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## Ichthyotoxic plants of Manipur

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### Abstract

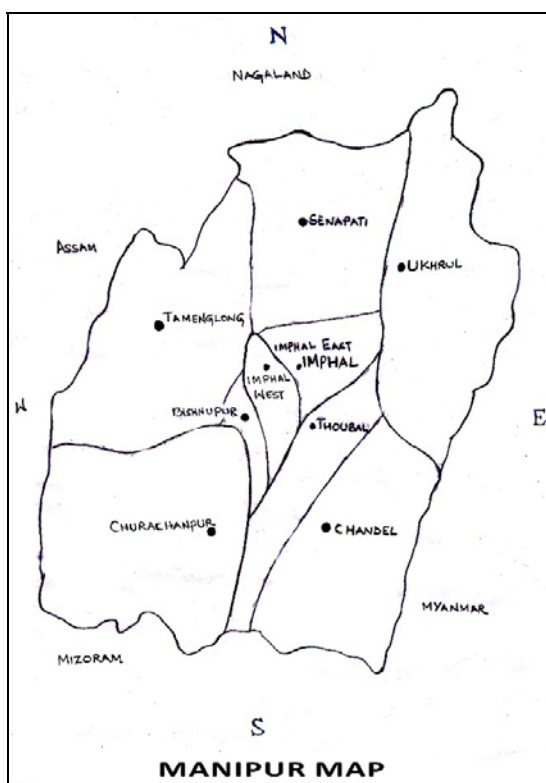
Fishing with the aid of poisonous plants or ichthyotoxic plants was formerly very common in Manipur. 20 families, 37 genera and 45 species of the ichthyotoxic plants with their types, parts used, mode of utilization and distribution in Manipur, the Indo-Burma hotspot in the northeastern corner of India are presented here in this paper.

**Keywords:** Fish, Toxic, Plants, Manipur

### Introduction

Manipur, one of the important biodiversity hot spot lies in the northeastern corner of India. Herbal fish stupefying agents are excellent means of fishing, which do not kill the whole fish stock unlike chemical poisons. Many of the fish stupefying plants are being used since time immemorial by the hill peoples of Manipur. The poisonous ingredients are pounded and thrown into a pool or dammed sections of a small river and hill streams. After a few minutes which varies according to or depending on the quantity of the plant used and its toxicity, the fish begin to rise to the surface of water and can easily be collected.

There is no detail reports for ichthyotoxic plants of Manipur except some fragmentary reports of medicinal and economic plants [Sinha <sup>[8]</sup>, Singh <sup>[9]</sup> and Singh <sup>[9]</sup>, 2009]. Hill peoples of the remote areas of this state mainly practiced such plants for catching fishes but not recorded. And as such, the ichthyotoxic plants of this state Manipur is therefore reported here.



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## 2. Materials and Methods

The information was gathered during the study period from 2015 to 2016 through personal interviews with the different village elders or local experts, group discussions and vivid observations. The details were recorded in the information sheets. The field survey was conducted in the respective localities and the plant materials are collected by the following standard method of Rao & Jain <sup>[2]</sup> (1977). Plants were identified with the expert team of the Botanical Survey of India (BSI, Shillong) and experts of Forest Department, Government of Manipur by preparing herbarium.

## 3. Results and Discussions

The present study is the first of its kind with reference to the ichthyotoxic plants in Manipur which reveals the use of diverse plants consisting of 20 families, 37 genera and 45 species. Their families, names, types, parts used, mode of fertilization and distribution are appended below.

### 3.1 List of the ichthyotoxic plants of manipur

#### Family: Araceae

Scientific Name: *Arisaema tortuosum* Schott.

Vernacular Name: Lin cheisu (Manipuri).

Type: An erect herb.

Parts used: Shoots, leaves, stems and rhizomes etc.

Mode of utilization: Stupefying.

Distribution: Koubru, Sekmai, Sanahal Lokchao, Senapati District.

#### Family: Aristolochiaceae

Scientific Name: *Apama tomentosa* Engl./*Thottea tomentosa* (blume) Dinghou

Type: A herbaceous under shrub.

