

# SUMMARY

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In this investigation, four ( $F_1$  hybrids) of honeybees were used to evaluate their activities at Moshtohor environmental conditions, the hybrids were Starline, Buckfast, Midnite and Carnica. The experimented activities were :

- 1- Brood rearing                      2- Queen rearing      3- Royal jelly production
- 4- Honey production              5- Gathering pollen grains.
- 6- Some biometrical characters of queens, such as (the weight of virgin queens, number of ovarioles).
- 7- some biometrical characters of workers.

The obtained results could be summarized as follows :-

### ***1-BROOD REARING ACTIVITY :***

Data obtained in this study showed that the Starline hybrid was in the first category with average of 260.17 inch<sup>2</sup>/colony in the first season while in the second season of the study was 276.96 inch<sup>2</sup>/colony. The Carnica hybrid was in the second category with average of 239.77 inch<sup>2</sup>/colony in the first season while it was 252.88 inch<sup>2</sup>/colony in the second season. The Midnite hybrid was the third one, where its average was 231.64 inch<sup>2</sup>/colony in the first season and 237.81 inch<sup>2</sup>/colony in the second season. The last one was the Buckfast hybrid with an average of 229.19 inch<sup>2</sup>/colony in the first season and 234.19 inch<sup>2</sup>/colony in the second season of the study.

The statistical analysis appeared high significant differences between the four hybrids.

The data obtained about citrus honey produced in this study appeared that Starline hybrid was in the first category with average of 3,06 kg./colony in the first season, while it was 3.74 kg. per colony in the second season, and was in the second category the Buckfast hybrid, with average of 2.75 Kg./colony during the first season, while was the same hybrid in the finally category during the second season with average of 3.19 Kg./colony. Starline hybrid was in the third category with average of 2.53 Kg./colony in the first season, while was in the second category in the second season with average of 3.68 Kg./colony, Midnite hybrid was in the finally category during the first season with average of 2.36 Kg./colony, while it was the same hybrid in the third category during the second season with average of 3.35 Kg./colony.

As for the produced clover honey Carnica hybrid was in the first category, while the Starline hybrid was in the second category, Midnite hybrid was in the third category, and in the finally category Buckfast hybrid with average of 2.91, 2.44, 2.41 and 2.14 Kg./colony, respectively during the first season of the study. In the second season of the study Carnica hybrid was in the first category, Starline hybrid was in the second category, the Buckfast hybrid was in the third category, and in the finally category was Midnite hybrid with average 4.10, 3.98, 3.96, and 3.85 Kg./colony, respectively.

About the produced cotton honey Carnica hybrid was in the first category, the Midnite hybrid in the second category, the Starline hybrid was in the third category, and the Buckfast hybrid was in the finally category with average of 2.85, 2.28, 2,11 and 2.0 Kg./colony, respectively during the first season of the study. While in the second season of the study Carnica hybrid was in the first category, and Midnite

hybrid was in the second category, the Buckfast hybrid was in the third category, and was in the finally category Starline hybrid with average of 2.86, 2.36, 2.20 and 2.17 Kg./colony, respectively.

For statistical analysis, the data obtained in this study showed that the difference between the four honey bee hybrids about the amount of citrus honey and clover honey was significant in the first season and insignificant in the second season. As for the amount of cotton honey it was highly significant in the first season while it was significant in the second season of the study.

### **V-GATHERED POLLEN GRAINS :**

#### **a)- Citrus Flow :**

The data gained in this study appeared the dominance of Starline hybrid in producing pollen grains if compared with the other three hybrids. Its average was 42.48g/colony in the first season during the citrus period and 43.59 g/colony in the second season.

Midnite hybrid was in the second category in the first season of citrus flow with an average of 33.66 g/colony and was in the third category through the second season with an average of 33.58 g/colony.

Carnica hybrid was in the third category with an average of 33.62 g/colony through the first season while it was in the second category in the second season with an average of 38.75 g/colony. Finally the Buckfast hybrid was the last one during the two seasons with an average of 30.24 and 32.63 g/colony, respectively.

### **b)- Clover Flow :**

The four hybrids of bees were arranged through the clover flow as followed through the two seasons of the study :

The first one : Starline hybrid. The second one : Carnica hybrid. The third one : Midnite hybrid. The fourth one : Buckfast hybrid. Their averages in the first season were : 161.94, 150.68, 138.68 and 127.37 g/colony, respectively, And were : 164.6, 162.57, 137.23, and 128.23 g/colony, respectively through the second season of the study.

### **c)- Maize Flow :**

Starline hybrid was in the first category, Carnica hybrid in the second term, Midnite hybrid in the third term and finally Buckfast hybrid in the fourth term through the first season of the study. Their averages were 246.07, 229.62, 212.75 and 205.56 g/colony, respectively, while in the second season, the Starline hybrid was at the top, then Carnica hybrid, then Buckfast hybrid, and at last Midnite hybrid, Their averages were 277.08, 263.98, 239.85 and 227.27 g/colony, respectively,

As for citrus flow, statistical analysis showed that there was significant differences between the pollen grains produced by the four honey bee hybrids through the first season while there nosignificant differences in the second season.

As for clover flow, there were high significant differences between the gathered amounts of pollen grains during the first season while there were only significant differences in the second season. About the Maize flow, the differences were significant through the first season and were highly significant during the second season of the study.

