International Journal of Entomology Research
www.entomologyjournals.com
ISSN: 2455-4758
Received: 15-07-2022, Accepted: 02-08-2022, Published: 18-08-2022
Volume 7, Issue 8, 2022, Page No. 68-73

Diversity and traditional management practices of poisonous insects in Sipajhar, Darrang district, Assam

Sabina Langthasa[1*], Jubin Saharia[2]
[1] Assistant Professor, Department of Zoology, College B. Borooah College Affiliated to Gauhati University, Guwahati, Kamrup, Assam, India
[2] Bachelor of Science, Department of Zoology, College: B. Borooah College Affiliated to Gauhati University, Guwahati, Kamrup, Assam, India

Abstract
Insects occupy the diverse group of Animal kingdom and poisonous insects constitute an important part. This study explored the diversity of poisonous insects and its traditional management practices in Sipajhar, Darrang district, Assam. The present study documented the prevalence of 37 poisonous insects belonging to 20 families and 7 orders where Hymenopterans known for its venomous character occupied the dominance. Insects in spite of its great services to mankind pose threats due to its rigorous and defensive mechanism in the form of allergy, rashes, inflammation etc. Traditional knowledge system plays an important role among the lives of the people. The region has sound knowledge in insect poison management practices which has been practiced since ages. These serve as natural remedy. Management practices were either applied topically as paste or ointment and sometimes taken in oral form. But with emergence of newer generations, modernization and advancement in medical infrastructure such traditional practices have become less pronounced hence, there is a need to preserve traditional knowledge as it is highly cost-effective, easily available and has been much helpful for the people residing in rural areas where roads and hospitals could not be easily assessed. Till date no work of insect-people interaction has been undertaken in the study area. Thus, through this study an initiative has been made to document the diversity of poisonous insects and preservation of traditional knowledge system in the region.

Keywords: Assam, poisonous insects, preservation, remedy, traditional knowledge

Introduction
Insects belong to the class Insecta of the phylum Arthropoda of the Animal Kingdom. Their bodies are made up of 3 portions which are head (6 fused segments), thorax (3 segments) and abdomen (up to 11 segments) (Kotpal, 4). Insects are the most diverse group of animals (Chapman, 1). Known to serve as important factor to mankind such as in pollination, providing economically and health benefit products like honey, silk, lac etc, insects are also known for their rigorous and defensive behaviour which sometimes act as poison to human health. Insects which have venom or poison in their body and can introduce them to humans or animals by sting or bite or contact are called the poisonous insects (Shrivastava, 5). The order under the class Insecta, which includes greatest number of poisonous insect species is Hymenoptera (Gupta, 3). Female insects have the venom located in their posterior abdomen. Bites and stings from this group may cause allergic reactions, and sometimes rapid death from anaphylactic reactions (Fitzgerald, 2). Whereas in insects like moth and their caterpillars, poison glands are present which release the poison upon contact (Strother, 6).
Assam occupies one of the biodiversity hotspots for the floras and faunas and Sipajhar area constitute an important part of the state. This region is also home to a wide variety of insects including insects that are poisonous. People residing in rural areas of this region rely on traditional practices for relief from the insect poisons considering the traditional knowledge as an important tool. However, the traditional knowledge of the people and the insect diversity of this area has remained to be unreported. So, in order to have an initial knowledge, this study aimed to document the diversity of poisonous insects and to assess its traditional management practices in the region.

Materials and Methods
The geographical boundary of the Sipajhar area, the people residing there and their interaction with the environment serve as the material of the research. The study was carried out in the Sipajhar area (Fig. 1) of Darrang district. Sipajhar is located in the western part of Darrang district about 50 km away from Guwahati, capital city of Assam and about 15 km away from Mangaldai, the district headquarter of Darrang district. Darrang is an administrative district of the state of Assam. The district occupies an area of 1585 km² (Source: http://dbpedia.org) with a total population 15671 (acc. to 2011 census report).

Exclusive field visit and household survey was conducted for a period of 4 months from February 2022 to May 2022. Firstly, a handmade insect trap (sweep net) was made with easily available materials like cloth, wires, bamboo, etc. at home. Then it was taken to the field to try and trap insects. Field visits were done mostly during the day time because most of the insects are out in the environment in the hot temperature. The sweep net was used to collect different insects which are poisonous. When the insects were airborne or were resting the insect net was swept to collect the insects. Then immediately they were put inside small bottles to trap them and take them home. After collection the insects were taken home and preserved in 70% alcohol, some were even preserved dry. They were then identified by using suitable literatures, books, publications and by comparison with the museum specimen available at the department of Zoology, B. Borooah college, Guwahati.