Parts used: Stem and leaves.

Mode of utilization: Stupefying

Distribution: Western hills of Manipur.

#### Family: Asclepiadaceae

Scientific Name: *Asclepias curassavica* Linn.

Vernacular Name: Krishnachura (Manipur), Langthlei (Kuki).

English Name: Curassavian Swallow-wort/ Tropical milkweed.

Type: An under shrub.

Parts used: Stem, root and leaves.

Mode of utilization: Stupefying.

Distribution: Common in the hills and valleys of Manipur.

#### Family: Asteraceae

Scientific Name: *Blumea balsamifera* (Linn.) DC.

Plate 1: Fig 1

Vernacular Name: Phunil-Napakpi/Langthrei (Manipuri), Laangthrii (Moyon).

English Name: Sambong.

Type: A shrub with silky hairs.

Parts used: Leaves are used as fish poison.

Mode of utilization: Stupefying

Distribution: Common in the hill areas of Manipur.

#### Family: Asteraceae

Scientific Name: *Mikania cordata* (Burm.) B.L. Robinson.

Plate 1: Fig 2.

Vernacular Name: Oori-hingchabi (Manipur), Naga-purol (Rongmei), Naga-runoh (Moyon)

Type: An aggressive climber.

Parts used: Stem, leaves and roots.

Mode of utilization: crushed and Stupefying.

Distribution: Very common in the hill and valley of Manipur.

#### Family: Asteraceae

Scientific Name: *Sphaeranthus indicus* Linn.

Type: A spreading herb

Parts used: Stem, roots and leaves.

Mode of utilization: Crushed and stupefying.

Distribution: Very common in wasteland.

#### Family: Asteraceae

Scientific Name: *Spilanthes oleracea* Murr.

Type: A herb.

Parts used: Whole plants (Stem, roots and leaves).

Mode of utilization: Crushed and stupefying.

Distribution: Tengenoupal, Chandel district.

#### Family: Cornaceae

Scientific Name: *Alangium longiflorum* Merr.

Plate 1.Fig.3

Vernacular Name: Kokan manbi (Manipuri), Nasha/kekemara (Moyon).

Type: Tree

Parts used: Leaves.

#### Traditional use and its effects

The leaves of *Alangium longiflorum* is pounded (crushed) and kept overnight or two for fermentation to make its poison stronger. It is then mixed with water, crushed it further and the extract is let to run in the water of the chosen spot. The stupefy fishes are thus collected. The juice is also used for the treatment of scabies and skin itching by applying on the ailing spot.

Distribution: Chandel district.

#### Family: Ebanaceae.

Scientific Name: *Diospyros montana* Roxb.

Vernacular Name: Guinathei (Rongmei)

English Name: Mountain persimmon.

Type: A small tree.

Parts used: Leaves and fruits.

Mode of utilization: Crushed and stupefying.

Distribution: Common in hills, Mao, Maram, Kangpokpi, Temui, Sita, Moreh, Ukhrul.

#### Family: Euphorbiaceae

Scientific Name: *Eupatorium odoratum* Linn.

Vernacular Name: Kambi-lei (Manipuri)

English Name: Bone set.

Type: An under-shrub.

Parts used: Stem, roots and leaves.

Mode of utilization: Stupefying.

Distribution: Common in the hills and valleys of Manipur.

#### Family: Euphorbiaceae.

Scientific Name: *Jatropha curcas* Linn.

Vernacular Name: Awa-kege (Manipuri).

English Name: Physical nut.

Type: A shrub.

Parts used: Plant used as fish poison by stupefying method.

Distribution: All districts of Manipur.

**Family: Euphorbiaceae.**

Scientific Name: *Jatropha gossypifolia* Linn.  
Vernacular Name: Kege-manbi/Yai-Kege-manbi (Manipur).  
Type: A large shrub or small tree.  
Parts used: Barks and leaves.  
Mode of utilization: Smashed bark and leaves are thrown in water for trapping fishes.  
Distribution: Kangchup hillock, Imphal west.

