

Evaluation of Pollen Sources to *Apis mellifera* L. in Gudalur, Dist. Theni, Tamil Nadu

Rakesh Kumar

Central Bee Research and Training Institute, Khadi and Village Industries Commission,
1153, Ganeshkhind Road, Pune – 411 016

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THE pollen analysis of honey is important for identifying the botanical and geographical origin of honey (Louveaux *et al.* 1978). Suryanarayana *et al.*, (1990) studied on pollen loads of *Apis cerana* honey bees and found that *Cocos nucifera* was the good pollen source to *Apis cerana* in Tamil Nadu.

The investigations were carried out during 1996-97 at the Field Observation Station (FOS) of Central Bee Research and Training Institute, Pune, located at Gudalur, Tamil Nadu where some colonies of *Apis mellifera* L. were maintained. Total 355 samples of pollen loads were collected in different months of the year from the incoming *Apis mellifera* L. honey bees into the hive on a clean paper by using pollen trap in front of the hive at an hourly interval. Each pollen load was examined microscopically, after preparation of temporary pollen slides to identify the pollen grains. The loads were then subjected to acetolysis (Erdtman 1960) for preparation of permanent slide. The identification was aided by reference pollen slides and relevant literature.

The results of pollen analysis of 355 pollen load samples indicates that a total 25 plant species served as pollen and nectar source to *Apis mellifera* L. in Gudalur (Table 1).

Cocos nucifera L. was the major pollen source which provided bee forage throughout the year to *Apis mellifera* L. honey bees. It represented 56.3 per cent of the total pollen loads. *Helianthus annuus* L. and *Tridax procumbens* L. were found as a medium pollen sources and represented 17.8 per cent of total loads. Among the minor sources contributing to nearly 25.9% of the total loads are : *Vitis vinifera* L.,

Table 1. Frequency occurrence (%) of pollen loads collected from the honey bees, *Apis mellifera* L.

No.	Taxon	No. of pollen load	Percen- Stage	Pollen Forage Value
1.	<i>Acacia</i> sp.	2	0.6	Minor
2.	<i>Albizzia</i> sp.	3	0.8	Minor
3.	Asteraceae	8	2.2	Minor
4.	<i>Borassus flabellifer</i>	1	0.3	Minor
5.	Caesalpinaceae	3	0.8	Minor
6.	<i>Cardiospermum</i> sp.	1	0.3	Minor
7.	<i>Ceiba pentandra</i>	2	0.6	Minor
8.	<i>Cocos nucifera</i>	200	56.3	Major
9.	<i>Cucurbita</i> sp.	4	1.1	Minor
10.	<i>Cyanotis</i> sp.	4	1.1	Minor
11.	Fabaceae	9	2.5	Minor
12.	<i>Helianthus annuus</i>	35	9.9	Medium
13.	<i>Ocimum sanctum</i>	1	0.3	Minor
14.	<i>Parthenium hysterophorus</i>	2	0.6	Minor
15.	<i>Peltophorum pterocarpum</i>	4	1.1	Minor
16.	<i>Pennesetum typhoides</i>	2	0.6	Minor
17.	<i>Punica granatum</i>	1	0.3	Minor
18.	<i>Sida</i> sp.	5	1.4	Minor
19.	<i>Tamarindus indica</i>	8	2.2	Minor
20.	<i>Terminalia bellirica</i>	1	0.3	Minor
21.	<i>Tridax procumbens</i>	28	7.9	Medium
22.	Unknown	10	2.8	Minor
23.	<i>Vernonia</i> sp.	2	0.6	Minor
24.	<i>Vitis vinifera</i>	17	4.8	Minor
25.	<i>Zea mays</i>	2	0.6	Minor

Total

355

Pollen Forage Value :

No. of loads-

1- 20 Minor Pollen Source

21-50 Medium Pollen Source

> 50 Major Pollen Source

Fabaceae, *Tamarindus indica* L, Asteraceae, *Sida* sp., *Cucurbita* sp., *Peltophorum pterocarpum*, *Cyanotis* sp., *Albizia lebbek* (L) Benth, Caesalpiniaceae, *Zea mays* L., *Parthenium hysterophorus* L., *Pennesetum typhoides* (Burm) Stapf & Hubbard, *Acacia* sp., *Vernonia* sp., *Ceiba pentandra* L. (Gaerth), *Borassus flabellifer* L., *Terminalia bellirica* Roxb., *Punica granatum* L., *Cardiospermum* sp. and *Ocimum sanctum* L.

