



Pollens of *Apis Dorsata* Honey from Nagpur Region

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Abstract:

Honey is a sweet and viscous fluid produced by honeybees from the nectar of flowers. It is defined as a pure and natural product that does not include any other substances, such as water or sweetener. In the present study total 15 species of *Apis florea* honey were collected from Nagpur region to study the source of pollen in the honey. Eighteen families were identified from fifteen honey samples. Most prominent pollen sources were the member of Asteraceae, Amaranthaceae and Leguminosae. While the secondary pollen sources were the members of Myrtaceae, Euphorbiaceae, Malvaceae and the minor sources were the members of Poaceae and Fungal spores. On the basis of the percentage of occurrence of pollen in the honey samples, the samples may be identified as a unifloral, bifloral and multifloral honey.

Keywords: *Apis florea*, prominent pollen, Honey.

Introduction:

Honey was the first bee product used by human being in ancient times. The world honey consumption has been increasing due to its medicinal, nutritional values. The world wide honey consumption has already reached 1.2 million tons (Bogdanov *et.al* 2008). Among bee products, honey and pollen are the most popular. Bees collect the nectar gathered from flower into honey. They also gathered pollen for protein and energy source. As bees transfer from one flower to another, pollen grains from the anther are deposited into the stigma and pollination is affected.

The pollen grains present in the honey reflects the nectar sources of a specific honey samples, the plant preferred by the honey bees and the pollen spectrum of the area from where the honey comes from (Tiwari *et al.* 2012; Bhargov *et al.* 2009; Tilde and Payawal 1992) pollen spectra present in the honey therefore determined through mellissopalynology or pollen analysis. Identifying pollen source of honey may also aid in the determination of the physico-chemical properties. In the present study pollen of the *Apis florea* honey from region was identified to determine the forage sources.

Materials and Methods:

Eighteen honey samples of *Apis florea* honey were collected from Nagpur regions. Samples were kept in dark in air tight containers. These samples were subjected to pollen analysis following the procedure for acetolysis proposed by the International commission for Bee Botany (Lauveaux *et al.* 1978). Slides were prepared from acetolysed samples and were subjected to microscopical analysis for identification. Identification of the pollen types from the honey samples was facilitated by comparing them with the reference pollen slides, technical monograph, and identification plates. Phomicrographs of each pollen types were taken. The relative importance of the pollen type was determined by counting atleast 250 pollen grains and calculating the relative frequency of the pollen types





in each sample. Four frequency classes were used as described by Lauveaux *et al.*, (1978).

The frequency of occurrence of pollen type was determined from the appearance of the pollen types in each sample. The following terms used by the Louveaux *et al.* (1978) were adapted to classify the frequency occurrence.

- Very frequent- Grains present in > 50% of the total samples.
- Frequent- Grains present in 20-50% of the total samples.
- Infrequent- Grains presents in 10-29% of the total samples.
- Rare grains present in < 10% of the total samples.

Result and Discussion:

The result of present work were depicted in the Table-I and II. Fifteen honey samples were used for pollen analysis. This fifteen honey samples had total thirty seven pollen types. Nineteen families were identified from fifteen honey samples (Table-I). Most prominent pollen sources were the member of Asteraceae, Amaranthaceae and Leguminosae (Bhargava *et al.* 2009). Secondary pollen sources were the members of Myrtaceae, Euphorbeaceae, Malvaceae and the minor sources were the members of Poaceae. Rare grains present in the honey samples were the Fungal spore of Alternaria (Shubharani *et al.* 2012; Tiwari *et al.* 2012) (Table-II). Depending on the majority of taxa in honey samples, the samples may be unifloral, bifloral and multifloral (Table-I,Chart: I).

Table. 1- Uni, Bi and multi floral honey.

