The Scientific Journal of Cahul State University "Bogdan Petriceicu Hasdeu"
Economic and Engineering Studies
№. 1 (3), 2018
http://jees.usch.md/ e-mail: journal.ees@usch.md

SENSORIAL EVALUATION OF ROMANIAN HONEY

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Abstract. *In general, sensory analysis is the peer examination of a product through the evaluation of its characteristic attributes by the human senses, and this is a very useful tool in product characterization. Honey possesses the sensory characteristics typical of the surrounding flora in the habitat where it was produced and its geographical origin influences. The objective of this paper was to evaluate the sensory profile of five Romanian honey samples (acacia honey, lime honey, sunflower honey, rape honey and polyfloral honey). Sensory evaluation of Romanian honey samples was conducted inside the Educational Project "DEGUSTO FEST" 2016. The sensorial evaluation was performed by 50 untrained panelists (students and teachers of the Technical College "Edmond Nicolau" Brăila), between the ages of 17 and 50, using a nine point hedonic scale ranging from 1 (most disliked) to 9 (most liked) for the parameters appearance, color, odor, taste and overall acceptability. All the honey samples indicate that a good sensory evaluation and acacia honey showed the highest sensory quality. This is important for understanding the product characteristics and its impact on consumer acceptability. The results show that the honeys available and consumed in different areas of Romania are of good quality.*

Keywords: *sensory analysis, honey, hedonic scale*

UDC: 638.162(498)

Introduction

Romania is a country with a significant beekeeping potential. The development of associative forms (associations, cooperatives, producer groups) contributed to the development of the performance of the Romanian beekeeping sector in the last two decades.[1]

Honey is the natural sweet substance produced by *Apis mellifera* bees from the nectar of plants or from secretions of living parts of plants or excretions of plant-sucking insects on the living parts of plants, which the bees collect, transform by combining with specific substances of their own, deposit, dehydrate, store and leave in honeycombs to ripen and mature (Annex I, point 1). According to this definition, honey is a natural product in which nothing is added or taken away. On the other hand, with the same regulation it is now possible to market filtered honey "honey obtained by removing foreign inorganic or organic matter in such a way as to result in the significant removal of pollen" (Annex I, point 2 (b) (viii)).[2]

Both the *Codex Alimentarius* and EU law establish that the country or countries of origin where the honey was produced must be indicated on the label and that this information may be supplemented by reference to the floral or vegetable origin. The reason for this is that, in addition to climatic conditions, the type of plant species and flowers visited by the bees may influence the characteristics of the honey, and therefore both botanical and geographical origin determine honey quality.[3]

Many authors have emphasized the importance of honey sensory analysis in order to identify and differentiate honeys by botanical origin and quality. Honey has distinct and unique flavors related to origin of location - local sensory uniqueness.[4]

Additionally, honeys from similar locations could also differ in sensory profiles. Similarly, it is concluded that volatile composition and sensory impression of honey samples are greatly influenced

by the geographic origin - an important quality factor closely correlated with the chemical and sensory characteristics of honeys.[5]

Sensory evaluation enables us to identify and quantify certain defects (fermentation, impurities, off-odours and flavours). It also plays an important role in defining product standards and in the related controls, regarding botanical denominations or other specific labels. Moreover it is an essential part of consumer preference/aversion studies.[6]

Materials and methods

The samples were being acquired during 2015-2016, from well-known manufactures, members of the Romanian Beekeeping Association (ACA Romania). Principal honey types and samples code are presented in Table 1.

Table 1. Principal honey types and samples code

Type of honey		Code
Monofloral honey	Acacia honey (*Robinia pseudoacacia*)	ACA1
	Lime honey (*Tilia*)	ACA2
	Sunflower honey (*Helianthus annuus*)	ACA3
	Rape honey (*Brassica napus*)	ACA4
Polyfloral honey	(*Prunus, Helianthus annuus, Brassica napus*)	ACA5

Sensory evaluation was carried out by 50 untrained panellists (25 females and 25 males) selected from students and teachers of the Technical College "Edmond Nicolau" Brăila, between the ages of 17 and 50, who had been selected based on their regular consumption of commercial honey.

