

## Ethnobotanical Survey of Medicinal Plants Used by Ethnic and Rural People in Eastern Sikkim Himalayan Region

<sup>1</sup>Trishna Das, <sup>2</sup>Shanti Bhushan Mishra, <sup>1</sup>Dipankar Saha and <sup>3</sup>Shivani Agarwal

<sup>1</sup>Girijananda Chowdhury Institute of Pharmaceutical Sciences, Guwahati (Assam), India

<sup>2</sup>United Institute of Pharmacy, UCER, Naini, Allahabad (UP), India

<sup>3</sup>Himalayan Pharmacy Institute, Majhitar, Rangpo, Sikkim, India

**Abstract:** Sikkim is a very small hilly state in the Eastern Himalayas with a total geographical area of 7096. sq. kms. Sikkim, covering just 0.2% of the geographical area of the country, harbours more 26% flowering plants has tremendous biodiversity in the Eastern Himalayas. The present paper enumerates status and traditional uses of 79 plant species by the ethnic and rural people of eastern Sikkim Himalaya region. The claims were gathered by interviewing traditional healers, especially villagers of the study area. Attempt was made to verify the efficacy of claims with actual beneficiaries, though it was not possible in all cases due to social customs.

**Key words:** Ethnobotanical • Eastern Sikkim Himalaya • Medicinal Plant • Rangpo

### INTRODUCTION

In ethnobotanical studies, the major contribution has been in the field of medicine. A large number of ethnomedicinal information remained endemic to certain regions or people due to lack of communication. India is the second largest country in the world in respect of human population. Over 550 tribal communities are covered under 227 ethnic groups residing in about 5000 villages of India in different forests and vegetation types. The ethnic and rural people of India have preserved a large bulk of traditional knowledge of medicinal uses of plants growing around them. This knowledge is handed down to generations through word of mouth and is extensively used for the treatment of common diseases and conditions [1].

Sikkim is a very small hilly state in the Eastern Himalayas with a total geographical area of 7096. sq. kms. Sikkim, covering just 0.2% of the geographical area of the country, harbours more 26% flowering plants has tremendous biodiversity and has been identified as one of the hot spot in the Eastern Himalayas. At glances Orchids-410, Rhgododendrons-36 Bamboos-26, ferns and Ferns allies-326, Tree ferns-8, Primulas-30, Oakd-11 and approx 242 of medicinal plants are found here [2]. The local inhabitants for treatment of various ailments use

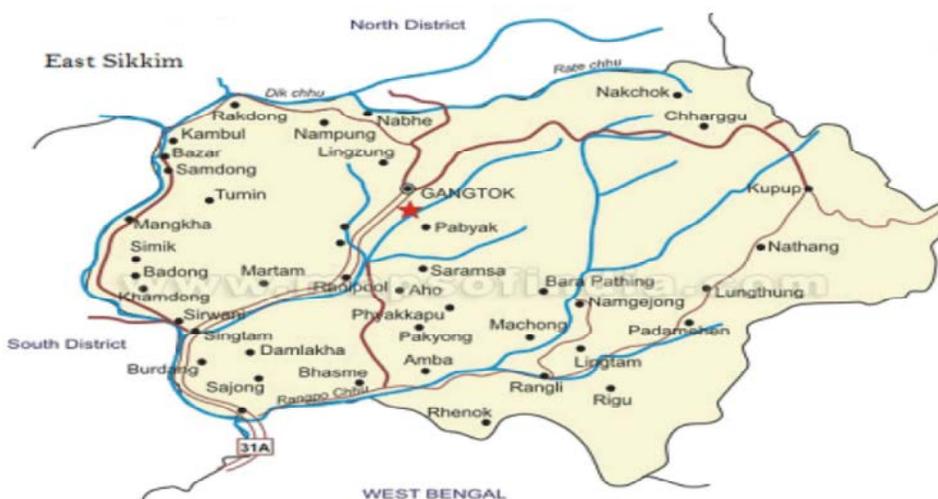
numerous herbal remedies. Further more modern medicines owes to the flora of these mountains. Many inhabitants for treatment of various ailments use numerous herbal remedies. Further more modern medicines owes to the flora of these mountains [3]. Many species of Himalayan origin have revolutionized the allopathic systems of medicine. There is urgent need to have a specific programme on medicinal plants: There is urgent need to have a specific programme on medicinal plants: Research and Development Programme for in-situ and ex-situ conservation, establish Germ Plasm Bank, documentation of traditional knowledge, Database and development of Agro-cultivation techniques etc. for the Himalayan Regions.

