

## Abstract

Ethnobotany is the study of man-plant interaction in relation with foods, medicinal, social, cultural and material needs of human beings. It is believed that numerous cultural groups of people use plants in several useful ways. Ethnobotanical study of Muslim community in Manipur appears to be one that has not been studied before although their traditional practices mainstream the use of plants in multiple ways. Thus the study of ethnobotany of Muslim (*Pangal/Meitei Pangal*) was taken up during the study period (2012-2016) with the aims and objectives to document the traditional medicinal plants, food and beverages, plants used in material culture and socio-religious customs. This study would help identify and document various plants in the region and their usage by the community.

The study was carried out in five districts of Manipur state namely, Imphal East, Imphal West, Thoubal, Bishnupur and Chandel. The informants were shortlisted from randomly selected Muslim households. Altogether 172 informants (110 male and 62 female) had participated in the study.

The total plants studied in this research belonged to 52 families, 99 genera and 109 species. The calculated value(s) of Dicot-Monocot ratio of family, genera and species are 1:0.20; 1:0.32 and 1:0.40 respectively; which show that dicot outnumbers monocot. Most frequently used plant families across different categories of the study [Medicinal (M), Food and beverages (FB), Material culture (MC), Socio-religious aspects (SR)] are 57 times Poaceae followed by 9 times Lamiaceae, 8 times Fabaceae, 6 times Arecaceae, 5 times Malvaceae, 5 times Solanaceae, 5 times Zingiberaceae and 5 times Cucurbitaceae respectively. It has been seen that Poaceae is the most dominant family with greatest number of genera i.e., *Bambusa*, *Coix*, *Cymbopogon*, *Cynodon*, *Dendrocalamus*, *Echinochloa*, *Imperata*, *Melocanna*, *Oryza*, *Saccharum* and *Zea*. The genus *Bambusa* has four species. i.e. *Kingiana*, *Nana*, *Tulda* and *Nutans*.

The share of major plant taxa are mainly Dicot (78.43%), followed by Monocot (17.65%), Gymnosperms (1.96%) and Bryophytes (1.96%). The plant groups in different habits have been recorded as 42 Angiosperm-herbs, 29 Angiosperm-trees, 16 Angiosperm-grasses, 14 Angiosperm-shrubs, 7 Angiosperm-climbers, 1 Bryophyte and 1 Gymnosperm-tree. The numbers of plants habitat-wise are 99 Terrestrial, 9 Aquatic and 1 Epiphytic.

The result revealed 55 medicinal plants which can cure various ailments. The plants used to prepare medicines along with its dosages and mode of preparation have been documented. Some medicinal plants used to treat common ailments are *Acacia farnesiana* (L) Willd. [Perforation of ear lobe], *Alocasia macrorrhizos* (L) G. Don. [Bee sting], *Celtis timorensis* Span. and *Lindernia ruelloides* (Colsm) Pennel [Kidney stone] and *Cucurbita maxima* Duch. [Night blindness]. The medicinal plants identified in this study belong to 37 families, 54 genera and 55 species. The leaves were found to be the most important part of the plants which were used in the making of medicines. Out of the 55 identified medicinal plants, 20 were used to treat kidney stones, 3 as antiparasite/germicidal, 2 for abortion, 2 for constipation, 2 as wormicide/anthelmintic, 2 for dog bite, 2 for jaundice, 2 for night-blindness, 2 for burns, 2 as appetiser, 2 for skin allergy, 1 for stomach ulcer, 1 for bathing of corpse, 1 for circumcision, 1 for snake bite, 1 for irregular menstruation, 1 for lack of stamina, 1 for perforation of ear lobe, 1 for persistent cough, 1 for white discharge of women, 1 for boils, 1 for sunburn, 1 for mental problems (ngaoba), 1 as hallucinogenic, 1 for fever, 1 for tonsillitis and 1 for bee sting. Such plant medicines prescribed by traditional healers (Maiba/Maibi) are claimed to be without side effects; even the patients prefer herbal medicines to modern. From time immemorial, medicinal plants have been traditionally used to treat various health problems. Therefore, such a system of traditional medicine has been encouraged. This research and documentation provides scope for future research into alternative treatment modalities from medicinal plants.

The plants used in food and beverages were found to be from 27 families, 45 genera and 45 species. Food and beverages included staple food (1 plant), vegetables, spices etc. (22 plants), edible fruits (17 plants), beverages (2 plants), and animal food (7 plants). Some food plants are *Oryza sativa* L (staple food), *Dendrocalamus giganteus* Munro (bamboo shoot), *Hibiscus cannabinus* L. (appetiser), *Areca catechu* L (stimulatory), *Cammelia sinensis* (L) Kuntze, *Meyna spinosa* Roxb. ex Link (fruit) etc. The animal food are *Cynodon dactylon* (L) Pers., *Alternanthera philoxeroides* (Mart.) Griseb., *Imperata cylindrica* (L) Raeusch., *Riccia natans* L, *Saccharum officinarum* L, *Oryza sativa* L and *Echinochloa stagnina* Retz. etc.

