

## Antidiabetic plants used in Thoubal district of Manipur, Northeast India

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The ethnic communities of Thoubal district in Manipur uses various plants in alleviating various diseases that are inherited from the forefathers through oral folklores. An attempt has been made to document the precious traditional knowledge about the uses of 54 plant species in treating diabetes by different ethnic communities in the district.

**Keywords:** Traditional knowledge, Ethnomedicine, *Meitei*, *Meitei-pangal*, Diabetes, Manipur

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In the recent years, there is a revival of interest in the traditional system of medicine, where medicinal plants are a major source of biodynamic compounds of therapeutic values. The traditional knowledge on medicinal plants is the main basis for biocultural and ecosystem conservation as well as selection of various plant species for further pharmacological, phytochemical, toxicological and ecological studies. Health will not be a problem if man lives with nature<sup>1</sup>. According to a WHO estimate, more than 80% of the world's population relies on traditional medicinal practices for primary healthcare needs<sup>2</sup>. Over 75% of the world population is depending on local health practitioners and traditional medicines for their primary needs<sup>3</sup>. Traditional ethnomedicinal studies have in recent years received much attention due to their wide local acceptability and clues for new or lesser-known medicinal plants<sup>4</sup>. The study on the nexus between the aboriginal or primitive people and their immediate environment has received the attention of many researchers. Of paramount importance in such studies is the enumeration of several plants of therapeutic value used by different ethnic communities. The indigenous know-how of the tribal need to be studied closely and continuously updated as periodic field survey spread over time. The ethnic communities of different age groups, different gender and spread over different zones reveal immense variety in application and mode of treatment.

Manipur offers immense scope for ethnobotanical studies since it is inhabited by numerous aboriginal tribes and the region happens to be the part of Indo-Burma Hot-spots of diversity<sup>5</sup>. It possesses rich diversity of flora and a large number of economic and medicinal plants which forms an integral part of the culture of the ethnic communities. Thoubal district which lies between 23°45'N and 24°45'N Latitude and 93°45'E and 94°15'E Longitude occupies the bigger portion of the eastern half of Manipur valley which is inhabited by various ethnic communities, i.e. *Meiteis*, *Meitei-pangals* (Muslim), scheduled castes like *Loi*, *Yaithibi* and tribes like *Chiru*, *Gangte*, *Hmar*, *Kabui*, *Kom*, *Lamkang*, *Maring*, *Paite*, *Simte*, *Tangkhum*, *Vaiphei*, *Zou*, etc. which all have their own tradition and culture. All the ethnic groups use different types of plants for domestic as well as for the prescription of healing activities to a great extent. In the investigation, some plant species used by the ethnic communities of the district in diabetes are enumerated.

### Methodology

Ethnomedicinal information practiced by the different ethnic communities of the district was collected through the field visits in the areas inhabited by different ethnic communities<sup>6</sup>. The collected plant material used ethnomedicinally by the ethnic communities were identified<sup>7-12</sup>. After identification, the correct nomenclature were given to the specimens and kept in the herbarium centre of Manipur University, Manipur.

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### Observation

After conducting regular exploration trips in all the seasons during the year 2000-2003 in most parts of this district, the ethnomedicinal information collected on 55 plant species used for the treatment of diabetes are enumerated. For each plant species listed, Latin name, local (vernacular) names in *Manipuri* (Man.), Hindi (Hin.), and English (Eng.), family, and uses are given.

*Aegle marmelos* (Linn.) Correa (Rutaceae); syn. *Crateva marmelos* Linn.; *Heikhagok* (Manipuri); *Bel* (Hindi); Stone apple (English)

Uses: The *Loi* community eats tender raw leaf with milk.

*Antidesma acidum* Retz. (Euphorbiaceae) syn. *A. ghaesembilla* Gaertn.; *A. diandrum* Roth. *Heikum* (Man); *Amari* (Hin)

Uses: The *Lois* prescribes boiled extract of the leaf.

*Ardisia colorata* Roxb.; (Myrsinaceae); *Uthum* (Man)

Uses: *Meitei* and *Meitei-pangal* communities give boiled extract of the leaf.

*Areca catechu* Linn.; (Arecaceae); *Kwa* (Man); *Supari* (Hin); Betel nut (Eng)

Uses: The *Meitei* community uses boiled extract of the nut.

*Artemisia maritima* Linn.; (Asteraceae); *Ching laibakngou* (Man)

Uses: *Meitei* and *Meitei-pangal* communities give boiled extract of the leaves.

