



## EDIBLE INSECTS OF MISHING COMMUNITY AND THEIR MEDICINAL VALUE IN BEBEJIA, DHAKUAKHANA, ASSAM

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### Abstract:

North East India is one of the world's biggest biodiversity hotspots, with lush forests and favourable climatic conditions that support a diverse flora and fauna, including several types of edible insects. Edible insects are an essential food source in many impoverished nations. They are rich in proteins, lipids, carbs, minerals, and vitamins. Geographically, Bebejia is located in latitude 27°25'N and longitude 94°12'E. The Lakhimpur district had 197886 Mishing residents, according to the 2011 census. The second-largest Mishing population in Assam is found in the Lakhimpur district. The Mishing community in Bebejia mostly engages in farming, fishing, dairying, ceramics, silkworm culture, and a few other significant economic activities. The 12 insects that the Mishing people of Bebejia eat are revealed in this research. The insects are gathered utilizing several conventional techniques and equipment. Insects are also used as medicine by the Mishing population in Bebejia, which is quite beneficial.

**Keywords:** Edible, Insects, Proteins, Bebejia, Assam

## 1. INTRODUCTION

The most varied and prevalent type of life, insects make up a significant portion of the earth's whole faunal biodiversity. In most parts of the world, a wide variety of bug species are easily digested. Tribal communities in and around India have historically utilized a variety of insects as nourishment from prehistoric times. There are notable regional variations in the diversity and quantity of edible insect species. There are 1.4 million insect species that are essential to the Earth's ecosystem, according to scientific literature (Kulstrestha and Jain 2016). Insects including caterpillars, pupae, termites, grasshoppers, Eri and Muga silkworms, red ants, honeybees, and more were eaten by the Assamese ethnic communities (Borkakati et al., 2004). The Mishing people of Bebejia, Assam, frequently eat giant water bugs (Jewankori), juvenile ants and vespa (Borol), locusts (kakoti foring), grasshoppers (foring), crickets (uisiringa), silkworm larvae (poli), and termites (uipukh). For sustenance, the residents of Bebejia gathered various insects from grasslands, ponds, rivers, beels, forests, and rice fields. According to their elders, some insects were utilized as traditional medicine.

The Mishing people continue their ancient custom of eating various bug species, which are mostly found in rivers and areas close to them, because they dwell mostly on the banks of rivers in various regions. Because they include a variety of dietary sources, including protein, lipids, minerals, and vitamins, these insects offer a

number of health benefits. The Mishing people eat a lot of insects by roasting or drying them. Insects get crispy when they are roasted and dried. Some insects aren't accessible all year round, therefore they are sun-dried for later use. In the off-season, they thus employ dried insects. Certain insects—mostly crickets and water bugs—are fried in mustard oil, some are boiled with herbs, and some are occasionally consumed uncooked.

The Mishing people in Bebejia, Lakhimpur district, Assam uses insects for nourishment and health. According to elders, certain insects have distinct healing powers that pass down from generation to generation. Some larvae and beetles are ingested to treat digestive problems and stomach ailments. Other bug species are used to treat fever, cough, and cold symptoms, as well as infections and joint discomfort.

The residents of Bebejia's Mishing hamlet used a variety of techniques to gather various insect species. These are similar to hand picking, particularly for larger insects like crickets, grasshoppers, and beetles, which are taken straight from rice fields, riverbanks, and Bebejia forests. They gather various fish and insects using cast nets (khewali jal). Saloni, Dingora, Sepa, aquatic insect nets, and other traditional instruments are also used by them to gather insects.

Bebejia uses economically edible insects as a source of revenue. Some individuals who are struggling financially gather various edible bug species from wetlands, rivers, ponds, streams, and rice fields in order to sell them and make money. When the rural Mishing people don't have enough vegetables or insects, certain species are smoked dry and preserved by them for later use. The majority of people eat insects because they taste so good. Insect consumption has always been valued by the ethnic community both medicinally and culturally. They have been doing it for a very long time.

## **2. Methods and Methodology**

### **Survey**

Survey was conducted 4 no.s of villages with 1 revenue circle that is Subansiri revenue circle. The villages are—Alimur gaon, Ubhota Champaran, Mohora chapari, and Lahaul vet-toli.