Field visits included interviewing the residents about the different traditional management practices that were employed. A structured questionnaire was first prepared. The Head of the village, Gaonbura was visited to collect information of the village and the villagers residing in the area. Then the structured questionnaire was administered to elderly villagers (both male and female) of the age group of above 45 years. Questionnaires prepared included local names, time of availability of insects, effect of insect poison, traditional management practices and were given more emphasis on questions like whether they use homemade or allopathic medicines for management of insect bites, what the different homemade remedies are and how they are prescribed such as in dry or liquid form and for how many doses and their responses were recorded.

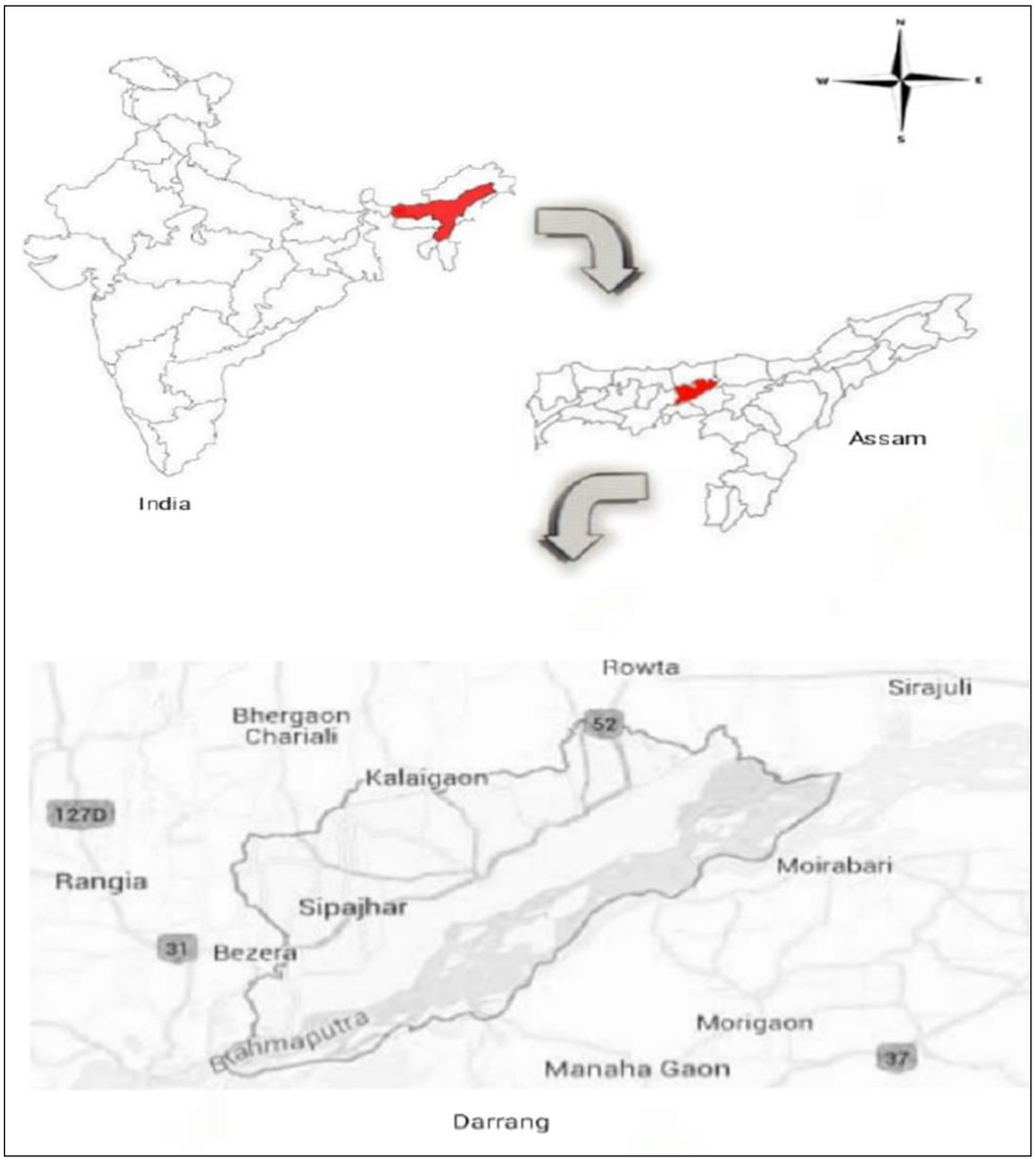

Fig 1: Map of study area (Source: www.maps-india-in.com)

Results and Discussion

The study recorded 37 species of poisonous insects belonging to 20 families and 7 orders (Hymenoptera, Lepidoptera, Blattodea, Coleoptera, Orthoptera, Diptera and Hemiptera) (Table 1). Order Hymenoptera occupied the dominance with 20 species. This was followed by Coleoptera and Lepidoptera with 5 species each, Hemiptera, Blattodea and Orthoptera with 2 species each and Diptera with 1 species.