*Artocarpus lakoocha* Wall. ex Roxb.; (Moraceae) *Hari-kokthong* (Man); *Barhal* (Hin); Monkey jack tree (Eng)

Uses: Both *Meitei* and *Meitei-pangal* communities prescribe boiled extract of the bark mixed with common salt.

*Averrhoa carambola* Linn.; (Averrhoaceae); *Heinoujom* (Man); Carambola (Eng); *Rupuanthai* (*Kabui*)

Uses: *Meitei-pangal* community give boiled extract of the bark.

*Azadirachta indica* A. Juss; (Meliaceae); *Neem*

Uses: *Neem* leaves along with leaves of *Justicia adhatoda* and *Zanthoxylum acanthopodium* are boiled and consumed by *Meitei-pangal* community.

*Cassia alata* Linn.; (Caesalpiniaceae); syn. *Senna alata* Roxb. *Dao pata macha* (Man); *Dadmurdan* (Hin); Ringworm senna (Eng)

Uses: *Meitei* community prescribes the boiled extract of tender leaf.

*C. didymbotrya* Fresen.; *Dao pata achouba* (Man)

Uses: *Meitei-pangal* community prescribes boiled extract of the leaf.

*Catharanthus roseus* (Linn.) G. Don.; (Apocynaceae); *Saheb lei* (Man); *Sada bahar* (Hin); Periwinkle (Eng)

Uses: The *Loi* community takes the boiled extract of the leaf.

*Centella asiatica* (Linn.) Urban; (Apiaceae); syn. *Hydrocotyle asiatica* Linn.; *Peruk* (Man); *Brahma manduki* (Hin); Indian pennywort (Eng)

Uses: *Meitei-pangal* community prescribes the extract of *Parkia timoriana* bark and *Ficus glomerata* fruits.

*Clerodendrum indicum* (Linn.) Kuntze. (Verbenaceae); *Charoidong* (Man)

Uses: *Meitei* community gives the extract obtained by boiling *Clerodendrum indicum* leaves along with *Justicia adhatoda* leaves.

*C. viscosum* Vent.; syn. *C. infortunatum* Linn.; *Kuthap-manbi* (Man); *Bhat* (Hin)

Uses: *Meitei* community prescribes the boiled extract of the leaf.

*Coix lacrymajobi* Linn.; (Poaceae); *Chaning-angouba* (Man); *Sankur* (Hin); Jobs tears (Eng)

Uses: *Meitei* community takes the crushed extract of the root.

*Cyperus esculentus* Linn.; (Cyperaceae); *Kaothum* (Man)

Uses: *Meitei-pangal* community uses the boiled extract of the tuber to relieve thirst of diabetic patients.

*Debregeasia longifolia* (Burm.f.) Wedd. in DC.; (Urticaceae); syn. *D. velutina* Gaud. *U-khajing* (Man)

Uses: *Meitei-pangal* community uses boiled extract of the root.

*Enhydra fluctuans* Lour.; (Asteraceae); *Komprek tujombi* (Man)

Uses: *Meitei-pangal* community prescribes the extract obtained by boiling the plant cut into pieces at the nodes.

*Equisetum debile* Roxb. ex Vauch.; (Equisetaceae); *Lai utong* (Man); Horsetail (Eng)

Uses: *Meitei-pangal* community prescribes the extract obtained by boiling the plant along with the root of male *Carica papaya*.

*Ficus glomerata* Roxb.; (Moraceae) syn. *F. racemosa* Linn. *Heibong* (Man); *Gular* (Hin); *Fig* (Eng)

Uses: *Meitei-pangal* community uses the extract obtained by boiling the fruits along with *Centella asiatica* and *Parkia roxburghii* bark.

*Ficus hispida* Linn. f.; *Ashi heibong/Perelhei* (Man); *Daduri* (Hin)

Uses: *Meitei-pangal* community uses boiled extract of the leaf. *Meitei*, *Meitei-pangal* and the *Maring* communities also eat the fresh raw fruits.

*F. pomifera* Wall. ex King; *Heiba* (Man)

Uses: The *Meitei* community uses boiled extract of the leaf and the fruit.

*Flacourtia jangomas* (Lour.) Raeusch.; (Flacourtiaceae); syn. *F. cataphracta* Willd.; *Stigmarota jangomas* Lour.; *Heitroi* (Man); *Paniala* (Hin)

Uses: *Kuki* and *Meitei* communities eat raw fruits.

*Glycine max* (Linn.) Merrill.; (Fabaceae); *Nung hawai* (Man); *Bhat* (Hin); Soyabean (Eng)

Uses: Dry seed powder, sugar candy or the water soaked sprouted seed is eaten raw by *Meitei* and *Meitei-pangal* communities.

