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DIVERSITY OF NECTIFEROUS AND POLLENIFEROUS BEE FLORA FOR *APIS MILLIFERA* IN THE PARIKSHITGARH AREA OF MEERUT DISTRICT, UTTAR PRADESH, INDIA

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Abstract

The current study aimed to examine the variety of plants that produce nectar and pollen, which attract bees, in the Parikshitgarh block of Meerut district. The flowering plants were surveyed to determine the presence and foraging behaviour of honeybees. Plants were classified as bee foraging species if they were visited by at least three honeybees within a 10-minute interval. The bee flora consists of several plant types that are visited by worker bees, including vegetable crops, fruit crops, plantations, fragrant plants, attractive plants, and medicinal plants. The flora that was identified was categorised into plants that produce pollen, plants that produce nectar, and plants that produce both pollen and nectar. The analysis revealed that honey flow times occurred from mid-December to February and mid-July to September, while significant dearth periods were found from mid-April to mid-June.

Keywords : Bee flora, beekeeping, *Apis millifera*, nectariferous and polleniferous, foraging activities.

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Introduction

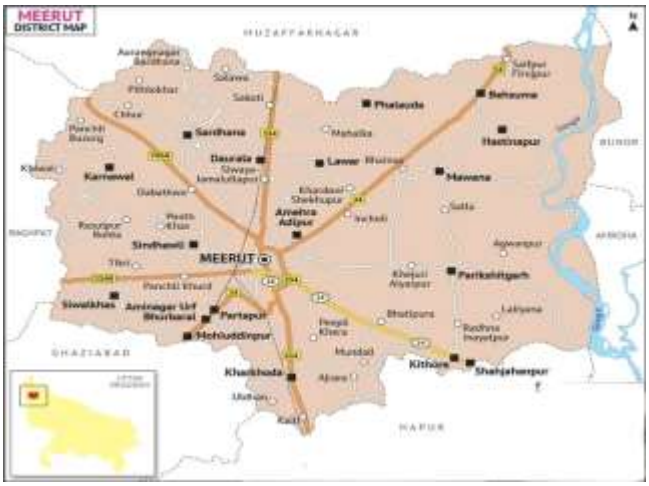
India is a prominent country in terms of mega biodiversity, with over 750 species of bee flora. The honey bee is a eusocial insect known for its exceptional colony organisation. They have undergone coevolution with angiosperm plants as part of the evolutionary process, resulting in reciprocal benefits. Bees rely only on blooming plants to meet their dietary needs and, in return, facilitate the pollination of the plants. Plants that are pollinated correctly yield high-quality seeds for further propagation in nature. The bee seeks for plants in order to obtain its sustenance, which consists of honey and pollen. The reason for the bees' consistent attraction to flowers is their inclination towards nectars that contain high levels of sugar and pollens that offer more nutritional value. In addition to obtaining food for the bees, their visits also result in the pollination of many crops. Honey bees mostly consume carbohydrates obtained from nectar as their main source of nutrition. Nectar is a sweet liquid produced by specialised glands called nectaries within flowers. Nectar mostly comprises carbohydrates, which serve as a source of energy for bees. The nectar also contains amino acids, terpenes, alkaloids, flavonoids, vitamins, and oils. Several dicotyledonous plants employ this nectar to allure pollination insects. In addition, the bees extract protein and other essential elements from the pollen of the flowers. Pollen is a protein-rich substance that is generated in the anther, which is the male reproductive organ of a flower. Pollen is needed for honey bees to grow their brood. the hive bees, namely *Apis mellifera*.

The blooming plants encompass a variety of plant species, such as fruit-bearing plants, vegetable plants, oilseed plants, decorative plants, herbaceous plants, shrubs, bushes, as well as plants found in forests or along avenues. Areas abundant in nectar and pollen-producing plants over extended periods are optimal for beekeeping. Bees and bee colonies may maintain their health by consistently consuming nectar and pollen. Honeybees engage in mutualistic pollination with a diverse range of flowers, including cultivated and wild species as well as ornamental crops (Divekar *et al*., 2021; Divekar *et al*., 2022a). Bees and flowers have coevolved over millions of years. The interaction between the bee and the stationary plant is mutually beneficial, as the bee receives nourishment in the form of nectar or pollen, while the plant is able to spread its pollen (sperm cells) to other plants of the same species. The objective of this study was to identify the range of plants that produce nectar and pollen for bees in the Parikshitgarh block of Meerut district from April 2022 to March 2024, with the aim of building an apiary.

Materials and Methods

Study area- The chosen research location is Parikshitgarh, a historic site situated in the Meerut region of Uttar Pradesh, India. Parikshitgarh derives its name from King Parikshit, a prominent character in the epic Mahabharata. Parikshitgarh is located in the northern plains of India; known for their level and lush landscape that forms a portion of the extensive Indo-Gangetic plain. The latitude of Parikshitgarh is roughly 29.1713° N, while the longitude is around 77.9275° E.

