

Manna honey sugar profile

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Abstract: Manna honey is a different type of honey. It is produced by bees in absence of flower nectar sources from secretions left on leaves or tree bark. It is important to know the main parameters in order to determinate mana honey quality. Individual glucidic spectrum was determinated, along with pH, and acidity.

Key words: manna honey, glucidic spectrum, pH, acidity

INTRODUCTION

The melliferous potential of an area consists of the capacity of this zone to assure the food of the bees' families. The quantity of the nectar and of the pollen from the spontaneous flora and from the cultures as animal and vegetal manna is influenced by numerous factors depending directly on melliferous flora. Among these determinative factors there are: the species, the plants age, the blooming period, genetic factors as well as the size of the flowers, their position on the plant assuring the development as well as the easiness of approaching it by the bees and last but not least the sanitary stage of the area (Antonie Iuliana, 2014). Honey is a widely used food undoubtedly due to its sweetness, pleasant taste and aroma. Since honey is a natural substance and is food for the honeybee, there has been much speculation as to its value in the nutrition of man. Honey is prepared from the nectar of flowers by worker bees and stored in the honeycomb. Although honey is derived primarily from nectaries of flowers, we cannot overlook the part the honeybee plays in storing the nectar in the hive and in processing it to its final form. Thus honey should be considered the product of the bee processed from a plant product (Kitzes et al., 1943). Honey is a natural product, mainly composed of a complex mixture of carbohydrates and other minor substances, such as organic acids, proteins, minerals, vitamins and lipids (Finola et al., 2007). It is very well known that honey's composition varies, depending on floral origin, geographical, environmental and seasonal conditions. The manna honey is obtained from other substances than the pollen and the nectar, being a honeydrew honey of

animal origin. Manna honey has a darker green, dark-brown or red-brown color because of the lack of pollen which gives the golden color of flower sources honey. The taste is specific, because of the higher content in minerals manna honey is slightly caramelized.

MATERIAL AND METHODS

A major characteristic of manna honey is represented by the high content of glucose. In sugar, glucose and fructose are bound together to form sucrose, which comes from sugar beets or sugar cane and is more commonly known as table sugar. In honey, fructose and glucose are primarily independent of each other (Kappico et al., 2012). In order to determinate the quality of the sample of manna honey we had to determinate individual sugar spectrum by using HPLC-RID method (Bogdanov et al., 1997) on a Shimadzu instrument with refractive index detector, amino silica gel modified column Alltima Amino. pH and acidity were determined using Titrolyne Easy and Titrolyne Alpha 10 plus equipment.

RESULTS AND DISCUSSION

The influence of the botanical origin in the sugar composition is important for all types of honeys. In case of manna honey determining sugar profile was primordial. In figure 1 it can be observed the individual values of each sugar determinate in the examined sample.

The important sugar amount is represented by fructose (36,39), glucose (28,14) and melesitose (5,65). The differences between other types of honey is represented by the presence in high value of the sugar called melesitose (5,65).

High content of melesitose is specific for manna honey, and it comes from a unique and scarce melesitose honey which is manna honey, that is obtained only after unusual and rare weather and floral conditions.

Acidity and pH represent few of main physical and chemical indicators that reflect the honey quality. The acidity of honey is the content of all free acids, expressed in milliequivalents/kg honey.

Honey acidity is mainly due to organic acids whose quantity is lower than 0,5%. Acidity contributes to honey flavours, stability against microorganisms, enhancement of chemical reactions and antibacterial and antioxidant activities (Gheldof et al., 2002).

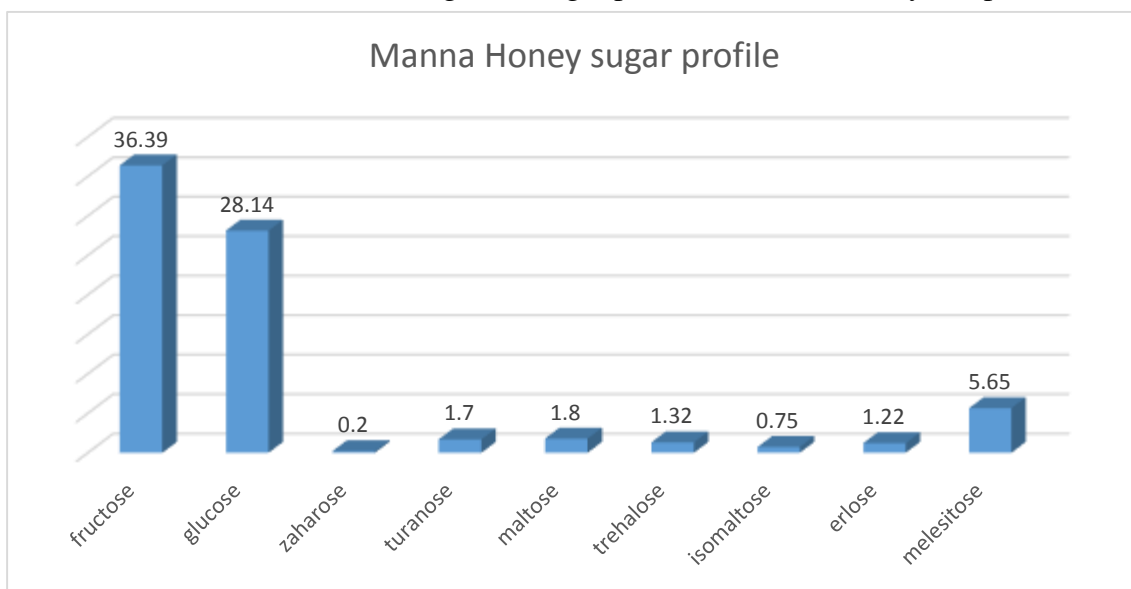
pH of honey depends on both the ionized acids content and mineral elements and influences microorganisms development, enzymatic activity and texture, among other properties (Estupiñán et al., 1998).

Table 1: Physycal-chemical parameters

Sample	pH	Lactones	Free Acidity	Total Acidity
Manna Honey	3,935	19,712	19,246	38,96

Lactones determination is interesting because their hydrolysis increases free acidity (White et al., 1958). Total acidity is the sum of free acidity and lactones acidity.

Figure 1.Sugar profile of Manna Honey sample



CONCLUSIONS

Free acidity is one of the most important parameters for honey quality control that is included within European composition criteria for honey in general. According to the European Council Directive, free acidity can't exceed

50 meq/kg for honey in general and cannot exceed 80 meq/kg for baker's honey (OJEC, 2002).

The physical-chemical and hygienic qualities of honey constitute indicators that offer information regarding the energetic and nutritional quality, as well as the possibility of falsifying honey. The authentication of honey is assessed through its physical and chemical parameters falling within the limits imposed by the present legislation (Popa et al., 2009).

Honey production has a significant economic importance, lately many scientific works about it have been published. Manna honey is not so spread as other types of honey, and it's not so easy to falsify. It represents a special sort of honey that gains more interest every day and scientist try to determinate the individual spectrum of every region. The manna honey we have analyzed was procured from a beekeeper from Ștei region, Bihor. According to the results of this study, the parameters of manna honey sample are in concordance with the limits imposed by the present legislation.

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