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Inventory of medicinal trees in lower hills of Darjeeling, West Bengal, India

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Abstract

Seven forest types recognised from the tropical and sub-tropical lower hills of Darjeeling district in West Bengal houses a myriad of tree species. Many of these species have potential therapeutic value. Out of the 210 species encountered in the area, 62 species (i.e. 30%) are known to have medicinal values. The numerical strength, distribution, economic potential, use pattern and uses in treating 83 ailments have been highlighted. The potentiality of the study for prioritizing species and habitat for conservation, management along with possibility for carrying out economic activity to benefit the forest dependent communities have been discussed.

***Keywords*:** Inventory, Lower hill, Darjeeling Hills, forest types, medicinal tree, conservation

INTRODUCTION

Among the different habit group of plants, trees form one-third of the total medicinal plants found throughout India (Ved 2006). These are important source of alkaloids, glucosides, essential oils and other physiologically active organic compounds used in treating various ailments. Even today, 70% of the population belonging to 4,000 ethnic communities living in rural India depend on herbal medicine and the tree-species forms significant proportion of the resource (FRLHT, 2006). Many of these medicinal plants can be potential raw material for modern bio-pharmaceuticals and bio-cosmetic industries. Despite their economic importance a baseline data on medicinal tree species is still lacking (Adhikari *et al* 2003; Bhojvaid 2003; Sarin 2003). Estimation of this valuable resource is critical at this juncture when they are becoming rare and/or extinct.

Though, Biswas & Chopra (1956), Rai & Sharma (1996), Rai (2002), Gurung (2002) and Das & Mondal (2003) documented medicinal plants from Darjeeling and Sikkim Himalayas, but the data related to their basic ecology and natural habitat in general is still lacking (Bhojvaid 2003). Forests are true indicators of ecological setup of an area (Roy *et al* 2002). Quantification of medicinal tree species with distribution-abundance information to manage them scientifically is a long awaited need. Such study will provide valuable insight for developing strategy for proper management of the resource (Mayers 1992; Sarin 2003; Bhojvaid 2003).

Conservation of ecosystems such as forests is linked to their potential as sources of medicines (McClatchey, 2005). Like most others species medicinal trees are also facing threat due to habitat shrinkage and fragmentation and over harvesting (Rai & Sharma 2000; Chettri *et al* 2005; Larsen 2005; Olsen 2005). Generally, through the destructive mode bark, root, wood and stem are collected from trees. Many of them have high timber value and as such are traded illegally. This dual use has resulted in depletion of wild population and their regeneration is seriously affected (Das 2004). A scientific inventory at this juncture becomes critical for developing appropriate conservation measures.

The lower hills of Darjeeling district with its extremely variable habitat support a number of distinct forest types and is one of the richest in terms of tree species diversity (Rai & Das 2004). Almost 30% of the tree species have been found to have medicinal value. The present study is aimed at making an inventory of medicinal tree species with detailed information on the abundance

and distribution, economic potential, and use pattern of these plants in the lower hills of Darjeeling district and to provide baseline information for prioritizing species and their habitat for management.

