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Stingless Honey a Sustainable Economy in Nagaland

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Abstract

Nagaland has a tradition of beekeeping since time immemorial. They practice both apiculture and meliponiculture, while the former is preferred over the latter. Meliponiculture or stingless beekeeping is negligible due to little or no domestication technology. Stingless bee is the smallest honey producing bee. The honey of stingless bee taste sweet and sour and is different from common honey. Nagas use the stingless honey as an ethno-remedy to treat various diseases and usually take it before going out for hard work to get more strength and energy. It has high demand in the market because of its great medicinal value. However demand of the market is not fulfilled due to less number of stingless bee keepers. Nagaland Beekeeping and Honey Mission- NBHM has opened many avenues for the beekeepers to sell their pure organic produce like in Hornbill festival at Kohima, and also to local, national and international tourist. This paper would like to study the economic importance of beekeeper with a special reference to stingless bee in rural areas. The researcher would like to emphasize on how the village livelihood are sustained by rearing bee. It will also cover the farmers with beekeeping as hobby turn into full time prosperous beekeepers.

Keywords: Stingless honey, Meliponiculture, Stingless bee, Sustainable Economy, Rural Employment, Nagaland.

1. Introduction

Bees are known for honey and sting but stingless bees are exceptional, priceless and incredible. Stingless bees, they belong to the family *Apidae*, sub family *Meliponinae*, tribe *Meliponini*. Stingless bees are found in most tropical or subtropical regions of the world. Interestingly, Nagaland comes under this geographical region. Nagaland is a botanical hot spot region in India with lush green forest covering about 80% of the state and different flowering plants. In Nagaland, stingless bees are reared mostly in districts like Peren, Kohima, Zunheboto, Phek, Tuensang and

Mokokchung.

Three species of stingless bees were observed in Nagaland; *Tetragonula irridipenis*, *Tetragonula laviceps* and *Lophotrigona canifrons*. *T. irridipenis* were reared by most of the beekeepers. Two types of nesting habitats were observed terrestrial and subterranean. The *T. irridipennis* and *T. laviceps* constructed their nest terrestrially (Fig 1 & 3); hollow tree log, tree branches or rock crevices. The underground stingless bee (Fig 2) *L. canifrons* nesting behaviour was subterranean (Singh AK, Oct. 2016). Nagas have been rearing these bees in hollow log hives for quite a long time, though some beekeepers transfer them to a

wooden box as this makes it easier to control the hive.

Stingless bees do not sting like the common honey bees. They have highly reduced stings which cannot be used for defense mechanism. Of course they bite and attack the intruder in large numbers when they are disturbed. The nest are built from wax mixed with resins collected from trees. In each colony there is a queen, several drones and many worker bees. The queen eggs are laid and raised in brood combs (Fig 1). The stingless bee honey is stored in pots (Fig 1). In the case of common bees the honey is stored in combs. This is the uniqueness of stingless bee. Pollen (Fig 1) is usually found at the edge. Sometimes the honey pots are often intermixed with pollen pots which make it difficult to extract honey pots. Stingless bees are poor honey gatherers; they store only limited quantity of honey (about 500 gm/hive/year). Stingless bee produce limited quantity of honey up to 100 ml/ colony (Singh AK, Oct. 2016). Stingless bee honey (Fig 4) has a distinct smell and taste- a mix of sweet and sour. The taste varies depending on the seasons and the flower and trees they visit. Stingless bees visit the plants which the other bees do not forage so this is how the taste is different. Harvesting is done once in a year. Usually harvesting is done during the month of October and December (Imchen, Aokumla. March 2012).

The main predators of the stingless bee is the ant and the spider. However, these are taken care of if the beekeeper frequently monitor it. Sometimes wild animals can destroy or eat the honey if the honey bee farm is located in the jungle. In the case of prosperous beekeeper Ningsangwati Kichu, 25 bee boxes were damaged and the honey was eaten by bear in the month of November 2019.

The Nagas used the stingless honey for the treatment of wounds, injuries, burns, dysentery, cholera, cough, rheumatism. One interesting thing is that when a person is bitten by a snake or by a spider, stingless bee propolis is usually warmed with candle or heated and is applied on the wound. That is how they have been using it as a first aid in the village.

