

Ethno-Medicinal Plants of Mizoram



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CHAPTER 1

INTRODUCTION

1.1 Location and Physiography

Mizoram is situated in the extreme end of the Himalayan ranges in the North-Eastern part of India. It is located between $21^{\circ} 58'N$ and $24^{\circ} 35'N$ latitudes and $92^{\circ} 16'E$ and $93^{\circ} 29'E$ longitudes and bounded by Cachar District of Assam in the North, Manipur state in the North-East, Myanmar in the East and South, and Bangladesh and the state of Tripura in the West. The tropic of cancer passes just through the southern periphery of Aizawl Town at $23^{\circ} 30' N$ latitude (Anonymous, 1996).

The lengths of borders along the sides of Assam, Tripura and Manipur are 123, 66 and 95 km, respectively. The strategic international boundary has the length of 404 km along the side of Myanmar and 318 km along the side of Bangladesh (Anonymous, 1996).

The State of Mizoram has predominantly mountainous terrain of tertiary origin. The mountain ranges run in north to south direction, intercepted by narrow deep valleys and criss-crossed by innumerable small hillocks.

The slope gradients are very steep, and they leave only 59,197 ha of land arable for W.R.C. (Wet Rice Cultivation) which is 2.80% of the total geographical area of 21,081 km² (Anonymous, 1997).

The lowest portion at Tlabung is 20 m asl and the highest peak called **Phawngpui (Blue Mountain)** is 2157 m asl and the average height is about 1000 metres.

Some of the major mountains and their respective heights are : Phawngpui (Blue Mountain) 2157m, Lengteng 2141 m, Sur tlang 1967 m, Chalfih 1866 m, Hrangturzo 1854 m, Zopui tlang 1850 m and Tawizo tlang 1857 m (Anonymous, 1991, 1994, 1996).

The major rivers in Mizoram flow either in northerly or southerly direction. The lengths of some of the major rivers are. : *Tlawng* 185.15 km; *Tiau* 159.39 km, *Chhintuipui* (Kolodyne) 138.46 km; *Khawthlangtuipui* 128.08 km; *Tuichang* 120.75 km, *Mat* 90.16 km and *Tuipui* 86.94 km (Anonymous, 1992, 1996).

1.2 Population and Health Status

According to Census 1991, the total population of Mizoram is 6,89,756 persons, density being 33 km²; female sex ratio being 921; annual growth rate being 3.34%; urban population being 46.1%; literacy rate being 82.3% (second highest in India); work participation rate being 48.9%; in the primary sector being 66.0%; and the projected population in 2001 AD being 9,63,554 (Vijayanunni, 1996; Anonymous, 1996). The crude birth rate of Mizoram is 21.6 (national 30) while the crude death rate is 4.6 (national 10). The life expectancy is 53 years (national 56 years). A decadal growth of population since 1901 up to a projected population for 2001 is presented in **Fig. 1**.

The status of health in Mizoram is poor and the availability of health facilities is not adequate. The distribution of medicare is also inreciprocal with the increase in population, the outbreak of epidemic diseases and the demand of the sick people. The basic requirements for health, *viz.*, safe drinking water and *exreta* disposal facilities are also not fulfilled in many areas. This could be one of the reasons that causes an increase in the population of mosquitoes which ultimately leads to the spread of malarial diseases which have always been ranked at the top of deadly diseases in the State.

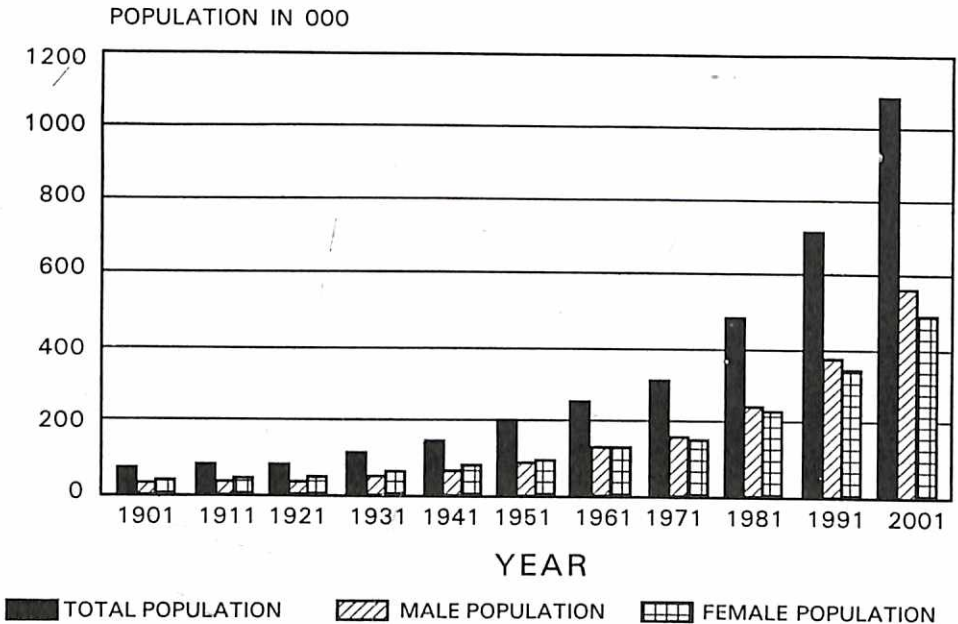


Fig. 1. Population in Mizoram.

