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Temperament of Sudanese Honeybees

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Abstract. The defensive tendency of Sudanese honeybee colonies and their Fl's was evaluated by a modified technique of Stort (1974). The native Kuku colonies exert the most defensive morale; 41.1 folds than the Carniolan colonies, 4.7 times that of the native Demazin and double that of the hybrids Kuku F1 and Demazin F1 colonies. Kuku honeybees took 13 seconds to get very aggressive, while the Carniolan colonies became aggressive after 167 seconds. The Sudanese honeybees specially Kuku strain pursued an observer who started to walk at a normal speed away from the colonies about double the distance than the Carniolan bees. Honey harvesting was a true battle, and afterwards the apiary could not be managed for two weeks. This parlous temperament seriously hindered beekeeping development in the Sudan.

Introduction

The Sudanese honeybees were claimed to be aggressive, wild, easily irritated, fierce and attack immediately any person or animal who comes nearby [1]. Goncalves [2] stated that disturbed African bees pursued a person or animal for distances far greater than is usual for European bees. Besides, there were many animals and even people being killed by stings of African bees. Stort [3] detected differences in aggressiveness between the Africanized bees *A. m. adansonii, A. m. mellifera* and *A. m. ligustica.* However *A. m. adansonii* was very sensitive to odours [4].

While working with the Sudanese wild bees in the forests it was observed that behaviour of the native bees greatly varies in different localities, in different sites of the same locality, and often in different wild colonies nested within the same site [5]. Realizing this fact, honeybee colonies were collected from two different locations in the Sudan; Khartoum Province (Kuku honeybees) which was described as *A. m. Sudanensis* [6] and Blue Nile Province (Demazin honeybees) which was named *A. m. nubica* [6,7] to verify such temperament.

Materials and Methods

A modified technique of Stort [3] was adopted. The procedure started by jerking a black leather ball, sprayed with a strong Sudanese perfume [Dilka) in front of the

hive entrance for 120 seconds, or occasionally until the bees became aggressive. The following observations were made:

1- Time at which the first sting was made in the leather ball.
2- Time taken for the colony to become very aggressive, that is after several bees had stung the leather ball and large numbers began to fly around nervously and knock against obstacles.
3- Number of stings in the leather ball after 120 seconds.
4- Number of stings left in the gloves of the observer during 120 seconds.
5- Distance that the bees followed an observer who started to walk at a normal speed away from the hive after 120 seconds.

Twenty colonies were used in the test; Kuku, Demazin and their F1 hybrids (progenies of open mated queens). Carniolan bees were tested as a control. Four colonies in each category were subjected to the test and each colony was examined three times at intervals of 30 minutes. This experiment was carried out at the alfalfa nectar flow season (May) in the experimental Apiary of the Faculty of Agriculture, Cairo University at Giza. Colony size was 10 combs full of bees on both sides (about 25000 bees in each).

Results and Discussion

Table 1 indicates that Kuku colonies were the most aggressive, followed by Kuku F1, Demazin F1, Demazin and Carniolan honeybees.

Table 1. Some of the aggression parameters of Sudanese honeybees and their hybrids compared to the Carniolans "Reps. 4 colonies each" ±SD.

Strain	Time to first sting seconds	Time to become very aggressive seconds	No-of stings in gloves & ball	Pursuit distance meters
Carniolan	135.70±11.81	167.30±14.56	28.00± 2.41	142.70±12.42
Demazin	15.50± 1.36	30.40± 2.65	125.50±10.74	213.00±18.54
Demazin F1	4.70± 0.41	20.00± 1.74	126.70±10.94	250.70±12.57
Kuku	3.30± 0.29	13.00± 1.13	150.70±12.51	280.00±14.37
Kuku F1	4.70± 0.40	13.70± 1.14	136.30±11.68	219.30±10.86

With regard to the time taken for the first sting Kuku colonies took the least time (3.3 seconds) followed by the two hybrids then Demazin and the Carniolan bees which took an average of 135.7 seconds to sting the ball. The time taken for the colony to become very aggressive showed the same order and was shorter in Kuku colonies (13.0 seconds) compared to 167.0 seconds in Carniolan colonies.

