

Evaluation of Algerian's honey in terms of quality and authenticity based on the melissopalynology and physicochemical analysis and their antioxidant powers

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Abstract.

BACKGROUND: Honey is a vegetable and animal product which comes from nectar and / or honeydew. It is used in different nutritional and therapeutic fields.

OBJECTIVE: Melissopalynology and physicochemical analysis of Algerian honeys, determination of their phenolic compounds and authenticity parameters and the evaluation of their antioxidant properties.

METHODS: Twenty Algerians honey were studied for their physicochemical parameters (moisture, pH, proteins, proline, hydroxymethylfurfural, ash, color, electrical conductivity, and optical rotation), floral origin and phenolic compounds contents. Antioxidant activities were tested too.

RESULTS: Melissopalynological analyses revealed that the studied honeys were twelve multifloral, seven Fabaceae, and one Myrtaceae. All honeys were acidic ($3.65 \leq \text{pH} \leq 4.35$) and most of them were low in moisture content. The electrical conductivity varied between 0.29 mS/cm and 1.78 mS/cm. Ash, protein and proline contents results showed that the majority of honeys were in agreement with the legislation and were authentic. The color varied from mimosa yellow to dark brown. The specific rotation was levorotatory in most honey samples and the hydroxymethylfurfural values (from 1.5 mg/kg to 34.73 mg/kg) agreed with the international requirements. Honeys were rich in total phenolic compounds, 22.41 (Honey11) to 96.16 (Honey15) mg gallic acid equivalents/100 g, and flavonoids, 8.90 (Honey11) to 80.02 (Honey 02) mg quercetin equivalents/100 g. Honey samples 15,03, 05, 01, and 06 exerted more than 50% reduction of 1,1-diphenyl-2-picrylhydrazyl and 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonate) radicals and were able to reduce iron while honey samples 12, 18, 19, 14, and 11 chelate efficiently iron. High significant correlations between physicochemical parameters and antioxidant activities were found.

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