A 9-point hedonic scale was employed, ranging from 1 (dislike extremely) to 9 (like extremely), for the parameters appearance, color, odor, taste and overall acceptability.

The test was carried out between 10:00 and 13:00. Each panellist tasted the five honey samples. Each sample was mixed thoroughly and kept in glass containers at room temperature till analysis was carried out. Twenty g of each honey sample were presented in random order, at room temperature, to each consumer in a glass vials sealed with a twist-off cap. Panelists were asked to evaluate the samples, visually (appearance and color) and then sensorial (odor and taste), finally expressing a judgment on overall acceptability. Drinking water was provided for palate cleansing between each sample.

Sensory evaluation of Romanian honey samples was conducted inside the Educational Project "DEGUSTO FEST" 2016 (Figure 1).

Figure 1. Sensory evaluation of Romanian honey samples.

Results and discussion

The visual impressions are registered with the sense of sight (eyes) and they include appearance and color. Appearance, especially surface brilliance, represent the key factos of honey quality. The results of appearance evaluation of honey samples were shown in Figure 2 and was observed that appearance of sample ACA1 was found the best, followed by ACA2, ACA5, ACA3 and ACA4.

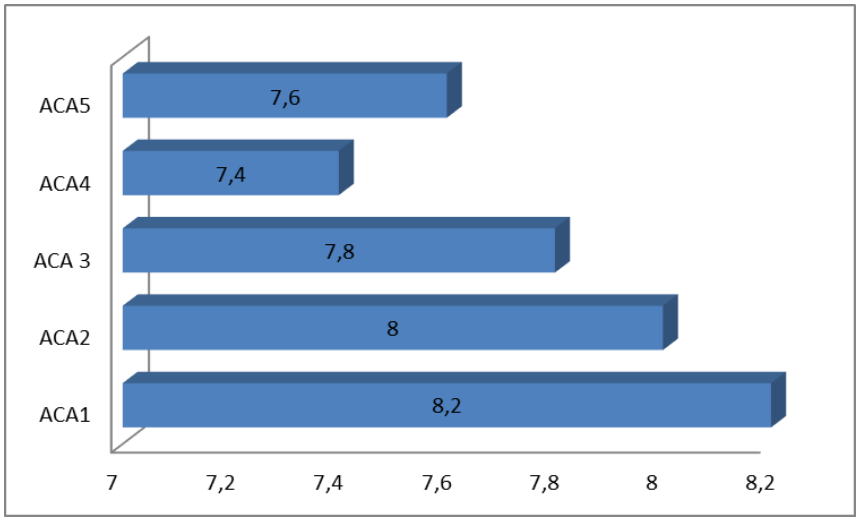

Figure 2. Appearance evaluation of honey samples.

The results of colour evaluation of honey samples were shown in Figure 3. We also *found* that colour of sample ACA1 was found the best, followed by ACA2, ACA5, ACA3 and ACA4.

For the objectification of the sensory characteristics of color of food products, as well as of honey, it is recommended at the same time to perform instrumental determinations of the color quality parameters and to correlate the thus obtained results with the sensory impressions for nuance (hue), brightness and saturation of colour.[7] Panellists have different preferences, and one feature influencing preferences is the colour. The colour is one of the characteristics that most influences the choice of the consumers.[8] The average score observed for the color of sample ACA4 is low (5.0). This could be explained by habit of consumers to use commercial honey of light amber color.

