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Insect as Medicine: Meghalaya and Manipur

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Meghalaya and Manipur are one of the biodiversity rich State in Northeast India which is a home to diverse indigenous communities such as the Khasi, Garo and Jaintia tribes in Meghalaya and Tangkhul, Mao and Poumai ethnic community of Manipur where they possess a rich traditional knowledge of natural medicine. Among these practices, the medicinal use of insects plays a significant role in treating various ailments. Insects can be used either as food (Entomophagy) or as therapeutic agents (Entomotherapy). Honey bees, silkworms, ants, termites and beetle larvae are the commonly used insects. They are known for their antimicrobial, anti-inflammatory, wound healing and nutritional properties. Traditional healers prepare treatments using dried, roasted, crushed, or fermented insects for treating wounds, respiratory disorders, digestive problems, skin diseases and weakness. The important medicinal insects of Meghalaya and Manipur, their traditional uses, preparation methods and significance in health care is documented in this article. The study highlights the importance of conserving indigenous knowledge and promoting scientific validation of insect-based medicines for sustainable healthcare development.

Keywords: Medicinal insects, Traditional medicine, Indigenous knowledge.

Introduction

Insects are small invertebrate animals belonging to the Class Insecta, characterized by a three-part body (head, thorax, abdomen), three pairs of legs, and usually wings. They are the most diverse group of organisms on Earth and play important ecological roles such as pollination, decomposition, and biological control. Globally, scientists estimate that about 5–10 million insect species exist, out of which around 1 million species have been formally described. Among these, approximately 1,000 insect species have been reported to be used in traditional medicine worldwide (Entomotherapy). This means only a very small percentage (less than 0.1%) of the total insect diversity is currently known for medicinal use. Acceptance of insect-based medicine varies across cultures. It is high in traditional societies of Asia, Africa, and Latin America, but limited in modern mainstream healthcare systems.

In India, about 63,000–70,000 insect species have been recorded so far, though the actual number is believed to be much higher. Ethno zoological studies indicate that around 200–300 insect species are used in traditional medicine by different tribal and rural communities, particularly in Northeast India. However, acceptance remains largely within indigenous groups, and insect-based remedies are not widely incorporated into formal medical practice nowadays.

Among these, studies from Northeast India suggest that 40–90 species are traditionally used for food and medicinal purposes The use of insects as medicine in NEH is mainly due to easy availability, deep-rooted traditional knowledge, cultural acceptance, and belief in their natural healing properties.)

Study area and Target Group

Meghalaya, known as the 'Abode of Clouds' is a state in the north eastern part of the country and the place receives a high rainfall, dense forests, rich biodiversity and a strong tradition of indigenous knowledge systems. The Khasi, Garo and Jaintia – the major tribal communities depend heavily on forest resources for food, medicine and livelihood. Their culture is deeply rooted with traditional medicine which is often practiced using plants, animals and insects. They are traditionally used to treat wounds, stomach disorders, fever, skin infection, cough, joint pain and weakness. These treatments are prepared using simple procedure such as drying, cooking, roasting and grinding.

Like Meghalaya, Manipur also hosts thousands of insect species in its forest and wetland ecosystem. Ethno zoological survey indicates that around 30-60 insect species are traditionally used for food and medicinal purposes with several specifically used to treat ailment such as- fever, cough, infection. They preserved this knowledge through oral traditions. Looking into Manipur, total of 41 insect species were recorded as edible which are from 8 orders under 24 different families and 36 genera, where a total of 10 species of Hemiptera were consumed. (Shantibala et al., 2012)

Diversity of medicinal insects in Meghalaya & Manipur

Meghalaya & Manipur are diverse state with different species of insects which is used in traditional medicine belonging to the order such as Hymenoptera, Coleoptera, Orthoptera, Lepidoptera, Hemiptera and Diptera.

1.Giant Honeybee

Honeybees are widely used for their medicinal products honey, propolis, royal jelly, bee pollen, beeswax, and venom therapy. Honey is used to treat cough, cold, sore throat and digestive problem, it is applied on wounds and burns. According to Senthil Kumar et al., (2022) a tonic made from the larva and pupa of A. dorsata is useful to elevate weariness and sunburn.

Preparation: Raw honey is consumed directly or mixed with warm water or herbal extracts.

2. Eri Silkworms

Pupae is used for nutritional and therapeutic purposes. It improves strength and immunity, helps in treating malnutrition and anemia, also used for join pain and body weakness.

Preparation: Pupae are roasted or boiled and sometimes powdered.

3.Red ants

It is used for pain relief and immune boosting. Their eggs are commonly used by tribal communities. Some others uses include treatment for stomach disorders and indigestion, it improves appetite and immunity and for energy booster.

Preparation: Ants are crushed into paste or mixed with spices and consumed.

4.Termites

Termites are rich in proteins and minerals. Termites are used for treating malnutrition and weakness for bone strength and muscle development and for wound healing

Preparation: Roasted or dried termites are powdered and consumed.

