

CREATION OF GEO-SPATIAL DATA BASE OF MEDICINAL PLANTS OF SENAPATI DISTRICT, MANIPUR

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ABSTRACT

An extensive and intensive field survey were conducted to find out the extent of availability of the medicinal plants in 37 villages in Senapati district, Manipur during 2008 to 2010. Altogether 176 medicinal plants have been collected, among them 111 plants have been identified and the remaining 65 plants are yet to be unidentified. Out of the total collected plants it has been observed that 33 plants such as *Aerisaema tortuosum*, *Blumeopsis falcata*, *Clerodendrum colebrookianum*, *Croton caudatus*, *Curcuma caesia*, *Curcuma leucorhiza*, *Hydrocotyle sibthorpiodes*, *Melothria purpusila*, *Cucumis sp.*, *Paris polyphylla*, *Potentilla anserina*, *Scutellaria discolor*, *Zingiber sp.*, *Rhaphidophora laciniata*, *Taxus baccata*, *Goniothalamus sesquipedalis*, *Hodgsonia macrocarpa*, *Thalictrum foliolosum*, *Smilax ovalifolia*, *Bergenia ciliata*, *Stemona tuberosa*, *Rauvolfia serpentina*, *Taxillus lonicerifolius*, *Coix lacryma-jobi*, *Phlogacanthus jenkinsii*, *Kaemferia galanga*, *Mimosa pudica*, *Solanum nigrum*, *Vitex negundo*, *Phyllanthus niruri*, *Drymaria cordata*, *Asparagus racemosus*, *Tacca chantreiri* are very rare medicinal plants. Among the identified plants 19 plants are internationally known plants and their bio-active molecules have been identified. The plants are *Acorus calamus*, *Ariaema tortuosum*, *Artemisia nilagirica*, *Centella asiatica*, *Cephalotaxus harringtonia*, *Clerodendrum colebrookianum*, *Costus speciosus*, *Croton caudatus*, *Curcuma caesia*, *Elephantopus scaber*, *Goniothalamus sesquipedalis*, *Hedychium spicatum*, *kaemferia galangal*, *Paris polyphylla*, *Phyllanthus niruri*, *Potentilla anserina*, *Rauvolfia serpentine*, *Taxus baccata*, *Thalictrum foliolosum*. During the survey, exact location of the plants were documented by using GPS and presented by using GIS software. The paper will highlight about the satellite location ranges of the identified plants and their medicinal uses, their bio-active molecules as well as location and habited where the plants are being naturally grown are mentioned.

Keywords: Geo-spatial, Data base, Medicinal plant, Tribe, Senapati, Manipur

I. INTRODUCTION

The use of medicinal plants in the treatment of diseases was conceived by tribal people thousands of years ago. The tribal people and ethnic races throughout the world have developed their own cultures, customs, cults, religious rites, taboos, legends and myths folk tales and songs, food, medicinal practices etc. They have been using several plants and their various parts by collecting from near and around their settlement for medical preparation and these medicines are known as ethnomedicine. The collected plants are recorded with the help of GPS to know their extent of availability at the natural habitat. Various wild and cultivated plants play a very important & vital role among these cultures. This interrelationship has evolved over generation of experience and practices. It is noticed that a plant is used for a disease in different ways and for different types of diseases. The medicinal plants in particular have received the attention of

Scientists for chemical, pharmacological and clinical angles in India and abroad. Ethnobotanical data base studies assume great importance in enhancing our knowledge about the plants found at their natural habitat used by native/tribal communities, the rich diversity assembled by them for their sustenance and the different means adopted by them for its prevention and conservation?4. A vast knowledge on medicinal plants exists as oral among the folklore and traditional medicine men of India, where a large number of potent medicinal herbs are found growing wild. However, the young generation is not interested to hold this invaluable traditional knowledge transmitted orally from generation to generation. Therefore, before this traditional knowledge is lost forever it must be documented properly with data basing system and sustainable utilization of these medicinal plants depends on the judicial application of sciences and technology.

Senapati district is located at the northern site at a distance of 60 km from Imphal which passes NH 37 and lies between $N24^{\circ}38.828 - N25^{\circ}91.865$ Latitudes, $E093^{\circ}45.243 - E094^{\circ}59.425$ Longitudes, Elevation: 880 - 4615 msl and covering an area of 3271 sq km. It has immense scope of ethnobotanical data base studies of Medicinal plants due to natural forest coverage. Due to poor transportation and medical facilities in the rural areas, the rural folk to a great extent still hold onto their traditional faith in local medicine men and wild herbal plants.

II. METHODOLOGY

A data basing field survey was carried out in 6 sub-division, namely Mao Maram (inhabited by Nagas), Paomata (inhabited by Naga), Purul (inhabited by Naga), Kangpokpi (inhabited by Kuki), Saikul (inhabited by Kuki), Saitu Gamphazol (inhabited by Kuki) of Senapati district, Manipur during March 2008 - March 2010. Each division consisted of six survey team, each team comprising two persons one village elders (a local expert) and a field assistant who did the write up. These teams visited the natural habitats and eco-system of 37 villages and assess the extent of availability of the medicinal herbs with the help of GPS and mapped on the satellite district map with the help of GIS software (Fig. 1) and then took the photograph of each plant at their natural habitat. The information were collected and documented including traditional medicinal uses of plants along with plant parts used and from literature the chemical composition and active principles were documented and then tabulated. The collected medicinal plants are identified with the help of a taxonomist.

III. RESULT AND DISCUSSION

Manipur lies in one of the hot spots and naturally rich in flora and fauna. Traditional system of medicine is prevalent in Manipur since times immemorial making use of the plant found around.

A total of 176 plants have been found to be used for medicinal purposes by the Senapati tribes. Out of

