

Beekeeping & Development

the journal for sustainable beekeeping September 1999 - No 52

Todas and Honey
Revival of *Apis cerana*

Special Issue from
India

bee-diversity across a tropical tract

honey bees & people in india - an overview

by Pratim Roy

Apiculture in India is diverse. From commercial beekeepers in Himachal Pradesh to local honey collectors in the hills and forests of Tamil Nadu to migratory beekeepers of Kanyakumari - they all practice some form of beekeeping. Tools, techniques and associated traditions in honey bee rearing vary from region to region. There are several honey bee species which are exploited by communities. Given below is a brief description of honey bees across the Indian subcontinent.

Apis cerana

These beekeepers are found across the breadth and range of the country. There are rural beekeepers in the high

mountains of the Himalayas who keep log hives in house walls and rivetements. Each family typically owns half a dozen bee-logs and honey combs are only removed for local consumption.

Beekeeping with *Apis cerana* has been a growing industry in the central parts of the country with the Central Bee Research & Training Institute and the Khadi & Village Industries Commission, located at Poona & Mumbai, respectively. The hills of



Log hives for *Apis cerana* in the Himalayas

Mahabaleshwar located in Maharashtra were the pioneering areas for beekeeping training and experiments.

REGION/AREA	STATES	VEGETATION	MAJOR BEES SPECIES
I - Himalayas	Jammu & Kashmir, Himachal Pradesh, Punjab, Uttar Pradesh	mountains, foothills, agriculture lands	<i>Apis cerana</i> , <i>Apis dorsata</i> , <i>Apis laboriosa</i> , <i>Apis mellifera</i>
II - Central India	Bihar, Madhya Pradesh, Maharashtra	dry, scrub forests	<i>Apis cerana</i> , <i>Apis dorsata</i> , <i>Apis mellifera</i>
III - Desert	Gujarat, Rajasthan	deserts	<i>Apis florea</i>
IV - Eastern Coast	West Bengal & Orissa	mangrove forests	<i>Apis cerana</i> , <i>Apis dorsata</i> , <i>Apis mellifera</i>
V - North East	Assam, Arunachal Pradesh, Meghalaya, Tripura, Nagaland, Manipur, Sikkim, Mizoram	hills	<i>Apis cerana</i> , <i>Apis dorsata</i> , <i>Apis mellifera</i>
VI - South	Andhra Pradesh, Kerala, Tamil Nadu, Karnataka	hill areas, forests	<i>Apis dorsata</i> , <i>Apis cerana</i> , <i>Apis florea</i> , Dammar bees

Beekeeping is a traditional industry in West Bengal and some North Eastern states like Arunachal and Sikkim. In Karnataka & Tamil Nadu - there is a strong tradition of beekeeping with *Apis cerana*. Areas such as Coorg in Karnataka & Marthandam in Tamil Nadu are famous for their beekeeping culture. In Kerala, especially in the rubber growing areas, beekeeping is a regular activity and large quantity of honey (from extra floral nectar) is being produced.

Apis dorsata

The giant rock bees are found in large numbers in the Himalayas. In higher reaches, *Apis laboriosa* is found and in the lower areas of the Terai (foothills), *Apis dorsata* is commonly found. Huge quantities of honey and bees wax are sold to wholesalers from towns in this region.

In the central parts of the country - honey yields are substantial from *Apis dorsata*, primarily due to good forest patches in and around sanctuaries & protected areas. *Apis dorsata* collectors are mainly tribals. Honey for health and Ayurvedic medicines has been a traditional industry in this region.

The mangrove forests of the Sunderbans are an excellent habitat for *Apis dorsata*. The entire southern region is rich in *Apis dorsata* populations - contributing to a large share of the total Indian honey



Apis dorsata on trees

market. In Andhra Pradesh, farmers & honey hunters in the hills of the Eastern Ghats collect honey. Significant quantity of honey is passed on to traders. Intricate technologies and practices have been going on since a long time. Honey hunting is done on rocks and trees. Any accurate estimates of the

number of honey collectors is not available.

Apis mellifera

Commercial migratory beekeepers with *Apis mellifera* are steadily increasing in the northern hill state of Himachal, the plains of Punjab, Bihar and Madhya Pradesh. Rich bee farmers come in trucks bringing hundreds of colonies of *Apis mellifera* to apple orchards for pollination business in Himachal Pradesh. They move up the mountains during summer and come down to plains for placing the bee hives amongst eucalyptus and sun flower during winter. The introduction of *Apis mellifera* is going on at a good pace in West Bengal.