The total number of stings on ball and gloves verify that Kuku colonies and their hybrids were more aggressive than Demazin, Demazin F1 and Carniolan colonies, respectively.

Finally, the pursuit distance of the observer who started to walk in the vicinity of the apiary also certify that Kuku colonies were the most aggressive, most fierce and ready to attack.

The apparent anomaly in aggression of the different colonies may be due to the differences in the number of olfactory plates in antennae of the different strains [3], or otherwise to differences that exist in the colony morale and tendency of bees to sting at a certain level [5].

According to our field observations, one could emphasize that small colonies (9 combs full of bees or less) were more peaceful than strong powerful ones (more than 10 combs of bees) which would sting readily. Moreover, when the colonies were manipulated, bees flew outside their hives and soon after, they flew buzzing around the observer's head, striking against the veil, investigating all possible means to sting. The tested native honeybees were very nervous and sting even from outside the protective clothings. They would examine all moving objects around the apiary and attack most of the animals and people within sight. To harvest honey was a true battle, and afterwards the apiary could not be managed for two weeks or even more.

The native bees are a potential menace in a mixed apiary. They are severe robbers particularly to honeybees in 4-comb boxes rather than to those kept in hives or nuclei. El Sarrag [5] proved that 80% of the Carniolan colonies were killed in a breeding programme due to the robbing tendency and aggressive behaviour of the Sudanese honeybees. After mating of Carniolan virgin queens and soon after they were transferred to 5-comb boxes in the same apiary, they were severly attacked by the native bees despite the presence of queen excluder at the entrance hole of the boxes. The invaders didn't respond to robbing preventive techniques and insisted on robbing and killing Carniolan queens and most of the workers in the attacked boxes. The robbing tendency and aggressive behaviour of the Sudanese bees gave Nasr [8] the reason for the reduced mating rate of the Carniolan queens to only 30% in a mixed apiary.

The aggressive behaviour of the native bees obstructed much of the routine work in the experimental apiary and limited management and manipulation. This certainly is one of the reasons which seriously hindered the development of the beekeeping industry in the Sudan. However, understanding the behaviour of the native bees is a task in itself as a step towards modifying their temperament, and improvements.

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القدرات الدفاعية لسلالات النحل السودانية

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ملخص البحث. لتقدير قدرات النحل الدفاعية، عرضت كرة من الجلد الأسود المعطر بأحد العطور القوية أمام مدخل طوائف النحل لمدة دقيقتين تم فيها تقدير السلوك التالي:

١ ـ الزمن اللازم لأول شغالة نحل تلسع الكرة.

٢ ـ الزمن اللازم لإثارة النحل بكثافة عددية كبيرة تجعله يرتطم بما حوله من جماد أو حيوان.

٣ ـ عدد آلات اللسع على الكرة.

٤ ـ عدد آلات اللسع على قفاز وملابس النحال.

٥ ـ المسافة التي تتابع فيها الشغالات النحال الذي يسير بخطوات ثابتة بعيدًا عن الطائفة بعد دقيقتين من زمن التجربة.

أجريت التجربة ثلاث مرات متتاليات على فترات كل نصف ساعة، وذلك خلال موسم فيض الرحيق.

أظهرت النتائج أن سلالة النحل السوداني (كوكو) أكثر شراسة بنسبة تصل إلى ٤١ ضعفًا من شراسة النحل القياسي الكرنيولي و ٥ أضعاف شراسة السلالة السودانية (دمازين).

استغرقت طوائف النحل كوكو ثلاث عشرة ثانية فقط لتصل إلى قمة شراستها بينما استغرقت طوائف النحل الكرنيولي ١٦٧ ثانية. أيضًا طاردت طوائف النحل السوداني (خصوصًا كوكو) النحال ضعف المسافة التي طاردته فيها طوائف النحل الكرنيولي بعيدًا عن مسكنها، وقد أدت هذه الشراسة في النحل السوداني إلى صعوبة فحص طوائف المنحل وإدارته.