The health facilities available at present are 7 Government Hospitals and 4 Non-Government Medical Institutions; 6 Community Health Centers (0.85%); 18 Subsidiary Health Centers (2.57%); 38 Primary Health Centers (5.43%) and 314 Sub-Centers (44.92%), out of 699 inhabited villages. The doctors' population till 1995 was 1:3600 (Anonymous, 1996).

The percentage distribution of death prevailing in the State till 1993 was: (1) Malaria (34.8%); (2) Asthma (20.4%); (3) Fever (17.8%); (4) Pneumonia (11.1%); (5) Cancer (10.2%); (6) Gastroenteritis (7.9%); (7) Heart attack (7.4%); (8) T.B. of lungs (6.04%); (9) Anaemia (1.8%); (10) Typhoid - Nil (Ray, 1994).

Due to the inability of modern system of medicine to provide the pre-requisite health care, people in rural areas have to depend on herbal medicines which are derived from wild plant resources.

Since 80% of the world's population rely on herbal medicines, the WHO (World Health Organisation) has recognised and encouraged the use of traditional medicines which have been proven to be safe and effective (Akerle, 1988; WHO, 1993).

1.3. Geology

The geology of Mizoram has been studied by some workers recently. Mizoram consists of sandstone and shales of tertiary age thrown into long folds. The rocks of Mizoram are the continuation of those rocks forming Patkai Range and Cachar Hills (Pachau, 1994).

Geologically, Mizoram is a part of the Tripura Mizoram Miogeosyncline depression (Assam Gulf) formed in the post-ocean thrust of the Himalaya orogeny leading to regional uplift of Barail group of sediments (*in* Kumar, 1997).

The lithostratigraphic succession in Mizoram is divided into : (i) Barail Group, (ii) Surma Group and (iii) Tipam Group, which are briefly described and reported by Ganguli (1975); Ganju (1975); Nandi *et al.* (1983); Pachau (1994); Lallenmawia (1994); Tiwari, *et al.* (1996). The deposits of the Fourth Group *i.e.*, Alluvial Group, is limited to only river beds comprising mainly loose sand and gravels as thin layers in the river valleys.

1.4. Soils

The soils of Mizoram in general are young, immature and moderate to highly acidic. The contents of potash and phosphorus are low, whereas the content of nitrogen is high, due to the accumulation of organic matter in the uneroded soils. The soils are generally fertile and responsive to the vigorous growth of vegetation as well as arable crops.

Soils of Mizoram are categorized into three orders :(i) Entisols, (ii) Inceptisols, and (iii) Ultisols (USDA, 1988) followed by Hrahsel (1988), Singh & Datta (1989), Pachua (1994) and Saithantluanga (1997).

According to Kumar (1997), the soils of Mizoram are broadly classified into Alluvial and Residual soils. The alluvial soils usually occur in the foothills of the north and west and in the intermontane plains and valleys, dominated by coarse sand. Residual soils which are further classified as lateritic, brown earth and podzolic occur in most parts of the State on steep slopes.

The soils of Mizoram are essentially derived from sedimentary rocks belonging to Barail, Surma and Tipam Groups of Miocene to Pleistocene periods (Kumar, 1997) or the product of slow diagenetic changes of the parent materials comprising mica schist, ferruginous sandstone and shales giving the inherent acidic character (Saithantluanga, 1997).

1.5 Climate

Mizoram enjoys a pleasant and moderate climate. It is generally warm in summer, and it is not very cold in winter. The climatic condition accorded to Mizoram may be called humid tropical sub-tropical and sub-temperate climates, characterized by short winter and long summer with heavy rainfall. The year may be divided into four seasons.

- (i) The winter lasts from December to February and the temperature varies from 10^o C to 22^o C, with little or no rain.
- (ii) The spring lasts from March to May and the temperature varies from 19^o C to 29^oC, characterized by bright sunshine and clear sky unless disrupted by the pre-monsoon rains.
- (iii) The summer lasts from June to August, characterized by violent storms and monsoon rains often causing landslides in some places, and the temperature varies from 20^oC to 32^oC.

- (iv) The autumn season lasts from September to November, characterized by a pleasant climate during the daytime and at night. The temperature varies from 18°C to 25°C.

