

FORAGING BEHAVIOUR OF GIANT BEE, *APIS DORSATA* (HYMENOPTERA-APIDAE) ON *AGERATUM CONYZOIDES* IN NORTHERN HILL ZONE OF CHHATTISGARH

G.P. Painkra*

IGKV, All India Coordinated Research Project on Honey Bees and Pollinators, RMD College of Agriculture and Research Station, Ambikapur-497001 (Chhattisgarh) India

Email: gppainkrarmd@gmail.com

Received-06.09.2018, Revised-21.09.2018

Abstract: A field investigation was undertaken at Raj Mohini Devi College of Agriculture and Research Station, Ambikapur under substation of Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during 2016-17 for the purpose of foraging behaviour of rock bee, *Apis dorsata* on *Ageratum conyzoides*. During the first week of October the bee visitation was recorded minimum at 0900hrs (0.83 bees/5min/m²) and it was suddenly increased at 1100hrs (2.77 bees/5min/m²), after that it was declined (1.66 bees/5min/m²) at 1300hrs and 1.11 bees/5min/m² at 1500hrs and the lowest was recorded (0.72 bees/5min/m²) at 1700hrs and the mean bee population was recorded (1.41 bees/5min/m²). The average maximum bee population (5.43 bees/5min/m²) was recorded during the 2nd week of January 2017 followed by 2nd week of Nov 2016 (5.00 bees/5min/m²). However, at the hours of the day the bee visitation was noticed (2.51 bees/5min/m²) at 0900hrs and increased its peak at 1100hrs (7.67 bees/5min/m²) and it was started declined (5.83 bees/5min/m²) at 1300hrs, 3.05 bees/5min/m² at 1500hrs and 1.37 bees/5min/m² at 1700hrs. The highest average population was recorded at 1100hrs(7.67bees/5min/m²).

Keywords: *Apis dorsata*, *Ageratum conyzoides*, Foraging behaviour, Weed.

INTRODUCTION

This weed, *Ageratum conyzoides* belongs to family Asteraceae is popularly known as Basnahi in Surguja region. It is also called various names in various states of India like goat weed, billy goat weed, tropical whiteweed, in Hindi it is also called Jangli pudina, Visadodi, Gha buti in Marathi-ghanera osaadi, Kannada- Ooralu gida, Helukasa, Tamil- Pumppillu, Appakkoli, Bengali- Uchunti and in Nepali- Bhedda Jhar. It is a noxious and annual weed found all the seasons but winter season is favorable for its growth and multiplication. It is a herbaceous erect, height is about 30 to 100 cm its stem is covered with white hairs. It bears blue color flower and it is a good source of pollen due to which the bees are attract at the flowers. The root is well branched tap root, Stem Herbaceous, erect, cylindrical, branched, solid, hairy, green. Leaves Ramal and cauline, opposite, ovate, serrate, acute, hairy, unicostate reticulate, green. Inflorescence Capitulum, different capitula are arranged in corymbose manner, involucre of bracts is present outside the capitula. Flowers Sessile, complete, hermaphrodite, actinomorphic, penntamerous, epigynous, violet. Calyx made up of 5 sepals, polysepalous, valvate, very much reduced, green. Fruits Cypsela, black in colour, sharply trig nous, glabrous or hairy on angles only.

MATERIALS AND METHODS

The foraging behaviour of giant bee, *Apis dorsata* was recorded on a weed, *Ageratum conyzoides* at two

hours interval starting from morning 0900hrs to evening 1700hrs. The activity of bees was recorded weekly and randomly selected one square meter area within five minutes by visually observed and counted the population of bees.

