



POLLEN ANALYSIS OF HONEY SAMPLES FROM DIFFERENT GEOGRAPHIC AREA (MARRIGUDAM, SIRKONDA, KOPPELA) OF Tah. SIRONCHA, Dist. GADCHIROLI OF MAHARSHTRA.

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ABSTRACT:

The study represents the pollen contents of 3 honey samples of natural bee hives of *Apis cerana indica* in summer season collected from the 3 different geographic regions of Tah. Sironcha, Dist. Gadchiroli of Maharashtra. According to qualitative analysis, 3 honey samples were multifloral. Pollen analysis of honey samples, 23 different plants have been determined. The plants contributing nectars and pollens to honey samples in different areas of Tah. Sironcha, Dist. Gadchiroli were found as follows; Fabaceae (*Pongamia*, *Butea*, *Trifolium*, *Dalbergia*, *Tamarindus*); Asteraceae (*Tridax*, *Helianthus*); Apiaceae (*Daucus*, *Coriandrum*); Anacardiaceae (*Mangifera*); Meliaceae (*Azadirachta*); Mimosaceae (*Acacia*); Myrtaceae (*Psidium*, *Syzygium*); Combretaceae (*Terminalia arjuna*, *T. tomentosa*, *T. chebula*); Malvaceae (*Abelmoscus*); Sapotaceae (*Madhuca*); Brassicaceae (*Brassica*); Rutaceae (*Citrus*); Poaceae (*Oryza*); Solanaceae (*Lycopersicon*). The pollen spectra of the samples were indicated various plant species, visiting by honey bees in the area which reflect the vegetation types in the geographical area (Marrigudam, Sirkonda, Koppela) of Tah. Sironcha, Dist. Gadchiroli. And other important taxa as sources of nectars by honey bees were also identified and listed. The numerous pollen types and their diversity showed that bees travel considerable distance collecting nectar and pollen for honey production.

Keywords: Honey, Pollen diversity, Pollen analysis, *Apis cerana indica*.

INTRODUCTION:

Melittopalynology is one of the applied branches of Palynology that deals with the study of pollen in the honey. The term Melittopalynology is derived from the Greek words Melitta and Melissa (the Attic form) meaning "a bee" as well as honey (in Homer). The Latin word mel (mellis) also means honey. Though the International Commission for Bee Research prefers the term Melissopalynology involving the study of pollen in honey.

Bee forage includes nectar and pollen nectar is the basic raw material from which honey bees make honey, whereas pollen rich in Amino acids, Carbohydrates, Vitamins and hormones as an essential ingredient for bee nutrition and development of the brood and is therefore essential for the maintenance of a healthy bee colony. Pollen analysis of honey and bee collected pollen loads for their pollen content provide valuable information regarding plant preferred by the bees for nectar / pollen or both nectar and pollen. It further reflects upon the characteristic local flora and vegetation assemblage of the area studied. It also furnishes information on major and minor sources of nectar and pollen and helps identifying area with possibilities of having for commercial honey production.

The present research work made on honey bee pollen loads of Marrigudam, Sirkonda and Koppela areas of Tah. Sironcha, Dist. Gadchiroli of Maharashtra. The region is potentially covered with medium sized trees and shrubs which constitute the woody component of the forest. They includes *Tectona grandis*, *Madhuca indica*, *Terminalia* sp., *Mangifera indica*, *Acacia nilotica*, *Pongamia pinnata*, *Syzygium cumini*, etc. are widely distributed along the agriculture tracks. The major cultivated crops and vegetables are *Oryza sativa*, *Helianthus annuus*, *Daucus carota*, *Lycopersicon* sp., *Brassica* sp. considerably grown in this regions. The area is also covered with several weeds and grasses.

