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Insects Associated With The Medicinally Important Plants Used By The Tai Khamyang Tribe Of Titabar, Assam

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***Abstract*:**

A small, very small Assamese community group known as the Tai Khamyang or Shyam people live in the districts of Tinsukia, Jorhat, Sivasagar, and Golaghat in Assam, as well as certain nearby areas of Arunachal Pradesh. The villages where the Shyam people live, Balijaan Shyam Gaon, Na Shyam Gaon, and Betbari Shyam Gaon in Titabor in the Jorhat district, were chosen for the research. The people of rural areas are mostly economically unstable and dependent on medicines extracted from plants for the treatment of diseases, as it has almost no side effect. The curing capacity of the medicinal plants is also good. The survey was done to collect data by interaction with the local people and interviews were taken with the people of the area to get an idea about their food habits and uses of medicinal plants. Several new findings on traditional rural practices were reported. A total of 43 species of flower-visiting insects were reported associated with 26 species of medicinally important flowering plants used by the Shyam people. The flower-visiting insects unintentionally transfer the pollen grains from the anther to the stigma while nectaring, thus helping in pollination. The insects visit the flowering plants for nectaring.

Keywords: Tribor, Medicine, Insects, Jorhat District, Tai Khamyang, Pollination.

Introduction

Palaeo-ethnobotanical information from ancient archeological sites demonstrates man's reliance on plants for survival (Renfrew, 1963; Smith,1986). The tribal people are very close to nature. The tribal people depend on plants and their products as food, medicine, and for its ornamental and aromatic properties. Tai khamyang people are also not an exception in this regard. The Tai Khamyang, also known as the Shyam people, are a relatively tiny Assamese community group that live in the districts of Tinsukia, Jorhat, Sivasagar, and Golaghat in Assam, as well as some nearby areas in Arunachal Pradesh. Medicinal plants have many properties which help in natural remedies for various diseases. Pollinators may be drawn to flowers in several ways, such as by offering nectar, floral patterns, and extra pollen that can be consumed, or covered (Faegri and Vander Pigl, 1971). The brightly colored flowers which can provide nectar to the insects and also can provide landing space are visited by the

insects. The coevolution of blooming plants and their pollinators over millions of years has increased the richness of both the flora and animals (Stebbins, 1983). The orders Hymenoptera, Lepidoptera, Diptera, Coleoptera, Thysanoptera, and Hemiptera include the insects that visit flowers. In India, scanty works are available on pollinating insects of North Eastern states. There are several varieties of fragrant and medicinal plants found in the state of Assam (P. Duara,2018). Pollination is the process by which pollen is transferred from the stamens to the ovary. The vast majority of flowers that exist in our environment today are entomophilous, or pollinated by insects. The entomophilous flowers get pollinated with the help of various types of insects. There are many ways to attract certain insect species, including flower form and color, fragrance, bloom position on the stalks, and pollen and nectar-offering season (Wilson, 1999). An enormous amount of richness exists in both flora and wildlife as a consequence of blooming plants and their pollinators coevolving over millions of years (Stebbins, 1983). The Tai khamyang tribe is rich in the usage of medicinal plants and knowledge. The khamyangs have faith in their traditional knowledge and try to treat diseases with the help of natural medicine obtained from plants. They believe in passing their traditional knowledge from one generation to the next. The drugs are made with the help of extracts from different plants in definite proportion. Different parts are used and usually, the fresh plants are used for the purpose. The medicine is either given in raw form or mixed with the foods for better results. The elderly people of the tribe are familiar with the symptoms and with the help of general observations, they are able to give proper medicine to the patients. The elderly people with knowledge of traditional herbs and plants are experienced enough to diagnose the disease. Some people are experts in giving medicines to some specific diseases and are specific to some particular ailment. The methods used by them are trial and error methods but most of them are accurate in identifying the disease and curing it with traditional knowledge. Most of the plants are found in wild conditions but few are cultivated also.in Northeast India, a number of workers study ethnomedicinal practices A significant source of physiologically active drugs is natural products. (Saleh et al, 2009)

Materials and Methods

Study Area: Three villages were selected for study-Balijaan Shyam Gaon, Na Shyam Gaon, and Betbari Shyam Gaon where Shyam people reside, near Titabor in Jorhat district of Assam. The geographical location is 26.75° North and 94.22° East.

