PROFITABLE BEEKEEPING WITH APIS CERANA

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I am reporting my progress since the article Restoration of Apis cerana japonica on the Goto Islands was published in BDJ 85, December 2007. In that article I described how I reintroduced Apis cerana to four Japanese islands where indigenous honey bees had become extinct after World War II. I traced all the families that had kept the bees on these islands before the end of the war, and described causes for extinction of Apis cerana.

Immediate results
To produce enough bees for the islands, I invented a device to protect bees from attack by the Asian hornet Vespa mandarina and I put it on all my hives. Consequently my colony numbers doubled every year and I had enough to transfer 50 colonies to the Goto Islands in 2008.

On each island the bees rapidly increased in numbers and people decided to take up beekeeping as their occupation. They realised that beekeeping with Apis cerana was more lucrative than with Apis mellifera, because the Apis cerana honey sells at four times the price of Apis mellifera honey.

Advantages and disadvantages of Apis cerana
Apis cerana suffers from hardly any disease. It is not necessary to administer medicines to the bees and the honey is free from residues of any unnatural chemicals. Apis cerana is resistant to attack, is docile, a good pollinator and produces delicious honey. Also you need less beekeeping equipment.

There is one disadvantage with Apis cerana: their radius of foraging activity at 2 km is half that of Apis mellifera. This means that a colony covers only a quarter of the area covered by Apis mellifera and therefore one colony of Apis cerana produces one quarter of the honey produced by an Apis mellifera colony. I do not think that this is necessarily a disadvantage. If you have four times as many colonies you will get the same amount of honey as from Apis mellifera. For example, one island produces a certain, total amount of nectar. Both species of honey bees collect the same amount of nectar from the island. The price of honey from Apis cerana is four times that of Apis mellifera. If you use Apis cerana to collect the nectar, you will harvest the same amount of honey but four times the amount of money!

Some say that Apis cerana readily abscond. I say that they hardly abscond without reason. The beekeeper’s thoughtlessness causes this absconding and I rarely experience it with my bees. I will explain how docile Apis cerana is. The bees make friends with humans and they never sting their friends; I never wear a bee veil even when I harvest honey. A smoker? No, I never use one.

Apis cerana has a language that you can learn if you live with them for a time. I now understand around 20 expressions. Apis mellifera also has a language, but I understand only 10 expressions in their vocabulary.
Apis cerana flies without making any sound. If you hear a hum, the bees are saying something to you and their sisters. You will notice that after they become your friend, they are silent as they pass you as they go out and come back into the hive. When Apis cerana are attacked by Vespa mandarina, they come to you and beg for your help. They hum and alight on your shoulder. If you doubt that insects do such a thing, keep Apis cerana yourself!

Differences in behaviour

Apis cerana bees face upwards when in a cluster and do the same when working on honeycombs. Apis mellifera face downwards. There are other differences in behaviour between the two species. Apis cerana’s ‘forearms’ seem to be stronger than those of Apis mellifera, and will hang in a cluster with the weight of the others hanging below. Apis cerana catch and confine hornets with their strong ‘forearms’ forming a ball of bees around the hornet and killing it with heat (see picture overleaf).

Box pile hives

For 20 years I have been searching for the best hive for Apis cerana. I have collected many types of hives, and pictures of hives, from all over Japan and the rest of Asia. I built hives and tested them with my bees. I believe now that the best is the ‘box pile hive’ or ‘multi-storey hive’ that is a traditional, Japanese style of hive. It consists of 3-4 piled up boxes with the internal dimensions of each box at 25 x 25 x 15 cm. The hive has a lid, and floor with entrance and a number of boxes. I am certain that I have arrived at the best dimensions for the box pile hive.

Unlike Apis mellifera, Apis cerana lays eggs in newly built cells, and you have to keep giving them room to extend the combs downwards. Box pile hives are a good solution, because you always can add a box to the bottom of the hive.

Hives with movable frames are a further development of the box pile hive. Many of them are in use in Iki Island where the nectar flow is abundant all year because beekeepers grow forage plants to flower continuously. The bees are spared the job of rebuilding honeycombs and so they collect nectar more quickly.

*The box pile hive is similar to the Abbé Warré hive – a simple hive in which bees build their combs attached to slats across the ceilings of the box. No frames and no foundation. Slots enable the bees to move between boxes [Ed]

For more on hive designs see the Information Portal of the BfD website
Apis cerana evolved in monsoon forests using hollows in tree trunks for nesting, i.e. vertical cylinders. This means that the best hives for Apis cerana are vertical and long.

Islanders’ efforts to become professional beekeepers
Iki Island is the most successful of the four islands, and where we tried to create professional beekeepers. Eleven people started keeping Apis cerana japonica, each with two hives that I gave them in 2007. By spring 2009 some of them had 30 colonies and harvested 500 kg of honey with an income of about JPY5 million (US$55,200; €40,000). They anticipate having 100 colonies in 2010, with beekeepers each harvesting one tonne of honey.

The beekeepers are cultivating neglected fields for forage sources and creating new apiary sites. They plan to grow buckwheat and rape seed, and by planting seeds continuously, nectar sources will be available throughout the year. More people are interested to start beekeeping and they plan to create a union of entrepreneurs.

Success factors for professional beekeepers
Ensuring sufficient forage is the most important issue for beekeeping. Indigenous trees are thriving on Iki Island and the scent of their flowers drifts all over the island in the swarming season. However, beekeepers cannot depend solely on the natural nectar flow, and it is necessary to plant other nectar sources like buckwheat, rapeseed and annual vegetables. Iki Island is depopulated like other islands of Japan and there are many neglected fields. Fortunately, most of the members are farmers and they can rent other fields for almost nothing.

In Japan we have two periods in the year: dry and wet seasons. The humidity in the dry period is 45%, and can reach 75% in the rainy season. The bees are unable to condense their honey sufficiently at this time and the honey, if harvested, will ferment and cannot be served on the table. It must be stored in a refrigerator to prevent fermentation. Apis mellifera beekeepers heat the honey at 50°C for three hours to kill the fermenting yeast.

Iki Island beekeepers have sought ways to reduce the water content to below 20% without heating. They found a way to extract the water from the honey using a desiccant. This discovery has enabled them to harvest honey at any time it fills the hive. You do not have to feed the bees with sugar syrup and you can harvest every 45 days.
Apis cerana is one of eight honey bee species indigenous to Asia. Apis cerana naturally nests inside cavities and therefore can be kept in hives.

Apis mellifera is the (only) honey bee species indigenous to Africa, Europe and the Middle East. Apis mellifera has been introduced world-wide and provides the basis for beekeeping industries in many countries.

Usually the ‘doors’ are closed and bees use the 6 mm entrance provided.

Interior of a box pile hive

One box showing the wooden slats under which the bees construct the comb.

Ready for harvest

Mr. Masahiro and his box pile hives in his apiary on Iki Island

Apis cerana catch and confine hornets with their strong ‘forearms’ and kill them with heat by ‘balling’ the hornet.

Further reading

BfD Journal 85 Restoration of Apis cerana japonica on the Goto Islands
BfD Journal 61 Mono Block Clay Hive for Apis cerana
BfD Journal 54 Effect of Apis mellifera on indigenous plant and animal species in Japan
BfD Journal 30 Apis mellifera versus Apis cerana in the north of Thailand
BfD Journal 26 Genetic diversity in Apis cerana