

**Traditional Uses of Insect and Insect Products in Medicine and Food by  
the Mishing tribe of Dhemaji District, Assam, North-East India**

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**Abstract**

Inter-linkages between cultural diversity and the environmental ethics or traditional conservation, has been very less understood, lest studied. Traditional mode of living or sustenance, invariably relates to the immediate nature and the resources that reside therein (Negi et.al, 2007). The traditional people thus have been innovative uses of the insects or insect products in the traditional medicine and food through several generations in close contact with nature. The present paper thus attempts to inventorize the little left out insect resources base among the Mishing Tribe of Dhemaji District, Assam, N.E.India, with an aim that this knowledge bank could be put to more efficacious to use through sustainable harvest. The research investigation was carried out from January 2007 to 2010 by performing through structured questionnaires with villagers of different age groups for collecting data related to uses of insects as food. A total 15

species belonging to 12 families and 15 genera consumed by Mishing tribe. Hymenopterans order shared with maximum number of 4 species followed by Lepidopterans by 3 species, Orthopterans by 3 species, Hemipterans by 2 species, Coleopteran by 2 species and Isopteran by 1 species respectively. Edible insects like *Vespa orientalis*, *Apis cerana indica*, *Samia cynthia ricini*, *Antheraea assamensis*, *Oecophylla smaragdina*, *Odontotermes obesus*, *Eumenes petiolata*, *Schistocerca gregaria* are use in therapeutic purposes and beliefs by Mishing tribe.. The investigation thus aims at to listing out the numbers of insects used as food, their habitats, availability and therapeutic purpose for the greater benefit of mankind.

**Keywords:** *Edible insects, Traditional food, Medicine, Mishing tribe, Dhemaji, N.E.India.*

## **INTRODUCTION**

The Mishings, are also known as Miris, are the second largest group of Scheduled Tribes (P) of Assam. They are mainly concentrated in the riverine areas of Dhemaji, Lakhimpur, Dibrugarh, Sibsagar, Jorhat and Sonitpur districts of Assam. Primarily, they have characteristic physical features of the Mongoloids and belongs to the Tibeto Burman family of the Mongoloid group (Bordoloi, et.al, 1987). These indigenous tribe utilizes a wide range of biological resources in diverse ways. These tribal communities also maintain their social and cultural relationship with surrounding nature and keep traditional knowledge of insects and insect products use restricted to their society-a closely guarded treasure. The great diversity of habitats of insects species that serve as traditional foods presents an almost endless diversity of situations in which recognition and enlightened management of the food insect resource can result not only in better human nutrition but simultaneously aid in maintaining diversity of habitats for other forms of life (DeFoliart, 1997). The insect resources used as medicine by the tribes of Kerala consisted of honey and honeybee, termite, wasp, ants, mole cricket and black beetle. They have been using these insects for the treatment of over 15 kinds of diseases or ailments, including ulcer, rheumatics, anaemia, scabies, conjunctivitis, malaria, asthma,

cough, throat, chest infection, chest pain, back pain, head ache and cold ( Wilsanand,et.al.,2007). Insects have played an important part in the history of human nutrition in Africa, Australia, Asia and the Americas. 100 species have been used as human food (Froome, 2005). Ants, bees, termites, caterpillars, waterbugs, beetle larvae, flies, crickets, katydids, cicadas and dragonfly nymphs are among a long list of edible insects that provide nutrition for the people of Asia, Australia, Africa, South America, the Middle East and the far East (Srivastava, et.al, 2009). About 11 species of insects were used by traditional healers in Tirunelveli district, Tamil Nadu by Kaniyars and Paliyars tribes (Ranjit Singh et.al, 2004). There are 177 species of insects belonging to 96 genera of 54 families in 11 orders, such as Hymenoptera, Coleoptera and Lepidoptera, were used as dishes in China and 22 kinds of insects medicines were used in therapeutic purposes (Chuanhui et. al,2010). Worldwide at least 1400 species have been recorded as human food (Durst et.al, 2008). About 60 to 100 insect species, representing 10 insect orders, are eaten by indigenous people of Papua, Indonesia (Ramandey et.al, 2008). The ethnic tribes of Karbi Anglong district consume as many as 40 (forty) species of edible insect. Among the ethnic tribes-the Karbis and Rengma Nagas are found to be the highest insects consumer. 10 species of edible insects are used in therapeutic purposes by the ethnic tribes of the Karbi Anglong (Ronghang, et.al, 2010). Traditional knowledge concerning insect bioresources utilization has a vital role in the state of Manipur. A total of 56 insect species were utilized by 30 ethnic groups in edible, medicinal, edible oil, cultural and aesthetic & ornamental categories (Lokeshwari et.al, 2011). At least 81 species of local insects, belonging to 26 families and 5 orders of insects are being consumed as food among members of two tribal societies (i.e. the Nyashi of East Kameng and the Galo of West Siang) of Arunachal Pradesh ( Chakravoty et.,al.,2011).Around 29 species of different edible insects are consumed by tea tribes in greater Chabua of Dibrugarh of Assam (Das,et.al, 2011).Most of the tribal people of are also habituated with the consumption of Giant water bug (*Lethocercus indicus*),cricket, locusts, honeybee brood, especially late instar larvae and pupae etc.(Hazarika,2008).Edible insects such as *Dorylus orientalis*,*Acheta domestica*,*Lethocercus indicus*,*Odontotermes obesus*,*Apis indica*,*Vespa orientalis*,*Hydrochera rickseckeri*,*Heiroglyphus bannian*,*Neoconocephalus palustries*,*Philosomia ricini*, *Anthera assama* and *Bombyx mori* (Borkakati,2005). The