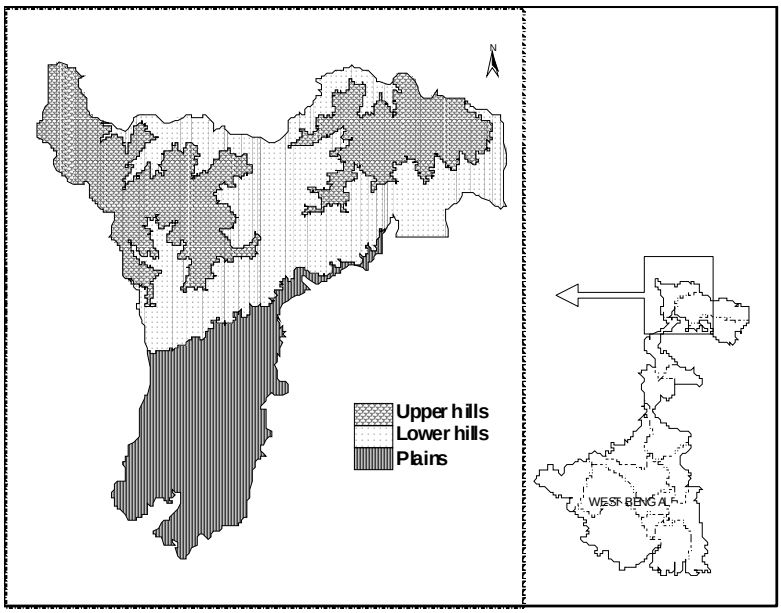

Fig. 1: Study area in the Lower Hills of Darjeeling district

Study Area

The study was conducted along the lower hills of Darjeeling, Kurseong and Kalimpong sub-divisions in Darjeeling district, West Bengal, which belongs to biogeographic zone 2B (the Himalayas) of India (Rodgers & Panwar 1988) and is located between 26° 45' 59.36" - 27° 11' 39.27" N latitude and 88° 07' 03.55" - 88° 53' 04.36" E longitude (Fig. 1). Elevation ranges from 200 m to 1200 m amsl covering a total area of 1230.5 km^2. It covers Mahananda Wildlife Sanctuary and numerous reserve forests that constitute 29.28% of the total district forest cover (Anonymous 1997). The region is an integral part of Eastern Himalaya and is recognised for its rich phyto-diversity (Das 1995, 2004; Bhujel & Das 2002). It is one of the 34 critical centres of biodiversity in the world (Singh & Chowdhery 2002; CI 2005).

Hills in the area are gentle south sloping seven distinct forest types viz. *Himalayan Sal Forest, Tropical Semi-evergreen Forest, Moist Mixed Deciduous Forest, Riverine Forest, Sub-tropical Broad Leaved Forest, Bamboo Brakes* and *Degraded Forest* (Rai & Das 2004; Rai 2006) have been recognised there. These forests have been recognised by Champion and Seth (1968) under *Group 2B* and *Group 3C* in their revised classification.

The overall climate of the area is sub-tropical and the average minimum and maximum temperature ranges between 17.34° C and 23.02° C. The average monthly minimum and maximum rainfall ranges between 17.48 – 839.28 mm and an average annual rainfall of 3454.60 mm. The annual mean relative humidity of the study area is 78.62%. The general soil type is light sandy loam with coarse texture and clayey. Forests floor is covered with a thick mantle of humus.

METHODS

Forest types recognised in the present study are based upon the integrated approach with real time ground truth in conjunction with satellite remote sensing image and GIS. In the present study a stratified random sampling approach was adopted to make an inventory of tree species using 20 × 20 m quadrat (Anonymous 2003). The sampling sites were chosen at least 500 m away from the road and village settlements to minimise human interference as it favours exotic and introduced species (McIntyre & Lavorel 1994).

Stands with more than 15 cm girth at breast height (gbh) were considered as trees. Lianas with girth exceeding 10 cm gbh are also included in the present analysis. In case of buttressed trees

girth was measured just above the buttress, and if a tree was branched below breast height, it was counted as two (or more) individuals and each measured separately. Identification of a species with local name was done in the field itself. Doubtful and unidentified species were identified by consulting literatures and matching herbarium specimens at NBU and CAL after proper processing (Jain & Rao 1977).

Data generated in the field were pooled to understand the phytosociological characteristics like percentage frequency, density (stand density/ha) and basal area (m^2/ha) (Misra 1969) for all the seven forest types. Depending upon the numerical strength of a tree species and their extent of occurrence they were categorised as sparse, fair, medium and good. Information on the medicinal uses of the species was gathered mainly from the secondary sources, through literature and websites to understand their use pattern, economic potential for exploitation

RESULTS AND DISCUSSION

Results of inventory from 82 sample plots in 7 forest types recorded the presence of 210 species of trees in the lower hills of Darjeeling district. The information on the species encountered and number of plot studied is provided in Table 1. The total species encountered in the lower hills constitutes 45.36% of Bhujel's (1996) enumeration of tree species from entire Darjeeling district. Such species heterogeneity can be seen only in the tropical forests (Padalia *et al* 2004). Out of the total species recorded, 62 (29.52%) have known medicinal properties. This figure accounts to 54.4% of medicinal tree species enumerated from Sikkim (Gurung 2002).