Parikshitgarh is situated in close proximity to the Hastinapur Wildlife Sanctuary in Uttar Pradesh, India. The flora and fauna of Parikshitgarh exhibit the usual characteristics of the northern plains of India, which include agricultural fields, indigenous trees, common animals, birds, reptiles, and a diverse range of insects. The territory is enriched by the biological abundance of neighbouring places like as Hastinapur Wildlife Sanctuary, which enhances its biodiversity and natural legacy. Parikshitgarh has a typical climate of northern India, which is characterised by different seasons including summer, monsoon, and winter. The region is primarily characterised by rural landscapes, consisting mostly of cultivated fields dedicated to agriculture. These fields primarily grow crops such as wheat, rice, sugarcane, and other agricultural products, as well as forests. Beekeeping may be pursued as an environmentally benign and profitable vocation, suitable for both full-time and part-time engagement.



Meerut district of Uttar Pradesh

Parikshitgarh

Assessment of bee flora: Flowering plants were observed directly on a weekly basis from April to March in both **2022** and **2024.** Observations were made throughout the winter and fall seasons from **9:30** to **17:00**, whereas observations during the summer were collected from **8:00** to **18:00.** The identification of honeybee foraging plants was conducted by observing honeybee workers (Apis spp.) visiting their flowers for a duration of **10** minutes (Silveira, **2004).** The assessment of nectar and pollen sources was conducted by observing the behaviour of honeybees on various flowers. Honeybees that extended their proboscis into the flowers were identified as nectar sources, while bees carrying pollen on their hind legs were identified as pollen source plants (Mbah and Amao, **2004**; Bista and Shivakoti, **2000-2001).**

Observation on nectariferous (N) and polleniferous (P) bee flora: The honey bee acts as a forager, visiting various plant species' flowers to collect nectar, pollen, or both. The classification of plants as nectariferous or polleniferous is determined on the specific activities carried out by honeybees on distinct blooms. If a honey bee lands on a flower and remains still while inserting its proboscis into the flower or collecting nectar from the outside nectaries, the flower is classified as nectariferous. On the other hand, if bees are highly active inside the flower, carrying pollen on their body or in their pollen basket (hind leg) from the flower, the flower is classified as polleniferous. Flowers that attract honey bees and support both nectar collection and pollen transfer are classified as nectariferous and polleniferous flora. Visitation intensity was visually recorded during the same time period. The plant was identified in the field with the assistance of local individuals and by collecting plant parts for scientific identification in a laboratory setting, using published documents as references.

Identification of bee flora: The recorded observation showed a total of **140** plant species, namely in the form of bee flora, which are both widespread and extensively dispersed in the research region. A total of **140** plant species were recorded as bee flora in the investigated region. Among these, **39** were identified as medical plants, including **19** vegetables and **14** fruit plant species. Additionally, **19** plant species were classified as attractive plants. Furthermore, **13** plant species were categorised as agricultural crops, including grain, pulses, fibre, and oil seed (Table: **1- 7).**

Results and Discussion

The availability of bee plants is consistent throughout the year, with the major periods being December-March and July-August. The minor flow period of pollen occurs in April-May, while June is a period of scarcity. Nectar from medicinal plants remains accessible for a minimum of two months. Several plant species, including Murraya koenigii (L.), Justicia adhatoda L, and Bauhinia variegata (L.), are accessible for a three-month period. Ricinus communis L and Eucalyptus obliqua (L.), on the other hand, are available for four and five months, respectively. Thorough observations were conducted on thirty species of trees and thirty-eight types of medicinal plants. Fifty-four groups of flora were examined, and some families such as Fabaceae, Leguminaceae, Cucerbitaceae, Solanaceae, and Malvaceae were identified as possible nectariferous medicinal bee foraging plants. Pollination is crucial for preserving the ecological equilibrium of ecosystems and serves as the foundation for crop cultivation, establishing a connection between agriculture and the life cycle. Therefore, pollination plays a significant role in the economic sector by enhancing both the quality and quantity of products. Honey bees play a crucial role in the agriculture ecology by pollinating a diverse range of crops. This study identifies **140** plant species from **54** different families that serve as a bee flora in the region. Out of these, the majority (**38)** are tiny medicinal plants, followed by **30** trees, **19** vegetables, **19** decorative plants, **14** fruit plant species, and **13** grain, pulses, fibre, and oilseed plants. Additionally, there are **7** species of climbing plants. Based on recorded observations, several fruits, vegetables, cereals, pulses, oilseed crops, fibre crops, decorative plants, and wild plant species were shown to be sources of nectar and pollen in both natural and crop ecosystems.

