# FLOWER VISITING INSECTS OF THE ETHNOMEDICINAL PLANTS USED BY THE TRIBES OF ASSAM

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**Abstract:** Ethnomedicine plays an important role in the medical health aspect of the tribal people. The present study was done in Nambor Wild life Sanctuary situated in Golaghat and Karbi Anglong districs of Assam and many tribal people were found inhabiting near the Sanctuary who depend on wild plants for food, medicine, fodder fuel, dye and for festival rituals and other functions. Karbi, Bodo, Mishing, Hmar, Kuki and Garo are the tribes of Karbi Anglong district. The present study aims at studying the flower visiting insects of the ethnomedicinal plants that perform pollination while nectaring. The act of pollination is the most important and essential phenomena of plant by which the sexual reproduction is possible. Total 29 species of flowering plants and 36 species of insects belonging to 7 families were recorded visiting the plants. Investigation of these insects and medicinal plants are essential for documentation of indigenous and traditional knowledge which will add new findings.

**Keywords**: Ethnomedicine, Flower visiting insects, Pollination, Tribes.

**Introduction:** Tribal people are the ecosystem people who live in harmony with the nature and maintain a close link between man and environment. Ethnomedicine is a study or comparison of the traditional medicine practiced by various ethnic groups, and especially by indigenous peoples. The Karbi Anglong district is mostly inhabited by various ethnic tribes such as— Karbi, Bodo, Dimasa, Garo, Jaintia, Rabha, Hmar, etc., and a few plain tribes (Phangcho, 2001).Although different workers have documented the uses of various medicinal plants from different parts of India (Dutta and Dutta 1997,Dam and Hajra 1997,Hajra and Baishya 1997,Khunbongmayum et al 2005 ), information on the flower visiting insects of the medicinal plants in these tribal area is unavailable.Therefore the present study gave emphasis on investigating the flower visiting insects of the ethnomedicinal plants used by the tribal people and unintentionally perform the process of pollination while nectaring. . The process of transportation of pollens from stamens to the ovary is called pollination. A great majority of flowers that we see around us today are insect pollinated or entomophilous.Flowers can attract pollinators by various means -providing nectar of the right composition, recognizable floral patterns, providing excess pollen as food, or providing shelter (Faegri and Vander Pigl, 1971).The insects that visit flowers belong to the group Hymenoptera, Lepidoptera, Diptera, Coleoptera, Thysanoptera and Hemiptera.

**Material and Methods:**

**Study sites**: Study was conducted at nearby villages of Nambor Doigrung wild life sanctuary which is situated in the Golaghat and karbi Anglong districts of Assam. It covers and entire area of 37 sq. km. Study was conducted from January 2013 to January 2014. Nambor Doigrung Wildlife sanctuary is geographically located between $92^{o}$ 52`to $92^{o}$ 53`east longitude and $26^{o}$ 22` to $26^{o}$ 24` North latitude.The area is in tropical basin of India and as a result of that the temperature are never too high or low with a very heavy monsoon. The maximum/minimum temperature is 8 to $30^{o}$c. Annual rainfall is 2500mm.

**Insect and plant sampling**: Diversity of insect pollinators and plant was observed using line transect and point transect method. Several insect visitors were collected for species identification purpose. Each of the sites was sampled for insects on sunny days. Sampling walks started at either 8.00 or 14.00, the period of relatively high-flower visitation by insects.

**Line transect**: A transect is a line of survey. The transect was an about 100m walk counting the species of insects.

**Point counts**: This technique involves staying in a fixed point for an amount of time (20-30 minutes) and counting the insects seen.

**Equipments used for collecting insects**: Insect net, Killing Jar, Forceps, Relaxing Jar, Spreading Board, Insect pins and Labels, Storage Boxes.

**Identification**: Identification of the insects were done with the help of various books and literatures. Plants collected were dried, made into voucher specimen as per standard methods (Jain and Rao, 1977). The specimens were identified in the Department of Zoolgy, Gauhati University.

**Result:** Total 29 species of flowering plants were recorded used by the various local tribes,and 36 species of flower visiting insects belonging to 7 families were found.

