

Ethnomedicinal plants of the Khangchendzonga National Park, Sikkim, India

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The present study was carried out to survey and document the herbal drugs used by the tribal people in the Khangchendzonga National Park area in Sikkim, India. A report on 110 species of ethnomedicinal plants belonging to 100 genera and 70 families is presented here.

Keywords: Ethnomedicine; Ethnobotany; Sikkim Himalaya; Khangchendzonga

Introduction

Most of the area in Sikkim is located far from civilization and is land-locked. The life-saving herbs are the primary source of medication here. Lack of modern medical facilities and the richness of medicinal flora have led to strong ethnomedicinal practices in the region. During the last three decades, several tribal localities of India have been explored for ethnomedicinal studies by a number of workers. However, a very few of such studies have been conducted in this region (Chhetri 1997).

Study area and people

The Indian state of Sikkim extends between 27° 5' - 28° 10' N latitude and 88° 4' - 88° 58' E longitude and lies sandwiched between the kingdoms of Nepal in the west and Bhutan in the east. On its north is the plateau of Tibet, while on the south lie the plains of West Bengal. With just a population of 0.4 million and an area of 7096 sq km, Sikkim is one of the smallest states of India (Verma 1995). The altitude ranges from 100 m to 8500 m above sea level. Sikkim is one of the rainiest places in India. The area under forest cover is 36.34% (Venu *et al.* 1990). The present study area includes the Khangchendzonga National Park (KNP), which encompasses portions of North and West Sikkim covering an area of 850 sq km and taking in its fold some of the highest mountains in the world. The peaks of Khangchendzonga (India's highest and third in the world), Talung, Kabru, Nepal and Tent

form its western boundary; Mt. Pandim and Narsing are on the southern boundary and Mt. Siniolchu demarcates the northern boundary of the Park. The altitude of KNP area ranges from 1829 m to 8585 m above sea level. The Park was commissioned on 26 August 1977 and named after the highest peak within its boundary. Of the 69 National Parks identified in the Indian union, KNP is the only one which covers a vertical distance of 6656 m. Obviously, the higher reaches of KNP could not be explored due to its inaccessibility and for logistic reasons. The climate of KNP region is peculiar in having triple extremities of a high rainfall (380-550 cm) in its lower and middle zones, a high relative humidity throughout and one of the highest snowfalls in the world in its upper regions (Lavkumar 1983).

Human habitation can be found in the southeastern fringes of KNP. The people here are mainly dependent on agriculture, horticulture and animal husbandry, for their livelihood. This part of the Himalayas is the cornucopia of ethnicity. The major ethnic groups of the region are Lepcha, Bhutia and the Nepalese; the Nepalese constitute a conglomerate of over 20 ethnic tribes. Each of these tribal groups has its own distinct culture, language and traditions. However, Nepali language is the medium of communication among the tribes. These tribes also have rich ethnomedicinal traditions about which only a few reports are available (Biswas 1956;

Puri, Pandey 1980; Bennet 1983; Krishna, Singh 1987; Srivastava *et al.* 1987; Pandey 1991; Rai & Sharma 1994; Gurung 2002; Rai & Sharma 2002; Chauhan 2003)

With only 5 hospitals and 25 primary health centres modern medical facilities in Sikkim are negligible. The doctor-to-people ratio is 1:3000. Therefore, the people are completely dependent on herbal medicines for their healthcare.

Methodology

Regular field trips to KNP area were conducted between April 1998 and September 2000 for collecting ethnobotanical data and voucher herbarium specimens. The tribal people, including local healers, Jhankris (Nepalese traditional healers), Bongthings (Lepcha medicinemen), Lamas (Bhutia priests), who regularly use the plants provided important information regarding the ethnomedicinal usage of the plants. Information obtained from more than one source only has been incorporated. The main localities surveyed included Yuksom, Tsoka, Dzongri, Bakhim, etc. in West Sikkim and Lachen, Lachung, Chungthang, Maltim, Yaksha, etc. in North Sikkim, where these medicinal plants are used. The collected plants were identified with the help of herbarium and literature and the voucher herbarium specimens were deposited in the herbarium of the Medicinal Plants Division, Panchavati Greentech Research Society, Darjeeling.

