

# Chemical analysis of summer honeys collected from *Apis dorsata* hives of Chandrapur Tahsil of Chandrapur District of Maharashtra State (India)

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## Abstract

The present investigation was undertaken to determine the chemical analysis of 5 summer honey samples (CHN-CHN-LOH, CHN-CHN-AJA, CHN-CHN-NAN, CHN-CHN-URJ, and CHN-CHN-CHI) collected from forest area of Chandrapur Tahsil of Chandrapur District of Maharashtra State (India). These samples were analyzed 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; Chandrapur Tahsil

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## 1. Introduction

Honey is a carbohydrate rich naturally complex product produced by honey bees from floral nectar. Honey has been used by all civilizations 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 ML – Manary *et al.*, 2002) because of this unique 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 (Balsubramanyam, 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. (Adenekan *et al.*, 2010; Anklam, 1998; Cherian *et al.*, 2011; Borkar Laxmikant and Mate Devendra, 2014; Downey *et al.*, 2005; Ramnath nad Shivaramm, 2012, Terrab *et al.*, 2002; Xesus *et al.*, 2010). The scientific literature revealed that the information is not available with respect to chemical characteristics of honeys from Chandrapur Tahsil of Chandrapur District of Maharashtra State in India. The purpose of this study has 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 Chandrapur Tahsil of Chandrapur District of Maharashtra State in India.

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## 2. 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.

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### 3. Results and discussion

The chemical properties of the 5 summer squeezed honey samples (Viz. CHN-CHN-LOH, CHN-CHN-AJA, CHN-CHN-NAN, CHN-CHN-URJ, CHN-CHN-CHI) were collected during the period 16 March, 2012 to 03 May, 2013 from Lohara, Ajaypur, Nandgaon Pole, Urjanagar, Chichpalli respectively from Chandrapur Tahsil of Chandrapur District of Maharashtra State are reported in table.

**Table 1** Chemical Analysis of honey samples obtained from Chandrapur Tahsil of Chandrapur District

| Parameter |                       |                    |            |                        |                        |                       |           |           |           |
|-----------|-----------------------|--------------------|------------|------------------------|------------------------|-----------------------|-----------|-----------|-----------|
| Sr. No.   | Location of Parameter | Date of Collection | Moisture % | Total Reducing Sugar % | Levulose or Fructose % | Dextrose or Glucose % | L/D Ratio | Sucrose % | Acidity % |
| 1         | CHN-CHN-LOH           | 16-03-2012         | 26         | 72.929                 | 37.246                 | 35.575                | 1.167     | 2.551     | 0.2904    |
| 2         | CHN-CHN-AJA           | 19-03-2013         | 24.5       | 71.098                 | 39.584                 | 31.514                | 1.398     | 2.010     | 0.4255    |
| 3         | CHN-CHN-NAN           | 10-04-2012         | 23.4       | 65.062                 | 35.25                  | 29.812                | 1.361     | 1.627     | 0.313     |
| 4         | CHN-CHN-URJ           | 26-04-2013         | 32.43      | 74                     | 37.084                 | 36.916                | 1.145     | 3.635     | 0.2369    |
| 5         | CHN-CHN-CHI           | 03-05-2013         | 23         | 66.648                 | 32.937                 | 33.539                | 1.080     | 1.746     | 1.278     |

In the present study moisture content in the sample ranges from 23-26. Increase in 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 from attack by microorganism.

#### 3.1. 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 indicated that Chandrapur 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 flavor, since fructose is much sweeter than glucose.

#### 3.2. Acidity

Acidity of the honey sample ranges by 0.2369-1.278 respectively. Acidity values may indicate the fermentation of honey sugar by yeast.

### 4. Conclusion

Method enabling the examination of several parameters which would provide the quality of bee honey within a short period of time are needed modern techniques which have been developed and validated over the past few years provide high precision and accuracy but need further improvement so that the natural bee honey available on the market can be tested as quickly and reliably as possible further research into method of honey quality assessment should focus on developing techniques of rapid evaluation of the botanical origin of honey since the principle method currently in use, the melittopalynological method is very time consuming requires considerable experience botanical knowledge as well as knowledge of the honey production process. It produces inconclusive result which can be difficult to interpret

meorever it is necessary to devise quick reliable and expensive methods for detecting honey adulteration as an overview of current method of honey quality assessment, this paper can help shape the direction of future research in this field.

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## Compliance with ethical standards

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### *Disclosure of conflict of interest*

The author declare no conflict of interest.

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