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DIVERSITY AND ETHNOBOTANICAL USES OF WILD EDIBLE FRUITS IN MIZORAM, NORTHEAST INDIA

***Ramachandra Laha, Lalhriatpuia, Rosie Lalmuanpuii, Laldinfeli Ralte and P.C. Lalremruata**
Department of Botany, Mizoram University, Aizawl-796004

***Corresponding Author Email: rc_laha@yahoo.com**

ABSTRACT

A study of wild edible fruits in Mizoram selected districts was carried out to assess the diversity and its ethnobotanical importance. During the study period fifty-one species belonging to 31 families were encountered with local folk name, used by different ethnic group and available districts. Among them 40 were trees, 5 shrubs, 5 climbers and 1 herb. The importance of documenting the wild edible fruits is important because of rapid loss of biodiversity due to anthropogenic activities and will help in conservation of the valuable wild edible species.

KEY WORDS

Ethnic groups, Mizoram, Wild edible fruits, Ethnic uses

INTRODUCTION:

Wild fruits have been good sources of food from time immemorial may be consumed when food source is scarce (Rasingam, 2012) and a source of various nutrients. The term wild refers to non-cultivated plants gathered in the field (Tardio *et al.*, 2006). Wild fruits make up the greatest percentage of wild food plants and many wild fruits are eaten worldwide (FAO 2011) as raw, unripe and cooked form. However, consumption of wild fruits has gradually decreased due to the introduction of exotic fruits (Deshmukh, 2011). The collection and consumption of wild fruits have played an important role in indigenous community for their day to day life (Jeeva, 2009). Verheij and Coronel (1991) provided a comprehensive review of edible fruits and nuts in Southeast Asia with a total number of 795 species along with a revival of interest an wild edidle fruits among different workers in India, Northeastern India and World (Jeeva, 2009; Sankaran *et al*., 2006 and Jin *et al.*, 2009).

In the present context of study there are very few studies conducted on edible wild fruits in the region, so the study aimed to enumerate, identify different edible fruit species in the study region and to harness the rich ethnobotanical uses among the different ethnic groups. The study proposes in increasing the awareness among the local and to boost the importance of different wild edible species.

MATERIALS AND METHODS:

Mizoram is situated in the extreme end of the Himalayan ranges in the North Eastern part it is located between 21° 58’ N and 24° 35’ N latitude and 92° 16’ E and 93° 29’ E longitudes (Pachuau, 1994). The studied districts Aizawl, Champhai, Lawngtlai and Saiha have predominantly mountaineous terrain; mountain ranges run in north to south direction, the soil in general young, immature, moderate to acidic. The districts enjoy a pleasant, moderate climate warm in summer and cold in winter with an average rainfall of 2500mm per annum, the temperature varies from 11°C to 35°C, forest cover in the region is tropical wet evergreen type and the region is rich in biodiversity with

many endemic flora and fauna. The districts constitute six major different ethnic groups Mizo, Mara, Lai, Pang, Bawm and Chakma rich ethnobioculturally on the use of biodiversity and folk knowledge.

Field visits were conducted during January 2015 - December, 2016 covering different villages and natural reserves inhabited by different ethnic groups of the region. During the visits to the village transect walks in natural reserve, secondary forest in around the region to collect wild edible fruit species. Interviews with knowledgeable villagers, local market observations and plant material collection carried out during field visit and record the ethnobotanical information local name for the species. The plant sample collected processed following the method of plant collection and herbarium technique (Jain and Rao, 1977). The specimen collected identified with the help of relevant floras and standard literature (Hooker, 1984; Kanjilal *et al.*, 1982a; 1982b).

