

Full Length Research Paper

Diversity, distribution, indigenous uses and conservation prioritization of the economically important floristic diversity in Nadaun Block of Hamirpur District, Himachal Pradesh

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The present study was carried out in 11 representative villages in Nadaun Block of Hamirpur district in Himachal Pradesh. Total 265 economically important species belonging to 81 families and 211 genera includes 78 species of trees, 46 shrubs and 141 herbs were records. The dominant families were Poaceae (20 species); Fabaceae (18 species) and Asteraceae (14 species). Twenty eight (28) families were monotypic. The inhabitants use these species as medicine (210 species), wild edible/food (109 species), fodder (88 species), fuel (42 species) for religious purpose (23 species), making agricultural tools (6 species), timber (12 species) and miscellaneous (12 spp). It was found that out of 265 economically important species recorded, 26 were found to be native to the Himalayan region, 10 species native to the Himalayan region and adjacent countries and states, 243 species were non-natives. Out of the total recorded species, one species has been categorized as critically endangered, four species endemic, seven species near endemic and 14 species vulnerable.

Key words: Himalayan region, economically important, monotypic, critically endangered, vulnerable, near endemic.

INTRODUCTION

Himalaya meaning “abode of snow” is one of the largest mountain chains in the world, where floral and faunal diversity vary extensively with climate from one region to another. The Indian Himalayan Region (IHR) covering approximately 4,19,873 km² includes parts of Jammu and Kashmir, Himachal Pradesh, Uttarakhand (Garhwal and

Kumaun), West Bengal (Darjeeling Hills), Sikkim, Arunachal Pradesh and other north eastern states. The present paper focused on diversity, distribution, indigenous uses and conservation prioritization of the economically important floristic diversity in Nadaun Block of Hamirpur district, Himachal Pradesh.

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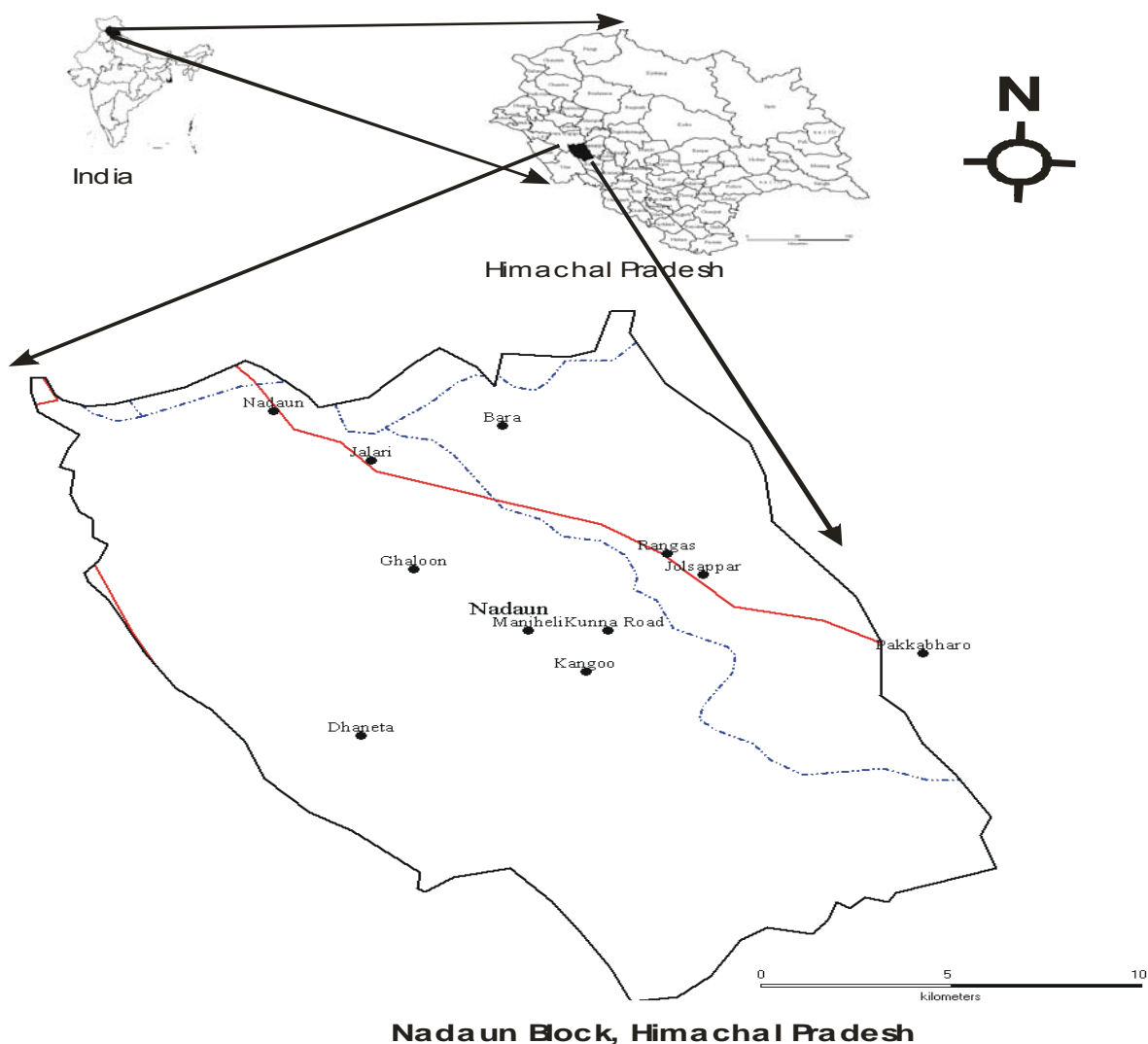


Figure 1. Map of the study area.

This region supports about 18,440 plant species, out of which 27% are endemic to the Himalaya (Samant, 1998). 1748 species of medicinal plants with various traditional and modern therapeutic uses (Samant, 1998), 675 species of wild edibles (Samant and Dhar, 1997), 279 species of fodder (Samant, 1998) and 155 sacred plants (Samant and Pant, 2003) have been reported from the Indian Himalayan Region (IHR).

MATERIALS AND METHODS

Study area

The State of Himachal Pradesh (30° 22' 4" to 33° 12' 40" N latitudes and 75° 47' 55" to 79° 04' 20" E longitudes) includes the parts of Trans and North Western Himalaya. Of the total area, 66.45% is under forests. Of the total forest, 20.45% area is under Protected Area Network and 3.41% area under reserve forests.

The present study was conducted in eleven representative villages: Kangoo, Dhaneta, Nadaun, Bara, Jalari, Rangas, Ghaloo,

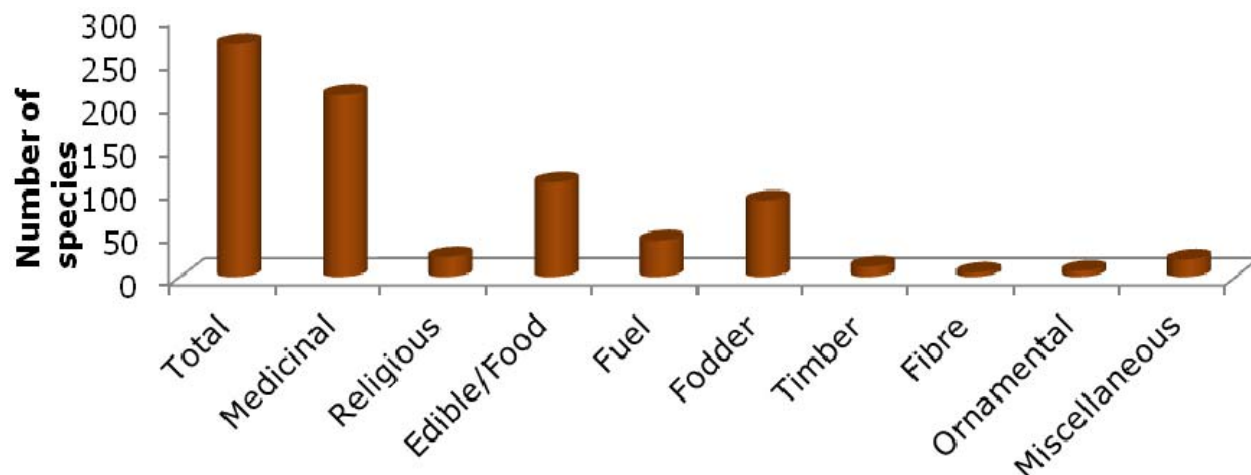
Pakkabharo, Manjhali, Jolsappa, and Kunna road. Nadaun Block is located at 31°47'N 76°21'E to 31.78°N 76.35°E. It is not a typical "Hilly and Chilly" type of climate in Nadaun Block as it is closer to the plains. Mainly humid sub-tropic zone occur. The mean annual temperatures vary from 20-24°C and mean annual precipitation is 1180 to 1900 mm. There has been a report of snow only once in Nadaun in 2012. Agriculture and horticulture are the amongst major livelihood options of the villages. The study area is highlighted in the Figure 1.

