BEEKEEPING IN VIETNAM

by **Vincent Mulder**

All over Vietnam's long-shaped country beekeeping is an important economical acitivity. However, because of the variety of ecological and climatic conditions, every area has its own beekeeping system. There are various beekeeping or honey hunting traditions in each area; different levels of beekeepers' organisations (from local bee-hunters groups to nationwide migratory beekeeping units), and, perhaps most importantly, at least four different honeybee species, as well as stingless bees. In order to illustrate the variety of beekeeping systems in Vietnam, reports by five beekeepers working in various parts of Vietnam are summarised below.

Exploiting rafter bee nests of *Apis dorsata* in southernmost Vietnam by Mr Tran Cong Ta

Apis dorsata, locally named "rafter bee", "tree bee" or "giant bee", is endemic to Asia. It has a single comb nest, which hangs from a sloping branch of a tree. During each honey flow, three harvests can be obtained, each of 5-10 kg of honey per colony. Many unsuccessful attempts have been made to contain *A. dorsata*: shortly after hiving them in a wooden box, glass box or netted box, they abscond.

In the southernmost two provinces of Vietnam, Minh Hai and Kien Gian, *A. dorsata* nests are exploited by tempting the bees on to man-made rafters. This is traditionally practised in "Tram" forests, characterised by a high density of low trees (*Melaleuca leucadendron*) in marshy land. Many collectives specialise in raftering bees, called "phong ngan", each collective consisting of 30-50 households that rely for much of their income on the harvest of honey and wax. In 1979 these collectives harvested 150 tonnes of honey. For raftering suitable places are selected in the *Melaleuca* forest. Two stakes are driven into the ground, one being about 2 m high and the other about 1.2 m. A long wooden bar of 2.2-2.5 m (the rafter) is put on top of the stakes, at a slope for water run-off. The bar is a piece of trunk from *Melaleuca* or *Areca* palm, which is odourless, impervious to water and of 10 cm diameter. The trunk section is split into two parts with the flat side uppermost and the curved side down. The higher extremity should be in the sun.

In this way one household makes up to 100 rafters for tempting *A. dorsata* swarms, and experienced bee tempters find 80% of their rafters accepted by bees as a good nesting place. There are two main harvests of honey and wax each year, the first, called the "dry harvest" is between November and April: in this period the honey is more condensed, aromatic and tasty. The second harvest period called "water harvest" begins in May and ends in July. The honey then is watery and a little acid, but even in times of dearth there might be some harvest. At each harvest local people try not to kill bees, but smoke them gently for temporary chasing with *Ficus* root. Most of the comb is then cut off, but both honey and brood is left on the upper part of the rafter to which the bees return and rebuild their nest.

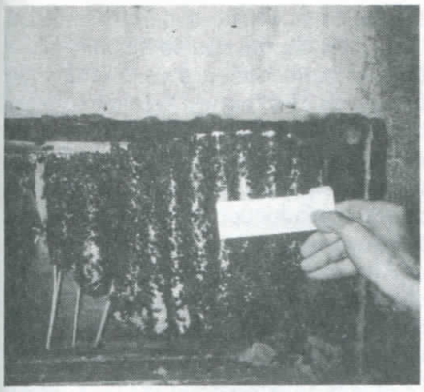
At the end of the honey flow when the comb gets darker the colonies will abscond and move to other regions where flowers are available, eg to the seaside mangrove forests. Next season they will return to the old sites. Unfortunately, due to huge deforestation practices everywhere in the country and even in the marshy *Melaleuca* zones, this *A. dorsata* honey resource becomes less and less.

The next report is of an Apis cerana beekeeper in Hau Gian province, Mr Duong Quang Thua:

The width of a frame bar

It is a fact that when an *Apis cerana* colony is attacked heavily by wax moth larvae, destroying non-covered parts of their brood combs, such a colony is sure to abscond. From my observations on four colonies I concluded that the width of the frame bar and the spacing between two bars play important roles in controlling absconding of *A. cerana*.

Observation 1: One day in September 1988, when I inspected my empty hive stock (some still filled with old frames) that I had carelessly piled up



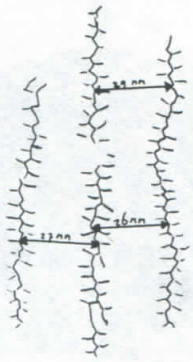
in a hut behind my house, I found two swarms in boxes. These swarms were quite different in size and shape and had already made three to four combs each. The combs were built across the old frames in the hives. Curiously, the nests were thriving, although wax moth larvae were eating old combs nearby.

