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Research Article

## Qualitative analysis of pollen grains through honey samples collected from the different villages of Rahuri tehsil

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### ABSTRACT

Honey is one the oldest food of mankind and there have been references to it. Today honey is regarded as an important food and nutrient throughout the world. Honey bees utilize certain natural raw materials that are identifiable in honey. These raw materials are pollen and nectar from flowers of various plants major source of protein for bees. Identification of pollen found in honey shows to give clear idea honey bees visit to particular plant to the nectar regarding and content into honey. This study carried out to determine different types of pollen observed in honey sample by pollen analysis method with the help of Compound Microscope. The samples were collected from different villages of Rahuri tehsil during months of October to January.

**Keywords-** Pollen grains, honey, pollen analysis, Rahuri tehsil

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### INTRODUCTION-

Identification of pollen found in honey shows to give clear idea honey bees visit to particular plant to the nectar regarding and content into honey. Honey is one the oldest food of mankind and there have been references to it. Today honey is regarded as an important food and nutrient throughout the world. Honey bees utilize certain natural raw materials that are identifiable in honey. These raw materials are pollen and nectar from flowers of various plants major source of protein for bees. Honey is one the oldest food of mankind and there have been references to it. Today honey is regarded as an important food and nutrient throughout the world. Honey bees utilize certain natural raw materials that are identifiable in honey. These raw materials are pollen and nectar from flowers of various plants major source of protein for bees. Metittopolynology is an applied branch of palynology dealing with the study of pollen grains in honey samples and its application in Apiculture. Metittopolynology is concerned with the identification of pollen in honey (Bhargava H.R.*et.al.*, 2009). The presence of honey plants that provide pollen and nectar is very important for the existence, colony strength, production and

productivity of the honey bee colony. Pollen analysis of their honey can help to determine changes in nectar and pollen sources and may help determine the causes of this decline (Gretchan D.J.2014)

It is essential to study relationship between regional flora and honey bee in order to obtain maximum production of a good quality. The diversity of the physical and chemical properties of honey like, color, flavor, moisture and content of protein and sugar etc. depends on the nectar and pollen of the original plants. It has been observed that the composition of the minor constituents of natural honey varies with location, nectar sources and different climatic condition some physiochemical properties of honey that can be easily determined have found to be helpful for comparison and can help to distinguish natural honey from artificial honey (Cherian K.J.*et.al.*2011). The knowledge of plants visited by bees is essential in guiding prospective beekeepers in the choice of suitable sides for locating apiaries. It is also essential in the identification of crops that may benefit from pollination by the honey bee (Usman H.D.*et.al.*, 2013). The pollen percentage frequency, together with the total pollen assemblage from produced honey are

useful indicators of the local and regional plant species visited by the honey bee as a nectar sources for a trained melissopalynologist it is possible to distinguish between honey from a particular town to another. It may also be able to say almost accurately, the time of the season a particular honey was produced (Adekanmbi.o *et al.*,2009)

## MATERIALS AND METHODS-

**Honey Sample Collection:** - The honey sample was collected from different locality of Rahuri tehsil. Total 04 honey samples were collected from different villages from Rahuri tehsil.

The honey samples were classified as,

Sample No.1	-	Ambi
Sample No.2	-	Aradgaon
Sample No.3	-	Chinchvihire
Sample No.4	-	Ganegaon

The collected honey was stored in plastic bottles and kept it 20°C to 25°C. The analysis of honey sample was done in accordance with known method (Louveaux *et al.*, 1987 and Suryanarayana *et al.*, 1981)

Chemicals - Distilled water, ethyl alcohol

Glassware - slide, coverslip, beaker, measuring cylinder

Instrument - Biowizard, Binocular Microscope; Remo centrifuge, Micropipette.

The qualitative analysis was made to know the specific nature of the pollen grain. The percentage representation of different pollen type was determined. The pollen type thus observed provided the information about foraging species.

For the purpose of qualitative analysis the method proposed by Bureau of Indian standards (BIS, 1994); (Mauriza, 1951); (Nair, 1964); (Suryanarayana *et al.*,1981); (Chaturvedi, 1989 and 1998); (Ramanujam and Kalpana, 1990) and (Andrada and Telleria, 2002) were followed. The extraction of pollen from honey was achieved by heating honey to 60°C in a water bath and stirring properly to ensure uniform mixing of the pollen. Pollen preparation was made by dissolving 1 gm of honey in 2ml of water followed by centrifuge at 5000 rpm for 10 minutes and again washing with distilled water and then centrifuge and decanted for complete removal of sugar. At last sediment was centrifuged in ethyl alcohol to get maximum number of pollen grains from honey. The sediment was divided into two parts. The half part was supernatant and basic part is residue, remove the supernatant and these sample sediment was dispersed in (0.5 ml) of ethyl alcohol.

The slides were prepared by simple staining method. The pollen grain samples dissolve in 1 drop of water and mounted on slide and observed through the Biowizard, Binocular Microscope under 45 x magnification.

