MEDICINAL TREES OF UTTARANCHAL STATE : DISTRIBUTION, USE PATTERN AND PROSPECTS FOR CONSERVATION

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Introduction

The Himalayan region is bestowed with a variety of natural resources which have been exploited by mankind since times immemorial. One of the major sectors of natural resources in the region is 'medicinal plants'. The description of Himalayan medicinal plants can be seen in ancient as well as modern literature including those dealing with Ayurveda, Yunani, Tibetan, Chinese and Western systems of medicine. It is believed that out of over 1,600 species of medicinal plants traditionally used in India (Uniyal *et al.*, 2002), more than 50% species come from the Himalayan region. In recent years there has been a sudden rise in the demand of herbal products and plant based drugs across the world resulting in the heavy exploitation of medicinal plants. Uncontrolled and unscientific harvest of several species has resulted in the drastic decline of species and habitat degradation. Several authors e.g., Uniyal *et al.* (2002), Maikhuri *et al.* (2001) have recommended *ex-situ* conservation and domestication of medicinal plants in the region. However, agro-technology for many species, especially herbaceous plants has not yet been standardized. Yet, a large number of Government and Non-Government agencies have been promoting cultivation and harvest of medicinal plants in the region, to the extent of duplication of efforts and over emphasizing on selected herbaceous species. It is noted that a large number of tree species found in the Himalayan region have great potential to become raw material for modern pharmaceutical industries and other uses. Such multi-purpose species have largely been neglected by the agencies dealing with medicinal plants. Since silvicultural techniques for many of the tree species have already been evolved, it would be easy to cultivate multi-purpose tree species as part of farm-forestry, wasteland development and agro-industries.

In this paper, an update on the distribution, use patterns and potential for conservation of medicinal trees in Uttaranchal, a newly established State in the Himalayan region, has been presented.

Material and Methods

The State

The State of Uttaranchal which came into existence as the 27th State of Republic of India on November 9, 2000, was carved out from the erstwhile Uttar Pradesh. It lies between 28°53'24" and 31°27'50" N latitudes and between 77°34'27" and 81°02'22" E longitudes. The State covers an area of 53,483 km^2, of which 51,000

km^2 comes under the Himalayan region. The State has 13 districts viz., Chamoli, Pauri Garhwal, Tehri, Rudraprayag, Dehra Dun, Nainital, Udhamsingh Nagar, Almora, Bageshwar, Pithoragarh and Champawat. The State forms the catchment areas of three major river systems viz., Yamuna, Ganga and Kali. The river Ganga is fed by several tributaries viz., Alaknanda, Bhagirathi, Mandakini, Pindar and Vishnu Ganga of the region. Among the mountain peaks are Nanda Devi (7816m, the highest peak of the State), Gauri Parvat, Kamet, Trishul, Chaukhamba, Dunagiri, Panchchuli and Nanda Kot. Gaumukh, Pindari and Milam are the major glaciers in the State, which are visited by numerous tourists, trekkers and nature lovers every year.

The climate of Uttaranchal is strongly influenced by the South-West and North-East monsoons. However, there are mainly three prominent seasons, viz., winter, summer and rainy, while a short period for autumn and spring is noticeable. The State is divisible into four major geologic formations: Siwalik (outer) Himalayas, Lesser (lower) Himalayas, Greater (main) Himalayas and trans-Himalayas (Wadia, 1966). These geologically distinct areas represent different soil types ranging from alluvial soil, podsolic soil, mountain and hill soil and high altitude meadow soil (Singh and Singh 1992).

The State is divisible into four eco-climatic zones viz., sub-tropical (<1500m), warm temperate (1500-2500m), cool temperate (2500-3000m), sub-alpine (3000-3500m), alpine (3500-5500m) and nival (>5500m). According to Champion and Seth (1968) and Osmaston (1926) several forest-types represent different climatic zones. In sub-tropical zone the dominance of moist and dry sal forests, dry riverine (*Acacia-Dalbergia*) forest, dry deciduous (*Acacia-Anogeissus-Aegle-Dalbergia*) forest and dry bamboo brakes are the major forest types. In warm temperate zone, Chir pine (*Pinus roxburghii*) forms the forest with several associates: Chir pine-*Terminalia*, Chir pine-Banj oak (*Quercus leucotrichophora*), Chir pine-*Acacia-Mallotus-Lannea* and Chir pine-*Wendlandia*, while in moist riverine forest *Alnus-Toona, Aesculus-Juglans* form the major communities. In cool temperate zone, all the Oaks [Banj oak; Tilonj oak (*Quercus floribunda*); and Rianj oak (*Quercus lanuginosa*)] form pure forests and in some localities mixed,broadleaved (mainly oaks), while moist Deodar (*Cedrus deodara*), Cypress (*Cupressus torulosa*) and deciduous (*Aesculus-Acer-Juglans*) forests also occupy the similar altitude in the zone. Silver fir (*Abies pindrow*), Kharsu oak (*Quercus semecarpifolia*), mixed Silver fir-Kharsu oak, Silver fir-Birch (*Betula utilis*) and Birch forests predominate in sub-alpine zone. The sub-alpine region terminates at treeline where species of Juniper (*Juniperus*), *Salix* and Birch are commonly found. The herbaceous and shrubby vegetation dominates the alpine region.

In all there are 6 National Parks and 6 Wildlife Sanctuaries in the State, which cover 12.1% of the total geographical area. The State harbours one of the premier biosphere reserves of the country, which has two core zones i.e. Nanda Devi National Park and Valley of Flowers National Park.

