

OBSERVATION ON THE ROBBING BEHAVIOR IN TWO HONEYBEE HYBRIDS (CARNIOLAN AND ITALIAN) IN KAFR EL SHEIKH GOVERNORATE

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ABSTRACT: Robbing is the takeover honeybee on honey or nectar from other hive in the same species, this process caused damage to colonies in the apiary, rapid spread of transmittable diseases and unequal the strength of colony. This study was conducted to know which hybrid tend to the robbing behavior, to avoid this undesirable manner. Experiments were carried out in Kafr–Elsheikh governorate to study the robbing behavior in two different honeybee hybrid (Carniolan – Italian). A hundred colonies with no rising disease were chosen to observe the phenomenon. The hive is considered to have been supposed to robbing if many bees of both hybrids are seen dead inside and around the hive. The obtained results showed that, the Italian hybrid bee tended to robbing behavior especially in weak colonies, so it must be careful when used the Italian hybrid in beekeeping.

Key words: Robbing, honeybee, Carniolan hybrid, Italian hybrid.

INTRODUCTION

Robbing is the process of taking bees to honey from another hive of the same species. It was a problem for honeybee researchers and problematic for beekeepers. Honeybee workers can invade and steal honey/nectar from other colonies or sugar/corn syrup from feeders used to deliver syrup to other colonies. This is called “robbing” behavior. Robbing behavior typically involves the collection of nectar and honey, but not pollen or brood. Some beekeepers report that robbing bees may steal wax or propolis from other hives, but not many data are available on this occurrence. Robbing behavior can escalate quickly from just a few bees robbing other colonies to a massive frenzy of bees robbing many colonies in an apiary. Robbing has been reported between *Apis cerana indica* and *A. mellifera* (Kellogg, 1959), and robbing of *Apis cerana indica* colonies by *Apis dorsata* (Singh, 1959). In the Punjab State in India at 1983, robbing of *Apis mellifera* colonies by *Apis florea* was observed Koeniger and Vorwohl (1979). A furious fight between the two species

occurred in which *fiorea* overcame *mellifera*, completely disorganizing its colonies. A large number of workers of both species were killed, but the mode of attack and exact cause of death were not determined.

The present experiments were carried out to study the robbing behavior of Carniolan and Italian hybrid. The results of the studies are reported in this paper.

MATERIALS AND METHODS:

This study was carried out along one year, to study the robbing behavior in two different honeybee hybrids (Carniolan – Italian). A hundred colony with no rising disease were prepare as follow:

- 1- Fifty Carniolan hybrid colonies were divided into two group each one had twenty-five colony. The first had 3-5 brood combs covered with worker bees and the second had 6-10 brood combs covered with worker bees.
- 2- Fifty Italian hybrid colonies were divided into two group each one had twenty-five colony. The first had 3-5 brood combs covered with worker bees and the

second had 6-10 brood combs covered with worker bees.

The robbing behavior was weekly observed during one year in all hybrid colonies.

Determination of robbing cases:

To study the robbing behavior, the interspecific robbing observed in all apiary's colonies under study. The hive is considered to have been supposed to robbing if many bees of both hybrids are seen dead inside and around the hive.

RESULTS:

Generally, when nectar sources are rare or unavailable locally the hive been attracted by honey in neighboring hives. Honeybee colonies attack on hives that are unable to guard themselves and steal their honey or sugar syrup. This behavior of robbery as opposed to the customary colony gathering nectar for itself is termed robbing in

Apiculture. The data in Table (1) and Fig. (1) show that, robbing behavior was observed in the Carniolan hybrid just only at June in the colony, specially for that have combs ranged from three to five. The rest of the year has no detected robbing cases.

Data in Table (2) and Fig. (2) indicated that, the Italian hybrid colony with 3-5 combs had no observed robbing cases at January, May, July, August and December while, the mean numbers of observed robbing cases were noticed at February, March, April, June, September, October and November as 2, 3.5, 3, 3, 1.5, 0.5, and 1 respectively. Whereas, in the 6-10 combs colony, the mean numbers of rubbing cases were 1, 2, 2, 2.5 and 0.5 in February, March, April, June and September, respectively. Anywhere, no robbing cases were observed at January, May, July, August, October, November and December.