Eleven representative villages were selected to take information on the economically important floristic diversity and their utilization pattern by the inhabitants. Further, knowledgeable persons including village Vaidhyas from each village were interviewed. Information on the local names, altitudinal range, life forms, part(s) used, and use values including indigenous knowledge and practices were gathered.

Fresh samples of the useful species were collected and identified with the help of available literature and floras (Pangtey et al., 1991; Purohit and Samant, 1995; Samant and Pangtey, 1995; Sharma and Singh, 1996; Kala et al., 1998; Singh and Rawat, 2000; Kaur and Sharma 2004). The information was compiled and analysed for the utilization pattern following Samant, (1998).

Table 1. Taxonomic/habit wise description of economically important plants in the Nadaun Block.

Taxonomy/ habit group	Family	Genera	Species	Herbs	Shrubs	Trees
Angiosperms	80	210	264	141	46	77
Gymnosperms	1	1	1	-	-	1
Total	81	211	265	141	46	78

**Figure 2.** Utilization pattern of floristic diversity for various purposes

RESULTS

Diversity, distribution and utilization pattern

The present study records 265 economically important species belonging to 81 families and 211 genera from the Nadaun Block. Of the recorded species, 78 species were trees, 46 shrubs and 141 herbs (Table 1). The recorded species were distributed at altitude between 450-1000 masl. The dominant families were Poaceae (20 spp.); Fabaceae (18 spp.); Asteraceae (14 spp.); Lamiaceae (10 spp.); Moraceae, Caesalpiniaceae and Brassicaceae (9 spp. each); Cucurbitaceae and Apocynaceae (eight spp., each); Rutaceae and Solanaceae (seven spp., each); Euphorbiaceae and Rosaceae (six spp., each); Apiaceae and Myrtaceae (five spp., each), respectively. *Brassica* (five spp.); *Bauhinia*, *Terminalia* and *Citrus* (four spp., each); *Albizia*, *Prunus* and *Cassia* (three spp., each); *Achyranthes*, *Agave*, *Trachelospermum*, *Asparagus*, *Ageratum*, *Bidens*, *Berberis*, *Cucurbita*, *Euphorbia*, *Vigna*, *Mentha*, *Allium*, *Acacia*, *Morus*, *Syzygium*, *Dendrocalamus*, *Saccharum*, *Pyrus*, *Grewia*, *Viola* and *Vitis*, (two spp., each) were the dominant genera. Twenty eight families were monotypic. The inhabitant of Nadaun Block use these species as medicine (210 spp.), wild edible/food (109 spp.), fodder

(88 spp.), fuel (42 spp.), for religious purpose (23 spp.), making agricultural tools (6 spp.), for timber/house building (12 spp.), and for other purposes (12 spp.) (Figure 2).

The notable medicinal plants were *Adhatoda vasica*, *Acorus calamus*, *Achyranthus aspera*, *Centella asiatica*, *Spilanthes oleracea*, *Terminalia arjuna*, *T. chebula*, *Cuscuta refle*, *Ajuga parviflora*, *Mentha longifolia*, *Aloe barbadensis*, *Azadirachta indica*, *Melia azedaracht*, *Tinospora cordifolia*, *Acacia catechu*, *Murraya paniculata*, *Bacopa monnieri*, etc.; wild edibles were *Carissa opaca*, *Phoenix humilis*, *Cordia dichotoma*, *Tamarindus indica*, *Acacia nilotica*, *Morus alba*, *Psidium guajava*, *Syzygium cumini*, *Ziziphus mauritiana*, *Ficus palmata*, *Pyrus pashia*, etc.; fodder were *Deeringia amaranthoides*, *Asparagus adscendens*, *Brassica campestris*, *Stellaria media*, *Terminalia myriocarpa*, *Shorea robusta*, *Mallotus philippensis*, *Trifolium repens*, *Linum usitatissimum*, *Toona ciliata*, *Albizia lebbek*, *Dendrocalamus strictus*, *Grewia asiatica*, etc.; those used as fuel were *Mallotus philippensis*, *Diospyros Montana*, *Pinus roxburghii*, *Bauhinia retusa*, *Terminalia myriocarpa*, *Toona ciliata* etc.; timber were *Bombax ceiba*, *Cordia dichotoma*, *Terminalia myriocarpa*, *Dalbergia sissoo*, *Juglans regia*, *Toona ciliata*, *Albizia lebbek*, *Syzygium cumini*, *Pinus roxburghii* etc.; and plants for religious purpose were

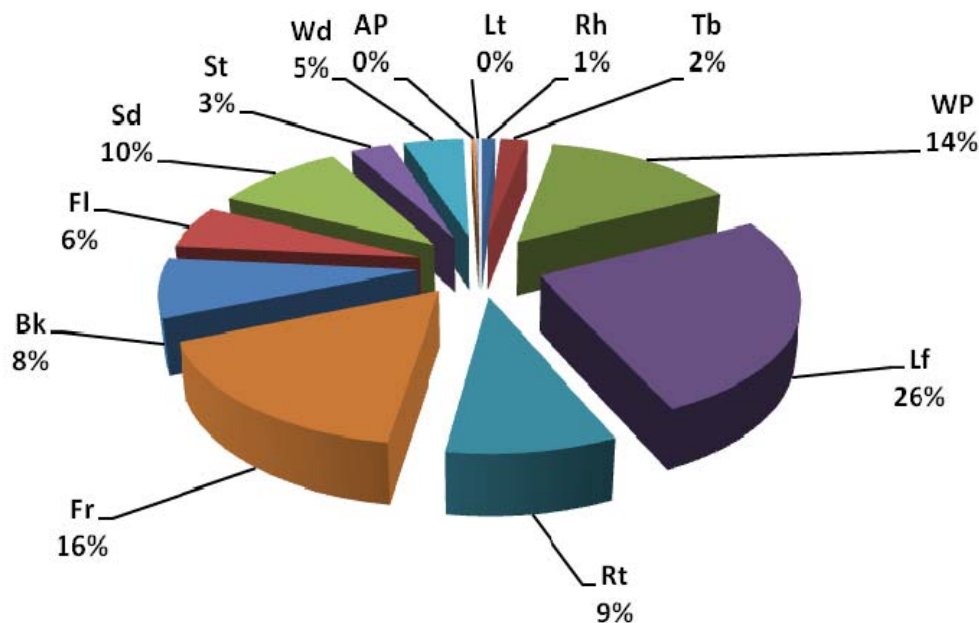


Figure 3. Statistics of plant parts used. Fr = Fruit; Rt = Root; Lf = Leaf; WP = Whole Plant; Bk = Bark; Fl = Flower; Sd = Seed; Tb = Tuber; Rh = Rhizome; St = Stem; Lt = Latex; Wd = Wood and AP = Aerial Parts.

Bauhinia variegata, *Ficus bengalensis*, *Centella asiatica*, *Evolvulus alsinoides*, *Ocimum sanctum*, *T. cordifolia*, *Cynodon dactylon*, *Ficus religiosa*, *Valeriana jatamansi*, etc. The different parts these of plant are used for curing different diseases and economic uses (Figure 3).