Conclusion

The production of many agricultural goods, such as medicinal and aromatic plants, relies on pollination by insects. Pollination by honey bees, indigenous bees, and flies is an annual event that has a major impact on economies across the world. A wide variety of fruits, vegetables, cereals, pulses, oilseed crops, fibre crops, decorative plants, and wild plant species supplied pollen and nectar to both the natural and agricultural ecosystems, according to the data collected. It follows that the Parikshitgarh region is a good place to start scientific beekeeping if you want to help farmers out. For future research in apiculture, the current results could provide light on how to best compile a database of the world's bee flora. The current research reveals a plethora of honey bee foraging medicinal plants. This information on bee flora is useful for colony management. Paying close attention to the maintenance and multiplication of existing flora is crucial to the conservation of these floras.

Table **1:** Nectariferous / polleniferous bee flora of vegetable crops in Parikshit Garh

S. No	Common name	*Botanical name*	Family	Flowering period	Nectar	Pollen	Nectar + Pollen
1.	Brinjal	***Solanum melongena***	Solanaceae	Jan to Jul	-	**P**	-
2.	Tomato	***Lycopercicon esculentum***	Solanaceae	Jul-Sep	-	**P**	-
3.	Chilli	***Capsicum sp.***	Solanaceae	Jul-Feb	-	**P**	-
4.	Bhindi	***Abelmoschus esculentus***	Malvaceae	Aug – Nov	-	-	**P+N**
5.	Beans	***Phaseolus vulgaris***	Fabaceae	Dec-Feb	**N**	-	-
6.	Bottlegourd	***Lagenaria siceraria***	Cucurbitaceae	Oct – Feb.	-	-	**P+N**
7.	Cucumber	***Cucumis sativus***	Cucurbitaceae	Aug – Oct.	-	**P**	-
8.	Muskmelon	***Cucumis melo***	Cucurbitaceae	March – May.	-	**P**	-
9.	Pumpkin	***Cucurbita pepo***	Cucurbitaceae	Aug – Oct.	-	-	**P+N**
10.	Watermelon	***Citrullus lanatus***	Cucurbitaceae	July – Aug.	-	**P**	-

11.	Onion	***Allium cepa***	Liliaceae	Jun– Aug.	-	P	-
12.	Drumstick	***Moringa oleifera***	Moringaceae	Nov – Feb.	-	-	**P+N**
13.	Ridgegourd	***Luffa acutangula***	Cucurbitaceae,	July –Oct.	-	-	**P+N**
15.	Clusterbean	***Cyamopsis tetragonolobus***	Leguminosae	Jun - Aug.	N	-	-
16.	Rajgiri/Amaranthus	***Amaranthus gracilus***	Amaranthaceae	Feb-Mar	-	P	-
17.	Bitter gourd	***Momordica charantia***	Cucurbitaceae	Aug-Oct	N	-	-
18.	Snake gourd	***Trichosanthes anguina***	Cucurbitaceae	Jan-Mar	-	-	**P+N**
19.	Little gourd	***Coccinia grandis***	Cucurbitaceae	Aug-Oct	-	-	**P+N**

Table **2:** Nectariferous / polleniferous bee flora of Pulses ans Cereal crops in Parikshit Garh

S. No	**Common name**	***Botanical name***	**Family**	**Flowering period**	**Nectar**	**Pollen**	**Nectar + Pollen**
1.	Turkish gram balls	***Vigna aconitifolia***	Fabaceae	March - May.	**N**	-	-
2	Black eyed pea	***Vigna unguiculata***	Fabaceae	Jul – Aug.	**N**	-	-
3	Black gram	***Vigna mungo***	Fabaceae	Aug – Sep.	**N**	-	-
4	Chickpea	***Cicer arietinum***	Fabaceae	Dec – March.	**N**	-	-
6	Mung bean	***Vigna radiata***	Fabaceae	Aug – Sep.	**N**	-	-
7	Pea	***Pisum sativum***	Fabaceae	Aug- Sep.	-	-	**N+P**
8	Pigeon pea	***Cajanus cajan***	Fabaceae	July – Sep.	**N**	-	-
9	Wheat	***Triticum aestivum***	Poaceae	Jan – Apr	**N**		-
10	Maize	*Zea mays*	Poaceae	Aug - Sep, Feb - Mar	-	P	-
11	Rice	*Oryza sativa*	Poaceae	Sept- Oct	-	P	-
12	Jowar	*Sorghum vulgare*	Poaceae	Feb-Mar	-	P	-
13	Barely	*Hordeum vulgare*	Poaceae	Feb-Mar	**N**	-	-

Table 3: Nectariferous / polleniferous bee flora of fruit crops in Parikshit Garh.