Enumeration

In the enumeration, data on ethnomedicinal uses of plants are presented in the following sequence: serial number, botanical name, family (in parentheses), local name in Nepali (N), Lepcha (L) and Bhutia (B) whenever available, place of collection, voucher specimen number followed by the plant part used and the mode of use (in brief). In the present report, decoction means a solution derived by boiling the medicinal herbs, infusion means the liquid obtained by soaking the plant parts in hot water for a considerable time, extract denotes the liquid obtained by grinding the plant parts with water and filtering through a fine cloth,

while juice signifies the liquid obtained by crushing and pressing the useful plant parts without adding water. Whenever more than one species belonging to the same genera were used for the same purpose only the more commonly used species is furnished. The new ethnomedicinal use of the enlisted plants has been indicated with asterisk mark preceding the botanical name of the enumeration.

**Abies webbiana* Lindl. (Pinaceae); 'Gobray salla' (N), 'Dumsing' (L); Bakhim, 336. Decoction of the needle is taken orally in cough and bronchitis. The same is also used as an antispasmodic medicine.

**Achyranthes bidentata* Bl. (Amaranthaceae); 'Apamarg' (N), 'Apamarga' (T); Bakhim, 115. Infusion made from leaves is used as diuretic. Root is used as toothbrush in case of toothache.

**Aconitum ferox* Wall. (Ranunculaceae); 'Bikhumma' (N), 'Nyine' (L); Lachung, 248. A pinch of dried root is chewed as an emetic along with saline water in case of food poisoning.

**A. heterophyllum* Wall. ex Royle (Ranunculaceae); 'Bikhjhar' (N), 'Bohna drakpo' (B); Chungthang, 243. Paste of root is used externally (topically) in the treatment of gout and rheumatism.

Acorus calamus L. (Araceae); 'Bojo' (N) 'Riklok' (L), 'Sudag' (B); Maltim, 305. Dried rhizome is chewed directly in throat pain. Decoction of rhizome is taken orally in case of fever and rheumatism.

**Adiantum lunulatum* Burm. (Polypodiaceae); 'Kaney uniu' (N); Yuksom, 356. Decoction of root is taken in epilepsy.

**Aeschynanthus maculata* Lindl. (Gesneriaceae); 'Sinduray' (N); Fedang, 116. Fresh flower is chewed in case of throat pain.

**A. sikkimensis* Stapf. (Gesneriaceae); 'Sinduray' (N); Yuksom, 233. Decoction of root is taken to cure fever.

Ageratum conyzoides L. (Asteraceae); 'Ilamay' (N), 'Namyew' (L); Mangan, 205. Root decoction is used in the treatment of gall bladder and kidney

stones. Leaf juice is used in common wounds and sores.

Alstonia scholaris (L) R. Br. (Apocynaceae); 'Chhatiwan' (N), 'Puroo' (L), 'Lomabdur' (B); Sumdong, 66. Decoction of bark is given orally in hypertension and heart disorders.

Anemone obtusiloba D. Don (Ranunculaceae); 'Bankankra' (N); Chungthang, 392. Decoction of seed is used in constipation as a purgative. Root paste is applied over wounds and sores.

**Angiopteris evecta* Hoffm. (Angiopteraceae); 'Uniu' (N); Bakhim, 309. Paste of frond is used in the treatment of bone fracture.

Artemisia indica Willd. (Asteraceae); 'Titaypati' (N) 'Tuk gnyel' (L), 'Dhama naga' (B); Lachung, 60. Fresh leaves are crushed and used as nose plugs to stop nose bleeding. Leaf juice is also used in cuts and bruises.

**Astilbe rivularis* D. Don (Saxifragaceae); 'Buro-okhati' (N), 'Pango' (L); Chungthang, 91. Dried root is chewed directly in case of dysentery. Paste of root of this plant along with root of *Bergenia ciliata* is used in post-natal recovery of mothers after childbirth.

**Bassia butyracea* Roxb. (Sapotaceae); 'Chiuri' (N), 'Yelpote' (L); Pengla, 336. Seed paste is applied as an ointment in case of rheumatism.

Bauhinia purpurea L. (Caesalpiniaceae); 'Tanki' (N), 'Checkung' (L), 'Kobidata' (B); Chungthang, 301. Decoction of bark is given orally in dysentery.