**Objective:** A large number of plants/plant extracts/decoctions are equally used by ethnic and rural people in North East India in treatment of various ailments. The present work attempts to analyze the ethno botanical knowledge for treatment various diseases by tribal's and folklore practices prevailing in Sikkim Himalayan Region.

**Research Design and Methodology:** Following methods were adopted by the authors during the course of present investigation:

Table 1: Some facts and figures about East Sikkim

Geographical Area (Sq.km.)	7096 Sq.km
Population	2,44,790 (as per 2001 Census)
Population Density	281 persons/Sq.km.
Percentage	Male : 53.12%
	Female : 46.88%
Literacy	65.13%
Average Annual Rainfall	3,894 mm
Average Maximum Temperature	27.2°C
Average Minimum Temperature	1.6°C
Area under Forest	104.751 sq.km.
Area not available for cultivation	48.712 sq.km.
Area under non-agricultural uses	7.168 sq.km.



- The plants used by the ethnic and rural people in the treatment of various diseases were collected by the investigators from the different study sites of East Sikkim during July 2008 to December 2008.
- Field and survey work was made after carefully planned field trips. During the field trip personal interview was made between the authors and tribes of the regions.
- Data regarding herbal remedies were collected as per plan suggested by Sinha [4].
- Voucher specimen were collected from different study sites and preserved as per method suggested by Agrawal [5].
- Confirmation of the specimen was made with the help of floristic literature Kurian, [6] and Khare [7].

**Study Area:** Sikkim, situated in the eastern Himalayas is the 22<sup>nd</sup> state of India occupies a total area of 7096 sq km and lies between 27° 5' and 28° 10'N Latitude and 88° 4' and 88° 58' E Longitude. Mt. Kanchendjunga, the third highest mountain system in the world is located in Sikkim. Sikkim constitutes 0.22 percent of the total geographical

area of India. The present investigation has been carried out in the Eastern Sikkim scattered over 3 towns (Pakyong, Rangpo, Singtam). For a proper and orderly study, the study sites were selected considering the population and density of flora. The data were obtained from native informants who were hakims, priests, tribal people and common people who have knowledge of the therapeutic value of the plants.

### DISCUSSION AND CONCLUSION

Ethnobotany is multidisciplinary science defined as the interaction between plants and people [8] which records the history and current state of human kind even while foretelling the future [9]. In every ethnic group there exists a traditional health care system, which is culturally patterned. In rural communities health care seems to be the first and foremost line of defense. The WHO has already recognized the contribution of traditional health care in tribal communities. In the present work authors have collected 79 plant species from different study sites. These species contain valuable chemical substances and