Present Analysis

For the compilation of medicinal trees

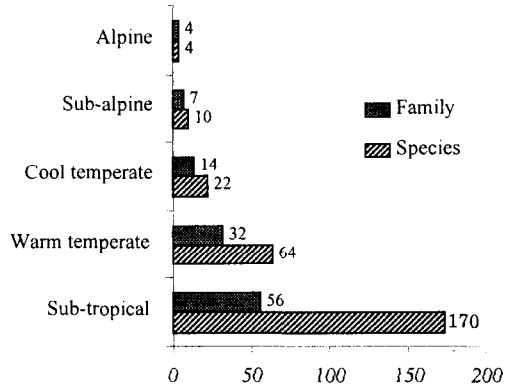
of Uttaranchal State, an extensive survey of literature was carried out, which includes several florulas, such as Anon. (1948-1976), Balodi (1988), Lal and Dube (1984), Duthei (1903-29), Gaur *et al.* (1983), Gaur (1999), Goel and Bhattacharya (1981), Gupta (1962, 1968, 1981), Hooker (1887-1897), Jain (1968, 1991), Kanjilal (1928), Maheshwari and Singh (1984), Maikhuri *et al.* (2001), Naithani (1984), Nautiyal (1981), Osmaston (1926), Purohit and Dhar (1997), Purohit *et al.* (1985), Raizada and Saxena (1978), Rajwar (1983), Rawat and Pangtey (1987), Samant *et al.* (1998), Singh and Prakash (2002), Singh *et al.* (1980), Sharma *et al.* (1979) and Uniyal *et al.* (2002). Bennet (1987) was consulted for name changes.

The information on the medicinal use of trees, altitudinal range, parts used and uses for different ailments was collected and given in Appendix I.

Results

(a) *Medicinal trees: An update* : A total of 197 tree species belonging to 59 families have been identified as medicinally important in the State (Appendix I). The larger families of medicinal trees are in following order: Euphorbiaceae, Fabaceae and Moraceae (11 species) > Rosaceae (10 species) > Lauraceae, Mimosaceae and Caesalpiniaceae (8 species) > Pinaceae, Sterculiaceae and Tiliaceae (6 species). 19 families had one tree species of medicinal value. The total families in each zone with species number is shown in Fig 1. The medicinally important trees comprise nearly 80% of all the tree species recorded in the State (Purohit and Dhar 1997). It was found that 23% species were native to Himalaya.

Fig. 1



Families and Species distribution in different eco-regions

(b) *Distribution of medicinal trees in various eco-climatic regions* : The dominant families present in different regions are listed in Table 1.

Of the total species 86%, 32%, 11%, 5% and 2% species are present in different regions (sub-tropical to alpine). The species in blocks (128, 3 and 1) are exclusively in sub-tropical, warm temperate and cool temperate zones, respectively, while no species were restricted to sub-alpine and alpine zones.

The statistics of the total species for each zone are given in Table 2. The table also depicts the species present between the zones in vertical direction.

(c) *Use pattern* : Bark, leaves, fruits, root, and seed are the most frequently used parts for various ailments. Their ranking in terms of use is as follows: bark (118 species) > leaves (78 species) > fruits (65 species) > root (42 species) > seed (30 species). The contribution of other parts is quite low, e.g., flowers (17 species), stem (9 species), latex (6 species) resin (4 species)

Table 1

Dominant families in diferent eco-regions

Region	Total		Dominant families (species number)	Number of families with single species
	Species	Families		
Sub-tropical	170	56	Euphorbiaceae (11)	15
			Fabaceae (11)	
			Moraceae (10)	
			Caesalpiniaceae (8)	
			Mimosaceae (8)	
			Anacardiaceae (7)	
			Sterculiaceae (6)	
			Myrtaceae (5)	
			Lauraceae (6)	
			Tiliaceae (6)	
Warm temperate	64	32	Rasaceae (9)	6
			Lauraceae (7)	
			Pinaceae (7)	
			Euphorbiaceae (4)	
			Moraceae (3)	
Cool temperate	22	14	Pinaceae (6)	3
			Rosaceae (4)	
Sub-alpine	10	7	Pinaceae (2)	2
			Ericaceae (2)	
			Salicaceae (2)	
Alpine	4	4	-	4

and wood and gum (5 species each). The overall contribution for each plant part is shown in Fig. 2.

Use of plant parts for 24 major diseases was sorted out. It was found that maximum trees are being used for dysentery, fever, diarrhea, Rheumatism, wounds, cholera, skin diseases, bronchitis, cough and asthma. The number of species used for different diseases are shown in Fig. 3.

Prospects of conservation

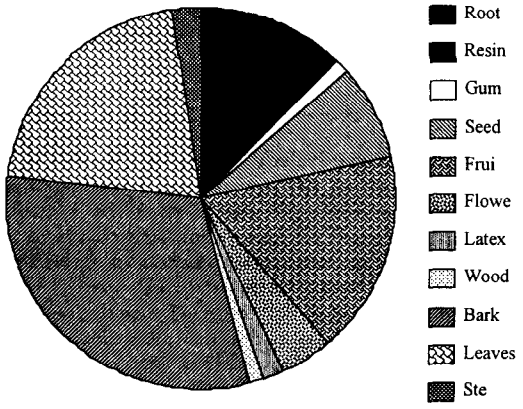
Uttaranchal has been projected as 'Herbal State' of India. Considering its rich forest cover (*ca.* 45% of the State), a wide range of eco-climatic regions and a diverse medicinal flora, there is no doubt that the State has great potential to serve as a model for conservation and development of herbal plants. While alpine region and temperate grassy slopes are ideal for *in-situ* and *ex-situ* conservation of

Table 2

The number of medicinal trees (richness) in different eco-climatic regions of Uttaranchal.

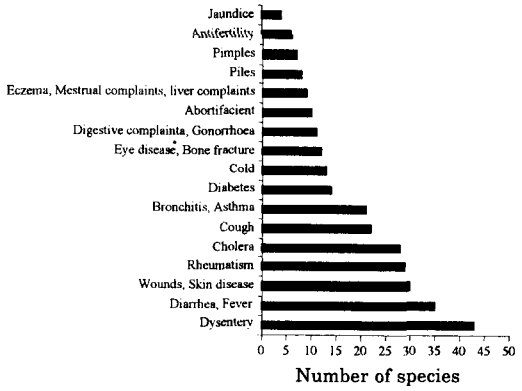
Zone	Altitudinal range (m)				
	< 1500	1500-2500	2500-3000	3000-3500	> 3500
Tropical	128				
Warm temperate	39	3			
Cool temperate	1	11	1		
Sub-alpine	1	6	0	0	
Alpine	1	2	2	0	0
Total	170	64	22	10	4

Fig. 2



Percentage of parts used for various ailments

Fig. 3



Number of species used for different diseases

herbaceous medicinal plants, the areas below 3500m, especially with rich soil, would be ideal for plantation of tree crop, especially multipurpose and medicinally important trees. For example, in the Bhabar (sub-tropical) region Khair (*Acacia catechu*), Bel (*Aegle marmelos*), Harar (*Terminalia chebula*), Bahera (*Terminalia belerica*), Amla (*Emblica officinalis*) and Arjun (*Terminalia arjuna*) can be propagated at commercial scale in the buffer/ecodevelopment zones of Protected Areas, village and community lands. Similarly, the warm temperate region has tremendous potential to harbour a variety of medicinal trees, which would bring modest but perpetual health and economic returns to the local people. While a number of agencies are engaged in promotion of medicinal 'herbs', forestry sector needs to revamp the silviculture of medicinal trees in the State before a large 'niche' of this sector is diluted.