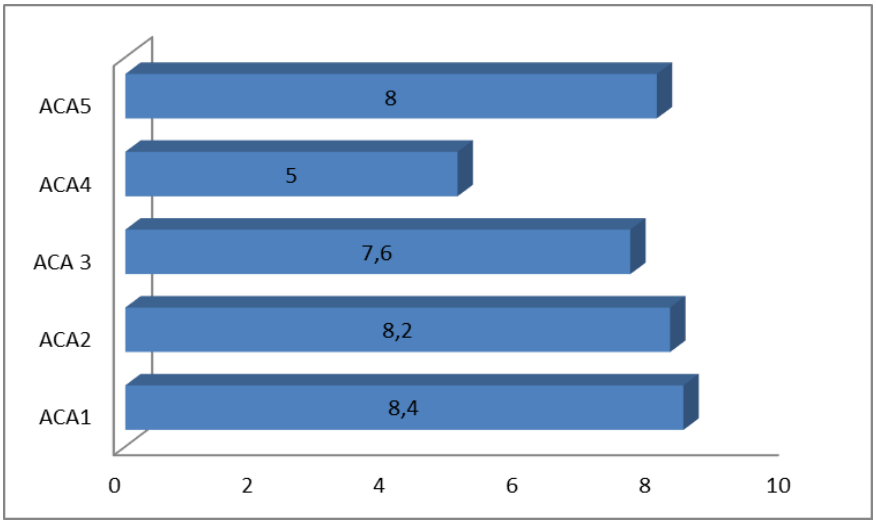

Figure 3. Colour evaluation of honey samples

After the visual impressions, in the procedure of sensory analysis of samples the odorous or olfactory sensations are applied. The sense of smell characterizes common sense information for recognizing odor quality, and at the same time the taste quality, which is of the primary importance for the evaluation of aroma (flavor). As can see in Figure 4 odour of sample ACA1 was found the best, followed by ACA2, ACA5, ACA3 and ACA4.

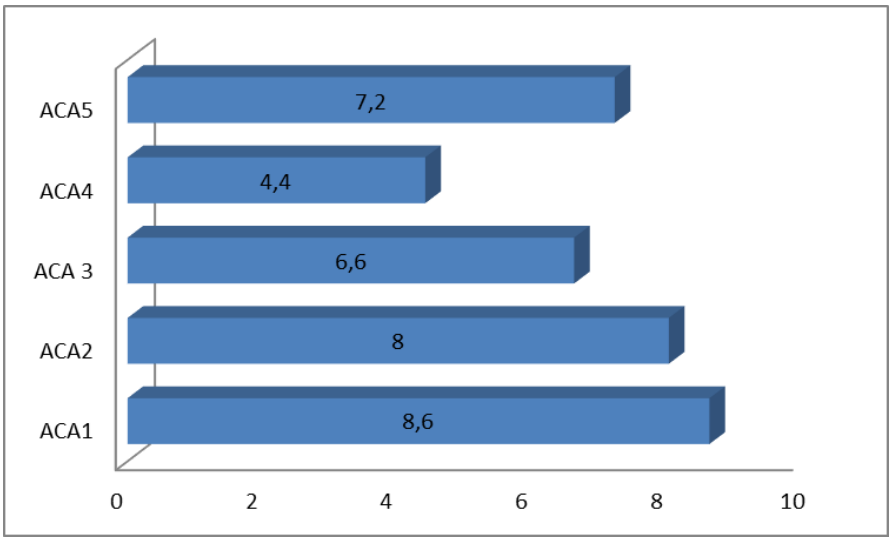

Figure 4. Odour evaluation of honey samples.

The panellists prefer honey with a strong aromatic taste as can see in Figure 5. High scores was given varieties of monofloral honey ACA1 (acacia honey) and ACA2 (lime honey). The panellist don't prefer monofloral honey ACA4 (rape honey).

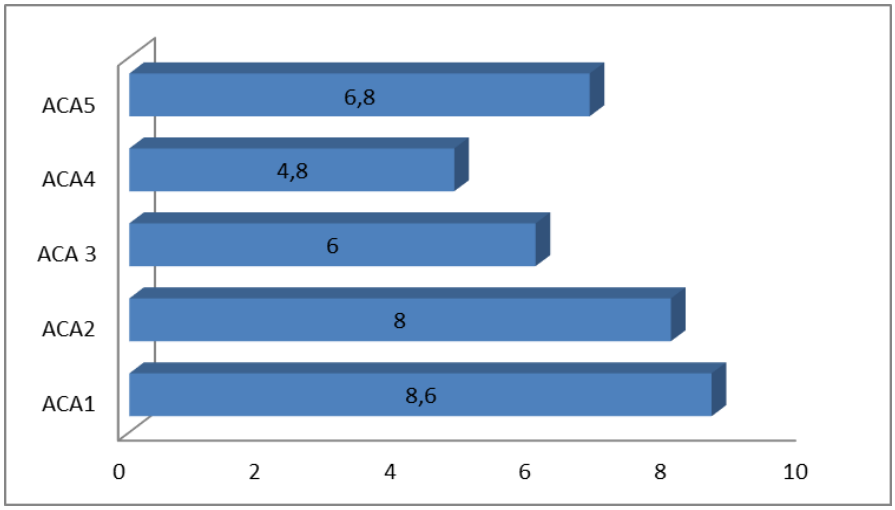

Figure 5. Taste evaluation of honey samples.