Table (1): Robbing phenomenon in the Carniolan hybrid as affected by comb numbers

Comb numbers	Months											
	Jan.	Feb	Mar.	Apr.	May	Jun.	July	Aug.	Sept.	Oct.	Nov.	Dec.
3-5	0	0	0	0	0	1	0	0	0	0	0	0
10-6	0	0	0	0	0	0	0	0	0	0	0	0

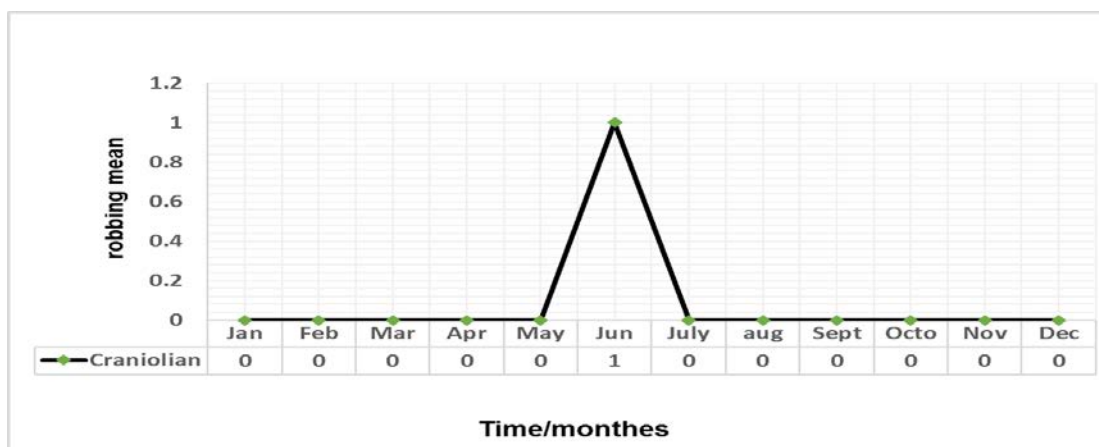


Fig (1): Robbing phenomenon in the Carniolan hybrid as affected by comb numbers

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Table (2): Robbing phenomenon in the Italian hybrid as affected by comb numbers

Comb numbers	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sept.	Oct.	Nov.	Dec.
3-5	0	2	3.5	3	0	3	0	0	1.5	0.5	1	0
6-10	0	1	2	2	0	2.5	0	0	0.5	0	0	0