Simultaneously, the temperature is increasing probably due to increase in population, urbanisation and environmental degradation.

1.6 Rainfall

The entire state of Mizoram is under the direct influence of maritime tropical airmass brought in by South-West monsoon. The rainy season lasts from May to October with an average rainfall of 2500 mm per annum. July August are the rainiest months, whereas December and January are the driest months of the year with almost no rainfall.

Humidity is relatively high nearly all the year round. The relative humidity is highest during monsoon rains. It is above 90%. The period from January to April is comparatively dry, whereas the relative humidity remains between 60 and 70% (Pachau, 1994). A decadal average rainfall (1986-1996) is shown in **Table 1**.

1.7 Forest Types and Wildlife Sanctuaries

1.7.1 Forest Cover

Out of the total geographical area (21,081 km²) of the state, the recorded forest area in 1992 was 15,935 km² or 75.5%, whereas the actual forest cover as per the State of Forest Report, 1995 was 18,576 km² or 88.1% and the growing stock volume per hectare in cubic metres is 35.3 (Anonymous, 1995) which, according to Forestry Statistics India (1995), are 18,697 km² or 88.7% and 30.3, respectively (Anonymous, 1995). On the basis of the 1995 assessment of India Remote Sensing Satellite Product (IRS-IB) the forest cover was found to be reduced by 156 km² in 1993 and 121 Km² in 1995 (Anonymous, 1995). Decrease in forest area is mainly due to the continuous practices of *shifting* cultivation, and increase in forest cover is due to regeneration programmes and natural vegetation.

Table-1. A Decadal monthly rainfall data (1986-1996) Mizoram (in mm).

Sl. No.	Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
1.	Jan.	5.9	12.4	0.6	1.1	1.6	1.1	5.3	18.7	3.1	4.2	23.6
2.	Feb.	8.9	27.4	28.2	29.7	23.8	30.0	8.2	129.6	16.4	10.1	34.0
3.	Mar.	30.1	64.4	64.3	20.9	177.5	28.1	7.1	98.8	233.1	36.5	123.1
4.	Apr.	200.6	2.3	136.8	131.3	259.9	137.0	50.3	108.3	159.5	40.1	106.4
5.	May.	101.4	86.4	333.3	195.2	398.2	202.4	161.1	481.5	195.1	266.5	238.9
6.	June	297.5	387.4	497.1	335.1	317.3	402.3	277.1	641.0	302.0	448.8	283.4
7.	July	424.6	556.1	552.4	755.7	416.1	711.2	374.1	709.0	417.6	405.0	352.5
8.	Aug.	435.5	552.8	518.8	460.6	552.4	452.9	382.9	462.0	434.3	474.4	308.4
9.	Sept.	391.8	518.8	94.8	336.1	422.2	346.2	316.2	339.2	209.8	349.7	407.5
10.	Oct.	170.0	94.8	119.9	351.0	97.5	302.1	265.1	217.1	109.9	171.4	166.3
11.	Nov.	100.7	119.9	11.1	1.3	124.4	1.3	39.1	23.6	26.3	195.4	37.0
12.	Dec.	4.8	11.1	1.0	0.4	37.1	1.1	10.1	Nil	0.2	0.5	5.9
TOTAL		2171.8	2743.8	2657.5	2619.4	2828.0	2615.7	1955.8	3228.8	2071.3	2502.6	2042.0

Sources :a) Statement of monthly rainfall, Directorate of Economics & Statistics, Mizoram, Aizawl, 1997.

b) Metrological Data Register, HQ. C.E. (P) Puspak, Aizawl, 1977.

Table 2. The legal classification of Forests in Mizoram

Sl.No.	Forest category	Area.(km ²)
1.	State Owned:	
	a. Protected forests	1300
	b. Reserved forests	5146
	c. Wildlife sanctuaries	681
		7,127
2.	District Council owned (Chhimituipui District):	
	a. Protected forests	347
	b. Reserved forests	363
	c. Wildlife sanctuaries	210
	d. Village safety and supply reserved forests	866
		1,786
3.	Village Council Controlled:	
	a. Village safety and Supply reserved forests	1782
	b. Unclassed state forests (Controlled by revenue Department)	3240
		5,022
	TOTAL :	13,935

Source : Statistical Hand Book Mizoram 1992, p.138.

From 1992, onwards, the forest area has been decreasing. It has decreased from 15,935 km² in 1994 to 10,745 km² in 1995-96 (Anonymous, 1994, 1996). It reveals that the recorded forest area has been reduced to 50.97% in 1996. On the other hand, the area of wildlife sanctuaries has increased up to 941 km² (Anonymous, 1996).