RESULTS AND DISCUSSION

The result depicted in table 1. The foraging activity was recorded from first week of October 2016 from 0900hrs to 1700hrs two hours intervals. During the morning hours at 0900hrs the population of giant bee was noticed (0.83 bees/5min/m²) and increased (2.77 bees/5min/m²) at 1100hrs and started decline at (1.66 bees/5min/m²), 1.11 bees/5min/sqm at 1500hrs and 0.72bees/5min/m² at 1700hrs respectively. The average population was recorded 1.41 bees/5min/m². During the 2nd week of October lowest population was recorded at 0900hrs (1.77 bees/5min/m²) and increased at 1100hrs (7.27 bees/5min/m²) and decreased 4.72 bees/5min/m² at 1300hrs, 4.16 bees/5min/m² at 1500hrs and 1.94 bees/5min/m² at 1700 bees/5min/m² respectively. The average population was recorded 3.97 bees/5min/m². During the 3rd week of October 2016 the maximum population was recorded at 1100hrs 6.11 bees/5min/m² and lowest was recorded 1.38 bees/5min/m² at 1700hrs. The average population was recorded 3.97 bees/5min/m². During the 4th week of October, lowest population was recorded at 1700hrs (1.72 bees/5min/m²) however the highest population was recorded at 1100hrs (8.38 bees/5min/m²) and decreased (5.55 bees/5min/m²) at 1300hrs, 2.50 bees/5min/m² at

*Corresponding Author

1500hrs and 2.27 bees/5min/m² at 0900hrs. the average population was noticed 4.08 bees/5min/m². During the last week of October maximum population was recorded 8.94 bees/5min/m² at 1100hrs followed by 5.72 bees/5min/m² at 1300hrs and 4.16 bees/5min/m² at 1500hrs lowest was found 2.16 bees/5min/m² at 0900hrs. The average population was recorded 4.65 bees/5min/m².

During the first week of November maximum bee visitation was recorded at 1100hrs (7.27 bees/5min/m²) followed by 4.72 bees/5min/m² at 1300hrs and 4.33 bees/5min/m² at 1500hrs however the lowest was record 0.83 bees/5min/m² at 1700hrs. Average population was recorded 3.93 bees/5min/m².

During the second week of November the lowest population was recorded 1.38 bees/5min/m² at 1700hrs. However the highest population was recorded 10.05 bees/5min/m² at 1100hrs and it was decreased at 6.05 bees/5min/m² and 4.88 bees/5min/m² at 1300hrs and 1500hrs respectively. The average population was 5.00 bees/5min/m².

During the 3rd week of November 2016 highest population was recorded 7.66 bees/5min/m² at 1100hrs and the lowest population was recorded 0.83 bees/5min/m² at 1700hrs. The average population was recorded 4.21 bees/5min/m².

During the 4th week of November maximum population was recorded 7.72 bees/5min/m² at 1100hrs however the lowest was noticed 1.72 bees/5min/m² at 1700hrs. The average population was recorded 3.96 bees/5min/m².

During the first week of December highest population was recorded 8.05 bees/5min/m² at 1100hrs followed by 6.38 bees/5min/m² and 2.50 bees/5min/m² at 1300hrs and 1500hrs respectively. However, the lowest population was recorded 1.66 bees/5min/m² at 1700hrs. The average population was recorded 4.07 bees/5min/m².

During the 2nd week of December highest and lowest population was recorded at 1100hrs (7.27

bees/5min/m²) and 1.55 bees/5min/m² at 1700hrs. The average population was recorded 3.91 bees/5min/m².

During the 3rd week of December the maximum population was recorded 7.83 bees/5min/m² at 1100hrs followed by 6.94 bees/5min/m² and 2.50 bees/5min/m² at 1500hrs. Lowest was recorded 1.38 bees/5min/m² at 1700hrs. The average population was recorded 4.13 bees/5min/m².

During 1st week of January 2017 the population of bee was recorded lowest 1.38 bees/5min/m² at 1700hrs however the highest was 6.94 bees/5min/m² at 1100hrs. The average population was recorded 4.21 bees/5min/m².

During 2nd week of January maximum population was recorded 10.5 bees/5min/m² at 1100hrs followed by 7.00 bees/5min/m² at 1300hrs and 4.50 bees/5min/m² at 1500hrs and the minimum was recorded 1.55 bees/5min/m² at 1700hrs. The average population was recorded 5.43 bees/5min/m².

During the third week of January the highest population was recorded 7.33 bees/5min/m² at 1100hrs and lowest was recorded at 1700hrs (1.22 bees/5min/m²). The average population was recorded 3.95 bees/5min/m².

During the 4th week of January maximum population was recorded 8.94 bees/5min/m² at 1100hrs followed by 4.16 bees/5min/m² and 2.27 bees/5min/m² at 1300hrs and 1500hrs respectively. The minimum population was recorded at 1700hrs 1.00 bees/5min/m². The average population was recorded 3.99 bees/5min/m².