Indigenous uses

Out of the 265 economically important species, 210 species were used for curing various diseases/ailments. For example, leaves of *Amaranthus hybridus* is used in diarrhoea, dysentery and eczema; shoots of *Adhatoda vasica* is used in for cold, cough, bronchitis, early asthma, fever, sedative and as antiseptic; *Phoenix humilis* is used in sprain; roots of *Hedychium spicatum* is used for the treatment of asthma, bronchitis, eye problems, gastric dysfunction, as tonic and blood purifier; roots and leave of *Strobilanthes atropurpureus* is used as antidote for snake bite, bronchitis, pneumonia, wounds, headache and swelling; root of *Rauvolfia serpentina* is used widely applied in the case of intestinal disorders, in opacity of cornea, in the case of high fever, nervous disorders and in cholera; flower of *S. oleracea* is used in toothache, in throat problem, used as a stimulant and as diuretic. The remaining species were used for the treatment of various diseases/ailment (Appendix 1).

DISCUSSION

Plant resources are used by mankind to meet their daily needs. Man has been using plants as medicine, food

(edible), fuel, fodder, timber, agricultural tools, for religious purpose and other purposes since time immemorial (Samant et al., 1996; Samant and Dhar, 1997). In spite of the efforts made by various workers, the information still remains fragmentary and most of the biodiversity rich areas remained unexplored or under explored (Samant, 1998).

Multipurpose utility of *B. ceiba*, *Cannabis sativa*, *Terminalia chebula*, *Terminalia bellrica*, *Emblica officinalis*, *Dalbergia sissoo*, *Pinus roxburghii*, *Juglans regia*, *Melia azedaracht*, *Reinwardtia indica*, *Acacia catechu*, *Aegle marmelos* and *Pistacia integerrima* indicated high pressure on these species. These species are facing high anthropogenic pressures in the area due to habitat degradation and over exploitation of propagating parts mainly roots/tubers/rhizomes of *Aconitum heterophyllum*, *Acorus calamus*, *Rauvolfia serpentina*, *Hedychium spicatum*, *Gloriosa superb*, etc, and fruits and seeds of some of the species which may lead to extinction of these species in near future.

The over exploitation and habitat degradation of some of the high value species have caused severe threat to these species. Such continued practices will cause the loss of these species and also, loss of moisture and humus content which will lead soil erosion and finally habitat degradation. It has been observed that due to unplanned collection of the resources, ecology of the forests has been seriously affected. Similar problems are also prevalent in the Nadaun Block. Therefore, adequate conservation measures have to be taken to maintain current status of the habitats, species and communities

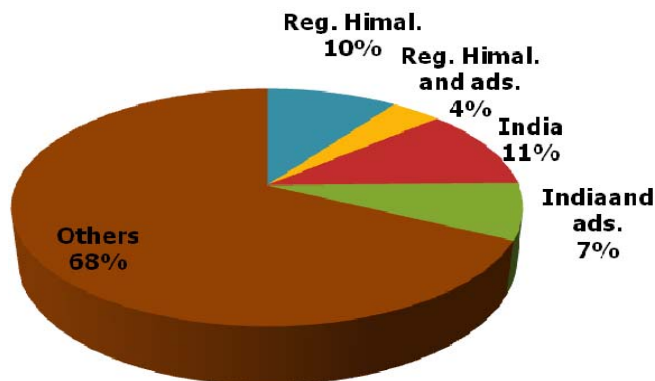


Figure 4. Native and non-native species of Nadaun Block.

and for the effective management of the economically important plants of Nadaun block. Awareness among the inhabitants of the Nadaun Block needs to be created for the resource utilization techniques, so that sustainable utilization of the species could be done by the inhabitants.

Analysis of nativity and endemism of floristic diversity

Native and endemic species play an important role in assessing the conservation value of any habitat, community and ecosystem, for making a strategy and action plan for conservation and management of a particular biogeographic province, state, district, tehsil, block, watershed, valleys and catchments

Out of the total 265 economically important species recorded from the Nadaun Block, 26 species (10%) were native to the Himalayan region, 10 species (4%) native to the Himalayan region and adjacent countries and states, 29 species (11%) were recorded from India, 19 species (7%) from India and adjacent countries, whereas 181 species (68%) were non-native representing other biogeographical regions such as Arabia, Australia, America, Africa, Japan, Malaysia, etc. (Figure 4).

The depleting population of native and endemic species and invasion by non-natives is a great concern due to the negative impacts of non-natives on the other species of a particular region and even entire ecosystems. The past studies have proved that non-natives affect the hydrology and nutrient cycles of entire ecosystems. Such impact leads to the extinctions of the native and endemic species.

Rarity and prioritization of species for conservation and management

Diversity and distribution pattern of threatened plants

The economically important floristic diversity has been

analyzed for rarity. Of the total recorded species, 1 species have been categorized as critically endangered (*Rauvolfia serpentina*), four endangered (*Dioscorea deltoidea*, *Shorea robusta*, *Gloriosa superba* and *Withania somnifera*) and 14 vulnerable (*Acorus calamus*, *Pistacia integerrima*, *Asparagus recemosus*, *Berberis aristata*, *Berberis lycium*, *Capparis zeylanica*, *Terminalia arjuna*, *Costus speciosus*, *Cinnamomum tamala*, *Azadirachta indica*, *Thalictrum foliolosum*, *Aegle marmelos*, *Zanthoxylum armatum* and *Hedychium spicatum*). There are other species facing habitat degradation and over exploitation and may be considered to be under near threatened and least concern categories.

Studies have been conducted to explore and identify the threatened plants including medicinal plants of the Indian Himalayan Region by some workers (Badola and Pal, 2003). However, in most of the studies, identification of threatened species has been carried out using qualitative attributes/observations, only. Assessment of status of the species using qualitative as well as quantitative attributes has been suggested by few workers (Samant, 1998).

Habitat degradation and overexploitation were the two major factors responsible for the population depletion of the economically important species. Most of the species were severely affected by both factors.

Further promotion of mass scale propagation through conventional and *in vitro* methods of such species and their rehabilitation in the *in situ* conditions or similar habitats may also help in conservation and management. The developed seedlings need to be disseminated among the farmers for mass scale plantation/cultivation. All the species categorized under various categories of rarity are traded, hence prioritized for conservation.

Conflict of Interest

The author(s) have not declared any conflict of interest.

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Appendix 1. Diversity, distribution, indigenous uses and conservation prioritization of the economically important floristic diversity in Nadaun Block of Hamirpur District, Himachal Pradesh.