Forest types

On the basis of Champion (1936) and Champion & Seth (1964), the forests of Mizoram have been broadly divided into 3 (three) categories:

- (a) Tropical Wet Evergreen Forests;
- (b) Tropical Semi-Evergreen Forests;
- (c) Montane Sub-Tropical Pine Forests.

The third category of the above classification (i.e., **Montane Sub-tropical Pine Forests**) may require a revision on the ground that pine may not occupy dominancy over the vegetation of that area.

Based on Champion & Seth (1968), Negi (1989) and Subramanian & Sasidharan (1996), the forests of Mizoram can be divided as follows:

- (a) Tropical Wet Evergreen Forests (up to 900 m);
- (b) Tropical Semi-Evergreen Forests (900-1500 m);
- (c) Sub-tropical Hill Forests (1500 - 2158 m).

The common timber trees in each forest type and some economically important plants species are given below:

(a) Tropical Wet Evergreen Forests

The common important tree species with local names are given in parentheses : *Dipterocarpus turbinatus* Gaertn. f. (Lawngthing); *D. retusa* Bl. (Thingsen); *Terminalia myriocarpa* Heurek & Muell.-Arg. (Char); *T.chebula* Retz. (Reraw); *T.bellirica* (Gaertn.) Roxb. (Thingvandawat); *Aphanamixis wallichii* (King) Haridasan & Rao (Sahatah; *Michelia champaca* Linn. (Ngiau); *Haldina cordifolia* (Roxb). Rids. (Lungkhup); *Mitragyna rotundifolia* (Roxb.) O.Ktz.(Lungkhup); *Lagerstroemia speciosa* (L.) Pers.(Thlado); *Chukrassia tabularis* A. Juss. (Zawngtei); *Artocarpus chama* Buch-Ham. (Tatkawng); *Bombax ceiba* L. (Phunchawng); *B.insigne* Wall. (Pang); *Bischofia javanica* Bl. (Khuangthli); *Duabanga grandiflora* (Roxb.ex DC.) Walp (Zuang); *Toona ciliata* M. Roem. (Teipui); *Dillenia indica* L. (Kawrthindeng); *Calophyllum polyanthum* Choisy (Sentezel); *Podocarpus neriifolia* D.Don. (Tufar, Thlangfar); *Stereospermum colais* (Dillow). Mabb. (Zinghal); *Knema linifolia* (Roxb.) Warb. (Thingthi); *Garcinia* spp. (Chengkek, Vawmva); *Gmelina arborea* Roxb. (Thlanvawng); *Gynocardia odorata* R.Br. (Saithei); *Hydnocarpus kurzii* (King.) Warb. (Khawitur); *Baccaurea ramniflora* Lour. (Pangkai) etc.

Of cane species, *Calmus* spp. (Hruipui, Hruizik); *Zalaca baccarii* HK. f. (Thilthek); *Plectocarpia khasiana* Griff. (Mawt), etc are common. Of palms, *Barassus flabellifera* L. (Siallu); *Licula peltata* Roxb. (Laisua) and *Typha elephantiana* Roxb. (Sakuhlakhuih) are very common. *Melocanna baccifera* (Roxb). Kurz. (Mautak) is predominant over the species of *Dendrocalamus longispathus* Kurz. (Rawnal); *Bambus tulda* Roxb. (Rawthing), etc.

A moderately slope gradient secondary forests are being utilized for large-scale plantations of the most valuable timber species, *Tectonia grandis* L. (Teak/Tlawr).

(b) Tropical Semi-Evergreen Forests

This type of forest covers the central biogeographic zone and the coverage is approximately 50% of the total geographical area.

The common important tree species are : *Gmelina arborea* Roxb. (Thlanvawng); *Phoebe attenuata* Nees. (Bulbawr); *Persia petiolaris* (Hook.f.) Deb. (Bulpui); *Syzygium cumini* (L.) Skeels (Hmuipui); *S. fruticosum* DC. (Hmuichaw); *Albizia chinensis* (Osborne) Merr. (Vang); *A. odoratissima* (L.F.) Benth. (Kangtekpa); *A. procera* (Roxb.) Benth. (Kangteknu); *A. thomsonii* Brandis (Thingri chi khat); *Sapium baccatum* Roxb. (Thingvawkpui); *S. eugeniaefolium* Ham.ex Hook.f. (Thingvawkpuipa); *Schima wallichii* (DC.) Korth. (Khang); *Pterospermum acerifolium* Wild. (Siksil); *Castanopsis tribuloides* (Sm.) DC. var. *typica* King (Thingsia); *Cassia javanica* L. ssp. *nodosa* (Buch Ham.ex Roxb.) K.&S. Larsen (Makpazangkang); *Chisocheton paniculatus* (Roxb.) Hiern. (Sahatahpui); *Carallia brachiata* (Lour.) Merr. (Theiria); *Styrax polyspermum* Cl. (Theipalingkawh); *Alstonia scholaris* (L.) R.Br. (Thuamriat); *Erythriana stricta* Roxb. (Fartuah/Tuahpui); *Firmiana colorata* (Roxb.) R.Br. (Khaukhim); *Neolamarckia cadamba* (Roxb.) Bossue (Banphar); *Eurya acuminata* DC. (Sihneh); *Ficus* spp. (Theipui/Hmawng chi); *Dillenia pentagyna* Roxb. (Kaizawl/Kawmkaw); *Embllica officinalis* Gaertn. (Sunhlu); *Quercus semiserrata* Roxb. (Sehawrvar); *Litsea* spp. (Nauthak); *Mesua farrae* L. (Herhse); *Cinnamomum* spp. (Thakthing chi) etc.