**Table 1:** Flower visiting insects of the medicinal plants used by local tribes during the study period

| Plants | Family | Parts used | Associated insets | Medicinal value |
|---|---|---|---|---|
| *Centella asitica* | *Apiaceae* | Whole plant | *Triodes helena,Formica sp* | All parts of the plant are used. The paste is applied locally on the wound and taken to cure gastric. It is also taken as tonic |
| *Verbena speciosca* | *Verbenaceae* | Leaves | *Hypolimnias bolina,Cethosia cyane* | Juice of the leaves is taken orally as tonic to relieve from dysentery |
| *Emblica officinalis* | *Euphorbiaceae* | Roots | *Papilio demnon* | Roots are used in urinary problem, burning sensation, etc |
| *Hibiscus rosa sinensis* | *Malvaceae* | Bark and flower bud | *Ypthima huebneri,Parthenos hordonia* | Crushed bark is used for the treatment of Cholera. Flower buds consumed for relieving stomach pain. |
| *Mentha spicata* | *Malvaceae* | Tender shoots and leaves | *Discophora sondaica,Fannia cannicularis* | Fresh juice of leaves and tender shoot helps in relieving from liver enlargement and loss of vigour. |
| *Nyctanthes arbor tristris* | *Nyctantheceae* | Leaves and flowers | *Bombus sp, Xylocopa sp* | Leaves are used in treatment of fever, flowers are used in stomach pain and seeds in treating baldness. |
| *Ocimum basilicum* | *Lamiaceae* | Leaves | *Catopsilia Pomona, Hebomoia glaucippe* | Paste of the leaves is applied locally in a minor cut, accidental bleeding. It is taken to relieve cough. |
| *Opantia vulgaris* | *Cactaceae* | Whole plant | *Lasius niger* | Syrup of the plant is used in treating ulcer and urine disease. |
| *Abution indicum* | *Malvaceae* | Flowers | *Vespa magnifica, Polistes sp* | Use in cold fever |
| *Cassia fistula* | *Caesalpiniaceae* | Flower,Bud | *Apis florae,Xylocopa sp* | Use in constipation,, common cold |
| *Chenopodium album* | *Chenopodiaceae* | Tender shoots | *Danaus plexipus, Danaus genutia* | Use as food |
| *Clerodendrunm indicum* | *Verbenaceae* | Tender shoots | *Pieris canidia* | Anti inflammatory agent and help in wound healing |
| *Cycas pectinata* | *Cycadaceae* | Tender leaves | *Junonia atlites* | Use as vegetable |
| *Ficus hispida* | *Moraceae* | Fresh leaves | *Junonia lemonias* | Act as antihaemorrhagic |
| *Ipomea batatas* | *Convolvulaceae* | Tender leaves | *Graphium serpedon,Papilio* | Use as food |

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| | | | *demnon* | |
| *Leucas aspera* | *Lamiaceae* | Leaves | *Apis cerana,Apis mellifera* | Use in sinusitis |
| *Oxalis corniculata* | *Oxalidaceae* | Leaves | *Papilio polytes,Cirrchroa aoris* | Antihelminthic,Anti inflammatory |
| *Portulaca oleracea* | *Portulacaceae* | Tender shoots | *Euploea core* | Roles in abnormal uterine bleeding |
| *Tagetes patula* | *Asteraceae* | Tender leaves | *Junonia atlites* | Whole herb is digestive and diuretic |
| *Ageratum conyzoides* | *Asteraceae* | Leaves | *Apis cerana,* | It an insecticide and nematicideestive |
| *Spilanthes oleracea* | *Asteraceae* | Leaves and flower heads | *Catopsilia Pomona,Triodes Helena* | Use in toothache |
| *Lantana camara* | *Verbenaceae* | Leaves | *Papilio demoleus,Papilio pyrene* | Leaves show antimicrobial property |
| *Pisum sativum* | *Fabaceae* | Seed | *Fannia cannicularis* | Use as food |
| *Ixora coccinea* | *Rubiaceae* | Fruit,whole plant | *Charaxes marmus,Papilio demoleus* | Antimicrobial |
| *Duranta repens* | *Verbenaceae* | Fruit,flowers | *Hypolimnias bolina,J.atlites* | Fruit use for malaria and intestinal worms |
| *Ziziphus mauritiana* | *Rhamnaceae* | Fruit,bark | *Moduza procris,Apis cerana* | Fruits are applied on cuts and ulcers |
| *Carica papaya* | *Caricaceae* | Whole plant | *Apis cerana* | Fruit used as food and help digestion |
| *Mangifera indica* | *Anacardiaceae* | fruit, seed, stem, bark, root, pulp as well as the leaves. | *Apis cerana,Apis mellifera* | various parts of the plant are used as an antiseptic, |
| *Heliotropium indicum* | *Boraginaceae* | Leaves | *Papilio clytia,Cethosiia biblis* | leaves of the plants is used on wounds, skin ulcers |
| *Catharanthus roseus* | *Apocynaceae* | Whole plant | *Graphium doson,Catopsilia Pomona* | Used as a folk remedy for diabetes |