Table 2: List of medicinal plant species in Eastern Sikkim Himalaya region

S.No.	Scientific name/ Family	Local name	Type	Parts used & Uses
1	<i>Abies wabbiana</i> Pinaceae	Gobre salla	Tree	Leaves & Gum Tonic, Tuberculosis. Internal hemorrhage
2	<i>Abrus precatorius</i> Papilionaceae	Lalgeri	Climbing shrub	Fruits/roots Tonsillitis & Pneumonia
3	<i>Acorus calamus</i> Araceae	Bojho	Herbaceous plants	Root/Rhizome Vermifuge, fever antispasmodic, Insect repellent
4	<i>Aconitum heterophyllum</i> Ranunculaceae	Bikh, Atish	An erect Herb	Roots, Anti-fertility agent, tonic, stomachic, anti-periodic, hysteria, piles, throat diseases
5	<i>Asparagus racemosus</i> Asparagaceae	Kurilo	Woody climber under shrub	Tuberous root Diabetes, jaundice, urinary disorder
6	<i>Aconitum ferox</i> Ranunculaceae	Bikh, Bish,	Perennial Herb	Tuberous roots Cough, asthma, leprosy, fever snakebite, skin diseases
7	<i>Astilbe rivularis</i> Saxifragaceae	Buriokahti	Herb	Leaves/ roots/ Rhizome, Diarrhea, dysentery, blood purifier
8	<i>Adhatoda vasica</i> Acanthaceae	Asuru	Shrub	Bark, root, leaf, flower, It is good insecticide, leaves & root expectorant & antispasmodic. It is used as remedy for asthma, cough, fever, gonorrhea leprosy, Phthisis
9	<i>Azadirachta indica</i> Meliaceae	Nimpat	Tree	Roots, bark, leaves, flower, fruits, seed & gum juice As an anti-septic, treatment of small fox, as tooth brush, prophylactic for mouth & teeth, used as febrifuge
10	<i>Aesandra butyraceae</i> Sapotaceae	Chewri	Tree	Fruits used in rheumatism
11	<i>Allium wallichii</i> Liliaceae	Ban Lasun	deciduous bulb	Leaves, Seasoning spices
12	<i>Aloe barbadensis</i> Liliaceae	Ghiukumari	Herb	Plant leaf root, leaves and flower Used on burns, purgative, efficacious in treatment of leucoderma
13	<i>Alstonia scholaris</i> Apocynaceae	Chatiwan	Tree	Bark, latex and flower. Bark as tonic, in fever, skin disease in treatment of leucoderma.
14	<i>Amomum subulatum</i> Zingiberaceae	Elaichi	Herb	Seed. Stomachic, heart and liver tonic
15	<i>Artemisia vulgaris</i> Compositae	Titaypati	Herb	Leaves. Leaf extract used on cuts and bruises to stop bleeding mostly in nose bleeding. Supposed to possess detergent effect & used as cleansing agent.
16	<i>Aconogonum molle</i> Polygonaceae	Thotne	Herb	Young Shoots. The plants is used as an astringent and eaten relished in the hills as vegetable and pickle. It has similar flavour as their of the Himalayas rubarb
17	<i>Berginia ciliata</i> Saxifragaceae	Pakhanbed	Herb	Root & rhizome. Tonic, fever, boils, astringent
18	<i>Bauhinia vahlii</i> Caesalpiniaceae	Verla	Perennial creeper	Seeds, bark, leaves. Seeds used as tonic, aphrodisiac, leaves demulcent, bark is useful in skin disease, diarrhea
19	<i>Bauhinia variegata</i> Caesalpiniaceae	Koirala	Perennial creeper	Flower / fruits Flower juice is taken to cure dysentery, diarrhea & stomach pain. The flower buds are taken for skin disease & ulcer. Fruits are used for blood purification.
20	<i>Bauhinia purpurea</i> Caesalpiniaceae	Tanki	Small tree	Large flower Roots, Bark. The astringent bark is used to control diarrhoea. The flower are laxative and root is carminative The bark root and flowers are also useful as maturant for boils and abscesses. Used against animal bite