Major bamboo species have been reported by Lalramnghinglova & Jha (1995); Lalramnghinglova (1995, 1997) in which *Melocanna baccifera* (Roxb.) Kurz. is predominant. *Dendrocalmus* spp. are common, whereas *Neohonzeaua dullooa* (Gamble) Camus (Rawthla) and *Pseudostachyum polymorphum* Munro (Chal/Chalte) are rare species.

Among the palm species, *Pandanus odoratissimus* (Lamk.) L. (Ramlakhuihthei); *Caryota mitis* Lour. (Meihle); *C. urens* L. (Tum); *Arenga saccharifera* Labill (Thangtung); *Wallichia densiflora* Mart. (Tawlhphahrit) and *W. disticha* T. Anders (Lem) are present in small populations. Cane population is gradually decreasing, whereas epiphytic orchid population is emerging towards the eastern higher altitude above 1200 m asl.

(c) Sub-Tropical Hill forests

This type of forests come under the major group **Montane Sub-tropical Forests** (Subramanian & Sasidharan, 1997) or **Sub-tropical Broadleaved Hill Forests** (Negi, 1989) in the eastern fringes bordering Myanmar and approximately extending from 1500-2158 m asl. The area constitutes about 24% of the total geographical area. It has a sub-temperate climate and the temperature varies from 9^o C to 25^oC.

The forests are characterized by *Rhododendron arboreum* Sm. (Chhawkhlei); *Myrica esculenta* Buch.Ham. ex D.Don (Keifang); *Engelhardtia spicata* Leschn. ex Blume (Hnum); *Pinus kesiya* Royle ex Gordon. (Far); *Lithocarpus dealbata* (Miq.) Rehder. (Fah); *Quercus griffithii* Hk.f. & Th. ex DC (Sasawthing); *Quercus serrata* Thumb. (Sehawrdum) etc.

Arundinaria callosa Munro (Phar); *Chimonobambusa khasiana* (Munro) Nakai (Lik); *Dendrocalamus sikkimensis* Gamble (Rawmi) and *D. giganteus* Munro (Rawpui) are the characteristic bamboo species. *Melocalamus compactiflorus* Benth. (Sairil) are also present, whereas distribution of *Melocanna baccifera* (Roxb.) Kurz is restricted to the forests. *Trachycarpus martiana* H. Wendl. (Siallute) and few *Cycads* are also present.

This forest type is the natural abode of epiphytic orchids like *Renanthera inschootiana* Rolfe (Senhri); *Vanda coerulea* Griff ex Linda, (Lawhleng); *Mantisia saltoria* and *M. wengerii* Fischer (Ruala, 1985; Singh *et al.*, 1990).

1.7.3 Wildlife Sanctuaries and National Parks

The Wildlife (Protection) Act, 1972 (as amended up to 1991) (Anonymous, 1972) has been brought out to the public notice in 1992, following the declaration of the "Year of Wildlife Conservation" in Mizoram, a joint venture of the Environment & Forest Department and Young Mizo Association (Y.M.A.), the largest single voluntary organisation in Mizoram. This led to the receipt of the Best Award on Wildlife Conservation programme from the Government of India in 1993. National Parks and Wildlife sanctuaries (**Fig.2**) are briefly described below:

(i) Dampa Tiger Reserve

The Dampa Tiger Reserve is the largest sanctuary in Mizoram. It is located in the western part of Aizawl District covering an area of 500