As I discovered these colonies I took two clean empty hives and new frames of which the top-bar width was 3 cm, with spacing nails of 0.5 cm on both sides. Then I transferred these two colonies to the new hives by cutting their brood combs and attaching them into the usual-sized *A. cerana* frames (used especially in the northern region of our country) of 21 x 41 cm. After three weeks these colonies absconded, leaving behind their combs infested by many wax moth larvae.

Observation 2: In July last year I worked with my colonies that were in a front yard of a farmer's house for collecting citrus honey. The farmer's son showed me an *A. cerana* swarm he had collected last year and put in a large wooden box about the size of a Langstroth hive, containing six frames. He asked me to help him in arranging the colony so that it could be managed, as it had given off many swarms while he could not inspect it. When I took off the cover board I saw what he meant: he had cut the six frames himself, with a top-bar averaging 3.5 cm. The bees had built their combs across these big frames, at some places sticking together. But certainly this colony was strong with big combs. Because of the large size of these combs, that did not fit my *A. cerana* frames I decided to re-use the big frames in the box. Most of the large brood combs I tied to the top-bars, leaving out two old pieces of comb containing over one litre of honey. Ten days later I inspected this four comb hive and found wax moth larvae in unoccupied parts of comb. This phenomenon supports my idea that the width of the frame bar is essential for controlling wax moth larvae in *A. cerana* combs. When the space between two combs is too wide the bees have difficulty in controlling nest warmth, and therefore they group together in the centre to keep warm, leaving the edges unoccupied. The same occurs when colonies become weaker in the dearth periods, and the number of bees decreases; then they are likely to abscond.

Observation 3: another swarm is in an old empty hive box in front of my house, that I left untouched for two months. In the hive box brood combs are built at random across the old frames and underneath the cover board. Sometimes I tried to lift off the cover to study the colony's development and it looked a mess inside. Recently I saw drones coming out of the hive, so I transfered the nest by cutting the wild combs and sticking them in 2 cm wide frames. At the same time I split the colony into two, with a natural queen cell in one. Now I have two nice colonies. After I had transferred the combs out of the wild nest I made measurements of the distance between the attachment of the comb centres on the cover board. This average distance seems to be 22 mm ±1 mm. Similarly I made some base prints of an *A. cerana* swarm of a gentle colony with big yellow workers, that was originally brought from the north of our country in 1982. Surprisingly we can see that the bees themselves indicate that they need a wider comb spacing: the average comb space here seems to be 27 mm.

Finally I want to report a very strange, though lucky phenomenon: for some years I have suffered from a disease called goitre caused by iodine deficiency. I myself was very much depressed because I thought it was a



cancer tumour in my neck. Anyhow, I tried to cure it myself in many ways, but nothing could diminish the tumour until one evening I started to pick up paralysed bees that were falling down dazed by the heat lamp in my house, after which I let them sting my neck at the place of the tumour. After doing this for a few evenings a week I could see that the tumour diminished. By now, one year later, there is nothing left of the swelling. For me that was the reason to start using this cure in the village where I have my new apiary. Many young women had the first signs of swelling in their necks. Now I have 12 patients of whom seven are now cured. Total sting shots per patient for curing: 80-100; daily shots: 2-4. My assistant now continues the treatment with the five remaining patients. Could anybody tell me about similar effects of bee stings? Please write to this *Newsletter*.

And now the story of a migratory A. cerana beekeeper, based in the north of Vietnam, but migrating every year more than 1000 km south for spring harvests:

Report of the Hai Hung Beekeeping Group of Dong Ket apiary on bee management and honey production in south Vietnam *by* **Mr Can.**

In the evening of 7 November 1988 a group of beekeepers left Hai Hung province for the south with 212 bee colonies and a total of 620 combs (*A. cerana*).