Family/Taxa	Local Name	Altitudinal Range (m)	Life form	Part/s Used	Nativity	Indigenous uses
Acanthaceae						
<i>Adhatoda vasica</i> Nees	Basuti	500-900	Sh	WP	As Trop	Medicinal (cold, cough, bronchitis, early asthma, fever, sedative, expectorant, antispasmodic, rheumatism and antiseptic); miscellaneous (dye)
<i>Dicliptera roxburghiana</i> Nees	-	550-1000	H	WP	Ind Or	Medicinal (tonic)
<i>Peristrophe bicalyculata</i> Nees	-	400-600	H	WP	As et Afr Trop	Medicinal (eye disorder, fracture and sprain)
<i>Rungia pectinata</i> (L.) Nees	-	600-900	H	WP	Ind Or Burma	Medicinal (small pox and urine complications); Edible
Acoraceae						
<i>Acorus calamus</i> L.**	Bare/ Bauch	800-1000	H	WP	Reg Bor Temp	Medicinal (Bitter tonic, carminative, emetic, antispasmodic, dyspepsia, diarrhoea, nerviness tonic, fevers and bronchitis)
Achyranthaceae						
<i>Achyranthes aspera</i> L.	Puth kanda	450-1000	H	WP	Trop	Medicinal (asthma, bronchitis, cold, cough, dysentery, germicide, headache, laxative, leucoderma, piles, pneumonia, rheumatism, skin diseases, sore, stomach, tonic, whooping cough, wounds and veterinary diseases); Religious
<i>A. bidentata</i> Bl.	-	500-950	H	WP	As Trop	Medicinal (blisters in mouth, cholera, scorpion sting, swelling, whooping cough)
Alliaceae						
<i>Allium cepa</i> L.	Pyaz	500-1000	H	WP	Asia Temp	Medicinal; edible
<i>Allium sativum</i> L.	Lahsun	500-1000	H	WP	Europe	Medicinal (rheumatic pain, chronic ulcers, antibiotic activity, neuralgic pain and leprosy); miscellaneous (ropes)
Amaranthaceae						
<i>Amaranthus hybridus</i> L.**	Bathu	550-1000	H	Lf, Rt	Am Bor	Medicinal (diarrhoea, dysentery, colic and eczema); edible
<i>Deeringia amaranthoides</i> (Lam.) Merr.**	-	600-1000	H	Lf, Fr	Reg Himal China	Medicinal (Sores); Fodder
Agavaceae						
<i>Agave angustifolia</i> Haw.	Rambaan	600-1000	H	Lf	As Trop	Miscellaneous (ropes); piscicidal
<i>A. cantula</i> Roxb.	-	450-900	H	Lf, Rt	As Trop	Miscellaneous (ropes); piscicidal
Anacardiaceae						
<i>Lannea coromandelica</i> (Houtt.) Merr.	Salam bada	500-900	T	Bk, Lf	As et Afr Trop	Medicinal (astringent, bruises, skin eruptions, heart diseases, dysentery, mouth sores, toothache, local swelling and pains)
<i>Mangifera indica</i> L.	Aam	700-750	T	WP	Ind Or Malaya	Medicinal (laxative, diuretic, stomach debility, uterine hemorrhage, skin diseases, nasal bleeding, melanin, Antifertility, cancer, dropsy, digestion, eye complaints, fever, rheumatism, laxative, jaundice, diarrhoea and anasarca); edible; religious
<i>Pistacia integerrima</i> Bin. Stewart**	Kakarsingh	600-1000	T	Fr	Egypt Persia, Reg Himal	Medicinal (tonic, expectorant, cough, asthma, fever, appetite, chronic pulmonary affection, dysentery, vomiting, diarrhoea); edible; fodder; timber; miscellaneous (dye)

Appendix 1. Contd.

Apiaceae						
<i>Centella asiatica</i> L.	Brahmi	700-1000	H	Rt Fl	Reg Trop et Sub	Medicinal (Nerving, cardio-tonic, improves memory, dermatitis, cough, diabetes, anemia, insanity, eye troubles, skin diseases, leprosy, blood diseases and antiseptic); Religious
<i>Coriandrum sativum</i> L.	Dhania	450-1000	H	WP	Europe, Austr	Medicinal (Stimulant, carminative, diuretic, tonic, and stomachic); Edible
<i>Daucus carota</i> L.	Gajar	450-1000	H	Tb	Europe Austr	Medicinal (Heart problems); Edible
<i>Foeniculum vulgare</i> Mill.	Saunf	450-1000	H	WP	Europe Austr	Medicinal (Carminative, vermicide, colic pain and diuretic); Edible
<i>Trachyspermum ammi</i> L.	Ajowain	450-1000	H	WP	Europe Ind	Medicinal (Tonic, diarrhea, atonics dyspepsia, colic, flatulence, cholera, diuretic, antiseptic and carminative); Edible
Apocynaceae						
<i>Carissa opaca</i> Stapf ex Haines	Garnoin	500-1000	Sh	Lf Fr	Ins Moluce	Medicinal (Appetizer); Fodder; Edible; Fuel
<i>Holarrhena pubescens</i> Wall. and G. Don	-	700-800	Sh	WP	Ind Or	Medicinal (Antidote to snake bite, bronchial fever, diarrhea, malaria)
<i>Nerium indicum</i> Miller	-	500-900	Sh	Lf, Rt	Cosmop	Medicinal; Ornamental
<i>Rauvolfia serpentina</i> Benth. ***	Sarapgandha	600-1000	Rt	Rt	Trop Himal Malaya	Ind Medicinal (Fever, nervous disorder, insomnia, intestinal disorders, cholera, colic, opacity of cornea, reserpine in fevers); Fodder
<i>Trachelospermum fragranus</i> Hk.f.	-	850-950	Sh	Fr	Reg Himal	Medicinal (Tonic, convalescence, constitutional debility)
<i>T. lucidum</i> (Don) Schum.	-	800-900	Sh	WP	Reg Himal	Medicinal (Boils, eye problem, fever, headache)
<i>Vallis solanacea</i> (Roth) Ktze.	-	500-1000	Sh	St, La,	Ind Or Burma	Medicinal (Abortificant. Wounds); Fiber; Miscellaneous (Household)
<i>Vinca rosea</i> L.	Sadabahar	800-1000	H	WP	Cosmop Trop	Medicinal (Cold, cough)
Araceae						
<i>Colocasia esculenta</i> Schott	Arvi/Kachalu	600-1000	H	LF Tb	Trop	Medicinal (Decoction, heart disease Edibles)
Arecaceae						
<i>Phoenix humilis</i> Royle	Khajoor	600-800	T	Rt, Lf, Fr	Ind Or Burma	Medicinal (Sprain); Edible; Miscellaneous (broom); Fiber
Asclepiadaceae						
<i>Calotropis procera</i> (Dryand.) Aiton	Ak	500-1000	H	Fr, Lf	Peru Afr Trop	Medicinal (Dysentery, diaphoretic, expectorant, fevers, cough, cold and asthma); Miscellaneous (Fiber)
<i>Cryptolepis buchananii</i> Roem. and Schultes	-	900-1000	Sh	WP	Ind Or	Medicinal (Rickets); Fiber
Asparagaceae						
<i>Asparagus adscendens</i> Rox.	Safed musli	500-1000	Sh	Lf, Fr	Reg Himal	Edible; Fodder; Medicinal
<i>A. racemosus</i> Wild.**	Sanserpali	500-1000	Sh	Fr	Ind Afr Austr Trop	Medicinal (Antifertility, asthma, burns, child birth, hydrophobia, ringworm, snakebite, spleen complaints and toothache)

Appendix 1. Contd

Asteraceae

<i>Ageratum conyzoides</i> L.	Ookalbuti	500-1000	H	Lf, Rt, Sd, Fl	Reg Trop	Medicinal (Antilithic, antiseptic, burns, cancer, cuts, diarrhoea, headache, snake bite, ring worm, sores, uterine disorders and hair problems); Edible
<i>A. houstonianum</i> Mill.	Chhota phulnu	750-900	H	Lf	Am Bor	Medicinal (Anti-inflammatory, antibacterial, antifungal)
<i>Argemone mexicana</i> L.	-	500-1000	H	Rt, Lf Sd	Reg Trop	Medicinal (Malaria, leprosy, skin diseases, inflammations, purgative, sedative, ophthalmia, rheumatism, tumor, anthelmintic)
<i>Bidens biternata</i> (Lour.) Merr. and Sherff.	-	500-1000	H	Fr, Lf, Fl, Rt	Reg Trop	Medicinal (Appetizer, cough, cuts, inflammation, snake bite)
<i>B. pilosa</i> L.	Lumb	500-900	H	Lf, Fl	Ind Occ Am austr	Medicinal (Cough, antiseptic, foul, ulcers, swollen glands, eye problems and ear trouble)
<i>Conyza stricta</i> Wild.	-	500-1000	H	Lf, Fl	Ind Or Afr Trop	Fodder; Aromatic
<i>Galinsoga ciliata</i> Ref.	Banmara	900-1000	H	Lf, Fr	Mexico Am	Fodder; Edible
<i>Helianthus annuus</i> L.	Surajmukhi	500-900	Sh	Sd, Fr, Rt	Am Bor	Medicinal (Bronchitis, fever, diuretic, pulmonary infections and astringent); Edible; Fodder; Fuel; Miscellaneous (Paper)
<i>Sonchus asper</i> L. Hill.	-	500-1000	H	Lf, Rt,	Cosmop	Medicinal (Cough, bronchitis, asthma and eye trouble); Edible; Fodder
<i>Spilanthes oleracea</i> L.	Akkarkarha	450-900	H	Fl	South America	Medicinal (Toothache, throat, gum infection, inflammation, stimulant, scurvy, dysentery, as diuretic and mosquito repellent)
<i>Stevia rebaudiana</i> Hemsl.	Stevia	600-900	H	Lf, Fl	Parag	Medicinal (Control diabetes)
<i>Tagetes erecta</i> L.	Genda	700-1000	H	Fl, Lf	Am Trop	Ornamental
<i>Taraxacum officinale</i> Weber. ex. Wiggers	Kanphul	700-1000	H	WP	Reg Temp Bor et	Medicinal (Laxative, diuretic, hepatic stimulant, stomachic, vermifuge, dropsy and drug); Edible
<i>Tridax procumbens</i> L.	-	900-1000	H	WP	Am Trop	Medicinal (Antiseptic, pimples, anemia, antifertility, aphrodisiac, boils, bone fracture, chicken pox, cholera, cough, diarrhoea, fever, skin diseases, leprosy, tonic, urine complaint)