Conclusion

Over 197 species of trees are reported to be medicinally important in Uttaranchal. In recent years, Uttaranchal Government has set up a separate Herbal Development and Research Institute for the propagation and development of medicinal herbs. In addition, several sectors of Government and NGOs have been working towards promotion of medicinal herbs in the State. However, potential of native trees as medicinal plants has been neglected. As silvicultural practices and cultivation techniques for many medicinal trees are already known, forestry sector needs to revamp propagation of medicinal and multi-purpose tree species in various eco-climatic regions of Uttaranchal. At the same time a policy on harvesting protocols needs to be developed by concerned agencies for the wise and sustainable harvest of plant parts.

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SUMMARY

This paper deals with distribution and use pattern of medicinal trees in the State of Uttaranchal, India. Based on extensive literature survey, a list of 197 medicinal trees found in Uttaranchal has been appended. Their altitudinal distribution and parts used in various ailments have been given. Euphorbiaceae, Fabaceae, Moraceae and Rosaceae are the largest families having more than 10 species of medicinal trees. The medicinal trees in different ecological regions found in sub-tropical, warm temperate, cool-temperate, sub-alpine and alpine are 170, 64, 22, 10 and 4, respectively. The major parts used in various ailments are bark (118 species), leaves (78 species), fruits (65 species), root (42 species) and seed (30 species). The diseases such as dysentery, fever, diarrhoea, rheumatism, wounds, cholera, skin diseases, bronchitis, cough and asthma are the most frequent ailments. The prospects of *in-situ* and *ex-situ* conservation of medicinal trees in Uttaranchal State have been discussed.

उत्तराँल राज्य के औषधीय वृक्ष : विस्तारण, उपयोगिता एवं संरक्षण की सम्भावनाऐं

बी०एस० अधिकारी, एम०एम० बाबू, पी०एल० सकलानी व जी०एस० रावत

सारांश

प्रस्तुत शोधपत्र में उत्तराँचल राज्य में पाये जाने वाले औषधीय वृक्षों का विस्तारण एवं औषधीय गुणों का वर्णन किया गया है । पूर्व प्रकाशित साहित्य से किये गये सर्वेक्षण के आधार पर 197 विभिन्न वृक्ष प्रजातियों व उनके उपयोगी भागों की सूची तैयार की गई है । यूफॉर्बियेसी, फैबेसी, मोरेसी तथा रोजसी कुलों में 10 से अधिक औषधीय वृक्ष हैं । सब-ट्रॉपिकल, वार्म, टेम्परेट, कुल टेम्परेट, सब-एल्पाइन तथा एल्पाइन क्षेत्रों में क्रमशः 170, 64, 22, 10 तथा 4 औषधीय वृक्ष प्रजातियाँ मिली हैं । औषधि हेतु मुख्यतया छाल (118 प्रजातियाँ) पत्तियाँ (78%), फल (65%), मूल (42%) तथा बीज (30%) उपयोग में लाये जाते हैं। इन भागों की उपयोगिता अधिकतर ज्वर, उदर विकार, गठिया, घाव, हैजा, चर्म रोग, श्वांस, दमा, और खांसी में होती हैं । इन वृक्षों की स्व-स्थाने (*in-situ*) तथा बहि-स्थानें (*ex-situ*) संरक्षण हेतु सुझाव रखे गये हैं ।

Appendix I

Family & Sc. Name	Local Name	ER	Parts used	Diseases
1	2	3	4	5
ACERACEAE				
Acer acuminatum Wall. ex D.Don	Rath-kanchula, Kanjla	WT-CT	Sd	Abortifacient
ANACARDIACEAE				
Buchanania lanzan Spreng.	Maira, Piyal, Pural	T	Fr, Lv	Indigenous, cough, cold, skin ailments
Lannea coromandelica (Houtt.) Merr.	Kalmina, Jhinghan	T	Lv, Bk	Diarrhoea, cholera, dysentery, stomach ache, sores, swelling, ulcer, wounds
Mangifera indica L.	Aam, Amra	T	Bk, Sd	Haemorrhage, diarrhoea
Pistacia chinensis Bunge	Kakar Singi	T	Fr	Cough, asthma, dysentery Antidote in snake bite, scorpion stings
Pistacia khinjuk Stock.	Kakra-singi, Kakroi	T-WT	Lv and Fl	Cough, fever
Semecarpus anacardium L.f.	Bhilwa, Bhilao	T	Fr, Sd, Rt	Burns, abortifacient, dyspepsia, cough, asthma, epilepsy, gonorrhoea, leprosy, piles, skin diseases, ulcer, throat diseases, sores, wounds
Spondias pinnata (L.f.) Kurz.	Amra, Dieng-soh-per	T	Lv, Fr, Bk	Stomachache, rheumatism, fever, revive taste, dysentery, cholera, ear ache, ringworm, diarrhoea
ANNONACEAE				
Annona squamosa L.	Sitaphal	T	Bk, Sd	Skin disease, abortificant, kill lice
APOCYNACEAE				
Alstonia scholaris (L.) R.Br.		T	Bk, La	Fever, malaria, diarrhoea, headache, sinusitis, leprosy, wounds
Plumeria rubra L.	Gulechin, Khair-champa	T	Bk, Fr, Lv, Fl	Malarial fever, indigestion, lactation, cholera, antifertility, abortificient

Contd...

