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BOTANICAL ORIGIN AND ANTIOXIDANT ACTIVITY OF UNI-AND MULTIFLORAL HUNGARIAN HONEYS

Alexandra Bodó, Ágnes Farkas and Marianna Kocsis

University of Pécs, Hungary

Honey is a supersaturated solution of sugars, which contains phenolic compounds, enzymes, free amino acids, minerals, vitamins and proteins acting as minor components. It is well established that honey has antioxidant effect, for which the phenolic acids and flavonoids are responsible. The aim of this study was to evaluate the antioxidant capacity of some floral and honeydew honeys available on the Hungarian market, with four different antioxidant techniques; and to classify the honeys according to melissopalynological analysis. We applied spectrophotometric methods: Folin-Ciocalteu (FC) assay and 1,1-diphenyl-2-picrylhydrazyl (DPPH) assay for antiradical activity, trolox equivalent antioxidant capacity (TEAC) assay for total antioxidant activity, ABS450 for color intensity and one fluorimetric method: oxygen reactive antioxidant capacity (ORAC) for the antilipoperoxidant activity. To classify the botanical origin of honeys, we carried out qualitative and quantitative melissopalynological analyses. The antioxidant capacity measured by the Folin reagent reactivity correlated with the color parameters, as well as with the antioxidant activities measured with the other methods. Black locust honey samples with pale color had the lowest (116 mAU), while dark honeydew honeys called “meadow clary (*Salvia pratensis*) honey” exhibited the highest (1617 mAU) radical scavenging activity. Values ranged from 197.93 ± 4.64 to 937.64 ± 28.43 mg GAE/kg, 89.14 ± 26.9 to 240.15 ± 47.3 μ M TE/100g, 61.76 ± 2.85 to 5.47 ± 0.02 , and 14.78 ± 1.15 to 114.89 ± 10.43 μ M TE/g for the FC, TEAC, DPPH (IC₅₀), and ORAC assays, respectively. However, the melissopalynological analysis revealed that the “meadow clary honey” was in fact of multifloral origin. Among unifloral honeys the chestnut (*Castanea sativa*) honeys (1037 mAU) had the highest antioxidant activity (PC: 636.48 ± 31.9 mg GAE/kg, TEAC: 171.23 ± 2.0 μ M TE/100g, DPPH (IC₅₀): 17.37 ± 0.57 , ORAC: 75.2 ± 4.71 μ M TE/g). The results of this study demonstrated that the botanical origin and the color intensity of honeys have the greatest influence on their antioxidant activity.

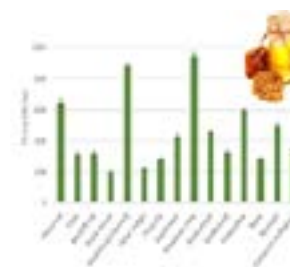


Figure 1: Antioxidant activity of some Hungarian honey samples, measured by Folin-Ciocalteu assay.

Recent Publications

1. Gorjanović S Z, Alvaraz-Suarez J M, Novaković M M, Pastor F T, Pezo L, et al. (2013) Comparative analysis of antioxidant activity of honey of different floral sources using recently developed polarographic and various spectrophotometric assays. *Journal of Food Composition and Analysis* 30:13–18.
2. Song X Y, Yao Y F and Yang W D (2012) Pollen analysis of natural honeys from the Central Region of Shanxi, North China. *PLOS ONE* 7(11):1–11.
3. Alvarez-Suarez J M, Tulipani S, Díaz D, Estevez Y, Romandini S, et al. (2010) Antioxidant and antimicrobial capacity of several monofloral Cuban honeys and their correlation with color, polyphenol content and other chemical compounds. *Food and Chemical Toxicology* 48:2490–2499.
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Biography

Alexandra Bodó is a PhD student at the University of Pécs, Hungary. She has been researching on honey for a couple of years, first as a beekeeper, later as a researcher. She finds it important to investigate the quality and bioactivity of honeys, in order to avoid adulterations and provide customers with honeys of certified origin and beneficial health effects. Besides the research work, she takes part in teaching plant anatomy and plant physiology courses.

alexandrabodo88@gmail.com