IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Honey Bee (Hymenoptera: Apidae) and its products used as nutritive food.

Dr. Jayanta Kr. Das, Assistant Professor, Department of Zoology, Barama College,Barama

Abstract: Honey bee is a eusocial flying insect within the genus Apis of the order Hymenoptera. The ethnic people in Nalbari district of Assam consume the eggs and larvae of honey bees as food besides consuming honey. Honey bees are important pollinators for flowers, fruits and vegetables. Honey collected from nature by the ethnic communities is an important source of nutrition and also contribute to their income generation. Honey and beeswax are two economically important products of honey bee from an economic and nutritive point of view. Three species of honey bees found in the study area are *Apis dorsata, Apis cerena and Apis florae.* The local people of the study area have started bee-keeping commercially for their livelihood. Honey is full of fructose and glucose) and many amino acids, vitamins, minerals and enzymes. It cures many diseases like Coughs, Flu, Asthma, Pneumonia etc.

Keywords: Ethnic, Livelihood, Minerals, Nutritive, Pollinators, Vitamins

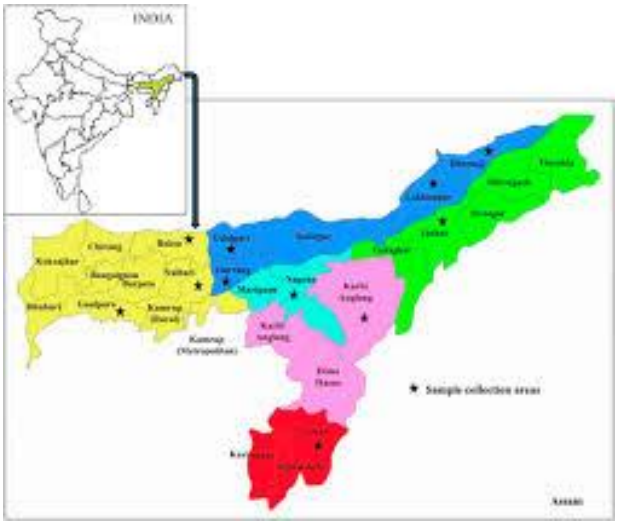
Introduction: Honey bee is a eusocial flying insect within the genus Apis of the order Hymenoptera in Arthroptera. Honey and honey bees have evolved in India millions of years ago. Honey has been regarded as the sweetest food tasted by the ancient Indian living in the forests. Honey bee performs a vital role in the pollination of flowers, fruits and vegetables. Extensive declines of insect pollinators occurred across much of Europe since the start of the millennium (Potts et al. 2010); that indicated systemic problems impacting pollination. Evidence suggests this might be occurring through a combination of agricultural intensification, habitat degradation and the spread of pests and pathogens (Goulson et al. 2015). Honey bee produces honey, royal jelly, pollen, beeswax, purpolis and venom and all the products have been used for various nutritional as well as medicinal purposes since long before. Honey is the most well-known economically important and nutritive hive product. Besides, beeswax is also another second important product of bees from an economic standpoint. Beeswax is trendy for making candles and as a constituent in artists' materials and in leather and wood polishes. Beeswax is used as a binding agent and drug carrier in medicinal drugs companies. Beeswax is also one of the most commonly used waxes in cosmetics. Bees and other insect pollinators are vital for human

life, fertilising close to 75% of the world's food crops, according to the UN Food and Agriculture Organisation (FAO). Beekeeping has been practicing in Assam by using traditional methods from time immemorial. It is profits generating small industrial segment which is an important component of present day strategies for integrated rural development and for sustainable livelihoods. The major portion of honey comes from the wild bees, *Apis dorsta* (Sivaram et. al. 1993).

Honey represents a source of income for some of these people as it can afford them with an important source of income (Paar et. al. 2004).But, deforestation, and indiscriminate use of pesticides, urbanization and pollution have threatened the existence of bees and their products. These bees are known to be aggressive when they are disturbed and then can sting humans (Basavarajappa and Raghunadan, 2013). The production of honey depends on the colony strength, availability of suitable food crop and weather condition. The main role of bees in the different ecosystems is their pollination work. Other animal species are connected with bees: either because they eat the brood or honey, pollen or wax, because they are parasitic to the bees. Honey is a natural product that has been widely used for its therapeutic effects. Honey is composed primarily of fructose and glucose but also contains fructo-oligosaccharides (Chow, 202) and many amino acids, vitamins, minerals and enzymes (White and Crane, 1975). The main objective of the study is to find out the common and available varieties of honey bees and to fulfil the objective of generating employment opportunities for the poor rural people in the study area through bee-keeping.