Study Tribe: The tribe selected for study was the Tai-Khamyangs. They belong to an area called "Khamjang" in Myanmar. The people who live in the Jorhat district's Balijan Shyamgaon, Betbari Shyamgaon, and Na Shyamgaon are allegedly descended from individuals who arrived in Assam in the thirteenth century. It is also said that they came from Thailand through the Patkai hills. The Temples of Shyam people are called Viharas and Pagodas show their distinctive history, culture, and traditions.

Collection of data: A field study was done covering the three villages of Jorhat district of Assam with inhabitants of Shyam people. The local people and Village heads were interviewed to collect data on wild edible plants used by the tribe. Much useful information on wild edible plants was gathered including the use of different parts of medicinal plants. Herbarium sheets were created in accordance with the results of the ethnobotanical surveys for identification. (Bennett,1970; Jain and Rao,1967).

Methods of Insect Survey

1. **Transect and point count**: A survey line is called a transect. In a line transect, all insects found within a defined distance (4 m) on each side of a given length of travel along the transect were documented using a predetermined sampling path. (P.Duara,2018)
2. **Sweep net sampling:** Using a sweep net, flying insects were collected. Many kinds of nets come in conventional diameters of 30.5 cm (12 in) or 38 cm (15 in). The primary purpose of aerial nets was to catch flying insects. (P.Duara,2018).
3. **Direct searching:** Direct searching can be used for hymenopteran insects like ants, wasps bees, etc. (P.Duara,2020)
4. **Identification of insects:** For the most part, simple observation was used to identify insects. Evans (1932), Wynter-Blyth (1957), Haribal (1992), Kunte (2000), and Kehimkar's keys were used to identify the insects (2008).

Results

Table 1: Diversity of flower-visiting insects of medicinally important plants used by the Tai Khamyang tribe of Titabar, Assam

