

IMPORTANCE OF TRADITIONAL HEALING SYSTEM OF ADIS AND ITS POTENTIAL

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Abstract:

The study was carried out to document the information on utilization and economic importance of ethnomedicinal plants used by Adi community of East Siang district, Arunachal Pradesh. A total of 102 plant species of 49 families and 84 genus have been recorded from the surveyed areas. Family Asteraceae is the most dominant family among 49 families representing with 10 species followed by Zingiberaceae, Lamiaceae, Euphorbiaceae and Rutaceae. The present work is based on the field survey and personal interviews of local people, aged 30-80 years of both the sexes, using standard questionnaires. Extensive surveys at the household level and market survey were also conducted. The tribal community uses these plant materials against various health problems like cut and wound, skin disease, fever, dysentery, urinary problem, bone fracture, stomach disorder etc. An effort has also been made to give a better concept about the role of medicinal plants on socio-economic development of the tribal community.

Key words: Ethnomedicine, Adi tribe, East Siang, Arunachal Pradesh.

Introduction: Medicinal plants are being used by the tribal communities of India since early days. In India, above 6000 plant species are known for medical uses in traditional folk and herbal medicine (Rajshekharam 2002). The World Health Organization (WHO) estimated that 80% of the population of developing countries predominantly relies on traditional medicines (WHO, 2002-2005). The maximum numbers of medicinal plants are being used in traditional systems (Prakash et al., 2008). The tribal communities of Arunachal Pradesh have a vast knowledge on traditional medicine and they have been using different plant parts for uplift of various diseases method of treatment. Medicinal plants also act as alternative source of economic uplift of underprivileged communities. Cultivation of important medicinal plants will provide more support to this upgrading process.

Adi is a Mongoloid racial community originated with the Tibeto-Burmese linguist genealogy (Pandey and Tripathy 1997, Ali and Ghosh 2006). Literally,

Adi means "hill" or "mountain top". It is second largest tribal group of Arunachal Pradesh with a number of sub-tribes (i. e. Padams, Minyongs, Boris, Bokars, Ramos, Pailibos, Shimongs and Milangs). They mostly inhabit Upper Siang, West Siang, East Siang, Upper Subansiri and Dibang Valley. The Adi tribe is unique in their tradition, religious right and food habit within their jurisdiction (Bhuyan 1999, Burkill 1924, Chandra 1989, Pal 1994, Sharma & Borthakur (2008). Traditionally follow Donyi-Polo, although a sizeable minority has converted to Christianity. Apart from their common practices like hunting, gathering, fishing and utilization of forest resources, the Adis practice shifting cultivation or Jhum in the Indology. But in this process of Jhum cultivation, the ecosystem of that particular area being destroyed by cutting, slashing and burning of invaluable forest resources and later it may leads to a severity by courting the extinction of different species of flora and fauna with much economic importance. The forest resources have also been hampered due to high demand with the increasing in

human needs, which are being over-exploited (Ali and Ghosh, 2006). The Adi community has well organized traditional village council called Kembang and it takes special interest in conservation of forest resources and bio-diversity (Raj, 2010).

Although, availability of a large quantity of medicinal plants with high demand, the importance of ethnomedicinal studies in Adi tribe did not received much attention. However, a few reports are available; but it is not too enough for sharing good ethnomedicinal knowledge among the Adi tribes (Nimasov *et al.* 2012). Therefore, an attempt has been made to conserve and document this vanishing knowledge on traditional medicine of Adi tribes and trying to give a flash about the conservation status of these medicinal plants used by the Adi community of Arunachal Pradesh.