Table 1: Plot information of each forest types

Forest Type	No. of Plots	Total species
Tropical Semi-evergreen Forests	7	51
Himalayan Sal Forests	26	77
Moist Mixed Deciduous Forests	15	80
Riverine Forests	9	42
Sub-Tropical Broad Leaved Hill Forests	6	60
Bamboo Brakes	12	42
Degraded Forests	7	31
Total	**82**	**210**

Distribution of Medicinal tree taxa

Medicinal tree species recorded from the lower hills were distributed in 54 genera and 35 families (Fig. 2). Better represented families are Euphorbiaceae (6 species), Combretaceae (5 species), Anacardiaceae (4 species), Mimosaceae (4 species), Verbenaceae (4 species), Apocynaceae (3 species), Moraceae (3 species) and Sterculiaceae (3 species) (Fig. 3). Bignoniaceae, Caesalpiniaceae and Ulmaceae contributed 2 species each and rest 24 families were represented by single species.

Analysis of the number of tree species in each forest types revealed a rich repository of the resource. The number of medicinal tree varied from 17 to 35 species in different forests. *Himalayan Sal Forest* recorded 35 of 77 species of medicinal trees accounting to 45.53% and forms significant proportion of tree species composition. This is followed by *Moist Mixed Deciduous Forest* with 29 of 81 species recorded (35.80%). Other forest types showed lesser percentage of medicinal tree species. A comparative figure of medicinal tree species against total species for each forest is provided in Fig. 4. Quite interestingly, *Bamboo Brakes* and *Degraded Forest* recorded a comparatively high percentage of medicinal tree species (59.52% and 54.84% respectively). This value suggested that these forests have experienced heavy removal of valuable timber yielding species. Another possible reason may be due to their low timber value that keeps them safe from

the timber raiders. It was also observed that these forests were heavily infested by bamboo (*Dendrocalamus hamiltonii*), which arrested the regeneration of other species and only those species that are tolerant to bamboo could survive.

Tree Density per hectare

A comparative distribution of tree stands of medicinal tree species per hectare in different forests revealed wide differences. *The Himalayan Sal Forest* again showed good numerical strength with 487 of the total 607 trees/ha contribution 80.18% of the total individuals recorded. This is followed by *Moist Mixed Deciduous Forest* with 320 of 553 trees/ha (57.83%). For *Riverine Forest* and *Sub-tropical Broad Leaved Forest* medicinal tree density/ha were calculated at 55.8% and 40.12% respectively. *Tropical Semi-evergreen Forest* exhibited lowest percentage (38.6%). The total tree density for all forest types except for *Bamboo Brakes* and *Degraded Forest* are comparable with the findings of lower hills of Darjeeling (Kapoor *et al*. 1989; Uma Shankar *et al.* 1998) and tropical forests of Garo Hills in Meghalaya (Kumar *et al*. 2006). Numerically the *Bamboo Brakes* and *Degraded Forests* showed comparatively less individuals of medicinal tree species (148 and 154 trees/ha) but their percentage contributions were 81.72% by far the highest and 56.67% respectively. The medicinal trees against the total trees/ha is provided in Fig. 5. Such quantitative information on the resources is important for bioprospecting (Sarkar & Margule 2002). High percentage of medicinal species in some of these forests suggests their vital role in moderating these forest ecosystems. It also has an important bearing on local people depending on these plants resource for their primary health care.

