

Physicochemical Properties of Dhania Honey

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Abstract

Honey is in great triumph on the tremendous using since the ancient times of the world history in view of effective healing, antiseptic, antioxidant and antibacterial therapy in defiance of panoply of food produces. The current study intent was to come to fight the physical and biochemical properties of dhania honey. The study results divulged to contribute $14.6\pm0.01\%$ moisture, $0.19\pm0.01\%$ ash, 84.378% total carbohydrate, $0.83\pm0.01\%$ protein, $0.002\pm0.00\%$ fat and 75% TSS in dhania honey. There were detected 34.085 Kcal/100 g DIT and 340.85 Kcal/100 g dietary energy content retaining 4.76 p^H level.

Keywords

Dhania Honey, Physicochemical Properties

1. Background

Honey is a natural global food produce, well-known for thousands of years for its nutritive value and healing properties. Honey, derived from nectar of flowers or from honeydew, is produced by Apis mellifera bees [1, 2] following the process of secretion, transformation, storage and maturation in combs [2]. There is a complex honey composition, containing some 181 substances including sugars, proteins, vitamins, minerals, HMF (5hydroxymethylfurfural), enzymes, flavonoids, phenolic acids and volatile compounds [3] and the main constituents are moisture, glucose, fructose, sucrose, proteins, minerals, organic acids, salts and phenolic compounds [4-8]. Honey composition primarily rested on floral sources, seasonal and environmental variations, however, with basic nutrients e.g., sugars, proteins, fats, vitamins (vitamin B complex and vitamin C mainly) including catalase, oxidase, ascorbic acid, phenolic acids, flavonoids, carotenoids, organic acids and Maillard reaction produces [9, 10].

There is an entire Surah in theHoly Qur'an "Al-Nahl (the Bee)" by name. According to Hadith, the Prophet Hazrat Muhammad (Sm) widely recommended honey for healing purpose. The Surahclearly defines honey as, "And thy LORD taught the bee to build its cells in hills, on tree and in men's habitations, then to eat of all the produce of the earth and find skill the spacious path of its LORD, there issues from within

their bodies a drink of varying colors, whereinis a healing of men, verity in this a sign for those who give thought." [11]

In Hinduism, honey is one of the five elixirs of immortality and in the Christian New Testament, Matthe 3:4, John the Baptist is said to have lived for a long period of time in the wilderness on a diet consisting of locusts and wild honey.

Honey, blessed by varying colorful colloids, it is set templates since prehistoric times and is still being exploited for its fantastic benefits and has been used in folk medicine since ancient times. The various physical, chemical, biochemical and biological honey properties have revealed several advantageous claims through various techniques. The multi facet assay of honey anchored in scientific race is regarded as a sweetener, functional food, antioxidant, antimicrobial, antibacterial, antiseptic, bacteriostatic, prebiotics, pro-biotics, anti-cancer, anti-tumour,antiinflammatory and immune modulatory effects amongst others [12]. Consumption of honey alone or combination with other beverages or snacks increases antioxidant capacity of human serum [13]. It is in rampant use since long time domestic needs and medicinal purposes, but its antioxidant convenience come to limelight in recent times. With demand rising due to antioxidant in the food, honey has come into fashionas a trendy antioxidant rich source as it is rich in

flavonoids, phenolic acids, catalase, glucose oxidase, carotenoid derivatives, proteins and amino acids [14]. Honey contains a number of compounds and the antioxidant values are well known across the world. The antioxidant properties of honey derived from both the enzymatic (e.g., catalage, glucose, oxidase and peroxidase) and nonenzymatic substances (e.g., ascorbic acid, α -tocopherol, carotenoids, amino acids, proteins, Maillard reaction products, phenolic acids and flavonoids) [15-17]. The amount and antioxidant types rested on the floral source and honey variety and a correlation between antioxidant activity with phenolics has been proved [15, 18]. It has been shown in different studies to have antioxidant potential of honey largely correlated with total phenolics concentration and there are more than 150 polyphenolic compounds reported, including phenolic acids, flavonoids, flavonols, catechin and cinamic acid derivatives [19-21]. It has capacity to lower or prevent oxidative damage to erythrocytes and lipid peroxidation associated inflamatory diseases involving oxidative stress [22]. It is also effective in preventing lipid oxidation in meat and deteriorative enzymatic browning of vegetables and fruits [18, 23].