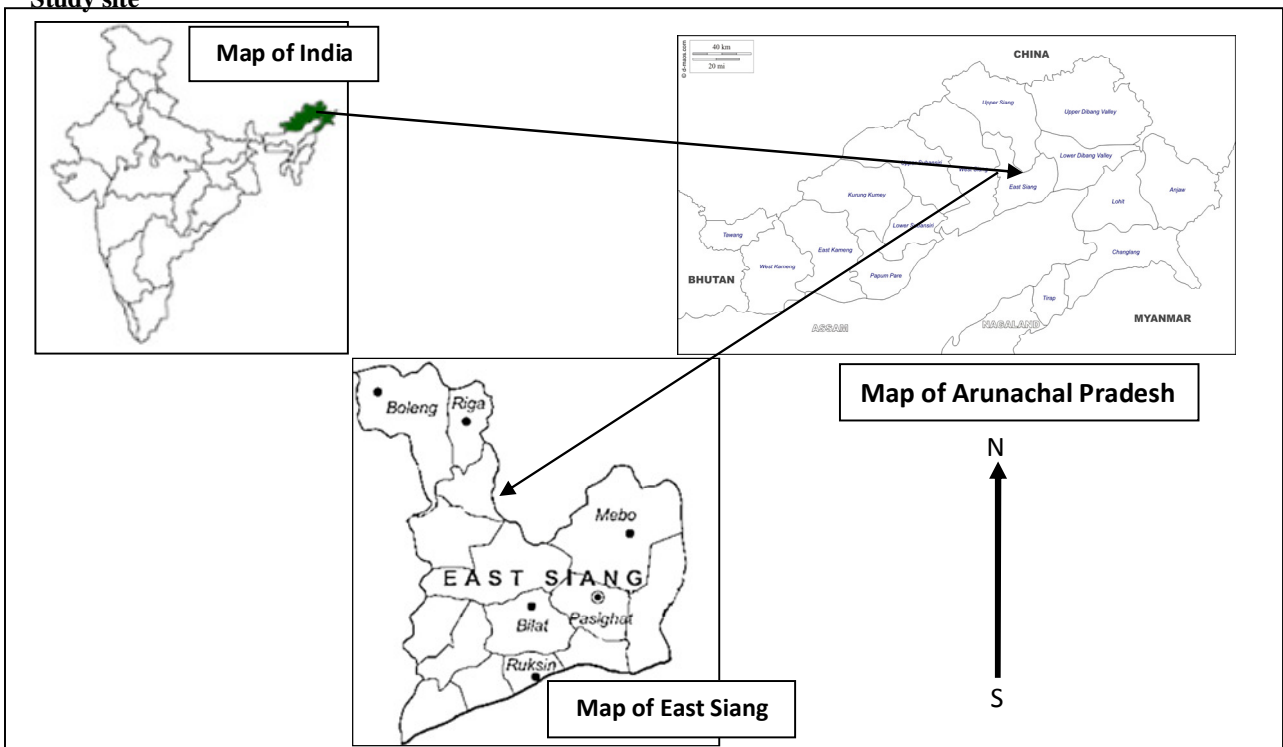
Materials and methods:

The present study was conducted in East Siang district, Arunachal Pradesh, often called as the "gateway to Arunachal Pradesh". The study site East Siang district is bounded by Upper Siang in the North, Dhemaji district of Assam is in the South, Dibang Valley is situated in the East corner and West Siang district in the West. The East Siang district

covers 4004 sq. km geographical areas of the state with undulating topography. Among the various tribal communities, Adi is the most dominant in the district. The climate falls under humid sub-tropical with wet summer and winter, with some other parts fall under tropical conditions. The average temperature is 18-28°C respectively and average annual rainfall is about 4400 mm. The soil condition is rocky sandy loam with pH ranges from 5.0-6.5 and the climatic condition is suitable for cultivation of crops for both summer and winter seasons.

The present work has been accomplished by field survey and personal interviews of local people, aged 30-80 years of both the sexes, using standard questionnaires. The survey was conducted during the year 2013-2015. Extensive surveys at the household level and market survey were also conducted in 6 tehsils of East Siang District such as Pasighat, Bilat, Ruksin, Riga, Boleng and Mebo. A total of 300 individuals were interviewed and consulted with randomly selecting 180 households. The standard questionnaire was used to collect information on wild and cultivated medicinal plants and their pattern of uses. The collected plant species were identified by consulting herbarium, regional floras and published literatures.