1	2	3	4	5
Wrightia arborea (Dennst.) Mabb.	Darula, Daira	T	Bk, Lv, Rt	Stomach ache, ear ache, fever, dysentery, colic, menstrual troubles, wounds
ARECACEAE				
Phoenix humilis Royle	Khajoor, Thakal	T	Rt	Sprain
Phoenix sylvestris Roxb.	Khajoor	T	Rt, St, Lv	Menstrual complaints, venereal diseases, gum trouble, toothache, dysentery, diarrhoea
BARRINGTONIACEAE				
Barringtonia acutangula (L.) Gaertn.	Hijala, Paniha	T	Bk, Sd, Rt	Gum trouble, toothache, cholera, liver problems, rheumatism, fish poison
Careya arborea Roxb.	Kumbhi	T	Lv, Bk, Fl, Fr	Face swelling, fistula, eye diseases, cold, cough, amoebiasis, fish poison
BERBERIDACEAE				
Mahonia nepalensis DC.	Nthou	T-WT	Bk, Fr	Skin diseases, fever, eye complaints
BETULACEAE				
Alnus nepalensis Don	Utees	T-WT	Bk, Rt, Lv	Dysentery, stomachache, diarrhoea, wounds
Betula alnoides Buch.-Ham. ex D.Don	Kath-bhuj	T-WT	Bk	Antidote
Betula utilis Don	Bhoj-patra	CT-A	Bk	Spermicidal, wounds
Corylus jacquemontii Decne.		WT-CT	Fr	Tonic
BIGNONIACEAE				
Kingelia africana (Lamk.) Benth.	Balamkhira	T	Fr	Leprosy
Oroxylum indicum (L.) Vent.	Tantia, Arula	T	Bk, Fr, Lv, Rt	Fever, dysentery, diarrhoea, epilepsy, miscarriage, jaundice, piles, purgative, small pox, pimple, dysuria, rheumatism, dyspepsia, induce conception, oedema, headache, tonic, vermifuge, stomachache, chest pain, cholera, colic

Contd...

1	2	3	4	5
Stereospermum chelonoides DC.	Padeli, Paral	T	Rt, Bk, Sd	Stomachache, rheumatism, malaria, liver complaints, asthma, cholera, dysentery, nervous diseases
BOMBACACEAE				
Bombax ceiba L.	Semal, Salmali	T-WT	Fl,Gum	Aphrodisiac, digestive disorders, pimples, anaemia, asthma, chicken pox, cholera, gonorrhoea, leprosy
BURSERACEAE				
Boswella serrata Colebr.	Salar, Salai	T	Bk	Antiseptic, cold, cough, diarrhoea, dysentery, snake bite, stomach trouble, hair growth, sores, epilepsy
Garuga pinnata Roxb.	Titmar, Kaikar	T	Bk, Fr,	Diabetes, asthma, astringent, dysentery, wounds, skin and veneral diseases
CAESALPINIACEAE				
Bauhinia purpurea L.	Guiral, Kwiryal	T	Bk	Astringent, wounds, stomach ache, bone fracture, small-pox, rheumetism, dropsy
Bauhinia racemosa Lamk.	Jhinghora, Kachnal	T	Bk, Fr	Dysenetry, diarrhoea
Bauhinia retusa Ham.	Semla	T	Bk, Lv	Cholera, sores
Bauhinia roxburghiana Voigt.	Semal, Samlu	T	Bk	Sores, cholera, snake bite
Bauhinia variegata L.	Guiral, Kuiral	T-WT	Lv, Bk	Leprosy, bleeding piles, worms, dysentery, indigestion, obsesity, syphilis
Cassia fistula L.	Kirala, Amaltas	T	Lv, Fr	Blood purification, asthma, anti-fertility, antiseptic, burns, dog bite, cough, diarrhoea, gastric, cancer problems, leprosy, liver problems, ringworm, jaundice, stomach ache, toothache, throat swelling, blindness, dysuria, epilepsy, syphilis

Contd...

1	2	3	4	5
Saraca asoca (Roxb.) De Wilde	Ashok	T	Lv, Bk	Urinogenital diseases, tonic, menstrual problems
Tamarindus indica L.	Imli, Ambli	T	Lv,Sd	Boils, indigestion, cold, cough, anthelmintic
CAPPARIDACEAE				
Crataeva adansonii DC.	Barne	T	Lv	Bronchitis, urinary problems, skin diseases
Crataeva religiosa Forst.f.	Barun	T	Lv, Bk, Rt,Bk	Rheumatism, bladder stone, Hydrocoele
CARICACEAE				
Carica papaya L.	Papeeta	T	Fr, Latex, Lv,	Urinary bladder complaints, indigestion, skin ailments, ring worm, constipation, gastric troubles
CELASTRACEAE				
Cassine glauca (Rottb.) Ktze.	Dhebri, Patiyal, Jamrasi	T	Lv	Accelerate sneezing, epilepsy, snake bite
Euonymus tingens Wall.	Konk, Bhambeli, Kumkum	T-WT	Rt, Bk	Dysentery, eye diseases, headache
COCHLOSPERMACEAE				
Cochlospermum religiosum (L.) Alston	Gabdi, Gehra	T	Bk,Rt	Bone fracture, digestive disorders, sores, urinary diseases
COMBRETACEAE				
Anogeissus latifolius Bedd.	Dhauri, Dhawadi, Bankla	T	Bk, Sd	Cholera, cold, diarrhoea, dysentery, headache, leucorrhoea, excess perspiration, spleen trouble, toothache, stomach ache
Terminalia alata Roxb.	Ashna, Sain	T	Wp	Anaemia, antiemetic, burns, cholera, dysentery, fever, haematuria, loose motions, sores, stomachache, wounds

Contd...

