of phenolic compounds of which was higher in the Belarus species. This can be explained by the fact that herbs growing in the highland are subject to more extreme environmental factors, such as higher levels of ultraviolet radiation and insolation, lower temperatures, etc. To resist the aforementioned abiotic conditions, herbs develop a survival strategy which expresses itself via higher synthesis of phenolic compounds.

**Conclusions:** The majority of extractions of investigated medical herbs growing in the highland contain higher levels of phenolic compounds and flavonoids compared to those growing in lower geographic locations.



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