Nagaland Beekeeping and Honey Mission- NBHM

was started in the year 2007 as part of post-harvest and honey enterprise. They source 3 three varieties of natural and pure honey; *Apis cerana* (common honey bee), *Apis laboriosa* (rock bee) and *tetragonula* (stingless bee) from the project beekeeping villages. Thus the sourced honey is processed, bottled, packaged and sold under the brand Nagaland Honey. The NBHM also produces beeswax, pain balms and nine different flavoured lips balms which are in great demand in the market. The Mission has so far trained 17,200 people, formed 320 village bee keeping committee (VBKCs) and intervened in 478 villages in Nagaland. Before the annual production of honey was estimated to be 120 *metric tons*. Now after the intervention by NBHM, the production of honey in Nagaland is around 420 *metric tons* per annum (NBHM Souvenir 1, 2018).

2. Review of literature

Singh AK (Oct. 2016) stated that nowadays due to acculturation, traditional knowledge of meliponiculture is disappearing. Young Nagas are oriented towards office job as they viewed this profession as anachronistic. Only time will tell if Naga youths will find some incentive to carry on the indigenous meliponiculture of their ancestors. If not, traditional knowledge will pass from memory.

Kothai S and Jayanthi B (2014) concluded that Stingless bee propolis (*Tetragonula iridipennis*) reared in Pudukottai region, Tamilnadu is a potential natural antioxidant source and is a promising antimicrobial drug for various bacterial infections.

Das Rakesh et al. (Feb. 2019), the study concluded that Nagas keep the stingless bees as a kind of hobby and not for commercial purpose. Therefore awareness about the importance and usefulness of native stingless bees has to spread among the farmers. Like the value of honey and other hive products which would help them to improve their economic condition and livelihood.

Chidi O. H. and Odo P. E. (July 2017) reported that many people who left beekeeping because of the highly defensive behavior of honey bees

may be opted to meliponiculture, particularly if flora resources are abundant. Stingless beekeeping generates incomes to the rural poor through honey, resins production and cerumen (mixture of wax and plant resin).

From the above literature review it is concluded that stingless bee honey has lots of economic potential. The researcher has decided to explore this area whether meliponiculture is really a Sustainable Economy in Nagaland or not?

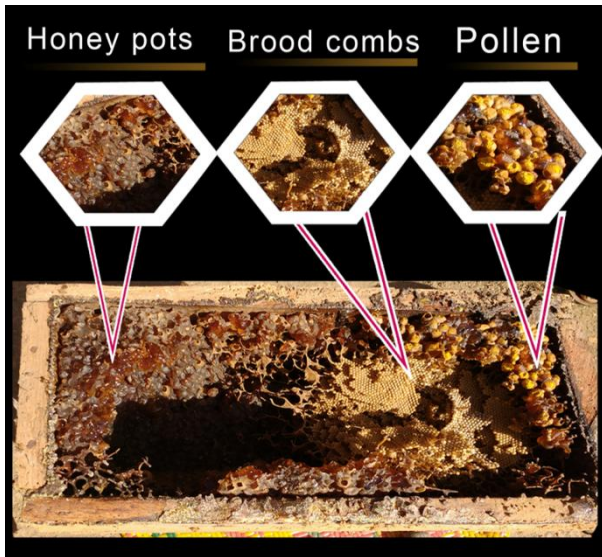


Fig 1. Stingless bee hive



Fig 2. Underground stingless bee



Fig 3. Rectangle bee box with 3 chambers



Fig 4. Harvested stingless honey

3. Objective

- To preserve the rich traditional knowledge and skill of meliponiculture.
- Importance of traditional remedy of Stingless honey.
- Meliponiculture is a good source of income specially for the villager.
- Stingless bee keeping can generate employment.

- To promote as a sustainable profession not just a hobby.

4. Methodology

Qualitative Method of research was carried out. Primary data collection: Random selection of four prospering beekeepers and were interviewed from four districts of Nagaland. Data was also collected from the NBHM experts and a herbal medicine practitioner. Data was collected from the field in the year 2018. Telephone interview was also carried on August 2020 to get the present status. Secondary data collection: Research paper, books and leaflets of NBHM.

5. Limitation

Data collection was on a focus group- four prospering stingless beekeepers from four districts (Peren, Mokokchung, Zunheboto and Phek) and a herbal medicine practitioner.