S. no	Plant name	Family	Wild/cultivated	Parts used	Associated insect species
1	*Chenopodium album*	Amaranthaceae	Both	Leaves are used	*Cicadellidae sp*
2	*Coriandrum sativum*	Apiaceae	Cultivated	Leaves are used	*Apis cerana,Apis dorsata,Orthellia coerulifrons*
3	*Colocasia esculenta*	Araceae	Both	Leaves are used	*Chrysomya megacephala, Colocasiomyia sp.*
4	*Asparagus racemosus*	Asparagaceae	Both	Young shoots are used	*Apis cerana, Ammophila sp.*
5	*Lactuca sativa*	Asteraceae	Cultivated	Leaves are used	*Apis cerana, Lasius niger*
6	*Spilanthes oleraceae*	Asteraceae	Wild	Flower is used	*Orsotriaena medus,Mycalesis perseus,Mycalesis mineus*
7	*Brassica oleracea*	Brassicaceae	Cultivated	Leaves are used	*Apis florae,Xylocopa fenestrate,Xylocopa violacea*
8	*Brassica rapa*	Brassicaceae	Cultivated	Whole plant is used	*Apis mellifera,Apis cerana,Xylocopa fenestrate*
9	*Ipomoea batatas*	Convolvulaceae	Cultivated	Both Tubers and shoots are used	*Ochetellus sp, Hemaris diffinis*
10	*Cucurbita maxima*	Cucurbitaceae	Both	Both Leaves and fruits are used	*Apis mellifera,Trigona spinipes,Diabrotica speciosa*
11	*Momordica charantia*	Cucurbitaceae	Both	Fruits are used	*Halictus gutturosus,Trigona irridipennis*
12	*Phyllanthus emblica*	Euphorbiaceae	Both	Fruits are used	*Apis florae, Bembix oculata*
13	*Glycine max*	Leguminosae	Cultivated	Seeds are used	*Agapostemom virescens ,Lasioglossum*
14	*Pisum sativum*	Leguminosae	cultivated	Pods, seeds, and young shoots are used	*Neoheegeriia sp, Acyrthosiphon pisum*
15	*Mentha spicata*	Lamiaceae	Both	Seeds are used	*Eupoedes sp, Cydia pomonella*
16	*Ocimum tenuiflorum*	Lamiaceae	Both	Both Leaves and flowers are used	*Mellisodes sp, Nomia sp*
17	*Allium sativum*	Liliaceae	Cultivated	Both Leaves and bulbs are used	*Apis mellifera, Acytolepis puspa, Hypolycaena erylus*
18	*Hibiscus sabdariffa*	Malvaceae	Cultivated	Leaves are used	*Ypthima baldus,Moduza procrisPapilio helenus, Hebomoia glaucippe*
19	*Psidium guajava*	Myrtaceae	cultivated	Fruits are used	*Apis mellifera, Notocrypta curvifascia*
20	*Bambusa sp.*	Poaceae	Both	Young shoots are used	*Trigona fulviventris,Toxomerus teligera*
21	*Zea mays*	Poaceae	Cultivated	Seeds are used	*Apis mellifera*
22	*Polygonum sp*	Polygonaceae	Both	Leaves are used	*Syrphus sp,Eupoedes sp*
23	*Citrus maxima*	Rutaceae	Cultivated	Fruits are used	*Apis florae*
24	*Capsicum annuum*	Solanaceae	Cultivated	Fruits are used	*Bombus terrestris,Pieris canidia*
25	*Solanum tuberosum*	Solanaceae	Cultivated	Both Tubers and leaves are used	*Apis mellifera*
26	*Zingiber officinale*	Zinziberaceae	Cultivted	Rhizome is used	*Mylabris sp, Macroglossum nycteris*