*Grewia abutilifolia*, Vent ex Juss.; (Tiliaceae); syn. *G. macrophylla non.* G. Don. *Ching boro* (Man)

Uses: *Meitei* community uses boiled extract of the fruit.

*Hibiscus syriacus* Linn. (Malvaceae), *Juba kusum angouba* (Man)

Uses: *Meitei-pangal* community uses decoction of the leaf.

*Hygrophila phlomoides* Nees; (Acanthaceae); *Ising langthrei* (Man)

Uses: *Meitei* community uses boiled extract of the plant.

*Imperata cylindrical* (Linn.) P. Beauv.; (Poaceae); *Imom* (Man); *Ulu* (Hin); Thatch grass (Eng)

Uses: *Meitei-pangal* community uses the extract obtained by boiling the root along with the leaf of *Citrus aurantium* against thirst in diabetes.

*Ipomea aquatica* Forssk.; (Convolvulaceae); *Kolamnii Taothrak* (Man); *Kalmisag* (Hin); Swamp cabbage (Eng)

Uses: *Meitei-pangal* community uses the boiled extract of tender shoot against thirst in diabetic patients.

*Jussieua repens* Linn.; (Onagraceae); syn. *J. adscendens* Linn.; *Ludwigia adscendens* (Linn.) Hara.; *Ishing-kundo* (Man)

Uses: *Meitei-pangal* community uses boiled extract of the plant.

*Justicia adhatoda* Linn.; (Acanthaceae); *Nongmangkha angouba* (Man); *Bakas* (Hin); Malabar nut (Eng)

Uses: *Meitei* community gives the extract obtained by boiling the leaves along with the leaves of *Clerodendrum siphonanthus*; *Meitei-pangal* community uses the extract obtained by boiling the leaves along with the leaves of *Azadirachta indica* and *Zanthoxylum acanthopodium*.

*Kyllinga triceps* Rottb.; (Cyperaceae); syn. *Cyperus triceps* (Rottb.) Endl.; *Chumthang namthibi* (Man)

Uses: *Meitei* and *Meitei-pangal* communities use boiled extract of the plant.

*Leucaena glauca* Benth.; (Mimosaceae); *L. leucocephala* (Lam.) de Wit.; *Mimosa leucocephala* Lam.; *Chigongnglei angouba* (Man)

Uses: Both *Meitei* and *Meitei-pangal* communities use leaf decoction.

*Ludwigia octovalvis* (Jacq.) Raven. ssp. *sessiliflora* (Mich.) Raven.; *Kabo khaji* (Man)

Uses: Both *Meitei* and *Loi* communities use boiled extract of the whole plant.

*Mentha arvensis* Linn.; (Lamiaceae); *Nungshi hidak* (Man); *Pudina* (Hin); Field mint (Eng)

Uses: Almost all the communities use crushed extract of the plant mixed with honey.

*Meyna spinosa* Roxb. Ex Link.; (Rubiaceae); syn. *Lam heibi* (Man); *Moina* (Hin)

Uses: *Meitei* and *Meitei-pangal* communities use boiled extract of the fruit.

*Morus indica* Linn.; (Moraceae); syn. *M. australis* Poir.; *Kabrangchak* (Man); *Tut* (Hin); Mulberry (Eng)

Uses: *Meitei* and *Meitei-pangal* communities eat the tender leaf cooked with any roasted fish.

*Musa sapientum* Linn.; (Musaceae); syn. *M. Paradisiaca* Linn.; *Lafu* (Man); *Kela* (Hin); Banana (Eng)

Uses: The *Loi* community eats the cooked inflorescence. The extract of water soaked smashed inflorescence is also sometimes used by both *Meitei* and *Loi* communities.

*Nelumbo nucifera* Gaertn.; (Nelumbonaceae); syn. *Nymphaea nelumbo* Linn.; *Thambal* (Man); *Kamal* (Hin); Sacred lotus (Eng)

Uses: *Meitei-pangal* community uses the extract obtained by boiling the tender shoot along with *Phyllanthus fraternus*.

*Ocimum americanum* Linn.; (Lamiaceae); syn. *O. canum* Sims.; *Mayangba* (Man); *Kalatulsi* (Hin); Basil (Eng)

Uses: The *Loi* community uses the ash of the petiole mixed with honey.

*Osbeckia nepalensis* Hook.; (Melastomataceae); *Yachubi* (Man)

Uses: *Meitei-pangal* community uses boiled extract of the tender shoot.