these 176 plants 111 plants have been identified, their Botanical names followed by Family, Local name, Parts used, Locality, Satellite location ranges Medicinal/Ethnobotanical uses are given in alphabetical order (Table 1). Different parts of plants like leaves, root, rhizome, inflorescence, fruit, seed etc. being used for different purposes. About 7 plants for Blood pressure, 7 plants for Cancer, 14 plants for Caugh and asthma, 9 plants for diabetes, 9 plants for digestive disorder, 5 plants for gastritis, 3 plants for gout, 6 plants for jaundice, 5 plants for liver diseases, 8 plants for malaria, 7 plants for piles, 5 plants for sinus, 10 plants for skin diseases, 11 plants for stone case etc. Sometimes, a single species is used to cure more than one disease. A few such species are *Acorus calamus*, *Alocasia indica*, *Aloe barbadensis*, *Bergenia ciliata*, *Blumeopsis falcate*, *Centella asiatica*, *Clerodendrum colebrookianum*, *Croton caudatus*, *Cucumis sp*, *Curcuma caesia*, *Dendrobium aphyllum*, *Drymaria cordata*, *Elephantopus scaber*, *Eupatorium nodiflorum*, *Hedyotis auriculata*, *Hodgsonia macrocarpa*, *Houttunia cordata*, *Hydrocotyl*, *Kaemferia galanga*, *Mimosa pudica*, *Phyllanthus niruri*, *Rauvolfia serpentine*, *Solanum nigrum*, *Stemona tuberosa*, *Tinospora cordifolia*, *Xanthium strumarium*, *Zanthoxylum acanthopodium* etc. Biochemical analysis of some medicinal plants have been documented from the literature⁶ (Table 2). Use of 176 plants species for ethnomedicinal purposes by the tribals of Senapati district belonging to 50 families. Photographs of some of the medicinal plants have been attached at the Plate - I,II,III,IV. Ethnobotanical data basing investigations into the tribal communities of Senapati district have been made by earlier worker with different perspectives. The study has revealed the utilization of 176 species of plants in ethnomedicine by the tribes of Senapati district, Manipur. The inventory in Lauraceae family of semi evergreen forest site of Manipur revealed the presence of 24 species⁷. Further investigations into the pharmacological importance of such plants and their diversity may add new knowledge to the information in the traditional medical and cultural system of Senapati district, Manipur.