Photoplates

Moduza procris ***Spilanthes oleracea*** ***Pieris canidia***

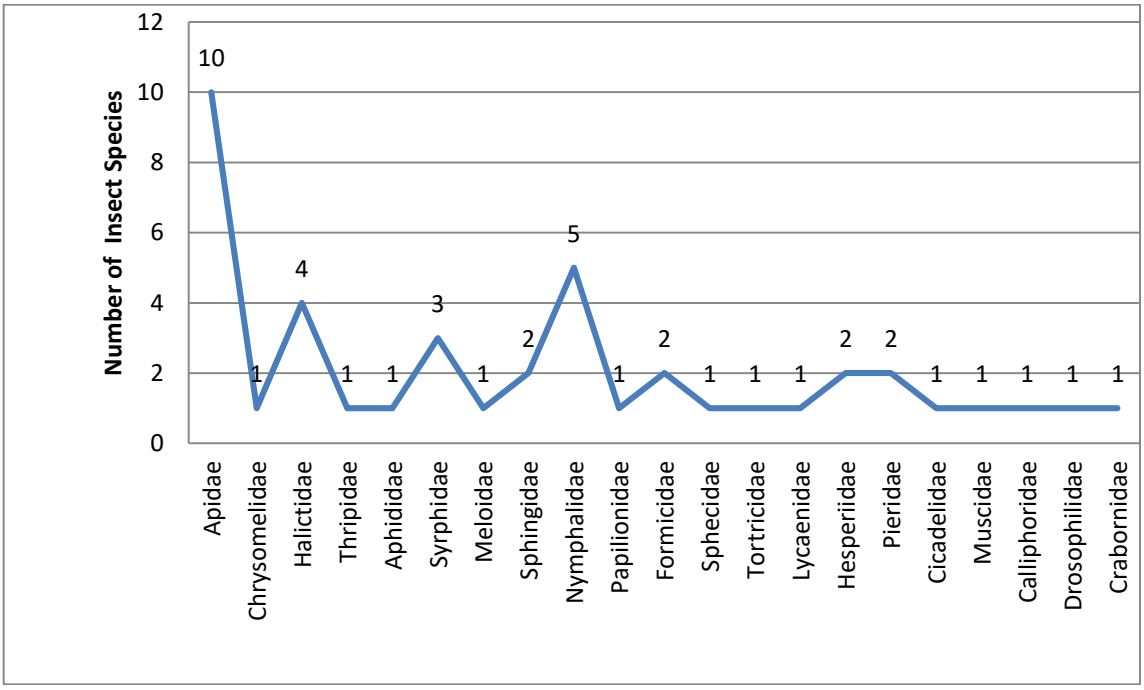

Fig 1: Family-wise classification of insects found visiting the flowering plants.

Discussion

A total of 43 species of insects visiting flowers, belonging to 21 families and 6 orders were reported associated with 26 species of medicinally important flowering plants used by the Shyam people. Insect species belonging to the order Hymenoptera, Coleoptera, hysanoptera, Hemiptera, Diptera, and Lepidoptera were found visiting the flowering plants. Apidae has the greatest number of species, followed by Nymphalidae. (Fig.1) This result is consistent with those of Thorp (1979), Inouye (1980), and Gilbert (1981), who found that most epidopterans, including bees, are capable of pollinating a wide variety of flower species and constitute the primary source of pollination for many insect-pollinated plants. (P. Duara,2018). The Shyam people cultivate a lot of plants in their home gardens which belong to the family Amaranthaceae, Apiaceae, Araceae, Aspergaceae, Cucurbitaceae, Lamiaceae, etc. Some wild plants are also used by the Shyam people. The flowering plants in the home gardens of Shyam people also attract insects visiting flowers, and they perform the process of pollination while nectaring. The home gardens are well maintained and they depend on these for their food. The most significant and necessary plant phenomenon that enables sexual reproduction is pollination. A whole flower has two parts: the ovary, which has ovules, style, and stigma, the female particle, and stamens, which create pollen, the male particle. Pollen is transferred from one flower to another by insects that visit the plants to feed on their nectar. The grains of pollen stick to their body parts. According to Berenbaum (1995), sexual reproduction is crucial for maintaining genetic variety in plants. The species of pollinating insects were more where flowering plants were available. Pollinator diversity and blooming plants are directly correlated. (P.Duara,2018). The results corroborated those of Bateman (1947), Levin and Kerster (1969 a, b), and others who reported that pollinators travel short distances between flowers and often visit nearby plants. When the number of medicinal plants is more, then the insects visit the flowers for nectar and perform the act of transfer of pollen. More than any other plant family, Asteraceae was employed as a medicinal herb. Since the Asteraceae family is one of the largest in the plant kingdom and contains

a large number of plants, Heinrich et al. (1998) and Thomas et al. (2009) also found that more plants from this family are used medicinally than any other plant family. This is because the family is enriched with a wide range of biologically active compounds. More bees were visiting the blooms than there were butterflies. Bees were thus more effective pollinators. This result is consistent with that of Thorp (1979), Inouye (1980), and Gilbert (1981), who found that bees visit a wide variety of flower species and are in charge of pollinating many insect-pollinated plants. H. D. Pham (2012) also discovered that bees are the primary pollinators of numerous significant plants. The present study reveals that there is a close association between Lepidopteran insects and plants belonging to the family Malvaceae. According to Herrera (1988), butterflies and Malvaceae plants are closely related. Shaprio (1991) also mentioned the connection between Malvaeceae and butterflies. Insects that are active throughout the day visit flowers more often than those that are not. Insects visit plants in general rather than specifically when flowers are rare (Schoener, 1969; Colwell, 1973; Kunin and Iwesa, 1996, for example). When their favored bloom is rare, hoverflies, bumble bees, and honey bees all visit in a generalist way (Kunin, 1993; Chittka et.al., 1997).

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