METHOD AND MATERIAL:

In the present melittopalynological study, three samples of honey were collected during the summer season from different location of Tah. Sironcha. All honey samples were collected from the natural *Apis cerana indica* hives. Honey combs were squeezed to remove the honey and only the honey storage portion of comb was used. 50 to 100 gm of honey was collected from each hive and brought in the laboratory for the pollen analysis. The acetolysis method adopted by Erdtman (1960) was used for this study. After centrifugation, the supernatant liquid was decanted off. The pollen sediments was taken on a pallet of glycerin jelly and transferred to

the centre of the slides. After being warmed slightly the melted jelly with pollen sediment was covered by cover slip and sealed it with paraffin wax (Nair, 1960). These slides of pollen observed under the microscope. For the identification of pollen.

Following are the recommendations of International Commission for Bee Botany (ICBB, 1970), samples with 45% or more pollen of a single type are termed as 'unifloral'. The terminology used for describing pollen morphology is based on that of Erdtman et al. (1961) and modified by Nair (1970). For the presentation of frequencies of pollen grains in honey, the system adopted by Louveaux *et al.* (1978) was used.

Observations:

Tah.Sironcha of vegetation includes moderate size Trees, Shrubs and Herbs occur in forest with agricultural tracks. In melittopalynological studies, three honey samples collected during honey flow period May to June 2017. The colour of the honey sample is light amber. On the basis of frequency distribution of pollen type in honey, all three samples are multifloral. There are twenty three plant species of different families shows their appearance in the collected honey samples of *Apis cerana indica*. The illustrate plant species in Table – 1 regarded as a source of nectar and pollen to honey bee in the summer period of this regions.

RESULT AND DISCUSSION:

After the analysis of pollen load, the appearances of plant species that are Fabaceae: *Pongamia*, *Trifolium*, *Butea*, *Dalbergia*, *Tamarindus*; Asteraceae: *Tridax*, *Helianthus*; Apiaceae: *Daucus*, *Coriandrum*; Anacardiaceae: *Mangifera*; Meliaceae: *Azadirachta*; Mimoseae: *Acacia*; Myrtaceae: *Psidium*, *Syzygium*; Combretaceae: *Terminalia*; Malvaceae: *Abulmoscus*; Sapotaceae: *Madhuca*; Brassicaceae: *Brassica*; Rutaceae: *Citrus*; Poaceae: *Oryza*; Solanaceae: *Lycopersicon* representing the main major pollen source for *Apis cerana indica* in the region of Tah. Sironcha, Dist. Gadchiroli.

The region of investigation is mainly tropical where the flowering plants, trees, shrubs and herbs are profusely distributed along with agricultural fields. The region selected for investigation has good potential for sustaining beekeeping venture because of nectar and pollen. The honey obtained during summer period is of high quality and has high commercial potential.

CONCLUSION:

