

Abundance of Rock Bee Colonies During Different Months in Dharwad*

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Abstract: The colony abundance study on rock bee, *Apis dorsata* F. was carried out round the year during 1994-95 and 1995-96 in and around Dharwad (Karnatak). The results indicated that the colony abundance on terrestrial nesting sites was maximum (18.81%) during November followed by October. The least abundance was noticed during February (2.49%). Similarly, the colony abundance on arboreal nesting sites was highest during November (17.41%) followed by October and least during January (3.17%). In general, the rock bee colony abundance was more on terrestrial sites (16.17%) as compared to arboreal (3.16) sites.

Introduction

The rock bee, *Apis dorsata* F. is one of the leading honey yielder as compared to other species of honey bees existing in south India. Since, it is a wild and highly mobile species, the proper basic knowledge about its abundance in a particular locality during different months of the year is necessary to plan for the harvesting of honey and exploit them for pollination. Further, without this information, some times, it may go unnoticed about their existence in any area. In this direction, some work is being done in different parts of the country (Anon.1967 and 1968; Ahmad, 1989, Soman and Kshirsagar, 1991 and Dyer and Seeley, 1994) and very little is known from Karnataka by Muthappa (1979), Reddy, *et al* (1986), Reddy and Reddy (1987 and 1993), Venkatesh and Reddy (1989). Though, some work is done in southern Karnataka, it is essential to have the first hand information from this locality as it varies from place to place. Hence, the present study was carried out in detailed for two years during 1994-95 and 1995-96

Material and Methods

Abundance of rock bee colonies was determined on randomly selected eleven terrestrial and ten arboreal nesting sites by recording the total number of colonies at weekly intervals on each nesting site irrespective of colonization or de-colonization. Data so collected were later totalled for a month by adding weekly observations. Such totalled data from two years were averaged to respective months and sites. The average number of colonies on all terrestrial and arboreal nesting sites were added to workout the mean and per cent abundances. Later, the transformed (Arc sin) data were analysed with DMRT and original data with students 't' test for statistical interpretation.

Results and Discussion.

The abundance of rock bee colonies was maximum during November which recorded the mean of 36.45 (18.81%) colonies out of total colonies recorded in a year on terrestrial nesting

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Table 1. Abundance of *A.dorsata* F. on terrestrial nesting sites (Average of two years)

Nesting Site No	No. of colonies during different months											
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.
T ₁	21	37	48	58	34	09	06	11	17	13	16	21
T ₂	18	33	48	47	18	04	05	15	19	14	11	09
T ₃	02	09	13	14	13	03	02	04	04	04	04	08
T ₄	06	09	12	10	05	02	02	03	06	04	04	08
T ₅	08	13	25	21	13	04	06	10	15	06	03	05
T ₆	11	20	21	13	07	02	03	09	15	10	07	14
T ₇	04	07	10	10	04	01	02	03	04	03	02	02
T ₈	49	75	114	221	40	15	09	25	35	15	09	28
T ₉	38	45	64	64	40	10	10	24	27	18	05	15
T ₁₀	04	05	05	12	05	03	02	03	04	03	02	02
T ₁₁	25	28	32	31	18	09	06	12	13	07	05	07
Total	186	281	392	401	197	62	53	119	159	97	68	119
Percentage	8.72	13.18	18.39	18.81	9.24	2.91	2.49	5.58	7.46	4.55	3.19	5.49
Mean	16.91 ^{cd}	25.55 ^b	36.64 ^a	36.45 ^a	17.91 ^c	5.64 ^d	4.82 ^d	10.82 ^{cd}	14.45 ^{ab}	8.80 ^b	6.18 ^b	10.82 ^{cd}

Note: Means followed by the same alphabets indicate statistical parity (P=0.05) by DMRT

sites. The abundance during November was significantly more as compared to other months except during October which was at par. During February, abundance was the least with 4.82 (2.49%) colonies which was significantly inferior and on par with the abundance during January, May and June (Table 1).