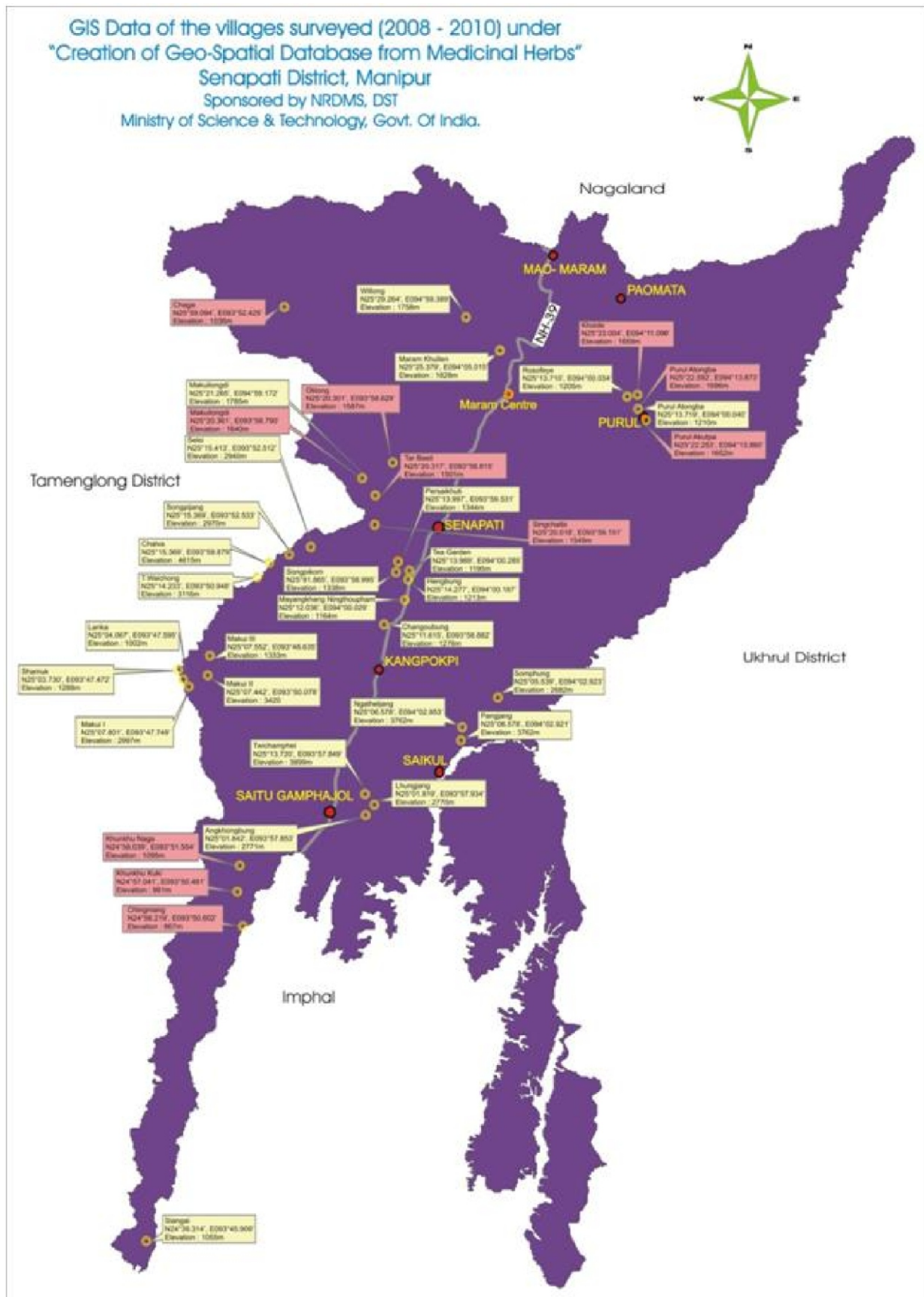


Fig. 1. GIS Data of Villages surveyed

Table 1. Geo spatial database of Medicinal plants of Senapati district

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
1.	<i>Acorus calamus</i> Linn.	Araceae	Okhidak (Manipuri) /Abakha (Maram)	Rhizome	Makui II, Willong	N 25°06.622' - N 25°07.442' E 093°49.742'-E 093°50.078' Elevation: 2867m – 3420m	Snake bite, epilepsy, bronchitis, hoarseness
2.	<i>Allium hookeri</i> Linn.	Liliaceae	Maroi napakpi (Manipuri)	Root, leaves	Changou-bung	N25°11.027' - N 25°11.615' E 093° 58.799'- E 093°58.882' Elevation: 1172m - 1278m	High blood pressure, stomach ulcer
3.	<i>Allium odorosum</i> Spring.	Liliaceae	Maroi nakuppi(Manipuri)	Root, leaves	Changou-bung	N25°11.027' - N 25°11.615'E 093°58.799'- E 093°58.882' Elevation: 1172m - 1278m	Improving hair growth
4.	<i>Alocasia indica</i> Schott.	Araceae	Hong-ngoo(Manipuri)	Tuber, leaves	Changou-bung	N25°11.027' - N 25°11.615'E 093°58.799'-E 093°58.882' Elevation: 1172m - 1278m	Laxative, diuretic, piles, constipation
5.	<i>Aloe barbadensis</i> Mill.	Liliaceae	Aloe vera (Manipuri)	Leaves	Willong	N 25°26.821' - N 25°29.264' E 093° 58.184'-E 094°59.389' Elevation: 1645m - 1758m	Cancer, burns, skin diseases
6.	<i>Amaranthus species</i>	Amaranthaceae	Chengkruk angangba(Mani.)Jat (Paomai)	Leaves, stem	Purul atongba	N 25°22.501' - N 25°22.592' E 094° 13.864'-E 094°13.873' Elevation 1685-1696m	Diabetes
7.	<i>Aphanamixis polystachya</i> (Wall.) Parker.	Meliaceae	Heirangkhoi (Manipuri)/ Majoungsibang (Liangmei)	Leaves	Makui I, Lanka, Makui III	N 25°07.733' - N 25°07.801' E 093°47.215' – E 3°47.749' Elevation: 2698m – 2997m, N 25°02.006'-N 25°04.067', E 093°45.723'-E 093°47.595' Elevation: 880m-1002m, N 25°07.552' E 093° 48.635' Elevation: 1333m	Malaria, fever
8.	<i>Arisaema tortuosum</i> Schoot.	Araceae	Lin cheisu (Manipuri)	Rhizome, leaves	Persaikuti, Songpikom, Makui III	N 25°13°997', E 093°59°531' Elevation: 1344m N 25° 91°865', E 093°58°995' Elevation: 1338 m N 25°07.552' E 093° 48.635' Elevation: 1333m	Snake bite, dropsy

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
9.	<i>Artemisia nilagirica</i> (CB Clarke) Pamp.	Asteraceae	Leibakngou (Manipuri)	Leaves	Teagarden, Mayangk-hang	N 25°13.944' - N 25°13.989' E 094°00.264' - E 94°00.285' Elevation: 1170m – 1195m, N 25°11.946' - N 25°12.036' E 093°59.978'-E 094°00.029' Elevation: 1154m - 1164m	Insect repellent, antiseptic
10.	<i>Asparagus racemosus</i> Willd.	Liliaceae	Nungarei (Manipur) / Hiiring (Maram)	Root	Willong	N 25°26.821' - N 25°29.264' E 093°58.184'-E 094°59.389' Elevation: 1645m - 1758m	Gastritis
11.	<i>Azadiracta indica</i> Juss.	Meliaceae	Neem (Manipur) / Ponsop (Thadou)	Leaves, fruit, bark	Saikul Lung-jang, T Waichong	N 25°01.306' - N 25°01.919' E 093°57.340'- E 093°57.934' Elevation: 2694m – 2770m, N 25°13.862'-N 25°14.233' E 093°50.382'-E 93°50.948' Elevation:2684m -3116m	Malaria, Pile case
12.	<i>Basella alba</i> Linn.	Basella-ceae	Urok sumban (Mani.)/Novu (Paomai)	Leaves	Purul akutpa	N 25°22.114' - N 25°22.253' E 094°13.848'-E 094°13.860' Elevation 1645-1652m	Lowering blood pressure
13.	<i>Bergenia ciliata</i> (Haw.) Sternb.	Saxifragaceae	Tatenpiu (Liangmai)	Root, leaves	Shamuk	N 25°01.147' - N 25°03.730' E 093°47.472'-E 093°47.860' Elevation: 1002m - 1288m	Blood cancer, stomach disorder, sinus etc.
14.	<i>Blumeopsis falcate</i> (D.Don) Merr.	Astera-ceae	Haochak (Manipuri)	Leaves	Persaikuti	N 25°13.997' E 093°59.531' Elevation: 1344m	Bronchial congestion, catarrh and cold
15.	<i>Botrychium ternatum</i> Sw.	Ophioglossaceae	Machiubang (Liangmai)	Leaves	Lanka	N 25°02.006'-N 25°04.067', E 093°45.723'-E 093°47.595' Elevation: 880m-1002m	Dysentery
16.	<i>Brucea javanica</i> Linn./ Merr.	Simarouba-ceae	Toiheng (Thadou) / Heining (Manipuri)	Leaves	T. Vaichong, Makui III	N 25°13.862'-N 25°14.233' E 093°50.382'-E 93°50.948' Elevation:2684m -3116m N 25°07.552' E 093°48.635' Elevation: 1333m	Night blindness
17.	<i>Bryophyllum pinnatum</i> Lam.	Crassulaceae	Meikahlou (Thodou) / Mirouhui (Zeme)	Leaves	Saikul-Lhungjang, Makuilongdi	N 25°01.306' - N 25°01.919' E 093°57.340'- E 093°57.934' Elevation: 2694m – 2770m N 25°20.185' - N 25°21.265' E 093°57.794'-E 94°59.172' Elevation: 1479m – 1785m	Used in the burn area
18.	<i>Cardamine hirsuta</i> Linn.	Brassicaceae	Uchi hangam (Manipuri) / Uichomngong(Thodou)	Leaves	Saikul-Ankhong-bu ng, Makuilongdi	N 25°01.432' - N 25°01.842' E 093°57.212'- E 093°57.853' Elevation: 2719m – 2771m N 25°20.185' - N 25°21.265' E 093°57.794'-E 94°59.172' Elevation: 1479m – 1785m	Dysentery, Jaundice