B. vahlii W & A. (Caesalpiniaceae); 'Bhorla' (N), 'Makrik' (L); Yuxsom, 373. Seed is roasted, made into paste and taken with milk as an adaptogenic drug and tonic.

**Begonia inflata* Clarke (Begoniaceae); 'Ban begunia' (N); Yaksha, 239. Decoction of the whole plant is given orally in dysentery.

**Berberis asiatica* Roxb. ex DC. (Berberidaceae); 'Sanu Chutro' (N), 'Kissie' (L); Maltim, 237. Root extract is taken in jaundice.

**Bergenia ciliata* (Haw.) Stenb. (Saxifragaceae); 'Pakhanbed' (N); Lachung, 73. Dried root is chewed directly in toothache. Infusion of root is used in fever and bronchitis. Mixture of the root of this plant along with that of *Astilbe rivularis* is made into a paste and used to relieve body pain after childbirth.

**Betula acuminata* Wall. (Betulaceae); 'Saur' (N), 'Sanglikung' (L), 'Stagpa' (B); Yumthang, 317. Decoction of bark is administered in concussion, hysteria, epilepsy, etc.

Bidens pilsa L. (Asteraceae); 'Kuro' (N); Yuxsom, 251. Leaf juice is applied on cuts and bruises.

Botrychium ternatum Sw. (Ophioglossaceae); 'Harre jhar' (N); Fedang, 360. Decoction of rhizome is taken in dysentery.

Callicarpa arborea Roxb. (Verbenaceae); 'Guenlho' (N), 'Sunga' (L); Yuxsom, 272. Bark paste is applied topically on scabies and ringworm.

**Cautleya gracilis* (Sm.) Dandy (Zingiberaceae); 'Hardi jhar' (N); Lachen, 319. Infusion of rhizome is taken in stomach and liver troubles.

**Chenopodium album* L. (Chenopodiaceae); 'Bethu' (N); Chungthang, 367. Plant extract is taken as a digestive, anthelmintic and antacid. Leafy twigs are taken as curry in cardiac disorders and general debility.

**Cinnamomum obtusifolium* Roxb. ex Nees (Lauraceae); 'Bhaley Sinkauli' (N), 'Songsor kung' (L), 'Drizim boiloma' (B); Yuxsom, 19. Decoction of bark is used as a liver tonic.

**Citrullus colocynthis* (L.) Schrad. (Cucurbitaceae); 'Indreni' (N), 'Karbyo' (L), 'Bisala' (B); Mangan, 202. Root extract is taken in jaundice.

Corydalis govaniana Wall. (Fumariaceae); 'Boxyphool' (N), 'Talizang' (B); Chungthang, 113. Decoction of root is used as a liver tonic.

**Curculigo orchoides* Gaertn. (Amaryllidaceae); 'Dhotisara' (N); Tsoka, 203. Decoction of rhizome is taken in kidney troubles. Decoction

is also used in asthma and bronchitis.

Dactylorhiza hatagirea (D. Don.) Soo (Orchidaceae); 'Panch aunlay' (N); Thangsing, 249. Paste made from dried root is applied over cuts and bruises. Dried root powder is also taken as an anti-ageing medicine.

**Datura stramonium* L. (Solanaceae); 'Dhaturo' (N), 'Lantase' (T); Yuksom, 264. Mustard oil is applied on the surface of the green leaves and roasted and then the leaf is applied locally for curing hydrocoele.

**Delphinium denudatum* Wall. ex Royle (Ranunculaceae); 'Nirbish' (N); Yumthang, 268. Dried roots are chewed in toothache. Decoction of root is taken in cases of kidney and gall bladder stones.

**Dendrocalamus hamiltoni* Nees (Poaceae); 'Choyabans' (N); Bakhim, 269. Water reserved in the hollow internodes is collected and taken in case of burning sensation during urination.

**D. strictus* (Roxb.) Nees (Poaceae); 'Malingo' (N); Chungthang, 351. Leaf juice is given orally during childbirth for easy delivery.

**Dichroa febrifuga* Lour. (Hydrangiaceae); 'Paharay Basak' (N), 'Asru' (L); Yuksom, 138. Leaf infusion is taken orally in fever and cough.