In addition to poisonous insects, four economically important honeybee species were recorded. Species such as *Vespula vulgaris* (Fig. 2), *Polistes* sp. (Fig. 3), *Ryncium* sp. (Fig. 4), *Vespa affinis* (Fig. 5), *Sceliphron spirifex* (Fig. 6), *Chalybion bengalese* (Fig. 7), *Xylocopa* sp. (Fig. 8), *Tetraporena rufonigra* (Fig. 9), *Coridius nepalensis* (Fig. 10), *Holotrichia* sp. (Fig. 11), *Camponotus* sp., *Orthosoma brunneum*, *Acheta domesticus* (Fig. 12), *Periplaneta americana* (Fig. 13), and *Bactrocera dorsalis* were also documented from the study area.

Insects were found in a wide variety of habitats from terrestrial to arboreal. Wasps and weaver ants-built nests on trees, some were found on shrubs, man-made structures such as doors, windows or pillars of houses and many more. Abundance of Hymenopterans in the region may be because it can mostly thrive in all the adverse climatic conditions.

Insects mostly causing threats to mankind with their stings and bites were honey bees, wasps (paper wasp and common wasp), carpenter bee, species of ants, bed bug, moth and their caterpillars and mole cricket. Bites by bees, wasps and carpenter bee were largely recorded as allergic and painful. They cause swelling with severe pain. The pain might be so severe that sometimes it can even cause death of the individual. Bites by ants like little black ant cause slight itching with significantly less pain, however bites by weaver ants and fire ants cause considerably large pain. Bites of giant honey bee (*Apis dorsata*) and fire ant (*Solenopsis* sp.) may even turn fatal. Moths and caterpillars were found to cause itching and rashes on skin. Bites by fruit flies and mole cricket were found painful and that of bed bugs were found to cause itching with slight swelling on the bitten area.

Though beneficial to mankind insects were also found as harmful. In order to get relive from insect poisons people in the region have adopted the traditional management practices when hospitals could not be easily reach out. Management of poisonous insects mean management or treatment of insect bites. Management practices can be traditional or allopathic. The people of Sipajhar area use various traditional practices for management of poisonous insects which has been practiced since ages. Traditional management practices include using various natural resources as remedy. Such methods include using certain plants of medicinal value *viz*. tulsi, neem, aloe, ginger, turmeric, etc. These were either applied topically or sometimes taken in oral form. Various plant parts were used such as leaves, stem, roots, branches etc. Extracts from different parts were used or paste were prepared for application. Sometimes a mixture of different types of plants or plant products were prepared.

Fig 2: *Vespula vulgaris*

Fig 3: *Polistes sp*

Fig 4: *Rhyncium sp*

Fig 5: *Vespa affinis*

Fig 6: Sceliphron spirfex

Fig 7: Chalybion bengalese

Fig 8: *Xylocopa* sp

Fig 9: *Tetraporena rufonigr*

Fig 10: *Coridius nepalensis*

Fig 11: *Holotrichia sp*

Fig 12: *Acheta domesticus*

Fig 13: *Periplanata americana*

Table 1: Diversity of poisonous insects in Sipajhar area, Darrang district, Assam