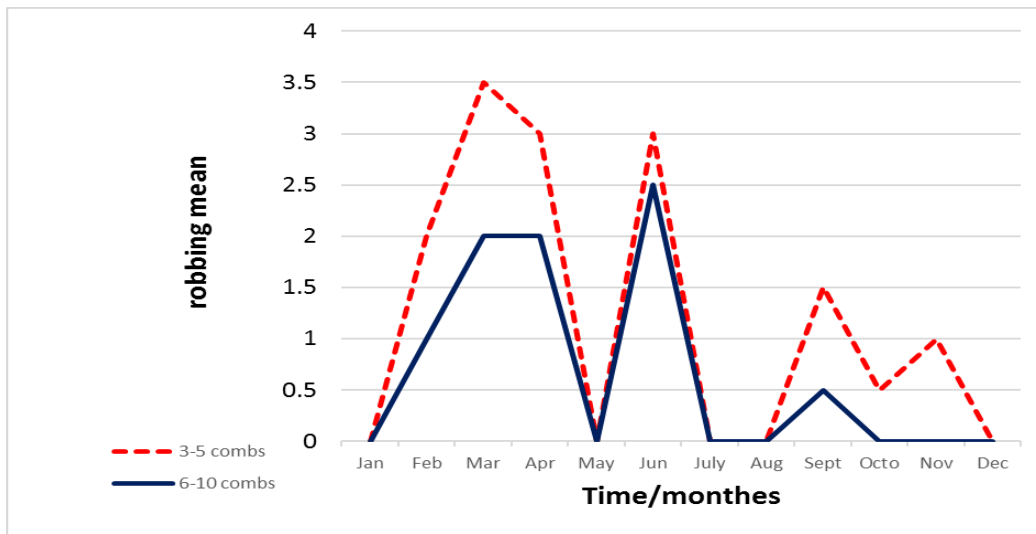


Fig (2): Robbing phenomenon in the Italian hybrid as affected by comb numbers

The obtained results illustrated in Fig. (3) revealed that, the Carniolan hybrid showed one robbing case at July month, while the Italian hybrid was more active in robbing behavior at February, March, April, June, September, October and November where it reached 3, 5.5, 5, 5.5, 2, 0.5 and 1 cases, respectively. The highest observed robbing cases were recorded at March and June months, followed by February, while the lowest robbing cases were observed at October followed by November.

The obtained results depicted in Fig. (4) show the difference between the two hybrids, where the Italian hybrid was tended to the robbing behavior more than the Carniolan.

DISCUSSION

The Italian hybrid is lay egg in early

spring, so it was need a lot of food. The Italian race was rising in Appenine peninsula of Italy where this region has a worm blossoming spring, thus it was adapted to lay egg early, so, perhaps this character became genetic. On the opposite, the Carniolan hybrid lay egg in late spring. The origin region which Carniolan hybrid was became from alpine regions of Austria, Slovenia, Yugoslavia, and Danube valley where it has short late blossoming spring and hot summer, so it lay egg late, therefore maybe after time, this behavior became genetic. At Egypt, no references in this study were done. The obtained results agree with Harry (2004) who found that Italian race has a greater tendency to rob weaker colonies. The robbing cases frequently noticed at the time of honeybee weakens.