5. Beetle larvae

Longhorn beetle larvae are used in folk medicine. It is used for treating gastrointestinal problems, stomach aches, and malaria.

Preparation: Larvae are cooked, dried or ground into paste.

6. Grasshoppers and crickets

for digestive and respiratory ailments (Kalita, 1998-99)

Preparation: (Drying/Roasting): The insects are typically roasted or dried over a fire.

Powdering: Dried grasshoppers are ground into a fine powder.

7. Spider

The traditional practitioners particularly used certain spiders for treatment of boils and wounds, spiders are crushed and applied topically on wounds and boils and left covered for at least two days (Kumari et al., 2013)

8. American Cockroach

Whooping cough can be cured using a American Cockroach. According to traditional practitioners, trapping the cockroach in mustard oil inside the chimney and eating the oil fried Cockroach can cure this disease.

9. Treehopper

The nymph and the adult stages are consumed by frying after discarding wings and its decoction is used for treatment of jaundice. It is said to heal diabetes and high blood pressure.

Preparation: The local people crushed the insect into powder.

10. Pink Oak borer

This insect is often consuming in raw which is effective for Cancer treatment. It can also help in curing of body ache and cough.

Preparation: The larval stage of this species is cooked or fried.

11. Asian Giant Hornet

It is believed that this insect imparts medicinal values like improving eyesight and strengthening the body.

Preparation: The larva and pupa stages are consuming by cooking or boiling.

Entomophagy and Entomotherapy

Edible insects are meant to cure to prevent or cure diseases. For example, pregnant and lactating women consumed termites to improve strength and milk production. Grasshoppers are eaten to alleviate digestive problems while ant-based preparations are used for joint pain and fatigue. Recent studies emphasize the high protein content, essential fatty acids, vitamins and minerals in edible insects, supporting their medicinal value. The dual role of insects as food and medicine strengthens food security and healthcare simultaneously

Entomotherapy: Insect based remedies are used for human and animal wounds, skin infections, respiratory problems, gastrointestinal disorders and musculoskeletal pain by the traditional healers in Meghalaya.

Survey requirement for investigation

The study of insect-based medicine in the states requires a systematic survey approach covering communication, analysis and medicinal properties.

Communication: In order to collect information effective oral communication with indigenous communities is essential. It is done through interviews with traditional healers and elders, using local languages where necessary with prior informed consent to ensure ethical documentation.

Analysis: Collected information should include local names of insects, methods of collection, preparation, dosage, and ailments treated. Proper taxonomic identification and comparison with existing literature are necessary for scientific validation.

Survey: Field surveys and interviews with local healers, elders, and farmers.

Observation: Recording preparation techniques and usage patterns.

Medicinal properties: Medicinal insects should be evaluated for their therapeutic properties through laboratory studies, including antimicrobial and anti-inflammatory activities, along with safety and toxicity assessment to support traditional claims.

Conclusion

Insect benefit us in various ways, including their high nutritional value, ability to reproduce quickly, ease of maintenance, and ability to rear on waste material. Medicinal insects play an important role in the traditional healthcare system of Meghalaya and Manipur. They provide affordable, accessible, and eco-friendly treatment options. Preservation of indigenous knowledge and scientific validation can help promote sustainable healthcare and biodiversity conservation.

List of Insects use as Traditional medicine in Meghalaya and Manipur

Scientific name	Order	Common name	Body parts/ products used/ stage used	Disease/Ailments for which insect is used/ Food value	Formulation
Apis dorsata	Hymenoptera	Giant Honeybee	Larvae, Pupa, Honey	Cough, cold, sore throat and digestive problem	The eggs, larvae are crushed and mixed with honey and are consumed.
Attacus ricini	Lepidoptera	Silkworm	Pupa	Immunity, malnutrition, anemia and join pain	Pupa are roasted or boiled and sometimes powdered.
Oecophylla smragdina	Hymenoptera	Red ants	Eggs	Pain relief and immunity boosting	The eggs, larvae are crushed into paste or mixed with spices and consumed
Odontotermes formasanus	Isoptera	Termites	Whole termites	Malnutrition, Weakness for bone strength and muscle strength	Roasted or dried termites are powdered and consumed
Lytta vesicatoria	Coleoptera	Beetle (Longhorn beetle)	Larvae	gastrointestinal problems, stomach aches, and malaria	Larvae are cooked, dried or ground into paste
Romalea microptera,	Orthoptera	Grasshoppers (Eastern lubber grasshopper)	Whole part	Digestive and respiratory ailments	Insects are typically roasted or dried over a fire.
Phoneutria nigriventer	Araneae	Spider (Brazillian Wandering spider)	Whole insects	Boils and Wounds	Spiders are typically crushed and applied on wounds.
Periplaneta americana	Blattodea	Cockroach (American Cockroach)	Whole parts	Whooping cough	Oil fried cockroach can be consumed.
Darthula hardwickii	Hemiptera	Treehopper	Nymph and adult	Jaundice, diabetes and High BP	Consumed by frying after discarding wings

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