**Family: Euphorbiaceae**

Scientific Name: *Phyllanthus urinaria* Linn.  
Vernacular Name: Chakpa-heikru (Manipur).  
Type: An annual herb  
Parts used: Stem, roots and leaves.  
Mode of utilization: Stupefying.  
Distribution: Common in grassland and along foothills.

**Family: Flacourtiaceae**

Scientific Name: *Gynocardia odorata* R.Br.  
Type: A large evergreen tree.  
Parts used: Bark, leaves, roots and fruits mainly.  
Mode of utilization: Fruit pulp mainly used as stupefying.  
Distribution: Tamenglong district.

**Family: Flacourtiaceae**

Scientific Name: *Hydnocarpus kurzii* (King) Warb.  
Vernacular Name: Oohan/Uhan (Manipur).  
Type: A tree with hanging branches.  
Parts used: Fruits and barks.  
Mode of utilization: Crushed and stupefying.  
Distribution: Western side of Manipur.

**Family: Gnetaceae.**

Scientific Name: *Gnetum montanum* Markgraf.  
Plate 1: Fig.4  
Vernacular Name: Oothangjing manbi (Manipur), Khai (Rongmei), Iriih (Moyon), Thanping-rhui (Mizo).  
Type: A subclimber/ A small tree.  
Parts used: Stem, root, bark and leaves.

**Traditional use and its effects**

Barks are peeled in small pieces or smashed against rocks or boulders and mixed with the extract juice of either smashed barks of the root of *Milletia pachycarpa* or smashed barks of *Albizia chinensis*. It is also used as fish preservative. Here the direction of flow of the stream is changed or the stream is blocked by an obstacle made up of the arrangement of stones, pebbles, boulders and soil. The mixed poison ingredient is then put into the water and thus stupefied the fishes.  
Mode of utilization: Peel the bark or smashed and stupefy.  
Distribution: Khongkhang, Moreh, Chandel, Churachandpur.

**Family: Juglandaceae**

Scientific Name: *Engelhardtia spicata* Var *Colebrookeana* (Lindl.ex Wall) Koord & Valetton.  
Vernacular Name: Limphop/Heijuka-manbi (Manipur).  
Type: A medium sized tree.  
Parts used: Bark  
Mode of utilization: Crushed, smashed and thrown into water for stupefying the fish.  
Distribution: Nungba, Tamenglong, Noney, hill areas of Manipur.

**Family: Juglandaceae**

Scientific Name: *Juglans regia* Linn.

Plate 1: Fig.5

Vernacular Name: Heijuga (Manipuri), mangkha (Moyon).  
English Name: Walnut.  
Type: A large deciduous tree.  
Parts used: Bark, leaves, rind of unripe fruits.  
Mode of utilization: Crushing, grinding and stupefying.  
Distribution: Hills of Tamenglong, Senapati, Ukhrul and Chandel district.

**Family: Lacythidaceae or Barringtoniaceae**

Scientific Name: *Barringtonia acutangula* Gaertn.  
Vernacular Name: Ingar  
English Name: Mango pine, Itchy tree, Fish poison tree, Fish killer tree.  
Type: An evergreen tree.  
Parts used: Barks, leaves, roots and seeds.  
Mode of utilization: Crushed and stupefying.  
Distribution: Jiribam, Imphal west.

**Family: Liliaceae**

Scientific Name: *Smilax lanceifolia* Roxb.  
Vernacular Name: Kwamanbi.  
Type: Climber.  
Parts used: Whole (mainly roots and leaves)  
Mode of utilization: Stupefying  
Distribution: Hill areas.

**Family: Mimosaceae**

Scientific Name: *Acacia pruinoseens* Kurz.  
Plate 1: Fig.6  
Vernacular Name: Te-bam (Naga), Taepuung (Moyon), Khung (Manipuri), Motu (Mao).  
**Type:** A large woody climber armed with more or less recurved prickles.

**Traditional use and its effects**

The fruits known as 'Kangko' (in Moyon) is crushed and used as shampoo and detergent. The plant bark is smashed to extract the juice which is used as stupefying the fishes. It is normally used as mixer with other ichthyotoxic plants as it is a little mild & forms a lot of foams which makes difficult to see the fishes clearly or to collect.  
Parts used: Smashed bark is used for stupefying fishes.  
Distribution: Mao, Kangpokpi, Sekmai, Chandel.