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
19.	<i>Centella asiatica</i> Linn. Urb	Apiaceae	Peruk (Manipuri)/ Kuaklei (Rongmei)	Whole plant	Songpikom	N 25° 91•865', E 093°58•995' Elevation: 1338 m	Tonic, diuretic, gastric & kidney problem
20.	<i>Cephalotaxus harringtonia</i>	Taxaceae	Uchan manbi (Manipuri)	Whole plant	Siangai	N 24°38.828' - N 24°39.314' E 093°45.243'- E 093°45.909' Elevation: 910m -1055m	Anti cancer
21.	<i>Cereus grandiflorus</i> Mill.	Cactaceae	Gildon (Thodou)	Leaves	Saikul-Lhungjang, Selsi	N 25°01.306' - N 25°01.919' E 093°57.340'- E 093°57.934' Elevation: 2694m – 2770m N 25°15.317' - N 25°15.413' E 093°52.426' - E 093°52.512' Elevation: 2937m -2940m	Cardiac stimulant, dropsy
22.	<i>Clerodendrum colebrookianum</i> Walp.	Verbina- ceae	Khutahap angouba (Manipuri)/Anphuii (Thadou)	Root,leaves, bark	Hengbung, Songpikom	N 25°14.075' - N 25°14.277' E 093°59.89' – E 094°00.187' Elevation: 1173-1213 m N 25° 91•865', E 093°58•995' Elevation: 1338 m	Lowers BP, asthma, cough
23.	<i>Coix lacryma-jobi</i>	Poaceae	Chang-ning (Manipuri) Ping pi (Thadou)	Leaf	Khunkhu kuki	N 24°57.020' - N 24°57.041' E 093°50.479' - E 093°50.481' Elevation 913-991m	Stone case
24.	<i>Costus speciosus</i> (K) Smith.	Zingiber- aceae	Khongban takhellei (Manipuri)	Rhizome	Hengbung	N 25°14.075' - N 25°14.277' E 093°59.89' – E 094°00.187' Elevation: 1173-1213 m	Expectorant, inflammations
25.	<i>Croton caudatus</i> Giesel.	Euphorbi- aceae	Yong khullokpi (Manipuri)/Manmathap (Liangmai)	Leaves	Makui I, Makui II, Lanka,	N 25°07.733' - N 25°07.801' E 093°47.215' – E 3°47.749' Elevation: 2698m – 2997m N 25°06.622'- N 25°07.442' E 093°49.742'-E 93°50.078' Elevation: 2867m – 3420m N 25°02.006'-N 25°04.067' E 093°45.723'-E 093°47.595' Elevation: 880m-1002m	Cancer, sinus, BP, piles
26.	<i>Cucumis sp.</i>	Cucurbi- taceae	Kelchangmai (Thodou)/Lam Thabi (Manipuri)	Whole plant	T. Waichong	N 25°13.862'-N 25°14.233' E 093°50.382'-E 93°50.948' Elevation:2684m -3116m	Jaundice, kidney infection, stone case
27.	<i>Curcuma augustifolia</i> Roxb.	Zingibe- raceae	Yaipan (Manipuri)	Rhizome	Hengbung	N 25°14.075' - N 25°14.277' E 093°59.89' – E 094°00.187' Elevation: 1173-1213 m	Invalids for children

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
28.	<i>Curcuma caesia</i> Roxb.	Zingiberaceae	Yaimu (Manipuri)/Chagakatikbo (Liangmai)	Rhizome	Hengbung, Siangai, Lanka	N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m N 24°38.828' - N 24°39.314' E 093°45.243' - E 093°45.909' Elevation: 910m -1055m N 25°02.006'-N 25°04.067', E 093°45.723'-E 093°47.595' Elevation: 880m-1002m	Cough, asthma, cuts & wounds
29.	<i>Curcuma leucorhiza</i> Roxb.	Zingiberaceae	Yaing angouba (Manipuri)	Rhizome	Hengbung, Siangai	N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m N 24°38.828' - N 24°39.314' E 093°45.243' - E 093°45.909' Elevation: 910m -1055m	Cough, asthma
30.	<i>Curcuma</i> sp.	Zingiberaceae	Yaingang angouba (Manipuri)	Rhizome	Siangai	N 24°38.828' - N 24°39.314' E 093°45.243' - E 093°45.909' Elevation: 910m -1055m	Hoarseness of vocal
31.	<i>Curcuma</i> sp.	Zingiberaceae	Ailaivom (Thadou)	Rhizome	Saikul	N 25°05.141' - N 25°05.539' E 094°02.363' - E 094°02.923' Elevation: 2676m - 2682m	Fever, cholera, chest pain and dizziness
32.	<i>Curcuma</i> sp.	Zingiberaceae	Blackginger (English)/Aivom (Thadou)	Rhizome	Saikul	N 25°01.306' - N 25°01.919' E 093°57.340' - E 093°57.934' Elevation: 2694m - 2770m	Dysentery
33.	<i>Cyperus rotundus</i>	Cyperaceae	Sembang-kouthum (Manipuri), Thip (Thadou)	Whole plant	Khunkhu Kuki	N 24°57.020' - N 24°57.041' E 093°50.479' - E 093°50.481' Elevation 913-991m	Kidney problem
34.	<i>Datura stramonium</i> Linn.	Solanaceae	Sagol hidak amuba (Manipuri)/Sumkon (Thadou)	Leaves	Selsi	N 25°15.317' - N 25°15.413' E 093°52.426' - E 093°52.512' Elevation: 2937m -2940m	Cuts & wounds, dizziness, muscles sprain
35.	<i>Dendrobium aphyllum</i>	Orchidaceae	Saheikungat (Thadou)	Pseudo bulbs	Willong	N 25°26.821' - N 25°29.264' E 093°58.184' - E 094°59.389' Elevation: 1645m - 1758m	Cooling and mucilaginous, stomach & lung cancer
36.	<i>Dicrocephala latifolia</i> DC.	Astera-ceae	Lallukok (Manipuri)	Whole plant	Changou-bung, Selsi	N25°11.027' - N 25°11.615' E 093°58.799'-E 093°58.882' Elevation: 1172m - 1278m N 25°15.317' - N 25°15.413' E 093°52.426' - E 093°52.512' Elevation: 2937m -2940m	Hair lotion for curing dandruff and falling hairs

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
37.	<i>Drymaria cordata</i> Willd	Caryophyllaceae	Tandon mana (Manipuri)	Whole plant	Changou-bung, Hengbung	N25°11.027' - N 25°11.615' E 093°58.799'-E 093°58.882' Elevation: 1172m - 1278m N 25°14.075' - N 25°14.277' E 093°59.89'-E 094°00.187' Elevation: 1173-1213 m	Dysentery, diarrhea, sinusitis
38.	<i>Elephantopus scaber</i> Linn.	Asteraceae	Shijakpui (Thadou)	Leaves	Changou-bung, Hengbung	- do -	Dysuia,haemorrhoids,skin disease
39.	<i>Equisetum sp.</i>	Equisetaceae	Lai utong (Manipuri)	Leaves	Tea garden	N 25°13.944' - N 25°13.989' E 094°00.264' - E 94°00.285' Elevation: 1170m - 1195m	Backache, arms and loins pains
40.	<i>Eupatorium nodiflorum</i> Wallich DC.	Asteraceae	Khongsaipu (Longmei)	Leaves, stem	Changou-bung,Tea garden	- do -	Gastritis, asthma, indigestion, cuts and wounds, bleeding
41.	<i>Eupatorium odoratum</i> Linn.	Asteraceae	Kambilei (Manipuri) / Longlen (Thadou)	Leaves, stem	Hengbung	N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m	Cuts and wounds
42.	<i>Ficus species</i>	Moraceae	Tat (Thadou)	Leaves	T. Waichong	N 25°13.862'-N 25°14.233' E 093°50.382'-E 93°50.948' Elevation:2684m -3116m	Dysentery, digestive disorder
43.	<i>Fragaria indica</i> Andr.	Rosaceae	Heirong-kak (Manipuri)	Whole plant	Changou-bung, Tea garden, Hengbung	N25°11.027' - N 25°11.615' E 093°58.799'- E 093°58.882' Elevation: 1172m - 1278m N 25°13.944' - N 25°13.989' E 094°00.264' - E 94°00.285' E N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m levation: 1170m - 1195m	Diabetes, rheumatic gouts, fever
44.	<i>Gnaphalium indicum</i> Linn.	Asteraceae	Phunil (Manipuri)	Whole plant	Changou-bung, Hengbung	N25°11.027' - N 25°11.615' E 093°58.799'- E 093°58.882' Elevation: 1172m - 1278m N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m	Gout, diuretic
45.	<i>Goniothalamus sesquipetalis</i> Hook.	Annonaceae	Leikham (Manipuri) / Makhen (Liangmei)	Whole plant	Lanka, Hengbung	N 25°02.006'-N 25°04.067', E 093°45.723'-E 093°47.595' Elevation: 880m-1002m N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m	Cough & urine problem
46.	<i>Gynura cusimba</i> (D.Don) Moore.	Asteraceae	Terapaibi (Manipuri)	Whole plant	Changou-bung	N25°11.027' - N 25°11.615' E 093°58.799'- E 093°58.882' Elevation: 1172m - 1278m	Coagulant, BP