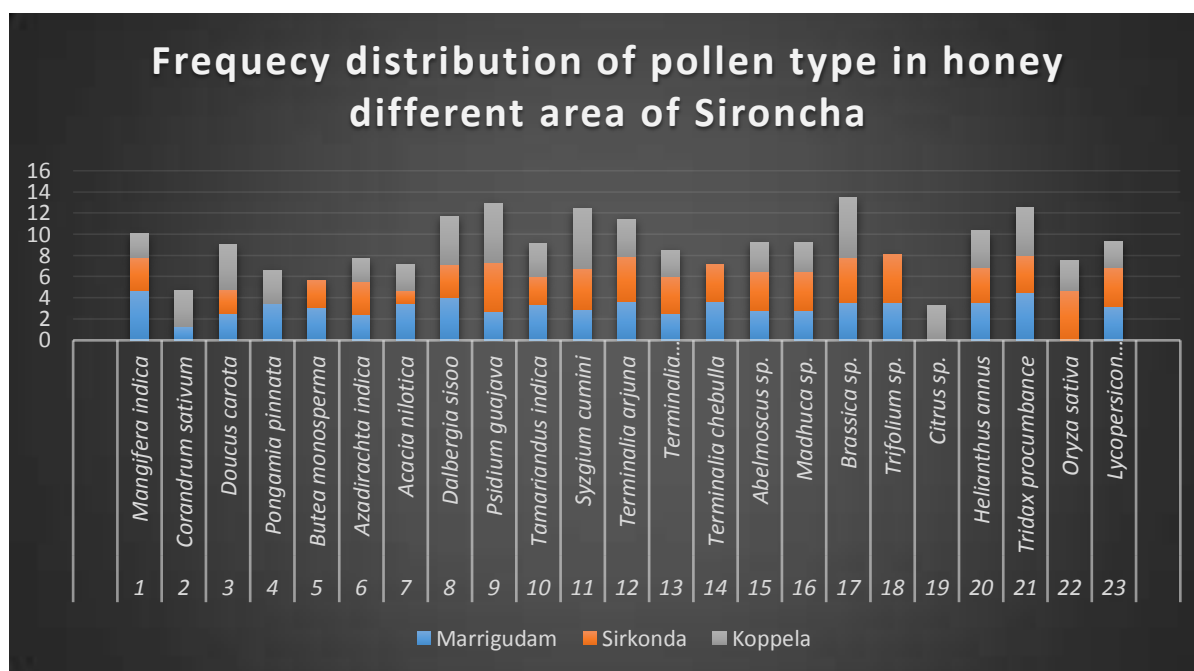
Although a relatively vigorous understanding of the major genera within Solanaceae exists, it is interested to note that if the sample population is more than phylogenetic inference was found to be poor. As indicated by present investigation after utilizing non-coding trnL-F data, it generate advocacy towards the utilization of this region to discriminate the species under same genus. Moreover, combined data set from coding and non-coding regions of species can also provide robust analysis for separation of closely related species as well as varieties.

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Table-1: Frequency distribution of pollen type in summer honey of *Apis cerana indica* Collected from different areas of Tah. Sironcha.

Sr.No.	Plant species	Marrigudam	Sirkonda	Koppela
1.	<i>Mangifera indica</i>	4.72	3.1	2.24
2.	<i>Corandrum sativum</i>	1.27	---	3.45
3.	<i>Doucus carota</i>	2.54	2.24	4.22
4.	<i>Pongamia pinnata</i>	3.46	---	3.1
5.	<i>Butea monosperma</i>	3.05	2.6	---
6.	<i>Azadirachta indica</i>	2.4	3.1	2.24
7.	<i>Acacia nilotica</i>	3.46	1.27	2.45
8.	<i>Dalbergia sissoo</i>	4.05	3.05	4.62
9.	<i>Psidium guajava</i>	2.69	4.6	5.6
10.	<i>Tamariandus indica</i>	3.38	2.67	3.1
11.	<i>Syzygium cumini</i>	2.89	3.84	5.67
12.	<i>Terminalia arjuna</i>	3.61	4.25	3.57
13.	<i>Terminalia tomentosa</i>	2.54	3.47	2.5
14.	<i>Terminalia chebulla</i>	3.67	3.5	---
15.	<i>Abelmoscus sp.</i>	2.82	3.64	2.80
16.	<i>Madhuca sp.</i>	2.82	3.64	2.80
17.	<i>Brassica sp.</i>	3.52	4.3	5.69
18.	<i>Trifolium sp.</i>	3.55	4.5	---
19.	<i>Citrus sp.</i>	----	---	3.23
20.	<i>Helianthus annus</i>	3.57	3.3	3.45
21.	<i>Tridax procumbens</i>	4.5	3.45	4.54
22.	<i>Oryza sativa</i>	---	4.67	2.82
23.	<i>Lycopersicon esculentus</i>	3.2	3.69	2.42

Graph: Shows frequency distribution of pollen type in summer honey of *Apis cerana indica* collected from different areas (Marrigudam, Sirkonda, Koppela) of Tah. Sironcha.