RESULTS AND DISCUSSION:

The study reveals the diversity of wild edible fruits in the four different districts a total of 51 species belonging to 31 families identified. The dominant family with the maximum number of species eight belong to Moraceae followed by Phyllanthaceae and Rosaceae with four species each,Anacardiaceae ,Asteraceae and Clusiaceae with trhee species each,Burseraceae with two species, Actinidiaceae, Annonaceae, Apocyanaceae, Asclepiadaceae, Begoniaceae, Canninaceae, Combretaceae, Dilleniaceae, Ebenaceae, Elaegnaceae, Elaeocarpaceae, Leguminosae, Malastomataceae, Meliaceae, Menispermaceae, Myricaceae, Myrtaceae, Primulaceae, Rhamnaceae, Rubiaceae, Sabiaceae, Styracaceae, Symplocaceae and Vitaceae with one species each. (Table 1 and Figure 1)

The status on the habit of the wild edible fruit species in the studied four districts show the dominant species trees, followed by climbers, shrubs and herb as such trees 40 species (78%), Climbers 5 species (10%), Shrubs 5 species (10%) and herb 1 species (2%). (Table 1 and Figure 2)

The study on the ethnic group uses of the different species maximum species used by Mizo 48 species (31%), followed by Lai 42 species (27%), Mara 27 species (17%), Chakma 18 species (11%), Pang 17 species (11%) and Bawm with only 5 species (3 %). (Table 1 and Figure 3)

Table 1: Wild edible fruit species with family, local name, habit, ethnic group(s), ethnobotanical use(s) and available district(s).

Sl.No.	Name of Plants	Family	Local Name	Habit	Ethnic Group	Ethnobotanical use(s)	Available Districts
1.	*Aglaia edulis* (Roxb.) Wall.	Meliaceae	Raithei	Tree	Mizo, Mara	Furniture, Boat, House posts, Firewood	Aizawl, Saiha
2.	*Alphonsea lutea* (Roxb.) Hook.f. & Thomson	Annonaceae	Zawngbalhla	Tree	Mizo, Lai, Pang	Firewood	Aizawl, Lawngtlai
3.	*Antidesma bunius* (L.) Spreng.	Phyllanthaceae	Ṭuaiṭit	Tree	Mizo, Mara	Firewood, Medicine, Bark for making rope	Aizawl, Champhai, Saiha
4.	*Aphananthe cuspidata* (Blume) Planch.	Cannabaceae	Theisehret	Tree	Mizo, Mara	House construction, Rafter, Firewood, Charcoal	Aizawl, Saiha
5.	*Artocarpus chama* Buch. -Ham.	Moraceae	Tatkawng	Tree	Mizo, Lai, Pang, Mara, Bawm, Chakma	House construction, Furniture, Medicine, Fodder	Aizawl, Lawngtlai, Champhai, Saiha
6.	*Artocarpus lacucha* Buch. -Ham.	Moraceae	Theitat	Tree	Mizo, Lai, Chakma	House construction, Furniture, Firewood, Fodder	Aizawl, Champhai, Lawngtlai, Saiha
7.	*Baccaurea ramiflora* Lour.	Phyllanthaceae	Pangkai	Tree	Mizo, Lai, Mara, Chakma, Pang	Medicine	Aizawl, Champhai, Lawngtlai, Saiha
8.	*Begonia roxburghii* A.DC.	Begoniaceae	Sekhupthur	Herb	Mizo, Lai	Medicine	Aizawl, Champhai, Lawngtlai
9.	*Bruinsmia polysperma* (C.B.Clarke) Steenis	Styracaceae	Theipalingkawh	Tree	Mizo, Lai, Mara	House construction, Firewood, Medicine	Aizawl, Lawngtlai, Saiha
10.	*Calamus erectus* Roxb.	Arecaceae	Thilthek	Shrub	Mizo, Lai, Mara	Thatching, Vegetable	Aizawl, Lawngtlai, Saiha
11.	*Caryota mitis* Lour.	Arecaceae	Meihle	Tree	Mizo, Lai, Mara	Medicine	Aizawl, Lawngtlai, Saiha