Material and methods

3.1 Study Area: Nalbari District is situated between 26 degree North and 26.51 degree North latitude and 91 degree East and 91.47 degree East longitude. The north and west side of the district is bounded by Baksa and Barpeta districts respectively .The southern and eastern side of the district is bounded by Kamrup district. The entire area of the District is situated at the plains of the Brahmaputra Valley. . The winter temperature drops to 10^0C and summer temperature goes up to 35^0C. The District has a sub-tropical climate with semi dry hot summer and cold winter. The District experiences annual (average) rainfall of 1500 mm and its relative humidity hovers around 80%.



3.2 Sampling methods for collection

The wild bees (*A. dorsata*) were harvested by plucking the nest from the tree and drop them in a bucket and *Apis cerena* were colled by hand by some village honey hunters. Honey hunters have to climb steep cliffs or ascend tall "bee trees" by hand-made ladders during the darkness of the night then kept away with smoke and cut away the comb completely for collecting honey. Honey is extracted by squeezing the entire comb by hand, which leads to accumulation of dirt in the honey. This technique is a very strenuous, laborious and demanding job (Mardan et al., 1989, Othman, 1997). A literature search is done using the ISI Web of Science database or using google search engine.

Result-and discussion:

During survey, a total of 3 species of bee insect belonging to apidae family were found (Table-1)

Table-1 Taxonomy of species of honey bees with their seasonal avaiability.

Sl no	*Scientific name*	order	Family	English name	Vernacular name	Seasonal availability	Edible part	Mode of eating
1	*Apis cerena*	Hymenoptera	Apidae	Cavity-nesting bees or Indian honey bee	Gharasia Mow	May-October	Egg& larvae	Raw
2	*Apis dorsata*	Hymenoptera	Apidae	Giant bee or Rock bee	Bor Mow	May-November	Egg& larvae	Raw
3	*Apis florea*	Hymenoptera	Apidae	Dwarf honey bee	Kunkuni Mow	May-November	Egg& larvae	Raw

Three Apis species are commonly found in Baksa, Assam i.e. the Little Bee (*Apis florae*) Rock Bee (Apis dorsata) and the Asian Honeybee (*Apis cerena*). *Apis florae* has single-comb nesting habits suspending its nest from a tree limb or overhang. In general, *A. dorsata* tends to nest high in the air, usually from about 3 to 20 meters above the ground. Besides, *Apis florae* and *Apis dorsata* are found in both domestic and wild conditions while the *Apis cerena* is domesticated. The main period of production of honey in Assam is of only around three months from July to September. The ethnic people in the Nalbari, Assam are an extraordinary for their large-scale consumption of brood of honey bees (*Apis* spp., Apidae).*Apis dorsata*, are aggressive bees which have never been domesticated as they do not use enclosed cavities for nesting, and can be extremely dangerous if their colony is provoked. The most common bee in the study area is *Apis cerana*, which is traditionally domesticated in the cavities of trunks, hollows of rocks, domesticated in wooden boxes with fixed frames. The ethnic people of Nalbari district in Assam consume eggs as well as larvae of honey bee in raw state. The people in the study area generally earn a lot of income by selling honey. Large amount of honey is also extracted from wild species i.e. *Apis dorsata*. The people of villages who professionally gather honey are called honey-hunters. They are involving in gathering honey from wild species during September to May. But the domestic products of bees' extraced from *Apis cerena* are available during the peak flowering time of mustard(belongs to the family of "Cruciferae") from mid October to January. A few people of the area now has adopted the bee-keeping commercially who earn yearly a good amount of cash from the products of honey. They even export honey and waxes to other neighboring states or countries. The giant honeybees are found predominantly in or near forests, although at times nests may be observed in towns near forest areas. Mustard is a cross-pollinated crop and cross-pollination is occurred naturally by the bees. It has been established that there has been an increase in crop production by almost 30%, " explained Prabal Saikia, Chief Scientist at RARS-AAU, who is involved with the project. The majority of the households in rural Assam are blessed with plentiful wild flowers and fruit and little pollution has become well suited to bee-keeping. Furthermore, indiscriminate uses of pesticides often kill a large number of pollinators and reducing their numbers further. Bhuyan and Bhattacharyya (2002) study the foraging activity of honeybee on Assam lemon. Citrus species and varieties greatly vary in their pollination needs.

The production of honey depends on the colony strength, availability of suitable food crop and weather condition. The main role of bees in the different ecosystems is their pollination work. Other animal species are connected with bees: either because they eat the brood or honey, pollen or wax, because they are parasitic to the bees, or simply because they live within the bees nest. The people of the study area generally use the traditional method, as these methods have accepted on from generations to generations and reflect the ethnicity of the harvester's and their region. The honey is squeezed into a large vessel and then is used for direct consumption or to sell to the market. Of course much species of bees are died due to adopting the traditional methods. Moreover, indiscriminate use of pesticides often kills a large number of pollinators and reducing their numbers to a great extent.