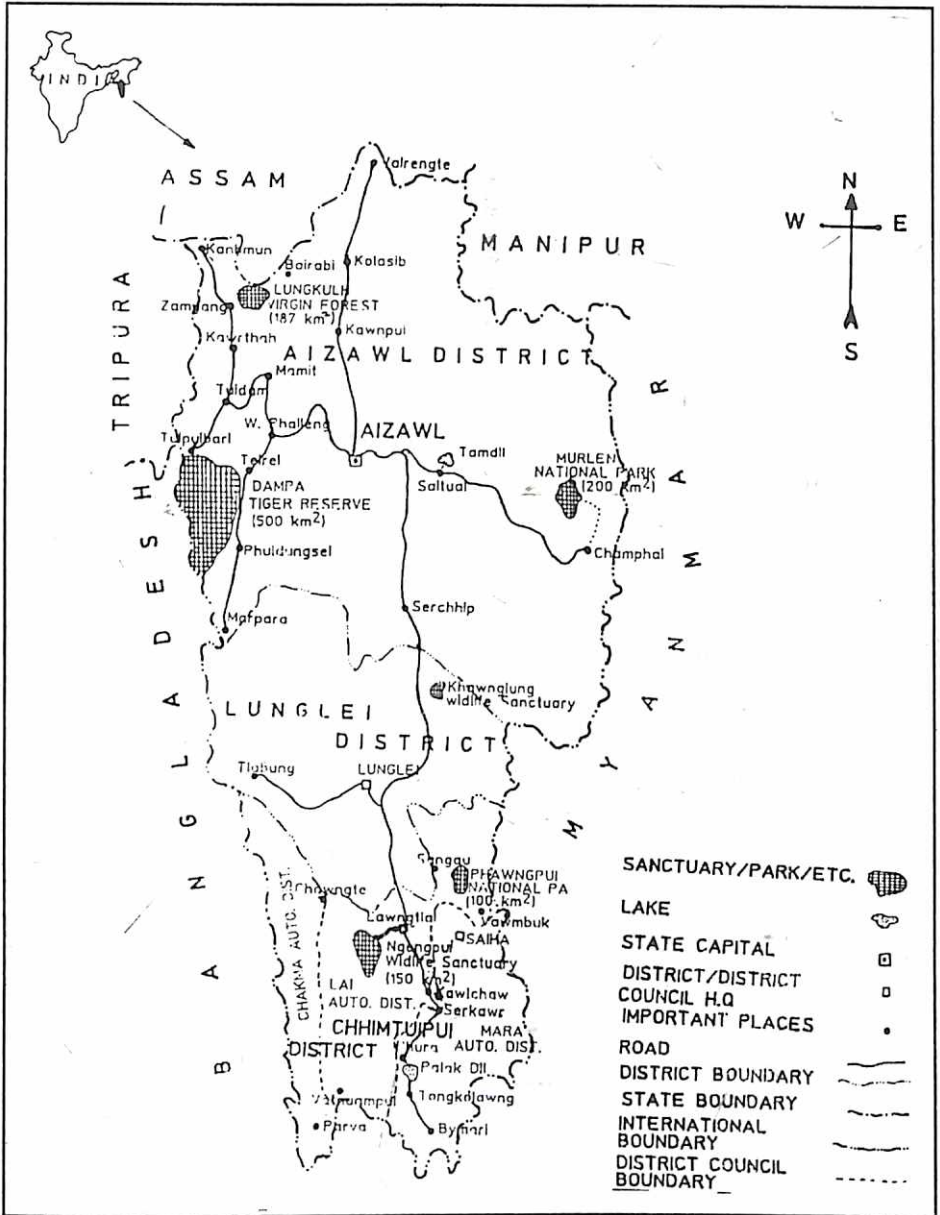


Fig. 2. Map showing Natural Parks and Wildlife Sanctuaries.

km², and it extends between 200 and 1100 m asl. Tropical evergreen and semi-evergreen forests fall into the area. Shankar Raman (1995) has listed out 215 species of birds from the sanctuary. It is 123 km away from Aizawl at Teirei.

(ii) Murlen National Park

Situated in the eastern part of Mizoram (bordering Myanmar) it has an area of 150 km² and the highest peak is 2175 m asl. Sub-tropical hill forests and tropical semi-evergreen forests prevail in the area. Pradhan (1995) has recorded 427 species of animals including 275 species of birds. The distance from Aizawl-via-Champhai is about 245 Km.

(iii) Phawngpui National park

It is located in the eastern part of Lai Autonomous District Council in Chhimituipui District of South Mizoram. The area is 50 km² and the park includes the highest peak in Mizoram, *i.e.*, **Phawngpui** or **Blue Mountain** (2157 m asl). The existence of a Sub-tropical hill forests is characterized by the natural growth of *Rhododendron arboreum* Sm. and is endowed with rich growth of epiphytic orchids. Robertson (1996) has reported birds, *viz.*, *Falco peregrinus*, *Garrulax virgatus*, *Ficedula superaciliaris*, etc. which were not seen anywhere in Mizoram.

(iv) Ngengpui Wildlife Sanctuary

This sanctuary lies within Lai Autonomous District Council in Chhimituipui District of South Mizoram. The area is 110 km² and the distance from Lawngtlai at Ngengpui is 40 km. Tropical wet evergreen forest abounds in the sanctuary which extends from 100 to 500 m asl. Robertson (1996) has noted a number of interesting bird species which include *Vanellus cinereus*, *Glaucidium brodei*, *Pitta nivalensis*, etc. in this area.