The 11-day travelling that followed was tiresome and full of difficulties. The bees were transported by a truck already overloaded with iron. Because of the too-heavy freight, the wheels were often flat and the truck went very slowly. In addition the travel duration and the arrival date were not clearly determined in the transport contract, so the driver felt somehow happy-go-lucky. At last the colonies arrived at the destination on 18 November at 1200. After inspection 48 colonies with 162 combs had died of suffocation; the surviving colonies were seriously weak: 90% of the brood combs were empty, without eggs or larvae, many colonies were of a one-comb population. One week later it

appeared that 40 one-comb colonies had to be united as they were too weak because queens had lost their egg-laying capability. By 25 November the colonies totalled 158 with 327 combs. Thanks to the *Mimosa*, which was still flowering, colonies gradually became stronger. In these favourable conditions, queens were reared as soon as possible, for brood rearing. Furthermore a number of colonies needed to be united and colonies were multiplied to three combs each (normally four combs each colony). After that the two first batches of queen-rearing and colony multiplication were well implemented and successful: 85-90% good quality queens. But the queens reared by 10 January and 18 January 1989 were bad with only 30% of good quality. The building of new combs was combined with queen rearing and colony multiplication, resulting on 9 February in a total of 260 colonies, with 943 combs. As for supplementary feeding, from 20 November to 25 January 335 kg of sugar were invested. Sugar was fed after the settling and, later on, to colonies that were building new combs. Up to now (20 March 1989) six harvests have been made. A total of 3590 kg of honey has been obtained averaging 3.5 kg/comb. All colonies are strong and healthy and many combs are newly built. This contrasts with neighbouring *A. mellifera* apiaries, where the colonies become weaker after the start of the honey flow from *Hevea* trees (15 February). In *A. cerana* wax can only be be harvested from the cappings of honeycombs and some supplementary combs. The quantity is low: after six harvests 18.5 kg of wax were obtained. After *Hevea* honey production bees will be migrated to the Mekong delta region for harvesting longan honey. *A. cerana* is very fond of this nectar.

And now some findings of professional A. mellifera beekeepers, who work in the central southern region of the country:

Some experiences in the structure of bee colonies for higher yield and better honey quality, by supering and more efficient bee management *by* **Mr Tran Thanh Can and Mr Cong Du Dien.**

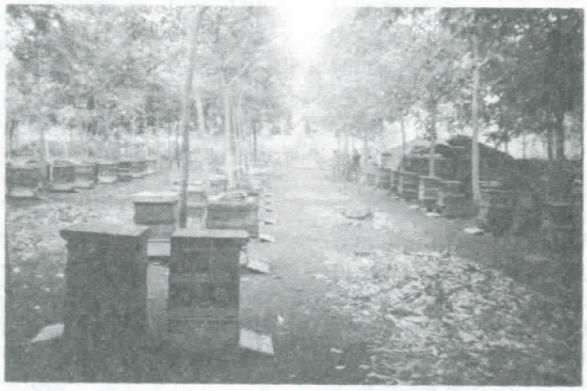
In November 1987, with the assistance of the Dutch Committee for Science and Technology for Vietnam, we conducted a programme of experiments for improving the honey quality. From the experiences obtained since then we would like to present some findings and observations:

During the period from October to January, prior to honey harvest, there is plenty of pollen and nectar making conditions favourable for queen rearing and colony multiplication. But the results depend very much on the beekeepers' investment capability. At the end of December beekeepers must select strong and healthy colonies for honey production that will be supered from that time. New combs should be built for the bees to store honey, thus ensuring the transparency of honey. Weaker colonies become supporting colonies, one for each supered colony, out of which combs and bees will be used to strengthen the production colonies until these have two supers.

The biological control of *Varroa jacobsoni* and *Tropilaelaps clareae* should be thoroughly practised by confining infested brood combs in queenless hives (only queen cells present), and trapping mites on drone combs with larvae. Chemicals should be **absolutely avoided** because bees and human consumers are very sensitive to any residues, which cannot be seen.

If pollen combs are abundant, surplus can be stored for future use. For longer and better conservation, dry sugar can be sprinkled on the open cells.

From 10 January supering can begin and production colonies should be strengthened with brood combs from supporting colonies. So, starting from 20 January, empty combs become available in the supers ready for honey storage, and from the beginning of February we have a mighty force of workers ready for the honey flow that starts about 10 February. After supering, royal jelly may be produced in the supers (providing queen excluders are available).



Honey harvest should only be done on sunny days, because high air humidity will dilute the sealed honey quickly: honey should only be extracted when at least 50% is sealed, and only from supers. Attention should also be paid to the cleanliness of honey extraction implements and honey tanks. The result of such management is that honey will be very transparent and of low water content (17-19%). Moreover sugar feeding before the harvest period can be reduced due to supering. The quantity of honey harvested will be slightly reduced compared to the old method without supering, but the quality of the honey is much higher.

