

## Effect of Honeybee Venom Collection from Different Races on Honey Area

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**Abstract:** The objective of this investigation was to evaluate the effect of collecting venom from *Apis mellifera carnica* race as well as its control colony and *apis mellifera ligustica* as well as its control colony in different season through the year on honey bee area inside the colony. The results revealed that the honey bee area of *carnica* and its control was 387.3, 662.4, 307.1, 386.3 and 377.9, 715.3, 331.6, 415.9 inch<sup>2</sup> for spring, summer, autumn, winter season respectively. And for *ligustica* and its control was 266.5, 496.7, 229.5, 279.1 and 268.9, 477.4, 237.1, 291.2 for spring, summer, autumn, winter season respectively. These results indicate that mean for a. m. *carnica* and its control was 435.8 and 460.2 inch<sup>2</sup> and for a. m. *ligustica* and its control was 317.9 and 318.7 inch<sup>2</sup>. In other wise that mean was 325.1, 588.0, 276.3, 276.3 and 343.1 for spring, summer, autumn, winter season respectively.

**Key words:** Honey • Bee Venom • *Apis Mellifera* • *Carnica* • *Ligustica*

### INTRODUCTION

The stinging behavior in insects is only found in order hymenoptera. There are four hymenoptera families significance in insect sting, these include: apidae (Honeybee), bombidae (Bumblebee), vespidae (Wasps and yellow jackets), formicidae (Ants) [1, 2]. Many factors affecting honey bee venom production and its quality such as; honey bee race, age of bees, colony strength, season of collection, feeding supply, race, its defense behavior and method of collection [3-6] venom secretion in honey bee worker begins just prior to emergence and increases slowly towards a maximum between the tenth and sixteenth day [1, 7, 8]. The sting is fully developed in bees older than 5-7 days [9]. Several new economic electrical devices have been developed and modified for commercial venom collection [6, 10, 11]. The electric devices forced bee workers to stinging in responses to the electric shocks and received the venom droplets through glass plates [10, 12, 13]. The objective of this investigation was to evaluate the effect of collecting venom on the activity of honey bee gathering and storing inside the colony.

### MATERIALS AND METHODS

**Venom Collection:** This work was carried out in the El kanater El khairea station in Kaliobia governorate, which belongs to honeybee research center, Plant Protection Research Institute, Agriculture Research Center, Dokki, Giza, during the 2013. Venom collected from the honeybee (*Apis mellifera* L.) workers [4, 10] of Carniolan race as well as its control colony and *ligustica* well as its control colony experiment depends on collecting venom from the top of the frames, Venom collected with 2 week intervals. The bee venom was collected by the electric shock device (VC-6F model from Apitronic Services, 9611 No. 4 Road, Richmond, B.C., Canada), It comprises a bee venom collection frame with wire electrodes installed in parallel to each other. Electrical current goes through them in the form of impulses bee venom frames are mounted on the top the frames in every hive and then are connected to an electro-stimulator. Using electrical impulses to stimulate the bee workers to sting through latex sheet placed on a glass plate and collected the dry venom using sharp scraper [13]. Bees that come into contact with the wires received a mild electrical shock and stung onto the glass

sheet. The alarm odor, which evaporated from the venom, mobilized and irritated the other bees and they also started to sting. The frames with the fresh dried bee venom on them are carefully packed into a special container for transportation to the laboratory. The processing of bee venom is starting after the frames are brought back in the laboratory through 24-48 hours, the bee venom collected dries on the glass. After that bee venom is packed up in the dark glass jars and stored in a cool and dry place.

**Honey Stored Areas (inch<sup>2</sup>):** Twenty four honey bee colonies of about equal strength headed by open mated pure queens were located in El kanater El khairea Station in Kaliobia governorate station research during (2013). The bees in this investigated colony were allowed to free flight for collecting available nectar and pollen from cultivated crops as well as natural plants existed in this area. Measurement of a. m. *carniaca* as well as its control colony and activities were investigated to evaluate the effect of *apis mellifera ligustica* as well as its control colony and *apis mellifera ligustica* as well as its control colony. The area (inch<sup>2</sup>) of stored honey (Unripened and ripened) on combs of each tested colony were measured by the same square inches divided frame.

**Statistical Analysis:** Means and standard deviations of the data collected for each experiment were calculated using Microsoft Excel and statistical significance determined by t-test and two-way ANOVA.