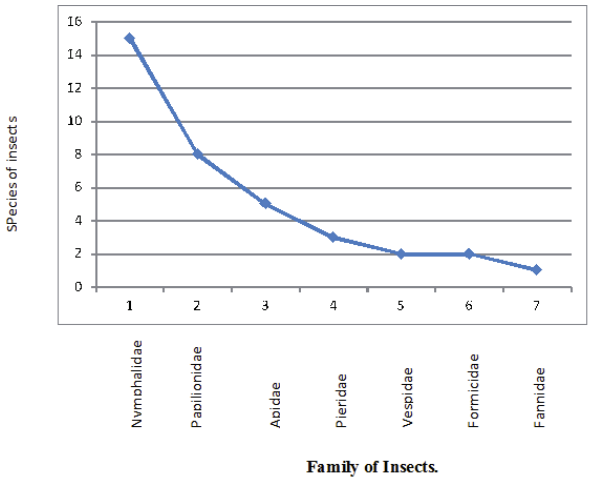



**Figure 1:** Number of species of flower visiting

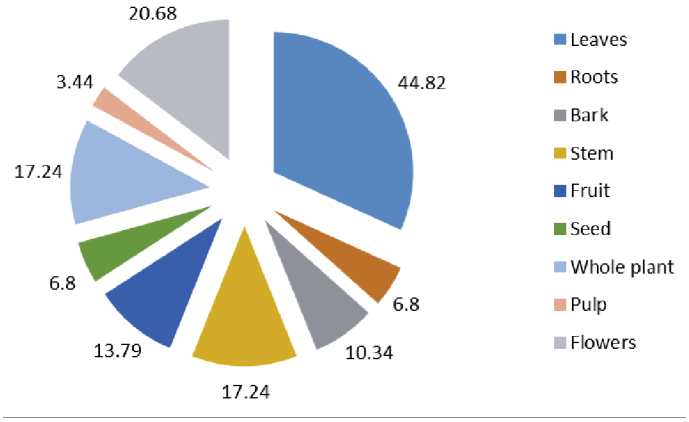
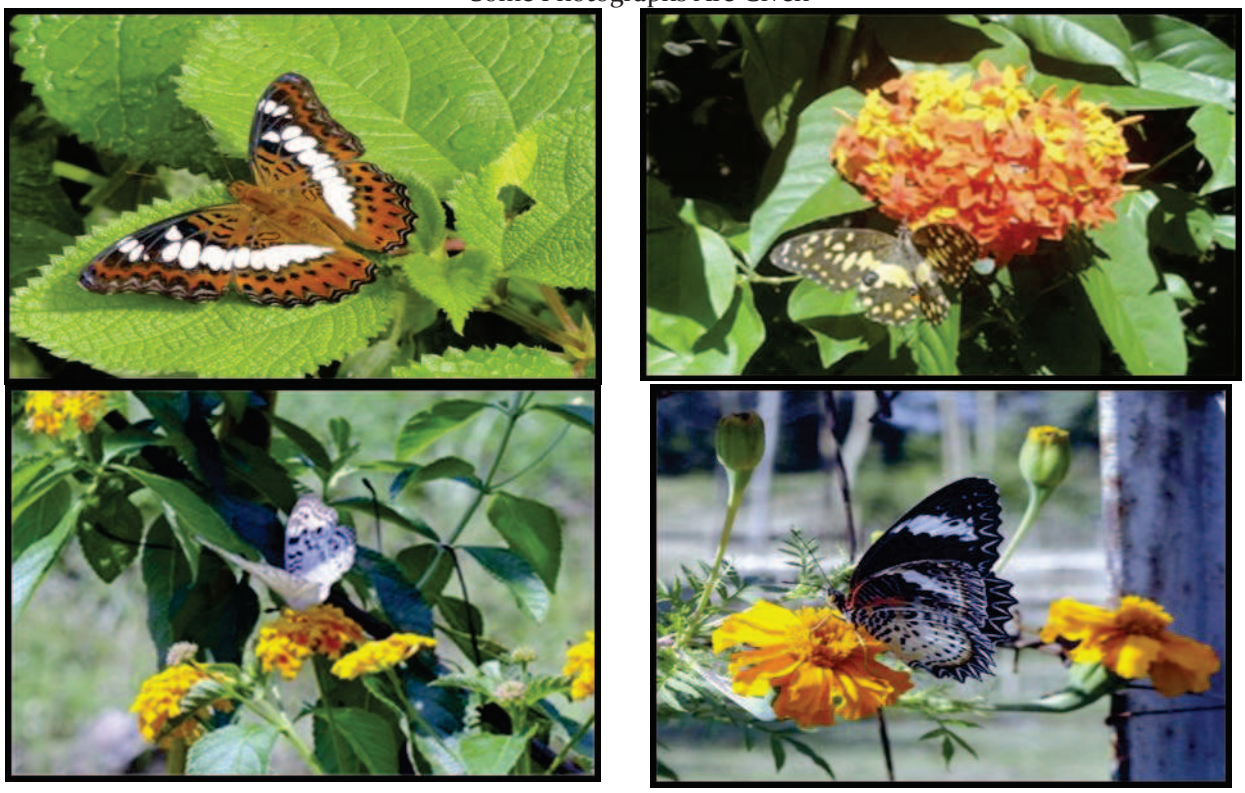



