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Studies on Wax Recovery from Natural Combs of Rockbee *Apis dorsata* Fabricius

Bee wax is a by–product of apiculture industry and is widely used for making of foundation sheets, manufacture of candles, electrical insulators, cosmetics, etc. Different species of honeybees contribute towards total wax production in India, but major quantity of wax is contributed by rockbee, *Apis dorsata* (Dadant and Sons, 1975; David and Kumarswamy, 1982; and Singh, 1962). It has also been reported that several thousand kilogram of wax is produced from rockbee combs every year (Singh, 1962). This is mainly due to large sized comb, abundance and prevalance of *A. dorsata* throughout the country. However, there is no information on the extent of wax collection and its economics from such deserted comb of rockbee. Therefore, an attempt is made here to know the amount of wax that can be harvested from combs of *A. dorsata.*

The old and naturally deserted combs of *A. dorsata* were selected randomly at Dharwad campus of University of Agricultural Sciences, Dharwad during 1991–1992 for the study. Forty intact combs were removed and weighed. For wax extraction, the hot melting method as described by Shaha (1983) was followed. The extracted wax was solidified into a cake in petridishes of 20 cm. diameter. The weight of each wax cake was recorded and expressed as per cent weight of the combs melted.

The weight of combs of rockbees varied from 405 to 1377 g with an average of 786.45 g (Table 1). Further, out of 40 combs used in wax extraction, of them (22 combs) weighed between 500 to 1000 g, whereas 20.0 and 25.0 per cent of these weighed less than 500 g and more than 1000 g, respectively (Table 2). The average weight of the extracted wax per comb was 386.77 g. The least and the highest quantity wax obtainable from a comb were respectively, 180 g and 657 g. These corresponded to combs weighed least and highest in the lot (Table 1). About 62.5 per cent samples recorded their weight in the range of 250 to 500 g whereas 22.5 per cent of samples weighed more than 500 g on the contrary, only 15.0 per cent of samples recorded less than 250 g (Table 2).

Recovery of wax varied from 40.8 to 66.7 percent with a mean of 49.5 per cent (Table 1). Further, majority of the samples (80.0%) fell in the range of 45 to 55 per cent as compared to 12.5 per cent samples falling in less than 45 per cent range, whereas 55 and above per cent range recorded only 7.5 per cent samples. In majority of the samples, recovery was around 50 per cent (Table 2). It is clear from the data that about 50% of the comb was not wax. This is probably due to the presence of dead brood and regular attack of greater wax moth which feeds on the wax.

The results indicated that there is the good scope for getting additional income from the deserted combs as it fetches good price ranging from Rs. 60 to 80 per kg of wax. Of late, with expansion of sunflower area in northern districts of Karnataka, the rockbee is also seen spreading to these areas. Therefore, there is an ample opportunity to harvest the wax from deserted rockbee combs.

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Table 1. Per cent recovery of wax from natural combs of rockbee, *Apis dorsata* F.

Sample No.	Comb weight (g)	Wax weight (g)	Wax recovery percentage	Sample No.	Comb weight (g)	Wax weight (g)	Wax recovery percentage
1.	750	370	49.33	21	1345	645	47.96
2.	875	452	51.66	22.	980	433	44.18
3.	630	257	40.80	23.	1040	495	47.59
4.	1125	547	48.62	24.	565	275	48.67
5.	1150	620	53.91	25.	470	255	54.25
6.	425	245	57.65	26.	405	180	44.45
7.	1075	533	49.58	27.	570	265	46.49
8.	775	383	49.42	28.	650	320	49.23
9.	415	209	50.36	29.	520	230	44.23
10.	940	492	52.34	30.	475	260	54.73
11.	1157	565	48.83	31.	490	260	53.06
12.	550	267	48.54	32.	860	380	44.19
13.	1332	615	46.20	33.	720	350	48.61
14.	637	425	66.72	34.	560	310	55.36
15.	759	385	50.72	35.	525	263	50.09
16.	1377	657	47.71	36.	1000	450	45.00
17.	1153	545	47.28	37.	450	210	46.66
18.	460	208	45.21	38.	810	380	46.91
19.	1253	600	47.90	39.	650	330	50.76
20.	815	445	54.60	40.	720	360	50.00
Average	—	—	—		786.45	387.77	49.50