Study site



Results:

The present study lights on 102 plant species with 49 families and 84 genus as ethnomedicinal plants used by the Adi community of East Siang district. Among 49 families, Asteraceae is the most dominant family having 10 species followed by Zingiberaceae, Lamiaceae, Euphorbiaceae and Rutaceae. Both wild and cultivated plant species are used in the preparation of medicine where a part of the medicinal plants are being cultivated and are maintaining plants in home gardens and other suitable sites also. The people collect required plant materials (e.g. fruit, flower, twigs etc.) either from forest or from the cultivated areas and some of these were sold in nearby market. They used these plant species for various health problems like cut & wound, skin disease, fever, dysentery, urinary problem, bone fracture, stomach disorder etc. This traditional treatment system supports and maintains their cultures. All the recorded species are presented alphabetically giving the scientific name, local name, family and uses in the Table 1.

On recent days, India became a part of international market which deals with medicinal plants for pharmaceutical uses. Various medicinal institution/organization like Ayurvedic Medicine Manufacturers Organisation of India, Kerala; Indian Medicines Pharmaceutical Corporation Ltd. (IMPCL), Uttarakhand etc. have demanded about 500 medicinal plant species and National Medicinal Plants Board (NMPB) has received requirement of different plant parts from these organizations (NMPB, 2014). As per as information published from FRLHT and NMPB (2008), about 960 medicinal plant species are traded in India (Ved & Goraya 2007). A part of these required medicinal plants from different Ayurvedic Medicine Manufacturers Organisations and various medicinal institutes are available in East Siang district which can be used for upliftment of the economic status of the local communities. A list of highly traded medicinal plant species that are available in East Siang district of Arunachal Pradesh are documented below (List 1).

List 1: List of available medicinal plant species of East Siang district that are highly traded/required/demanded from various medicine manufacture institutes from India:

Ageratum conyzoides, *Alpinia galanga*, *Ricinus communis*, *Piper nigrum*, *Curcuma longa*, *Zingiber officinale*, *Amaranthus spinosus*, *Citrus limon*, *Tamarindus indica*, *Solanum nigrum*, *Terminalia bellirica*, *Terminalia chebula*, *Tinospora sinensis*.

(Source: www.nmpb.nic.in/..../links/4811533290178_high_traded_species.doc)

Discussion: Cultivation and marketing of medicinal plants is a good scope for better economic development. The people of East Siang district is provided with a huge portion of wasteland area of natural vegetation which can be used for the preparation of herbal medicines by involving educated persons in association with the drug manufacturing firms. The people having a large portion of cultivated land or wasteland can practice cultivation of medicinal plants along with other food crops to get dual benefit and it will reduce the pressure on wild population. Special importance should be given for the cultivation important species like *Acorus calamus*, *Alocasia acuminata*,

Alpinia galanga, *Amomum subulatum*, *Centella asiatica*, *Carica papaya*, *Centella asiatica*, *Cheilocostus speciosus*, *Citrus limon*, *Citrus medica*, *Clerodendrum glandulosum*, *Curcuma caesia*, *Curcuma longa*, *Dioscorea pentaphylla*, *Eryngium foetidum*, *Garcinia pedunculata*, *Houttuynia cordata*, *Litsea cubeba*, *Mentha arvensis*, *Paederia foetida*, *Piper mullesua*, *Piper sylvaticum*, *Solanum nigrum*, *Solanum torvum*, *Tamarindus indica*, *Terminalia belerica*, *T. chebula*, *Tinospora sinensis* and some other valuable medicinal plants. Some medicinal plants are used as spices and condiments with highly demand in market. But production of these medicinal plants is too low because of its

negligible cultivation. Although, some reports are available on medicinal plant cultivation in some hilly areas of East Siang District. The District Horticulture Department & North Eastern Institute of Folk Medicine, Pasighat, East Siang District, has undertaken some initiative step of cultivation and management of medicinal plants. Some NGOs are also involved in cultivation and sharing of knowledge to the villagers on medicinal plant cultivation and its positive role on socio-economic development (Ali & Ghosh, 2006). But it is not sufficient to establish a good economic position

for the whole community. The traditional treatments system of Adi community has much value in social life and culture till now and marketing demand of lots of species supports a better economic condition of the community in future. But the community is lack of knowledge on proper cultivation, management and utilization of medicinal plants. The government, NGOs and other organizations should conduct sufficient training programme on cultivation and management of medicinal plants for a bright economy of the community.