**Figure 2:** Percentage of plant parts used as herbal

insects found during the study period.

Some Photographs Are Given



**Discussion**: From the present study total 29 species of flowering plants and 36 species of flower visiting insects were recorded. The flowering plants belong to 22 families.The flower visiting insects belong to 7 families-Papilionidae, Nymphalidae, Pieridae, Apidae, Formicidae, Fannidae and Vespidae. The highest number of insects found were of Nymphalidae-15 species, followed by Papilionidae-8 Species,Apidae-5 species,Pieridae-3 species,Vespidae-2.Formicidae-2 and Fannidae-1 Species. Most of the insect visitors were diurnal. According to Luo etal. 2011 the diurnal visitors to the flowers of J. curcas are bees and flies, and the nocturnal visitors are moths. Flowers received significantly more visits by diurnal insects than by nocturnal insect.

It was seen that the 29 species of flowering plants belonging to 22 families have medicinal value and used by the local tribes. The flowers belonging to Asteraceae, Malvaceae and Verbenaceae family were found more in number. Ethnomedicinal uses of plants have been reported from various tribes of Assam by different workers.Dutta and Dutta, 2000 reported that Hmar tribe uses 16 medicinal plants and kuki tribe uses 25 different plants as medicine.Borthakur,1997 reported that the Karbi tribe uses 24 plants,Hajra and Baishya reported Mishing uses 32 and according to Singh etal they uses 44 different plants having medicinal value.

World Health Organization (WHO) has shown great interest in documenting medicinal plants used by tribal communities Worldwide (Kaido et al., 1997). The foresaid tribes uses these medicinal plants for treatment of various ailments like cough, fever, dysentery, indigestion, headache, stomach-ache, diarrhoea, skin diseases, and bone fracture etc. The results shows that the leaves were used to a maximum extent (44.82%), followed by Flowers (20.68%),Stem (17.24%), Whole plant (17.24%), Fruit (13.79%), Bark(10.34%),Root(6.8%), Seed (6.8%), pulp (3.44%) for the treatment of various diseases. Thus, the present study emphasizes to investigate and document the use of the different plant parts as medicine by various tribes residing near Nambor Wildlife Sanctuary along with the flower visiting insects that unintentionally perform the process of pollination while nectaring.As pollination is essential for sexual reproduction and propagation of these plants so the present study helps in formulation of potential raw materials from these medicinal plants in modern pharmaceutical industry for further availability and utilization of mankind.

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