

# COMPARISON OF INDIVIDUAL PHENOLIC COMPOUNDS IN FREEZE-DRIED AND SPRAY-DRIED HONEY POWDERS

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## Abstract

Dehydrated honey could be used as an alternative substitute to liquid honey, which could expand the usage of honey in food industry. As honey contains many different phenolic compounds in different concentrations, it is a natural source of antioxidants. Phenolic compounds are important to human as protectors against free radicals. In this study, the changes of individual phenolic compound content in spray-dried multifloral honey sample and freeze-dried multifloral honey samples were investigated. The aim of the research was to evaluate and compare the changes in phenolic compound content in the dehydrated honey samples according to the drying method.

Individual phenolic compounds in the samples were detected by high-performance liquid chromatography (HPLC) method. The dehydration of multifloral honey was performed in the laboratory using spray drying and freeze drying techniques. Dehydrated honey samples and liquid honey samples were analyzed by Shimadzu Nexera LC-40 liquid chromatograph using diode-array detection (DAD).

Overall, 16 phenolic compounds were identified in the samples, of which 10 belonged to phenolic acids, 6 belonged to flavonoids, and 1 phenolic aldehyde. A wide range of hydroxycinnamic acids were detected in the honey powder samples. The highest concentration of all detected hydroxycinnamic acid showed vanillic acid in the freeze-dried honey sample ( $8 \mu\text{g} \times 100 \text{g}^{-1}$  honey, calculated on dry matter). Of all identified flavonoids, luteolin was detected in all samples. The concentration of luteolin ranged from 1 to  $8 \mu\text{g} \times 100 \text{g}^{-1}$  honey.

The results showed that during the thermal dehydration process there were decrease in the concentrations of phenolic compounds. The results allow to conclude that dehydrated honey could be used as an antioxidant source in human diet.

**Key words:** Honey, Honey powder, Spray drying, Freeze drying, Phenolic compounds.