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Table 1: Ethnomedicinal plant species found in East Siang district, Arunachal Pradesh

Sl. No.	Scientific name	Local name	Family	Uses
1.	<i>Abroma augusta</i> (L.) L.f.	Yadukh	Malvaceae	Decoction of bark is used for dysentery and vomiting. Root is used in urinary problem.
2.	<i>Acmella paniculata</i> (Wall. ex DC.) R.K. Jansen	Marshang	Asteraceae	Decoction of the herb is given in scabies and psoriasis. Aerial part of the plant is cooked and eaten in dysentery and also used as tooth-ache.
3.	<i>Acorus calamus</i> L.	Buch	Acoraceae	Rhizome is used for remittent fever, colic and snake bite.
4.	<i>Ageratum conyzoides</i> (L.) L.	Yabum/ Marsangsny	Asteraceae	The juice of the leaf is used in cut injuries to prevent bleeding.
5.	<i>Alocasia acuminata</i> Schott	Enge	Araceae	Leaves are used in the treatment of scorpion sting and cut injuries.
6.	<i>Alpinia galanga</i> (L.) Willd.	Greater galangal	Zingiberaceae	Rhizome is used as disinfectant, bronchodilator and anti-inflammatory agent and for treating asthma, bronchitis, hiccup, obesity and diabetes.
7.	<i>Alpinia malaccensis</i> (Burm.f.) Roscoe	Puprere	Zingiberaceae	The rhizome is used for stomach disorder.
8.	<i>Amaranthus spinosus</i> L.	Gobrai	Amaranthaceae	The whole plant is antidote in snake bite. Roots used for gonorrhoea and menorrhagia.
9.	<i>Amomum subulatum</i> Roxb.	Tage	Zingiberaceae	Seed powder is taken in high blood pressure. Seeds are stomachic, useful in neuralgia.
10.	<i>Aristolochia indica</i> L.	Hinger	Aristolochiaceae	Whole plant grinds and consumed for skin disease.
11.	<i>Artemisia indica</i> Willd.	Laglin	Asteraceae	Leaf boiled and steam inhaled for sinus problem.
12.	<i>Artocarpus heterophyllus</i> Lam.	Bellang	Moraceae	The root is a remedy for skin diseases and asthma.
13.	<i>Bauhinia variegata</i> L.	Pacham	Caesalpinaceae	Infusion of bark is taken in leucorrhoea. The bark is astringent and anthelmintic.
14.	<i>Bischofia javanica</i> Blume	Sitil/takkir	Euphorbiaceae	The crushed leaves are rubbed into an aching stomach.
15.	<i>Blumea balsamifera</i> (L.) DC.	Tangloti	Asteraceae	Leaves are used as herbal treatment for fevers.