**Drymaria cordata* (L.) Roem. et Schult. (Caryophyllaceae); 'Abhijalo' (N), 'Ayokgim' (L); Chungthang, 119. The whole plant is roasted and the vapour is inhaled to cure sinusitis. Leaf extract is used as a heart tonic.

**Equisetum elongatum* Willd. (Equisetaceae); 'Kurkure jhar' (N); Bakhim, 368. The whole plant extract is taken in case of kidney stones.

Eupatorium glandulosum H.B.K. (Asteraceae); 'Banmara' (N), 'Nam nong' (L); Lachung, 160. Leaf juice is used as antiseptic in cuts and bruises.

**Evodia fraxinifolia* Hook. (Rutaceae); 'Khanakpa' (N), 'Kanu' (L); Samdong, 261. Decoction of bark is given in fever.

**E. rutaecarpa* Hook. f. et Thoms. (Rutaceae);

'Peju' (L); Bakhim, 170. Decoction of bark is used in acidity and stomachache.

**Ficus benjamina* L. (Moraceae); 'Kabra' (N), 'Kunhip' (L); Yuksom, 89. Paste of young leaves is applied on sores, scabies, ringworm, etc.

**F. cunea* Ham. ex Roxb. (Moraceae); 'Khanu' (N); Yuksom, 315. Decoction of bark is taken in dysentery.

**Gaultheria hookeri* Clarke (Ericaceae); 'Lalgedi' (N), 'Kalomba' (L); Lachen, 326. Fruit is crushed and given to patients suffering from kidney troubles.

**Geranium wallichianum* D. Don (Geraniaceae); 'Pahaday geranium' (N), Chuhgthanag, 407. Decoction of root is taken in cold and cough.

**Geum alatum* Wall. (Rosaceae); 'Bhuin Okhati' (N); Lachung, 280. Infusion of the whole plant is taken in throat pain.

**Girardinia palmata* (Forsk.) Goud. (Urticaceae); 'Bhangray Sisnoo' (N); Chungthang, 274. Root decoction is used in kidney troubles.

**Gynocardia odorata* R. Br. (Flacourtiaceae); 'Gantay' (N), 'Tukkung' (L); Tsoka, 127. Fruit juice is used in diabetes and as an anthelmintic.

Hedychium spicatum Ham. ex Smith (Zingiberaceae); 'Dudh Kewanra' (N), 'Zurpa karpā' (B); Tsoka, 299. Decoction of rhizome is given twice a day to treat bronchitis, pleurisy and tuberculosis. It is also used as a mouthwash.

**Heracleum wallichii* DC. (Apiaceae); 'Chimphing' (N), 'Sanberi' (L); Lachen, 331. Decoction of dried fruit is taken orally in influenza.

Holarrhena pubescens (Buch.-Ham.) Wall. ex D. Don (Apocynaceae); 'Khirra' (N), 'Fajeerip' (L); Lachen, 253. Decoction of bark is taken in dysentery and diarrhoea.

**Hydrocotyle asiatica* L. (Apiaceae); 'Golpatta' (N); Tsoka, 393. The whole plant extract is taken orally in dysentery. Leaf extract is taken as a brain tonic and blood purifier.

**H. javanica* Thunb. L. (Apiaceae); 'Dhungri jhar' (N); Yuksom, 342. Leaf extract is taken orally in kidney and urinary troubles and also to reduce blood pressure.

**Impatiens tripetala* Roxb. (Balsaminaceae); 'Bantil' (N); Yuksom, 155. Root juice is given in haematuria.

**Juglans regia* L. (Juglandaceae); 'Okkhar' (N), 'Kanola' (L), 'Starga' (B); Lachung, 318. Bark decoction is used as an anthelmintic. Leaf paste is applied externally in skin diseases.

**Juniperus communis* L. (Cupressaceae); 'Sukpa' (N), 'Chukboo' (L); Yumthaang, 425. Dried fruit is chewed as a nut in case of throat pain and sore throat.

**Laportea terminales* Wight (Urticaceae); 'Patlay Sisnoo' (N), 'Ongyalop' (L); Lachung, 418. Inflorescence and young shoots are cooked as a curry taken in case of high blood pressure.

**Litsea citrata* Bl. (Lauraceae); 'Siltimbur' (N), 'Tanghaecha' (L); Bakhim, 349. One seed (dry or fresh) is chewed at a time in case of stomach disorders or headache.