S. No	**Common name**	*Botanical name*	**Family**	**Flowering period**	**Nectar**	**Pollen**	**Nectar + Pollen**
1.	Citrus	*Citrus limon*	Rutaceae	Oct – Jan, July – Sep.	-	-	**P+N**
2.	Mango	*Mangifera india*	Anacardiaceae	Dec- Jan	N	-	-
3.	Ber	*Ziziphus jujuba*	Rhamnaceae	July – Oct.	-	-	**P+N**
4.	Custard apple	*Annona squamosa*	Annonaceae	Aug – Oct.	-	-	**P+N**
5.	Pomegranate	*Punica granatum*	Punicaceae	March – June	-	-	**P+N**
6.	Sweet lime	*Citrus aurantifolia*	Rutaceae	Nov – March	-	-	**P+N**
7.	Caronda (Kavale)	*Carissa carandas*	Apocynaceae	Mar-Apr	-	-	**P+N**
8.	Water melon	*Citrullus lanatus*	Cucurbitaceae	Sep-Oct	-	P	-
9.	Mandrin	*Citrus reticulata*	Rutaceae	Mar-Apr	-	-	**P+N**
10	Banana	*Musa sp.*	Musaceae	Jan-Dec	-	-	**P+N**

11.	Gauva	*Psidium guajava*	Myrtaceae	Mar-Jun	-	-	**P+N**
12	Sapota	*Manilkara achras*	Sapotaceae	Mar-Jun	-	-	**P+N**
13	Amla	*Phyllanthus emblica*	Phyllanthaceae	April-may	-	-	**P+N**
14	Jamun	*Syzygium cumini*	Myrtaceae	Apr-May	-	-	**P+N**

Table **4:** Nectariferous / polleniferous bee flora of Aromatic and Ornamental Plants in Parikshit Garh Block.

S. No	Common name	*Botanical name*	Family	Flowering period	Nectar	Pollen	Nectar + Pollen
1.	Kufiya	*Cuphea hyssopifolia*	Lithraceae	July-Aug	-	P	-
2.	Jasmine	*Jasminum sp.*	Oleaceae	July-Aug	N		-
3.	Rose	*Rossa spp*	Rosaceae	April-june			**N+P**
4.	Gladiolus	*Gladiolus communis*	Iridaceae	Nov-Dec	N	-	-
5.	Marigold	*Tagitus sp*	Asteraceae	Oct-Nov	-	-	**N+P**
6.	Chrysanthimum	*Chrysantimum sinararifolium*	Asteraceae	August-Oct	-	-	**N+P**
7.	Tuberose	*Polianthes tuberosa*	Asparagaceae	Sept- Oct	-	-	**N+P**
8.	Gaillardia	*Gaillardia aristata*	Asteraceae	Sept- Oct	-	-	**N+P**
9.	Jungle flame	*Ixora Coccinea*	Rubiaceae	Feb-Mar			**P+N**
10	Chamomile	*Matricaria recutita*	Asteraceae	All time			
11	Hibiscus	*Hibiscus rosa-sinensis*	Malvaceae	All time	-	-	**P+N**
12	Cosmos	*Cosmos bipinnatus*	Asteraceae	Mid summer	N		-
13	Vinca rosea	*Catharanthus roseus*	Apocynaceae	July- sep			**N+P**
14	Chadni	*Tabern divaricata*	Apocynaceae	June-august	N	-	-
15	Salvia	*Salvia officinalis*	Lamiaceae	summer	-	-	**N+P**
16	Pansy	*Viola tricolor*	Violaceae	Feb-april	-	-	**N+P**
17	Coleus	*Coleus blumei*	Lamiaceae	Late summer	-	-	**N+P**
18	Dog flower	*Antirrhinum majus*	Plantaginaceae	April	-	-	**N+P**
19	Zinnia	*Zinnia elegans*	Asteraceae	March-april			**P+N**

Table**5:** Nectariferous / polleniferous bee flora for small medicinal plants in Parikshit Garh.

S. No	Common name	*Botanical name*	Family	Flowering period	Nectar	Pollen	Nectar + Pollen
1	Wild mint	*Ageratum conyzoides*	Asteraceae	Dec-May	-	**P**	-
2	Atibala	*Abutilon indicum*	Malvaceae	Sep- april	-	**P**	-
3	Apmarga	*Achyranthes aspera*	Amaranthaceae	All time	-	-	**P+N**
4	Akarkara	*Acmella paniculata*	Asteraceae	Sep-jan	**N**	-	-
5	Vasha	*Adhatoda vasica*	Acanthaceae	Feb-april	-	-	**P+N**
6	vajardanti	*Barleria prionitis*	Acanthaceae	Nov-july	-	**P**	-
7	Purnava	*Boerhavia diffusa*	Nyctaginaceae	Jan-april	-	**P**	-
8	Patarchata	*Bryophyllum pinnatum*	Crassulaceae	July-sep	-	-	**P+N**
9	Madar	*Calotropis gigantea*	Apocynaceae	summer	-	**P**	-