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
47.	<i>Hedychium flavum</i> Roxb.	Zingiberaceae	Loklei (Manipuri)	Rhizome	Tea garden, Hengbung	N 25°13.944' - N 25°13.989' E 094°00.264' - E 94°00.285' Elevation: 1170m – 1195m N 25°14.075' - N 25°14.277' E 093°59.89' – E 094°00.187' Elevation: 1173-1213 m	Bronchitis, tonsillitis
48.	<i>Hedyotis auriculata</i> Linn.	Rubiaceae	Langban koukha (Manipuri)	Whole plant	Changou-bung, Hengbung	N25°11.027' - N 25°11.615' E 093°58.799' - E 093°58.882' Elevation: 1172m - 1278m N 25°14.075' - N 25°14.277' E 093°59.89' – E 094°00.187' Elevation: 1173-1213 m	Jaundice, wounds, diabetes
49.	<i>Hodgsonia macroptera</i> (Blume) Cong.	Curcubitaceae	Gammai (Thadou)/ Shiungshi (Liangmei) / Lam Mairen (Manipuri)	Leaves, fruit	T. Waichong, Lanka	N 25°13.862'-N 25°14.233' E 093°50.382'-E 93°50.948' Elevation:2684m -3116m N 25°02.006'-N 25°04.067', E 093°45.723'-E 093°47.595' Elevation: 880m-1002m	Pile case, bacterial infection
50.	<i>Holnskioldea sanguinea</i>	Verbenaceae	Mailangkok(Thadou)	Whole plant	T. Waichong	N 25°13.862'-N 25°14.233' E 093°50.382'-E 93°50.948' Elevation:2684m -3116m	Hernia
51.	<i>Houttuynia cordata</i> Thunb.	Saururaceae	Toningkok(Manipuri)	Root, leaves	Changou-bung, Hengbung	N25°11.027' - N 25°11.615' E 093°58.799' - E 093°58.882' Elevation: 1172m - 1278m N 25°14.075' - N 25°14.277' E 093°59.89' – E 094°00.187' Elevation: 1173-1213 m	Measles, gonorrhoea, skin troubles
52.	<i>Hydrocotyl sibthorpioides</i> Lam.	Apiaceae	Lai peruk (Manipuri)	Whole plant	Changou-bung, Tea garden, Makui III	N25°11.027' - N 25°11.615' E 093°58.799' - E 093°58.882' Elevation: 1172m - 1278m N 25°13.944' - N 25°13.989' E 094°00.264' - E 94°00.285' Elevation: 1170m – 1195m N 25°07.552',E 093°48.635' Elevation: 1333m	Rheumatism, pulmonary & digestive troubles
53.	<i>Kaempferia galanga</i> Linn.	Zingiberaceae	Yai thamnambanbi (Manipuri) / Galam (Rongmei)	Rhizome, leaves	Siangai	N 24°38.828' - N 24°39.314' E 093°45.243' - E 093°45.909' Elevation: 910m -1055m	Gastritis, tumours, swelling and wounds
54.	<i>Knoxia roxburghii</i> (Spreng.) M.A.Rau.	Rubiaceae	Meiteilembum(Mani.)/Nguh(Paomai)	Whole plant	Koide village	N 24°23.004',E 094°11.096' Elevation 1659m	Gastritis
55.	<i>Lantana camara</i> Linn.	Verbenaceae	Sambal lei (Mani.)/Siubie (Paomai)	Whole plant	Purul atongba	N 25°22.501' - N 25°22.592' E 094°13.864' - E 094°13.873' Elevation 1685-1696m	Digestive disorder

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
56.	<i>Leucas aspera</i> Spring.	Lamiaceae	Mayang Lenbum (Manipuri)	Whole plant	Changou-bung	N25°11.027' - N 25°11.615' E 093°58.799'- E 093°58.882' Elevation: 1172m - 1278m	Cough & cold, skin eruptions & painful swellings
57.	<i>Litsea species</i>	Lauraceae	Jourminao eh theh	Bark	Saikul Pangjang	N 25°05.163' - N 25°06.578' E 094°02.664'- E 094°02.921' Elevation: 2674m - 3762m	Diabetes
58.	<i>Lycopodium sp.</i>	Lycopodaceae	Leisang (Manipuri) / Pantamruan (Rongmei)	Leaves	Tea garden	N 25°13.944' - N 25°13.989' E 094°00.264' - E 94°00.285' Elevation: 1170m - 1195m	Caught, beri-beri
59.	<i>Magnolia grandiflora</i> Linn.	Magnoliaceae	Thingthambal (Thadou) / Uthambal (Manipuri)	Leaves	Changou-bung, Saikul Pangjang	N25°11.027' - N 25°11.615' E 093°58.799'- E 093°58.882' Elevation: 1172m - 1278m N 25°05.163' - N 25°06.578' E 094°02.664'- E 094°02.921' Elevation: 2674m - 3762m	Stone case
60.	<i>Melastoma malabathri-cum</i> Linn.	Melastomaceae	Kongbiu (Rongmei)/Yachubi (Manipuri)	Bark, leaves	Tea garden, Chagoubung	N 25°13.944' - N 25°13.989' E 094°00.264' - E 94°00.285' Elevation: 1170m - 1195m N25°11.027' - N 25°11.615' E 093°58.799'- E 093°58.882' Elevation: 1172m - 1278m	Diarrhoea, dysentery, leucorrhoea, cuts & wounds
61.	<i>Melothria purpusilla</i> Cogn.	Cucurbitaceae	Lamthabi (Manipuri)	Whole plant	T Waichong	N 25°13.862'-N 25°14.233' E 093°50.382'-E 93°50.948' Elevation:2684m -3116m	Jaundice
62.	<i>Mentha arvensis</i> Linn.	Lamiaceae	Nungshihidak (Manipuri)/ Tapa (Maram)	Whole plant	Saikul-Lhungjang, Willong	N 25°01.306' - N 25°01.919' E 093°57.340'- E 093°57.934' Elevation: 2694m - 2770m N 25°26.821' - N 25°29.264' E 093°58.184'-E 094°59.389' Elevation: 1645m - 1758m	Gastric problem
63.	<i>Meriandra strobilifera</i> Benth.	Lamiaceae	Kanghuman (Manipuri)	Leaves, stem	Tea garden, Changou-bung	N 25°13.944' - N 25°13.989' E 094°00.264' - E 94°00.285' Elevation: 1170m - 1195m N25°11.027' - N 25°11.615' E 093°58.799'- E 093°58.882' Elevation: 1172m - 1278m	Ulcers, antiseptic
64.	<i>Mimosa pudica</i> Linn.	Mimosaceae	Kangphal ekaithabi (Manipuri)	Whole plant	Changou-bung, Hengbung	N25°11.027' - N 25°11.615' E 093°58.799'- E 093°58.882' Elevation: 1172m - 1278m N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m	Piles, jaundice, angioneuetic oedema

