Chemical Analysis of Winter Honeys Collected from *Apis dorsata* Hives of Bhiwapur Tahsil of District Nagpur, Maharashtra (India)

D. M. Mate
Department of Botany, Nutan Adrasha Arts, Commerce and Smt.
M.H.Wegad Science College, Umrer, Dist- Nagpur 441203
E-mail: drdmmate@gmail.com

Abstract:

The present investigation was undertaken to determine the chemical analysis of 5 winter honey samples (NGP- BH-Dhu-1 , NGP-BH-Mgr-3,NGP-BH-Cha(Mog)-8,NGP-BH-Man-13 & NGP-BH-Kar-14) collected from agricultural tracts region of different villages namely Dhurkheda, Mangarul, Chargaon (Moglai), Manora & Kargaon of Bhiwapur tahsil of Nagpur District, Maharashtra State (India) during winter season particularly in the months of October ,November & February 2012. These samples were analysed for several parameters such as Moisture, total Reducing sugar, Levulose or Fructose, Dextrose or Glucose, L/D ratio, Sucrose, Acidity etc. This type of chemical analysis favours the utilization of the honey for good quality in this area.

Key words:
Chemical Analysis, Winter Honey, Bhiwapur 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 (AI – 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,Borkar Laxmikant & Mate Devendra 2014; Cherian et al., 2011; Downey et al., 2005; Ramnath and Shivramm,2012, Terrab et al., 2002; Xesus et al., 2010).

The scientific literature revealed that the information is not available with respect to chemical charecteristics of honeys from Bhiwapur Tahsil of Nagpur 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 Bhiwapur Tahsil of Nagpur District of Maharashtra State in India.

Material and methods:

Chemical analysis of the honeys are carried out by using Indian standard Specification, 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 5 winter honey samples (Viz, NGP-BH-Dhu-1,NGP-BH-Mgr-3,NGP-BH-Cha(Mog)-8,NGP-BH-Man-13&NGP-BH-Kar-14) from Bhiwapur Tahsil of Nagpur District of Maharashtra State are reported in Table.

Table. 1- Chemical analysis of honey samples obtained from Bhiwapur Tahsil of Nagpur District

Sr.No.	Honey Samples	Moisture %	Total Reducing Sugar %	Levulose or Fructose %	Dextrose or Glucose %	L/D Ratio	Sucrose %	Acidity %
1	NGP-BH-Dhu-1	25	68.333	38.845	29.488	1.467	1.854	0.2829
2	NGP-BH-Mgr-3	29	74.545	43.484	31.063	1.561	1.311	0.276
3	NGP-BH-Char (Mog)-8	25	69.491	35.726	33.765	1.174	3.125	0.23
4	NGP-BH-Man-13	23	74.545	40.78	33.765	1.343	2.213	0.1679
5	NGP-BH-Kar-14	25	72.781	40.592	32.189	1.403	2.545	0.2323

In the present study moisture content in the samples ranges from 23-29. Increase the temperature moisture is low and decrease the temperature moisture is high. Increase in moisture content of honey is aslo indicative of important part of the system which protect honey 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 indicates that Bhiwapur 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 ratio may have an impact or honey flavour, since fructose is much sweeter than glucose.The percentage of sucrose ranges from 1.311

to 3.125. Similarly Leulose/ Dextrose ratio of the honey samples ranges from 1.174 to 1.561. In most of the honeys, Levulose (L) content is generally higher than that of Dextrose (D), L/D ratio being more than 1. In the present investigation the L/D ratio is more than 1 in all the five honey samples.

Acidity :

The present investigation shows that the acidity of the honey sample ranges from 0.1679 to 0.2829. Acidity values may indicate the fermentation of honey sugar by yeast.

References:

1. **Adenekan, Mo, Amusa NA, Lawal Ao, Okpeze VE.** Physicochemical and microbiological properties of honey samples obtained from Bada, *Joural of Microbiology and Antimicrobials*, 2010; 2(8): 100-104.

2. **Al Ml, Danil DJ, Moise A, Bebis O, Lasio L, Bogedanov S. Phycochemical and bioachive** properties of different floral originhoneys from Romdnia. *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. **Balasubramanyam MV.**Chemical Characterristics of much floral wild and apiary honey from Western Ghats of Karnataka. *The Bioscan*, 2011:6,467-469

5 **Borkar Laxmikant & Mate Devendra** . Chemical analysis of summer honeys collecte from *Apis dorsata* hives of Bhadrawati tahsil of Chandrapur District of Maharashtra State (India). *Int. Res. J. of Science & Engineering*. 2014; Vol. 2 (4) : 139-141

6. **Cherian KJ; Bhowal M and Godghate S .D.** Pollen and physiochemical analysis of honey preduceed by Apis cerena indica of Nagpur, Maharashtra (India.) *Journal of Environmental Research and Develoment*, 2011; 5(3): 542-550.

7. **Downey GJ, Hussey K, Kelly JD, Walshe TF and Martin PG.** Preli\minary contribution to the characteristics of artisanal honey produced on the island of Ireland by palynological and physic – 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, *Indian I.J.S.N*, 2012:3(4)831-835

11 **Terrab AJ, Diez Mj and Heredia Fj.** Characterization of Moroccan unifloral honey by theis physicochemical characteristisc. *Food chemistry*, 2002:79,373-379.

12 **Xesus FJ, Jose P, Maria LE, Antonio I and Jose PA.** palynological and physicochemical data characterization of honey produced in the Entre-Douro e Munho region of Portugal, *International Journal of food science and Technology*, 2010; 45,:1255-1262.