The calendar of important pollen sources to *Apis mellifera* L. is given in Table 2. Although pollen is available throughout the year in the locality, the peak pollen availability was from September to October. It is the peak period which encourages the multiplication of bee colonies in Gudalur.

Table 2. Important pollen sources to *Apis mellifera* L. in Gudalur, Dist. Theni, Tamil Nadu

Taxon	Folwering Period	Local/Common Name	Pollen Forage Value
ASTERACEAE			
Asteraceae (Unidentified)	December	-	P3
<i>Helianthus annuus</i> Linn	April, July-October	Suryagandi	P2
<i>Parthenium hysterophorus</i> Linn	April	Grass	P3
<i>Tridax procumbens</i> Linn	August-October	Tridax	P2
<i>Vernonia</i> sp.	December	Vernonia	P3
ARECACEAE			
<i>Borassus flabellifer</i> Linn	December-January	Panai	P3
<i>Cocos nucifera</i> Linn	Throughout the year	Thennai	P1
BOMBACAEAE			
<i>Ceiba pentandra</i> (L) Gaerth	January	Silk cotton, Ilavu	P3
CAESALPINIACEAE			
Caesalpiniaceae (Unidentified)	February, September	-	P3
<i>Peltophorum pterocarpum</i>	March, April	Copper pod	P3
<i>Tamarindus indica</i> Linn	April, May	Puli	P3
COMBRETACEAE			
<i>Terminalia bellirica</i> Roxb.	March, April	Kadukai	P3
COMMELINACEAE			
<i>Cyanotis</i> sp.	October	-	P3
CUCURBITACEAE			
<i>Cucurbita</i> sp.	April, May	Vellaiia	P3
FABACEAE			
Fabaceae (Unidentified)	April, December	-	P3
LAMIACEAE			
<i>Ocimum sanctum</i> Linn	January, November	Tulsi	P3
MALVACEAE			
<i>Sida</i> sp.	August-October	-	P3
MIMOSACEAE			
<i>Acacia</i> sp.	December, January	-	P3
<i>Albizia lebbek</i> (Linn) Benth	February, March	Velvagai	P3
POACEAE			
<i>Pennesetum typhoides</i> (Burm)	October	Kaepi	P3
<i>Zea mays</i> Linn	August, September	Makka	P3
PUNICACEAE			
<i>Punica granatum</i> Linn	September	Mathulai	P3
SAPINDACEAE			
<i>Cardiospermum</i> sp.	October	-	P3
VITACEAE			
<i>Vitis vinifera</i> Linn	January, July-September	Grapes, Thirat	P3

Pollen Forage Value (PFV) : P1= Major Pollen Source, P2= Medium Pollen Source, P3= Minor Pollen Source.

From the botanical point of view the area is horticulturally and agriculturally predominant with coconut throve, orchard of *Psidium guajava* L., *Punica granatum* L. The usual crops grown are cucurbits, *Zea mays* L., *Helianthus annuus* L., etc. All these contribute seasonal forage to *Apis mellifera* L. honey bees. The common weeds associated with cultivation which contributed pollen forage to *Apis mellifera* L. were *Tridax procumbens* L., *Cyanotis* sp., *Parthenium hysterophorus* L., etc.

In the present study a total 25 pollen types were recorded. These belong to 15 plants families. Microscopical analysis of pollen loads indicates that *Cocos nucifera* L. was the only major pollen source which provides pollen forage throughout the year to *Apis mellifera* L. in Gudalur. The weeds, *Tridax procumbens* L. and *Cyanotis* sp. were recorded as secondary pollen sources to *A. mellifera* L. honey bees. *Helianthus annuus* L. was another important pollen source to *A. mellifera* L. honey bees.

The study indicates the good potential of this

locality for the development of *A. mellifera* L. bee colonies. Bees need pollen for brood rearing and for growth in colony strength. So beekeepers can multiply the bee colonies throughout the year, but maximum during peak blooming period of the plants. The strong colony can collect nectar, if adequate sources of nectar are present in the locality.

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