(v) Khawnglung Wildlife Sanctuary

This is a proposed wildlife sanctuary and the legal approval from the Government of India is expected soon. It is located in Lunglei District and the area is 35 km² only. Tropical semi-evergreen forests prevail in the area.

The Mini-Zoo at Aizawl and the newly created Deer Park near Thenzawl are also linked with the management of wildlife sanctuary. Lengtend and Tawi Sanctuaries have been pre-notified in 1999 and 1997, respectively.

1.8 The People and Culture

The ethnology, status and culture of the Mizos have been thoroughly studies and well documented. The term "**Mizo**" is yet to be coined as a generic term (Sangkima, 1992) by which all tribes or sub-tribes are covered

(Phukan, 1992; Burman, 1992). The **Kukis**, the **Lushais** and the **Chins** in short, the **MIZOS**, are of Mongolian racial stock and resemble each other in appearance (Choudhury, 1992). They are characterised by short to medium stature, black hair, short legs, long arms, broad face, cheek bones high, eyes small and almond-shaped, nose short and flat with wide nostrils (Shakespeare, 1912).

1.8.1 Historical background

The Mizos believed that they came out from a cave called '*Chhinlung*' or '*Sinlung*' a '*closed-stone*' (Thanga, 1978). Chhinlung is said to be located at Szechwan Province in China or bordering the Shan- state in Eastern China (Sangkima, 1992). There are different views and ideas about the period in which the Mizos came into the present Mizoram. Some historians opined that they came from China-Burma border before the close of the 15th century (Siama, 1953; Zawla, 1964) while others think that they came at the close of the 18th century and at the beginning of the 19th century (Choudhury, 1992; Thanga, 1992).

1.8.2 Language

The Mizos speak Lushai (Mizo) language which belongs to the *Tibeto-Burman* branch of the *Sino-Tibetan* language family (Grieson, 1908; Changli, 1992; Rui, 1992).

1.8.3 Religious Beliefs, Festivals and Folk-dances

Formerly, the Lushais were animists. They believed in what they called '*Pathian*' the creator of everything. They also believed that the evil spirits lived in the hollows of big trees, streams, rivers, springs, mountains, cliffs, caves (Hluna, 1992) and other objects curiously shaped or deformed (Zairema, 1985). The evil spirits create disease, distress and even death. To avert such danger one has to sacrifice animals by way of propitiation through *Puithiam* (*Priest*). A detailed account is given by Parry (1928) and Zawla (1964).

The Mizos used to observe festivals, such as *Chapchar Kut* (February-March), *Mim Kut* (August-September) and *Pawl Kut* (December) in the past. Of these festivals, only *Chapchar Kut* is still observed these days.

Folk-dances of Mizo are : *Cheraw* (Popular bamboo dance), *Khual lam*, *Chheih lam*, *Chai lam*, *Rallu lam*, *Solakia*, *Sarlamkai*, *Par lam*, *Sakeilu lam* and *Tlang lam* (Vergheese & Thanzawna, 1997).

18.4 Occupation

Agriculture is the main occupation in Mizoram. More than 70% of the entire population of Mizoram live in rural areas and practice *shifting* agriculture or *jhum* farming. This method of cultivation no longer holds sustenance due to the shortening of *jhum* cycle to 3-5 years. Land tenure system is governed by the Mizo District (Land Revenue) Act of 1954, Jhuming Regulation Act of 1954 and the Mizo District (Forest) Act of 1955.

Paddy (*Oriza sativa* L.) is the principal crop in Mizoram. Other important crops are : *Zeas mays* L. (Vaimim), *Glycine max* (L.) Mere (Bekang), *Sesamum orientale* L. (Chhawahchhi), *Brassica rapa* (L.) Elampham (Antam), *B. oleracia* L. var. *capitata* L. (Zikhlum), *Zingiber officinale* Rosc. (Sawhthing), *Areca catachu* L. (Kuhva), *Aleurites montana* E.H. Wils. (Tung), *Capsicum frutescence* L. var. *baccata* Irish (Hmarchate) etc.

Detailed account of the pattern of land use system and nature of *shifting* cultivation are given by Thangchungnunga (1996) and Jha (1997), respectively.

1.9 Ethnobotany and Its Scope for Research

1.9.1 What is Ethnobotany?

Ethnobotanical study was first carried out by Edward L. Palmer in the South-West of the United States in 1869 and he found out plants used by the Indians for their food (Palmer 1871). Powers (1873-1875) used the term '*aboriginal botany*' which included all forms of vegetable used for medicine, food, cloth, ornament, etc.