commonly consumed insects of Assam are *Dorylus orientalis*, *Gryllus sp.*, *Lethocercus grandis*, *Odontotermes obesus*, *Apis indica*, *Vespa sp.*, *Agabetes acuductus* or *Hydrochera rickseckeri*, *Heiroglyphus bannian*, *Neoconocephalus palustris*, *Philosomia ricini*, *Anthera assama*, *Bombyx mori* etc.(Deva Nath et.al.,2005). The principal aim of the present study is to explore the insect resources use by Mishing tribe in traditional practices - medicine and food.

## **MATERIALS AND METHODS**

**Mishings:** The *Mishings* are an indigenous ethnic group of Assam. They are the second largest group of Scheduled tribe (P) of Assam, N.E.India (Bordoloi et.al., 1987). The *Mishings* villages have spread and interspersed over vast areas of Dhemaji, Lakhimpur, Sibsagar, Dibrugarh, Golaghat, Jorhat ,Sonitpur and Tinsukia district of Assam (Pegu, 2005,Taid,2007). The *Mishings* are sturdy people. They are monogamous, matrilineal and patrilocal tribe. They are primarily agriculturist and their socio-economic life is closely associated with environment. The *Mishings* live in pile dwelling houses and their traditional houses are constructed from bamboo, wood and thatch (Pegu, et.al, 2011).The traditions and linguistic traits of the *Mishings* affinities with *Adi* people of Arunachal Pradesh. Waddell observed in 1901 that:

“.....they have decided Mongoloid features so much as to remind me in many ways of Tibetans and Lepchas.....They are exceptionally sturdy and well developed physically although so many of them live in most malarial spots in Assam”. (Pegu, et.al, 2011).

**Study Area:** Extensive field surveys to record various uses of insects by the members of Mishings were carried out in the Dhemaji district, Assam. The district Dhemaji is situated in the northern bank of river Brahmaputra. The district lies between 94°12'18" E and 95°41'32"E longitude and 27°05'27"N and 27°57'16"N latitudes and 104m above the MSL. The annual rainfall of the district ranges from 2600 mm to 3200 mm. Rainfall generally begins from April and continues till the end of the September. The relative humidity varies from 90 to 73 percent. The temperature varies between 39.9°C in summer

and 5.9°C in winter. The district harbours 9 reserved forests and 5735 nos. ponds and beels, 10 nos. Swampy area, 33 nos. of low laying areas (District Information Officer, Dhemaji, 2009).

**Target groups:** Nine villages was selected randomly, (each village has 30-40 households) for survey works. The surveys were based on interviews with elderly persons, both male and female of 40 to 50 years of age, who traditionally practices insects as food and medicine. They are usually cultivators and fisherman and most of them are familiar about the traditional uses of insects as food and in therapeutic purposes.

**Collection , Preservation and Identification:** Insects were collected from different habitats, e.g., ponds, beels, soils, shrubs and trees, grassland and from rearing households by traditional methods. The insects were collected with the help varied collecting equipments depending upon their habitat (Fenemore, 2005, Michael, 1984).