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
65.	<i>Musa paradisiaca</i> Linn.	Musaceae	Lam laphu(Manipuri)	Stem	Makuilongdi	N 25°20.185' - N 25°21.265' E 093°57.794'-E 94°59.172' Elevation: 1479m – 1785m	Dysentery
66.	<i>Mussaenda roxburghii</i> Hook.	Rubiaceae	Hanurei (Mani.)/Baibehponkhon (Thadou)	Root, leaves	T.Waichong	N 25°13.862'-N 25°14.233' E 093°50.382'-E 93°50.948' Elevation:2684m -3116m	Paralysis
67.	<i>Nicotiana plumbaginifolia</i> Viv.	Solanaceae	Lamgi hidak mana(Mani.)/Khoupao(Paomai)	Leaves	Purul atongba	N 25°22.501' - N 25°22.592' E 094°13.864' - E 094°13.873' Elevation 1685-1696m	Animals wound, pain relief
68.	<i>Paederia foetida</i> Linn.	Rubiaceae	Chabipuriang (Liangmei) / Oinam (Manipuri)	Leaves, root	Makui II	N 25°06.622'- N 25°07.442' E 093°49.742'-E 93°50.078' Elevation: 2867m – 3420m	Bone fracture
69.	<i>Papaver somniferum</i> Linn.	Papaveraceae	Poppy plant(English) / Kani (Thadou)	Leaves, fruits	Saikul	N 25°05.141' - N 25°05.539' E 094°02.363'- E 094°02.923' Elevation: 2676m – 2682m	Dysentery, pile case
70.	<i>Paris polyphylla</i> Smith	Liliaceae	Singpan (Manipuri)	Rhizome	Hengbung, Maram khullen, Makui II	N 25°14.075' - N 25°14.277' E 093°59.89' – E 094°00.187' Elevation: 1173-1213 m N 25°25•379', E 094°05•015' Elevation: 1828m N 25°06.622'- N 25°07.442' E 093°49.742'-E 93°50.078' Elevation: 2867m – 3420m	Cancer,
71.	<i>Phlogacanthus jenkinsii</i> C.B. Clark	Acanthaceae	Nongmangkha asinba(Manipuri)	Leaves	Hengbung	N 25°14.075' - N 25°14.277' E 093°59.89' – E 094°00.187' Elevation: 1173-1213 m	Fever
72.	<i>Phyllanthus niruri</i> Hook. f., non Linn.	Euphorbiaceae	Chakpa heikru (Manipuri)	Whole plant	Changou-bung, Hengbung	N25°11.027' - N 25°11.615' E 093°58.799'-E 093°58.882' Elevation: 1172m - 1278m N 25°14.075' - N 25°14.277' E 093°59.89' – E 094°00.187' Elevation: 1173-1213 m	Leucoderma, stomach ache, jaundice
73.	<i>Piper sylvaticum</i> Roxb.	Piperaceae	Nathah (Thadou)/ Uchithi (Manipuri)	Fruit	Mayang-khang	N 25°11.946' - N 25°12.036' E 093°59.978'-E 094°00.029' Elevation: 1154m - 1164m	Cough & cold, essential oils
74.	<i>Plantago erosa</i> Wall.	Plantaginaceae	Yempat(Manipuri)	Leaves	Mayang-khang , Purul Atongba	N 25°11.946' - N 25°12.036' E 093°59.978'-E 094°00.029' Elevation: 1154m - 1164m N 25°22.501' - N 25°22.592' E 094°13.864'-E 094°13.873' Elevation 1685-1696m	Boil

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
75.	<i>Plumbago zeylanica</i> Linn.	Plumbaginaceae	Tel hidak angouba (Manipuri)	Seed	Hengbung	N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m	Muscular pain, digestion
76.	<i>Pogostemon parviflorus</i> Benth.	Lamiaceae	Sangkurai (Liangmai) / Sangbrei (Manipuri)	Root, leaves	Makuilongdi	N 25°20.361' E 093°58.790' Elevation 1640m	Dog bite
77.	<i>Polygonum perfoliatum</i> Linn.	Polygonaceae	Lilhar (Manipuri)	Whole plant	Mayang-khang	N 25°11.946' - N 25°12.036' E 093°59.978' - E 094°00.029' Elevation: 1154m - 1164m	Poultice on tumours
78.	<i>Potentilla anserina</i> Linn.	Apiaceae	Nungai peruk (Manipuri)	Whole plant	Mayang-khang, Hengbung	N 25°11.946' - N 25°12.036' E 093°59.978' - E 094°00.029' Elevation: 1154m - 1164m N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m	Stone case
79.	<i>Pratia nummularia</i> Kruz.	Lobeliaceae	Kihomman (Manipuri)	Whole plant	Mayang-khang, Hengbung	-do -	Stone case, blood coagulation
80.	<i>Raphidophora lacianata</i> (Burm. f.) Merr.	Araceae	Shingbangnui (Liangmei)	Whole plant	Lanka	N 25°02.006'-N 25°04.067', E 093°45.723'-E 093°47.595' Elevation: 880m-1002m	Bronchitis
81.	<i>Rauvolfia serpentina</i> Linn.	Apocynaceae	Rauvolfia(Manipuri)	Root, bark	Siangai	N 24°38.828' - N 24°39.314' E 093°45.243' - E 093°45.909' Elevation: 910m -1055m	Malaria, stomach troubles
82.	<i>Ricinus communis</i> Linn.	Euphorbiaceae	Kege(Manipuri) / Karabang(Maram)	Leaves, fruit	Mayang-khang, Willong	N 25°11.946' - N 25°12.036' E 093°59.978' - E 094°00.029' Elevation: 1154m - 1164m N 25°26.821' - N 25°29.264' E 093°58.184'-E 094°59.389' Elevation: 1645m - 1758m	Piles, gout, body pain
83.	<i>Rotenla rotundifolia</i> Roxb. Koehne	Lythraceae	Labook leiri(Manipuri)	Whole plant	Tea garden	N 25°13.944' - N 25°13.989' E 094°00.264' - E 94°00.285' Elevation: 1170m - 1195m	Urinary troubles
84.	<i>Rorippa duifia</i> Hara.	Brassicaceae	Uchihangam (Manipuri)/ Taja njiang (Liangmai)	Leaves	Chalva, Shamuk	N 25°13.547' - N 25°15.369' E 093°50.974' - E 093°59.879' Elevation: 2673m - 4615m N 25°01.147' - N 25°03.730' E 093°47.472'-E 093°47.860' Elevation: 1002m - 1288m	Jaundice
85.	<i>Rubus ellipticus</i> Smith.	Rosaceae	Heijampet (Manipuri)	Leaves	Makuilongdi	N 25°20.361' E 093°58.790' Elevation 1640m	Colic pains
86.	<i>Rubus lasiocarpus</i> Smith.	Rosaceae	Heijampet (Manipuri)	Leaves	Hengbung	N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m	Colic pains