*O. stellata* Buch.-Ham. ex D. Don.; *Yachubi* (Man)

Uses: The uses are more or less similar to *O. nepalensis*.

*Parkia timoriana* (A.DC.) Merr.; (Mimosaceae); syn. *P. roxburghii* G. Don; *Inga timoriana* A. DC.; *Yongchak* (Man)

Uses: Decoction of bark of the plant with *Centella asiatica* and *Ficus glomerata* fruits is used by *Meitei-pangal* community.

*Peristrophe fera* C.B. Clarke.; (Acanthaceae); *Ishing langthrei* (Man); *Artital* (Hin)

Uses: The *Loi* community uses boiled extract of the plant.

*Phologocanthus tubiflorus* Nees.; (Acanthaceae); *Nongmangkha angangba* (Man)

Uses: Decoction of bark and *Zingiber officinale* rhizome is used by the *Loi* community.

*Phyllanthus emblica* Linn.; (Euphorbiaceae); *Heikru* (Man); *Amla* (Hin); *Emblic myrobalan* (Eng)

Uses: *Meitei* community eats the cooked tender leaves along with a local fish *Ngakha meingangbi* (*Puntius phutunio*).

*P. fraternus* Web.; *Chakpa-heikrul Heikruman* (Man); *Jaramla* (Hin)

Uses: *Meitei-pangal* community uses the extract obtained by boiling the plant along with the tender leaves of *Nelumbo nucifera*. The *Loi* community uses boiled extract of the leaves and seeds.

*P. urinaria* Linn.; *Chakpa-heigrul Heikruman* (Man); *Hazarmani* (Hin)

Uses: More or less similar to *P. fraternus*.

*Scleria terristris* (Linn.) Fuss.; (Cyperaceae); *Lam thangjou* (Man)

Uses: *Meitei* and *Meitei-pangal* communities use boiled extract of the plant.

*Sesbania sesban* (Linn.) Merr.; (Fabaceae); syn. *S. aegyptiaca* Poir.;

*Chuchurangmei* (Man.); *Jainti* (Hin.); Common *sesban* (Eng.)

Uses: *Meitei* communities uses boiled extract of the leaf or tender shoot.

*Smilax lanceifolia* Roxb.; (Smilacaceae); *Kwa manbi* (Man)

Uses: *Meitei* communities uses boiled extract of the root.

*Syzigium cumini* (Linn.) Skeels.; (Myrtaceae); syn *Myrtus cumini* Linn.; *Eugenia jambolana* Lam.; *Jamhei* (Man); *Jaman* (Hin); *Java plum* (Eng)

Uses: *Meitei* and *Meitei-pangal* communities uses boiled extract of the seed.

*Thevetia peruviana* (Pers.) Merr.; (Apocynaceae); syn *T. nerifolia* Juss ex Steud.; *Utong lei* (Man); *Pile kaner* (Hin); *Yellow oleander* (Eng)

Uses: *Meitei* community uses the ash of the bark mixed with water.

*Zanthoxylum acanthopodium* DC.; (Rutaceae); *Muthrubi tingkhang panbi* (Man); *Darmar* (Hin)

Uses: Boiled root extract is prescribed by both *Meitei* and *Meitei-pangal* communities and also leaf decoction along with the leaves of *Azadirachta indica* and *Justicia adhatoda* taken in equal proportion is used by the *Meitei-pangal* communities.

*Z. armatum* DC.; *Muthrubi* (Man)

Uses: More or less similar to *Z. acanthopodium*.

## Discussion

The existing traditions of treating diabetes by 54 plant species among the different ethnic communities residing in Thoubal district have been collected and summarized. Every community and locality in the district had some village priests cum doctors locally called, *Maiba* or *Maibi*, who apart from practicing magico-religious rituals to combat diseases used to prescribe herbal medicines. It is through the treatment by the *Maiba* or *Maibi*, the people could be cured or so it was believed. They used various plants, animals, chemicals and other products for the treatment of various ailments and the scion of their families is still carrying on the tradition. Whether their preparation had any actual effect on the treatment of a particular disease is still yet not known for certain, but there have been instances when people have recovered without any side effects. This is evident from the fact that people living in the rural areas still undergo this type of treatment and recovered fully. In the study, it was found that the traditional knowledge about herbs that were used by the forefathers in alleviating diabetes was acquired mainly by the local practitioner, the *Maiba* and *Maibi* are in the decline. It is mainly because the younger generation does not show much interest in this age old medical practices due to the advent of modern medicines and excessive

extraction of herbal raw material from the wild has resulted in considerable decline in the availability of the plant species.

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