**Family: Mimosaceae**

Scientific Name: *Albizia chinensis* (Osbeck) Merr.  
Plate 1: Fig.7  
Vernacular Name: Jairi/Khok (Manipur), Rupho (Moyon).  
English Name: Siris.  
Type: A large deciduous tree.  
Parts used: Bark, leaves, roots are used for stupefying.

**Traditional use and its effects**

It is used in place of bleaching powder as it cleanses & purifies water to such an extent that water becomes crystal clear after an overnight but toxic, so can't be consumed on the day itself. The effect of its toxic depends on the quantity used. The effect of two hundred to three hundred 'chi' (A single bundle of bark scaled out rupho & bound is called as 'chi' in Moyon) is strong enough to stupefy fishes for 3-4kms. The barks of this bundle called 'chi' is smashed to pulp till foams appear and the colour of the surrounding water becomes

reddish. Fishes are collected either by bare hands or by using nets or bamboo baskets etc though the water is not clear much as of then.(Plate.2.Fig.5).Early in the morning when water become crystal clear people started collecting the fishes left floating of the previous day. The process of stupefying method for this plant is shown in Plate 2 Fig.1 to Fig.4.The effect of this plant can be made stronger by mixing with the roots of jaerii (*Milletia pachycarpa*). Some varieties of the fishes (Plate.2.Fig.6 to Fig.9) are caught by stupefying with *Albizia chinensis* are as follows; *Anguilla bungalensis*, *Neolissochilus hexagonolepis*, *Opsarius sp.*, *Garra sp.*, *Schistura manipurensis*, *Schistura nagaensis*, *Rasbora sp.*, *Devario sp.*, *Raiamas guttatus*, *Pethia sp.*, *Psilorhynchus sp.*, *Crossocheilus sp.*, *Channa sp.*, *Tor sp.*, *Glyptothorax sp.*, *Mastacembelus armatus etc.*  
Distribution: Noney, Tamenglong, Chandel.

**Family: Mimosaceae**

Scientific Name: *Entada phaseoloides* Merrill.  
Vernacular Name: Kangkhill (Manipuri).  
English Name: Elephant creeper, Nicker bean.  
Type: A large climber.  
Parts used: Seeds, barks or stems, fruit pulp.  
Mode of utilization: Crushed and stupefied.  
Distribution: Hills and valley.

**Family: Myricaceae**

Scientific Name: *Myrica esculenta* Buch.-Ham.  
Vernacular Name: Keifang (Mizo).  
English Name: Box Myrtle.  
Type: An aromatic small evergreen tree.  
Parts used: Bark  
Mode of utilization: Grinding of bark.  
Distribution: Mao, Maram, Ukhrul, Chatrick.

**Family: Myrsinaceae**

Scientific Name: *Maesa chisia* D. Don  
Vernacular Name: Susi-porma (Assamese).  
Type: A gregarious shrub.  
Parts used: Bark, root and leaves.  
Mode of utilization: Stupefied.  
Distribution: Common in and around the valley areas of Churachandpur.

**Family: Myrsinaceae**

Scientific Name: *Maesa indica* (Roxb) A.DC  
Vernacular Name: Arngen (Mizo).  
Type: A shrub or small tree.  
Parts used: Bark, roots and leaves.  
Mode of utilization: Stupefied.  
Distribution: Common in and around the valley area of Churachandpur.

**Family: Papilionaceae**

Scientific Name: *Pterocarpus dalborgiodes* Roxb.  
Vernacular Name: Padauk.  
Type: A medium sized tree.  
Parts used: Bark, leaves, roots.  
Mode of utilization: Grinding and stupefying.  
Distribution: Tupul, Imphal west.

**Family: Papilionaceae**

Scientific Name: *Derris ferruginea* Benth.

Vernacular Name: Kho (Manipuri).  
Type: A scandent shrub.  
Parts used: Roots.  
Mode of utilization: Stupefying.  
Distribution: Foothills of Thoubal and Chandel district.