S.No	Sample No.	Unifloral Honey	Bifloral Honey	Multifloral Honey
1	LH-01	Asteraceae	-	-
2	LH-02	-	-	+
3	LH-03	-	-	+
4	LH-04	Amaranthaceae	-	-
5	LH-05	-	Gentianaceae+Mimosaceae	-
6	LH-06	-	Asteraceae+Myrtaceae	-
7	LH-07	-	Leguminaceae+Asteraceae	-
8	LH-08	-	-	+
9	LH-09	Leguminosae	-	-
10	LH-10	-	-	+
11	LH-11	Leguminosae	-	-
12	LH-12	-	-	+
13	LH-13	Poaceae	-	-
14	LH-14	Leguminosae	-	-
15	LH-15	-	-	+





Table. 2- Pollen types identified of *Apis florea* honey

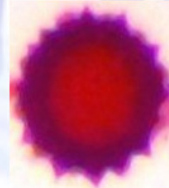
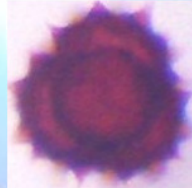
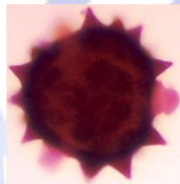
S.No.	Pollen types	Code no.	PS	SC	MS
1	Asteraceae				
	<i>Caesulia axillaris</i> (Roxb.)	1		+	
	<i>Blumea lacera</i> (Burm.f.) DC.	2	+		
	<i>B. oxidonta</i> (DC.)	3	+		
	<i>Launaea procumbens</i> (Roxb.)	4		+	
	<i>Sonchus arvensis</i> (L.)	5		+	
	<i>Syndrella vialis</i> (Less.)	6		+	
	<i>Acanthospermum hispidum</i> (DC.Prodr.)	7		+	
	<i>Ageratum conyzoides</i> (L.)	8		+	
	<i>Chrysanthemum indicum</i> (L.Sp.Pl.)	9		+	
2	Amaranthaceae				
	<i>Alternanthera paronycoides</i> (St.Hil.)	10			
	<i>Amaranthus lividus</i> (L.)		+		
3	Myrtaceae				
	<i>Syzygium caryophyllatum</i> (L.)	11		+	
4	Combretaceae				
	<i>Calycopteris floribunda</i> (Roxb.)	12		+	
	<i>Terminalia bellerica</i> (Roxb.)	13		+	
	<i>Terminalia arjuna</i> (Roxb ex DC)	14		+	
5	Leguminosae				
	<i>Butea monosperma</i> (Lam.)	15		+	
	<i>Cassia fistula</i> (L.)	16		+	
	<i>Prosopis julifera</i> (Swortz) DC. Prodr.	17	+		
	<i>Acacia nilotica</i> (L.)	18			+
6	Liliaceae				
	<i>Allium cepa</i> (L.)	19			+
7	Gentianaceae				
	<i>Conscora decurrens</i> (Dalzell.)	20		+	
	<i>Exacum tetragonum</i> (Roxb.)	21		+	
8	Euphorbiaceae				
	<i>Euphorbia spurge</i> (L.)	22		+	
	<i>Euphorbia pulcherima</i> (Willd.ex.Klotzsch)	23		+	
	<i>Phyllanthus lawii</i> (Grah.)	24		+	
9	Anacardaceae				
	<i>Holigama ferruginea</i> (Roxb.)	25			+
10	Umbeliferae				
	<i>Coriander sativum</i> (L.Sp.Pl.)	26			+
11	Cyperaceae				+
12	Acanthaceae				
	<i>Justicia diffusa</i> (Willd.)	27			+
13	Lamiaceae				



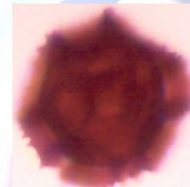
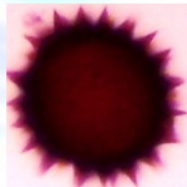
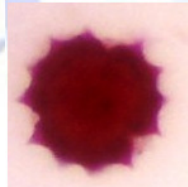


