



Chemical Analysis of Winter Honeys collected from *Apis dorsata* hives of Nagbhid Tahsil of Chandrapur District, Maharashtra State (India)

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Abstract

The present investigation was undertaken to determine the chemical analysis of 3 winter honey samples (CHN – NAG – AAW , CHN – NAG –SAW, CHN – NAG– GIR) collected from forest area of Nagbhid Tahsil of Chandrapur District of Maharashtra State (India). These samples were analysed for several parameters such as moisture, total reducing Sugar, Levulose or fructose, Dextrose or Glucose, L/D ratio, sucrose, Acidity. This type of chemical analysis favours the utilization of the honey for good quality in this area.

Keywords: Chemical Analysis, Summer Honey, Nagbhid Tahsil.

Introduction:

Honey is a carbohydrate rich naturally complex product produced by honey bees from floral nectar. Honey has been used by all civilization as nutrient food and in traditional medicine. The quality of honey depends on various physiological factors such as climate, soil, etc. Honey contains sugar, protein, moisture, vitamins, minerals, enzymes, polyphenols and flavonoids (Al – Manary *et al.*, 2002) because of this unique and complex nature, honey is proved to be useful in the treatment of burns, wounds, skin ulcers as an antioxidant and in the treatment of external eye diseases (Balasubramanyam, 2011). Furthermore, honey is a highly valuable ingredient in condiments, beverage, sauces and sweets. In fact numerous studies have been reported on physical, chemical and melissopalynological parameter of honeys from all over the world. (Adenken *et al.*, 2010; Anklam, 1998; Cherian *et al.*, 2011; Downey *et al.*, 2005; Ramnath and Shivaramm, 2012, Terrabet *et al.*, 2002, Xesuset *et al.*, 2010, Borkar Laxmikant and Mate Devendra 2014).

The scientific literature revealed that the information is not available with respect to chemical characteristics of honeys from Nagbhid Tahsil of Chandrapur District of Maharashtra State in India. The purpose of this study was to investigate some chemical parameters such as moisture, total reducing sugar, levulose or fructose, dextrose or glucose, levulose/ dextrose, sucrose, acidity and microscopical analysis of honey collected from different regions of Nagbhid Tahsil of Chandrapur District of Maharashtra State in India.

Material and Methods:

Chemical analysis of the honeys are carried out by using Indian standard Specification, IS: 4941 (1974) and IS: 8464 (1977). The percentage of total reducing sugar, (Levulose or Fructose + Dextrose or Glucose), Levulose, Dextrose, Sucrose, Acidity, Moisture and L/D ratio were estimated.





Result and Discussion:

The chemical properties of the 3 winter honey sample (Viz. CHN – NAG – AAW , CHN – NAG – SAW, CHN – NAG – GIR) from Nagbhid Tahsil of Chandrapur District of Maharashtra State are reported in Table .

In the present study moisture content in the samples ranges from 25.5 – 33. Increase the temperature moisture is low and decrease the temperature moisture is high. Increase in moisture content of honey is also indicative of adulteration. The low moisture content of honey forms an important part of the system which protect honey for attack by microorganism.

Sugars:

Honey consists of mostly glucose and fructose. The actual proportion of fructose to glucose, in any particular honey, depends largely on the sources of the nectar. All samples contained more fructose than glucose. This indicate that Nagbhid honeys would be less prone to granulation fructose level in honey is higher than that of glucose. Honey with high fructose to glucose ratio would remain liquid for longer period. The fructose/Glucose ratios may have an impact on honey flavour, since fructose is much sweeter than glucose.

Acidity:

Acidity of the honey sample ranges by 0.2944 to 0.342 respectively. Acidity values may indicate the fermentation of honey sugar by yeast.

Table. 1- Chemical Analysis of honey sample obtained from Nagbhid Tahsil of Chandrapur District.

S. N	Location of parameter	Date of Collection	Type of Honey	Parameter						
				Moisture %	Total Reducing Sugar %	Levulose or Fructose %	Dextrose or Glucose %	L/D Ratio	Sucrose %	Acidity %
01	CHN – NAG – AAW	11-11-2012	Multifloral	33	74.545	38.529	36.016	1.187	4.085	0.2944
02	CHN – NAG – SAW	15-11-2011	Multifloral	25.5	69.545	34.529	36.016	1.187	2.085	0.2944
03	CHN – NAG – GIR	13-12-2012	Unifloral	27.4	69.103	39.613	29.490	1.497	3.088	0.342

References:

1. **Adenekan, MO, Amusa NA, Lawal AO, Okpeze VE.** Physicochemical and microbiological properties of honey samples obtained from Bada, *Journal of Microbiology and Antimicrobials*, 2010; 2(8):100-104
2. **Al ML, Danial DJ, Moise A, Bebis O, Lasio L, Bogedanov S.** Phycochemical and bioactive properties of different floral origin honeys from Romdunia. *Food Chemistry*, 2002; 112, 863-867.
3. **Anklam EA.** A review of the analogical and botanical origine of honey, *Food Chemistry*, 1998; 63, 549 – 562.





4. **Balsubramanyam MV.** Chemical Characteristics of much floral wild and apiary honeys from Western Ghats of Karnataka. *The Bioscan*, 2011: 6, 467 – 469.
5. **Borkar Lamikant and Mate Devendra.** Chemical Analysis of Summer Honeys collected from Apisdoersata hives of BhadrawatiTahsil of Chandrapur District of Maharashtra State (India), *Int. Res. J. of Sci. &Engg.*, 2014: 2 (4):139_141.
6. **Cherian KJ Bhowal M and Godghate SD.** Pollen and hysiochemical analysis of honey preduced by *Apis cerana indica* of Nagpur, Maharashtra (INDIA). *Journal of Environmental Research and Development*, 2011; 5(3): 542-550.
7. **Downey GJ, Hussey K, Kelly JD, Walshe TF and Martin PG.** Preliminary contribution to the characteristics of artisanal honey produced on the island of Ireland by palynological and physico – chemical data. *Food Chemistry*, 2005; 91, 347-354.
8. **IS: 4941-1974** Indian Standard Specification for extracted honey (First Revision), Indian Standards Institution, 1974, New Delhi : 1-16.
9. **IS: 8464-1977** Indian Standard Specification for Squeezed honey, Indian Standards Institution, 1977, New Delhi : 1-8.
10. **Ramnath Subharani and Venkataramegouda Sivaramm** Physicochemical and pollen analysis of Western ghats honey of Karnataka south, India. *I.J. S.N.*,2012: 3(4):831- 835
11. **Terrab AJ, Diez MJ and Heredia FJ.** Characterization of Moroccan unifloral honeys by theis physicochemical characteristics. *Food Chemistry*, 2002: 79, 373 – 379.
12. **Xesus FJ, Jose P, Maria LE, Antonio I and Jose PA.** Palynological and physicochemical data charctrazation of honeys produced in the Entre – Douro e Munho region of Portugal, *International Journal of food Science and Technology*, 2010; 45,: 1255-1262.