The last report is taken out of an interview with traditional beekeepers on Cat Ba Island along the north east coast of the country. The beekeepers are Mr Thach and Mr Dien:

Traditional beekeeping techniques

Mr Thach started beekeeping years ago using horizontal log-hives made of hollow tree trunks. Starting with two such hives he found that the island is very good for bees, with three harvests every year. Like many other farmers on the island they go to the mountainous areas or far north on the mainland in Quang When bees fly back to their nests in a straight flight, then the nest is nearby (less than 1 km distance). If they fly first in small circles the nest is farther away. When they find a nest they use smoke to

clear bees off the combs. If possible they cut out all the combs, but try to re-attach the brood parts again.In cavities this can be done quite easily by putting forked sticks under the brood comb. In this way the honey collector can return to this nest next season for another harvest. Sometimes they are able to catch the whole colony. If so they Ninh province. They go for honey collection from *A. cerana* colonies hidden in small caves in the rocks. When they return home they always take some captured colonies with them, which they put into hollow trunks placed near their houses on low stands. To find the bees' nesting places, they watch foragers and they try to see where they fly to. The best time of day is 1400 hours. Sometimes they try to discover the nest site by using a little honey; the direction that bees fly after feeding is a guide to nest direction. try to catch the queen and bind a hair around her wing and put her in a piece of cloth or a jacket. When the whole colony has gathered around her they take it home.

Honey collection from *A. dorsata* happens in the same way, but they never try to take such a colony home, as they would abscond immediately. They collect only the honey comb, and visit it three or four more times for further harvests. For two years Mr Thach has put the *A. cerana* colonies in upright trunk hives. Each comb is attached to a top-

bar with a piece of string. On the top there is a stone cover, or planks. In this way honey harvest is much easier; from each bar he can cut away the honey part and re-attach the brood comb. He has learned this method with top-bars from other beekeepers on the island.

Mr Dien has kept bees, as sideline work, for 20 years. He learned from his father. Unlike other beekeepers he does not clip the queen's wing to prevent absconding as he fears that she may not then go for a mating flight. Feeding bees is not a common practice among the beekeepers in Cat Ba, but at every harvest they leave enough honey for survival during the dearth period. In wintertime they cover the hives with straw and mud.

If you are interested in the beekeeping programme in Vietnam, or want to correspond with any of these beekeepers, please write to: Committee for Science and Technology for Vietnam, IMAG, c/o Mr Jaap Brands, PO Box 43, 6700 AA Wageningen, Netherlands.

Apis andreniformis

This is a small honeybee, found in south-east Asia, which to the naked-eye appears very similar to *Apis florea*. However a recent paper by a multinational group of authors* confirms that *Apis andreniformis* is a species in its own right. This conclusion is based on studies which revealed differences in the endophalli of the two types, suggesting that mating between them would not occur. Other differences were in the structure of drone hind legs and worker bee venation. Previous authors have also detected biochemical and behavioural differences between the species.

It is known that *Apis andreniformis* exists at least in Thailand, Malaysia, Borneo and the Southern China peninsula. Past publications concerning *Apis florea* must now be reconsidered in a new light.

* Wongsiri,S; Limpipichai,K; Tangkanasing,P; Mardan,M; Rinderer,T; Sylvester,H A; Koeniger,G; Otis,G (1990) Evidence of reproductive isolation confirms that *Apis andreniformis* (Smith 1958) is a separate species from sympatric *Apis florea* (Fabricius 1787). *Apidologie* 21: 47-52.

How many *Apis* are there now?

Apis cerana, Apis dorsata, Apis florea and *Apis mellifera* are well-known. *Apis vechti* reported in ***Newsletter 12***) is now referred to as *Apis koschevnikovi**. Whether *Apis laboriosa* really is a separate species from *Apis dorsata* is not yet clear (although many believe it to be so) with *Apis andreniformis* (above), *Apis* species now number at least seven.

* Ruttner,F; Kauhausen,D; Koeniger,N (1990) Position of the Red Honeybee, *Apis koschevnikovi* (Buttel-Reepen 1906), within the Genus Apis. *Apidologie* 20: 395-404

Pseudoscorpions

Pseudoscorpion, a member of the arachnid family, was first documented in hives of the Indian honeybee *Apis cerana* in 1947 but had been observed in hives in Kashmir many years before. A specimen of pseudoscorpion collected from comb of an infected colony was sent to Rothamsted Experimental Station in the UK for identification by Dr M F Allen. Pseudoscorpion is dark brown in colour. It is easily detected because of its long body size (3.5 mm) and prominent pedipalps. They are found inside hives on walls, combs and bottom boards and are completely harmless to honeybees.

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