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
87.	<i>Rubus niveus</i> Thunb.	Rosaceae	Heijampet(Manipuri) / Tanai(Zeme)	Leaves	Persaikuti, songpikom, Mayang-khang	N 25°13•997', E 093°59•531' Elevation: 1344m; N 25° 91•865', E 093°58•995' Elevation: 1338 m ; N 25°11.946' - N 25°12.036' E 093°59.978'-E 094°00.029' Elevation: 1154m - 1164m	Dysentery, piles, kwarshiorkar
88.	<i>Saccarum officinarum</i> Linn.	Graminae	Chu angouba(Manipuri)	Stem	Oklong	N 25°20.301' E 093°58.629' Elevation: 1587m	Liver problem, jaundice
89	<i>Scutellaria discolor</i> Coledr.	Lamiaceae	Yenakhati(Manipuri)	Leaves	Mayang-khang, Saikul ankhong-bung	N 25°11.946' - N 25°12.036' E 093°59.978'-E 094°00.029' Elevation: 1154m - 1164m N 25°01.432' - N 25°01.842 ' E 093°57.212'- E 093°57.853' Elevation: 2719m – 2771m	Wounds, rheumatism
90.	<i>Sida cordata</i> (Burm. f.) Boiss.	Malvaceae	Manchep (Thodou)	Leaves	Songpikom, Saikul-Twicham-ph ei, Saikul ankhong-bung,	N 25° 91•865', E 093°58•995' Elevation: 1338 m; N 25°02.176' - N 25°13.720' E 093°57.578'- E 093°57.849' Elevation: 2731m – 3899m; N 25°01.432' - N 25°01.842 ' E 093°57.212'- E 093°57.853' Elevation: 2719m – 2771m	Leucorrhoea, gonorrhoea, burning sensation.
91.	<i>Siegesbeckia orientalis</i> Linn.	Asteraceae	Tingna(Rongmei)/ Hameng sampakpi(Manipuri)	Leaves	Mayangkhang, Maram khullen, Songpikom, Persaikuti, Purul Atongba,	N 25°11.946' - N 25°12.036' E 093°59.978'-E 094°00.029' Elevation: 1154m - 1164m N 25°25•379', E 094°05•015' Elevation: 1828m N 25° 91•865', E 093°58•995' Elevation: 1338 m N 25°13•997', E 093°59•531' Elevation: 1344m N 25°22.501' - N 25°22.592' E 094°13.864'-E 094°13.873' Elevation 1685-1696m	Diarrhoea, tonic, ulcers, skin sores
92.	<i>Smilax ovalifolia</i> . Roxb.	Liliaceae	Kwamana manbi (Manipuri)	Root	Hengbung, Changou-bung	N 25°14.075' - N 25°14.277' E 093°59.89' – E 094°00.187' Elevation: 1173-1213 m N25°11.027' - N 25°11.615' E 093°58.799'-E 093°58.882' Elevation: 1172m - 1278m	Scabies

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
93.	<i>Solanum indicum</i> Linn.	Solana- ceae	Leipungkhangga achouba (Manipuri)	Leaves, fruit	Changou-bung , Hengbung	-do -	Tooth ache, asthma, nasal ulcers
94.	<i>Solanum nigrum</i> Linn.	Solana- ceae	Leipungkhangga amuba (Manipuri)	Whole plant	Changou-bung, Makui I, Mayang-khang,	N25°11.027' - N 25°11.615' E 093°58.799'-E 093°58.882' Elevation: 1172m - 1278m N 25°07.733' - N 25°07.801' E 093°47.215' - E 3°47.749' Elevation: 2698m - 2997m N 25°11.946' - N 25°12.036' E 093°59.978'-E 094°00.029' Elevation: 1154m - 1164m	Skin disease, stomach ache, piles.
95.	<i>Spilanthes acmella</i> .	Astera- ceae	Manujeng(Thadou)	Leaves, flower	Mayang-khang, Purul atongba	N 25°11.946' - N 25°12.036' E 093°59.978'-E 094°00.029' Elevation: 1154m - 1164m N 25°22.501' - N 25°22.592' E 094°13.864'-E 094°13.873' Elevation 1685-1696m	Tooth ache, dysentery, paralysis of tongue
96.	<i>Stemona tuberosa</i> Lour.	Stemon- aceae	Mariubi (Liangmai)	Rhizome	Lanka	N 25°02.006'-N 25°04.067', E 093°45.723'-E 093°47.595' Elevation: 880m-1002m	Scabies, asthma, cough, diabetes, gout, malaria, rheumatism etc.
97.	<i>Stevia rebaudiana</i> Bertoni	Asteraceae	Stevia	Leaves	Hengbung	N 25°14.075' - N 25°14.277' E 093°59.89'-E 094°00.187' Elevation: 1173-1213 m	Diabetes
98.	<i>Tacca chantrieri</i>	Taccaceae	Aikha (Thadou)/Sekpilei (Manipuri)	Rhizome, leaves	Saikul Somphung	N 25°05.141' - N 25°05.539' E 094°02.363'- E 094°02.923' Elevation: 2676m - 2682m	Dysentery,rheumatism
99.	<i>Taxillus lonicericifolius</i> (Hayata) Chiu	Loranth- aceae	Khoinei (Thadou)	Fruit	Hengbung	N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m	Bone fracture, stomach disorder
100.	<i>Taxus baccata</i> Linn.	Taxaceae	Uchan manbi(Manipuri)/Thing kang (Thadou)	Bark, fruit, leaves	T.Waichong	N 25°13.862'-N 25°14.233' E 093°50.382'-E 93°50.948' Elevation:2684m -3116m	Murine leucoderma, lung, breast and ovarian cancer
101.	<i>Thalictrum foliolosum</i> DC.	Ranuncul- aceae	Rachuma(Maram)	Root	Rosofeye, Shamuk, Makui-I	N 25°13.710', E 094°00.034' Elevation: 1205 m; N 25°01.147' - N 25°03.730' E 093°47.472'-E 093°47.860' Elevation: 1002m - 1288m N 25°07.733' - N 25°07.801' E 093°47.215' - E 3°47.749' Elevation: 2698m - 2997m	Malaria
102.	<i>Tinospora cordifolia</i> Willd.	Minisperm- aceae	Ningthou-khong-lee (Manipuri)	Stem, leaves	Hengbung	N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m	Muscular sprain, menstrual disorder, cough