The insects were preserved according to standard methods (Singh et.al., 2006-07; Srivastava, 2004; Kumar et.al., 1997, 2001) and identified with the help published keys (Mcgavin, 2000; Hook, 2008; Singh et.al., 2006-07; Srivastava, 2004); (Edelstein et.al., (1993); (William et.al.,1998);(Atwal et.al.,2010). Some of the specimens were identified and confirmed by comparing with the specimens in Entomology Division of Department of Zoology, Gauhati University, Guwahati, Assam, India. Identified specimens were arranged in systematic order.

## **RESULTS AND DISCUSSION**

During the present study, 15 species were found to consume as food and out of 15 species 7 species of edible insects were used in therapeutic purposes by Mishing tribe. The 15 species belonging to 12 families and 15 genera. Hymenopterans order shared with maximum number of 4 species followed by Lepidopterans by 3 species, Orthopterans by 3 species, Hemipterans by 2 species, Coleopteran by 2 species and Isopteran by 1 species respectively. . It is reported that the Giant Water Bugs ( *Lethocercus indicus*), Eri silkworm ( *Samia ricini* ), Muga Silk-worm ( *Antheraea assama* ) and House cricket ( *Acheta domesticus*) are the most preferable insects among the *Mishings* tribe. The

Mishings tribe and the Ahom Community of Assam uses Red tree ants (*Oecophylla smargdina*) as one of the food items during an Assamese Festival Bohag Bihu in the month of April. These insects keep the health free from infection of diseases. The formic acid of these insects are being used in connection with scabies, malaria, tooth aches, stomach disorders, blood pressure anomalies etc. (Chakravorty et. al., 2011). The elderly people, both male and female were found to possess good knowledge of folklore medicines, specially derived from insects.

*Seasonal availability* : Their densities and diversities are determined by the availability of the food items as well as by the ecological conditions of the habitats. The Orthopterans were observed in most abundant in June-October, November and December (late summer) months. The Hymenopterans insects were abundant during March-April, early spring, Oct-Nov. The Lepidopterans insects were available throughout the year. Isopterans were found to be abundant during the months of April-May. Coleopterans and some Hemipteran insects were found to be available throughout the year.

*Stages and modes of insect consumptions*: The members of the Mishings tribe consumed immature stages such as egg, larva, pupa, nymph as well as adult insects as food items. The bee products honey is consumed for therapeutic purposes. The methods used in preparing the insects include roasting, dry frying, deep frying, baking, chutney, boiled and curry (Table-1).

*Insects and traditional medicine*: The use of insects in therapeutic purposes is an age-old practice of tribal peoples. The use of Eri-silkworm (*Samia cynthia ricini*) cocoon and cocoon ash against evil spirit particularly in children has been reported from the *Mishings* tribe. The use of honey and beeswax (produced by *Apis indica*) is common among the members of the *Mishings* tribe to treat coughs, colds and fevers. The beeswax are components used in traditional weavings by Mishings women called as “Mutkon”. The wasps (*Vespa orientalis*) have been reported to be used in treatment against coughs, colds and fevers. The larvae and eggs are also used in fish bait.