### **Data collection**

The Mishing people are collected insects from wetlands during fishing. The 4 no.s of wetlands are—Ubhata Champara beel (Ubhata champara), Mohara Beel (Mohara chapari), vet-toli Beel (Lahual vet-toli) and Borokha Baghmara Beel. Insects were collected from paddy field by traditional collecting devices used by Mishing communities. Some insects were collected by Insect net, light trapping, pond net, sweeping, Hand picking etc, they use different species of insects for medicinal purpose.

During interview of Mishing people of Bebejia said that they were collected insects from paddy fields, ponds, slow moving stream and bank of river. They used different method Hand picking, Use Pond net, Insect net, sweeping and light trapping. During field visit Insects are collected by using some Ethnic tools such as—Cast net (Khewali jal), Saloni (sieve rounded) pond net, kharahi (small sieve) and insect net etc.

**Insects which are taken as a food by Mishing communities in Bebejia, Assam:**

1. Scientific name: *Apis indica*

English name: Indian Honeybee

Local name: Tanggud

Stages of intake: Honey, Eggs

Characteristics:

- (a) It is medium sized Honeybee and smaller than *Apis Mellifera*.
- (b) The colour of the *Apis Indica* is Dark brown to black with light yellowish Bands.
- (c) They are less aggressive than the wild species.

Habitat:

- (i) It is mainly found in tropical and sub-tropical regions.
- (ii) They prefer forest, Shrub lands, Wooden area and agricultural lands.

Classification:

Phylum-Arthropoda

Class-Insecta

Order-Hymenoptera

Family-Apidae

Genus-*Apis*

Species-*indica*



**Fig i: Indian Honey Bee**

2. Scientific name: *Acheta domestica*

English name: House cricket

Local name: Takam

Stages of intake: Adult

Characteristics:

- (a) They are Yellowish Brown to light tan in colour.

(b) Their thread-like antennae generally longer than body.

(c) They are very active fast moving and good in jumps.

Habitat: They are found in Houses, Gardens and fields.

Classification:

Phylum-Arthropoda

Class-Insecta

Order-Orthoptera

Family-Gryllidae

Genus-*Acheta*

Species-*Acheta domestica*



**Fig ii: Cricket**

3. Scientific name: *Samia ricini*

English name: Eri silkworm

Local name: Anera polu

Stages of intake: Larva, pupa

Characteristics:

(a) The larva of *Samia ricini* are creamy white to light green in colour.

(b) The adult moth of *Samia ricini* are Brownish in colour.

(c) Female adult moth of *Samia ricini* is larger and heavier than the males.

Habitat:

(i) They are mainly reared in North-East India, particularly in Assam.

(ii) They are mainly growing in Warm and humid climates and take castor plants as food.

Classification:

Phylum-Arthropoda

Class-Insecta

Order-Lepidoptera

Family-saturnidae

Genus-*Samia*

Species-*ricini*



**Fig iii: Eri silkworm**

4. Scientific name: *Lethocercus indicus*

English name: Giant water Bug

Local name: Takshi

Stages of intake: Adult

Characteristics:

(a) It is Brown to Dark Brown in colour.

(b) They are flattened and Oval in Shaped.

(c) They have piercing -sucking mouthparts which helps in sucking the prey.

Habitat: They are mainly found in ponds, lakes, Streams and paddy fields.

Classification:

Phylum-Arthropoda

Class-Insecta

Order-Hemiptera

Family-Belostomatida

Genus-*Lethocerus*

Species-*indicus*



**Fig iv: Giant water bug**

5. Scientific name: *Antheraea assamensis*

English name: Muga silkworm

Local name: Sumani polu

Stages of intake: Larva, pupa

Characteristics:

- (a) The colour of the larva is Greenish - Yellow.
- (b) Adult moth is Yellowish Brown colour with Visible eye spots.
- (c) The female adult moth is heavier than males.

Habitat:

- (i) Mainly found in Northeast India, Assam and live in warm, humid subtropical climates.
- (ii) They mainly prefer Som and secondly soalu.

Classification:

Phylum-Arthropoda

Class-Insecta

Order-Lepidoptera

Family-Saturniidae

Genus-*Antheraea*

Species-*A. assamensis*



**Fig v: Muga silkworm**

6. Scientific name: *Bombyx mori*

English name: Mulberry silkworm

Local name: Nuni polu

Stages of intake: Larva, pupa

Characteristics:

- (a) The larva of *Bombyx mori* are creamy white to Yellowish Body.
- (b) The Adult moth is white and white in colour.
- (c) The cocoons of *Bombyx mori* are oval or elongated and white in colour.