Abundance

Percentage frequency and density per hectare provide information about the general distribution pattern and its numerical strength indicating rarity (Ambashat & Ambashat 1995). This information will be helpful in formulating conservation measures. The habitat distribution, frequency and density/ha of these species are provided in Table 2. An analysis on general abundance revealed 53.2% of the medicinal tree species were found to have sparse to rare distribution, whereas 19.35%, 20.97% and 6.45% showed fair to good distribution (Fig. 6). Some species were recorded only in one forest type with low frequency and their stand density/ha suggest rarity in the study area. These species are *Buchanania lanazan, Dillenia indica, Terminalia arjuna, Dalbergia sissoo, Kydia calycina.* They are abundant in the plains, which might have migrated to the foothills and are in the process of establishing themselves. The first three species are found in *Himalayan Sal Forest* and fourth and the last in *Moist Mixed Deciduous Forest* and *Bamboo Brakes* respectively.

Other important medicinal species with restricted distribution are *Acacia catechu, Michelia champaca, Bischofia javanica, Pterygota alata, Streblus asper, Pinus roxburghii,* etc. These indigenous rare species attaches higher conservation value as they contribute more to local biodiversity than the ubiquitous species (Duelli & Obrist 2003). Their localised distribution over spatial extent suggests special niche requirement. These species have become vulnerable by both direct and indirect human activities. Any imbalance in the ecosystem will have an adverse effect on their survivability. The most commonly occurring species within the study area are *Stereospermum colais, Mallotus philippensis, Schima wallichii* and *Lagerstroemia parviflora.*

Economic potential

Analysis of the economic potential of the 62 tree species revealed that 6 species have high market demand Sarin (2002). These species are *Emblica officinalis, Terminalia chebula, Terminalia bellirica, Gynocardia odorata, Holarrhaena pubescens,*and *Sapindus rarak.* The *Himalayan Sal Forest* recorded all 6 species while *Bamboo Brakes* recorded first 4 species. *Mallotus philippensis, Oroxylum indicum* having moderate economic value are common throughout the lower hills. These forests provide an ideal habitat to these species. An appropriate intervention by the forest department to

exploit this resource would ensure conservation of the resource, at the same time benefit forest dependent communities as a means of livelihood. List of medicinal plants found in Darjeeling Sub-Himalayan foothills with their local name, parts used and uses for different ailments along with their distribution is provided in Appendix I