12.	*Cleistanthus monoicus* (Lour.) Müll.Arg.	Phyllanthaceae	Phaktel	Tree	Mizo, Lai,	House construction, Firewood	Aizawl, Lawngtlai
13.	*Dillenia indica* L.	Dilleniaceae	Kawrthindeng	Tree	Lai, Chakma, Mara	Medicine	Lawngtlai, Saiha
14.	*Diospyros malabarica* (Desr.) Kostel.	Ebenaceae	Theikum	Tree	Mizo, Lai, Pang	House constrution, Firewood, Medicine	Aizawl, Lawngtlai
15.	*Elaeagnus caudata* Schltdl. ex Momiy.	Elaeagnaceae	Sarzukpui	Shrub	Mizo, Lai, Mara, Chakma	Medicine	Aizawl, Lawngtlai, Champhai, Saiha
16.	*Elaeocarpus rugosus* Roxb. ex G.Don	Elaeocarpaceae	Theikelek	Tree	Mizo, Mara	House construction, Firewood	Aizawl, Saiha
17.	*Embelia vestita* Roxb.	Primulaceae	Tling	Climber	Mizo, Lai, Mara, Pang	Vegetable, Medicine	Aizawl, Champhai, Lawngtlai, Saiha
18.	*Ficus auriculata* Lour.	Moraceae	Theibal	Tree	Mizo, Lai	Vegetable, Fodder	Aizawl, Lawngtlai
19.	*Ficus prostrata* (Wall. ex Miq.) Buch.-Ham. ex Miq.	Moraceae	Theitit	Tree	Mizo, Lai, Mara	Firewood, Medicine	Aizawl, Champhai, Lawngtlai, Saiha
20.	*Ficus racemosa* L.	Moraceae	Thei-chek	Tree	Mizo, Lai	Firewood, Dye, Medicine, Fodder	Aizawl, Lawngtlai
21.	*Ficus religiosa* L.	Moraceae	Hmawng	Tree	Mizo, Lai, Pang, Chakma	Firewood, Charcoal, Medicine, Fodder	Aizawl, Champhai, Lawngtlai, Saiha
22.	*Ficus semicordata* Buch.-Ham. Ex Sm.	Moraceae	Theipui	Tree	Mizo, Chakma, Lai, Pang, Bawm, Mara	Medicine	Aizawl, Lawngtlai, Saiha, Champhai
23.	*Garcinia lanceifolia* Roxb.	Clusiaceae	Chengkek	Shrub	Mizo, Lai, Mara, Chakma	Vegetable, Medicine	Aizawl, Lawngtlai, Saiha

24.	*Garcinia sopsopia* (Buch.-Ham.) Mabb.	Clusiaceae	Vawmva	Tree	Mizo, Lai, Pang	Medicine	Aizawl, Lawngtlai
25.	*Garcinia xanthochymus* Hook.f. ex T.Anderson	Clusiaceae	Tuaihabeh	Tree	Mizo, Lai	Firewood, Dye, Medicine	Aizawl, Lawngtlai
26.	*Garuga pinnata Roxb.*	Burseraceae	Bungbutuairam	Tree	Mizo, Lai, Chakma	House constuction, Furniture, Firewood, Medicine, Fodder, Dye	Aizawl, Lawngtlai
27.	*Haematocarpus validus* (Miers) Bakh.f. ex Forman	Menispermaceae	Theichhungsen	Climber	Mizo, Lai	Fodder	Aizawl, Lawngtlai
28.	*Licuala peltata* Roxb. Ex Buch.-Ham.	Arecaceae	Laisua	Tree	Lai, Mara	Vegetable, Medicine, Thatching	Lawngtlai, Saiha
29.	*Mangifera sylvatica* Roxb.	Anancardiaceae	Haifavang	Tree	Lai, Chakma, Mizo	House Construction, Furniture, Vegetable	Aizawl, Champhai, Lawngtlai
30.	*Meliosma pinnata* (Roxb.) Maxim.	Sabiaceae	Bungthei	Tree	Lai, Pang, Chakma	Firewood, Vegetable, Fodder	Lawngtlai
31.	*Memecylon celastrinum* Kurz	Melastomataceae	Theikawrak	Tree	Mizo, Lai	Firewood, Tool handle	Lawngtlai
32.	*Morus alba* L.	Moraceae	Thingtheihmu	Tree	Mizo, Lai, Mara, Pang	Medicine	Aizawl, Champhai, Lawngtlai, Saiha
33.	*Myrica esculenta* Buch.-Ham ex. D.Don	Myricaceae	Keifang	Tree	Mizo	Medicine	Aizawl, Champhai
34.	*Neonauclea purpurea* (Roxb.) Merr.	Rubiaceae	Lungkhup	Tree	Mizo, Lai	House posts, Firewood, Rice stirrer	Aizawl, Lawngtlai
35.	*Pentanura khasiana* Kurz.	Asclepiadaceae	Theikelki	Climber	Mizo, Lai, Mara	Fodder	Aizawl, Champhai, Lawngtlai, Saiha
36.	*Phyllanthus emblica* L.	Phyllanthaceae	Sunhlu	Tree	Mizo, Lai, Mara, Pang, Chakma	Medicine	Aizawl, Champhai, Lawngtlai, Saiha