16. <i>Blumea fistulosa</i> (Roxb.) Kurz	Rumbdum	Asteraceae	Used in Diarrhea
17. <i>Bryophyllum pinnatum</i> (Lam.) Oken	Nebinelum	Crassulaceae	Hot infusion of leaves is taken twice a day as antidysentric.
18. <i>Calamus rotang</i> L.	Tara	Arecaceae	Shoots are taken as anthelmintic.
19. <i>Callicarpa arborea</i> Roxb.	Yahorin	Verbenaceae	Bark is used for skin disease. Leaf juice is used to cure fever, giddiness and headache.
20. <i>Carica papaya</i> L.	Omita	Caricaceae	Fruit is used in gastric problem.
21. <i>Cascabela thevetia</i> (L.) Lippold	Hinj	Apocynaceae	Milky juice and seeds are highly poisonous.
22. <i>Centella asiatica</i> (L.) Urb.	Ankiyum/kidukiru/kipam	Apiaceae	Whole plant is used in stomach problem, leaves are used against dysentery.
23. <i>Cheilocostus speciosus</i> (J.Koenig) C.D. Specht	Siyyungiibar	Costaceae	Stem juice is used in jaundice and kidney stone.
24. <i>Chenopodium album</i> L.	Taye	Chenopodiaceae	Leaves are eaten in stomach pain. Leaves are antiscorbutic.
25. <i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.	Telimbabo	Asteraceae	The leaf juice is applied in fresh cuts to stop bleeding and to relief pain.
26. <i>Citrus limon</i> (L.) Osbeck	Jipin	Rutaceae	Fruit are used for stomachic and carminative. Fruit juice is used in scurvy.
27. <i>Citrus medica</i> L.	Jipin	Rutaceae	Fruit are stomachic and carminative. Preserve rind is used in dysentery.
28. <i>Clerodendrum glandulosum</i> Lindl.	Owin/tapen	Lamiaceae	Leaves are boiled and eaten to cure high blood pressure.
29. <i>Croton caudatus</i> Geiseler	Yobdak/risut	Euphorbiaceae	Leaf paste is used in cuts and wounds.
30. <i>Curcuma caesia</i> Roxb.	Yakane keloti	Zingiberaceae	The rhizome is used against diarrhea and stomach disorder.
31. <i>Curcuma longa</i> L.	Haldi/keloti	Zingiberaceae	Rhizome is used as stomachic, tonic, blood purifier and anthelmintic.
32. <i>Dalhousiea bracteata</i> (Roxb.) Benth.	Norong appir	Leguminosae	Root extract is taken locally and is said to be efficacious in dysentery.
33. <i>Dendrocalamus strictus</i> (Roxb.) Nees	E-a ashik/taok	Poaceae	Leaf paste on cut to check bleeding.
34. <i>Dendrocide sinuata</i> (Blume) Chew	Peji	Urticaceae	Root juice is used in chronic fevers. Leaf paste is applied externally in swellings.

35. <i>Dillenia indica</i> L.	Champak	Dilleniaceae	Dried fruits are used in dysentery. Unripe fruit decoction is applied to scalp for curing dandruff and hair fall. Fruit is used in diabetes also.
36. <i>Dioscorea pentaphylla</i> L.	Ogit	Dioscoreaceae	Tubers are used in bile and asthma.
37. <i>Diplazium esculentum</i> (Retz.) Sw.	Takang	Athyriaceae	Fronds are used as tonic.
38. <i>Drymaria cordata</i> (L.) Willd. ex Schult.	Tayi taor	Caryophyllaceae	The decoction of whole plant is used in vomiting and diarrhea.
39. <i>Elatostema platyphyllum</i> Wedd.	Sakobadha	Urticaceae	Fresh root juice is used for vomiting.
40. <i>Elephantopus scaber</i> L.	Aying ing	Asteraceae	Leaf juice for diarrhea and dysentery.
41. <i>Eleusine coracana</i> (L.) Gaertn.	Merung/tami	Poaceae	Solution of ash of grain for cough, cold and congestion.
42. <i>Elsholtzia blanda</i> (Benth.) Benth.	Papit namdung/ bok pomro	Lamiaceae	It is used in the treatment of common treatment of common colds, fevers, headaches, and diarrhea.
43. <i>Elsholtzia blanda</i> (Benth.) Benth.	Papit namdung/ bok pomro	Lamiaceae	Leaves are applied on cut and wounds. Leaf decoction is taken orally in urinary diseases.
44. <i>Erigeron bonariensis</i> L.	Daglentado	Asteraceae	Vapor of leaves is inhaled in sinus problem.
45. <i>Eryngium foetidum</i> L.	Ori/hariya	Apiaceae	Paste of leaf is applied on forehead in headache. Seed powder is used in madness.
46. <i>Erythrina stricta</i> Roxb.	Calling/tagol	Fabaceae	A paste made from the bark is slightly warmed and is applied locally to treat scorpion bite. Bark powder is mixed in water for bath to cure skin disease.
47. <i>Fagopyrum acutatum</i> (Lehm.) Mansf. ex K. Hammer	Amintatek	Polygonaceae	Seeds are useful in hypertension, haemorrhage and haemophilia.
48. <i>Garcinia lanceifolia</i> Roxb.	Tarak	Clusiaceae	Fruit is used in stomach problem.
49. <i>Garcinia pedunculata</i> Roxb. ex Buch.-Ham.	Tabing asing	Clusiaceae	Dried fruit slices are used against dysentery.
50. <i>Gonostegia hirta</i> (Blume ex Hassk.) Miq.	Oike	Urticaceae	Leaves boiled for increasing lactation in young mother.
51. <i>Houttuynia cordata</i> Thunb.	Roram	Saururaceae	Extract of tender shoot is given for stomachache. Warmed leaves are packed in banana leaves for snuff or get relief from sinusitis.