## **VI-BIOMETRIC CHARACTERS OF QUEENS :**

### **a)- Weight of Virgin Queens :**

The results gained in this subject showed that the mean weight of virgin queens of Starline hybrid was in the first category, then secondary the weight of Carnica hybrid queens, then thirdly came the weight of Midnite hybrid queens and lastly the weight of Buckfast hybrid queens.

The mean weights were 165.93, 153.1, 133.93 and 126.37 g/colony, respectively in the first season of the study, while the averages were 167.23, 157.43, 137.33 and 133.07 g/colony, respectively in the second season of the study.

Statistical analysis of this data showed that there were high significant differences between the rearing periods and the mean weights of honey bee queens in the two seasons of the study.

### **b)-Number of Ovarioles :**

In case of number of ovarioles in mated queens it was found that Starline hybrid queens were in the first category. Then carnica hybrid, afterwards the Midnite hybrid and finally the Buckfast hybrid during the two seasons of the study. Another group of queens from the four hybrids were reared in the second season of the study. The average numbers of the ovarioles in the first season were 334.84, 317.67, 286.85 and 279.35 ovariol/queen, respectively. During the second season were 335.63, 308.07, 285.67 and 275.62 ovariol/queen, respectively.

The statistical analysis for the number of ovarioles between the four hybrids and the periods of rearing queens showed that there were high significant differences in the two season of the study.

## **VII-BIOMETRIC CHARACTERS OF THE WORKERS :**

### **a)-Length of the Proboscis :**

The results obtained stated that the longest proboscis was of the Caucasian hybrid bees, then the Carnica hybrid, then the Starline hybrid then the Buckfast hybrid, then the Italian hybrid, then the Midnite hybrid, and afterwards the Egyptian worker bees. The averages of these hybrids were 6.540, 6.310, 6.210, 6.197, 6.120, 5.297 and 5.770 mm., respectively.

The statistical analysis stated that there were high significant differences between various hybrids used in this study.

### **b)- Width of Forewing :**

It was found that the largest width of forewing was of the Italian hybrid worker bees, after that the Starline hybrid, then the Midnite then the Buckfast hybrid, then the Carnica hybrid, then the Caucasian hybrid, and finally the Egyptian bees. The mean width of forewings was 3.133, 3.060, 3.05, 3.02, 2.983, 2.927 and 2.773 mm., respectively.

The statistical analysis stated that there were high significant differences between the measurements of the width of forewings.

### **c)-The Length of Forewings :**

The results stated that the Starline hybrid worker bees were in the first category about the length of the forewings, then the Italian hybrid, then the Carnica hybrid, after that came the Midnite hybrid, then the Buckfast hybrid then the Caucasian hybrid and lastly the Egyptian bees. The averages of this subject were 9.390, 9.357, 9.223, 9.027, 8.937, 8.890 and 8.560 mm., respectively.

About the statistical analysis of this point it was bound that there were high significant differences between the used hybrids of bee workers.

#### **d)-The Cubital Index :**

The cubital index of the Carnica hybrid worker bees was at the top, then the Italian hybrid, after that the Midnite hybrid, then came the Starline bees, then the Caucasian hybrid, then the Buckfast hybrid, afterwards the Egyptian hybrid with averages of about 3.047, 2.943, 2.916, 2.796, 2.513, 2.346 and 2.322 mm, respectively.

About the statistical analysis it was found that there were high significant differences between the sizes of the cubital index of the used bee workers.

#### **e) - The Size of Venom Sac :**

The size of the Italian hybrid worker bees was the largest one then followed by the Midnite hybrid, Egyptian then the hybrid after that the Buckfast hybrid, then the Starline bees, then the Carnica hybrid, afterwards came the Caucasian hybrid with averages of 1.018, 1.002, 0.994, 0.940, 0.935, 0.765, and 0.748 mm<sup>3</sup>, respectively.

As for the statistical analysis there were high significant differences between the size of venom sac of various hybrids of bee workers.

#### **f)- Pollen Basket Area :**

The pollen basket area of the Italian hybrid worker bees was the largest area then after that the area of the Midnite hybrid then followed by the area of the Egyptian hybrid, after that came the size of the area of the Buckfast hybrid, then followed by the area of the Starline hybrid and then the area of the Carnica bees and finally the area of the Caucasian hybrid with the following averages : 1.774, 1.761, 1.713, 1.671, 1.671, 1.651 and 1.558 mm<sup>3</sup>, respectively. There were no significant differences between the different areas.



### **g) - Weight of Hypopharyngeal glands:**

The weight hypopharyngeal glands in the Italian bees was the largest than Carinca and Egyptian bees, and more than development in the Italian bees then compared with Carnica and Egyptian bees.

### **h) - Development of wax glands :**

The longitudinal and transversal of wax plate were longer in the Italian bee worker than other honey bee races (Carnica and Egyptian bees), while, the distance between wax plate was similar in all races.

### **CONCLUSION :**

The conclusion of these studies showed that Starline hybrid  $F_1$  surpassed all other hybrids for producing swarms, rearing queens, producing pollen grains, high weight and high numbers of ovarioles of produced queens.

The Buckfast hybrid  $F_1$  surpassed other hybrids for producing royal jelly, while Carnica hybrid  $F_1$  was the best for producing high amounts of honey.

From the past studies the author advised keeping different honey bee strains inside the apiary. For producing swarms and royal jelly he recommended rearing the yellow honey bee strains such as the Starline and Buckfast bees or its hybrids, in case of producing high amounts of honey the writer advised rearing the ash-coloured strains of honeybee or its hybrids as Carnica bees.