Habitat:

- (i) They are growing in temperate to subtropical climates.
- (i) They require mulberry plants for rearing.

Classification-

Phylum-Arthropoda

Class-Insecta

Order-Lepidoptera

Family-Bombycidae

Genus-*Bombyx*

Species -*B. mori*



**Fig vi: Mulberry silkworm**

7. Scientific name: *Hieroglyphus bannian*

English name: Rice Grasshoppers

Local name: Kikambali

Stages of intake: Adult

Characteristics:

- (a) They are Green or Brown in colour.
- (b) They are medium in sized.
- (c) They have powerful hind legs for jumping.

Habitat:

- (i) They are found in cultivated land, Open grassland and mainly in paddy field of Bebejia.
- (ii) They mainly live in semi -arid tropical and subtropical climates also.

Classification-

Phylum-Arthropoda

Class-Insecta

Order-Orthoptera

Family-Acrididae

Genus- *Hieroglyphus*

Species-*Hieroglyphus bannian*



**Fig vii: Rice Grasshoppers**

8. Scientific name: *Oecophylla smaragdina*

English name: Red ant

Local name: Rukkum Merrang

Stages of intake: Eggs

Characteristics:

- (a) The long legs help in climbing and hanging on tree's branches.
- (b) Their mandibles are strong to cut leaves and gripping objects.
- (c) Antennae is used for sensing environment.

Habitat:

- (1) They are found in tropical and subtropical Regions.
- (2) They are mainly grow tall trees, Garden, plantations.

Classification-

Phylum-Arthropoda

Class-Insecta

Order-Hymenoptera

Family-Formicidae

Genus-Oecophylla

Species-*Oecophylla smaragdina*



**Fig viii: Red ant**

9. Scientific name: *Dytiscus marginalia*

English name: Predaceous diving beetle

Local name: Ashi Takshi

Stages of intake: Adult

Characteristics:

- (a) They are Dark Brown to Black in colour.
- (b) They have strong Mandibles which help in grasping and catch the prey.
- (c) Their Exoskeleton is shiny and Smooth.

Habitat: It is found in ponds, lake and slow-moving streams. Larvae live in aquatic environments as their adults.

Classification-

Phylum-Arthropoda

Class-Insecta

Order-Coleoptera

Family-Dytiscidae

Genus -*Dytiscus*

Species-*marginalis*



**Fig ix: Diving Beetle**

10. Scientific name: *Odontotermes obesus*

English name: Termite

Local name: Tabyn

Stages of intake: Macropterous and Brachypterous form

Characteristics:

(a) They are pale Yellow to Brown in colour.

(b) Their size from small to medium sized.

Habitat: They are mainly found in moist soil, Decaying wood and mound Environment.

Classification-

Phylum-Arthropoda

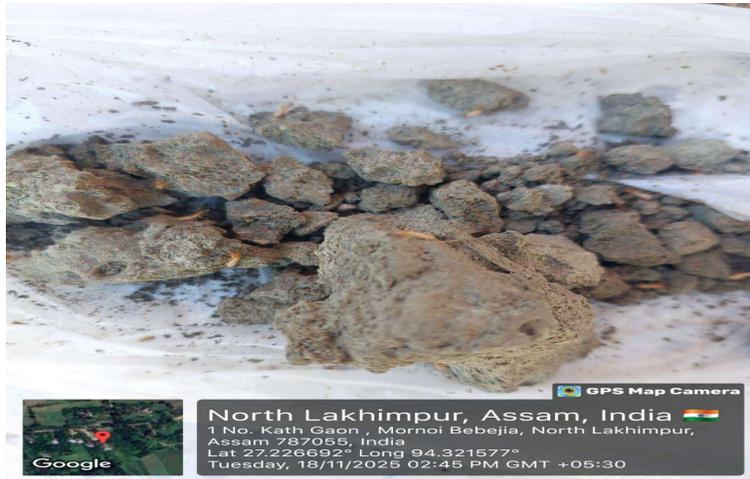
Class-Insecta

Order-Blattodea

Family-Termitidae

Genus-*Odontotermes*

Species-*Odontotermes obesus*



**Fig x: Termite**

11. Scientific name: *Vespa orientalis*

English name: Yellow wasp

Local name: Borol

Stages of intake: Eggs

Characteristics:

- (a) Head is Reddish Brown in colour, thorax is Yellow-Orange stripes on the abdomen
- (b) Wings are light transparent Brownish in colour.
- (c) Mandibles is Used for Biting and chewing the prey.