10	Madar	*Calotropis procera*	Apocynaceae	summer	-	P	-
11	Casmard	*Cassia occidentalis*	Caesalpiniaceae	All time	-	-	**P+N**
12	Chakarmard	*Cassia tora*	Caesalpiniaceae	July-sep	-	-	**P+N**
13	Lal murga	*Celosia cristata*	Amaranthaceae	Spring and summer	N	-	-
14	Ratrani	*Cestrum nocturnum*	Solanaceae	July-nov	-	P	-
15	Ban tulsi	*Croton bonplandianum*	Euphorbiaceae	Sep-dec	N	-	-
16	Sal parni	*Desmodium gangeticum*	Fabaceae	Nov-dec	-	-	**P+N**
17	False amaranthus	*Digeria muricata*	Amaranthaceae	Aug-feb	-	-	**P+N**
18	Dronpusphi	*Leucas cephalotes*	Lamiaceae	July-oct			
19	Karipattha	*Murraya koenigii*	Rutaceae	March-may, july-august	-	**P**	-
20	Harsringar	*Nyctanthes arbor tristis*	Oleaceae	Aug-dec	-	**P**	-
21	Van tulsi	*Ocimum basilicum*	Lamiaceae	summer	-	**P**	-
22	Tulsi	*Ocimum sanctum*	Lamiaceae		-	-	**P+N**
23	Marhua	*Origanum majorana*	Lamiaceae	Jul-sep	**N**	-	-
24	Trikhand	*Oxalis corriculata*	Oxalidaceae	March-oct	-	-	**P+N**
25	Changari ghass	*Oxalis latifolia*	Oxalidaceae	Aug-apr	-	**P**	-
26	Chitrak	*Plumbago zeylanica*	Plumbaginaceae	Sep-nov	-	**P**	-
27	Champa	*Plumeria chinensis*	Apocynaceae.	summer	-	-	**P+N**
28	Arandi	*Ricinus communis*	Euphorbiaceae	All time	-	**P**	-
29	Bala	*Sida acuta*	Malvaceae	Sep-may	-	P	-
30	Bala(Khareti)	*Sida cordifolia*	Malvaceae	All time	-	-	**P+N**
31	Janglibhat	*Solanum indicum*	Solanaceae	Dec-march	-	-	**P+N**
32	Makoiya	*Solanum nigrum*	Solanaceae	Dec-march	N	-	-
33	Methi	*Trigonella foenum*	Fabaceae	Oct-nov	-	P	-
34	Ashavgangha	*Withania sominifera*	Solanaceae	Oct-june	N	-	-
35	Tridax daisy	*Tridax procumbens*	Compositae	Jan-Dec.	-	-	**N+P**
36	Datura	*Datura sp.*	Solanaceae	Apr-Dec	-	-	**P+N**
37	Touch me not	*Mimosa pudica*	Mimosaceae	Jan-Dec	-		**P+N**
38.	Champa	*Michalea champaca*	Magnoleaceae	Mar-May	-	-	**P+N**

Table**6:** Nectariferous / polleniferous bee flora of Trees for bee in Parikshit Garh.

