

EVALUATION OF THE COLOR AS A CHARACTERIZATION PARAMETER OF HONEY FROM TUNISIA, ROMANIA AND MOLDOVA

<https://doi.org/10.52757/imb21.009>

Boistean Alina, Chirsanova Aurica, Capcanari Tatiana, Siminiuc Rodica

Technical University of Moldova, 168 Stefan cel Mare Bd., Chisinau, the Republic of Moldova

e-mail: alina.boistean@toap.utm.md

Many types of honey can be found in the market which differ in package, price, color or origin. The color of honey is one of its most variable features. Honey shows very different colors, varying from white or pale-yellow to dark red or even black. The color of honey is characteristic of its floral source due to minerals and other minor components. Exposure to heat and storage time may affect honey's color. Honey appears lighter in color after granulation. The color of a specific sample of honey, after granulation depends on the crystal size. The color of the product is one of the main criteria used by the consumers.

Polyfloral honey is very ubiquitous and therefore it was accepted for the research. This honey was purchased from the market of three different countries: Tunisia, Romania and Moldova, which differ in geographic location and climatic characteristics. Also, from the Republic of Moldova, two types of polyfloral honey from different apiaries located in different regions of the country were studied. The chromaticity coordinates CIELab of honey samples were measured using a chroma meter (KONICA MINOLTA, model CR-400) in an aqueous solution of honey, the instrument was calibrated with a black and white standard plate. Absorbance measurements were carried out using a spectrophotometer (model LLG uniSPEC-2).

Table 1. Physicochemical characteristics by honey type

Colour Parameters		Honey type			
		TPF	RPF	MPF ₁	MPF ₂
L	Mean ± SD	24,51±0,10	37,64±0,06	27,99±0,12	33,03±0,09
a*	Mean ± SD	3,96±0,05	1,40±0,01	3,25±0,04	2,27±0,01
b*	Mean ± SD	8,64±0,08	20,39±0,05	12,63±0,07	18,96±0,11
ΔE	Mean ± SD	35,17±0,11	21,50±0,09	30,93±0,01	25,51±0,06
Chroma*	Mean ± SD	5,02±0,16	6,60±0,11	5,64±0,18	6,52±0,12
Hue ^o	Mean ± SD	1,14±0,07	1,50±0,03	1,32±0,06	1,45±0,03
CI (mAU)	Mean ± SD	0,32±0,01	0,71±0,02	0,68±0,05	0,78±0,01
Pfund (mm)	Mean ± SD	0,13±0,04	0,29±0,05	0,53±0,09	0,43±0,03

L represents lightness ($L = 0$, black, and $L = 100$, colorless), a^* green/red color component ($a^* > 0$, red, and $a^* < 0$, green), and b^* blue/yellow color component ($b^* > 0$, yellow, and $b^* < 0$, blue). CI-colour intensity.

We compared on the basis of palynological, physicochemical analyses and CIELAB color parameters the polyfloral honey from 3 different countries for the first time in the literature. From the data obtained, it was noted that in the parameter L there was no big difference between the samples, but there were differences in the parameters a^* and b^* . The highest amount of yellow pollen was dominant in the honey from Romania, and the smallest amount of yellow pollen was found in the honey from Tunisia. The ΔE^* ab value gives the visible difference between the samples in the white standard. The honeys ranged between 0,13 and 0,53 mm Pfund, that according to the international Pfund scale for honey, Tunisian and Romanian honey was classified as a white honey variety, and Moldavian honey belonged to the honey variety with a color from extra light amber to light amber. Chroma (C^*ab) values ranged between 5,02 and 6,60 Cielab units, Lightness (L^*) between 24,51 and 37,64 Cielab units, and Hue between 1,140 and 1,500. Based on the obtained results, it was concluded that polyfloral honey from Romania was the most similar to the Moldovan honey, the Tunisian honey, as it was noticed, significantly differed both in color and in other characteristics. This indicates more similar geographic characteristics between Romania and Moldova, as well as the presence of more similar pollen in honey.

The research was possible thanks to the project number 4 of the joint research project organized by the Ministry of Education, Culture and Research of the Republic of Moldova and the University Agency of Francophonie for 2020-2021 (AUF-MECR 20-21/4), conducted within the Department of Food and Nutrition of the Technical University of Moldova.