52. <i>Imperata cylindrica</i> (L.) Raeusch.	Tasse dibin	Poaceae	The flowers are used in the treatment of wounds.
53. <i>Lagerstroemia speciosa</i> (L.) Pers.	Ajar	Lythraceae	Decoction of stem bark is given twice a day as antidyseric.
54. <i>Leucas aspera</i> (Willd.) Link	Eki sipyak	Lamiaceae	Leaf juice for nose bleeding and ear ache.
55. <i>Litsea cubeba</i> (Lour.) Pers.	Rayil/ tayerare	Lauraceae	Seeds are chewed in case of thread worm infection. Leaves are used in blood dysentery, stomach trouble and fever.
56. <i>Macaranga acerifolia</i> Airy Shaw	Yaduk	Euphorbiaceae	Leaf juice is applied in cut and wound.
57. <i>Melastoma malabathricum</i> L.	Pudiraju/ kechi-yaying	Melastomaceae	Fresh leaf extract is used as antidyseric. Powdered leaves are applied over healing pox, stem is used as toothbrush.
58. <i>Mentha arvensis</i> L.	Pudina	Lamiaceae	Leaf is used in stomach problem.
59. <i>Mikania micrantha</i> Kunth	Japanilota	Asteraceae	Used in cuts for early healing.
60. <i>Morus alba</i> L.	Hinskai	Moraceae	Leaves are used for gargling. Root is used for jaundice.
61. <i>Musa balbisiana</i> Colla	Kolung	Musaceae	The fruit boiled and used for dysentery and urinary troubles.
62. <i>Mussaenda glabra</i> Vahl	Takshap	Rubiaceae	Leaves are given in cough.
63. <i>Oxalis corniculata</i> L.	Phakep	Oxalidaceae	The whole plant is cooling and good remedy for dysentery.
64. <i>Oxyspora paniculata</i> (D. Don) DC.	Porkejale	Melastomaceae	Stem is used as toothbrush, stem after removing bark is eaten.
65. <i>Paederia foetida</i> L.	Bunke ripuk/ yapetare	Rubiaceae	Boiled leaves are taken in indigestion, diarrhea and dysentery.
66. <i>Parathelypteris glanduligera</i> (Kunze) Ching	Rukdik	Thelypteridaceae	Leaves are used for giving hot fomentation to get relief from pain.
67. <i>Perilla frutescens</i> (L.) Britton	Perilla/ Namdung	Lamiaceae	Seed oil is applied on forehead against headache and fever.
68. <i>Persicaria chinensis</i> (L.) H. Gross	Amintaktabo	Polygonaceae	Fruits are eaten in stomach problem.
69. <i>Persicaria nepalensis</i> (Meisn.) Miyabe	Ruri	Polygonaceae	Leaves are eaten as chutney.
70. <i>Phyllanthus fraternus</i> G.L. Webster	Bhui-amlokhi	Euphorbiaceae	Whole plant chewed in stomach problems.