S. No	**Common name**	***Botanical name***	**Family**	**Flowering period**	**Nectar**	**Pollen**	**Nectar + Pollen**

1	Khair	*Acacia catechu*	Leguminosae	July-august	-	-	**N+P**
2	Siris	*Albizia lebbeck*	Leguminosae	Sep-Oct	-	-	**N+P**
3	Saptaparni	*Alstonia scholaris*	Apocynaceae	March- july	-	-	**P+N**
4	Kadamb	*Anthocephalus cadamba*	Meliaceae	monsoon	-	-	**P+N**
5	Neem	*Azadirachta indica*	Meliaceae	Mar- mar, aug-sep	-	-	**P+N**
6	Kachnar	*Bauhinia variegata*	Leguminosae	Sep-nov	-	P	
7	Red Silk Cotton Tree	*Bombax ceiba*	Malvaceae	March-april	-	-	**P+N**
8	Dhak, Palash	*Butea frondosa*	Leguminosae	Jan-feb	-	-	**P+N**
9	Amaltas	*Cassia fistula*	Leguminosae	May-july	-		**P+N**
10	Lasora	*Cordia dichotoma*	Boraginaceae	Feb-april	-	-	**N+P**
11	Barna	*Crateva adansonii*	Capparaceae	March-april, oct-nov	-	-	**N+P**
12	Shisham	*Dalbergia sissoo*	Leguminosae	March-april	-	P	
13	Amla	*Emblica officinalis*	Euphorbeaceae	March-may	-	-	**N+P**
14	Indian Coral Tree	*Erythrina variegata*	Fabaceae	Late winter	-	-	**P+N**
15	Banyan Tree	*Ficus bengalensis*	Moraceae	Jan-sep	-	-	**P+N**
16	Pipal	*Ficus religiosa*	Moraceae	Jan-sep	-		**P+N**
17	Goolar	*Ficus glomerata*	Moraceae	Jan-sep	-		**P+N**
18	Bakain	*Melia azedarach*	Leguminosae	Sep-nov	-	-	**N+P**
19	Maulsiri	*Mimusops elengi*	Sapotaceae	April	-	-	**P+N**
20	Khirni	*Mimusops hexandra*	Sapotaceae	Aug-dec	-	-	**P+N**
21	Sohanjana	*Moringa oleifera*	Moringaceae	July-aug, oct-nov	-	-	**P+N**
22	Pharrai	*Oroxylum indicum*	Bignoniaceae	July-aug	-	-	**P+N**
23	Kanak Champa	*Pterospermum acerifolium*	Sterculiaceae	July-april		P	**-**
24	Jungli Jalebi	*Pithecellobium dulce*	Leguminosae	Dec-feb	-	P	**-**
25	Karanj	*Pongamia pinnata*	Fabaceae	April-july	-	-	**P+N**
26	Pilu	*Salvadora persica*	Savadoraceae	Sep-oct	N		
27	Kusum	*Schleichera oleosa*	Spandeaceae	March-april		P	**-**
28	Sal	*Shorea robusta*	Diptocorpaceae	April-may	N	-	**-**

29	Bahera	*Terminalia bellirica*	Combretaceae	April-may	N	-	-
30	Arjun	*Terminalia Arjuna*	Combretaceae	May-june	-	-	**P+N**

Table**7:** Nectariferous / polleniferous bee flora of creepers for bee in Parikshit Garh.

S. No	Common name	*Botanical name*	Family	Flowering period	Nectar	Pollen	Nectar + Pollen
1	Rangoon ceeper	*Combretum indicum*	Combretaceae	Feb-may, august-nov	-	-	**P+N**
2	Honeysuckle	*Lonicera caprifolium*	Caprifoliaceae	March-april	-	-	**P+N**
3	Aparajita	*Clitoria ternatea*	Leguminosae	March-april		P	-
4	Krishna bel	*Passiflora incarnata*	Passifloraceae	july	-	P	-
5	Dumbel	*Tiolophora indica*	Asclepidaceae	Oct-dec	-	P	-
6	Lehsunia bel	*Manosoa alliacea*	Bignoniaceae	All time	-	P	-
7	Antigonum	*Antigonum leptopes*	Polygonaceae	Apr- May	-	-	**P+N**