Sl. No.	Insect name	Scientific name	Local name (Assamese)	Family name	Habitat
1	Giant honey bee	*Apis dorsata* (Fabricius, 1793)	Bor mou	Apidae	Arboreal
2	Indian honey bee	*Apis cerana indica* (Fabricius, 1798)	Mou makhi	Apidae	Arboreal
3	Western honey bee	*Apis mellifera* (Linnaeus, 1758)	Mou makhi	Apidae	Arboreal
4	Dwarf honey bee	*Apis florea* (Fabricius, 1787)	Makhi mou	Apidae	Arboreal
5	Wasp	*Vespula vulgaris* (Linnaeus, 1758)	Borol	Vespidae	Arboreal
6	Greater banded hornet	*Vespa tropica* (Linnaeus, 1758)	Din kona borol	Vespidae	Arboreal
7	Lesser banded hornet	*Vespa affinis* (Linnaeus, 1764)	Kodu borol	Vespidae	Arboreal and terrestrial
8	Paper wasp	*Polistes sp.*	N/A	Vespidae	Arboreal
9	Potter wasp	*Ryncium sp.*	N/A	Vespidae	Arboreal
10	Yellow paper wasp	*Polistes flavus* (Cresson, 1868)	Borol	Vespidae	Arboreal
11	Black and yellow mud dauber	*Sceliphron spirifex* (Linnaeus 1758)	Kumaroni	Sphecidae	Arboreal, rock ledges, man-made structures, puddles, etc.
12	Oriental mud dauber	*Chalybion bengalese*	N/A	Sphecidae	Arboreal, man-made structures, etc.
13	Digger wasp	*Pemphredon sp.* (Latreille, 1796)	N/A	Crabronidae	Arboreal
14	Emerald Cockroach wasp	*Ampulex compressa* (Fabricius, 1781)	N/A	Ampulicidae	In Host-Cockroach
15	Carpenter bee	*Xylocopa* sp.	Bhomora, Ghun	Apidae	Wood, bamboo, furnitures
16	Weaver ant or Green tree ant	*Oecophylla smaragdina* (Fabricius, 1775)	Amroli pipira/porua	Formicidae	Arboreal
17	Little black ant	*Monomirium minimum* (Buckley, 1866)	Kola pipira/porua	Formicidae	Terrestrial
18	Slender ant	*Tetraponera rufonigra* (Jerdon, 1851)	Mojali pipira/porua	Formicidae	Terrestrial
19	Fire ant	*Solenopsis sp.*	Bih pipira/porua	Formicidae	Terrestrial, Arboreal
20	Carpenter ant	*Camponotus sp.* (Mayr, 1861)		Formicidae	Terrestrial, in woods
21	Common cockroach	*Periplaneta americana* (Linnaeus, 1758)	Poitasora	Blattidae	Terrestrial, In houses, in moist area
22	Blister beetle	Hycleus sp. (Latreille,1817)	N/A	Meloidae	Terrestrial
23	Banded blister beetle	*Mylabris phalerata* (Pallas, 1781)	N/A	Meloidae	Terrestrial
24	Chafer beetle	*Holotrichia* sp. (Hope, 1837)	N/A	Scarabaeidae	Terrestrial
25	Wheat or Grain weevil	*Sitophilus granarius* (Linnaeus, 1758)	Ghun	Curculionidae	Terrestrial
26	Moth	*Thosea cana* (Walker, 1865)	Bisa pokhila	Limacodidae	Terrestrial
27	Tussock Moth	*Euproctis* sp. (Hübner, 1819)	Bisa pokhila	Erebidae	Terrestrial
28	Handmaiden moth	*Syntomoides imaon* (Cramer, 1780)	N/A	Erebidae	Terrestrial

29	Red hairy caterpillar	*Amsacta albistriga* (Walker, 1865)	Bisa	Erebidae	Terrestrial
30	Cricula silkmoth	*Cricula trifenestra* (Helfer, 1837)	Bisa pokhila	Saturniidae	Terrestrial
31	Brown prionid	*Orthosoma brunneum* (Forster, 1771)	N/A	Cerambycidae	Terrestrial
32	Bed bug	*Cimex lectularius* (Linnaeus, 1758)	N/A	Cimicidae	Terrestrial
33	Rice bugs	*Coridius nepalensis* (Westwood, 1837)	Gandhi puk	Dinidoridae	Terrestrial
34	Fruit fly	*Bactrocera dorsalis* (Hendel, 1912)	N/A	Tephritidae	Terrestrial, on fruit plants
35	Termite	*Odontotermes obesus* (Rambur, 1842)	Ouipuka	Termitidae	Terrestrial
36	House cricket	*Acheta domesticus* (Linnaeus, 1758)	Ouisiringa	Gryllidae	Terrestrial
37	Mole cricket	*Gryllotalpa orientalis* (Burmeister, 1838)	Kumoti	Gryllotalpidae	Terrestrial