1	2	3	4	5
Terminalia arjuna (Roxb. ex DC.) Wt. et Arn.	Arjuna, Kowa, Arjun	T	Bk, Lv	Dysentery, dysuria, pneumonia, sores, pleurisy, leprosy, neuralgia, wounds
Terminalia belerica (Gaertn.) Roxb.	Bahera, Bibhitak	T	Fr,Sd,	Cough, asthma, bronchitis, diabetes, gastric problems, dysuria, cooling, leprosy, liver problems, piles, stomach ache, muscular pain, prugative
Terminalia chebula Retz.	Triphala', Haira, Har, Harara	T	Fr,Sd,	Bronchitis, cold, constipation, dysuria, eczema, dysentery, measles, sores, pneumonia, stomach complaints, spleen problems
CUPRESSACEAE				
Juniperus macropoda Bioss		CT-A	Lv, Fr	Dropsy, gonorrhoea, gleet, leucorrhoea, skin diseases
DILLENIACEAE				
Dillenia indica L.	Chalta	T	Fr	Dyspepsia, bronchitis
DIPTEROCARPACEAE				
Shorea robusta Gaertn.	Sal	T	Resin	Diarrhoea, dysentery, gonorrhoea
EBENACEAE				
Diospyros exsculpta Buch.-Ham.	Tendu	T	Rt, Bk, Fr	Scorpion bite, cuts, wounds, diarrhoea, dysentery
Diospyros malabarica (Descr.) Kost.	Gab, Kala-tendu	T	Fr, Bk	Dyspepsia, diarrhoea
Diospyros montana Roxb.	Pinna	T	Fr, Rt, Bk	Cracked feet, abortifacient, dysuria, fever, facilitate delivery, jaundice, pneumonia, vomiting, diarrhoea
EHRETIACEAE				
Cordia dichotoma Forst.f.	Lasora, Lisora, Koda	T	Sd, Lv, Fr,	Urticaria, ulcer, dyspepsia, expectorant, stomach ache, urinary complaints, jaundice, cholera, cold, cough, chest infection, lung diseases, constipation

Contd...

1	2	3	4	5
Cordia vestita Hk.f. & Th.	Bhairolu, Baurala	T	Fr	Expectorant
Ehretia acuminata Br.	Pudila, Nara	T-WT	Fr, Bk	Sores on tongue
Ehretia laevis Roxb.	Chamror, Khoda	T-WT	Lv	Bodyache, muscular pain, syphilis, diphtheria
ERICACEAE				
Lyonia ovalifolia (Wall.) Drude	Anyar, Aiyaar	T-SA	Sd	Wounds, boils, insecticide
Rhododendron arboreum Sm.	Burans	WT-SA	Lv, Bk, Fr	Respiratory disorders, digestive disorders, dysentery, fever, headache, wounds, rheumatism
EUPHORBIACEAE				
Bischofia javanica Bl.	Kanji, Kat-semla	T	Bk,	Antipyretic
Bridelia retusa (L.) Spreng.	Gauli, Ekadaniya	T	Lv, Rt	Diarrhoea, gargle
Bridelia squamosa (Lamk.) Gehrmann	Asan, Khajra	T	Bk, Fr	Wounds, tuberculosis, back pain, toothache, laxative, arthritis, rheumatism, stomach ache, general debility
Bridelia verrucosa Haines	Goya, Gondni, Kangnalia	T	Rt	Vermifuge
Drypetes roxburghii (Andr.) Focke	Juti, Pitmar	T	Lv	Skin allergy
Emblica officinalis Gaertn.	Anwala, Aola, Aonla	T-WT	Fr, Lv, Bk	Bronchitis, asthma, cooling, burns, constipation, headache, stomach ache, dropsy, madness, liver problems, diabetes, revive taste, dysentery
Macaranga indica Wt.		T	Gum	Wounds
Mallotus philippensis Muell.-Arg.	Rohni, Sindur, Ruin	T-WT	Fr, Sd, Rt	Anthelmintic, blisters, rheumatism, boils, dysentery, skin diseases, snake bite, tonic for pregnant women, ulcer, vermifuge, constipation
Sapium insigne Benth ex Trimen	Khinna	T-WT	La	Germicide
Sapium sebiferum Roxb.	Pahari-Shisham	T	Fr	Purgative, emetic

Contd...

1	2	3	4	5
Trewia nudiflora L.	Gutel, Tumri, Gamhar	T	Rt	Bile problems, phlegm, swelling, rheumatism
FABACEAE				
Butea monosperma (Lamk.) Taub.	Dhak, Tesu	T	Fl,Sd	Anthelmintic, antiseptic, blood purifier, tonic, indigestion
Butea parviflora Roxb.		T	St, Bk, Rt	Cholera, diarrhoea, dysentery, madness, mucus in urine, reheumatic pain in ribs, stomachache, toothache, veneral diseases
Dalbergia lanceolaria L.f.	Takoli, Bitwa	T	St	Fever, tongue infection
Dalbergia latifolia Roxb.	Shisham	T	Bk	Pimples, bodyache, dysentery, eczema, stomachache, ulcer, wounds
Dalbergia sissoo Roxb.	Shisham	T	Lv, St	Gonorrhoea, headache, dysentery, leprosy, skin diseases
Erythrina arborescens Roxb.	Dhauldhak, Mandir	T-CT	Bk, Lv, Rt	Skin diseases
Erythrina suberosa Roxb.	Madaru, Madar	T	Bk	Dysentery, ulcer
Erythrina variegata L.	Mandar, Rakta-mandar	T	Bk, Lv Fr.	Eye problems, anthelmintic, cough, cold, pimples, rheumetism, skin diseases
Ougeinia oojeinensis (Roxb.) Hochr.	Sandan,	T	St, Lv	Bronchitis, cholera, diarrhoea, asthma, dysentery
Pongamia pinnata Pierre	Karanjua	T	Sd, Fl	Bronchitis, chest pain, cold, burns, ear problems, leprosy, eczema
Pterocarpus marsupium Roxb.	Bija-sal, Bija	T	Wd, Bk, Lv, Fl,	Asthma, burns, pain, chest pain, diarrhoea, dysentery, tonic, sores, tongue diseases, stomach ache, toothache, cooling
FAGACEAE				
Quercus leucotrichophora Camus	Bans	T-WT	Sd, Wd	Urinary complaints, scabies, skin diseases

Contd...