Berberidaceae

<i>Berberis aristata</i> Dc.**	Kshambal	900-1000	Sh	Rt, Sd, WP	Reg Himal	Medicinal (Snake bite, boil, eye complaints); Fodder
<i>B. lycium</i> Royle**	Kasmal	500-900	Sh	WP	Reg Himal	Medicinal (Dysentery, diarrhea, skin disorders); Fodder

Bombacaceae

<i>Bombax ceiba</i> L.	Simbal	900-1000	T	Rt, Bk, Lf	Amer Austr	Medicinal (Stimulant, tonic, emetic, dysentery and diarrhea); Edibles; Fiber; Timber; Agricultural tools
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Brassicaceae

<i>Brassica campestris</i> L.	Toria	450-1000	H	Lf, Sd	Cosmop Europe	Medicinal; Feed; Edible
<i>B. nigra</i> Koch	Rai	450-1000	H	Sd	Cosmop Europe	Medicinal; Fodder
<i>B. oleracea</i> L. var. <i>oleracea</i>	Phulgobbi	450-1000	H	Fr, Sd	Cosmop Europe	Edible
<i>B. oleracea</i> L. var. <i>capitata</i>	Bandgobba	450-1000	H	Fr, Lf, Sd	Cosmop Europe	Edible
<i>B. rapa</i> L.	Shalgum	450-1000	H	Tb, Lf	Cosmop Europe	Edible
<i>Eruca sativa</i> Mill.	Taramira	450-1000	H	Lf, Sd	Reg Mediter	Fodder

Appendix 1. Contd.

<i>Raphanus sativus</i> L.	Mooli	450-1000	H	Rt	Europe	Medicinal; Feed; Edible
<i>Sisymbrium sophia</i> L.	Jangli saron	500-1000	H	Lf, Fl	Europe	Medicinal (Ulcers); Fodder
<i>Lepidium sativum</i> L.	Halim	500-1000	H	Lf	Reg Temp	Medicinal (Asthma, cough, heart trouble, laxative, insomnia, diuretic and liver diseases); Edible; Fodder
Buddlejaceae						
<i>Buddleja asiatica</i> Lour.	Bana	600-1000	Sh	Lf	As Trop Malaya	Medicinal (Inflammation, skin diseases, abortive); Edible
Cactaceae						
<i>Cactus monacantha</i> Haw.	Naag-phani	600-1000	Sh	WP	Am Austr	Medicinal (Nutritious, cough)
Caesalpinaceae						
<i>Bauhinia racemosa</i> Lamk.	-	600-900	T	Lf, Bk	Ind Or Burma China	Medicinal (Diarrhoea, dysentery); Edible; Fuel; Fodder; Miscellaneous (Household)
<i>B. retusa</i> Roxb.	-	700-1000	T	Bd, Fl	Reg Himal	Medicinal (Cholera, snake bite); Fuel; Fodder
<i>B. vahlii</i> (WtandArn.) Benth.	Tour	500-1000	Sh	Sd	Ind Or	Medicinal (Antifertility, dysentery, fatness, stomachache, tonic); Edible; Household; Fuel; Fodder; Religious
<i>B. variegata</i> L.	Krailaya	700-1000	T	Lf, Bk, Fr, Fl	Ind Or Burma China	Medicinal (Diarrhoea, dysentery, fatness, factual, piles, scrofula, skin diseases, leprosy, snake bite, tumors, ulcers and worms); Fodder; Fuel; Edible; Religious
<i>Caesalpinia bonduc</i> L. Roxb.	-	700-900	Sh	Rt, Bk, Sd	Cosmop Trop	Medicinal (Anthelmintic, stomachic, diuretic, anti-pyretic, febrifuge expectorant)
<i>Cassia fistula</i> L.	Amaltas	500-1000	T	Rt, Lf, Fr, Bk	As Trop	Medicinal (Constipation, cold, fever, liver disorder, tuberculosis glands, haematemesis, typhoid, asthma and leprosy)
<i>C. occidentalis</i> L.	-	500-1000	Sh	Rt, Lf,	Cosmop Trop	Medicinal (Diuretic, fevers, asthma, bronchitis, menstrual problems, tuberculosis, anemia, liver complaints, general weakness, gonorrhoea, urinary tract disorders, stomach cholic, anti-inflammatory, skin disorders)
<i>C. tora</i> L.	-	700-1000	H	Sd, Lf	Cosmop Trop	Medicinal (Antispasmodic, carminative, emollient, purgative, indigestion, skin diseases)
<i>Tamarindus indica</i> L.	Imli	4500-900	T	Fr, Bk	Ind Or	Medicinal (Wounds, asthma); Edible; Fodder; Fuel; Cosmetic; Agricultural tools
Cannabaceae						
<i>Cannabis sativa</i> L.	Bhang	500-1000	H	St, Sd	As Centr	Medicinal (Tonic, intoxicant, antiseptic, analgesic, sedative and narcotic); Religious
Capparaceae						
<i>Capparis zeylanica</i> L.**	-	600-800	Sh	WP	Ind Or	Medicinal (Ant helminthes, blisters, boils, cholera, colic, pneumonia, piles, rheumatism, snake-bite, swell testicle, ulcers); Edible
Carcicaceae						
<i>Carica papaya</i> L.	Papita	450-1000	T	Fr, Sd, St	Ind Or	Medicinal (Stomachic, carminative, diuretic, anthelmintic and sedative tonic); Miscellaneous (Ropes); Edible; Religious
Caryophyllaceae						
<i>Stellaria media</i> L.Vill.	Khokhua	500-1000	H	Lf, Fl	Reg Temp	Medicinal (Intestinal problems, renal, respiratory, inflammations, erysipelas, burns); Edible; Fodder
Chenopodiaceae						
<i>Chenopodium album</i> L.	Bathua	450-1000	H	Lf	Cosmop	Medicinal (Spleen disorders); Edible; Fodder

Appendix 1. Contd.