6. Discussion and Finding- Economic Prospect

There are about 30 household, who have 40 to 50 bee boxes in Chozubasa village. Before they had a tough time. Nobody was willing to lend money for their children's education. But when they started rearing bees, people tend to lend them money. As there is a secured beekeeping income, now they can afford their children's education and manage other miscellaneous expenses. The income generated by honey is around Rs.18.00 Lakhs. Now the villagers are into beekeeping as it is a profitable profession, said Zacipra O Shijoh of from Phek district

"When I see bees in the tree in jungle, I can't sleep even at night, to go and get it. The next day I go and collect the bee and bring them home. People come and ask the honey. They insist that it is for medicine so I have to give in. Stingless honey is the best medicine. I have 150 bee colonies. I sell at Dimapur, Peren and Kohima. I sell it for Rs.1500/- per bottle of 750ml. Whatever work I do, I do it sincerely. Looking at my works, the officers are also satisfied. My ideology is whatever I do I do it wholeheartedly," said Takangbe Zeliang of old Jalukie from Peren district.

Kheka Khekato Jimomi of Satakha old Village from Zunheboto district is rearing bees since 2006. He said that it is very easy to rear bees, even if one doesn't have enough land. He doesn't have a Govt. job but through this profession he runs the family. Once it is installed one doesn't need to spend a huge money like other profession. Just need a little monitoring in the morning and in the evening. In the garden he plants banana and orange for bee pollination and also to generate additional income. By Grace of God his family has come to this position through this income. Once the stingless bees are brought from the jungle, they are with the people throughout the life. They don't migrate like other bees. This is the reason he started rearing stingless bees. People come and buy from him. Sometimes NBHM buys it. Demand is so high that he cannot meet the demands. He doesn't need to go out to sell, instead people come to him. His total income is around Rs. 3.00 Lakhs to Rs. 4.00 Lakhs in a year.

Nungsangwati Kichu of Chungtia Village from Mokokchung district, designed a rectangle bee box with three chambers (Fig 3) through his innovative observation of stingless bees behavior and characteristic. " For more than 10 years I am successfully using this design. In traditional box we cut out the honey pots by knife. So it is harvested only once a year, which challenged me to come up with this new hive box. The honey pots are not taken out in this method. We prick the honey pots and it oozes down through the hole (Fig 3). This method of harvesting is clean and hygienic. Now we can harvest twice a year, this is how we can generate more income. The NBHM has accepted and approved this box in 2014. Now the department has initiated to use this design in all districts of Nagaland," said N Kichu who was conferred the "District Level Best Beekeeper Award" in December 2019.

He has 200 stingless bee boxes and from these boxes, 80 bottles (750ml) of honey can be harvested, costing Rs. 1200/-per bottle. From these 200 boxes, he splits it to 40 bee boxes, out of which he sells 10 boxes in a year for around Rs. 2500/- each.

Rev. Fr. Dr. Vilasal Godfrey Angami, a herbal medicine practitioner and the director of Global Holistic Health Center Jalukie, said that Stingless honey is the most important honey among all the honeys. He uses this stingless honey for all the medicine he prepares for the last 20 years. He said that he cannot make a good medicine without this stingless bee honey.

Conclusion

Meliponiculture is a profession which requires little or no investment other than hard work and passion. It has lots of potential to provide income and to generate employment. Nagas should inculcate the habit of hard work, consistency and should change the attitude of looking for subsidy or quick money. Nagaland has forest with abundant nectar-rich flowering plants and favourable climatic condition. One should start hunting for bees and begin with a colony, then slowly increase in numbers. One alarming factor is the lost of bee habitat and the lost of foraging plants due to deforestation or Jhum cultivation. It's high time that the plantation of foraging plant for the bees has to be done. Another threat is that of pesticides and it should be restricted to the surrounding areas. Stingless bee keeping should be encouraged to be taken up in a commercial scale as there is lots of demand and scope. Through this many employment will be generated for sustainable livelihoods.

Recommendation

- Government or financial institution should provide loan or financial assistance to prospering beekeepers to expand the business. There should be some assistance or cover for any damage through natural calamity, human beings or animal.
- Awareness programme should be organized for the unemployed youth to take up Meliponiculture as sustainable source of income.
- Training or workshop on modern and scientific method of stingless bee rearing along with traditional method should be organized.
- More scientific research and survey need to carry out on Ethnomedicinal uses of stingless honey.

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