Table 2. Grouping of comb, wax weight and per cent wax recovery

Comb weight (g)			Wax weight (g)			Recovery of wax (%)		
Range	No. of samples	Per cent samples	Range	No. of samples	Per cent samples	Range	No. of samples	Per cent samples
500 and less	8	20.00	250 & less	6	15.00	45 & less	5	12.50
500 - 1000	22	55.00	250-500	25	62.50	45 – 55	32	80.00
1000 and above	10	25.00	500 and above	9	22.50	55 and above	3	7.50

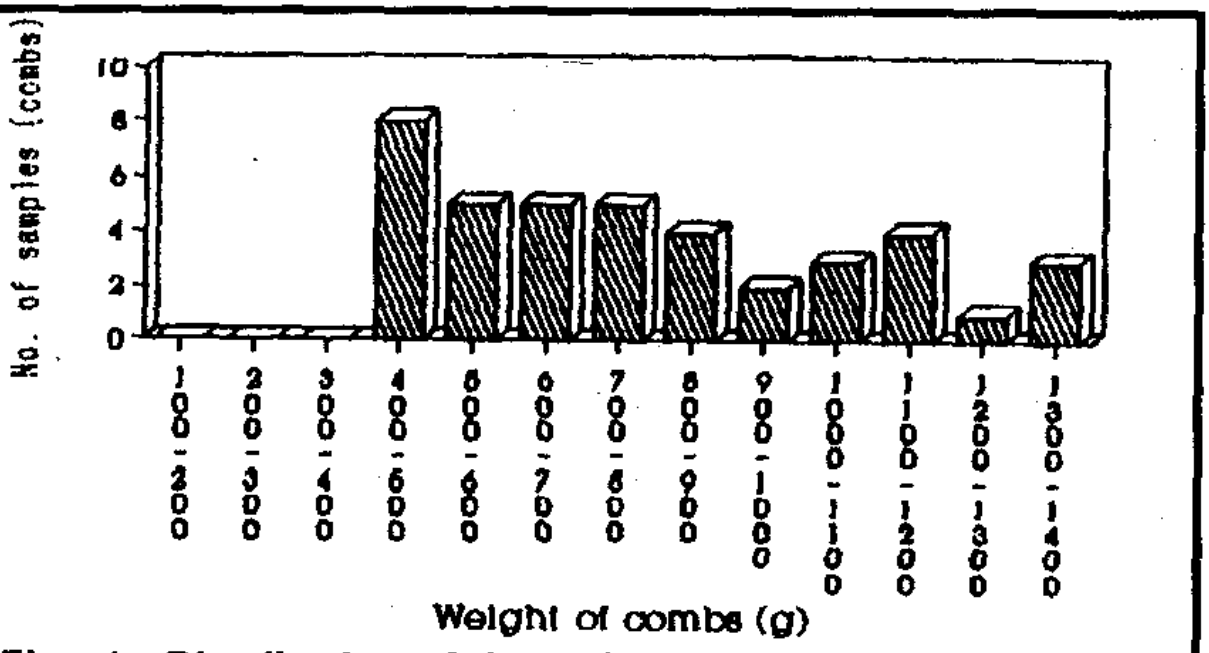

Fig. 1 : Distribution of the weight of naturally deserted combs of *A. dorsata*

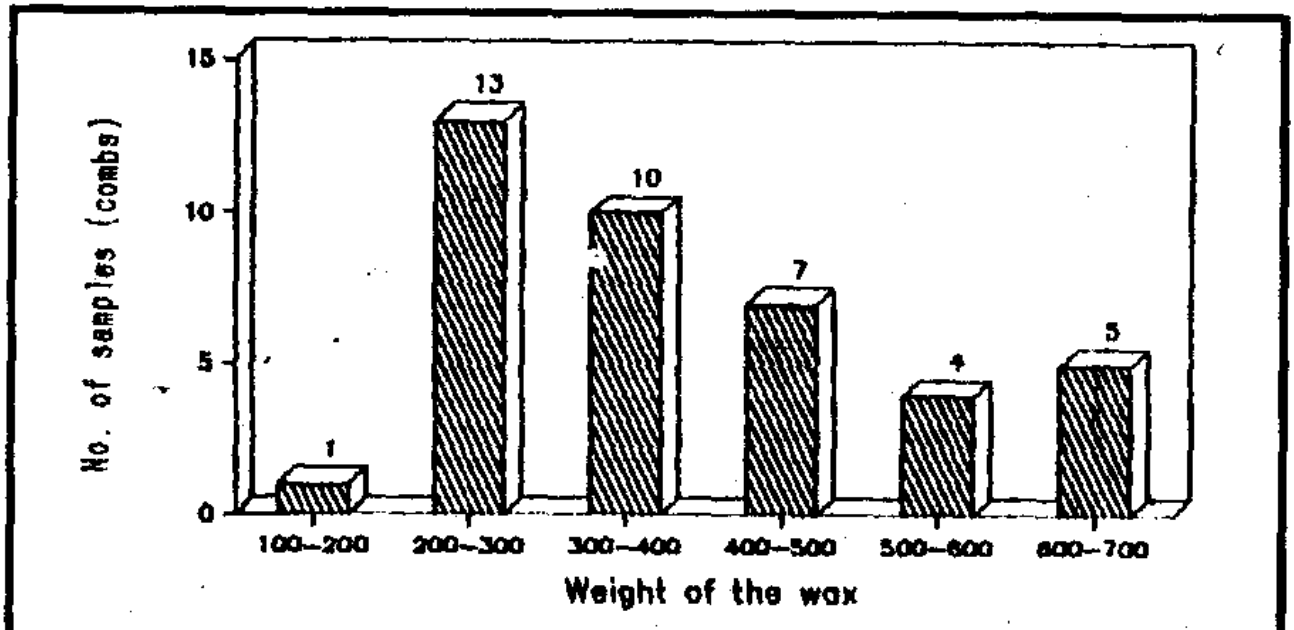

Fig. 2 : Distribution of weight of the extracted was from combs of *A. dorsata*

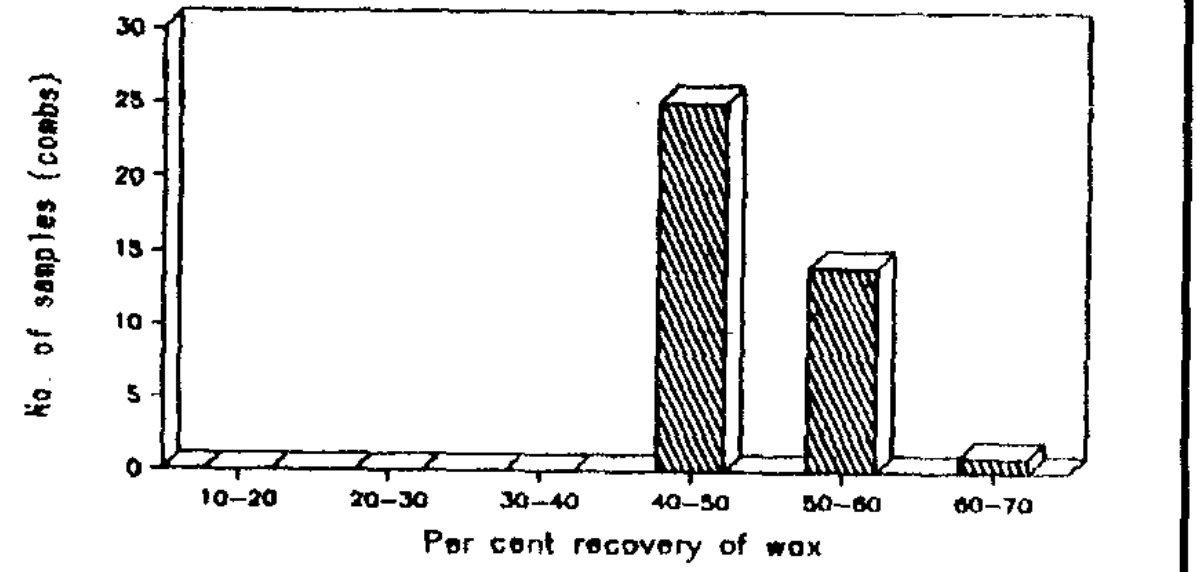

Fig. 3 : Distribution of per cent wax recovery from combs of *A. dorsata*

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White Grub *Anomala rufiventris* Redtenbacher (Coleoptera: Scarabaeidae) an Unrecorded Pest of Brinjal in Kumaon Hills

Brinjal (*Solanum melonqena* L.) is attacked by 60 insect pests belonging to 27 families of seven different orders and also 4 non insect pests belonging to two families of order Acarina at different stages of the crop from different parts of India. Among these only four species of white grubs, *viz. Holotricha insularis* Bren, *H. excisa* Moser, *Protaetia cinerea* Kraatz and *Clinteria spilota* Hope have so far been listed (Nair, 1986; Arif *et al.*, 1990; and Arif and Joshi, 1992).