Chrysanthemum Honey (Sample No. 86)

The honey is obtained from *Chrysanthemum indicum* blooming during September - November. The honey is brown in colour mild in taste and flavour. No granulation.

Rosa Honey (Sample No. 99)

The honey is obtained from wild rose species viz., *Rosa brunonii* blooming during March - May. The honey is dark amber, thick and non-granulated. Aroma is sweet like jaggery with mild taste.

Salix Honey (Sample Nos. 22, 89)

It is collected from Salix spp. Honey is yellow - orange to light amber in colour, with pleasing aroma and delicious taste. It contains moisture, 20.99%; Nitrogen, 0.038%; Ash, 0.38% Minerals viz. Na-56 ppm; K-882 ppm; Ca-35 ppm and reducing sugars 58.01%.

**PHYSICO-CHEMICAL PROPERTIES OF HONEY**

Honey is a viscous liquid ranging in colour from white (*Leucas stelligera*), yellow (*Terminalia* spp.) to dark amber (*Actinodaphne* sp.)(Deodikar, 1965). It mainly consists of sugars i.e., reducing and non-reducing, moisture, proteins, minerals, nitrogen, ash, etc.

In addition to the main constituents, honey consists of a number of other components which may not be true ingredients of it. These include calcium oxalate crystals,
soot, yeasts, plant and insect hair, particles of chitin and tissues from bees, mites, etc. (Maurizio, 1975).

The physico-chemical properties of unifloraI honey vary significantly. They contain water, 14-20%; Sucrose, 1-6%; dextrins, 0.1-10%; levulose, 30-40%; dextrose, 40-50%; proteins, 0.1-1.5%; minerals, 0.1-1.5%; along with some undeterminables (Deodikar, 1965).

The studies conducted in Western Ghats, India, have given the chemical composition of some unifloraI honeys (Phadke, 1962). The honey composition includes, specific gravity, 1.405-1.425; moisture, 16.09-19.37%; total dissolve solutes, 78.25-82.25%; total sugars, 76.24-79.89%; reducing sugars, 66.46-78.12%, non reducing sugars 0.55-11.26%; dextrins, 0.50-2.14%; ash, 0.014-0.298%; proteins, 0.389-1.135%; with undeterminables, 1.39-2.00%.

Similar studies conducted in the Northern India including U.P. have shown the chemical composition with respect to multifloraI honeys as specific gravity, 1.399; moisture, 19.98%; total dissolved solutes, 77.50; reducing sugars, 72.78%; non-reducing sugars, 2.01%; and ash, 0.196% (Singh, 1983).

Some other studies conducted on unifloraI honeys have revealed the composition as, water, 14.20%; sucrose, 1-6%; dextrins, 0.1-10%; levulose, 30-40%; dextrose, 40-50%; proteins, 0.1-1.5%; minerals, 0.1-1.5% along with
The present study has shown the range of different components in great variation as compared to earlier findings with respect to unifloral and multifloral honeys.

The unifloral honeys have moisture content, 8.80-22.82%; reducing sugars, 49.38-63.97%; Nitrogen, 0.01-0.042%; minerals, 0.0187-0.1715%; Na-0.0014-0.0071%; K-0.015-0.1576%; Ca-0.0021-0.0068%; and ash, 0.01-0.30%.

The composition of multifloral honeys ranged as moisture, 8.07-20.99%; reducing sugars, 49.83-65.38%; Nitrogen, 0.01-0.054%; minerals, 0.0225-0.1711%; Na-0.0018-0.0078%; K-0.0186-0.1576%; Ca-0.0021-0.0057% and ash content, 0.03-0.51%.

The composition of some unifloral and multifloral honeys from different localities has been given in Tables IVa & IVb.

The pollen analysis of honey samples is the important aspect of identifying bee forage plants of any locality (Maurizio, 1951; Sen and Banerjee, 1956; Vishnu-Mittre, 1958; Nair, 1964; Barth, 1971; Hodges, 1978). In the present study 83 pollen types have been identified as bee pasturage species in 100 honey samples collected from Garhwal Himalaya. This agrees with the findings for different parts of the world e.g. 58 pollen types in 54 Louisiana honey samples (Lieux, 1972), 67 pollen types in 130 Luxembourg honey samples (Maurizio, 1971), and 50 types in
6 honey samples from Nigeria (Sowummi, 1976) along with the reports on the temperate and subtropical parts of India, 20 pollen types from Kangra (Sharma, 1970a), 17 pollen types from Banthra (Chaturvedi, 1977), 56 pollen types from Punjab plains (Chaudhari, 1977), 70 pollen types from Padgaon (Chaubal, 1980b), 57 pollen types from Sagarmal (Chaubal, 1982), and 27 pollen types from Eastern Uttar Pradesh (Sadruddin and Tripathi, 1985).

Regarding the study on types of honey i.e. wild (dorsata) honey and domestic (indica) honey, most of the works lack a sharp distinction whether the studies were conducted on wild or domestic honeys, but for few attempts like that of Singh (1983), which has analysed the wild honey chemically but remained confined only upto the specific gravity and moisture contents of honey, indicating the values for the former from 1.3492-1.4401 with an average of 1.4043 and water percentage from 17 to 25.9%.

The chemical analysis of some of the wild (dorsata) honey and domestic (indica) honey in the present study has indicated the moisture, 8.07-23.82%; Nitrogen, 0.012-0.054%; Ash, 0.30-0.51%; Na, 18-78 ppm; K, 185-1472 ppm; Ca, 21-56 ppm; and reducing sugars, 54.01-65.21% for wild honeys and the values obtained for domestic honeys are as - moisture, 8.80-23.08%; Nitrogen, 0.012-0.045%; Ash, 0.03-0.53%; Na, 14-78 ppm; K, 152-1576 ppm; Ca, 21-68 ppm; and reducing sugars, 49.38-65.38% (Tables Va and Vb).