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Floral-type identification and quality evaluation of some honey types

Hamza M. Abu-Tarboush,[a] Hassan A. Al-Kahtani[a] & M. S. El-Sarrage[b]

[a] *Food Science Department,* [b] *Plant Protection Department, College of Agriculture, King Saud University, PO Box 2460, Riyadh 11451, Saudi Arabia*

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Floral identification of six of the most commonly used honeys was investigated and their chemical characteristics were reported and compared with the Saudi Standards on honey. Microscopic examination confirmed the origin of the honey claimed by the manufacturer. 'Sugar-feed' honey was significantly ($P < 0{\cdot}05$) the lowest in moisture and pH, but the highest in sucrose, while 'Buck thorn-sidir' was the highest in ash and pH, but the lowest in sucrose. Water-insoluble solids (WIS) as well as fructose/glucose ratio (F/G) values were nearly the same for all samples. Higher diastase activity (DIA) was found in 'Buck thorn-Zaarorah' followed by 'Pot marigold-kateefah'. However, DIA in 'Alfalfa-Berseem Higazi' was below the limit set by the Saudi Standard. Honey samples, except 'Buck thorn-Sidir' and 'Buck thorn-Zaarorah', exceeded the maximum level of hydroxymethyl furfural (HMF) set by the Saudi Standard. Individual mineral contents varied among samples and were present in abundance, particularly, phosphorus and potassium. Vitamins were generally very low and ascorbic acid was only high in 'Buck thorn-Zaarorah'.

INTRODUCTION

Honey is the sweet viscous substance elaborated by the honey bee from the nectar of plants. It is a very important energy food and is used as an ingredient in virtually hundreds of manufactured foods, mainly in cereal based products, for sweetness, colour, flavour, caramelization, pumpability and viscosity (LaGrange & Sanders, 1988).

The physical properties and chemical composition of honey have been published by many workers (White *et al.*, 1962; Siddiqui, 1970; Doner, 1977; Mesallam & El-Shaarawy, 1987; LaGrange & Sanders, 1988). The composition depends highly on the types of flowers utilized by the bee as well as regional and climatic conditions.

Some types of commercially available honey in Saudi Arabia are essentially monofloral. These include alfalfa, citrus, pot-marigold (Kateefah) and Buck thorn (Zaarorah and Sidir). Consumers in Saudi Arabia prefer honey produced from Sidir (Buck thorn) and they believe that this type of honey is superior to other types produced locally or imported from other countries around the world. Therefore, this study was conducted to investigate some of the most popular types of honey marketed in the country in terms of floral identification utilized by the bee and chemical evaluation of the products.

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MATERIALS AND METHODS

Sample collection

Commercial honey samples were purchased from a local market, Riyadh, Saudi Arabia. Representative samples were drawn and kept refrigerated until needed for analysis.

Identification of honey samples

Procedures by Wodehouse (1959), Moore and Webb (1978), and Musa (1989) were consulted for floral identification. Five grams of crude honey were centrifuged ($2000 \times g$) and pollen grains were expelled. With the aid of a brush, pollen grains were spread on a slide, a drop of water was added and impurities were removed. Pollen grains were then dehydrated in a series of alcohol solutions, 50, 70, 90 and 100%, where a drop of each concentration was put on the slide for 2 min. A drop of xylene was added and left for one minute. Slide mounting with glycerol was prepared for microscopic examination and compared with the reference for identification.