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Daily Activity of Pollen Collection According to Different Regions in Kafr El-Sheikh Governorate .

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ABSTRACT

Pollen loads were collected from the traps at 2 hour intervals from March to August during season 2014 from 8 a.m. till 6 p.m in three districts. The results showed that the highest amounts of trapped pollen occurred during the period from 10-12 a.m with an average 88.95, 64.99 and 57.77 g/colony in Biala, Sidi Salem and Kafr El-Sheikh, respectively with representing 28.07%, 27.34% and 29.39% while; the lowest amounts of trapped pollen occurred during period from 4-6 p.m with an average of 27.09, 16.81 and 13.77 g/colony in Bialla, Kafr El-Sheikh and Sidi Salem, respectively. for the whole season; The average amounts of trapped pollen were represented by 8.55 , 8.55 and 5.97% in the three locations , respectively.

INTRODUCTION

Pollen is acrucial material for honey bee and also to bee keeper.It is only source of protein which is necessary for normal bee growth (Day *et al*., 1990, Liu, 2001).Without pollen, the bee colonies are subjected to deterioration. Pollen is not only the mean source of protein but also source of amino acids and provides vitamins, minerals and fats that are required for the growth of all members of the colony (Roulston *et al*., 2000).

Mature stages of honey bee need various types of achieve their activities efficiently (Raj *et al*., 1993; Taha *et al*., 2009 and Abd El-Fattah *et al*., 2017).

The present study aimed to determine daily activity of pollen collection in every spring and summer months in different regions in Kafr El-Sheikh province (Sidi Salem, Bialla, Kafr El-Sheikh).Usually, the honey bees need several nutrient to complete their growth and activities in anormal way. So, the bee keeper provides the colonies with additional sources of protein and pollen substitutes, especially when the pollen are scarce in the fields and orchards. Hansen and Korie (2000) reported that plant families of high amounts of pollen are: Fabaceae, Asteraceae, Boraginaceae, Convolvulaceae, Euphorbiaceae, Poaceae, Mytaceae, Sapotaceae and Tilaceae. Pollen is not only the main source of protein but aiso source of amino acids and provides vitamins, minerals and fats (Roulston *et al*.,2000) that are essential for the development of brood and young adult bees.

MATERIALS AND METHODS

The present study was carried out in different regions in Kafr El-Sheikh Governorate (Kafr El-Sheikh, Sidi Salem and Bialla) for comparison between daily activity of pollen gathering in different regions during spring and summer season (2014). Fifteen colonies of first hybrid Carniolan honey bee (Apis mellifera L.). The experimental colonies were in equal strength and headed with sister recently mated queens. The colonies were divided into three equal groups (five colonies in every region) and these colonies were provided with pollen traps.

Constraction of pollen trap

The pollen trap is a wooden box, it has a slope roof and two vertical metal strips each 11 cm, in width and 32.5 cm in length. Each strip has hole of about 3 cm in diameter, a slide wooden box (collection tray) 7 cm in width, 30 cm, in length fixed under the fine wire screen to collect pellets which fall from the workers legs when try to pass from the rap to the hive (Fig. 1).

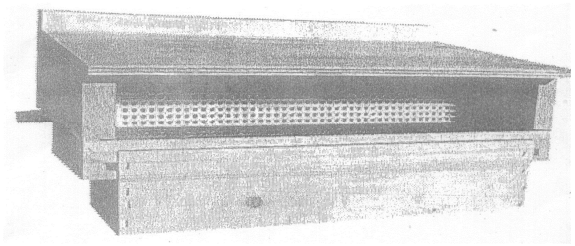

Fig. 1. Construction of pollen trap

Efficiency of pollen trap:

The efficiency of pollen trap in collecting pollen loads was determined by removing all stored pollen combs for one colony and fix pollen trap on hive entrance. After three days, also pollen loads which fall the workers legs in trap box (trapped pellets) were weighed and the efficiency of trap was 18%, calculated as follows:

$$\text{Pollen trap efficiency } \% = \frac{\text{Weight of trapped pollen (g)}}{\text{Weight of stored and trapped pollen (g)}} \text{x100}$$

Number of stored pollen/in^2 was estimated and the weight of these pollen was calculated (Fathy, 2006)

Estimation of daily activity of collecting pollen:

Pollen loads were collected from the traps at 2 hour intervals during 2014.

