Pollen analysis of some *Apis mellifera* L. honeys from Haryana, India

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Apiary honey samples from different localities of Haryana are analysed to identify and evaluate the sources 13 Plant species belonging to 11 families are identified.

Key-words— Honey Pollen analysis/Nectar plant, *Apis mellifera* L., Haryana

THE pollen analysis of honey is important for identifying the botanical and geographical origin of honey (Louveaux *et al.*, 1978). Melittopalynological studies have received to date only marginal attention in various parts of the country and particularly in Haryana, which is one of the honey producing states in North India. Seethalakshmi (1980) carried out pollen analysis of a few apiary honey samples collected across the country.

The present study is aimed to identifying and evaluating the sources; which can help to protect the consumer preference for specific locality for promoting the beekeeping industry in Haryana.

Seven apiary honey samples (300g each) of *Apis mellifera* L. (European hive bees) were produced from different localities of districts Ambala, Kurukshetra, Karnal and Yamuna Nagar in Haryana through state office of Khadi and Village Industries Commission, Ambala Cantt. The details of the collection of honey samples are given in Table 1.

Samples were subjected to qualitative and quantitative analyses of honeys. For quantitative studies, 1 gram honey was dissolved in 10 ml distilled water and centrifuged. The recovered sediment was treated with 5 ml Glacial acetic acid followed by acetolysis (Erdtman, 1960) method. Five pollen slides were prepared for each honey sample and pollen were identified with the help of reference pollen slides and relevant literature.

The method recommended by Suryanarayana *et al.* (1981) was employed to determine the absolute pollen count (APC) of honey samples.

For determining the frequency classes of pollen types, 200-300 grains of the pollen of nectariferous

Table 1: **Percentage of moisture content, colour and absolute pollen count (APC) of *Apls mellifera* L. honey samples.**

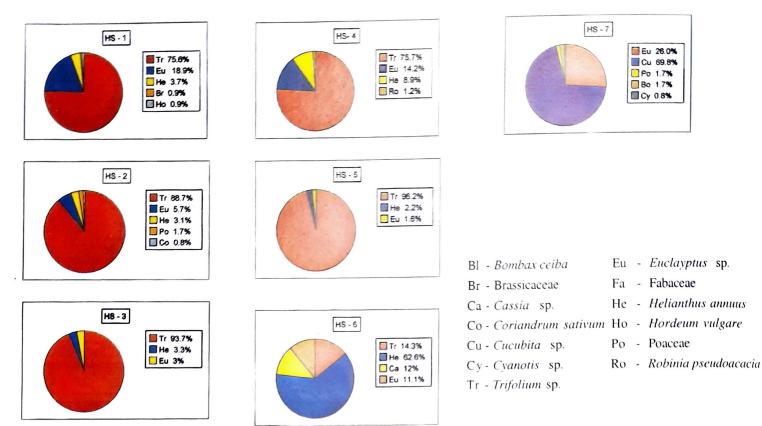| Sr. No.	Place of Collection	Collection Time	Colour	Moisture content (%)	APC
1.	Vill. Mamadi, Dist. Yamuna Nagar	April, 1994	Redish Yellow	18.0	21,300-G II
2.	Vill. Khudd, Dist. Ambala	May, 1994	Yellow	17.3	70,500-G II
3.	Vill. Bodi, Dist. Kurukshetra	May, 1994	Yellow	17.3	1,15,700-G III
4.	Vill. Bodi, Dist. Kurukshetra	May, 1994	Yellow	17.3	33,800-G II
5.	Bee Farm of State Govt. Haryana, Dist. Karnal	May, 1994	Yellow	18.9	44,400-G II
6.	Vill. Uchani, Dist. Karnal	May, 1994	Yelloish	20.0	9,100- G I
7.	Vill. Baldi, Dist. Karnal	May, 1994	Dark-Yellow	18.4	12,000-G I

Fig. 1 (HS 1-7) : Pollen spectra of *Apis mellifera* honey samples

plants in a honey sample were counted and expressed as percentages of the total (Louveaux *et al.*, 1978), four frequency classes were recognized: predominant pollen type (45 %), Secondary pollen types (16-45 %); important minor pollen types (3-15 %) and minor pollen types (<3 %).

The study has revealed that 13 plant species belonging to 11 plant families served during summer season as pollen and nectar sources to *Apis mellifera* L. honey bees in four districts of Haryana. Honey samples HS-1, HS-2 and HS-7 had maximum number of pollen types (05) whereas honey samples HS-3 and

Table 2: Frequency Distribution of Pollen Types in Honey Samples

Taxon	FREQUENCIES						
	HS-1	HS-2	HS-3	HS-4	HS-5	HS-6	HS-7
Bombax ceiba							1.7
Brassicaceae	0.9						
Cassia sp.						12.0	
Coriandrum sativum		0.8					
Cucurbita sp.							69.2
Cyanotis sp.							0.8
Eucalyptus sp.	18.9	5.8	3.0	14.2	1.6	11.1	25.8
Fabaceae							0.8
Helianthus annuus	3.7	3.1	3.3	8.9	2.2	62.6	
Hordeum vulgare	0.9						
Poaceae		0.7					1.7
Rohinia pseudoacacia				1.2			
Trifolium sp.	75.6	89.6	93.7	75.7	96.2	14.3	
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

HS-5 had minimum number (03) of pollen types. Honey samples (HS-4) had three pollen types.

The analysis revealed that *Trifolium* sp. was the predominant pollen types in honey samples HS-1, HS-2, HS-3, HS-4 and HS-5 and recording 75.6 to 96.2 %. in honey samples HS-6 and HS-7. *Helianthus annuus* and *Cucurbita* sp. were the predominant pollen types and represented 62.6 and 69.2 %, respectively. The analysis revealed that all these honey samples were found as unifloral (Table 2). The other secondary, important minor and minor pollen types were *Eucalyptus* sp., *Hordeum vulgare*, Brassicaceae, *Coriandrum sativum*, *Robinia pseudoacacia*, Poaceae, *Bombax Ceiba*, *Cyanotis* sp. and Fabaceae (Table 2). Figure 1 (HS 17) present the pollen spectra of the honey samples. Pollen photographs of some important nectar sources are given in figure 2.

Table 1 provides details of collection of honey samples. Based upon the absolute pollen counts, the honey samples HS-1, HS-2, HS-4, and HS-5 were referred to group II; HS-3 to group III and HS-6 and HS-7 were placed in group 1.

The colours of the honey samples were yellow to reddish-yellow. The moisture contents in the honey samples were varied from 17.3 to 20.0%.

The microscopical analysis of apiary honey samples collected from different areas of Haryana during summer season has revealed richness in crop and arboreal plants. *Trifolium* sp., *Helianthus annuus* and *Eucalyptus* sp. were the main pollen and nectar sources to *Apis mellifera* L, during summer season. Therefore, this study will be helpful to the beekeepers for identifying the pollen and nectar sources to honey bees during summer season and also to protect the consumer preference for specific source or for specific locality for promoting the beekeeping industry in Haryana.

ACKNOWLEDGEMENTS

Fig. 2. Pollen photographs of some important nectar sources in Haryana (X450)

1. *Trifolium* sp. 2. *Cyanotis* sp. 3. *Coriandrum sativum*
4. *Eucalyptus* sp. 5. *Bombax ceiba*

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