The sample ACA1 have higher scores for all investigated attributes, fallowed by ACA2 and ACA5. The sample ACA4 have the lowest scores for all investigated attributes. It is difficult to argue about the effectiveness of using organoleptic methods and reliability of the results obtained thus.

In general, the honeys showed a good overall acceptability score (range 5.2-8.8). The samples ACA1, ACA2, ACA5 showed a higher overall acceptability score than ACA3 and ACA4 as can see in Figure 6.

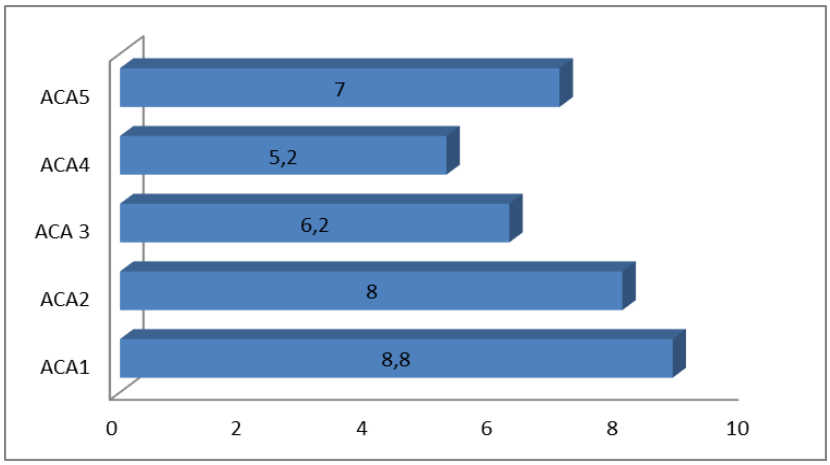

Figure 6. Overall acceptability evaluation of honey samples.

1. Conclusions

In general, the acceptability of sensorial characteristics was favourable for all samples. All the honey samples indicate that a good sensory evaluation and acacia honey showed the highest sensory quality.

REFERENCES:

1. POCOL C.B., MOLDOVAN-TESELIOS C., ARION F.H. Beekeepers' Association: Motivations and Expectations, Bulletin UASVM Horticulture, 2014, 71(1) Available online: http://journals.usamvcluj.ro/index.php/horticulture/article/viewFile/10047/8584 (accessed on 10 May 2018).)
2. EC Honey Directive No 2001/110/EC and subsequent amendments, the last being Directive 2014/63/EU
3. Codex Standard for Honey, CODEX STAN 12-1981; 1987 and 2001 revisions
4. STOLZENBACH S., BYRNE D.V., BREDIE W.L.P. Sensory local uniqueness of Danish honeys. *Food Res. Int*., 2011, 44: 2766-2774.
5. CASTRO-VÁZQUEZ L., DÍAZ-MAROTO M.C., DE TORRES C., PÉREZ-COELLO M.S. Effect of geographical origin on the chemical and sensory characteristics of chestnut honeys, *Food Res. Int*., 2010, 43: 2335- 2340.[1]
6. PIANA M.L., PERSANO ODDO L., BENTABOL A., BRUNEAU E., BOGDANOV S., DECLERCK C.G. Sensory analysis applied to honey: state of the art. *Apidologie*, 2004, 35(1):26-37.
7. POPOV-RALJIĆ J., ,LALIČIĆ-PETRONIJEVIĆ J. Sensory properties and Color Measurement of dietary chocolates with different composition during storage for up to 360 days. *Sensors.* 2009, 9: 1996-2016.
8. DIAS A.A., LARA S.B., SOARES M, CAZELLI PIRES I., PIRES C.V., HALBOTH N.V. Influence of color on acceptance and identification of flavor of foods by adults. *Ciênc. Tecnol. Aliment*., 32(2): 296-301.

Received: 24.05.2018
Reviewed: 15.06.2017
Accepted to publishing: 25.06.2018