

BIOLOGIE APICOLE

BIOLOGIE GENERALE

BIOLOGY AND MANAGEMENT OF AFRICAN BEES *APIS MELLIFERA ADANSONII* IN AFRICA

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Introduction

I have been working with the Africanized bees for 7 months in the region of Ribeirão Preto, Brazil in the period of 1957—1958. Mostly, the bees presented the cross between two races: the Italian *Apis mellifera ligustica* and the African one, *Apis mellifera scutellata*. During the last years I have been working with the African bees in several African countries. There are some clear differences between the African bee and the Africanized ones. The present study gives some observations conducted on the African bees, *A. m. adansonii*, in Ghana.

Abscinding

In many African countries the bees are kept in the Kenyan top bar hives. No doubt the most serious problem concerning the African bees is the tendency to abscond. This character hinders the introduction of a modern intensive management of the bee colonies. The bee colonies absconded even after the hive was opened for the search of the queen, but the queen was not removed. In another situation, bees absconded after a brood comb was taken twice for grafting the larvae for queen rearing, subsequently returning those combs. Twice it happened that bees absconded when a queen in cage was introduced to queenless colonies (one normal and the other one nucleus). Bee colonies also absconded when some bee brood or worker bees were taken away to create new small nuclei of bee colonies. Artificial multiplication of the bee colonies is perhaps possible during the swarming season, and absconding tendency may be lower during a better honey flow. Up to now, the phenomena occurring in the colonies before absconding were not described. However, it is very important to abscond as some steps may be undertaken to prevent this. It was found that bees, before absconding, eat most of their food reserves. But, most surprisingly, they eat all the larvae. They also open the sealed brood with white pupae and eat them. When a new comb with brood was introduced into the hive, the bees ate all the brood within two days. The queen also stops laying eggs. The colony waits few days until all or most of the workers emerge from the oldest dark pupae, and then it absconds. The youngest worker bees still cannot fly, and they are left crawling on the colony absconded.

After the colony was fed on sugar syrup, it was possible to induce the queen to start to lay eggs again. Suitable queen excluders fixed to the entrances also prevented the queens to abscond and the worker bees returned to their hives in several cases. But sometimes, the bees absconded and left their queen behind. Several times the bees did not uptake the syrup offered to them in a feeder inside the hive.

Determination of swarming or migration season

In the period of May — June, many empty hives were colonized. This part of the year was considered to be the swarming season. However, the nectar and pollen flow was so scarce that it was hard to admit that this was indeed the swarming season. Examination of 20 old and/or new colonies during the end of May and beginning of June revealed the absence of drone brood and adult drones, as well as the absence of queen cells. Consequently, this time of the year which was believed to be the minor swarming season was found to be the migration season. Compared to the swarming bees, migrating colonies must be managed differently. The latter requires more care and, if possible, should be fed with sugar syrup. Of course, queen rearing cannot be conducted during that period, but during the real swarming season only.

Split of brood or its improper position in the Kenyan top bee hives

Usually, the bees rear the brood in combs near the entrance and store the honey in combs far away from it. When the entrance is in the middle of the Kenyan top bar hives (KTB), honey is stored in the last combs on both sides of the hive, and when the entrance is in the front gable-wall, honey is stored in the last hind combs. In both the cases it is easy to harvest combs containing honey exclusively.

During the inspection of the bee colonies in Ghana it was found for several times that the combs containing some honey and pollen were located in the middle of the nest near the entrance, while the brood was reared in the last combs, on one or both sides of the nest.

In the beginning it was so believed that double entrances in the long side wall, found in some KTB hives, were responsible for this unusual placement of split of the brood nest. However later on, the brood nest was also found to be located in the rear of the hive, when the entrance was just in the opposite front gable wall. In this case sealed honey was located above the brood. So, it was impossible to harvest combs containing honey exclusively.

Later on was found that the reason for the improper place of brood rearing in the hive was the method of managing the bees. Honey is mostly harvested at night, from the last combs. The central part of the nest remains untouched. After several generations of bees are reared here, the remains of the cocoons make the combs very dark and the cells are too small to rear bees in them. So, the queen shifts egg laying into the new combs on both sides/or on the rear of the hive.

In order to get the brood nest in the proper position and honey in the last combs exclusively, the position of the combs must be rearranged by locating the new combs in the centre or near the entrance.

Start and end of flight activity

During the night, the worker bees create a small cluster in front of the hive entrance. It is still dark when the bees start to dissolve the cluster and fly out. Their behaviour differs from that during the day. The bees do not fly out directly from the entrance, but crawl at first up, on the front wall. In summer (June), during the rainy season, some bees start to walk out of the cluster at 5.00 to 5.10, when it is still dark. Some of the crawling bees start to fly out at 5.15, half an hour before the sun rise. Returning bees also land on the front wall and then walk to the entrance. In the meantime, it gets a little lighter. Records of the flight could be read at 5.30. The sun rises at 5.40 — 5.45. By then, the cluster before the entrance is dissolved, and the bees fly out and return to the hive directly from or to the entrance or the alighting board. At 5.45 returning bees are well visible and it is possible to start counting them.

In the evening, the sunset occurs at 18.20 — 18.25. Practically, around 18.35 the bees stop to fly. The last bees return when it is already dark, landing on the front wall of the hive and then walking to the entrance. At this time, the bees start to create the cluster before the entrance. At 18.45 is difficult to read records of flight and at 18.55 is so dark, that it is impossible to read anything.

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stinging during the dry season (13 January). Interaction occurs also between stinging and the season.

High variation in aggressiveness was found to exist between different colonies (mean 26—97 sting/min.). Very often bees from strong colonies stung more than those from the weak colonies. Thus, the absolute number of stings does not reflect the genetic potential of the character. Therefore, the percentage of stinging bees was calculated in relation to the foraging ones. The variation ranged from 31—192⁰/₀. Thus, in the most aggressive colony the number of stinging bees was twice as high as that of the foraging one. This percentage of aggressiveness should be used in selection of gentle bees.

After the conditions of the stinging bees were known and proper management was used, it was possible to work without any protection, without shirt and even without the smoke with the same colony, with which earlier it was impossible to work even with heavy protection.

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