Apis florea

Huge quantities of *Apis florea* honey is collected, commercially, from the dry Kutch belt adjacent to Rajasthan. Approximately 1,000 tons of honey is collected from this bee, in this area alone.

Honey Production

An interesting parallel can be drawn with North - South beekeeping. At both ends there are large beekeepers, practising migratory beekeeping - one with *Apis mellifera* the other with *Apis cerana*. Both these sectors have developed strong beekeeping cottage industries and today have power to influence local authorities in areas of pollination policy and honey production.

"Honey production in India is only about 27,000 tonnes a year and a major portion of this is obtained from *Apis dorsata*, though the share of apiary honey is increasing every year. At present, it is estimated that about 9000 tonnes of honey is produced from

six hundred thousand colonies. Only about 20-25 per cent of the bee flora is being exploited at present." (Mishra, R.C, The Hindu Survey of Indian Agriculture, 1999).



Migratory beekeeping with *Apis mellifera*

Importance of Diversity in Apiculture

Unlike many other countries where development in beekeeping has been unipolar, in India, due to the diversity in flora, topography and activities of people, beekeeping and management is diverse. In this country, beekeeping has been adapted to various ecosystems, socioeconomic profiles and habitat preferences. The need for modern science and technology is to understand this age old traditional system and provide useful inputs for relevant modern apiculture.

Rural beekeeping has a role to play as not all can become commercial beekeepers. This rural sector needs to be enhanced by appropriate tools, support systems and bring them to the forefront. It is this informal sector which is providing up to 70 % of the honey & bees wax market in India. Apiculture needs to retain its diverse characteristics - better and more imaginative systems need to be designed for standardization, quality control and marketing. Apiculture is an area with significant backward linkages and potential for a very high value high volume market.



marketing of honey and bees wax

by Mathew John

Importance and Relevance

Marketing is fast becoming an integral part of many income generating projects. It assumes importance especially in today's context as a means of becoming self reliant. Also, income generating projects cannot be supported by funding agencies indefinitely if they do not turn into economically viable units. However, marketing in a development context is not easy. There are dilemmas that need to be addressed constantly. There is one definite limitation - it is not an end but a tool to achieve other important objectives. That makes the effort more challenging and interesting.

For development organisations, it is all the more a key responsibility as we have decided to make an intervention in the lives of producers. Most of them are small groups of artisans, tribal communities or farmers who are extremely vulnerable.

The Experience With Honey

Since our primary group was the honey gathering community, honey was the first product that we started with. Some of the crucial things we had to keep in mind - the community, their environment, conservation of habitat, skill and tradition and crucially, a fair deal for the primary collector.

Our initial effort was to explore the local market and build upon it. It gave us a few advantages:

- they understood the value of good quality honey
- we did not spend unnecessary money on logistics to try and sell the honey at faraway places

It is very crucial to understand that profit margins cannot be very high initially as we are moving low volumes and we cannot recover all our costs immediately.

A very important step that we took was going in for a bank funding for the project. It meant standing upto a rigorous scrutiny but also meant that the project could be an economically viable enterprise. Initially, there was a high amount of energy that had to be put into providing information about the honey (even today, the effort has to be on). The honey was different - in packaging, in taste and aroma. The crucial thing was that it was priced reasonably. Locally, we started attracting a regular group of customers who prefer this 'different' honey.

Bees Wax - Value Addition

There was no tradition of collection of bees wax after the honey was extracted. After realizing that they could get good prices for wax, the tribals brought this to us, too.

Here, value addition played a key role as we made different kinds of candles. This was an item where the supply was limited and had a high value. Though the candles were made, there were a number of problems that cropped up in quality control. Persistence in finding solutions at each step has ensured that candles gives us an extremely high return. Today, the product is marketed as a niche product.

The few points below sum up the experience that we have gained over the past five years. However, the road does'nt end here - it is a learning process continually.