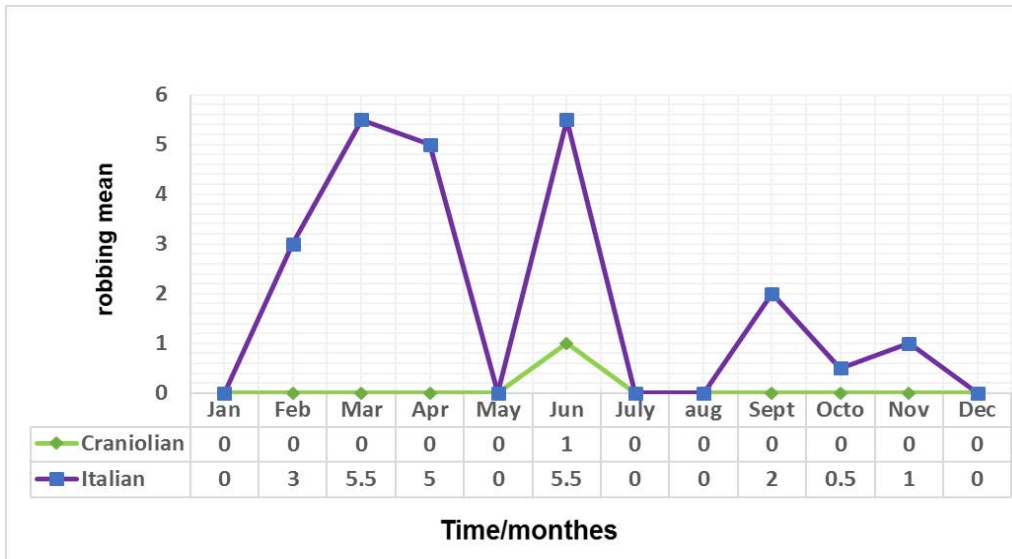


Fig. (3): Robbing phenomenon in Carniolian and Italian honeybee hybrids

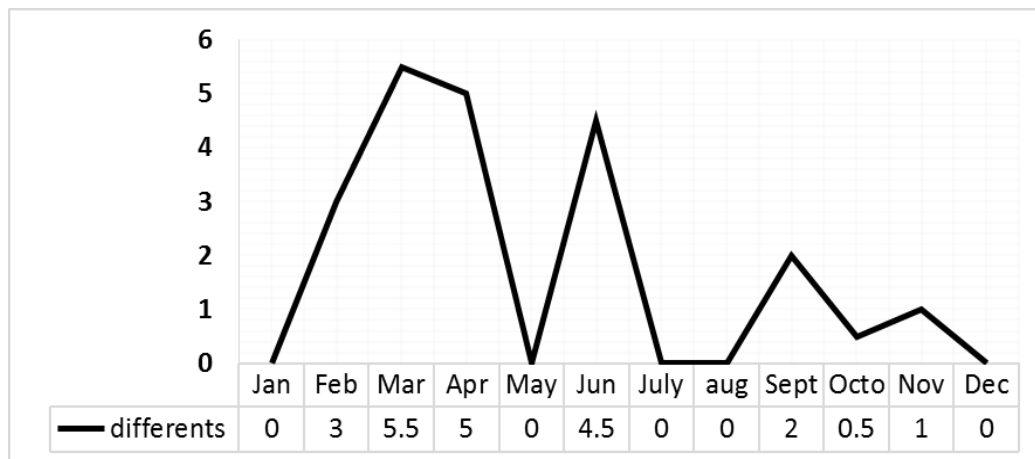


Fig (4): The difference between Carniolian and Italian hybrids in robbing

Large-scale battles are most likely when the future of the nest is at stake, since all members of the colony stand to lose their genetic contribution to the next generation if the nest is lost (Scharf *et al.*, 2011). Although there is less evidence for collective fighting in eusocial bees, intra- and interspecific battles are known to occur in the vicinity of foraging sites, where colonies compete for the possession of food resources (Johnson and Hubbell 1974, Nieh *et al.*, 2005). Since access to foraging sites can influence survival and reproduction

within the nest, especially if food is limiting (Roubik 1982), the inclusive fitness benefits to each worker of securing (or losing) one of these sites provide an explanation for why large numbers of fatalities can occur during these territorial battles (Johnson and Hubbell 1974). When bees come to attack on the nests, however, there are no examples in the bee literature that resemble the devastating collective attacks of warring ants. Africanized honeybees can invade and usurp the hives of European honeybees, (Schneider *et al.*, 2004) but attacking

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swarms here are relatively small (possibly reproductive or absconding swarms), and fighting is not extensive (Schneider *et al.*, 2004). In the primitive stingless “robber” bee *Lestrimelitta limao*, fights between workers can occur as a result of a nest-raiding strategy, but adult mortality is slight (Sakagami *et al.* 1993). Scouts of European honeybees were known to fight with workers from competing colonies while locating nest sites, and this can lead to robbing and killing of those in the minority (Rangel *et al.*, 2010). Fights to the death between queens of primitively eusocial bee and wasp species occur when an usurping queen invades another’s nest (Zobel and Paxton 2007), and queen fighting also occurs in bumble bees in the subgenus *Psithyrus*, which are obligate parasites on bumblebee species (Kreuter *et al.*, 2012).

It could be concluded that Italian and Carniolan hybrids are good races, but all of them has special characters where the Italian hybrid tend to robbing more than Carniolan hybrid.

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مشاهدات على ظاهرة السرقة في إثنين من هجن نحل العسل في محافظة كفر الشيخ

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الملخص العربي

إن ظاهرة السرقة من السلوكيات الضارة التي تؤدي الي العديد من المشاكل مثل ضعف بعض طوائف النحل في المنحل كما انها تتسبب في نقل كثير من الامراض . وقد تمت هذه الدراسة بغرض المقارنة بين نوعين من هجن نحل العسل وهما هجين النحل الإيطالي وهجين النحل الكرنولي في محافظة كفر الشيخ كما كان الغرض من البحث هو معرفة أي نوعي الهجن يميل للسرقة ، وقد إستخدم للدراسة مائة خلية ، وتم تقييم سلوك السرقة عن طريق رؤية النحل المبيت داخل الخلية وحولها.

أظهرت الملاحظات أن الهجين الايطالي يميل الي السرقة أعلى من الهجين الكرنولي. كما أظهرت النتائج أن الطوائف التي يكون بها عدد الاقراص أقل تكون عرضه للسرقة أكثر من الطوائف ذات عدد الاقراص الاكثر ، وتوصي النتائج بالحرص في التعامل مع الهجين الايطالي حيث أنه يميل للسرقة وخاصة في الطوائف الضعيفة ويراعي تقوية الطوائف وتساوي القوة النحلية داخل المنحل.