<i>Spinacia oleracea</i> L.	Palak	450-1000	H	WP	Cosmop	Medicinal (antibacterial, demulcent, diuretic, fever and intestinal inflammations); edible
Combretaceae						
<i>Terminalia arjuna</i> (Roxb.) Wt. and Arn.	Arjun	700-1000	T	Bk,Fr,Std	Ind	Medicinal (tonic, febrifuges, ant dysenteric, cardio tonic and diuretic); timber; ornamental; fodder; fuel
<i>T. bellirica</i> (Gaertn.) Roxb.	Bahera	500-1000	T	Fr,St	Ind Or Malaya	Medicinal (antipyretic, diarrhea, bitter astringent, dyspepsia, tonic, stimulant, diuretic, carminative and antispasmodic); Fodder; fuel; agricultural tools
<i>T. chebula</i> Retz.	Harad	700-1000	T	Fr,Bk,Std	As Trop	Medicinal (chronic ulcers, gargle instomatitis, bleeding gums, bark diuretic, in asthma, triphala); fuel
<i>T. myriocarpa</i> Heurck. and Muel.-Arg.	Alsan	500-1000	T	WP	As Trop	Fodder; fuel; timber
Commelinaceae						
<i>Commelina benghalensis</i> L.	-	500-800	H	Lf, Rt	Geront Trop	Medicinal (ache, dysentery, fever, scorpion bite, wounds); Edible
<i>Cyanotis cristata</i> (L.) D. Don	-	500-1000	H	Lf	Ind Or Malaya	Medicinal (sores); fodder; edible
Convolvulaceae						
<i>Convolvulus arvensis</i> L.	-	600-1000	H	WP	Geront Trop	Medicinal (purgative, burns, bruises); miscellaneous (detergent)
<i>Evolvulus alsinoides</i> (L.)	-	800-1000	H	WP	Amphig Trop	medicinal (asthma, fever, scorpion sting, stomachache); Religious
Cordiaceae						
<i>Cordia dichotoma</i> L.	Lasora	800-1000	T	Fr, Bk	Ind Or	Medicinal (astringent, anthelmintic, diuretic, lung and spleen trouble, antiseptic, kernels in ringworm injection and decoction in fever); edible; timber; fuel
Cuscutaceae						
<i>Cuscuta reflexa</i> Rox.	Akashbel	800-1000	H	Rt, Lf	Ind	Medicinal (Hepatic, laxative, carminative, urinary, spleen, liver disorders and pain relieving); ornamental
Costaceae						
<i>Costus speciosus</i> Sm.**	-	500-900	H	Fl	Ind Or Malaya	Medicinal (astringent, anthelmintic, snake bite, depurative and purgative); edible
Crassulaceae						
<i>Kalanchoe spathulata</i> DC.	-	700-1000	H	Lf	As Trop	Medicinal (healing for scar)
Cucurbitaceae						
<i>Benincasa hispisa</i> L.	Petha	450-1000	H	Fr	Cosmop	Edible (vegetable)
<i>Coccinia grandis</i> (L.) Voigt	-	900-1000	H	WP	Ind Or	Medicinal (cold, cough, diabetes, headache, filarial, swell, slow pulse, sores, syphilis, throat effect, vomit)
<i>Cucumis sativus</i> L.	Khira	450-1000	H	Fr	Trop	Edible
<i>Cucurbita maxima</i> Dch.	Kaddu	450-1000	H	Fr	Ind	Edible (vegetable)
<i>C. pepo</i> L.	Pumpkin	450-1000	H	Fr	Cosmop	Edible (vegetable)
<i>Luffa cylindrica</i> M. Roem.	Tori	450-1000	H	Fr	China Ind	Edible
<i>L.acutangula</i> M. Roem	Kali tori	450-1000	H	Fr	Trop Geront	Edible
<i>Momordia charantia</i> L.	Karela	450-1000	H	Fr	Ind Cosmop	Edible; medicinal

Appendix 1. Contd.

Cupressaceae						
<i>Thuja orientalis</i> L.	Saruwa	450-1000	H	Twg	China Japan	Medicinal (rheumatism, astringent, coughs, scurvy, diuretic, uterine stimulant and emmenagogue); ornamental
Cyperaceae						
<i>Cyperus compressus</i> L.	-	800-1000	H	WP	Cosmop Trop	Fodder
<i>Fimbristylis dichotoma</i> (Vahl) Kunth	-	700-1000	H	WP	Ind Or Madag Philipp	Fodder
Dioscoreaceae						
<i>Dioscorea bulbifera</i> L.	-	600-1000	H	Tb	As Trop	Medicinal (abdominal pain, boils, bone fracture, dysentery, piles, jaundice); edible
<i>D. deltoidea</i> Wall.ex Kunth*	Shingli-mingli	800-1000	H	Tb	Ind Or	Medicinal (Dysentery, piles); Edible
Dipterocarpaceae						
<i>Shorea robusta</i> L.*	Sal	450-1000	T	Lf,Wd Bk	Ind	Medicinal (yield honey, dysentery, gonorrhoea, and aphrodisiac); timber; fodder; resin
Ehretiaceae						
<i>Ehretia acuminata</i> R.Br.	-	700-900	T	Bk, Fr, Wd	As et Austr Trop	Medicinal; (Sores on tongue); Edible; Agricultural tools
<i>E. laevis</i> Roxb.	-	500-700	T	Lf, Bk, Fr	As et Austr Trop	Medicinal (Muscle pain); Edible
Ebenaceae						
<i>Diospyros montana</i> Roxb.	-	500-1000	T	Wd	As Trop	Fuel; agricultural tools; fodder
Euphorbiaceae						
<i>Emblica officinalis</i> L.	Amla	500-1000	T	Fr, Lf, Bk	Ind	Medicinal (acrid, cooling, anemia, eye disease, cough, heart disease); fodder; fuel; miscellaneous (tannin)
<i>Euphorbia hirta</i> L.	Dhudni	500-1000	H	WP	Amphig Trop	Medicinal (Antidote, snake bite, kidney disease, pain in joints, veterinary diseases, bone fracture); Edible
<i>E. royleana</i> Boiss.	Chhoein	800-1000	Sh	WP	Reg Himal	Medicinal (Stop bleeding, burns, ear complaints, skin disorders and wounds)
<i>Mallotus philippensis</i> Muell. - Arg	Kamal	600-1000	T	Sd, Fr	As et Austr Trop	Medicinal (Blisters, boils, skin diseases, snake bite); Fuel; Miscellaneous (Dye)
<i>Ricinus communis</i> L.	Arandi	500-1000	Sh	Fr	Reg Trop	Medicinal(Laxative, sores); Edible
<i>Sapium insigne</i> (Royle) Benth.	-	500-700	T	La	Ind Or	Medicinal (Germicide)
Fabaceae						
<i>Abrus precatorius</i> L. Benth.	Ratti	500-1000	Sh	WP	Reg Trop	Medicinal (Body pain, inflammation, promotes constipation); Religious
<i>Arachis hypogea</i> L.	Mungphali	600-800	H	Sd	As Trop	Edible; Fodder
<i>Butea monosperma</i> L.	Palash,Dhak	600-1000	T	Sd,Fl	Ind Or burma	Medicinal (Anthelmintic, gum, astringent, tonic, snake bite, antiseptic); Fodder; Edible; Fuel
<i>Cicer arietinum</i> L.	Channa	500-900	H	WP	Europe Ind	Medicinal (Jaundice); Edible
<i>Dalbergia sissoo</i> Roxb.	Shisham	500-700	T	WP	Ind Or Afghan	Medicinal (Decoction in gonorrhoea, astringent, leprosy and skin diseases); Timber; Fodder
<i>Erythrina suberosa</i> Roxb.	-	600-700	T	Bk	Ind Or	Medicinal (Dysentery)
<i>Glycine max</i> Merr.	Soyabean		H	Sd,Fr	As Trop	Medicinal (Veterinary diseases); Edible
<i>Indigofera atropurpurea</i> Buch. Ham. ex Horn.	Kathi	700-1000	Sh	Lf, Wd	Reg Himal China	Fuel; Fodder; Miscellaneous (Dye)

Appendix 1. Contd.