37.	*Protium seratum* (Wall. ex Coleebr.) Engl.	Burseraceae	Bil	Tree	Mizo, Lai, Chakma, Mara, Pang, Bawm,	Furniture, House-post, Firewood, Charcoal	Aizawl, Lawngtlai, Saiha, Champhai
38.	*Prunus bracteopadus* Koehne	Rosaceae	Lumlerh	Tree	Mizo	House construction, Furniture	Aizawl, Champhai
39.	*Prunus undulata* Buch.-Ham. ex D.Don	Rosaceae	Theiarlung	Tree	Mizo, Lai, Mara	Dye	Aizawl, Champhai, Lawngtlai, Saiha
40.	*Rhus semiata* Murray	Anacardiaceae	Khawmhma	Tree	Mizo, Lai, Mara	Firewood, Medicine	Aizawl, Champhai, Lawngtlai, Saiha
41.	*Rubus ellipticus* Sm.	Rosaceae	Hmuṭau	Shrub	Mizo, Lai, Mara	Medicine	Aizawl, Champhai, Lawngtlai, Saiha
42.	*Rubus birmanicus* Hook. f.	Rosaceae	Sialinuchhu	Shrub	Mizo, Lai, Mara, Pang, Chakma	Medicine	Aizawl, Champhai, Lawngtlai, Saiha
43.	*Saurauia punduana* Wall.	Actinidiaceae	Tiar	Tree	Mizo	Firewood, Charcoal	Aizawl, Champhai
44.	*Spondias pinnata* (L. f.) Kurz	Anacardiaceae	Tawitaw	Tree	Mizo, Lai, Chakma, Mara, Pang, Bawm,	Medicine	Aizawl, Champhai, Lawngtlai, Saiha
45.	*Symplocos racemosa* Roxb.	Symplocaceae	Keite	Tree	Mizo	Firewood, Dye, Medicine	Aizawl, Champhai
46.	*Syzygium cumini* (L.) Skeels	Myrtaceae	Lenhmui	Tree	Mizo, Lai, Pang, Bawm	Medicine	Aizawl, Lawngtlai
47.	*Tamarindus indica* L.	Leguminosae	Tengtere	Tree	Mizo, Lai, Mara, Pang, Chakma	Medicine	Aizawl, Lawngtlai, Saiha

48.	*Terminalia citrina* (Roxb.) ex Fleming	Combretaceae	Reraw	Tree	Mizo, Lai, Chakma, Mara	House construction, Furniture, Tool handle, Medicine	Aizawl, Lawngtlai, Saiha
49.	*Tetrastigma bracteolatum* (Wall.) Planch.	Vitaceae	Hruiriṭhet	Climber	Mizo	Vegetable, Medicine	Aizawl
50.	*Willughbeia edulis* Roxb.	Apocynaceae	Vuakdup	Climber	Lai, Pang, Mizo	Latex for making rubber	Aizawl, Lawngtlai
51.	*Zizyphus jujuba* Mill.	Rhamnaceae	Bawrai	Tree	Mizo, Lai, Chakma	House construction, Tool handle, Firewood, Charcoal, Fodder, Medicine	Lawngtlai, Saiha

Figure 1. Family wise distribution of different species.

