

# Ecological and physiological studies on queen rearing of some honeybee races :

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**SUMMARY** In this investigation two honeybee races and their hybrids were used to evaluate their activities at Al-kome EL Akhdar environmental conditions, the tested races were Italian race, Carniolan race, FI Italian hybrid and FI Carniolan hybrid. The studied activities were:-1- Queen rearing 2- Brood rearing 3- pollen gathering 4- Royal jelly production 5- propolies collection Also some biometrics characters of honeybee workers were investigated.

**1-Queen rearing**

**A-Effect of nectar/low season on queen rearink**

- Carniolan raceThe results indicated that, the number of queen cells acceptant rate, emerged queen, introduction and mating were higher for cotton nectarflow season. The mean average was 41.3,91.7,36.5,79.6, and 76.9 colony, respectively during the first season. The second season showed similar results for the cotton nectarflow season with mean average of 37.8,83.9,34.5,84.6- and 72.1/ colony, respectively.
- Italian raceThe results showed that, the number of queen cells acceptant rate, emerged queen, introduction and mating were higher in case of clover nectarflow season with a mean average was 33,73.3,29,81.2 and 74.6/ colony, respectively , in the first season. While in the second season the mean average values were 32,71.1,27.5,74.4 and 79.5/ colony, respectively for clover nectarflow season.

**B-Effect of different types of hives on queen rearink**

- Carniolan race\_ The number of accepted queen cells, acceptant rate and queens, introduction and mating were higher in swarm box. during the first season was 39.5,87.8,29.8,73.5 and 80.1 /col While in the second season the swarm box showed higher v avenge was 73.5,83.4,29.578 lanc168.9/colony,For the different parameters, respectively.
- Italian raceThe number of accepted queen cells, acceptant and emer ed queen was higher in swarm box. The mean average was 36.8,81.7and 3 .5/colony, respectively, while introduction and mating were higher in double queen hives the mean average in the first season was 80.9and 84.2%, res ectively. While in the second season the number of accepted queen cells, accep ant and emerged queen rate were higher in swarm box the averages were 34.8 77.3 and 32 /colony ,respectively , while introduction and mating were hither in double queen hives with a mean average of 83.1and 83.6% respectiv ly.

**C-E ect o di erent i es o am icial eedin on ueen r arin**

- \*Carniolan raceumber of emerged he mean average ny , respectively. lues the meanThe obtained results showed that, the number of accepted qu acceptant, emerged queen, introduction and mating were big Brewer's yeast and sugar the mean average in the first seaso i 40.5,90,38.4,75.6 and 78.5/ colony, respectively,. While in th higher values were achieved in case of Brewer's yeast and su were 40,88.9,36.5,81.1 and 86.7 colony, respectively.en cellser in case of fwassecond season ar the averages
- \*Italian raceThe results revalued that, the number of queen cells acceptant, emerged queen, introduction and mating were higher with Brewer's yeast and sugar. The averages were 38.3,85,34.3,82.2 and 79.1 /colony, respectively during the first season. While in the second season higher values were obtained also with Brewer's yeast and sugar the averages were 36.5,81.1,31.8,79.9 and 82.1colony, respectively

**2 -Brood Rearing Activity**The results indicated that the hybrid Italian gave the highest amounts of sealed brood mean one measured / year with an average of 267.6 in2 / colony / 13- days intervals in the first season, while in the second season with an average of 282.7 in2 / colony /13 -days intervals. The Italian race was in the second with an average of 254.5 in2 / colony /13 days intervals in the first season with an average of 271.5 in2 / colony /13- days intervals in the second season. The FI Carniolan hybrid was the third one, with an average of 244.8 in2 / colony /13-days intervals in

the first season and Lowest amount of sealed with an average of 224.6 in2 / colony /13 -days intervals in the second season. The last one was the Carniolan race with an average of 234.93 in2 / colony /13 -days intervals in the first season and with an average of 234.7 in2 / colony /13-days intervals in the second season of the study. The statistical analysis appeared high significant differences between the honeybee races and hybrids in brood rearing activity.