Habitat:

- (i) They are preferring live in dry, warm environment.
- (ii) They built nests in Underground, Hollow trees, wall cavities of Houses.

Classification-

Phylum-Arthropoda

Class-Insecta

Order-Hymenoptera

Family-Vespidae

Sub Family-vespinae

Genus-*Vespa*

Species-*Vespa orientalis*



**Fig xi: Yellow wasp**

12. Scientific name: *Hydrophilus piceus*

English name: Water scavenger beetle

Local name: Tapam

Stages of intake: Adult

Characteristics:

- (a) The colour of *Hydrophilus piceus* is in Dark Brown to Black in colour.
- (b) Exoskeleton is shiny and smooth.
- (c) Legs are used for swimming.

Habitat: They are found in ponds, and streams of Bebejia. They used vegetated water for Breeding.

Classification-

Phylum-Arthropoda

Class-Insecta

Order-Coleptera

Family-Hydrophilidae

Genus-*Hydrophilus*

Species-*H. piceus*



**Fig xii: Water scavenger beetle**

### **3. The Cultural value of Edible insect in Mishing community in Bebejia, Assam**

The Mishing people of Bebejia, Assam, have a strong cultural bond with edible insects, a custom that has been established over many generations by their intimate connection to the natural world. Edible insects are more than just a substitute food source for the Mishing people; they are an integral part of their daily lives, customs, and sense of community. A crucial component of their traditional cuisine is the consumption of insects including water beetles, grasshoppers, ants, and silkworm pupae, which reflects the richness and simplicity of their culinary culture. These insects are regarded as seasonal treats in many homes, adding diversity and nutritional value to their diet. These insects are prepared using traditional techniques, such as roasting, boiling, fermenting, or frying, which are taught informally by elders and passed down via participation and observation. Because of this, eating insects is not just a nutritional practice but also a way for the society to spread its culture.

Edible insects are directly associated with local ecological knowledge in Bebejia. The Mishing people have a thorough awareness of the many bug species' habitats, their seasonal availability, and the proper methods for gathering them without endangering the ecosystem. Their customary interaction with the local environment, particularly the farms, woodlands, and wetlands that surround the community, includes this knowledge. Children and young people frequently go with adults when they gather insects, which turns into an unofficial cultural activity where generations exchange ecological information. The traditional awareness of the local ecology is preserved and community ties are strengthened by this activity.

In the Mishing culture, edible insects also have symbolic and social significance. The sharing of insect-based meals during casual feasts, modest festivals, and family get-togethers is a symbol of hospitality, love, and unity. Giving visitors treats like water beetles or silkworm pupae is regarded as a show of kindness and respect. In this situation, food becomes a tool for expressing cultural identity. These insects' inclusion in regular meals symbolizes the persistence of ancestors' customs in the face of shifting societal circumstances.

In Bebejia, eating insects is also associated with traditional notions of health and wellbeing. Many people

in the society think eating insects like silkworm pupae and red ants offer digestive advantages, strength, and body warmth. Edible insects are an essential component of their traditional medical procedures because of these ideas, which have been formed over generations of observation and experience. Many homes still adhere to these indigenous beliefs, despite the growing introduction of modern healthcare services into rural life.

The community's sustainable approach to insect eating is another significant cultural feature. The Mishing people don't overuse local resources when gathering insects. Their seasonal harvesting methods aid in preserving ecological equilibrium and halting the decline of insect populations. Their reverent affinity with environment, which is essential to their cultural identity, is reflected in this sustainable approach. Thus, edible insects are a sign of traditional knowledge and ecological equilibrium in addition to being a source of sustenance.

However, the cultural relevance of edible insects is gradually diminishing due to the growing impact of contemporary lifestyles, market-based dietary choices, and shifting ambitions among the younger population. The custom of eating insects has gradually decreased in Bebejia as a result of the preference of many young people for packaged or mainstream cuisine. The community's elders nevertheless cherish insects as a component of their culture and identity in spite of these developments. For them, edible insects serve as a reminder of a more straightforward, sustainable lifestyle that captures the uniqueness of Mishing culture.

