

Extraction of Honey from Rock Bee (*Apis dorsata*)  
by Soliga tribes in BR Hills

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## ABSTRACT

A study was taken in BR hills, Mysore district as a part of sustainable forest resource utilization on wild honey extraction from *Apis dorsata*. We laid 17 transects along areas where normally hives are constructed by rock bees. We took data on the number of hives per transect and extrapolated the honey production and extraction to the entire sanctuary of 540 sq kms. We also took data on all 13 rock cliffs where honey combs were present in the sanctuary and a exhaustive survey of honey comb was undertaken. We also undertook surveys to record the number harvested combs in each of these sites.

We find that there is great variation between years i.e.. during 1995 and 1996 These variations are attributed to natural variations occurring which are intrinsic to biology of honey bees and not attributable to the extent of harvest made by the Soligas. Soligas, although harvested over 80 percent of hives in 1995 but in the following year, the production potential was over 22 tons which was more than the production potential of 1995 which was only 13 tons. We also find circumstantial evidence that Soligas are harvesting the hives in a sustainable fashion and not in an unsustainable fashion.

The Soligas, the native tribes of Biligin Rangan Hills in southwest India, extract a wide array of non-timber forest products from tropical forests (Murali et al., 1995). Honey was one of the staple food for Soligas during rainy season while they were completely dependent on forests. However, due to commercial interests and large cash flow from it the honey is now extracted to be sold to the outside market and very little is consumed for self. In the recent years, there has been great demand for honey by Pharmaceutical industries and therefore there is greater extraction levels being noticed from the forests. Studies of extraction levels of honey from the forests and their monitoring are lacking in India sub continent and therefore our aim is to understand the levels of extractions of honey from the forest and further monitor the colonies in the forests.

Here we address the impact of honey extraction on the future population of honey bee colonies and the honey yield per comb.

## METHODS

The Soligas, an indigenous tribe of southwest India, have lived in Biligiri Rangan (BR) Hills for centuries. The BR Hills straddle the Eastern and Western Ghats in peninsular India. The undulating terrain comprises low hills that, at several places, reach an altitude of 1700m or more. Approximately 4000 Soligas inhabit the BR Hills Wildlife Sanctuary, which is the subject of the present study. The sanctuary occupies an area of 540 km<sup>2</sup> and contains four forest types, viz, deciduous, evergreen, scrub and shola. The description of the site can be found in Murali et. al. (1996)

*Apis dorsata* is a major producer of honey in the forest ecosystems as they are very active in pollen collection but are very ferocious. They build combs in elevated places such as on branches of tall trees or high raised buildings. They are generally migratory. Because of these two reasons, i.e., migratory and ferociousness, the domestication has been difficult. However, recently in Vietnam and in some parts of India too, there are instances of domestication to certain extent:

It was found from the interview with the tribal people and through our preliminary surveys that the rock bees normally construct their combs on the branches of tall trees near the streams in the forest and over the rock cliffs. Based on this information we laid transects of 1 km length and 10 m wide along the streams permanently. This initiative was to understand the density of honey combs per unit area. We counted the number of hives in these transects, and the name of the tree which harbours the hive. We laid 17 such transects along the streams in the entire sanctuary. We also calculated the length of all streams using the topo sheets of the area. Further, we identified all the rock cliffs that are available in the sanctuary and on those which have bee hives. We counted the number of hives in 13 identified rock cliffs. Using this data on stream length and the average number of hives from the transect, we extrapolated the number of hives present in the sanctuary.

Major honey collection seasons are during May followed by a lean season during November. We undertook surveys during April to record the stock of hives, in June to know the harvest intensity. Similar one more monitoring is done during November and January every year.

## RESULTS

Our survey indicated that the total length of stream in the sanctuary was 262.1 km. The average hives per km during 1995 was 10.2 while during 1996 was 12.12. Total number of hives present in the rock cliffs during 1995 was 393 and during 1996 was 400. Average honey yield per hive during 1995 was 4.55 kg while during 1996 was 6.58 kg. Using these data the estimated production of honey was 20.2 tons during 1995 and 23.5 tons during 1996. We also counted the number of hives that are harvested during each season and found that in transects over 90% of hives would be harvested while on rock cliffs only about 60% of hives are harvested.