<i>Lathyrus aphaca</i> L.	Mithi matar	900-1000	H	Sd	Reg Himal	Fodder; edible
<i>Lens esculenta</i> Medik.	Masur		H	Sd	Ind	Edible
<i>Millettia auriculata</i> (Benth.) Baker	-	500-800	Sh	WP	Reg Himal	Medicinal (kill lice and ticks, spleen dislocation, toothache, kill bed bugs, fever); fodder
<i>Mucuna pruriens</i> (L.) DC.	Darygal	500-800	H	WP	Amphing Trop	Medicinal (Anasarca, aphrodisiac, appetizer, ulcers, bone fracture, cancer, cough, cold, dropsy, dysentery, diarrhoea, eye disorders, snake bite and madness)
<i>Ougeinia oojeinensis</i> (Roxb.) Hochr.	-	500-1000	T	St, Lf	Ind Or	Medicinal (asthma, cholera, dysentery); edible; fuel; fodder, agricultural tools.
<i>Phaseolus vulgaris</i> L.	French beans	450-1000	H	Sd	Cult	Medicinal (diuretic, kidney ailments, emollient); edible; fodder
<i>Pisum sativum</i> L.	Matar	450-1000	H	WP	Cult	Edible; fodder
<i>Trifolium repens</i> L.	Barseem	500-1000	H	WP	Geront Temp	Medicinal (detergent, depurative, tincture as ointment, astringent); fodder
<i>Vigna mungo</i> (L.) Hepper	Urd/Mah	450-1000	H	Sd	Ind Or As Trop	Edible
<i>V. radiata</i> (L.) Wilc.	Moong	450-1000	H	Sd	Reg Trop	Edible; fodder
Flacourtiaceae						
<i>Xylosma longifolium</i> Clos.	-	700-1000	T	Fr, Sd	Reg Himal	Medicinal (Stomachache); Fuel
Juglandaceae						
<i>Juglans regia</i> L.****	Akhrot	500-1000	T	Sd,Fr	Reg Himal	Medicinal (Tonic, stomachic, gastric acidity, antiseptic, tooth power, mouth wash, herpes, rheumatism); Fodder; Timber
Lamiaceae						
<i>Ajuga parviflora</i> Wall. ex.Benth.	Neel kanthi	700-1000	Sh	Lf	Afr Trop Ind Or As	Medicinal (gout and rheumatism)
<i>Colebrookia oppositifolia</i>	Gadush	600-1000		Lf,St	Ind Burma	Medicinal (burns, cold, cough, cuts, toothache)
<i>Mentha longifolia</i> L.	Pudina	700-1000	H	Lf	Ind Or, Europe	Medicinal (carminative, antiseptic, stimulant, rheumatic pain, fevers, heat apoplexy, cough and cold); edible
<i>M. piperata</i> L.	Vicks plant	500-1000	H	Lf		Medicinal (cold, cough, fever)
<i>Ocimum gratissimum</i> L.	Tuksi	450-1000	H	Lf	Ind	Medicinal (antibacterial, insecticidal property, fever, cold, cough); Religious
<i>O. sanctum</i> L.	Tulsi	450-1000	H	Lf	Europe, Afr Trop	Medicinal (antibacterial, insecticidal property, fever, cold, cough); religious
<i>Origanum vulgare</i> L.	Bantulsi	700-1000	H	WP	European As et Afr Bor	Medicinal (tonic, stimulant, rheumatism, diaphoretic, diuretic, whooping cough and bronchitis); cosmetic; edible
<i>Lavandula angustifolia</i> Mill.	Lavander	600-700	H	Lf		Medicinal (insect repellent); cosmetic
<i>Pogostemone bengalensis</i> (Burma. f. Ktze.	-	500-900	H	Lf	Ind Or	Medicinal (cuts, fever)
<i>Scutellaria angulosa</i> Colebr.	-	700-900	H	Lf	Reg Himal	Medicinal (dysentery, vomiting)
Lauraceae						
<i>Cinnamomum tamla</i> Nees**	Meethipatta	500-1000	T	Lf.Bk	Reg Himal	Medicinal (sedative, antiseptic, diaphoretic, anthelmintic, stimulant, carminative, toothache, muscular strain, diarrhoea and joint pains); Religious
Leeaceae						
<i>Leea aspera</i> Edgew.	-	900-1000	H	RT	Ind Or	Medicinal (skin diseases and ring worm); fodder; edible

Appendix 1. Contd

Liliaceae						
<i>Aloe barbadensis</i> Mill.	Alovera	600-900	H	Lf	Reg, Meditr	Medicinal (Stomachic, anthelmintic, piles, cathartic, colic pain); Cosmetic
<i>Gloriosa superba</i> L.*	-	600-700	H	Lf, Rt, Rh, Tb	Trop Afr	Medicinal (Pimples, skin irruptions, snake bites, curing baldness, bruises, chronic ulcers, hemorrhoids, cancer, leoprsay, skin infections, laxative, piles, inflammation, abdominal pains, intestinal worms, infertility and skin problems)
Linaceae						
<i>Linum usitatissimum</i> L.	Alsi	600-1000	H		Europe, orient	Medicinal (Skin infections, chronic ulcers, antibiotic activity, neuralgic pain, leprosy); Ornamental
<i>Reinwardtia indica</i> Dum.****	Matkhen	700-1000	Sh	AP	Ind Or	Medicinal (Mouth sores); Fodder
Lythraceae						
<i>Duabanga sonneratioides</i> Buch.-Ham.	-	600-1000	T	Wd	Ind Or	Fuel
<i>Lawsonia inermis</i> L.	Mehandi	500-1000	Sh	Lf, Sd	Orient	Medicinal (Antifertility, burning sensation, headache, pain in muscles, jaundice, sprain, weakness); Miscellaneous (Dye)
<i>Woodfordia fruticosa</i> (L.) Kurz.	Dhaw	700-1000	Sh	Lf, Wd	As et Afr Trop	Medicinal (Bone fracture, burns, dropsy, dysentery, sprains, smallpox, ulcer wounds, sprains); Fodder
Malvaceae						
<i>Gossypium arboreum</i> L.	Cappah		Sh			Fibers
<i>Hibiscus rosa-sinensis</i> L.	Gulab	700-1000	Sh	Fl	Afr	Medicinal (Fever, emollient, aperients, laxative, gonorrhoea); Edible; Religious
<i>Urena lobata</i> L.	-	700-1000	Sh	Rt, Lf	Cosmop Trop	Medicinal (Body pain, rheumatism, dysentery, constipation, hydrophobic)
Meliaceae						
<i>Azadirachta indica</i> L.**	Neem	500-1000	T	Lf, St, Bk	Ind Or	Medicinal (Bitter tonic, astringent, ant periodic, antiseptic, ulcers, stomachic, antiseptic); Cosmetic
<i>Melia azedarach</i> L.	Darek	500-1000	T	Fr, St, W, P	Ind Or	Medicinal (Wormicide, skin ailments and piles); Timber; Fuel
<i>Toona ciliata</i> M. Roem.	Tooni	500-1000	T	WP, Wd	Austr Malaya	Medicinal (Antiseptic, aphrodisiac, asthma, bone fracture, diarrhoea, malaria, dysentery and jaundice); Timber; Agricultural tools; Fodder
Menispermaceae						
<i>Cissampelos pareira</i> L.	-	700-1000	H	Rt	Reg Trop	Medicinal (Antiperiodic, stomachic, carminative, cold, cough, stimulant, diarrhoea, dropsy); Miscellaneous (Mats); Fodder
<i>Stephania glabra</i> (Rox.) Miers.	Galaukadi	700-1000	H	Tu	As Trop	Medicinal (Asthma, dysentery, fever); Fodder
<i>Tinospora cordifolia</i> (L.) Merr.	Giloe	500-800	H	WP	Ind	Medicinal (General disability, dyspepsia, skin diseases, fever, urinary diseases, antibacterial, anti-inflammatory and rheumatism); Religious; Fodder
Mimosaceae						
<i>Albizia lebbek</i> L.	Sarihn	500-950	T	Bk, Wd	Ind	Medicinal (Tonic, night blindness); Timber; Fodder
<i>A. chinensis</i> Merr.	-	600-1000	T	Wd, Lf	China	Fuel; Fodder
<i>A. julibrissin</i> Durazz	-	600-700	T	Wd, Lf	As Afr Trop	Fuel; Fodder

