THE ASIATIC HONEYBEE APIS CERANA

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The genus Apis consists of four species: the western Apis mellifera and three species that are found in Asia. Two species, Apis florea and Apis dorsata, are not "domesticated". They build their combs free on branches of trees or on rocks, and do not need a cave or a hollow tree for nesting. The habitat of Apis florea and Apis dorsata is restricted to tropical and subtropical climates, where these bees perform regular seasonal migrations.

APIS FLOREA

As Tirgari (1971) showed in South Iran, Apis florea, the dwarf honeybee, migrates within a small area and selects a nesting place according to the seasonal microclimate. In the region of Peshawar and in Sri Lanka we made similar observations. In the colder time of the year nests are found in places protected from wind, whereas during the hot season they are found in places protected against the sun. The honey of Apis florea is considered to be most valuable for the composition of various balsams and other remedies. When collecting honey the people take the whole comb or, in some regions, only the upper part of the comb; the bees then remain on the lower part which contains the brood. Economically the honey production of Apis florea would not seem to be very important, but it can be assumed that Apis florea plays a significant role in pollinating certain plants.

APIS DORSATA

Apis dorsata, the giant honeybee, is important in the honey production of India and other countries of Asia. One comb contains between 10 and 50 kg honey, according to the season. For honey collection, during darkness a fire is lit under the comb, and the bees are killed. In daylight the handling of an Apis dorsata colony may not be possible because of this bee's efficient colony defence (Koeniger, 1975). In many regions of Asia, Apis dorsata performs migrations over a distance of several hundred miles. Very often the bees follow the nectar flow, and gather at places with a rich seasonal flowering period.

APIS CERANA

Apis cerana is very similar to the European honeybee Apis mellifera. It is found in Asia not only in tropical and subtropical areas, but also in colder climates such as Siberia, North China, and the higher altitudes of the central Asian mountains. The natural nesting sites of Apis cerana are hollow trees and caves.

Morphologically this bee can be distinguished from Apis mellifera very easily. The venation in the hind wing shows a significant difference. Further, there is a tomentum at the last tergite of the abdomen, which is not
There are also some differences in the behaviour of Apis cerana. The position of the fanning bee is opposite to that of mellifera: the abdomen of Apis cerana is directed to the hive entrance, the mellifera bee fans with the head to the entrance. In colony defence Apis cerana shows such specific behavioural patterns as hissing and body-shaking, which are not present in mellifera (Koeniger & Fuchs, 1975).

Traditionally Apis cerana is kept by man in clay pitchers or logs. In some regions in the Swat Valley (North-West Frontier Province, Pakistan), Apis cerava commonly nests in the walls of the houses, where people leave a space for just this purpose.

During recent years modern methods of beekeeping have been introduced and practised with Apis cerana. In Pakistan, northern India and China the bees are kept in Langstroth hives on movable frames. In southern India (Poona), Sri Lanka and other tropical areas the hives used are of a similar construction, but smaller. The honey yield per colony differs locally over a wide range. In northern Pakistan and Kashmir a honey yield per hive of around 20 kg per year is reported, while in Sri Lanka and other tropical areas an average of 5 kg per year seems to be a good yield; compared with Apis mellifera yields, these values are quite small. The main reason for the smaller honey yields of Apis cerana seems to be its intensive swarming behaviour. The tropical forms of Apis cerana, especially, show a remarkable tendency to swarm. As soon as a colony reaches a population of around 20 000 bees, swarming will start, and very frequently large numbers of swarms will be produced. In the sub tropical climate of northern Pakistan an average of eight swarms per colony was reported. The size of the swarms is remarkably small; we have calculated that some swarms have no more than 2000 bees and one young queen.

Swarming has to be understood as a result of natural selection. Under tropical and subtropical climatic conditions, survival of small swarms is possible, and bees therefore use their honey stores for colony division. Even beekeeping management selects bees which have a strong swarming tendency; most private beekeepers - and also some government beekeepers - increase the number of their colonies by catching swarms. At some places, as in Tarnab Research Institute in North-West Frontier Province, beekeepers have started artificial queen rearing, but taking queens only from colonies which showed a low tendency to swarm. One of these queens was given to every swarm that was caught. Within five years it proved possible to breed bees which showed a significantly lower swarming activity.

Another problem that is especially notable with tropical forms of Apis cerana is absconding. The bees leave the hive and combs if the season is unfavourable. In northern Pakistan absconding is avoided easily by transporting colonies to places with a sufficient nectar flow.

Comparing the tropical and northern races of Apis cerana, we find a situation similar to that with Apis mellifera. Honey production is higher in a temperate climate with the native bees, whereas in a tropical climate honey production is very low.

**IMPORT OF APIS MELLIFERA TO ASIA**

In the past many attempts have been made to import Apis mellifera to Asia, but most of these experiments were a failure. The northern mellifera bees are not adapted to the various natural enemies of honeybees. In Pakistan and Kashmir for example the hornet (Vespa orientalis) destroys the colonies; in Sri Lanka it was observed that all mellifera bees were
caught by bee eaters (Merops). In other parts of Asia it has been reported that Apis cerana robbed mellifera colonies. At other places, where the mellifera colonies were protected against predators, it was observed that all virgin queens failed to mate during their "mating" flight, and we can guess that the mellifera drones were prevented from copulating with the queens by the competition from drones of the other honeybee species (Koeniger, 1976). Nevertheless, at some places in northern India, Apis mellifera seems to survive.

In consequence of this situation some might consider it useful to import a tropical race of Apis mellifera, but I want to stress that this would be a very hazardous and risky project. In the light of the sequence of events in South America, it seems possible that a tropical Apis mellifera could irreversibly damage the fauna of Asia, and indeed the consequence of such a step cannot be calculated. On the other hand, data on the interspecific competition between the species of Apis can be of great practical value. But these data must be obtained under strictly controlled conditions, for example on an island, and everything must be avoided which could lead to the introduction of a new honeybee species to any tropical territory where it is not now present.

REFERENCES


--------- (1976) Interspecific competition between Apis florea and Apis mellifera in the tropics. Bee World 57(3) : 110 - 112