21	<i>Bagonia picta</i> Begoniaceae	Magar Kanhce	Succulent stalks	Extracts from stalks used for venereal disease.
22	<i>Berberis aristata</i> Berberidaceae	Chutro	Herb	Root, Bark. Used in jaundice, malaria, fever & diarrhea. It is also used externally to cure eye disease
23	<i>Betula utilis</i> Betulaceae	Bhojpatra	Birch tree	Bark used to heal up the wounds.
24	<i>Bischofia javanica</i> Phyllanthaceae	Kainjal	Tree	Leaves & bark. Leaves contain Vit.'C', Bark contains tannin
25	<i>Bombax ceiba</i> Bombasaceae	Simal	Tree	Root used for curing diarrhea & dysentery
26	<i>Buddleja asiatica</i> Buddlejaceae	Bhinsinpatee	Flowering plant	Leaves, flower & stem. Used in skin complaints & as abortifacient.
27	<i>Callicarpa arborea</i> Verbenaceae	Guahelo	Tree	Bark & root. The bark juice is given to treat fever. The root is chewed in cases of boils on the gums.
28	<i>Callicarpa macrophylla</i> Verbenaceae	Sumali	Tree	Bark used in rheumatism gonorrhea
29	<i>Calotropis gigantean</i> Asclepiadaceae	Ankh	Shrub	Latex used in sprain & swelling
30	<i>Carica papaya</i> Caricaceae	Mewa	Tree	Leaf. The digestive enzyme papain is extracted from the milky sap.
31	<i>Cassia fistula</i> Caesalpiniaceae	Raj briksha	Creeper herb	Fruits, leaves The fruits are used for asthma, diabetes and eczema. Leaves used for treating skin diseases.
32	<i>Cassia sp.</i> Caesalpiniaceae	Methizar	Herb	Leaf & root The leaf powder is given to relieve indigestion & stomach pain. The root paste is used for ringworm.
33	<i>Centella asiatica</i> Umbelliferae	Gora taprey	Herb	Leaves are used for asthma and skin disease, Urinary discharges and improving memory.
34	<i>Cinchona officinalis</i> Rubiaceae	Sinchona	Tree	Bark. Quinine is extracted as remedy for malaria.
35	<i>Cinnamomum tamala</i> Lauraceae	Sinkauli	Tree	Leaves are stimulant used in rheumatism, in colic & diarrhea. Bark is given in gonorrhea.
36	<i>Citrus indica</i> Rutaceae	Chaksi	Tree	Fruits. Stomach problems.
37	<i>Clematis buchaniana</i> Ranunculaceae	Pinaasey lahara	Herb	Root used to cure sinusitis.
38	<i>Clerodendron infertunatum</i> Verbenaceae	Chitu	Small tree	Bark /leaves. Leaves are of anthelmintic, fresh juice of the leaves is tonic and febrifuge.
39	<i>Cordyceps sinensis</i> Clavicipitaceae	Yarcha gombuk	Whole plant	Rejuvenates liver, heart & cheeks again process & built up immune system.
40	<i>Costus speciosus</i> Zingiberaceae	Bet laure	Herb	Root useful in fever, bronchitis, anemia, rheumatism and diabetic.
41	<i>Calendula officinalis</i> Compositae	Calendula	Perennial plant	Flower, Leaves. It is antiseptic and antifungal, contains hormones and vitamin A. It is diaphoretic, stimulant, antispasmodic and small pox. It is also used in healing wounds, ulcers, burns.
42	<i>Dolichos uniflorus</i> Papilionaceae	Gahat	Tree	Seeds cure Measels, Chicken pox, tumors, asthma.
43	<i>Dioscorea bulbifera</i> Dioscoriaceae	Gittha	Tuber	Aphrodisiac, stomachic, improves appetite.
44	<i>Dichroa febrifuga</i> Saxifragaceae	Basak	Small tree	Roots& Leaves. Fever, malaria
45	<i>Daphne cannabina</i> Thymelaeaceae	Kagatey	Evergreen shrub	Bark & root. The bark decoction is given to treat fever. The roots are used for intestinal troubles.
46	<i>Elaeocarpus sphaericus</i> Elaeocarpaceae	Rudraksh	Tree	Fruit used in Vata and Kapha disease of head, epileptic fits.