Traditional Management Practices

1. *Aloe vera*: Gel obtained from this plant was found to subside the pain and irritation from insect bite. Part of the plant was cut and the gel were directly applied to the area bitten by the insect and left for some minutes.
2. *Mesua ferrea*: The Indian rose chestnut, locally called as 'Nahor', is used as ointment to relieve inflammation and pain from insect bites. Extracts of leaves and flower were made into paste as ointment and applied on the affected area.
3. Neem: Neem (*Azadirachta indica*) is known for its medicinal properties. 10-15 neem leaves were taken and boiled with a bowl of water. Later after cooling a cotton cloth was allowed to dip in that water which was later applied on the itchy area. It was found to relieve itchiness from bites mainly by bugs and moths and caterpillars.
4. Tulsi: The people of the region used to make a paste of Tulsi (*Ocimum sanctum*) by chopping some fresh leaves and applying it on the affected area. It served as instant relive from insect bites.
5. Ginger: Ginger (Z*ingiber officinale*) is a household item known to have anti-inflammatory properties. Fine paste of ginger was made into paste and applied on the affected area. It was found to relieve pain and itchiness of insect bite.
6. Turmeric: Turmeric (*Curcuma longa*) powder was taken orally after mixed with water. It was found beneficial in inflammation from insect.
7. Onion: Fresh onion bulb were taken and then mince to form a paste. Then the juice was extracted which was topically applied on the affected area which reduce inflammation and itchiness.
8. Garlic: Paste made from cloves of garlic (*Allium sativum*) were used to treat insect bites. Garlic cloves were made into paste with coconut oil. This was then applied on the wound which gradually diminish the itching cause by insect.
9. Honey: Honey obtained from honeybees serve as traditional remedy to insect poisons. This can be directly applied on an insect bitten area. After applying it topically, it was left for 2 to 3 mins, later it reduces itchiness and inflammation caused by insect poisons.
10. Baking soda: Baking soda were also recorder to treat insect bites from bugs and ants. It was made into paste with addition of 2 to 3 drops of water and applied on the infected area.

Out of the total respondents that were administered with the structured questionnaire, 65% preferred traditional homemade remedies, 25% used both traditional and allopathic medicines and the remaining preferred allopathic medicines for treatment of bites by these various poisonous insects. Symptoms like itching, wounds, pain and swelling were found to be easily treatable by homemade remedies. However, in cases of severe insect bites or stings by giant honeybee and fire ants baking soda is mostly preferred for relieve. Tablespoon of baking soda to a small amount of water were added and made into a paste. The paste was then applied to the site of bite and allowed to stay for amount 10 minutes. Later it was washed away which help to relieve the inflammation.

Conclusion

From the study it can also be concluded that the Sipajhar region provides suitable habitats to house a diverse range of poisonous insects belonging to various orders and families. Insect habitat ranges from terrestrial to arboreal. Out of the total 37 species documented order Hymenoptera showed the highest number with 20 species. However, there is scope to assess more amount of different species with better infrastructure and facilities. Even though insects are poisonous they are beneficial to mankind as they serve as edible insects, entomotherapy where insects are used as traditional medicine to cure various ailments, in providing useful products such as honey, silk, lac and many more. In addition to this, insects are also useful in agriculture as they help in pollination. Thus, the present study has helped to understand the insects prevailing in the region in a better way.

Traditional management practices of the region showed a great deal of knowledge among the older generations of the area. The study has given a better knowledge about the traditional methods employed to effectively manage the insect bites at home with easily available resources. Traditional practices serve as natural remedy in areas where hospitals could not be easily assessed. But with the emergence of newer generations of people, with

modernization and advancement in medical infrastructure and allopathic medicines such traditional practices are becoming less pronounced and such knowledge is getting lost. Even though allopathy is highly effective but there is a need to preserve traditional knowledge as it is highly cost-effective, easily available and is much helpful for the people mainly residing in rural areas.

References

1. Chapman AD. Numbers of living species in Australia and the World. Canberra. Australian Biological Resources Study, 2006, 60.
2. Fitzgerald KT. Insects—Hymenoptera. Small Animal Toxicology, 2013, 573-588.
3. Gupta PK. Poisonous and Venomous Organisms. Concepts and Applications in Veterinary Toxicology, 2018, 265-284.
4. Kotpal RL. Modern text book of Zoology Invertebrates, Rastogi Publications, 2015, 738-739.
5. Shrivastava KP. Venomous Arthropods and Treatments of their venoms. A text book of Applied Entomology, 1993, 262-269.
6. Strother GR. Stinging insects and poisonous spiders of Alabama. Pest management Fact sheet (Circular ANR-382), 1985.
7. http://dbpedia.org. Last assessed on 15 July 2022, time 2.30 p.m.
8. www.maps-india-in.com/plain-india-map. Last assessed on 27th June 2022, time 3:05 p.m.
9. www.censusindia.co.in/district/darrang-district-assam. Last assessed on 20th July 2022, time 3:12 p.m.