3-Pollen gathering activity :- Cotton flow tzea maize'Data showed that the FI Italian hybrid came the first with an average of 1657.75 g / colony, followed by Italian race with an average of 1557 g / colony, then followed by FI Carniolan hybrid with an average of 1543.75 g colony and the last one was the Carniolan race with an a colony, in the first season. During the second season F1 It first with an average of 1610.5 g / colony, followed b average of 1562.75 g / colony, then followed by FI Ca average of 1540.5 g / colony. The lowest amounts of Carniolan race with an average of 1529 g / colony. Clover Flow! Italian race was the first with an average of X98.5 g colony, followed by FI Italian hybrid with an average of 913.25 g / colon1, then followed by Carniolan with an average of 899.75 g / colony. The ast one was the FI Carniolan hybrid with an average of 899.75 g / colony, res•ectively. In the firstseason. While in the second season of the study it was fou d that the F1 Italian hybrid with an average of 893 g / colony, followed by Italian race with an average of 879 g / colony, followed by FI Carniolan with . average of 800 g / colony and the lowest amounts of collected pollen the Carniolan with anaverage of 796.75 g / colony. Citrus flowF I Italian hybrid gave the highest amounts of colt cted pollen with an average of 894.59 g / colony, followed by FI Carniolan hybrid with an average of 881.25 g / colony, followed by Italian race with an , verage of 881.25 g/ colony, and the lowest amounts of collected pollen Ca iolan race with an average of 768.25 g / colony, in the first season of the studWhile in the second season of the study the Italian race with an average of 747.75 g / colony, followed by Carniolan race with an average of 745.25 g / colony, then followed by FI Italian hybrid with an average of 721.75 g / colony and the last one was the FI Carniolan hybrid with an verage of 679.5 g / colony . Statistical analysis showed that the difference etween the races in amounts of collected pollen were non significant in the two seasons of theerage of 1506.25 g / Tian hybrid came the Italian race with an iolan hybrid with an collected pollen thestudy, and also the difference between various periods (data) according to the amounts of collected pollen were highly significant in the two seasons of thestudy .

4 - Royal jelly secretion activity :-Four similar Colonies from honeybee races and their hybrids were used for secretion royal jelly during the period from March to August through the two seasons of the study. The data obtained indicated that the F1 Italian hybrid gave the high amount of royal jelly , then the F1 Carniolan hybrid, then the Italian race , and finally the Carniolan race averages 322.9, 315.6, 304.9 and 301.6g / colony respectively in the first season of the study, while it were 287.7, 282.3, 267.3 and 266.9 g/ colony, respectively in the second season. Statistical analysis showed that no significant differences between the races and its hybrids during the two seasons of the study, and also the difference between various races for royal jelly secretion in the different production periods was highly significant during the two seasons of study.

5 - Propolis collection activity :The FI Italian hybrid gave the highest amounts of the collected propolis with an average of 89.1 g/ colony, followed by F1 Carniolan hybrid with an average of 81 g/ colony, then followed by Carniolan-race with an average of 42.9 g/ colony. The lowest amounts of propolis collected Italian race with an average of 41.9 g/ colony, in the first season of the study. While in the second season of the study it was shown that FI Carniolan hybrid with an average of 63.4 g/ colony, followed by FI Italian hybrid with an average of 55.8 g/ colony, then followed by Italian race with an average of 38.35 g/ colony. The lowest amounts of collected propolis which was found in Carniolan race with an average of 36.6 g/ colony.

6- Biometrics studies of honeybee w honeybee races:

- 1-Length of legs :The results stated that the Italian race were in the first length of the legs followed by the Carniolan hybrid, then and at last the Italian hybrid with averages 9.38,9.32respectively.
- 2-Pollen basket area:The pollen basket area of the Italian worker was t e largest area then after that the area of the Carniolan worker then followed by the area was of the Carniolan hybrid and the smallest area of the Italian ith the following averages 1.67, 1.66, 1.62 and 1.61 mm, respectively.
- 3-Length of the proboscis (glossa):The obtained results stated that the longest probosci was of the Italian hybrid then the Carniolan race, then the Carniolan hybrid, and at last the Italian race, the average of these were 6.33, 6.29, 6 16 and 6.13mm, respectively.

4-Hypopharyngeal glands :The longest hypopharyngeal glands were of the Itali Italian race, then the Carniolan hybrid and at last the averages of this subject were 0.19, 0.18, 0.16 and 0.16mmAlso the wild hypopharyngeal gland was the first Carniolan race, and the last one was the Italian hybrid, C average of this subject were 0.11, 0.11, 0.10 and 0.10mmrker of somecategory about the the Carniolan race and 9.23 mm,n hybrid, then the arniolan race, the , respectively.n the Italian race, iolan hybrid the , -spectively.5- Wax glandThe longest wax gland was of the Carniolan race, then the Carniolanhybrid, then the Italian race and Italian hybrid. The average of these glands were 2.31, 2.29, 2.26 and 2.26mm, respectively. Also, Wild of wax gland was of the Carniolan race and Carniolan hybrid, then the Italian bees and the Italian hybrid. The average of this gland were 2.48, 2.48, 2.43 and 2.41mm, respectively. Conclusion1-The results indicated that the swam box, Brewer's yeast and cotton nectarflow season gave better results in queen rearing2-FI Italian bees were mor active in brood rearing , pollen gathering, royal jelly secretion, and propolis collection, compared with the other races.