RESULTS AND DISCUSSION

Pollen loads were collected from the traps at two hours intervals on mid of every month from March to August 2014 starting from 8 a.m till 6 p.m. From the data presented in Table (1) and Figs. (2 & 3), it is evident that highest amounts of trapped pollen from 8-10 a.m with an average 25.68, 19.74 and 36.78 g/colony in Kafr El-Sheikh, Sidi Salem and Bialla, respectively. The highest amounts of trapped pollen was in summer 41.48%, 41.17% in Kafr El-Sheikh and Bialla and in spring in Sidi Salem 28.26%. The lowest amounts of trapped pollen occurred during period from 4-6 p.m. with an average 27.09, 16.81 and 13.77 g/colony in Bialla, Kafr El-Sehikh and Sidi Salem, respectively with representing 8.55% and 8.55% and 5.79% for the whole year.

Table 1. Average pollen grains collection (g/colony) by trapped colony every two hours on mid-year months at Kafr El-Sheikh, Sidi Salem and Biala regions during 2014 season.

Months	8-10 a.m	10-12 a.m	12-2 p.m	2-4 p.m	4-6 p.m	Total
			Kafr El-Sheikh			
Mar. 2014	1.63	2.52	3.03	2.53	1.09	10.80
Apr.	1.76	3.26	2.77	1.63	0.43	9.85
May	3.18	7.87	6.79	4.28	2.14	24.26
Spring	6.57	13.65	12.59	8.44	3.66	44.91
%						22.85%
Jun.	7.00	5.77	3.68	2.14	1.12	19.71
Jul.	6.58	6.77	5.02	3.60	1.24	23.21
Aug.	12.10	9.12	6.99	6.27	4.13	38.61
Summer	25.68	21.66	15.69	12.01	6.49	81.53
%						41.48%
			Sidi Salem			
Mar. 2014	4.06	5.19	4.40	3.05	1.01	17.71
Apr.	4.30	5.20	5.77	4.33	1.00	20.60
May	5.31	6.07	9.85	5.23	2.40	28.86
Spring	13.67	16.46	20.02	12.61	4.41	67.17
%						28.26%
Jun.	4.26	4.15	3.10	1.99	0.06	13.56
Jul.	6.19	4.88	3.60	2.22	1.00	17.89
Aug.	9.29	5.28	4.48	3.10	1.08	23.23
Summer	19.74	14.31	11.18	7.31	2.14	54.68
%						23.06%
			Biala			
Mar. 2014	4.03	5.02	5.43	2.73	2.10	19.31
Apr.	4.16	5.76	5.17	3.83	2.53	21.45
May	5.58	10.37	9.19	6.48	3.24	34.86
Spring	13.77	21.15	19.79	13.04	7.87	75.62
%						23.86%
Jun.	10.70	9.67	7.28	5.54	3.32	36.51
Jul.	10.28	10.67	8.62	7.00	3.44	40.01
Aug.	15.80	13.02	10.59	9.67	4.88	53.96
Summer	36.78	33.36	26.44	22.21	11.64	130.48
%						41.17%

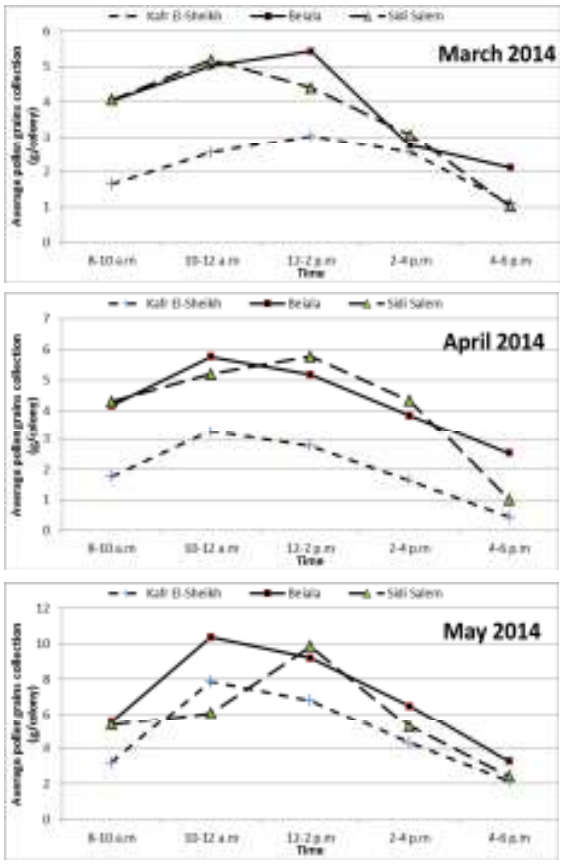

Fig. 2. Daily fluctuation of collection pollen (g/colony) by trapped colonies every two hours on mid of Spring months, 2014 in different regions.

