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### Comparative pharmacognostical evaluation of honey of marketed products

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#### Abstract

Honey gets its sweetness from the monosaccharide fructose and glucose and has approximately the same relative sweetness as that of granulated sugar (74% of the sweetness of sucrose, a disaccharide). It has attractive chemical properties for baking, and a distinctive flavor which leads some people to prefer it over sugar and other sweeteners. The present paper deals with the pharmacognostical evaluation of honey of marketed products.

#### Introduction

Honey is a sweet food made by some insects using nectar from flowers. The variety produced by honey bees is the one most commonly referred to and is the type of honey collected by beekeepers and consumed by humans. Honey produced by other bees and insects has distinctly different properties. This wonderfully rich golden liquid is the miraculous product of honey bees and a naturally delicious alternative to white sugar. Although it is available throughout the year, it is an exceptional treat in the summer and fall when it has just been harvested and is at its freshest. Honey bees form nectar into honey by a process of regurgitation and store it as a food source in wax honeycombs inside the beehive. Beekeeping practices encourage overproduction of honey so that the excess can be taken without endangering the bee colony. Honey gets its sweetness from the monosaccharide fructose and glucose and has approximately the same relative sweetness as that of granulated sugar (74% of the sweetness of sucrose, a disaccharide). It has attractive chemical properties for baking, and a distinctive flavor which leads some people to prefer it over sugar and other sweeteners. During the course of present investigation the pharmacognostical evaluation of honey was investigated and compared.

#### Material and Methods

The following evaluations were performed during the course of present investigation:

- Evaluation of macroscopic characteristics
- Evaluation of physical characteristics
  - Determination of total ash value
  - Determination of acid-insoluble ash value
  - Determination of moisture (loss of drying)
  - Determination of viscosity
- Evaluation of chemical characteristics

The standardisation of experimental work is based on the different Physicochemical parameters, with the use of different brands of honey, viz; Dabur honey- Sample A, Singhal honey- Sample B, Brij honey- Sample C. And hence these samples were tested & evaluated and their profile was noted.

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### Results and Conclusion:

Honey use and production has a long and varied history. In many cultures, honey has associations that go beyond its use as a food. Honey is frequently a talisman and symbol of sweetness. This evaluation study was intended to determine quality and physiochemical characteristics of honey collected from different suppliers. Physiochemical properties were determined using the harmonized methods of the international honey commission. Evaluation studies based on macroscopic parameters such as colour, taste, odour, and crystallization intensity of all three marketed products viz, Dabur, Singhal, and Brij honey was done and Dabur honey product was determined as most similar as others. The physical evaluation is done on the basis of Indian Pharmacopoeia by which it was found that evaluation values of Dabur honey product is most similar to the standard values given in the Pharmacopoeia. The ash value of samples of Dabur, Singhal, Brij was determined as per the method given in Pharmacopoeia and are found to be total ash (1.64%, 2.16%, 1.95%), acid-insoluble ash (295%, 180%, 149%), moisture content (2.12ml, 2.20ml, 2.15ml) and viscosity (4.94, 4.13, 4.24poise) respectively. The chemical test were performed by following the standard procedure, and treatment of different samples of honey with Molish, Fehling, Benedict, Barfoed, Salwinoff's reagents indicates that carbohydrates is confirmed. Also tested for Sodium, Calcium, Potassium, Iron etc respectively for trace element metal ions qualitatively. This couldn't evaluate quantitatively because they are rare and less in amounts. On this basis of evaluation studies it was found that all samples of honey passes the chemical tests performed. Hence, the three different brands of honey viz; Dabur, Singhal, and Brij honey products was evaluated.

**Table No. 1: Chemical test of Honey**

S.No.	Chemical tests	Observation	Result
1	<b>Carbohydrates</b>		
(a)	Molish Test: 2.3ml aqueous extract + Drop of alfa naphthol solution in alcohol Shake + Conc. $H_2SO_4$ From side of test tube.	Violet ring is formed at the junction of two liquid	Test Pass
2	<b>Test for reducing suger</b>		
(a)	<b>Fehling's Test:</b> Mix 1 ml Fehling A and 1ml Fehling B solution. Boil for 1 Minute + Add equal Volume of test solution, Heat in boiling Waterbath 5-10 minutes.	First a yellow, Then brick red precipitate is observed.	Test Pass
(b)	<b>Benedict's Test:</b> Mix equal volume of benedict's reagent and solution in test tube, Heat in boiling Waterbath for 5 minutes.	A solution appears green, yellow, and red depending on amount of reducing sugar present in test solution.	Test Pass
3	<b>Monosaccharides test</b>		
(a)	<b>Barfored's test:</b> Mix equal volume of Barforeed's reagent and test solution. Heat for 1-2 minutes in boiling Waterbath and cool.	Red precipitate is observed	Test Pass
4	<b>Test of Hexose Sugar</b>		
(a)	<b>Salwinoff's Test (For Keto-Hexose like fructose):</b> Heat 3 ml Salwinoff's reagent and 1 ml test solution in boiling Waterbath for 1-2 minutes.	Red colour is formed	Test Pass
(b)	<b>Cobalt-Chloride Test:</b> Mix 3 ml test solution + 2 ml cobalt- chloride. Boil and Cool. + Few drop NaOH solution.	Upper layer Greenish blue and Lower layer Purplish (Mixture of glucose and fructose)	Test Pass

5	<b>Test For Calcium</b>		
	10 ml filtrate, add 1 drop dilute NH <sub>4</sub> Cl and saturated ammonium oxalate solution.	White precipitate of calcium oxalate forms.	Test Pass
6.	<b>Test For Potassium</b>		
	2-3 ml test solution + few drops sodium cobalt nitrite solution.	Yellow precipitate of potassium cobalt nitrite observed.	Test Pass.
7	<b>Test For Iron</b>		
(a)	5 ml test solution + few drops 2% potassium ferrocyanide.	Dark Blue coloration is observed	Test Pass
(b)	5 ml test solution + few drops 5% Ammonium thiocyanate.	Solution turns Blood red.	Test Pass

**Table No. 2: Comparative macroscopical evaluation of honey**

S.No.	Features	Result		
		Sample A	Sample B	Sample C
1.	Colour	Yellowish brown	Pale yellow	Pale yellow
2.	Taste	Sweet and faintly acrid.	Sweet and faintly acrid.	Sweet and faintly acrid.
3.	Odour	Characteristic	Characteristic	Characteristic
4.	Crystallization intensity	More	Medium	Medium

**Table No. 2: Comparative physical evaluation of honey**

S.No.	Tests	Result		
		Sample A	Sample B	Sample C
1	Ash Value	1.64 %	2.167 %	0.124 %
2	Acid Insoluble Ash Value	295.52 %	180 %	149.08 %
3	Determination of Moisture (Loss of Drying)	2.12 ml	2.20 ml	2.15 ml
4	Viscosity	4.94 Poise	4.13 Poise	4.24 Poise

**Table No. 2: Comparative chemical evaluation of honey**

S.No.	Tests	Result		
		Sample A	Sample B	Sample C
1	Molish's Test:	+	+	+
2	Fehling's Test:	+	+	+
3	Benedict's Test:	+	+	+
4	Barfored's test	+	+	+
5	Salwinoff's Test	+	+	+
6	Cobalt-Chloride Test	+	+	+
7	Test For Calcium	+	+	+
8	Test For Sodium	+	+	+
9	Test For Potassium	+	+	+
10	Test For Iron	+	+	+

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