1	2	3	4	5
Quercus semecarpifolia Smith.	Kharsu	WT-SA	Rt	Cuts, wounds
FLACOURTIACEAE				
Casearia elliptica Willd	Chila, Chillak	T	Lv, Bk, Fr	Anthelmintic, wounds, blisters, stomach ache, sprain, headache, enlarged scrotum, tonic
Casearia graveolens Dalzell	Chilla, Chillak	T-WT	Rt, Bk, Sd	Liver complaints, stomach ache
Xylosma longifolium Clos.	Khand-gair, Sialu, Katrai	T	Bk	Stomachache
GINKGOACEAE				
Ginkgo biloba L.		T	Lv	Blood circulation, asthma, bronchitis, allergy
HIPPOCASTANACEAE				
Aesculus indica Colebr. ex Camb.	Pangar, Bankhor	T-WT	Sd, Fl, Lv	Rheumatic pain, cracks, leucorrhoea, wounds, diarrhoea
JUGLANDACEAE				
Engelhartia spicata var. *colebrookiana* Kooders & Balet.	Gadh-mauha, Mahwa	T-WT	Bk.	Diarrhoea
Juglans regia L.	Akhrot	WT-CT	Rt, Bk	Teeth cleaning, prevent decaying
LAURACEAE				
Cinnamomum camphora Nees		T	Gum, oil	Fever, cough, chest pain, diarrhoea, rheumatism, cholera, toothache
Cinnamomum tamala Nees	Tejpatta, Dalchini	T-WT	Bk	Dispepsia, throat irritation, heart trouble
Lindera pulcherrima Benth.	Cheri, Cher	WT-CT	Bk, Sd	Wounds, rheumatism
Litsea glutinosa (Lour.) Robins.	Singrau	T-WT	Bk	Bone fracture
Neolitsea cuipala (D.Don)Kost.	Lampatiya	T-WT	Fr	Infested wounds of cattle
Neolitsea pallens (D.Don.) Mom. & Hara	Bilaru	T-WT	Fr	Scabies, eczema

Contd...

1	2	3	4	5
Persea gamblei (King) Kost	Ongtat	T-WT	Bk	Pain
Phoebe lanceolata Nees.	Kaula	T-WT	Fr	Wounds, sores
LYTHRACEAE				
Lagerstroemia parviflora Roxb.	Dhauri, Dhaura	T	Lv, Bk	Cough, bronchitis, sores, syphilis, wounds, asthma
MAGNOLIACEAE				
Michelia champaca L.	Champa	T	Bk, Rt, Fl	Inflamation, antifertility, asthma, cholera, bronchitis, menstrual complaints, dysentery, fever, mucus in urine, menorrhoea, sores, ulcers, boils
MALVACEAE				
Kydia calycina Roxb.	Phuilau, Pulao	T	Bk, Lv, Rt	Body swelling, body ache, boils, diabetes, febrifuge, increases saliva, inflamation, rheumatism
MELIACEAE				
Azadirachta indica A.Juss.	Neem, Nimba	T	Fr, Lv	Antiseptic, skin diseases, kill lice, diabetes, spermicide
Melia azedarach L.	Dainkan, Bakain	T	Lv, Fr	Abortifacient, wormicides, antiseptic, rheumatic pain, skin diseases
Toona ciliata Roem.	Tun, Toon, Cedrla	T	Bk, Lv	Fever, gastric troubles, dysentery, antiseptic
Toona serrata Roem.	Daul, Pahari-tun, Nandaka	T-WT	Lv, Bk	Asthma, ulcer, boils
Trichilia connaroides (Wt. & Arn.)Benth.	Ban-reetha	T	Bk, Lv	Tonic, astringent
MIMOSACEAE				
Acacia caesia (L.) Willd.	Alila	T	Bk, Rt	Cough, bronchitis, measles, fistula, tuberculosis, small-pox

Contd...

1	2	3	4	5
Acacia catechu (L.f.) Willd.	Khair, Katha	T	Bk,Rt	Leucorrhoea, chest pain, mouth sores, menstrual complaints, gonorrhoea, diarrhoea, bronchitis, asthma, consumption, facilitate child birth, nasal bleeding, abortifacient, astringent, dysentery, toothache
Acacia eburnea (L.f.)Willd.	Kikar, pahari kikar	T	Lv	Eczema
Acacia farnesiana (L.) Willd.	Vilyati-kikar	T	Bk	Malaria, rabies, madness, epilepsy, convulsion, cholera, carbuncles, gonorrhoea, eye complaints, anti-fertility, delirium, snake bite
Acacia nilotica (L.)Del. ssp. *indica* (Benth.) Bren.	Babul, Kikar	T	Bk	Bronchitis, asthma, urinary disorders, dysentery, cholera, diabetes, ear complaints, hair loss, leprosy, liver complaints, syphilis, skin diseases, headache, throat infection, burns, eye complaints
Acacia pseudo-eburnea Drum.	Pahari-kikar	T	Bk	Skin disease
Albizia lebbek (L.) Willd.	Siris	T	Sd. Bk	Diarrhoea, dysentery, eye complaints, gonorrhoea, ulcer, piles
Albizia procera (Roxb.) Benth.	Karah	T	Sd	Gonorrhoea
MORACEAE				
Artocarpus lacucha Buch-Ham.	Dhau, Barhar	T	Sd	Conjuctivitis
Ficus benghalensis L.	Barghad	T	La, Ar.Rt, Fr, Bk.	Sexual disorders, spermatorrhoea, tonic, hair growth, diarrhoea, cholera, fever, gum problems, skin diseases, urinary problems, leucorrhoea, eye complaints, cuts, cough, toothache, mouth sores, menorrhoea, dysentery, diabetes
Ficus glomerata Roxb.	Gulmor	T	Bud, Bk,	Blood purifier, diabates, bleeding piles, wounds, nasal bleeding, menstrual problems

Contd...