The results are close agreement with the earlier workers Dalio (2013 and 2015) recorded the foraging behaviour of honey bee on Parthenium and Trianthema, Fazal Said et al (2015) on sunflower, Painkra (2016) on lajwanti grass, Painkra and Shaw (2016) on niger flowers. Kaur and Kumar (2013) and Roy (2014) on mustard.

Table 1. Foraging activity of giant bee on *Ageratum conyzoides* during 2016-17.

Date of observation	Population of honey bees / 5min /m ²					Total	Mean
	Hours of the day						
	0900	1100	1300	1500	1700		
1-7 /10/2016	0.83	2.77	1.66	1.11	0.72	7.09	1.41
8-14/10/2016	1.77	7.27	4.72	4.16	1.94	19.86	3.97
15-21/10/2016	1.94	6.11	5.27	1.94	1.38	16.64	3.32
22-28/10/2016	2.27	8.38	5.55	2.50	1.72	20.42	4.08
29-4/11/2016	2.16	8.94	5.72	4.16	2.27	23.25	4.65
5-11/11/2016	2.50	7.27	4.72	4.33	0.83	19.65	3.93
12-18/11/2016	2.66	10.05	6.05	4.88	1.38	25.02	5.00
19-25/11/2016	2.83	7.66	5.61	4.16	0.83	21.09	4.21
26-2/12/2016	2.55	7.72	4.88	2.94	1.72	19.81	3.96
3-9/12/2016	1.77	8.05	6.38	2.50	1.66	20.36	4.07
10-16/12/2016	2.11	7.27	5.83	2.83	1.55	19.59	3.91
17-23/12/2016	2.00	7.83	6.94	2.50	1.38	20.65	4.13
24-30/12/2016	2.11	7.44	6.38	1.94	0.83	18.70	3.74

31-6/01/2017	3.94	6.94	5.72	3.11	1.38	21.09	4.21
7-13/01/2017	3.61	10.5	7.00	4.50	1.55	27.16	5.43
14-20/01/2017	4.16	7.33	4.88	2.16	1.22	19.75	3.95
21-27/01/2017	3.61	8.94	4.16	2.27	1.00	19.98	3.99
Total	42.82	130.47	91.47	51.99	23.36	340.11	
Mean	2.51	7.67	5.38	3.05	1.37	20.00	



Plate 1. *Apis dorsata* foraging on *Ageratum* flower

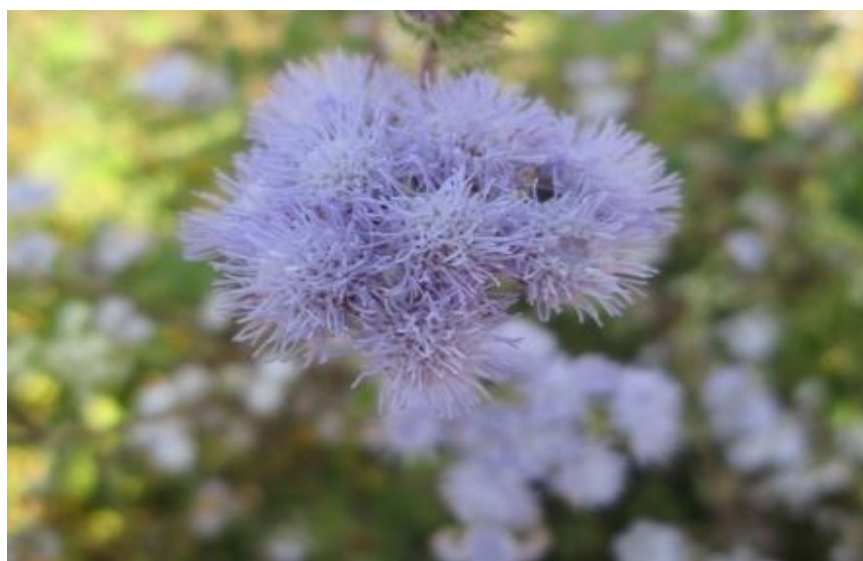


Plate 2. *Ageratum* flower

ACKNOWLEDGEMENT

The author is highly thankful to PC unit of All India Coordinated Research Project on Honey Bees and Pollinators, Division of Entomology, IARI, New Delhi for providing the financial support and technical guidance during the period of investigation.

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