**Macaranga indica* Wight (Euphorbiaceae); 'Malata' (N); Chungthang, 370. Latex is applied externally on sore, scabies ante skin eruptions.

**Melia composita* Willd. (Meliaceae); 'Labshi' (N); Bakhim, 27. Fruit is eaten raw as a liver tonic.

**Melissa parviflora* Benth. (Lamiaceae); 'Baranbuti' (N); Thangsing, 270. Leaf decoction is used in bronchitis and tuberculosis.

**Michelia champaca* L. (Magnoliaceae); 'Champ' (N); Lachen, 193. Leaf juice is taken as anthelmintic. Decoction of flower is used in kidney troubles.

**Mussenda treutleri* Stapf. (Rubiaceae); 'Dhobini phool' (N), 'Tumberik' (L); Chungthang, 207. Leaf extract is taken to cure fever, bronchitis, cough and jaundice.

**Myricaria rosea* Smith (Tamaricaceae); 'Ambu' (N); Thangsing, 424. Young shoots are

chewed in case of throat pain.

**Nardostachys jatamansi* DC. (Valerianaceae); 'Jatamaasi' (N), 'Spanspos' (B); DDzongri, 191. Root decoction is used as a tonic and in the treatment of epilepsy and hysteria. Dried root boiled in coconut oil is used as a hair tonic.

**Nasturtium officinale* R. Br. (Brassicaceae); 'Simrayo' (N), 'Shamrock' (L); Lachung, 380. Soup prepared from leaves and twigs is given to patients recovering from tuberculosis.

**Oroxylum indicum* Vent. (Bignoniaceae); 'Totola' (N), 'Phagorip' (L), 'Somaka' (B); Yuksom, 271. Decoction of bark is used as appetizer and in indigestion.

**Osbeckia crinata* Benth. (Melastomaceae); 'Chuleshi' (N), 'Nümbur' (L); Bakhim, 298. Decoction of leaves is used as mouthwash in case of toothache.

**O. nepalensis* Hook. (Melastomaceae); 'Angeri' (N); Lachen, 206. Decoction of root is taken orally in kidney troubles.

**Ougeinia oojeinensis* (Roxb.) Hochr. (Papilionaceae); 'Sandan' (N); Lachen, 277. Decoction of bark is given in urinary infections. Bark paste is applied on leucoderma.

**Oxalis corniculata* L. (Oxalidaceae) 'Chari amilo' (N); Tsoka, 208. The whole plant juice is taken as a liver tonic and in anemia.

**Oxyspora paniculata* DC. (Melastomaceae); 'Chulanay' (N); Lachung, 327. Decoction of root is taken orally in kidney troubles.

**Panax pseudoginseng* Wall. (Araliaceae); 'Panch patay' (N); Lachung, 381. Dried root powder is taken as a stimulant, adaptogenic and anti-ageing medicine.

**Passiflora nepalensis* Wall. (Passifloraceae); 'Garendal' (N); Yuksom, 226. Root decoction is taken orally in fever.

**Physalis minima* L. (Solanaceae); 'Phakphakay' (N), 'Swarana' (B); Chungthang, 201. Fruit juice is taken orally in diarrhoea. Dried fruits

are crushed and rolled into cigarette and smoked in toothache.

Picrorhiza kurrooa Royle ex Benth. (Scrophulariaceae); 'Kutki' (N), 'Putse-sel' (B); Zongtri, 284. Dried root powder is taken orally in fever and malaria. Infusion of root is taken in case of stomachache and dysentery.

**Pimpinella diversifolia* DC. (Apiaceae); 'Hansaraj' (N); Fedang, 304. Plant extract is taken as a stomachic, digestive and carminative.

**Piper longum* L. (Piperaceae) 'Pipla' (N), 'Koutin' (L), 'Pipiliri' (B); Chungthang, 266. Infusion of dried fruit is taken orally in cough and fever. Fruit is placed inside mutton liver and boiled and then taken together in case of night blindness.

**Plantago major* L. (Plantaginaceae); 'Jibray jhar' (N); Pengla, 341. Decoction of the whole plant is taken orally in kidney troubles. Leaf decoction is used to heal wounds.

Polygonum punctatum Ham. (Polygonaceae); 'Thotnayro' (N); Yumthang, 181. Leaf paste is applied externally over sprained area and swellings.