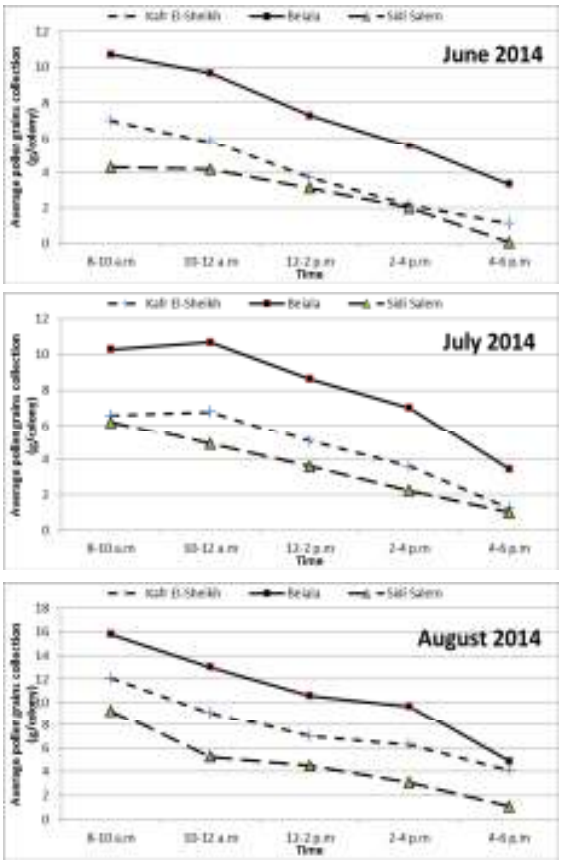

Fig. 3. Daily fluctuation of collection pollen (g/colony) by trapped colonies every two hours on mid of summer months, 2014 in different regions.

The highest activity period during day in spring occurred between 10-12 a.m. in Biala and Kafr El-Sheikh, while between 12-2 p.m. in Sidi Salem and in summer occurred between 8-10 a.m. in the region. The results were in agreement with (Awad, 1998).

Tables (1) and Figs. (2&3) showed that bees collected the highest amount of pollen grains during August in Beilla and Kafr El-Sheikh with an average 53.96 and 38.61 g/colony, respectively representing 41.17% and 41.98 May was the second highest month of amount of pollen collection with an average 98.86 g/colony/day, representing 28.26% in Sidi Salem and July with an average 40.01 g/colony/day, representing 30.66% in Biala.the results were agreement with (Kubota 1984) and (Wille *et al*,1985).

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النشاط اليومى لجمع حبوب اللقاح فى المناطق المختلفة فى محافظة كفر الشيخ.

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تم جمع حبوب اللقاح من المصيدة كل ساعتين إبتداء من مارس حتى أغسطس (٢٠١٤) من الساعة ٨ صباحاً حتى الساعة ٦ مساءً فى ثلاثة مراكز مختلفة فى محافظة كفر الشيخ هى: (سيدى سالم – بيلا – كفر الشيخ) . أوضحت النتائج أن أعلى كمية من حبوب اللقاح المجموعة كانت أثناء الساعة ١٠ – ١٢ صباحاً بمتوسط ٨٨,٩٥ و ٦٤,٩٩ و ٥٧,٧٧ جم / طائفة فى بيلا ، سيدى سالم ، وكفر الشيخ على التوالى بنسبة مئوية (٢٨,٠٧% و ٢٧,٣٤% و ٢٩,٣٩%) . وأقل كمية تم الحصول عليها كانت اثناء الساعة ٤ – ٦ مساءً بمتوسط ٢٧,٠٩% و ١٦,٨١% و ١٣,٧٧% جم / طائفة فى بيلا ، كفرالشيخ ، وسيدى سالم على التوالى بنسبة مئوية (٨,٥٥ % و ٨,٩٧ % و ٥,٩٧ %) على مدار العام .