The rock bee colonies were found throughout the year. There were two peaks noticed, one from August to November as major peak and second during April-May as minor peak. The maximum abundance during October-November is due to the fact that the colonization was moderate to high with less de-colonization during and preceding to these months, in addition, optimum climatic conditions and sufficient flora available in the nature. On the contrary, the least abundance of bee colonies during February is due to the least colonization with maximum de-colonization during previous months i.e. December and January. In addition, the cold weather which was unfavourable for normal activity of rock bees is also an additional limiting factor. The present findings are more or less in

conformity with the results of Muthappa (1979), Reddy and Reddy (1987), Reddy (1988), Venkatesh and Reddy (1989) and Sattigi *et al.* (1996). At the same time, the present findings disagree with the findings of Reddy *et al.* (1986), Reddy (1988), Ahmad (1989), Soman and Kshirsagar (1991), Reddy and Reddy (1993) and Dyer and Seeley (1994) where the maximum abundance was reported during March, April and minimum during August to November in some cases. This variation may be due to the change in weather conditions and composition as well as availability of bee flora.

On arboreal nesting sites, the colony abundance was significantly higher during November with mean the of 6.60 (17.41%) colonies over other months, but was at par with the abundance during October. The least abundance was noticed during January with minimum number of colonies recorded out of total colonies having a mean of 1.20 (3.17%), but was at par with the abundance of colonies during February, March, May, June, July and August (Table 2). According to the student's 't' test the colony abundance on

Abundance of Rock bee.....

Table 2. Abundance of *A.dorsata* F. on arboreal nesting sites (Average of two years)

Nesting Site No	No. of colonies during different months											
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.
T ₁	01	01	02	02	01	00	01	02	02	01	01	02
T ₂	04	04	05	06	04	01	01	02	02	00	00	01
T ₃	01	02	02	03	03	01	01	01	01	00	00	00
T ₄	01	01	04	05	04	01	03	03	03	01	00	02
T ₅	09	19	26	22	12	03	05	08	13	07	04	07
T ₆	01	02	03	04	03	01	01	02	03	01	00	01
T ₇	01	04	11	12	04	01	01	05	12	06	04	04
T ₈	01	01	03	03	01	00	00	01	02	02	01	00
T ₉	01	02	02	05	04	03	00	01	03	02	01	02
T ₁₀	02	02	03	04	02	01	01	02	03	02	01	02
Total	22	38	61	66	39	12	14	27	44	22	13	21
Percentage	5.80	10.03	16.10	17.41	10.30	3.17	3.69	7.12	11.61	5.80	3.43	5.54
Mean	2.20 ^a	3.80 ^{bc}	6.10 ^{ab}	6.60 ^a	3.90 ^{bc}	1.20 ^d	1.40 ^d	2.70 ^{cd}	4.40 ^{bc}	2.20 ^d	1.30 ^d	2.10 ^d

Note: Means followed by the same alphabets indicate statistical parity ($P=0.05$) by DMRT

terrestrial and arboreal nesting sites differed significantly throughout the year. It was significantly higher on terrestrial nesting sites (16.17) as compared to arboreal (3.16) nesting sites.

The colony abundance was maximum and significantly high during November with mean of 6.60 colonies over other months except the abundance during October. Significantly least abundance was noticed during January and was at par with the abundance during February, March and May to August. During rest of the year, it was moderate. The highest colony population during October and November is mainly due to more colonization and low de-colonization during previous months in addition to favourable climatic conditions and availability of sufficient bee flora. On the contrary, it was least during January to March and May to August due to low colonization and high de-colonization during preceding months with less flora availability and unfavourable weather conditions. The present findings are more or less in conformity with the findings of Venkatesh and Reddy (1989) and Sattigi *et al.* (1996). But, it differed from Anon (1968), Reddy

et al. (1986), Reddy and Reddy (1987 and 1993), Reddy (1988), Ahmad (1989), Soman and Kshirsagar (1991) and Dyer and Seeley (1994) who reported that the abundance of rock bee colony population during March to May from different places. The variation is mainly because of the change in locality, availability and abundance of bee flora in the respective locality and variation in the weather conditions.

When the abundance of colony population on terrestrial and arboreal nesting sites was compared through student's 't' test, the colony abundance was significantly high on terrestrial nesting sites as compared to arboreal nesting sites throughout the year which ranged from 8.42 to 36.45 and 1.20 to 6.60 colonies with a mean of 16.17 and 3.16 colonies per month, respectively. This is mainly due to the fact that the colonization on terrestrial nesting site was higher than on the arboreal nesting sites as indicated by colonization study. Further, these colonies got maximum protection from wind, heavy rains and direct sunlight on terrestrial nesting sites as compared to arboreal sites. Such studies on bee colony abundance are lacking, hence no comparison could be made.

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