	<i>Orthosiphon rubicundus</i> (Ddon.)	28			+
	<i>Hyptis suavealens</i> (L.) Poit.	29			+
14	Poaceae				
	<i>Sorghum roxburghii</i> (L.)	30			+
15	Malvaceae				
	<i>Hibiscus rosa sinensis</i> (L.)	31		+	
16	Rutaceae				
	<i>Limonia acidissima</i> (Auct. non L.)	32			+
17	Rubiaceae				
	<i>Hamiltonia suaveolens</i> (Roxb.)	33			+
18	Rhamnaceae				
	<i>Ventilago denticulate</i> (Willd.)	34			+
19	Dematiaceae				
	<i>Alternaria alternate</i> (Fr.)Keissl.	35			+

Photoplate-I

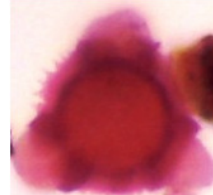
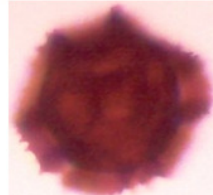
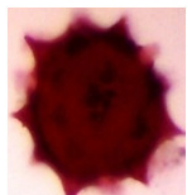


Acanthospermum hispidum (DC.Prodr.) *Ageratum conyzoides* (L.) *Blumia lacera* (Burm.f.) DC.



Blumia oxidonta (DC.)

Chrysanthemum indicum (L.Sp.Pl.) *Sonchus arvensis* (L.)

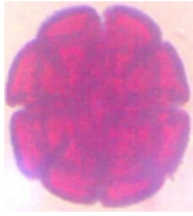


Caesulia axillaris (Roxb.)

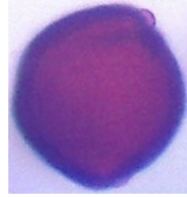
Syndrella vialis (Less.)

Launea procumbens (Roxb.)





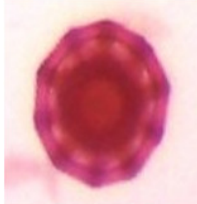
Acacia nilotica (L.)



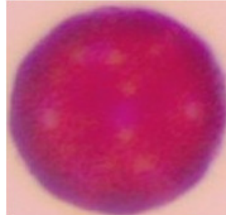
Butea monosperm (Lam.)



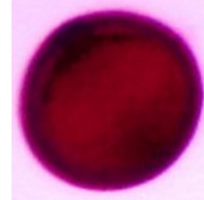
Prosopis julifera (Swortz) DC. Prodr.



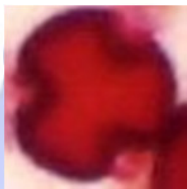
Alternanthera (St.Hil.)



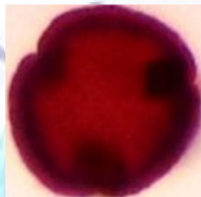
Amaranthus lividus (L.)



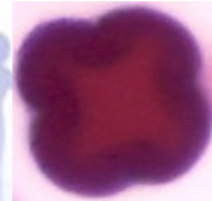
Cassia fistula (L.)



Euphorbia spurge (L.)



Euphorbia pulcherima (Willd.ex.Klotzsch)



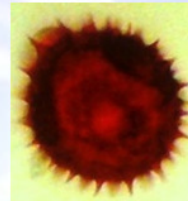
Phyllanthus lawii Grah.)



Allium cepa (L.)

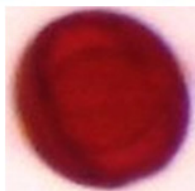


Coriander sativum (L.Sp.Pl.)

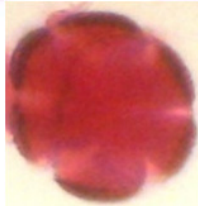


Hibiscus rosa sinensis (L.)

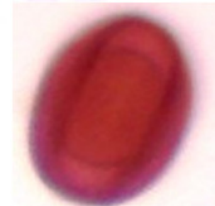
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Orthosiphon rubicundus (Ddon.)