**Family: Papilionaceae**

Scientific Name: *Derris robusta* Benth.  
Vernacular Name: Kho (Manipuri).  
Type: A middle-sized deciduous tree.  
Parts used: Roots.  
Mode of utilization: Stupefying.  
Distribution: North and West of Manipur.

**Family: Papilionaceae**

Scientific Name: *Derris scandens* Benth.  
Vernacular Name: Kho (Manipuri).  
Type: A middle-sized deciduous tree.  
Parts used: Roots.  
Mode of utilization: Stupefying.  
Distribution: Mao, Nungba, Tamenglong.

**Family: Papilionaceae**

Scientific Name: *Milletia extensa* Benth.ex Baker.  
Vernacular Name: Ngamu-yai (Manipuri).  
Type: A semi-erect shrub.  
Parts used: Roots.  
Mode of utilization: Stupefying.  
Distribution: Common in the foothills, Sugnu, Chandel and Chakpikarong.

**Family: Papilionaceae**

Scientific Name: *Milletia pachycarpa* Benth.  
Plate 1: Fig.8  
Vernacular Name: Ngamu-yai (Manipuri), Jaerii (Moyon).  
Type: A large climbing shrub.  
Parts used: Roots and seeds.

**Traditional use and its effects**

1. It is used in getting rid of body louse of dogs by smashing & putting it as a ring around their neck so that the dogs cannot lick it.
2. In treatment of scabies by smashing & applying (minimum) the juice in the affected area.
3. The juice extract of the crushed root or barks is used as fish poison in traditional fishing. The roots or barks (a peeled out smashed bark or root tied into a small bundle is called 'chi' in Moyon) in bundle is smashed against rocks or big trunks of tree/log and let the juice extract run into water. Fishes are easily stupefied and subsequently paralyzed. Then they are collected by hands or nets or baskets. The greater the number of the bundle, the stronger the effect on the fishes. This poison is more toxic than Rupho (*Albizia chinensis*) and is more commonly used as fish stupefying poison since it is available in grooves.

Mode of utilization: Stupefying by smashing.  
Distribution: Common in hilly areas, Litan, Ukhrul, Chandel.

**Family: Papilionaceae**

Scientific Name: *Pongamia pinnata* Pierre.  
English Name: Pongnam oil tree.

Type: A small tree.  
Parts used: Roots and seeds.  
Mode of utilization: Smashed and crushed for stupefying.  
Distribution: Hill areas of Manipur.

**Family: Papilionaceae**

Scientific Name: *Pterocarpus dalbergioides* Roxb.  
English Name: Padauk.  
Type: A medium sized tree.  
Parts used: Leaves, barks and roots.  
Mode of utilization: Smashed, crushed and stupefied.  
Distribution: Tupul, Noney, Nungba.

**Family: Papilionaceae**

Scientific Name: *Pterocarpus dalborgiodes* Roxb.  
Vernacular Name: Padauk.  
Type: A medium sized tree.  
Parts used: Bark, leaves, roots.  
Mode of utilization: Grinding and stupefying.  
Distribution: Tupul, Imphal west.

**Family: Papilionaceae**

Scientific Name: *Tephrosia candida* DC.  
English Name: White Tephrosia.  
Type: A shrub.  
Parts used: Leaves and seeds.  
Mode of utilization: Stupefying.  
Distribution: Foothills of Manipur.

**Family: Polygonaceae**

Scientific Name: *Persicaria lapathifolia* (L.) Delarbre.  
Plate 1: Fig.9  
Vernacular Name: Chakwaisabi (Manipuri), Swaisabi (Moyon).  
English Name: Pale smart weed/willow weed.  
Type: weed.  
Parts used: Whole parts of plant (stem, roots and leaves).  
Mode of utilization: Smashed and stupefied.  
Distribution: Foothills of Manipur.

**Family: Polygonaceae**

Scientific Name: *Polygonum hydropiper* Linn.  
Vernacular Name: Lilhar/Chaokhong (Manipuri).  
English Name: Water pepper.  
Type: A sticky herb plant.  
Parts used: Whole parts of plant (Stem, root and leaves).  
Mode of utilization: Powder of the dried herb is used as a fish poison.  
Distribution: Hills and valley, Chandel district.