Advantages

1. Can be more sensitive to market demands and changes
2. Response can be much faster

3. Adapt products to local tastes
4. Value addition to ensure higher returns
5. Unique products which can have a distinct identity

Disadvantages

1. Economies of scale are difficult
2. The intensity/amount of effort might not be justifiable - packaging, marketing, meeting local government regulations, etc
3. The overheads are too high
4. Failure of crop or disruptions in production and supply can effect consumer confidence
5. Impact of sophisticated technologies is not appropriate
6. Lacking standardization in most products
7. Danger of high/expensive inputs making products unmanageable

Steps to be kept in mind while undertaking income generating projects

- * Clear focus on developing market oriented/led products
- * Delineate potential customers
- * Initial focus on local markets
- * Adapt and innovate tools and processes for production
- * Consistent and continuous supply
- * Information dissemination on products/people/area



trees bees use

my favourite bitter honey

by Robert Leo

Information about the source of bitter honey

Botanical Family	: Myrtaceae
Name of tree	: <i>Syzygium cumini</i>
Local names	:
Tamil	- Naval/Naga
Kurumba	- Neree mara
Irula	- Nera mara
Kannada	- Nerale mara

Floral features: It is a densely foliaceous evergreen tree. It grows in a variety of habitats - riverbanks, scrub jungles or planted around temples or as avenue trees. New foliage appears in February and March. It grows up to 15 metres and spreads widely.

- 1. Stem/Trunk:** The bark is smooth in young trees. Dead bark flakes off. Branchlets appear when the tree gains a height of about 10 feet. The diameter of the trunk can be up to 1 m. The inner portion becomes hollow in old trees. The wood is dark brown. When the trunk is cut open, the colour can range from brown to reddish. The branchlets are often pendulous. Generally, galls are found on branchlets and leaves.
- 2. Leaves:** Decussate, elliptic or ovate-lanceolate 5.5 to 6.5 cm length, coriaceous, glabrous, glossy
- 3. Fruits:** Berry globose, green to dark blue and edible, collected and sold in the market. Juice of unripe fruits can be used for making vinegar.
- 4. Flower:** Flower appears in panicle as bunches, pale or dull white in colour. It is a major source of nectar and pollen. It blooms in July to August in the plains and April to May in the hilly regions of southern India. The tree starts flowering from the fifth year onwards.



© Mogens Jensen

Foraging by bees: It is visited by all four bee spp. of Indian sub continent, ie. *Apis dorsata*, *Apis cerana*, *Apis florea* and the *Trigona* spp. (dammar bees).

Honey: The honey is light reddish in colour and thin. The water content of this honey ranges from 21% to 26%. It has a distinguishing pungent/bitter taste, which limits the consumption by the villagers. Even for ordinary consumers, the concept of bitter honey is unique and shows them that honey can have varied taste. The granulation period is very slow, almost nil after two years. Sometimes the tribal people store this honey till the sweet honey appears to mix the two.

Pollen: Pollen grains are very small - if it gets mixed with honey it is impossible to separate. The pollen grains accumulate to the surface of the honey, in storage, even after two years.

Apiculture value: It is a major source for all bees. It is the first source of nectar and pollen for the bees to build new combs. Abundant storage of pollen is found in *Apis cerana* and *Apis dorsata* combs.

Medicinal property:

The tree is considered as possessing medicinal properties and hence the honey from this nectar source is seen similarly. The local tribal community uses the bark to cure stomach aches & disorders and toothache. It is used as an ingredient for liquor distillation in

tribal villages. Ayurveda preparations prefer this honey.

Plant propagation: Through seed dispersal.

Fate of Syzygium in Nilgiris

Species under threat, in Nilgiris. Large volume of honey is harvested during this time from *Apis dorsata*. Unfortunately, this tree is a target by the timber market and heavily under threat in private lands and forests.



© Mogens Jensen

revival of *apis cerana* in south india



by Keystone

Beekeeping in Southern India has been a traditional activity with large groups of beekeepers earning their living from the indigenous Indian hive bee, *Apis cerana*. The Western tracts of this region provide plenty of floral sources from the tropical forests of the Western Ghats. However, during the early 90s, the situation changed completely with the attack of the Thai Sac Brood Virus (TSBV). It virtually wiped out the entire industry. This virus, which attacks colonies at the larval stage, even affected natural colonies of *Apis cerana* in the forests.