Natural honey contains many flavonoides such as apigenin, pinocembrin, kaempferol, quercetin, galangin, chrysin and hesperetin), phenolic acids such as ellagic, caffeic, p-coumaric and ferulic acids), ascorbic acid, tocopherols, catalase, superoxide dismutase, reduced glutathione, Maillard reaction products and peptides. Most of the above compounds work together to provide a synergistic antioxidant effect (Johnston et al., 2005; Turkmen, et. al, 2006 & Rakha et al., 2008)). Hence, it has been suggested that honey, as a natural antioxidant, may serve as an alternative to some preservatives such as sodium tripolyphosphate in food preservation to delay lipid oxidation (Johnston et al., 2005). Positive effect of honey as an anticarcinogenic agent is reported in some studies (Sela, 1998 & Molan, 2001). In the study area, the **c**ollection of honey has been a traditional occupation of the tribal and also there are many tribal families who are involving in honey hunting for a livelihood. The local people of the study area have been widely used for its therapeutic effects to cure Coughs, flu, asthma. The local people also use honey with basal leaves (tulsi leaves) as a boon for immunity of the body.

Conclusion- Honey bees are extremely popular diet in the ethnic people in Assam and their products are extensively used amongst the all the tribes in Assam. Bee conservation is vital for the functioning of plant communities and human welfare. The wild bee population is gradually declining in the study area due to overall habitat destruction and pollution. Beekeeping is an interesting an ideal agro-based additional activity, providing major income to the peopl*e* in the rural areas. It increases crop yield through pollination of our gardens and enrich our lives in many ways. This agricultural benefit of honey bees is estimated to be between 10 and 20 times the total value of honey and beeswax. The youths of the study area are concentrated in bee-keeping activity commercially considering it as a means of livelihood. Educating honey hunter's of villages for scientific honey collection is necessary to protect honey bees and extract honey & wax collection.

Reference cited:

1. Basavarajappa, S., & Raghunandan, K. S. (2013). Colony status of Asian giant honeybee, Apis dorsata fabricius in Southern Karnataka, India. *African Journal of Agricultural Research*, *8*(8), 680-689.

2. Bhuyan, M., & Bhattacharyya, P. R. (2001). Foraging of honey bee upon assam lemon (citrus acida roxb.) under agroclimatic conditions of jorhat, assam, india. *geobios*, *29*(1), 33-36.

3. Chow, J. (2002). Probiotics and prebiotics: a brief overview. *Journal of renal nutrition*, *12*(2), 76-86.

4. Johnston, J. E., Sepe, H. A., Miano, C. L., Brannan, R. G., & Alderton, A. L. (2005). Honey inhibits lipid oxidation in ready-to-eat ground beef patties. *Meat science*, *70*(4), 627-631.

5. Mardan, M., Hamid, A. H., Emby, Z., Marasidi, A. R., & Ismail, M. M. (1989). Some aspects of honey collecting from colonies of Apis dorsata, in Peninsular Malaysia. In *Proceedings of the Fourth International Conference on Apiculture in Tropical Climates, Cairo, Egypt, 6-10 November 1988*

6. Molan, P. C. (2001). The potential of honey to promote oral wellness. *General dentistry*, *49*(6), 584-590.

7. Othman, M. S. H. (1997, October). Promoting beekeeping as apotential trump card in a drive to conserve selected pockets of melaleuca (gelam) forest in peninsular malaysia. In *International conference on Tropical bees and The environement, UPM, Malaysia*.

8. Paar, J., Oldroyd, B. P., Huettinger, E., & Kastberger, G. (2004). Genetic structure of an Apis dorsata population: the significance of migration and colony aggregation. *Journal of Heredity*, *95*(2), 119-126

9. Rakha, M. K., Nabil, Z. I., & Hussein, A. A. (2008). Cardioactive and vasoactive effects of natural wild honey against cardiac malperformance induced by hyperadrenergic activity. *Journal of Medicinal Food*, *11*(1), 91-98.

10. Sela, M. O. (1998). Effects of honey consumption on enamel microhardness in normal versus xerostomic patients. *Journal of oral rehabilitation*, *25*(8), 630-634.

11. Turkmen, N., Sari, F., Poyrazoglu, E. S., & Velioglu, Y. S. (2006). Effects of prolonged heating on antioxidant activity and colour of honey. *Food Chemistry*, *95*(4), 653-657.

12. White, J. W., & Crane, E. (1975). Honey a Comprehensive Survey. *by Eva Crane, Morrison and Gibb Ltd*, 194-206.