The present study was, therefore, carried out to investigate the physical and biochemicalproperties of dhania honey abetto make diet planning with honey by dint of the sound health continuation fiesta.

2. Methodology

2.1. Study Nature

The study was a cross-sectional study.

2.2. Sample Collection

The topic sample, dhania honey was collected from Afsar Ali, the Tangail district unit Bangladesh Apiculturist Welfare Association president, a big bug honey cultivator at Sagardighi of Ghatail upazila in Tangail, Bangladesh.

2.3. Experimental Places

The study was carried out at Food Technology and Nutritional Science department laboratory of Mawlana Bhashani Science and Technology University, Santosh, Tangail, Bangladesh and Bangladesh Council of Scientific and Industrial Research, Dhanmondi, Dhaka, Bangladesh.

2.4. Study Duration

The study was conducted from 2nd week of February to 2nd week of July 2015.

2.5. Physicochemical Analysis

The dhania honey sample was analyzed for moisture, protein, fat and ash as per the AOAC-2005 method [24]. The TSS was measured using Handrefractometer, pH using p^H meter and total carbohydrate, dietary energy and DIT using three different simple mathematical equations.

2.6. Data Analysis

Statistical mean and standard deviation were searched out applying SPSS 16 program. Microsoft Word and Microsoft Excel were in widespread use in the respective section.

3. Results

3.1. Nutrient Contents Analysis

Dhania honey is in galore nutrient contents density. The nutrient content of fresh collected dhania honey was analyzed for moisture, protein, fat, ash, carbohydrate and TSS contents. The results were found to have $14.6\pm0.01\%$ moisture, $0.19\pm0.01\%$ ash, $0.83\pm0.01\%$ protein, $0.002\pm0.00\%$ fat, 84.378% total carbohydrate and 75% TSS (Table 1).

Table 1. Nutrient Contents of Dhania Honey.

| Parameters | Amounts (Percentages) |
|--------------------|-----------------------|
| Moisture | 14.6±0.01 |
| Ash | 0.19±0.01 |
| Protein | 0.83±0.01 |
| Fat | 0.002±0.00 |
| Total carbohydrate | 84.378 |
| TSS | 75 |

3.2. Biochemical Analysis

The p^{H} content of dhania honey sample was obtained 4.76 at 27^{0} C room temperature.

3.3. Energy Yielding Assay

The dietary energy content of dhania honey was analyzed using mathematical calculation inserting the numeric values of carbohydrate, protein and fat contents at energy determining equation and the DIT was measure @ 10% of dietary energy content. The DIT was measured to contain 34.085 Kcal/100 g and the dietary energy content was analyzed to have 340.85 Kcal/100 g in dhania honey sample (Figure 1).



Figure 1. Energy Contents of Dhania Honey.

4. Discussion

The analysis of the physicochemical properties of dhania honey was done as a rule to the methodology discussed earlier and from the results gained applying various laboratory techniques and mathematical equations frequently used in the nutritional arena. The moisture was laid in trace amount in dhania honey and the mean total moisture content was 14.6% contributing within the limit $\leq 20\%$ recommended by the international quality regulations [25]. The investigated honey sample was in good quality, as indicated by the low moisture content [26, 27]. The honey has high TSS content (75%) contributing ample of sugar concentration on the honey solution to focus the solution strength. Low protein is desired to produce tender and crisp produces and ash content denoted the mineral contents in honey to aid smooth continuation of body electron transport system [28]. There was 84.378% available carbohydrate in dhania honey to fuel the fuel for alcohol fermentation [29, 30]. The sample p^{H} found <7 denoted the acidic nature [31, 32] of honey solution which was as like as the previously reported studies for other honey samples from India, Malaysia, Turkey, Brazil and Spain, Thailand and different countries [33-37]. There were high DIT and dietary energy content of selected honey sample associated with energy intake levels and weight gained consuming the honey for a specific study designed duration [38] indicating the dhania honey sample the superbenergy booster to give instant energy to maintain health soundness.

5. Closing

The results have revealed that the dhania honey is in low moisture, protein, fat contents and high TSS, carbohydrate, dietary energy and DIT pointing out the first-class physicochemical properties to adhere the produce in daily diet as a delicious sweet taste and moody mouth feel having many potential health benefits. The lower p^{H} level is the passive indicator of dhania honey having a good vitamin C and antioxidant sources. The honey sample is in good physicochemical contours in keeping with the CAC honey quality parameters.

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