The first signs of the disease were apparent in 1990-91. However, it was still believed that the disease would be overcome with manipulations and better management methods. Several methods were tried - from Ribavirin, a verazide, recommended for paediatric



use to traditional recipes of tobacco and neem mixtures. Intensive migratory beekeeping by beekeepers of Kanyakumari district was also responsible for the quick spread of the disease in large areas of Tamil Nadu.

According to information available from the Khadi Village Industries Board (KVIB), YMCA and Marthandam Beekeepers Cooperative Society (MBCS), about two hundred fifty

thousand colonies were lost due to TSBV, of which two hundred thousand colonies belonged to migratory beekeepers. However, the following example of beekeepers shows how through sheer determination and better management techniques they have been able to recover from this loss and today, it is again a thriving industry in many southern districts.

Over 10,000 beekeepers were working full time with *Apis cerana* bees during the early 90's in Kanyakumari district of Tamil Nadu. The onset of the TSBV disease destroyed all their hives. Some beekeepers committed suicide, some mortgaged their land and house to purchase mellifera boxes. Officials and scientists from Central Bee Research and Training Institute, Pune as well as other institutions could not provide much of an input. Local beekeepers tried treating with herbal plants, neem, turmeric, etc. in the hope of finding a remedy. Requeening was also tried but it was effective only for a short period.

However, some of the small beekeepers and farmers did not give up hope and started again with the remaining colonies that had survived the attack. Today, 5-6 years later, the *Apis cerana* beekeeping is thriving, with a good amount of honey production. The figures given relate to one particular society - MBCS but this is just an indication of the rapid revival of beekeeping. There are a number of private honey traders too, who collect from beekeepers in the district.

Year	No. of Beekeepers	Honey Extracted (in kgs)	Wax Collected (in kgs)
1988-89	1,842	152,186	data not available
1989-90	1,842	127,451	" "
1990-91	1,842	129,083	" "
1991-92	1,842	72,265	" "
1992-93	1,842	19,189	" "
1993-94	1,842	598	26.00
1994-95	1,842	nil	nil
1995-96	1,842	90,480	864
1996-97	1,263	103,672	1,546
1997-98	1,263	149,255	4,072
1998-99	1,351	290,910	2,630

Given below is a sample of beekeepers in the district of Kanyakumari and details of their beekeeping:

Beekeepers	A	B	C	D	E	F	G
No. of bee boxes	300	400	150	110	250	250	1200
Working	190	350	125	110	210	160	1200
Not working	110	50	25		40	90	800
In working hives:							
Diseased colonies	8	50	50	2	30	60	120
Swarming boxes per year		10	5	0	8	2	100
Absconding boxes per year	24	20	8	5	20	20	300
Honey produced per year	400	1500	650	510	790	500	6000
Colonies getting new queens every year	190	350	125	90	198	160	1200

the presently empty hives would be housed with bees. The beekeepers themselves were eager to start afresh and rebuild their beekeeping enterprise....

"While in Karnataka, we learnt that the Food and Agriculture Organization of United Nations was considering grant of a project to the State Government to revive beekeeping mostly with the indigenous bees. That surely was good news! "Revival of *Apis cerana* Beekeeping in Karnataka - A Tour Report" - M.C. Suryanarayana, *Indian Bee Journal* 58(1) :25-30: 1996.

The *Indian Bee Journal* 58(4) again, in its editorial, mentions that there is an increase in migration practices contributing to the revival of beekeeping with *Apis cerana* in Tamil Nadu.

In Andhra Pradesh, *Apis cerana* beekeeping continues to thrive in local districts. In TSBV affected areas of Srikakulam and Vishakhapatnam districts, the

An interesting information is that the hives are made to local specifications which are different from the normal Indian Newton Hive. At the moment, very few diseased larvae are found in these hives and do not seem to pose a problem. Most probably, due to a cyclical behaviour of the disease, there has also been a natural break in the spread. Also, since beekeeping

continued and expanded with the colonies that had survived, they might have developed a certain resistance to the virus. However, all this does not detract from the



abilities of the beekeepers who carried on.

According to Mr. Suryanarayana of the All India Beekeepers Association, Pune, in 1996, "There is every chance that *Apis cerana* would revive and soon all

colonies showed revival and beekeepers reestablished apiaries.

Similar information from different pockets, show that there is a slow but steady recovery of *Apis cerana* beekeeping.



A Marthandam Hive (left) and Newton Hive

