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Storage procedures influence the antioxidant capacity of bee pollen

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Abstract. Bee products, including bee pollen, are known for their therapeutic and nutritional properties due to the presence of several nutrients (essential lipids and amino acids, fat-soluble and water-soluble vitamins and bioelements) as well as natural antioxidants, such as flavonoids (eg: kaempferol, quercetin, and isorhamnetin), phenolic acids (chlorogenic acid) and catechins. Therefore, given its health beneficial properties, bee pollen is considered a valuable dietary supplement to the human diet, being currently marketed, and used as a food supplement. Nonetheless, the chemical and antioxidant properties of pollen can be altered by several factors, such as improper storage, type of sample handling and processing and sample ageing. Thus, we have evaluated the influence of different processing and conservation methods (freeze-drying, drying, and freezing) in the amount of total phenolics and antioxidant capacity present in 1 year samples, submitted to the different storing procedures. Total phenolic content (TPC) was estimated spectrophotometrically by using the FolinCiocalteu method and nuclear magnetic resonance spectroscopy (¹H NMR); while the antioxidant capacity (AC) was determined by the ABTS (2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid)) and DPPH (2,2-Diphenyl-1-picrylhydrazyl) methods, that measure radical scavenging activities. Different solvent extraction procedures (ethanol and acetone based) were also applied to the several samples prior to analysis. The results showed that the antioxidant activity and total phenolics reduce considerably after one year of storage, especially when bee-pollen is submitted to freezing procedures.

Keywords: Bee-Pollen, Antioxidant capacity, Total polyphenols, conservation procedures.