The other less yielding season was during November. The data on this season show very limited number of hives in transects as well as in the rock cliffs. This is primarily because that bee would migrate to plains or foot hills in search of food. During November, the floral resources or pollen resources are less in hills and they would have abundant pollen in agricultural fields particularly because of cultivation of niger, sesame and sunflower in the foot hills. In fact our recent interviews with various villagers in the foot hills indicated that during October (i.e., during Diwali festival) they get lot of hives in the coconut trees and nearby tall trees such as banyan or peepal trees. It would be worthwhile capturing the density of bee colonies during this time in the foothills as the population may be affected by the management or treatment by these people while they take refuge here and may not be because of the management done by the Soligas of hill tops. One such incidence was noticed in our recent visit to foot hills where the harvesting was done on the colony which very little honey but contained large quantity of larvae and pollen. In fact from one comb itself we collected

pollen over one kg.

**Extraction Levels :** Extraction levels were determined by making surveys before and after extraction by tribal people. In the year 1995 the level of extraction was around 67 % (90% in transects and 60% in rock cliffs). Thus the estimated extraction was 10.9 tons over the entire sanctuary, while for the year 1996 the estimate was 12.9 tons. The overall extraction was also highly variable between years. In the year 1995 the level of extraction was almost 80 % while in 1996 it was only 55 % although total extractable honey was higher than the previous year.

## **DISCUSSION**

It is evident from our data that the yield of honey, in terms of per comb and over the sanctuary, varied greatly between years. Surprisingly the levels of extraction was also varying greatly between years. This is attributed to the weather conditions during the harvest season. During 1996, there were many rainy days during May and therefore effective honey harvesting were less, while during 1995 it was more. Therefore the number of hives extracted was very high in 1995 while less in 1996. Our data also show that the extraction intensity does not influence the production potential in the future years. It may have a positive influence but not the negative influence. However, we must study the extraction at the foot hills of the forest where during the lean season the extraction go on. According to one of our preliminary surveys even in foot hills only Soligas residing in those area do harvest the honey. As honey harvesting is a skilled job many non-tribal people living in the foot hills do not attempt to harvest rock bee honey.

Our discussions with other bee experts indicate that it is good to harvest honey while the proportion of honey is highest in the comb and the proportion of pupae or larvae and pollen are lowest. In another experiment conducted by our workers indicate that over 60 percent of hives harvested does contain greater volumes of honey when collected during May. While collections done before yield higher proportion of pollen and larvae. The local people seem to identify these seasons of prime honey with the onset of flowering of a species called 'Honne' or botanically called *Pterocarpus marsupium* during May and 'Bende' or *Kydia calycina* during November season.

Soligas seem to have the sense of right season of harvest of honey for highest honey yields and the known techniques of harvest. Due to subsistence levels of harvest probably honey population was not lost. However due to commercial harvest levels now there is increased level of harvest. Our data does not show any decline in colony levels in the natural forests. Probably, honey bees follow a natural cycle of troughs and crests which is intrinsic to their biology and natural predators and so on. It appears there is no decline of colonies due to harvest by Soligas. Even bee experts believe that as no killing of bees either adults or young ones is involved in large scale the harvest per se is not a threat. However, it may be suggested to improve the quality of honey for marketability one may suggest them to harvest in cleaner or hygienic methods rather than the current methods. Further they may be encouraged to collect pollen for better income and use of pollen for food for other apiary maintenance.

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#### References

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Table I : Estimation of honey production and extraction in BR Hills

	1995	1996
No of hives in transects (n = 17)	173	205
Total estimated number of hives in the sanctuary.*	2,652.5	3,158.3
No. of hives in rock cliffs 395 (n=13)	416	
Average yield per comb	4.58	6.58
Total Production potential (in Kg)**	13,856.8	23,518.9
Amount Harvested (in Kg) ***	10,969.8	12,945.5
Percent Harvest	79.2	55.04

\* These are estimated figures using the average number of hives per transects and multiplying it with the total length of streams in the sanctuary.

\*\* These are estimated figures using product of the total number of hives in the sanctuary (estimated number of hives along streams plus total number of hives in rock cliffs) and the average honey yield per comb.

\*\*\* These estimates are based on the product of average hives extracted per transect, average yield per comb and the total length of the streams in the sanctuary plus the product number of hives harvested in the rockcliffs and average honey yield per comb.