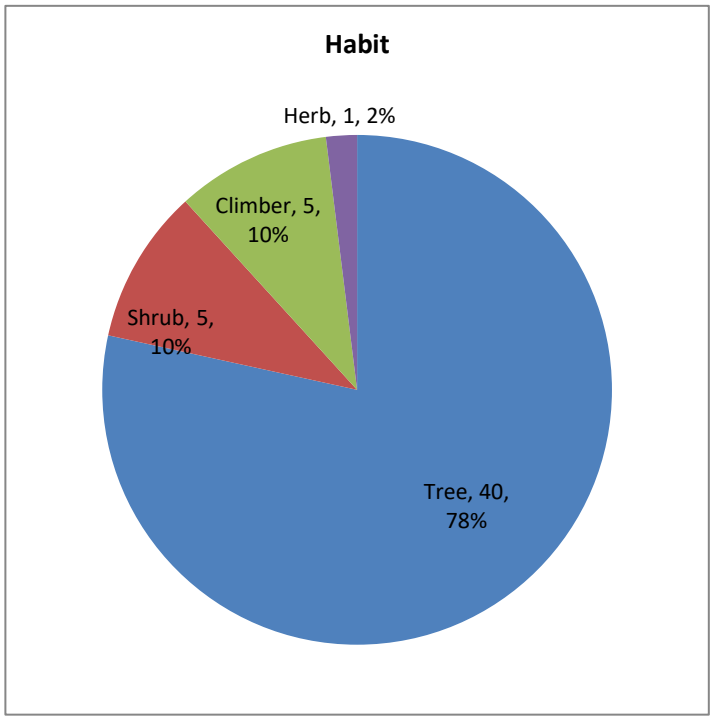

Figure 2: Habit of the wild edible fruit species

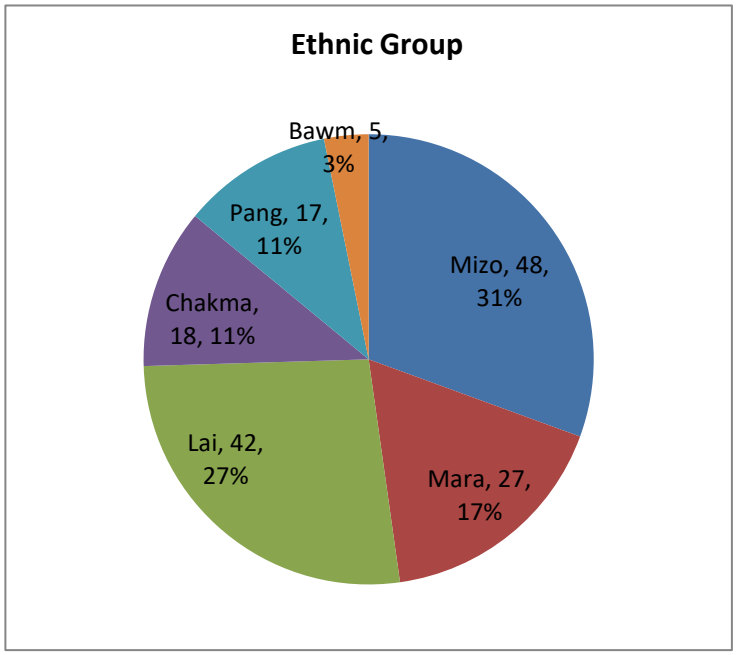

Figure 3: Number of wild edible fruit species used by different ethnic groups.