**Family: Polygonaceae**

Scientific Name: *Polygonum strigosum* R.Br.  
Vernacular Name: Chaokhong (Manipuri).  
English Name: Water pepper.  
Type: A herb.  
Parts used: Whole parts of plant (Stem, root and leaves).  
Mode of utilization: Infusion is used as fish-poison.  
Distribution: Wetlands, Keibul Lamjao, Moirang, Hill and valley.

**Family: Rubiaceae**

Scientific Name: *Canthium gracilipes* Kurz. /*Meyna spinosa*  
Plate 1: Fig. 10  
Vernacular Name: Lam-heibi (Manipuri), Lampa haepi (Moyon).  
English Name: May-nuh.  
Type: Tree.  
Parts used: Fruits.

**Traditional use and its effects:**

1. Crushed fruits are also used as detergents.
2. The fruits are collected in a basket and crushed them till the juice extract runs into water. It is generally used in areas where water is scanty and shallow. To make the ingredient strong, it is mixed with either Jaerii (*Milletia pachycarpa*) or Rupho (*Albizia chinensis*)

Mode of utilization: Crushed and stupefied.  
Distribution: Hills and valleys.

**Family: Rutaceae**

Scientific Name: *Zanthoxylum armatum* DC.  
Plate 1: Fig.11  
Vernacular Name: Mukthruhi (Manipuri), Shini (Moyon).  
English Name: Winged leaf prickly ash.  
Type: A small aromatic tree.  
Parts used: Bark.  
Mode of utilization: Crushed and stupefying.  
Distribution: Hills and valleys.

**Family: Rutaceae**

Scientific Name: *Zanthoxylum nitidum* (Roxb) DC.  
Vernacular Name: Mukthruhi.  
Type: A small aromatic tree.  
Parts used: Bark and fruits.  
Mode of utilization: Stem, Root, Leaves.  
Distribution: Hills and Valleys.

**Family: Sapindaceae**

Scientific Name: *Aesculus assamica* Griff.  
English Name: Horse chestnut.  
Type: A small deciduous tree.  
Parts used: Bark is employed as a fish poison.  
Mode of utilization: Smashed and stupefied.  
Distribution: Chandel district, Tamenglong district, Noney, Saramjao.

**Family: Sonneratiaceae**

Scientific Name: *Duabanga grandiflora* (Roxb.) Walp  
Vernacular Name: Tal, Wang.  
Type: A tall tree with drooping branches.  
Parts used: Bark is used for poisoning fishes.  
Mode of utilization: Crushed and stupefied.  
Distribution: Tamenglong, Senapati and Chandel districts.

**Family: Zingiberaceae**

Scientific Name: *Costus speciosus* (Koenig) Sm.  
Vernacular Name: Khongban-Takhellei/ Lam-Takhellei.  
Type: A perennial herb.  
Parts used: Whole plant (mainly roots).  
Mode of utilization: Stupefying.  
Distribution: Moist localities and forests.

Plate 1



Fig 1: *Blumea balsamifera*



Fig 2: *Mikania cordata*



Fig 3: *Alangium longiflorum*



Fig 4: *Gnetum montanum*



Fig 5: *Juglans regia*



Fig 6: *Acacia pruineseens*



Fig 7: *Albizia chinensis*



Fig 8: *Milletia pachycarpa*



Fig 9: *Persicaria lapathifolia*



Fig 10: *Canthium gracilipes*



Fig 11: *Zanthoxylum armatum*

Plate 2



Fig 1: Barks of Rupho (*Albizia chinensis*)



Fig 2: Smashing of *Albizia chinensis*



Fig 3: Foams of poison running from the smashing of *Albizia chinensis*



Fig 4: stupefying stage/intoxicated period



Fig 5: Collection of fishes



Fig 6: Varieties of fishes caught after stupefied.



Fig 7: Varieties of fishes caught after stupefied.



Fig 8: Varieties of fishes caught after stupefied.



Fig 9: Varieties of fishes caught after stupefied.

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