Sl. No	Scientific Name	Family	Local Name	Parts used	Locality	Satellite location range	Medicinal Uses
103.	<i>Verbena officinalis</i> Linn.	Verbenaceae	Tharoi phijup (Mani.)	Whole plant	Koide village	N 24°23.004' E 094°11.096' Elevation 1659m	Fever, body ache
104.	<i>Vitex negundo</i> Linn.	Verbenaceae	Khiubang (Maram)	Leaves	Willong	N 25°56.094' - N 25°56.934' E 093°52.304'-E 094°59.425' Elevation: 999m - 1036m	Fever, body pain, wounds & ulcer
105.	<i>Xanthium strumarium</i> Linn.	Asteraceae	Hamengsampakpi(Manipuri)	Leaves	Mayang-khang, Chalva, Khunkhu Naga	N 25°11.946' - N 25°12.036' E 093°59.978'-E 094°00.029' Elevation: 1154m - 1164m N 25°13.547' - N 25°15.369' E 093°50.974'- E 093°59.879' Elevation: 2673m - 4615m N 24°57.741' - N 24°58.039' E 093°51.268'-E 093°51.554' Elevation 983-1095m	Small pox, cough, fever,stone case
106.	<i>Zanthoxylum acanthopodium</i> DC.	Rutaceae	Mukthubi tingkhang panbi	Leaves	Hengbung	N 25°14.075' - N 25°14.277' E 093°59.89' - E 094°00.187' Elevation: 1173-1213 m	Fever, cough, bronchitis, Rheumatism
107.	<i>Zingiber sp</i>	Zingiberaceae	Kanbiu (Liangmei)	Rhizome	Lanka	N 25°02.006'-N 25°04.067', E 093°45.723'-E 093°47.595' Elevation: 880m-1002m	Digestive disorders
108.	<i>Zingiber sp.</i>	Zingiberaceae	Gamthing (Thadou)/ Lamshing (Manipuri)	Rhizome	T. Waichong, Saingai.	N 25°13.862'-N 25°14.233' E 093°50.382'-E 93°50.948' Elevation:2684m -3116m N 24°38.828' - N 24°39.314' E 093°45.243'- E 093°45.909' Elevation: 910m -1055m	Fever, stomach ache
109.	<i>Zingiber sp.</i>	Zingiberaceae	Chagaimaigaa (Liangmai)	Rhizome	Siangai	N 24°38.828' - N 24°39.314' E 093°45.243'- E 093°45.909' Elevation: 910m -1055m	Haemorrhage, abortion
110.	<i>Zingiber sp.</i>	Zingiberaceae	Gadai (Liangmei)	Rhizome	Siangai	N 24°38.828' - N 24°39.314' E 093°45.243'- E 093°45.909' Elevation: 910m -1055m	Sore throat, dry cough
111.	<i>Zingiber sp.</i>	Zingiberaceae	Madang (Maram)	Rhizome	Willong	N 25°26.821' - N 25°29.264' E 093°58.184'-E 094°59.389' Elevation: 1645m - 1758m	Sore throat, dry cough

PLATE - I



Fig. 1 *Paris polyphylla*



Fig. 2 *Croton caudatus*

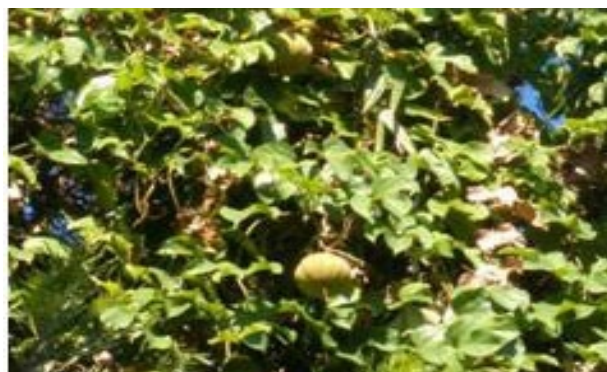


Fig. 3 *Hodgsonia macrocarpa*



Fig. 4 *Pratia nummularia*



Fig. 5 *Potentilla anserina*



Fig. 6 *Clerodendrum colebrookianum*



Fig. 7 *Acorus calamus*



Fig. 8 *Piper sylvaticum*

PLATE – II



Fig. 9 *Rauvolfia serpentina*



Fig. 10. *Bergenia ciliata*



Fig. 11 *Tacca chantrieri*



Fig. 12 *Dendrobium aphyllum*



Fig. 13 *Tinospora cordifolia*



Fig. 14 *Kaemferia galangal*



Fig. 15 *Drymaria cordata*

PLATE – III



Fig. 16 *Paederia foetida*



Fig. 17 *Taxus baccata*



Fig. 18 *Cucumis sp.*



Fig.19 *Thalictrum foliolosum*



Fig. 20 *Hydrocotyl sibthorpiodes*



Fig. 21 *Smilax ovalifolia*



Fig. 22 *Asparagus racemosus*



Fig. 23 *Houlttuynia cordata*

PLATE – IV



Fig. 24 *Solanum nigrum*



Fig. 25 *Solanum indicum*



Fig. 26 *Polygonium perfoliatum*



Fig. 27 *Spilanthes acmella*



Fig. 28 *Hedychium spicatum*



Fig. 29 *Curcuma longa*



Fig. 30 *Curcuma caesia*



Fig. 31 *Zingiber species*

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