71. <i>Physalis minima</i> L.	Bodopati	Solanaceae	Leaf and fruit juice is used for stomach problems.
72. <i>Piper mullesua</i> Buch.-Ham. ex D. Don	Odor	Piperaceae	Fruits are applied against cold, cough and fever.
73. <i>Piper nigrum</i> L.	Gol mirsi	Piperaceae	Fruits are used in cold, cough and fever.
74. <i>Piper sylvaticum</i> Roxb.	Rari	Piperaceae	Leaves are used as vegetable. Fruits are used for stomach disorder.
75. <i>Plantago asiatica</i> L.	Donihakang	Plantaginaceae	Cooked for digestion problems.
76. <i>Plantago major</i> L.	Dyoni sungkang	Plantaginaceae	Leaf is used for cut and early healing.
77. <i>Portulaca oleracea</i> L.	Gubar oying	Portulacaceae	Leaves are boiled and used as stomachic.
78. <i>Pothos scandens</i> L.	Lama loset	Araceae	Plant decoction is applied for bone fracture.
79. <i>Psidium guajava</i> L.	Madure	Myrtaceae	Young shoot is taken in dysentery.
80. <i>Pterospermum acerifolium</i> (L)Willd.	Sipop asing	Sterculiaceae	Flower, bark and leaves are used in smallpox and also used as tonic.
81. <i>Ricinus communis</i> L.	Aki rokmi	Euphorbiaceae	Leaf paste is used to relief pain.
82. <i>Sarcochlamys pulcherrima</i> Gaudich.	Ombe	Urticaceae	A tender shoot is taken to cure dysentery.
83. <i>Saurauia armata</i> Kurz	Himpum	Euphorbiaceae	Leaf paste is applied on cut and wound to check bleeding and for early healing.
84. <i>Scoparia dulcis</i> L.	Jalokbon	Scrophulariaceae	Whole plant is used against diabetes.
85. <i>Smilax perfoliata</i> Lour.	Dangal engine	Smilacaceae	Plant paste is applied for fracture.
86. <i>Solanum incanum</i> L.	Tumpuluk	Solanaceae	Fruit is used as anthelmintic.
87. <i>Solanum kurzii</i> Prain	Kope/ tita baigun	solanaceae	Fruits are applied locally to relieve toothache.
88. <i>Solanum nigrum</i> L.	Banko	Solanaceae	Leaf solution is used as liver tonic. Berries are used in digestion problem.
89. <i>Solanum torvum</i> Sw.	Sing kote/ byako	Solanaceae	Root extract is given in pneumonia.
90. <i>Sonchus arvensis</i> L.	Ogen	Asteraceae	Boiled leaves are taken for curing flatulence and body pain.
91. <i>Tamarindus indica</i> L.	Tetuli	Caesalpinaceae	Used in stomach problems.

92. <i>Terminalia belerica</i> (Gaertn.) Roxb.	Lokyo	Combretaceae	Fruit chewed against cold, cough and stomach problem.
93. <i>Terminalia chebula</i> Retz.	Hilika	Combretaceae	Fruits are eaten in stomach problem.
94. <i>Tinospora sinensis</i> (Lour.) Merr.	Kynie rimang	Menispermaceae	Plant is used against fever.
95. <i>Urena lobata</i> L.	Tangom	Malvaceae	Flowers are used as expectorant, given for dry and inveterate coughs. Roots are used as diuretic, also used externally for rheumatism.
96. <i>Zanthoxylum armatum</i> DC.	Onger	Rutaceae	Fruit are used as tonic and bark for stomach problem.
97. <i>Zanthoxylum burkillianum</i> Babu	(rikhom/ ombeng)	Rutaceae	Root are used for woman with delivery trouble.
98. <i>Zanthoxylum nitidum</i> (Roxb.) DC.	Ombe	Rutaceae	Used as tonic and in stomach problem.
99. <i>Zanthoxylum rhetsa</i> DC.	Onger	Rutaceae	Fruits are used against stomach disorder and also applied for hair cleaning.
100. <i>Zingiber officinale</i> Roscoe	Taking	Zingiberaceae	Rhizomes are used against cold and cough.
101. <i>Zingiber zerumbet</i> (L.) Roscoe ex Sm.	Kekir	Zingiberaceae	Rhizomes are used in diarrhoea, vomiting and stomach problems.
102. <i>Ziziphus jujuba</i> Mill.	Ganga asing	Rhamnaceae	Bark is used in diarrhea and fruit is used as cooling agent.