Table 1-Total nos. of insects used as food by Mishing Tribe, Assam, N.E.India

Scientific Name	English Name	Family	Local Name (Mishing=M)	Habitat	Availability
<i>Lethocercus indicus</i>	Giant water bug	Belostomatidae	Gajeng(M)	Pond,Beel,Mars hes,Swamp	Whole the year
<i>Dytiscus marginalis</i>	Predacious diving beetle	Dytiscidae	Ashi Takshi(M)	Pond,Beel,Mars hes,Swamp	Whole year
<i>Acheta domesticus</i>	House cricket	Gryllidae	Takam(M)	Soil	August – Nov.
<i>Oecophylla smaragdina</i>	Red ant or weaver ants	Formicidae	Rukkum merang(M)	Nests in twigs/branches	April -June
<i>Samia ricini</i>	Eri silkworm	Saturniidae	Anera polu(M)	Rearing	5-6 generation
<i>Antherea assamensis</i>	Muga silkworm	Saturniidae	Sumani polu(M)	Rearing	5-6 generation
<i>Vespa orientalis</i>	Yellow jacket wasp	Vespidae	Borol(M)	Tree, house ceiling, roof	April-June
<i>Apis cerana indica</i>	Honeybee	Apidae	Tanggud(M)	Culturing	April-Oct.
<i>Bombyx mori</i>	Mulberry silkworm	Bombycidae	Nuni polu(M)	Rearing	1-2 generation
<i>Odontotermes obesus</i>	Termite	Termitidae	Tabyn(M)	Termitaria	April-June
<i>Heiroglyphus bannian</i>	Short horned grasshopper	Acrididae	Kamyr(M)	Paddy and vegetation	August-Nov.
<i>Schistocerca gregaria</i>	Locust	Acrididae	Kikambali(M)	Vegeation, shrubs ,paddy	August-Nov.
<i>Pomponia imperatorial</i>	Cicada	Cicadidae	Jili (M)	Bark of trees	Periodical
<i>Eumenes petiolatus</i>	Potter wasp	Eumenidae	Yilud(M)	Holes,Ceiling	April –Oct.
<i>Hydrophilus piceus</i>	Water scavenger beetle	Hydrophilidae	Ashi Simang Takshi	Ponds,beels,mar shes,swamps	Whole the year

During the study seven species has been reported for therapeutic purposes and 1 species for animal feed by the *Mishings* tribe (Table-2). Chakravorty et.al. (2011) observed 12 species of insects origin used by the Nyashi and Galo tribes of Arunachal Pradesh, N.E.India. Ronghang and Ahmed (2010) observed 10 species of insects used in therapeutic purposes by the Karbis and Rengma Nagas –two ethnic tribes of Karbi Anglong district of Assam, N.E.India. Dixit et. al. (2010) observed 12 species on insects in South India for their traditional method of treatment using insects.

The Desert locust (*Schistocerca gregaria*) which are the pests of paddy are carnivorous feeding upon insects like flies, leafhoppers, grasshoppers, caterpillars, butterflies etc. are beneficial for us in naturally controlling the population of pest in the district are collected from the field during October to December.

Scientific name	English name	Part used	Therapy and other use	Remarks
<i>Samia cynthia ricini</i>	Eri Silkworm	Pupae, Cocoon and cocoon ash	Protect the liver. Cocoon and cocoon ash used to protect children from evil spirit. Commercial purposes. Animal feed.	Locally available. Traditionally reared by the tribe.
<i>Apis indica</i>	Honey bee	Honey, Beeswax	Used as preventive against cough, cold and fever. Beeswax in clothing.	Locally abundant. Cultured by traditional methods.
<i>Vespa orientalis</i>	Wasps	Whole insects, eggs, larvae	Cough, cold and stomach problem and eggs and larvae in fish bait.	Locally available.
<i>Dorylus orientalis</i>	Red ant	Eggs, adults	Protect against small pox, chichen pox. Adults in stomachache, dysentery.	Seasonally abundant during March-April.
<i>Schistocerca</i>	Desert locusts	Whole body and	Lip cracking	Seasonally



<i>gregaria</i>		body oil		abundant during Nov.-Dec.
<i>Antheraea assamensis</i>	Muga silkworm	Pupae and silk	Diet supplement and silk production. Animal feed .	Locally available. Traditional rearing.
<i>Eumenes petiolatus</i>	Potter wasp	Eggs, larvae	Protect from headache burns.	Seasonally abundant.
<i>Odontotermes obesus</i>	Termite	Adults	Use as fish feed in ponds and fisheries.	Seasonally abundant.

From the present study it was observed that the *Mishing* community uses a wide variety of insects in traditional practices of eating and for curing different ailments. Besides agricultural practices the *Mishings* and other tribes collect the edible insects as their good source of income, especially for the women. The insects are widely offered in local village markets in the Dhemaji district of Assam, N.E.India. Some of the edible insects have declined because of over exploitation and decreasing of natural habitats. These traditional practices of insects in food and medicine by the *Mishings* and other communities of Assam, N.E.India has great benefit to mankind and maintenance of insects bio-diversity.

Thus, it is pertinent to undertake further research on edible insects, its traditional rearing practices and sustainable use of these insects.

### Acknowledgements

Authors are thankful to all the cultivators and fishermen of the villages for their co-operation, providing insects and hospitality during the survey work and field study. Thanks are also to Entomology Division of Zoology Department, Gauhati University, Assam, India for providing facilities for the study.

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