In this sense, the Mishing community of Bebejia's cultural value of eating insects is firmly anchored in custom, ecological knowledge, social significance, health beliefs, and sustainable living. These customs demonstrate the community's close ties to the natural environment. In addition to protecting a significant aspect of culture, recording this information aids in comprehending how indigenous customs support ecological sustainability and dietary diversity.

#### **4. RESULT AND DISCUSSION**

From the study of the data recorded on Edible insects of Mishing communities of Bebejia and insect's species use as medicine by Mishing people are given in Table no 1. From the survey and the interview with the member of the Mishing people total 12No.s of insect were consumed as food.

Some Edible insect species are available in throughout the year but some species are available in particular season at Bebejia. The Mishing people of Bebejia collected the Edible insects by using different method such as-larger species like House cricket are collected by Hand picking method, Light trapping, digging method, sieving method, Rearing and culturing methods. During field visit we found that they are collecting insects from paddy field, ponds, Streams, wetland and river and use some tools such as-cast net (khewali jal), Saloni (sieve rounded) use pond net, kharahi (small sieve) and insect net. They are also used ethnic tools like-Dingora, Jakoi, plastic jar, and sepa Said during interview. They are consumed different stages of insects such as-Adults, Eggs, immature larvae and Honey. Different species of Edible insects are prepared differently for consumption as food. Some species of Insects stages are being consumed both raw and roasted (Honey). The Mishing people of Bebejia Insect were eaten as fry or roast or make chutney those species are belonging to cicadidae, gryllidae and Belostomatidae.

They eaten Eri silkworm (pupa), Muga silkworm (pupa), Mulberry silkworm (pupa) and Termite as fry and wasps are eaten mostly by smoked Said in interview.

During interview the Mishing people of Bebejia said that Four species of Insects were used as medicine such as- Eri silkworm pupa is used as a remedy to protect young ones from the negative influences. From *Apis Indica* (Indian honeybee) Honey is used as preventive against cough, cold and fever. Wasps (whole insects, Egg, Larvae) used to treat Cough, cold and stomach problem. Red Ants (Eggs, Adults) used in protect against small pox, chicken pox, and adults are used in dysentery. The present study revealed that 12 species Belonging to 12 families and six orders of insect, Hymenoptera 3 species, Lepidoptera 3 species, Orthoptera 2 species, Hemiptera 1 species, Coleoptera 2 species, Blattodea 1 species. are being consumed as food by Mishing people of Bebejia. Some species of insects are used as medicine.

Sl. No	Scientific Name	English Name	Part Used	Used as Medicine
1.	<i>Samia ricini</i>	Eri Silkworm	Pupa, cocoon and cocoon ash	Protect liver, cocoon and cocoon ash used as a remedy to protect young Children from negative influences.
2.	<i>Apis indica</i>	Honey bee	Honey and Beeswax	Used as preventive against cough, cold, and fever
3.	<i>Vespa orientalis</i>	Wasps	Whole insect, Egg, Larvae	Cough, cold, and stomach problem.
4.	<i>Dorylus orientalis</i>	Red Ant	Eggs Adults	Protect against small pox, chicken pox, adults in dysentery

**Table 1:** Insects use as Medicine by Mishing people of Bebejia, Lakhimpur District, Assam

## 5. CONCLUSION

From the study of Edible Insects and their medicinal value in Bebejia found that Edible Insects are not only nutritious food but also valuable for the use as medicine by the ethnic community. Edible Insects are rich in proteins, fats amino acids, minerals and vitamins. There are various paddy fields, pond, streams, wetland (Beel) and bank of river for collection of Insect and expand entomophagy in Bebejia. They are use different method and traditional tools for collecting the different species of Insects.

Economically they are strong because they were use edible insects as source of Income. In every season they were use Edible insects are source of Income. In every season the Mishing people of Bebejia do not get enough vegetable then they take Edible insects as food. In Bebejia there are various types of sources are available for collecting the Edible insects. Most of the Edible insects are used as medicinal purpose also. Consuming of Insects is a tradition of Mishing community of Bebejia. It is a good practice of consumption insects as food because insects are natural fauna.

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