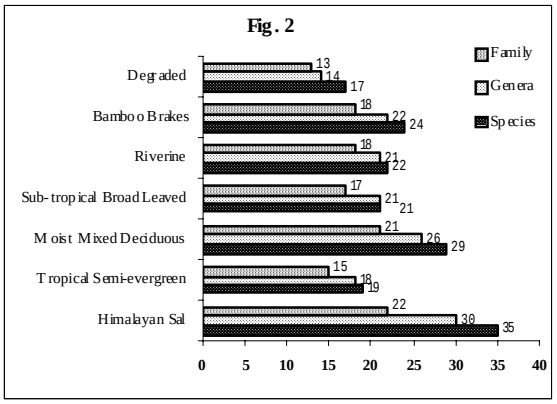

Fig. 2: Forest type-wise taxic distribution

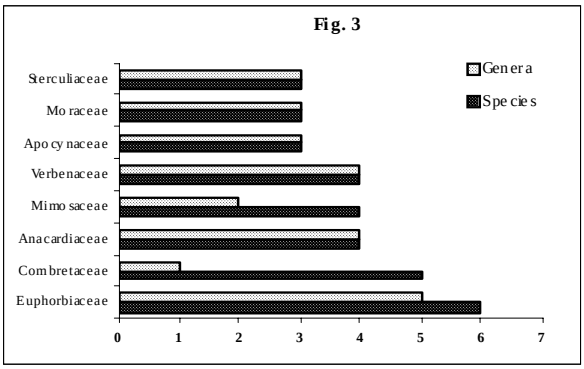

Fig. 3: Species and genera representation of 8 dominant families

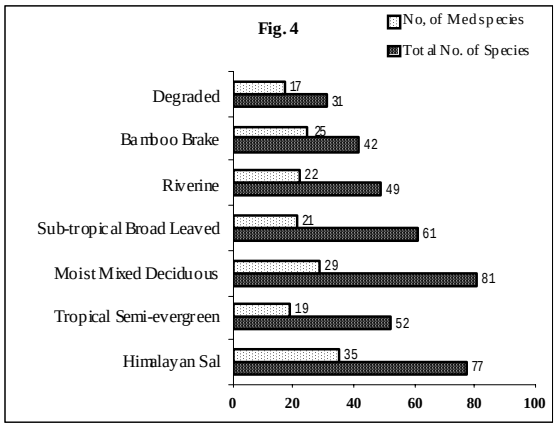

Fig. 4: Number of medicinal tree species

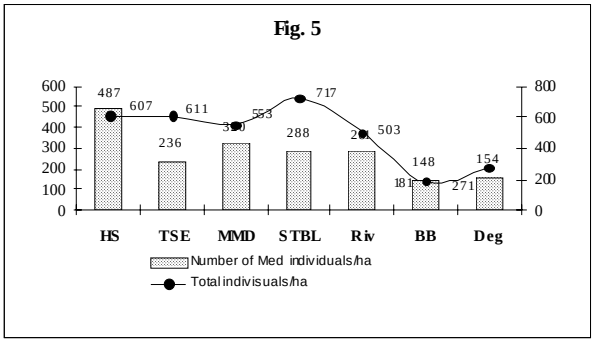

Fig. 5: Comparative distribution of trees/ha

Use pattern

The analysis of 62 tree species with respect to parts used indicates that bark, leaves, seeds, roots and fruits are most prevalent (89.34%). Barks constitute 31% of the total inventoried species (37 species), leaf 18% (22 species), seeds and roots 14% each (17 species). Harvesting of such parts has implication on the survival and sustainability of the wild population. Latex, gums and resins of few species are also in use but their usage percentage is much less. Contribution of different plant parts used is shown in Fig. 7. All the 62 species are used to treat 82 different ailments ranging from common ones like fever, diarrhoea, dysentery, wounds to chronic disease like rheumatism, leprosy etc (Appendix I).

CONCLUSION

An inventory of medicinal tree species in the forest of lower hills of Darjeeling revealed their good occurrence. Some of the species are common being present in almost all forest types, but few of them are rare and restricted to single forest type only with lesser number of individuals. Conservation for such species needs to be addressed at habitat level rather than species alone. Identification of

the habitat for rare species provides basis for conservation initiatives. Quantitative and qualitative information on the medicinal plant resources and their economic valuation for different vegetation provide right perspective in prioritizing habitats for medicinal plant species. The traditional timber based forest management and medicinal plant (tree species) can be coupled together to develop effective management plan. Silvicultural practices for some of these species are already known and propagation of these species as multipurpose species in suitable habitat will help in effective conservation.

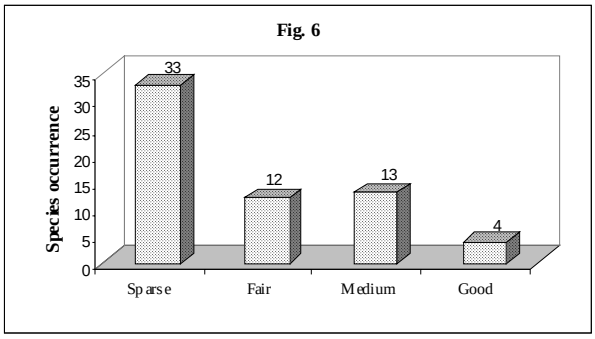

Fig. 6: Species distribution pattern in the lower hill forests

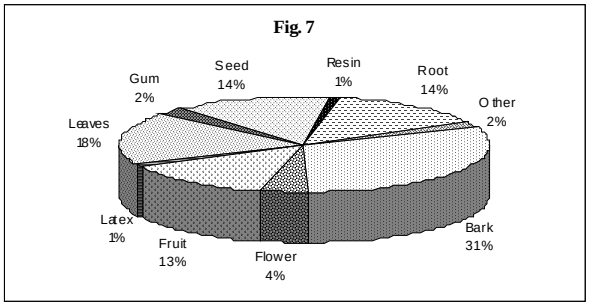

Fig. 7: Different parts used with percentage

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APPENDIX I: Medicinal trees in lower hill vegetation in Darjeeling along with their uses and availability.