Site Observation Photography

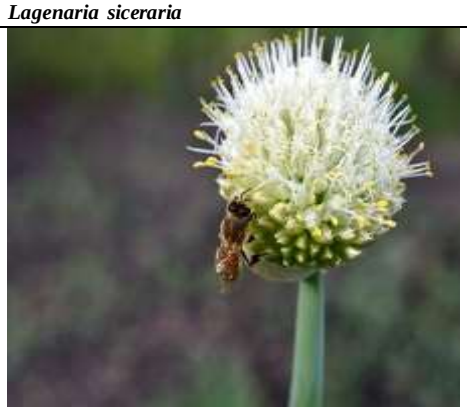
1. **Bee Flora of Vegetable Crops-**

Phaseolus vulgaris

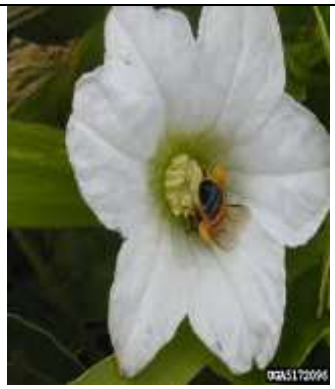
Lagenaria siceraria

Cucumis melo

Cucurbita pepo



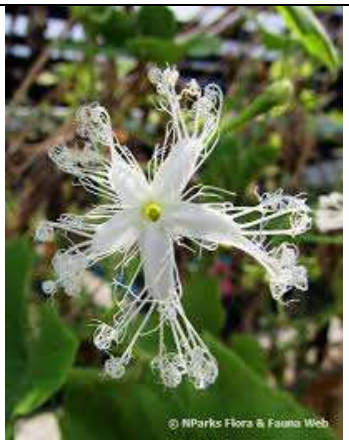
Allium cepa



Coccinia grandis

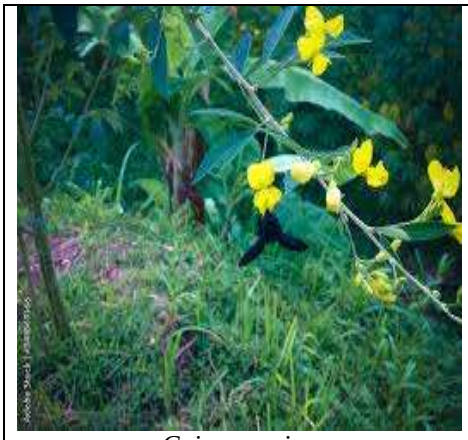
Cyamopsis tetragonolobus

Momordica charantia



Trichosanthes anguina

2. Bee flora of Pulses and Cereal crops-



Cajanus cajan

Triticum aestivum

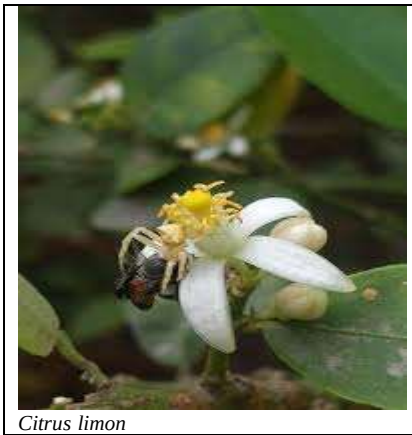
Zea mays

Oryza sativa

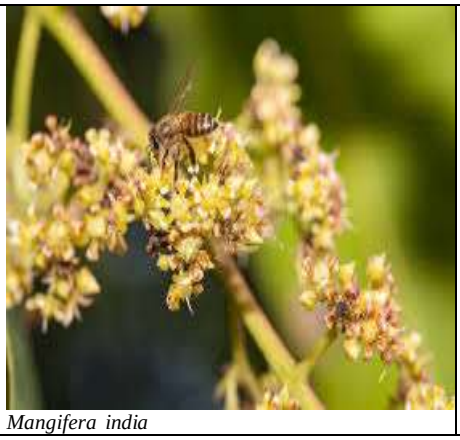
Sorghum vulgare

Hordeum vulgare

3. Bee flora of Fruit crops.

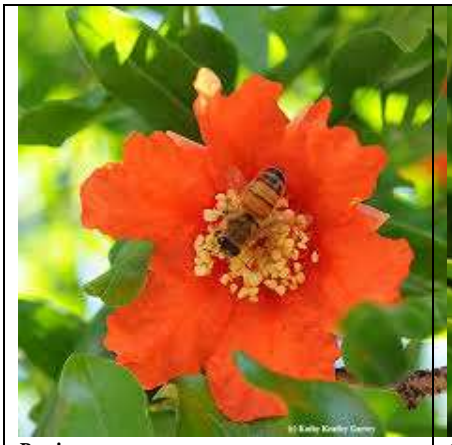


Citrus limon



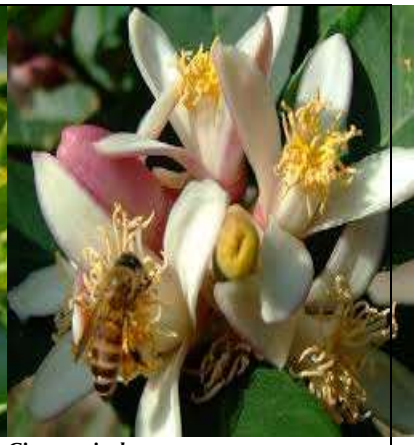
Mangifera india

Ziziphus jujube