This research has recorded 8 bamboo plants and 13 other plants useful in the tool making. About 57 tools are known to have been prepared from these plants. Of these, 47 tools have been made by 8 bamboo plants alone and the remaining 10 tools have been made by 13 other plants. Altogether 21 plants belong to 10 families, 16 genera and 21 species. These tools have found usage in the area of agriculture and horticulture, fishery, weaving, house building etc. Some of the plants useful in the making of tools are *Bambusa tulda* Roxb (Thread roller), *Dendrocalamus membranaceus* Gamble (Spread-sheet), *Melocanna bambusoides* Trin (House wall), *Bambusa nana* Roxb. (Spear handle), *Ageratum conyzoides* L (Shampoo), *Morus macroura* Miq (Threads), *Tamarindus indica* L (Hammer) etc.

Socio-religious aspects of plants have been identified to be associated with 20 plants from 10 families, 16 genera and 20 species. These are used in socio-religious events like performing of ear lobe and nasal edges, circumcision, bathing of dead bodies, grave covering process, breaking of fasting, marriage solemnisation, prayers and festivals. The plant parts useful are *Ziziphus mauritiana* Lam (seeds and curly spine use in circumcision), *Pogostemon cablin* (Blanco) Benth. (leaves used in bathing of dead bodies), *Coix lacryma jobi* L (seeds use to count prayers/chants) and so forth.

It has been envisaged in a hypothesis that the plants used in folk-songs and folk-proverbs are not different from each other considering usefulness of plants in

various aspects as Medicinal, Food and beverages, Material Culture, Socio-religious aspects of plants and cultivated plants. It has come to know from the calculation of a significant Chi-square ( $\chi^2$ ) test that the calculated value of Chi-square i.e. 0.118 is less than the table value at 5% level of significance i.e. 9.488. The hypothesis has been retained.

There is rich ethnobotanical information from time immemorial which has been waiting for its proper record till date. Thus, the information in the thesis provides relevant accounts regarding current uses of plants in different useful categories of study i.e. food and beverages, medicinal plants, material culture, socio-religious and cultivated plants. The examples are *Nicotiana tabacum* L (smoking with Mughal phoo by making Tikki), *Saccharum officinarum* L (boiling liquid extracts and making a thick syrup called 'chuhi'), *Coix lacryma jobi* L and *Ziziphus mauritiana* Lam. (seeds used to count prayers), *Pogostemon cablin* (Blanco) Benth. (used in Bathing of dead bodies) *Areca catechu* L and *Piper betle* L (in honouring the guests), *Alternanthera philoxeroides* (Mart) Griseb (poultry food), *Bambusa tulda* Roxb and *Dendrocalamus giganteus* Munro. (bamboo shoot as food), *Solanum melongena* L (typical food plants associated with community name), *Averrhoa carambola* L, *Lindernia ruelloides* (Colsm.) Pennell, *Fragaria nilgerrensis* Schltdl ex J. Gay., *Enhydra fluctuans* Lour., *Hydrocotyle* sp. and *Myriogyne minuta* (G. Forst.) Less., (treatment of Kidney stones) etc.

Many cultivated plants useful in different categories viz. medicines, foods, tools, social functions have been mentioned in folk-proverbs and folksongs. More research can be done to find ancestral linkage of cultivation of such plants through folklore. Interestingly, even most of the wild food plants have found mention in folk-songs and folk-proverbs. The plants such as *Alpinia allughas* (Retzius) Roscoe, *Curcuma angustifolia* Roxb. are associated with Muslim folk-songs and *Rhus chinensis* Mill. and *Meyna spinosa* Roxb.ex Link are used in spoken Manipuri proverbs.

The plants such as turmeric (*Curcuma longa* L.), sugarcane (*Saccharum officinarum* L), sweet potato (*Ipomoea batatas* L), banana (*Musa balbisiana* Colla), bamboo shoot (*Bambusa kingiana* Gamble, *Bambusa tulda* Roxb, *Bambusa nana* Roxb., *Dendrocalamus giganteus* Munro etc.), chilly (*Capsicum frutescens* L) etc. are potential food plants and have economic value in the markets and the plants can be encouraged to grow in wider scale. The ornamental plants such as *Magnolia macrophylla* L, *Tagetes erecta* L, *Mirabilis jalapa* L, *Mimusops elengi* L, and *Michelia champaca* L are found in villages. The study has found that the socio-religious functions and cultural behaviour of the *Pangal/Meitei-pangal* (Muslims) encourages useful plants to be cultivated. The cultivation of exotic plant such as *Phoenix dactylifera* L has aesthetic value and the fragrance exuding plant *Pogostemon cablin* (Blanco) Benth. is grown in graves, house garden and mosque campus. The domestic cultivation of *Cocos nucifera* L and *Areca catechu* L is becoming a traditional practice which should be encouraged.

It understood from the study of socio-religious aspects and material culture that there is a cultural inclination to conserve bamboos plants in villages to a large extent. Therefore, bamboo based small scale industries can be encouraged in the villages which can also create employment prospects for youth. The current study findings descriptively document the various ethnobotanical aspects of plants used by Muslim (Pangal/ Meitei-Pangal) community of Manipur. The results of this study would benefit conservation of useful plants in the region and also provide scope for future research.