Hyptis suaveolens (L.) Poit.

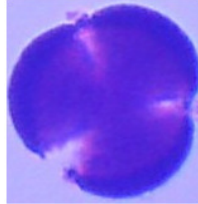


Terminalia bellerica (Roxb.)

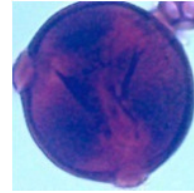




Limania acidissima (Auct. non L.)



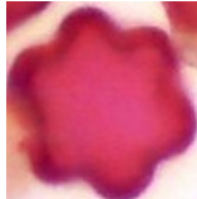
Hamiltonia suaveolens(Roxb.)



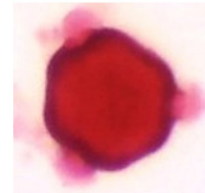
Ventilago denticulata (Willd.)



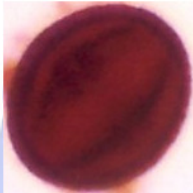
Alternaria(Fr.)Keissl.



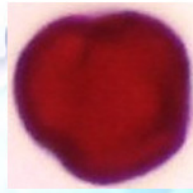
Terminalia arjuna (Roxb) ex DC



Calycopteris floribunda(Roxb)



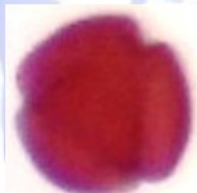
Conscora deccurrens (Dalzell.)



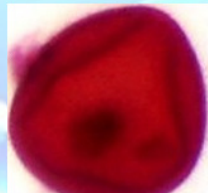
Exacum tetragonium(Roxb



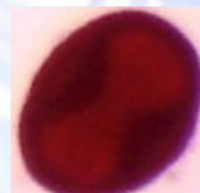
Holigama ferruginea (Roxb.)



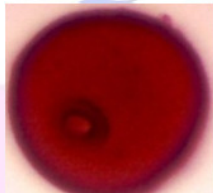
Syzygium caryophyllatum (L.)



Cyperaceae



Justicia diffusa(Willd.)

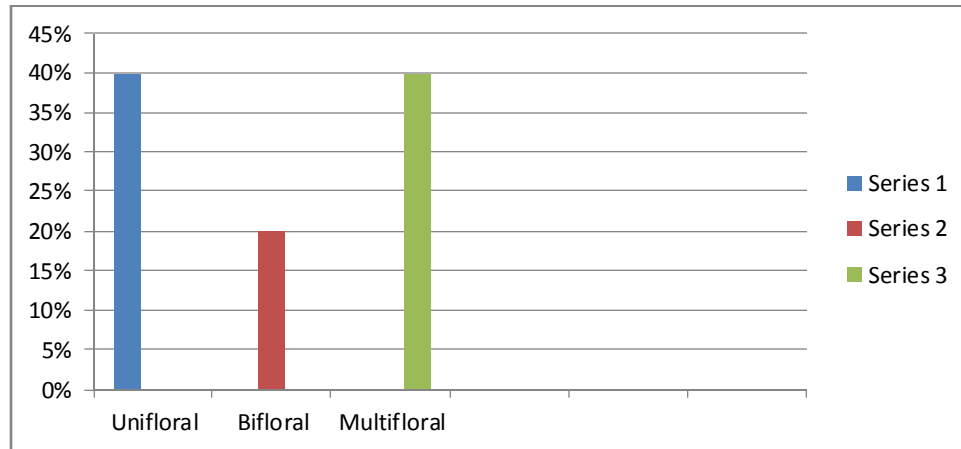


Sorghum roxburghii(L.)





Chart:I



Conclusion:

In the present work 40% of honey samples are unifloral and multifloral whereas 20% honey samples are bifloral. Asteraceae, Amaranthaceae and Leguminosae are the dominant families.

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