The term "*ethnobotany*" was first coined by Dr. John W. Harshberger in 1895. He described ethnobotany as "the study of plants used by primitive and aboriginal people" (Harshberger, 1896). Since then, it has been amplified and defined in the following manner:

- (a) The study of the relationship which exist between people of a primitive society and their plant environment (Schultes, 1962).
- (b) The study of direct interrelations between humans and plants (Ford, 1978).
- (c) The study of the past and present interrelations of primitive or aboriginal human societies with the ambient vegetation (Maheshwari, 1987).

- (d) The study of the relationship between the inhabitants and the habitats (Sarin, 1989).
- (e) The study of useful plants prior to their commercial exploitation and eventually domestication, including the use of plants by both tribal and non-tribal communities without any implications of primitive or developed communities (Wicknes, 1990).
- (f) The study of the total direct relationship between humans and plants (Jain, 1994).
- (g) The study of the interactions between people and plants (Martin, 1995).

Prance (1991) in his article entitled, “**What is ethnobotany today?**” considers ethnobotany as a changing science. According to Balick (1996), the ‘new’ ethnobotany links diverse disciplines, such as anthropology, botany, nutrition, ecology, conservation, economics and pharmacology. The interdisciplinary nature of ethnobotany has been explained by Jain (1987, 1989), Maheswari (1987) etc.

1.9.2 Scope of Ethnobotanical Research

It has been found that most of the plant species having medicinal value grow in the forests. About 95% of medicinal plants used by herbal pharmaceuticals and for export are collected from the wild with no parallel regeneration programme to replenish medicinal plants stock (Anonymous, 1995). It is the general concept that 80% of rural population in developing countries depend upon medicinal plants for their primary health care needs. A scientific survey of these medicinal plants and their ethnobotanical studies has been done by Botanical Survey of India, Research Institutions and Laboratories, Universities and Non-Government Organizations (NGO’s) in India. A number of detailed ethnobotanic exploitations were conducted in different tribal areas of the country.

Out of over 15,000 species of higher plants recorded so far in India, **All India Co-ordinated Research Project** has recorded over 9,500 wild plant species used by tribals for meeting their varied requirements. Of these, approximately 7,500 species are used for medicinal purposes, about 800 species for food, over 525 species for fibers and cordages, about 400 species for fodder, and about 300 species for piscicides and pesticides, of which at least 175 are promising for safe biopesticides (Anonymous, 1994).

It is reported that more than 800 plant species of ethnobotanical interest were collected at different centers (Anonymous, 1990). These plant species were over-exploited for a very long time and many of them have become endangered species. **Foundation for Revitalization of Local Health Traditions (FRLHT)**, a Non-Governmental Organisation, established in 1991 at Anandnagar, Bangalore has already housed 11,230 specimens accounting for about 2,250 species in its herbarium till June, 1997 (Anonymous, 1997).

On the basis of new **IUCN (International Union for Conservation of Nature) Red List Categories**, a First Red Data List of Indian Medicinal Plants was brought out as per the assessment of Conservation Assessment and Management Plan (CAMP) workshops held during 1995-1997. A first Red Data list of Indian Medicinal Plants include 36 medicinal plant species of South India and about 75 species from rest of the country, including North-East India (Anonymous, 1995b, 1997c).

The state of Mizoram receives little attention as far as the survey of medicinal plants is concerned. Like other tribes, the tribes in Mizoram practice traditional herbal medicines, the local knowledge of which has been descending through generations since time immemorial. Ethnomedicinal plants are still widely used for curing different diseases both in urban and rural areas. There is a need for documentation of such valuable indigenous knowledge and domestication of economically important medicinal plants to decrease pressure over natural resources and to fulfill the requirements of national and local needs.

The present study is designed and structured to tackle the above mentioned problems and provide useful information on plants of ethnobotanical importance based on local botanical and ecological knowledge for the benefit of the present and future generations. *The aims and objectives of the study are :-*

1. Contribution of first-hand detailed report of ethnomedicinal plants' occurrence, delineation of maps to show their natural habitats, systematic description and uses, with special emphasis on the ethnobotanical importance.
2. Collection, identification and documentation of indigenous medicinal plants supported by voucher specimens to be incorporated into the herbarium for future reference and information.
3. Screening of economically important medicinal plant species to be introduced in farming systems as one of the alternative means of *shifting* cultivation.

4. Identification of rare and endangered medicinal plants for future conservation and multiplication.
5. To safeguard wild plant resources, to strengthen ethnocultural knowledge and to promote economic and cultural heritage of the local people.
6. Domestication of important medicinal plants in local agro-ecosystems, *ex-situ* conservation through herbal gardens or drug farms, for there is a great potential for commercial exploitation as a source of livelihood for many rural families.
7. Application of practical results recommended for community development and biodiversity conservation.

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