

Evaluation of Physicochemical and Antioxidant Properties of Raw Honey from Algeria

Moussa Ahmed, Baghdad Khiati, Abdelmalek Meslem, Saad Aissat and Nouredine Djebli
Pharmacognosy and Api-Phytotherapy Research Laboratory, Mostaganem University, Algeria

Abstract

Honey production in Algeria has very long traditions dating back to ancient times. The purpose of the present work was to study the physicochemical properties and antioxidant capacity of Raw Honey of different botanical sources from Algeria. The study of the physicochemical parameters such as free acidity, pH, moisture, electrical conductivity, Hydroxymethyl furfural (HMF) content, diastase activity, invertase activity, fructose, glucose and disaccharide content were also identified and fructose/glucose ratio was calculated. Different types of honey were assessed for their contents of total phenolics and total flavonoids. The antioxidant capacity of honey was evaluated by Ferric-Reducing/Antioxidant Power Assay (FRAP) and Free Radical-Scavenging Activity (DPPH). Mean values obtained for physicochemical parameters were: pH 4.17 ± 0.2 ; $16.77 \pm 0.2\%$ moisture; 0.64 ± 0.01 mS/cm electrical conductivity; 17.22 ± 1.05 meq/kg free acidity; 8.46 ± 1.9 unit /kg honey invertase activity 17.44 ± 2.8 Gothe scale diastase activity and 11.65 ± 1.9 mg/kg HMF. The glucose and fructose contents of honey samples are ranged from 21.45 to 28.26 g/100 g and 25.20 to 37.64 g/100 g respectively. The polyphenol and flavonoid contents of four raw honey samples from different origins were found to range from 70.95 to 128.87 mg GAE/100 g and 8.57-21.77 mg QE/100 g respectively. The radical-scavenging activity of 2,2-diphenyl-1-picrylhydrazyl (DPPH) was found to range from 22.70% to 29.76% and the total antioxidant activity as measured by the Ferric-Reducing/Antioxidant Power (FRAP) assay was found to range between 223.19-958.42 $\mu\text{M Fe(II)/kg}$, indicating that raw honey has good antioxidant properties. No significant correlation was found between phenolic contents and antioxidant activity. In general, the raw honeys from Algeria had a good level of quality according to the results obtained for international regulation.

Keywords: Raw honey; Algeria; Physicochemical properties; Antioxidant capacities