[**Abbreviations used:** HS: Himalayan Sal Forest; MMD: Mixed Moist Deciduous Forest; Riv: Riverine Forest; STBL: Sub-Tropical Broad Leaved Hill Forest; TSE: Tropical Semi-evergreen Forest; BB: Bamboo Brakes; Deg: Degraded Forest; Bk: Bark; Lvs: Leaves; La: Latex; St: Stem; Rt: Root; Fr: Fruit; Sd: Seed; Fl: Flower]

Name	Family	Local Name	Plant parts used	Medicinal uses	Occurrence
Acacia catechu (L.f.) Wild.	Mimosaceae	Khair	Bk, Rt	Chest pain, menstrual disorder, diarrhoea, dysentery, gonorrhoea, bronchitis, facilitate child birth, toothache, asthmab	HS,TSE, MMD, STBL, Riv, BB, Deg
Albizia lebbeck (L.) Benth.	Mimosaceae	Siris	Sd, Bk	Diarrhoea, dysentery, eye complaints, gonorrhoea, ulcer, piles	HS,TSE, MMD, STBL, Riv, BB, Deg
Albizia odoratissima (L.f.) Benth.	Mimosaceae	Kukur siris	Bk	Intermittent fever	HS,MMD, STBL, Riv, BB, Deg
Albizia procera (Roxb.) Benth. Deg	Mimosaceae	Seto siris	Sd	Gonorrhoea	HS,TSE, MMD, STBL, BB,
Alnus nepalensis D. Don	Betulaceae	Uttis	Bk, Rt, Lvs	Dysentery, stomach ache, diarrhoea	HS, MMD, STBL, BB, Deg
Alstonia scholaris (L.) R. Br.	Apocynaceae	Chatiwan	Bk, La	Fever, malaria, diarrhoea, sinusitis, leprosy, strengthens teeth	HS,TSE, MMD, STBL, BB
Anthocephalus cadamba Miq.	Rubiaceae	Kadam	Bk	Cholera, fever, dysentery, skin diseases, mouth diseases, snake bite	HS, MMD, STBL, BB, Deg
Bassia butyracea Roxb.	Sapotaceae	Chiwri	Sd	Fish poison, rheumatism	HS,MMD, STBL, Riv, BB
Bauhinia purpurea L.	Caesalpiniaceae	Koirala	Bk	Smallpox, rheumatism, dropsy, bone fracture, stomachache	HS, MMD, Riv, BB, Deg
1*Bauhinia variegata* L.	Caesalpiniaceae	Tanki	Lvs, Bk	Piles, dysentery, Leprosy, indigestion, obesity, syphilis	HS, MMD, Riv, BB, Deg
1*Bischofia javanica* Bl.	Bischofiaceae	Kaijal	Bk	Fever	HS, MMD, BB, Deg
1*Bombax ceiba* L.	Bombacaceae	Simal	Fl, Gum	Aphrodisiac, stimulant, nerve tonic, haemorrhage, asthma, cholera, leprosy, digestive disorder, anaemia, chickenpox	HS,TSE, MMD, Deg