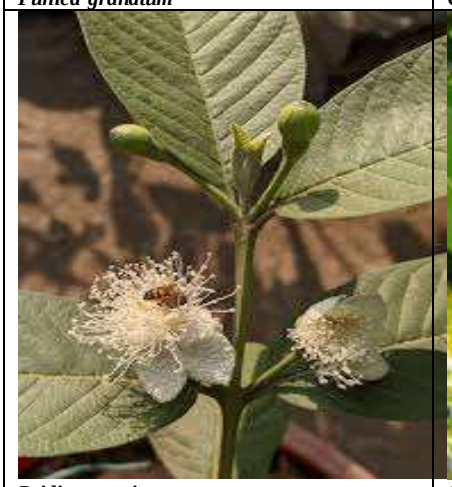


Punica granatum

Citrus aurantifolia



Citrus reticulate



Psidium guajava

Syzygium cumini

litchi chinensis

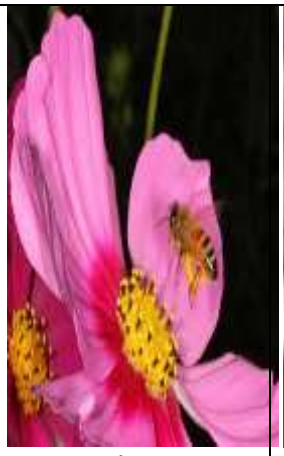
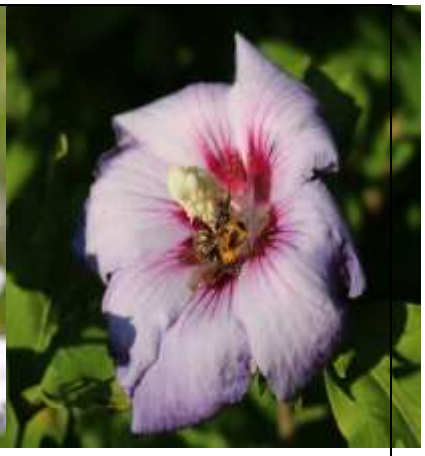
4. Bee flora of Aromatic and Ornamental Plants.

Jasminum sp

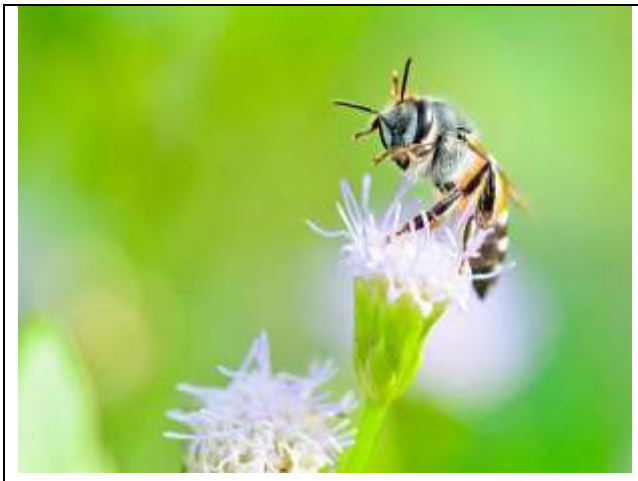
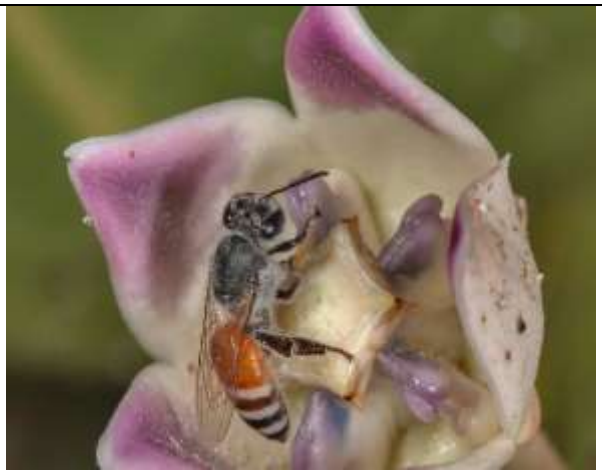
Rossa spp

Tagitus sp

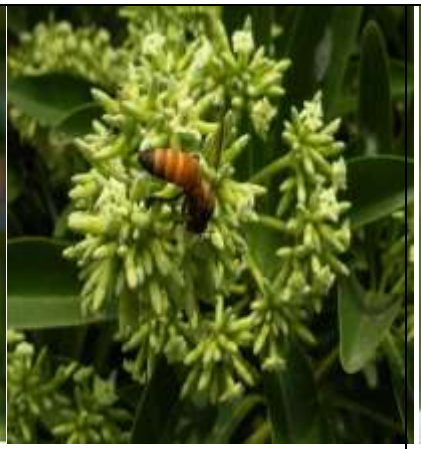
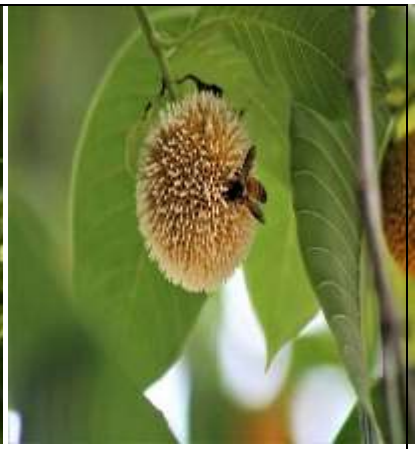
Chrysantimum sinararifolium

			
Ixora Coccinea	*Cosmos bipinnatus*	*Matricaria recutita*	*Hibiscus rosa-sinensis*

5. Bee flora of Small medicinal plants.

	
Ageratum conyzoides	*Calotropis gigantean*

6. Bee flora of Trees.

		
albizia lebbeck	*Alstonia scholaris*	*Anthocephalus cadamba*

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