**Polypodium wallichii* R. Br. (Polypodiaceae); 'Machha kanre' (N); Lachung, 362. Extract of rootstock is taken in diabetes.

**Potentilla fulgens* Wall. (Rosaceae); 'Banmula' (N); Yumesadong, 311. Decoction of root is taken orally in piles.

**Prunus cerasoides* D. Don (Rosaceae); 'Paiyun' (N), 'Kongki-kung' (L), 'Khamber' (B); Mangan, 279. Decoction of bark is taken orally in the treatment of asthma.

Pteridium aquilinum Kuhn (Polypodiaceae) 'Uniu' (N); Yuksom, 187. Decoction of rhizome and fronds is taken orally at bedtime in the treatment of worms.

Pteris biaurita L. (Polypodiaceae); 'Thaday uniu' (N); Yuksom, 164. Juice of frond is applied on cuts and bruises.

**Quercus lamellosa* Smith (Fagaceae);

'Bajranth' (N); Bakhim, 323. Bark powder is used as an astringent.

**Rheum emodi* Wall. (Polygonaceae); 'Padamchal' (N), 'Kenjo' (B); Thangsing, 244. Leaves are cooked and eaten as a curry in cold and cough. Root decoction is used as purgative.

Rhododendron anthopogon D. Don (Ericaceae); 'Sunpatey' (N), 'Paluchulu' (L), 'Palu' (B); Dzungri, 207. Leaf decoction is used in cold, cough and as a tonic.

R. arboreum Sm. (Ericaceae); 'Lali Gurans' (N), 'Etok' (L), 'Karabaka' (B); Lachung, 211. Flower powder is taken orally in dysentery. Fresh flower is used in the preparation of alcohol having therapeutic properties.

R. campanulatum D. Don (Ericaceae); 'Nilo Chimal' (N), 'Bargi' (B); Yumthang, 353. Dried leaf powder is taken as snuff in rheumatism.

Rhus semialata Murr. (Anacardiaceae); 'Bhakimlo' (N), 'Thanger-kung' (L); Tsoka 183. Decoction of fruit is taken orally in dysentery and diarrhoea. Fruit is boiled with mustard oil and applied externally to treat chilblain.

**Rubia manjith* Roxb. ex Fl. (Rubiaceae); 'Majito' (N), 'Vhyem' (L), 'Btsod' (B); Chungthang, 212. Decoction of root is used in jaundice and as a liver tonic. It is also given in diabetes.

**Rubus moluccanus* L. (Rosaceae); 'Bhotay paan' (N), 'Sufokji' (L); Samdong 283. Leaf extract is taken as an anthelmintic.

**Rumex nepalensis* Spreng. (Polygonaceae); 'Hallhalay' (N), 'Chyasu' (L); Chungthang, 265. Infusion of root is used in hepatitis and as a liver tonic.

Saccharum spontaneum L. (Poaceae); 'Kush' (N), 'Dambu' (B); Yuksom, 213. Decoction of root is used in urinary system troubles, kidney stones, etc.

**Sambucus javanica* Reinw. ex Blume (Caprifoliaceae); 'Kanike-phool' (N); Mangan, 313. Leaf decoction is used in fever and root decoction is taken in urinary troubles.

dried plant parts) or curry (by cooking with oil and spices in the form of soup). The difficulty in the traditional medicine was not the recipe, but the dose, which varies from practitioner to practitioner and needs to be standardized.

The present study shows that the KNP region is very rich not only in medicinal plant diversity but also in having strong traditions of ethnomedicinal practices of the local people. These factors make further studies in this field important and obligatory. The fragile ecosystem of KNP requires urgent care and sensitive handling.

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कंचनजंघा राष्ट्रीय पार्क, सिक्किम (भारत) की लोक वनौषधियाँ

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इस प्रपत्र में कंचनजंघा राष्ट्रीय पार्क, सिक्किम (भारत) में निवास करने वाली जनजातियों द्वारा प्रयुक्त लोक वनौषधियों का वर्णन किया गया है तथा सर्वेक्षण व अध्ययन से प्राप्त जानकारी द्वारा लोक वनौषधियों के रूप में 110 प्रजातियों का उल्लेख है जो कि 100 गण तथा 70 कुलों से संबंधित हैं।