Bridelia retusa (L.) Spreng.	Euphorbiaceae	Gayo	Lvs, Rt	Diarrhoea, rheumatism	HS, MMD, Riv, Deg
Bridelia sikkimensis Gehrm.	Euphorbiaceae	Gayo	Rt	Intestinal worms	HS,TSE, MMD, STBL,
Buchanania lanazan Spreng.	Anacardiaceae		Fr, Lvs	Cold & cough, skin disease	HS,TSE, MMD, STBL,
Callicarpa arborea Roxb.	Verbenaceae	Guyenlo	Bk, St	Skin diseases, gastric complaints, masticatory, pneumonia, fever, scorpion bite	HS,TSE, Riv, Deg
Careya arborea Roxb.	Lecythidaceae	Kumbi	Lvs, Bk, Fl, Fr	Eye disease, cough, amoebiasis	HS,TSE, MMD, Riv
Caryota urens L.	Palmae	Rangbhang	Fr	Dysentery	Riv
Celtis timorensis Spanoghe	Ulmaceae	Khari	Bk	Leprosy, joint pain, pimples, sprains	TSE, MMD, Deg
Colebrookea oppositifolia Sm.	Labiatae	Chusre	Rt, Lvs	Epilepsy, intestinal worms, wound, sores, bruises	MMD, BB, Deg
Crateva religiosa Forst. f. Agg.	Capparaceae	Sipli	Lvs, Bk, Rt	Rheumatism, bladder stone, hydrocele	HS, STBL, BB
Dalbergia sissoo DC.	Papilionaceae	Sisu	Lvs, Sd	Gonorrhoea, dysentery, skin disease, leprosy	Riv, BB, Deg
Dillenia indica L.	Dilleniaceae	Panchphal	Fr	Dyspepsia, bronchitis, arthritis	TSE, STBL, BB
Engelhardia spicata Bl.	Juglandaceae	Mawa	Bk	Diarrhoea	TSE, STBL, BB
Ficus semicordata Sm.	Moraceae	Kalo khasrey	Fr, Bk	Leprosy	HS,TSE, MMD
Gmelina arborea Roxb.	Verbenaceae	Gamari	Lvs, Rt, Fl, Bk	Antiseptic, bone fracture, blood purifier, cholera, diarrhoea, dyspepsia, dropsy, rheumatism, syphilis, small pox	HS, MMD, Riv
Grewia optiva Burret	Tiliaceae	Syal phusrey	Fr	Dysentery, facilitates child birth, fever, bone fracture	HS, MMD, Riv
Gynocardia odorata R. Br.	Flacourtiaceae	Gantey	Sd	Leprosy, skin diseases	HS, STBL, BB
Holarrhena pubescens (Buch. –Ham.) G. Don	Apocynaceae	Khirra	Bk	Dysentery	HS, MMD, Riv
Kydia calycina Roxb.	Malvaceae	Kubindey	Bk, Lvs, Rt	Diabetes, fever, rheumatism, boils, inflammation	HS, Riv, BB
Lagerstroemia parviflora Roxb.	Lythraceae	Sidha	Lvs, Bk	Asthma, bronchitis, cough, syphilis, sores & wounds	BB, Deg