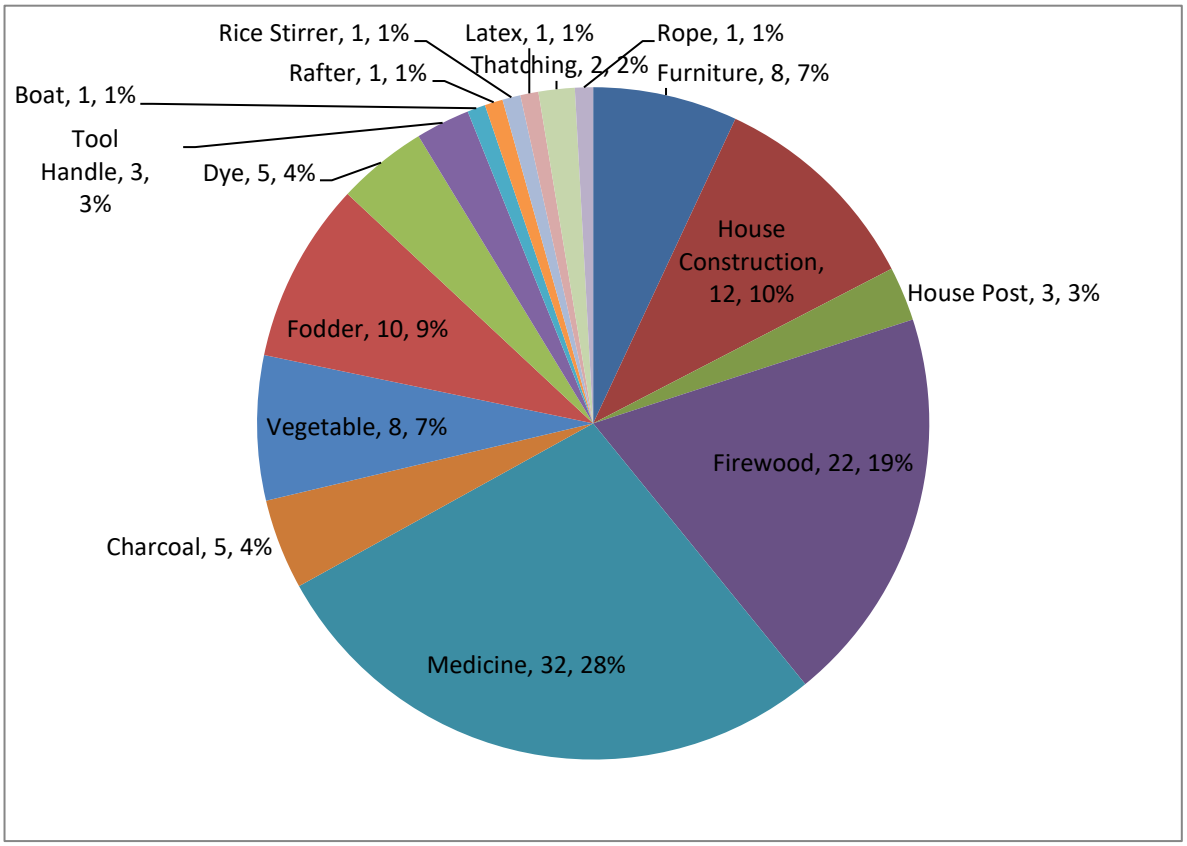

Figure 4: Ethnobotanical uses of different wild edible fruit species

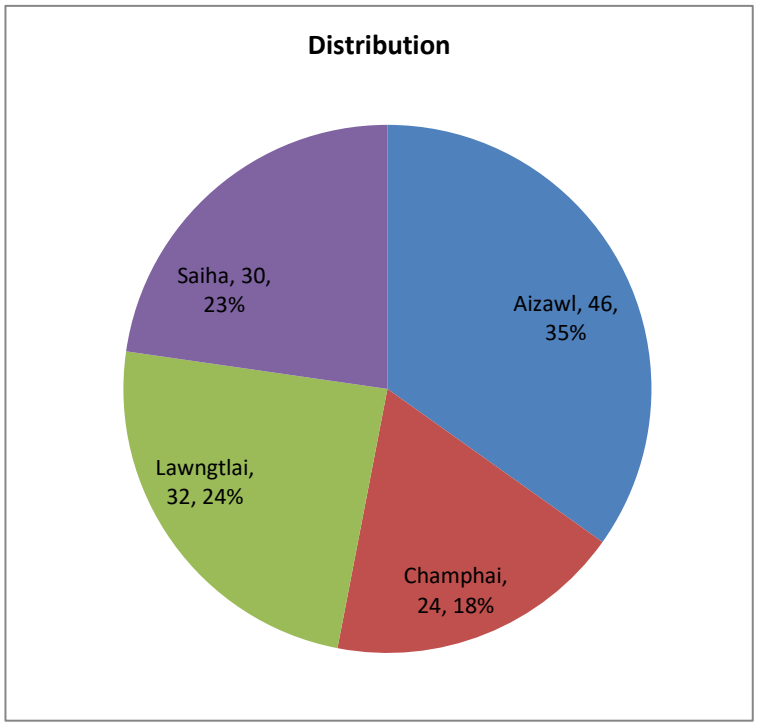

Figure 5: Distribution of wild edible fruit species in four districts of Mizoram

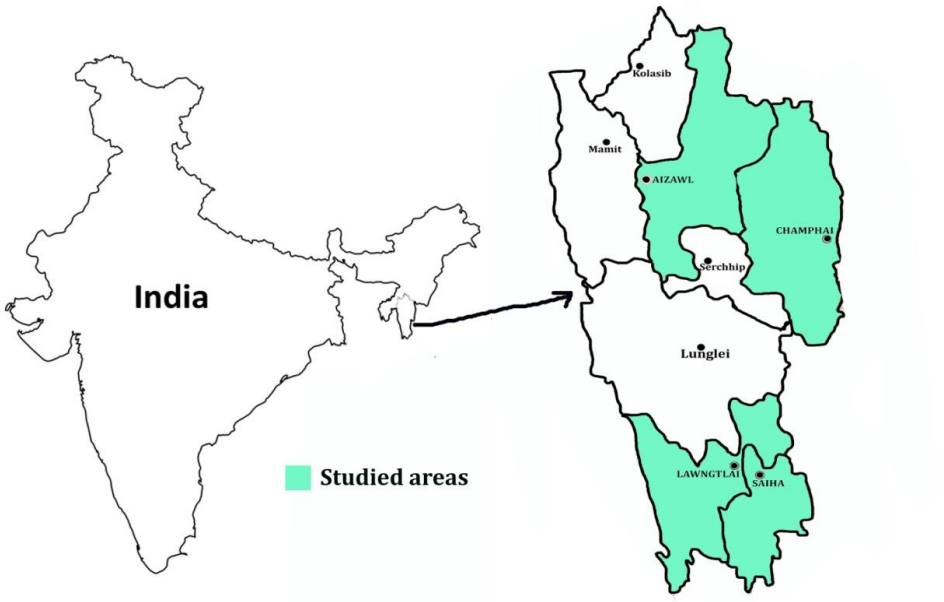

Figure 6: Map of Mizoram showing the four studied districts

The information on the ethnobotanical uses of the different wild edible fruit species by different ethnic groups the dominant use with the largest number of species 32 (28%) for Medicine, followed by Firewood 22 species (19%), Fodder and House construction 12 species (10%) each, Furniture making and Vegetable 8 species (7%) each, Dye and Charcoal making 5 species (4%) each House post and Tool handle 3 species (3%) each, Thatching 2 species (2%) and boat making, Rafter, Rice stirrer, Latex and Rope making 1 species (1%) each. (Table 1 and Figure 4)

The study on the diversity status on the availability of wild edible fruit species in different districts show Aizawl district with the maximum number of species 40 (35%) followed by Lawngtlai 32 species (24%), Saiha 30 species (23 %) and Champhai 24 species (18%). (Table 1 and Figure 5).

Several methods of fruit use have been recorded. Ripe fruits are usually eaten raw, whereas unripe fruit are used as vegetable, mixed with curry, with dry fish also eaten with salt (Jeeva, 2009). Wild fruits have been important source of nutrients and the consumptions of these species are essential part of the diet of the people and this traditional knowledge is handed down from generation to generation (Kruba *et al*., 2006). The past studies showed that different tribes of Northeast India (Gangwar and Ramakrishnan, 2000; Sankaran *et al.*, 2006; Jeeva, 2009) as well as in other parts of the world and India (Jin *et al*., 1999; Tardio *et al*., 2006; Verheij and Coronel, 1991) have intensively used wild fruits which shows the diversification of knowledge among the indigenous people in region to region and from nation to nation (Jeeva, 2009).

CONCLUSION:

This study showed the rich repository of edible wild fruits in the region and the findings has significant implications for the conservation, management and usefulness in the traditional knowledge system of different species. It can contribute to introduce for cultivation of wild edible species in jhum gardens, home gardens, agroforestry, restoration of the traditional heritage of the region, promoting the sustainable use of different species, protect and promote the dietary habitat and improve the economy. The rich bioresources along with the indigenous knowledge are depleting fast due to various anthropogenic activities and urbanization. The wild fruits of the region provide opportunity for bioprospecting for the discovery of important nutritional value.

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***Corresponding Author:**
Ramachandra Laha
Email: rc_laha@yahoo.com