## RESULTS -

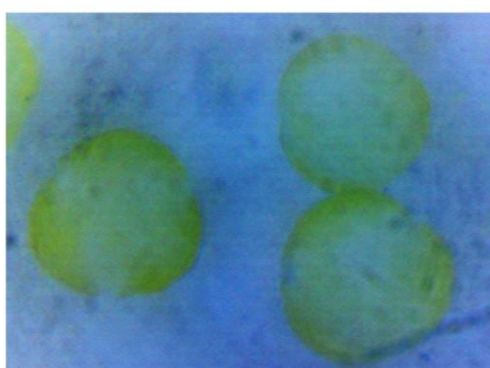
Pollen percentage for each pollen type was calculated and the honey was classified as either unifloral or multifloral. All 04 samples showed multifloral types of honey.

Pollen Types-

- Predominant Pollen (>45%)
- Secondary Pollen (16-45%)
- Important Minor Pollen (3-15%)

**In sample I** (Ambi) the following pollen grains were observed; they were listed below:

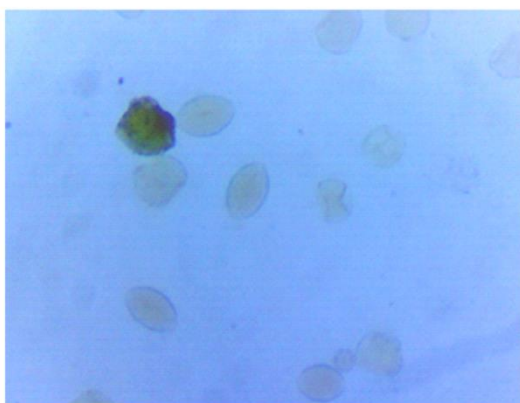
Sr. No.	Types of Pollen	Family	No of pollen of each species	Percentage of pollen	Pollen types
1	<i>Delonix regia</i>	Fabaceae	39	36.79%	B
3	<i>Pongamia pinnata</i>	Fabaceae	22	20.75%	B



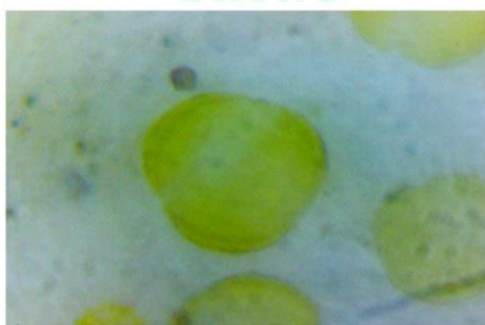
*Delonix regia*

**In sample II (Aradgaon)**

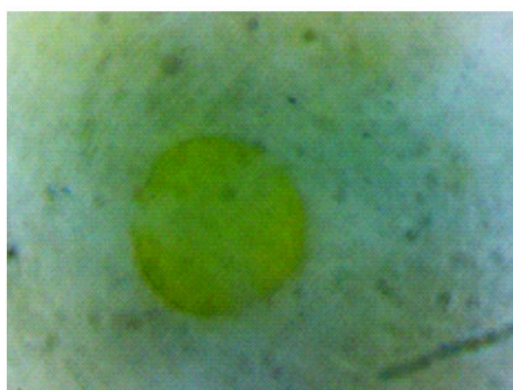
Sr. No.	Types of Pollen	Family	No of pollen of each species	Percentage of pollen	Pollen types
1	<i>Prosopis juliflora</i>	Fabaceae	18	21.95%	B
3	<i>Solanum melongena</i>	Solanaceae	27	32.92%	B

*Prosopis juliflora***In sample III (Chinchvihire)**

Sr. No.	Types of Pollen	Family	No of pollen of each species	Percentage of pollen	Pollen types
1	<i>Tecoma stans</i>	Bignoniaceae	20	23.52%	B
3	<i>Solanum melongena</i>	Solanaceae	27	31.76%	B

*Tecoma stans***In sample IV (Ganegaon)**

Sr. No.	Types of Pollen	Family	No of pollen of each species	Percentage of pollen	Pollen types
1	<i>Tecoma stans</i>	Bignoniaceae	15	20.83%	B
2	<i>Brassica spp.</i>	Brassicaceae	40	55.55%	A
3	<i>Pongamia pinnata</i>	Fabaceae	17	20.73%	B

*Tecoma stans**Brassica spp.*

**DISCUSSION-**

In present investigation 10 different samples investigated 04 pollen types belonging to 04 different families. Belonging to Fabaceae, Solanaceae, Bignoniaceae, Brassicaceae is present.

**CONCLUSIONS-**

During the present investigations analysis of honey and honey pollen has been taken place. The honey samples were collected from different villages of Rahuri tehsil. Present findings indicated that that the pollen analysis of honey would be provides information about the quality of pollen taxa present in the study region. This pollen analytical study provides information of resources of bee. The pollen grains from honey can be used for the taxonomic identification of honey yielding plants. Analysis of honey sample for pollen spectrum besides enabling to inform the botanical source of honey and also know its geographical source. From the pollen analysis of different honey samples it is observed that this region have wide diversity in bee flora.

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