Table 2: Continue

S.No.	Scientific name/ Family	Local name	Type	Parts used & Uses
47	<i>Equisetum debile</i> Equisetaceae	Kurkure Jhar	Aerial part	Clotting agent used in wound, nose bleeding & bleeding of urinary tract.
48	<i>Eupatorium cannabinum</i> Compositae	Banmara	Herb	Leaf and stem extract used on cut & bruises to stop bleeding & infection.
49	<i>Euphorbia royleana</i> Euphorbiaceae	Siwri	Cactus & succulent	The latex is used to cure cuts & stop bleeding; It is also used to relieve earache, cough & asthma.
50	<i>Fagopyrum dibotrys</i> Polygonaceae	Ban phapar	Herb	Fruit & Grains diet in colic, used in lungs infection and pulmonary abscess.
51	<i>Ferula narther</i> Umbelliferae	Hing	Herbaceous plant	Gum used in asthma, cough, hysteria & epilepsy.
52	<i>Foeniculum vulgare</i> Umbelliferae	Sounp	Herb	Leaves, tender shoots, fruit. It is used as flavouring agent of foods, curries and salad. Seeds are good in digestion, removes stomach pain regulates menstruation, improves appetite, breast milk production.
53	<i>Garuga pinnata</i> Burseraceae	Dubdabey	Deciduous tree	The bark juice is applied to treat dislocated bones & to heal wounds. Root bark is used for curing skin disease.
54	<i>Gloriosa superba</i> Liliaceae	Langarey	Herbaceous & glabrous climber	Tubers, roots flowers. Chronic ulcers, leprosy, piles, abdominal pains
55	<i>Holarrhena antidysenterica</i> Apocynaceae	Anley khirm	Small tree	Bark orally administered in amoebic dysentery.
56	<i>Hypericum patilum</i> Hypericaceae	Urila	Deciduous shrub	Seeds are aromatic & stimulant.
57	<i>Juglans regia</i> Juglandaceae	Okhar	Walnut tree	Oil is used for headache. Bark is used for dye & acts as andetergent.
58	<i>Kaempferia roturela</i> Zingiberaceae	Bhui Champa	Tuber	Bone settlers
59	<i>Leea macrophylla</i> Vitaceae	Bulyettra	Shrub	Roots, leaves & seeds. Tuber for ringworm & guinea worm, leaves paste floor stopping bleeding.
60	<i>Litsea citrata</i> Lauraceae	Siltimur	Deciduous Tree	Dried fruit used for stomach trouble.
61	<i>Mentha viridis</i> Labiatae	Pudina	Herbaceous plant	Roots. Leaves given in fever & bronchitis, oil is used for rheumatism.
62	<i>Mimosa pudica</i> Mimosaceae	Lajjawanti	Creeping herb	The leaf & root paste is used in case of piles & diseases of kidney.
63	<i>Mesua ferrea</i> Guttiferae	Nageeswari	Tree	The root is used in treating asthma, fever, cough, dysentery, vaginal & uterine complaint. Bark orally administered in various skin diseases (mostly poxes) & in menstrual disorder
64	<i>Nyctanthes arboristis</i> Oleaceae	Parijat	Tree	Leaves are boiled & the decanted water is taken to control malaria fever. Bark paste is used for dislocated bones, flower are offered to god & goddesses.
65	<i>Oxalis corniculata</i> Oxalidaceae	Chariamilo	Herb	Leaf juice is eaten to cure dysentery & fever, anemia and for appetite, digestion.
66	<i>Physalis minima</i> Solanaceae	Jangali	Herb	Fruits used as tonic, diuretic, laxative and useful in inflammations.
67	<i>Phytolacca acinosa</i> Phytolaccaceae	phokphokey Jaringo	Deciduous plant	Leaves. Fresh juice applied on cuts & wounds to stop bleeding & infection.
68	<i>Pteris biaurita</i> Pteridaceae	Thado unew	Fern	Mashed stem applied on cuts & wounds to stop bleeding & infection
69	<i>Rubus ellipticus</i> Rosaceae	Aeiselu	Thorny shrub	Root & young shoots for colic pain. Root paste is applied to treat wounds. Fruit juice is used to cure fever and cough.
70	<i>Rumex nepallensis</i> Polygonaceae	Halhaley	Herb	Root dried or fresh extract used orally in hepatitis, loss of hair, also plant used as dyes.
71	<i>Sapindus mukrossi</i> Sapindaceae	Ritha	Herb	The juice of fruit is used to cure burnt part of the body. The fruit is also used for epilepsy.
72	<i>Smilax zeylanica</i> Liliaceae	Kukur Dainey	Thorny climber	Used in Urinary complaints and dysentery Roots are taken as tonic
73	<i>Stephania glabra</i> Menispermaceae	Taubarkey	Herbaceous vines	Root bulb. Powder used in diabetes, tuberculosis, asthma, fever.
74	<i>Taxus baccata</i> Taxaceae	Dhengre salla	Tree	Leaf/bark, Leaf extracts used in breast cancer.
75	<i>Thysanolaena maxima</i> Graminae	Amliso	Herb	Roots, dried or fresh, paste applied to cheek boils.
76	<i>Valeriana jatamansi</i> Valerianaceae	Nakali Jatamansi	Herb	Root is given in case of hysteria, epilepsy and neurosis. It is Carminative and stimulant.
77	<i>Woodfordia fruticosa</i> Lythraceae	Dhayeroo	Shrub	Dried flower for piles, liver complaints Bark for gastric trouble.
78	<i>Zanthoxylum acanthopodium</i> Rutaceae	Bokey timbur	Peeper Tree	Fruit in Food poisoning.
79	<i>Zanthoxylum allatum</i> Rutaceae	Bokey timbur	Tree	Fruit carminative, stomachic, seeds used to cure dyspepsia & cholera.