1	2	3	4	5
Ficus hispida L.f.		T	Sd, Fr, Bk, La	Purgative, emetic, galactagogue, mouth ulcer, facilitate calf-laying
Ficus palmata Forsk.	Fagu	T	La, Fr	Sores, constipation, stomachache
Ficus racemosa L.	Gular	T	Rt, Bk, Lv, Fr	Small pox, stomach disorders, scabies, pneumonia, throat pain, menstrual complaints, dysentery, diarrhoea, boils, blisters, cancer, antifertility, diabetes, skin diseases, galactagogue, hydrocele, muscular pain, leprosy, piles, urinary complaints, cracks on heels and lips, venereal complaints, dislocation of joints, pulmonary diseases
Ficus religiosa L.	Pipal	T-WT	Fr, Bk	Skin ailment, bronchitis, abortifacient, asthma, carbuncle, cholera, rheumatism, mouth sores, toothache, urinary complaints, whooping cough, tonic, small pox, gonorrhoea, haematostat, skin diseases
Ficus semicordata Buch.-Ham. ex Sm.	Khainu	T-WT	Fr, Bk	Leprosy
Morus alba L.	Shahtut, Tutri	T	Fr, Bk	Vermicidal, purgative, refrigerent, dyspepsia, sore throat
Streblus asper Lour.	Dahia, Siora	T	Lv	Skin ailments
Morus australis Poir.	Shahtut, tut	T-WT	Rt	Diphtheria
MORINGACEAE				
Moringa oleifera Lam.	Sunara, Sainjna	T	Rt, Bk, Lv, Fr, Fl	Rheumatism, asthma, antifertility, baldness, facilitate delivery, cholera, dysentery, ear complaints, fever, menstrual complaints, liver complaints, postnatal treatment, wounds, swelling, spleen enlargement, hernia

Contd...

1	2	3	4	5
MYRICACEAE				
Myrica esculenta Ham. ex Don.	Kaphal, Kaiphal	T-WT	Bk	Asthma, diarrhoea, refreshing, fish poison
MYRTACEAE				
Eucalyptus citriodora Hook.	Safeda	T	Lv	Cold, cough
Eucalyptus globulus Labil.	Tephisei	T	Lv, Bk	Malaria, swelling, headache, body ache
Syzygium cumini (L.) Skeels	Jamun, Phalenda	T	Lv,Sd,Fr, Bk	Anaemia, astringent, colic, cancer, diarrhoea, diabetes, piles, digestive problems
Cleistocalyx operculatum (Roxb.) Nied.	Rai-jamun	T	Bk, Lv, Fr	Diabetes, pneumonia, neuralgia, carbuncles, rheumatism, anasarca, sores, pleurisy, astringent, inflamatory
Syzygium venosum (Duthie) Gamble	Dubra, Gulab-jamun	T	Bk	Astringent
OLEACEAE				
Fraxinus floribunda Wall.		T-WT	Bk	Laxative
Fraxinus micrantha Lingelschein	Angu, Angar	T-WT	Lv, Bk	Fever, bleeding dysentery
Osmanthus fragrans Lour.	Silingi	T	Fl,	Mouth and teeth ailments
PANDANACEAE				
Pandanus odoratissimus L.f.	Keura, Ketki	T	Lv, Rt, Infl	Skin diseases, leprosy, scabies, syphilis, miscariage, rheumatic arthritis, perfume, antidote in snake bite
PINACEAE				
Abies pindrow Spach.	Jhilla, Dodimma	WT-SA	Bk	Cough, bronchitis
Abies spectabilis (D.Don) Mirb.	Morinda	WT-CT	Lv, Bk	Fever, asthma, bronchitis

Contd...

1	2	3	4	5
Cedrus deodara (Roxb.) Loud.	Deodar	WT-CT	Bk, Wd	Bowel complaints, piles, lumbago, rheumatic arthritis, urticaria
Picea smithiana Boiss.	Rai, Roi	WT-CT	Resin	Cuts, sores, body pain
Pinus roxburghii Sarg.	Chir	T-WT	Saw-dust	Asthma, bronchitis
Pinus wallichiana Jacks.	Chilla, Kail	WT-SA	Resin	Rheumatic pain
RHAMNACEAE				
Rhamnus virgatus Roxb.	Chentuli, Choudelu	T-WT	Bk	Ringworm, emetic, purgative, eczema
Zizyphus mauritiana Lamk.	Ber, Ajapriya, Badra	T	Fr, Lv, Rt	Dysentery, headache, indigestion, rheumatism, cough, wounds, fever, eye diseases, diarrhoea, cholera, colic, blood purification, sores, spleen problems, ulcers
ROSACEAE				
Malus baccata (L.) Borckh.	Garh-melo, Ban-mohl	T-WT	Fr	Dysentery
Prunus armeniaca L.	Chulu, Chilu	T-WT	Fr	Fever, body pain
Prunus cerasoides Don	Payan, Pezie.	T-WT	Bk	Wounds, cuts, burns, fever, diarrhoea, hoof disease in cattle
Prunus cornuta (Royle) Steud.	Jamna, Jamoni	WT-CT	Sd	Neuralgic pain
Prunus nepaulensis (Sr.) Steud.	Aaru, Khurmani, Larosei	T-WT	Lv, Sd	Antiemetic, headache, scabies
Prunus persica Batsch.	Aaru	T-WT	Fr,Lv, Bk	Cough, cold, supressed urination
Prunus venosa Koehne	Gadh-aru, Aria	WT-CT	Fr	Skin eruptions, sores
Pyrus malus L.	Seb,apple	T-WT	Bk	Fever
Pyrus pashia Buch.-Ham. ex Don.	Garhmehan, Sohshur	T-CT	Lv	Eye problem, digestive disorder
Sorbus cuspidata Hedlund	Mouli	CT	Bk	Fever

Contd...

1	2	3	4	5
RUBIACEAE				
Anthocephalus chinensis (Lamk.) Rich. ex Walp.	Kadamb	T	Bk	Skin diseases, pimples, dysentery, sores, fever, cholera, mouth diseases, snake bite
Ceriscoides turgida Triv.	Thanera, Thanela	T	Fr, Rt	Dyspepsia
Haldinia cordifolia (Roxb.) Rids.	Haldu, Haridrika	T	Bk, Lv, Rt	Diabetes, dysentery, cold, cough, antiseptic, fever, urinarry complaints, scars on skin
Hymenodictyon orixense Mabb.	Boinga, Bandaru	T	Bk, Rt,	Abortifacient, cholera, diarrhoea, inflamatory, fever, malaria, menstruation, sores
Mitragyna parvifolia (Roxb.) Korth.	Phaldu, Kadam, Kaim	T	Lv, Bk	Purgative, cholera, contraceptive, headache, fever, sneezing, leucorrhoea, night blindness, sores, stomach ache, muscular pain
RUTACEAE				
Aegle marmelos (L.) Corr.	Bel, Belpatri, Mahaphal	T	Fr	Digestive disorders, astringent, dysentery, eye trouble, cholera, fever, gastric trouble, constipation, diabetes, diarrhoea
Citrus pseudolimon Tanak.	Pahari-Nimbu, Galgla	T	Fr	Stomachic, carminative, constipation, appetite
Clausena excavata Burm.f.	Agnijal	T	Rt, Lv	Malaria, acidity, fever, muscular pain
SALICACACEAE				
Populus ciliata Wall.	Gar-peepal	WT-SA	Bk	Tonic, stimulant, blood purifier
Populus nigra var. *italica* (Munch.) Koehne	Giutlat, Suket	T-WT	Bk	Bone fracture
Salix babylonica L.	Kashir-vir	T-A	Lv & Bk	Cooling, bone fracture

Contd...