Name	Family	Local Name	Plant parts used	Medicinal uses	Occurrence
Lannea corommendelica (Houtt.) Merr.	Anacardiaceae	Dabdabey	Lvs, Bk	Dysentery, diarrhoea, sores, swellings cholera, stomachache	MMD, STBL
Litsea glutinosa (Lour.) Robinson	Lauraceae		Bk	Bone fracture	HS, Riv
Macaranga indica Wt.	Euphorbiaceae	Malata	Gum	Wounds	MMD, STBL
Mallotus philippensis (Lam.) Muel.	Euphorbiaceae	Sindurey	Rt, Fr, Sd	Intestinal worm, carminative, appetizer, rheumatism, dysentery, boils, skin disease, constipation, tonic, ulcer	STBL, BB
Mangifera indica L.	Anacardiaceae	Aap	Bk, Sd	Haemorrhage, diarrhoea	TSE, STBL
Michelia champaca L.	Magloniaceae	Chanp	Bk, Rt, Fl	Antifertility, inflammation, cholera, asthma, bronchitis, menstrual complaints, dysentery, fever, menorrhea, mucus, sores, ulcers, boils, stimulant	HS, BB
Morus macroura Miq.	Moraceae	Tholu Kimbu	Rt	Jaundice	Riv
Oroxylum indicum (L.) Vent.	Begnoniaceae	Totola	Bk, Fr, Lvs, Rt	Fever, dysentery, diarrhoea, epilepsy, miscarriage, piles, jaundice, smallpox, dyspepsia, rheumatism, oedema, cholera	TSE, Riv
Phyllanthus emblica L.	Euphorbiaceae	Amala	Fr, Lvs, Bk	Bronchitis, asthma, constipation, dropsy, liver problem, dysentery, diabetes, headache	HS, MMD
Pinus roxburghii Sarg.	Pinaceae	Dhup	Saw-dust	Asthma, bronchitis	HS
Premna mucronata Roxb.	Verbenaceae	Gineri	Bk, Fr	Eczema, throat pain, boils, febrifuge	TSE, MMD
Pterospermum acerifolium (L.) Wild.	Sterculiaceae	Hatipailey	Fl, Lvs, Bk	Indigestion, stomach problem blood in urine, headache, tonic	HS, MMD
Pterygota alata (Roxb.) R. Br.	Sterculiaceae	Nareola Badam	Sd	Hallucinogen, tranquilizer	Riv
Rhus semialata Murray	Anacardiaceae	Bhakimlo	Fl, Sd	Blood dysentery, diarrhoea, stomachic, laxative	Hs
Sapindus rarak DC.	Sapindaceae	Ritha	Sd	Fever, hair growth, detergent, expectorant	STBL
Schima wallichii (DC.) Korthals	Theaceae	Chilauney	Bk	Anthelmintic & rubefacient	STBL
Shorea robusta Gaertn. f.	Dipterocarpaceae	Sal	Resin	Diarrhoea, dysentery, gonorrhoea	HS
Sterculia villosa Sm.	Sterculiaceae	Odal	Gum, Rt	Amoebiasis, bone dislocation, fractures, throat infection, joint pains, stomach disorders	Riv
Stereospermum colais (Dillwyn) Mabb.	Bignoniaceae	Parari	Rt, Bk, Sd	Stomachache, rheumatism, malaria, liver complaints, asthma, cholera, dysentery, nervous disease	BB
Strebulus asper Lour.	Moraceae	Kakshi	Lvs	Skin ailmen	HS
Syzygium cumini (L.) Skeels	Myrtaceae	Jamuna	Lvs, Sd, Fr, Bk	Anaemia, astringent, colic, cancer, diarrhoea, diabetes, piles, digestive problem	TSE
Tectona grandis L.f.	Verbenaceae	Teak	Bk, Fr, Sd	Ringworm, diarrhoea, bronchitis, urinary complaints, hair tonic, eye disease, eczema	TSE
Terminalia alata Roth	Combretaceae	Pakha shash	Wp	Anaemia, cholera, dysentery, fever, sores, stomachic, wounds	TSE
Terminalia arjuna Bedd.	Combretaceae	Arjun	Bk, Lvs	Dysentery, pneumonia, dysuria, leprosy, neuralgia, pleurisy, wounds	MMD
Terminalia bellirica (Gaertn.) Roxb.	Combretaceae	Barra	Fr, Sd	Cough, asthma, bronchitis, diabetes, gastric problems, dysuria, liver problems, piles, leprosy, muscular pain	HS
Terminalia chebula Retz.	Combretaceae	Harra	Fr, Sd	Bronchitis, cold, constipation, dysuria, eczema, dysentery, measles, sores, pneumonia, stomach disorder, spleen problem	BB
Terminalia myriocarpa Heurck & Muel.	Combretaceae	Pani sag	Bk	Internal haemorrhage, Bodyache	STBL
Toona ciliata Roem.	Meliaceae	Tooni	Bk, lvs	Fever, gastric troubles, dysentery, antiseptic	MMD
Trema orientalis (L.) Bl.	Ulmaceae	Kuail	Bk, Lvs	Limb pain	HS
Trewia nodiflora L.	Euphorbiaceae	Ramritha	Rt	Bile problems, phlegm rheumatism, swelling	Riv
Wrightia arborea (Dennstd.) Mabb.	Apocynaceae	Khirra	Bk, Lvs, Rt	Fever, dysentery, menstrual troubles, colic	Riv