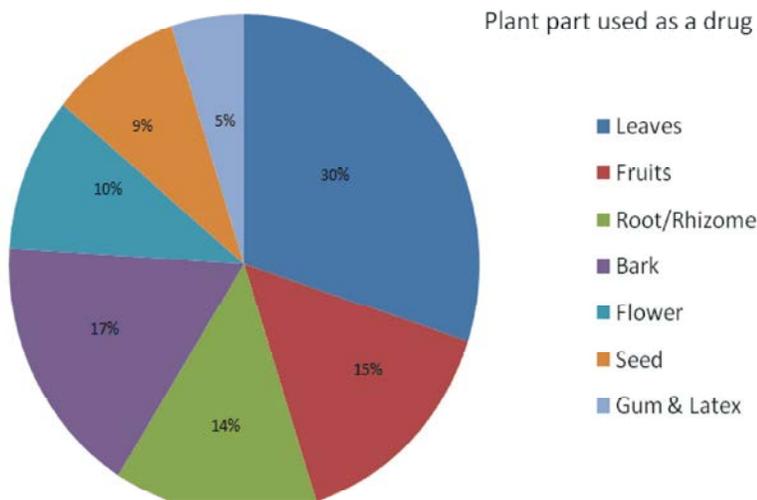


Fig. 1: Plant parts used as a drug in different preparations

are useful to cure various human ailments (Table 2). In this region the general feeling is that the future of traditional medicine is bright, because it is widely used and respected, especially by the rural population that constitutes the majority. The survey data shows 30% people using leaves, 15% fruits, 14% root / rhizome, 17% bark, 10% flower, 9% seed & 5% gum & latex (Figure 1). The ethno-botanical survey of the area revealed that the people of the area possessing good knowledge of herbal drugs but as the people are in progressive exposure to modernization, their knowledge of traditional uses of plants may be lost in due course. So it is important to study and record the uses of plants by different tribes and sub-tribes for futures study. Such studies may also provide some information to biochemists and pharmacologists in screening of individual species and in rapid assessing of phyto-constituents for the treatment of various diseases.

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