## RESULTS AND DISCUSSION

It is noticed from results in Tab.1 and Fig. 1 that the highest amount of stored honey was done during summer season with 588.0 inch<sup>2</sup> of stored honey, followed by winter season with an average of 343.1 inch<sup>2</sup>, the differences between the two previous seasons were significant. The amount of stored honey was significantly decreased during, spring season to 325.1 inch<sup>2</sup> and autumn season to 276.3 inch<sup>2</sup> and differences between the two previous seasons were significant too [14-16].

In general, there were significant deference's between the four seasons for stored honey because of various honey sources throughout different year months in the area of El kanater El khairea in Kaliobia governorate.

In other words differences between races showed that there were significant deference's between Carniolan race and its control colony which was 435.8, 460.2 inch<sup>2</sup> respectively in storing honey but there were no differences between Italian race and its control colony which present 317.9, 318.7 inch<sup>2</sup> respectively.

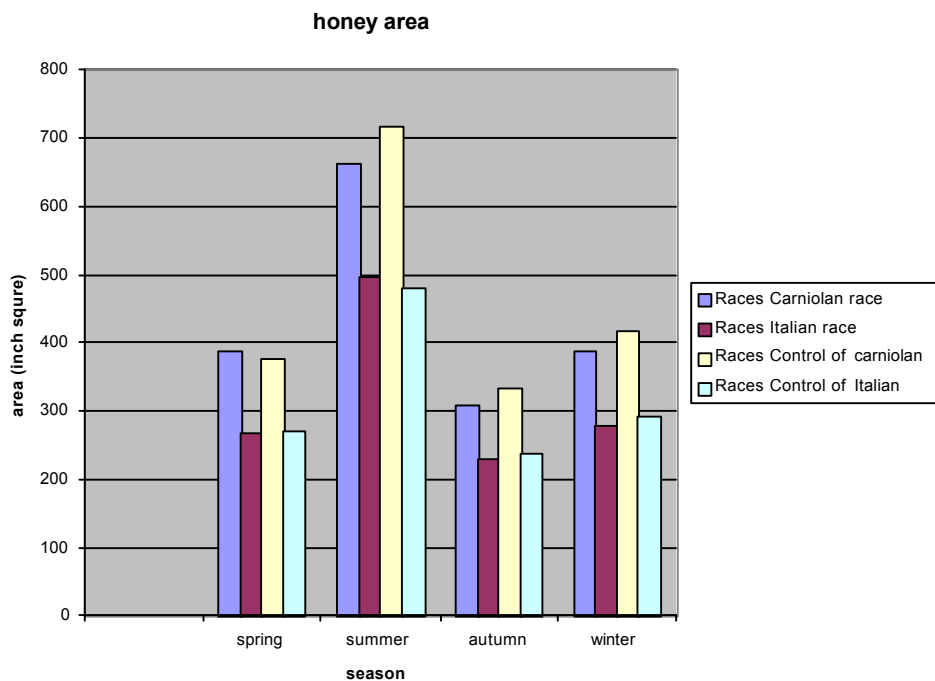


Fig. 1: Mean area (inch<sup>2</sup>) of honey at 20 day intervals under Kaliobia governorate conditions throughout 2013.

Table 1: Means of surplus honey (inch<sup>2</sup>) by Carniolian and Italian honeybee colonies at 20 day intervals under Kaliobia governorate condition during the period 2013

Races					
Season	Carniolan race	Italian race	Control of carniolan	Control of Italian	mean
spring	387.3	266.5	377.9	268.9	325.1 C
summer	662.4	496.7	715.3	477.4	588.0 A
autumn	307.1	229.5	331.6	237.1	276.3 D
winter	386.3	279.1	415.9	291.2	343.1 B
mean	435.8 b	317.9 c	460.2 a	318.7 c	

It is noticed from results in Tab. (1) that there were significant deference's between Carniolan race and Italian race which was 435.8 and 317.9 inch<sup>2</sup> respectively [6, 17, 18].

On the other hand, Carniolan control colony and Italian control colony had significant deference's between each other which were 460.2 and 318.7 inch<sup>2</sup> respectively.

It could conclude that from these results collecting venom from all of these races all over the year made an effect on the area of the honey inside these colonies which was noticed between seasons and races [19, 20].

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