1	2	3	4	5
SAPINDACEAE				
Sapindus mukorossi Gaertn.	Reetha, Arishthak	T-WT	Sd	Fever, hair growth, expectorant, detergent
Schleichera oleosa (Lour.) Oken.	Kusum, Koshamra	T	Sd, Bk, Fr	Hair tonic, pleurisy, pneumonia, fever, itching, rheumatism, skin diseases, wounds, ulcers, paralysis, cholera, burns
SAPOTACEAE				
Aesandra butyracea (Roxb.)Baehni	Chiura, Phalwaru	T-WT	Sd,	Rheumatic pain, fish poison
Madhuca longifolia (Koen.) Mac.	Mahwa	T	Bk, Fl, Lv	Toothache, gum trouble, jaundice, rheumatism, ulcer, colic, chest pain, cough, anstringent, tonic, bronchitis, diabetes, pneumonia
Manilkara hexandra Dubrad	Khirni	T	Fr, Bk	Diagestive complaints, stomachache, chest pain, eye complaints, insanity, bodyache, dysuria
Mimusops elengi L.	Maulsrai	T	Fl, Lv, Bk,	Bronchitis, ulcer, syphilis, sores, small-pox, dropsy, headache, fever, menorrhoea
SIMAROUBACEAE				
Ailanthus excelsa Roxb.	Arua, Arar, Madala	T	Bk, Lv	Febrifuge, abortifacient, bronchitis, cold, cough, rheumatism, skin diseases, swelling, wounds
STERCULIACEAE				
Firmiana fulgens Schum.	Budella, budulu	T	Resin	Tonic,
Pterospermum acerifolium Willd.	Kanak-champa	T	Fl, Lv, Bk	Blood in urine, dehydration, stomach problems, headache, indigestion

Contd...

1	2	3	4	5
Sterculia urens Roxb.		T	Gum, Rt, Bk	Blisters, amoebiasis, bone dislocation, fractures, stomach disorders, throat infection, joint pain
Sterculia villosa Roxb.	Udala, Kardala	T	Gum, Rt	Amoebiasis, constipation, dysentery, night fever, swelling, sores
SYMPLOCACEAE				
Symplocos chinensis (Lour.) Drace	Lodh	T-WT	Bk	Diarrhoea, astringent
Symplocos ramosissima Wall. ex Don	Lodh	WT-CT	Lv	Skin diseases
Symplocos paniculata (Thunb.)Miq.	Lodh	T-WT	Bk	Astringent, diarrhoea
TAXACEAE				
Taxus baccata L. subsp. *wallichiana* (Zucc.) Pilger	Thuner, Rakhal	WT-A	Lv, Bk	Tumour, cancer, tea of medicinal value
TILIACEAE				
Grewia asiatica L.	Pharsula	T	Lv, Fr, Rt	Fever, stomach ache, boils
Grewia helecterifolia Don		T	Rt, St	Headache, eye diseases, carbuncles, sores
Grewia obtusa Wall ex Gamble		T	Lv, Fr	Blisters, boils, ulcers
Grewia optiva Drumm. ex Burret	Bhimal	T	Fr	Fever, dysentery, facilitate child birth, bone fracture,
Grewia tiliaefolia Vahl.		T	Rt, Fr, Bk, Lv	Syphilis
Grewia villosa Willd.		T	Bk	Cholera, dysentery, sores
ULMACEAE				
Celtis australis L.	Khairk	T-WT	Bk.	Pimples, leprosy, sprains, joint pain
Holoptelia integrifolia (Roxb.) Planch.	Papri, Banchilla	T	Bk.	Rheumatic pain
Trema orientalis Bl.	Jivan	T	Bk, Lv	Limb pain
Ulmus wallichiana Planch.	Chamarmora, Mairu	WT-CT	Bk.	Bone fracture

Contd...

1	2	3	4	5
URTICACEAE				
Boehmeria rugulosa Wedd.	Genthi	T	Bk.	Bone fracture
Debregeasia longifolia Wedd.	Tusara	T-WT	Bk	Bone fracture
Debregeasia salicifolia Rendl.	Syanru, Tushaira	T-WT	Bk	Bone fracture
VERBENACEAE				
Callicarpa arborea Roxb	Kumhar, Ghiwala	T	Bk, St, Lv,	Skin diseases, gastric complaints, fever, headache, giddiness, pneumonia, masticatory, sorpion bite
Gmelina arborea Roxb.	Gumbhar, Kumbhar, Shivparni	T	Lv, Rt, Fl, Bk	Antiseptic, asthma, bone fracture, blood purifier, cholera, diarrhoea, dispepsia, dropsy, headache, rheumatism, stomachache, syphilis, urticaria, wounds, small pox, tonic
Premna barbata Wall. ex Schau.	Bakhara, Bakascha	T	St, Bk, Fr, Lv	Eczema, throat pain, rheumatic arthritis
Premna mucronata Cl.	Akond, Gauntia	T	Bk, Fr, St,	Eczema, throat pain, boils, febrifuge
Tectona grandis L.f.	Saigaun, Sagaun	T	Bk, Wd, Fr,Sd	Bronchitis, urinary complaints, eczema, hair tonic, stomach ache, ringworm, swelling, diarrhoea, eye diseases, headache, sores

ER: Ecological regions; T: Tropical, WT: Warm temperate, CT: Cool temperate, SA: Sub-alpine and A: Alpine

Parts Used: Rt: Root, St: Stem, Bk: Bark, Wd: Wood, La: Latex, Lv: Leaves, Fl: Flower, Infl: Inflorescens, Fr: Fruit, Sd: Seed

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