Appendix 1. Contd

<i>Acacia catechu</i> L.	Khair	600-1000	T	Bk,Wd	Ind	Medicinal (Astringent, betel nut, acidity, stomach pain and antiseptic); Fuel; Timber
<i>A. nilotica</i> L.	Babul	600-1000	T	Fl,Ft,Bk ,Sd	Afr Trop	Medicinal (Asthma, skin disorders, bronchitis and fever)
<i>Mimosa pudica</i> L.	Lajwanti	600-800	H	Lf,RT	Braz	Medicinal (Urinary complaints, glandular swelling, piles); Fodder; Ornamental
Moraceae						
<i>Ficus bengalensis</i> L.	Bargad	700-1000	T	Lf,Bk,Fr	Ind Afr Trop	Medicinal (Antimicrobial, remove mouth ulcers, dysentery); Fodder; Religious
<i>F. palmata</i> Forsk.	Anjiri	700-1000	T	WP	Ind Or Afr trop	Medicinal (Bladder and lung diseases); Wood; Fuel; Edible; Fodder
<i>F. racemosa</i> L.	-	700-1000	T	WP	Ind Or Burma	Medicinal (Cancer, blister, boils, leprosy, muscle pain, piles, dislocation joints); Religious; Fuel; Fodder
<i>F. religiosa</i> L.	Peepal	600-1000	T	Lf, Bk, St	Ind Or	Religious; Fodder; Fuel; Medicinal (Cooling, scabies)
<i>F. roxburghii</i> Wall.	Taryambala	450-900	T	Fr, Wd	As Trop	Edible; Fodder; Fuel
<i>F. rumphii</i> Bl.	-	700-1000	T	Reg Himal	Reg Himal Malaya	Fuel; Fodder; Edible
<i>F. semicordata</i> Buch.- Ham. ex Sm.	-	600-900	T	Fr, Bk	Reg Himal Malaya	Medicinal (Leprosy); Edible
<i>Morus alba</i> L.	Sehtoot	600-1000	T	Fr,Wd,L f	As Temp	Edible; Fodder; Fuel
<i>Morus serrata</i> Roxb.	Toot	600-1000	T		As Temp	Fodder; Fuel; Edible
Musaceae						
<i>Musa paradisiaca</i> L.	Kela	450-950	H	Fr,Lf	Fr	Medicinal (Stomachic cooling, colitis, digestive, astringent, uremia); Religious; Edible; Fodder
Myrtaceae						
<i>Callistemon citrinus</i> Curtis	Bottle brush	700-1000	T	Fl	Austr	Ornamental
<i>Eucalyptus tereticornis</i> Sm.	Safeda	500-800	T	St, lf	Austr	Medicinal (Cold, astringent); Miscellaneous (Paper)
<i>Psidium guajava</i> L.	Amrood	450-1000	T	Lf, Fr	Am Trop	Medicinal (Mouth sores, anthelmintic, wound infection, in epilepsy); Fuel; Fodder
<i>Syzygium cumini</i> Skees	Jaamun	500-1000	T	WP	Austr Trop	Medicinal (Stimulant, colitis, astringent, antidiabetic, diuretic, dysentery); Agricultural tools; Fodder; Fuel; Edible
<i>S. frondosum</i> (Wall.) Mahaumuni	-	500-1000	T	Fr, Fl, Sd	Ind Or Burma	Medicinal (Stimulant, colitis, astringent, anti-diabetic, diuretic, dysentery); Agricultural tools; Fodder; Fuel; Edible
Myrsinaceae						
<i>Maesa indica</i> Wild.	-	700-900	Sh	Fr	Ind Malaya	Medicinal (Syphilis, women disease); Edible
Nyctaginaceae						
<i>Boerhaavia diffusa</i> L.	Punarnava	700-900	H	Lf, Fl, Rt	Cosmop Trop	Medicinal (Diuretic, laxative, expectorant, asthma, stomach trouble, eye disease and jaundice); Fodder; Edible
<i>Mirabilis jalapa</i> L.	-	900-1000	H	Fl	A Medr Trop	Medicinal (Stomach disorders, tonic, antiseptic, nervous disorders, and aphrodisiac)
Oleaceae						
<i>Jasminum officinale</i> L.	Chameli	500-1000	Sh	Fl, Lf, Rt	Ind Bor china	Medicinal (Antidote to cobra genome, ulcers); Ornamental; Religious

Appendix 1. Contd

<i>Nyctanthes arbor-tristis</i> L.		700-1000	Sh	WP	Ind Or	Medicinal (Ant helminthes, bone fracture, cancer, cough, fever, internal injuries, scale on scalp); Edible: Religious
Oxalidaceae						
<i>Oxalis corniculata</i> L.	Khat mithu	500-1000	H	WP	Amphig Temp Trop	Medicinal (Dyspepsia, jaundice)
Papaveraceae						
<i>Argemone mexicana</i> L.	-	500-1000	H	Fl	Maxic Bor Medr	Medicinal
<i>Papaver somniferum</i> L.	-	500-1000	H	WP	As Trop	Medicinal; Miscellaneous (Narcotic)
Pedaliaceae						
<i>Sesamum indicum</i> L.	Til	450-800	H	Sd,Lf	Trop Afr Ind	Medicinal (Emollient, tonic, diuretic, urinary complaints and burns); Edible; Fodder;
Pinaceae						
<i>Pinus roxburghii</i> Sarg.****	Chir	700-1000	T	Sd,Wd, Res	Reg Himal	Medicinal (Antiseptic, bronchitis, arthritis, neuralgia, rheumatism); Timber; Fuel
Pistaciaceae						
<i>Pistacia integerrima</i> Stewart	Kakarsingi	600-900	T	Sd,Wd	China	Medicinal (Cough, dysentery, eye complaints)
Poaceae						
<i>Apluda mutica</i> L.	-	500-1000	H	WP	As Trop Polynesia Austr	Medicinal (Mouth sores); Fodder
<i>Arundinella nepalensis</i> Trin.	-	600-1000	H	WP	Ind Or	Medicinal (Ointment)
<i>Avena sativa</i> L.	Joi	600-1000	H	Sd	Reg Temp et calid	Medicinal (Nerviness, tonic, stimulant, laxative and fungicides); Edible; Fodder
<i>Capillipedium assimile</i> Camus	Toolig-gha	450-800	H	St	Reg Himal China Burma	Miscellaneous (Broom)
<i>Chrysopogon serrulatus</i> Trin.		500-1000	H	Lf	Reg Trop	Fodder
<i>Cynodon dactylon</i> (L.) Pers.	Doob grass	500-1000	H	WP	Cosmop	Medicinal (Dropsy, bleeding piles, gleet, antiseptic, astringent, chronic diarrhoea, dysentery and diabetes); Religious
<i>Dendrocalamus strictus</i> Nees	Bainj	600-1000	T	Rt, Lf, Bk	Ind Or	Medicinal (Antifertility, cough, fever, tonic, veterinary); Edible; Fodder; Religious; Miscellaneous (Making bamboo brakes)
<i>D. hamiltonii</i> Nees	Bainj	600-1000	T	Rt, Lf, Bk	Ind Or	Medicinal (Antifertility, cough, fever, tonic, veterinary); Edible; Fodder; Religious; Miscellaneous (Making bamboo brakes)
<i>Hordeum himalayense</i> Coel.	Barley	600-1000	H	WP	Ind	Fodder
<i>Hordeum vulgare</i> L.	Jaun	500-900	H	WP	Reg Himal	Edible; Fodder
<i>Oryza sativa</i> L.	Dhan	600-1000	H	WP		Medicinal (Demulcent, dysentery); Edible; Fodder; Religious
<i>Phalaris minor</i> Retz.	Canarygrass	600-1000	H	Lf, St	Oriens, Afr, Austr	Medicinal (Antifertility, cold, cough); Fodder
<i>Saccharum officinarum</i> L.	Ganna	600-1000	H	St, Lf	Reg Himal Burma	Medicinal (Jaundice, blood pressure, demulcent, cooling and diuretic); Edible; Fodder
<i>S. spontaneum</i> L.	Ganna	600-1000	H	Lf	Geront Trop	Fodder; Religious
<i>Setaria glauca</i> L.	-	500-1000	H	Sd	As Trop	Fodder
<i>Sorghum halepense</i> (L.) Pers.	Jowar	500-1000	H	WP		Fodder; Edible
<i>Themeda anathera</i> Hack.	-	700-1000	H	WP	Ins Philip	Fodder
<i>Triticum aestivum</i> L.	Kanak	500-800	H	Sd, AP	USSR (Mid Asia)	Medicinal; Edible; Fodder; Religious

Appendix 1. Contd.

<i>Vetiveria zizanioides</i> (L.) Nash	Khaskhas		H	Rt	Am Bor	Medicinal (Pain, carminative, cooling, colitis, flatulence, diaphoretic, stimulant and anthelmintic); Cosmetic
<i>Zea mays</i> L.	Makka	500-800	H	Sd	Amer	Medicinal (Adhesive, gel antiseptic); Edible; Fodder
Polygonaceae						
<i>Rumex hastatus</i> D. Don	Aambi	800-1000	H	Lf	Reg Himal	Medicinal; Edible
Punicaceae						
<i>Punica granatum</i> L.	Anar	500-1000	Sh	Fr	Europe Austr	Medicinal; Fuel; Edible
Ranunculaceae						
<i>Clematis buchananiana</i> DC.	Chabru	100-1000	Sh	Lf, Fl	Reg Himal	Medicinal; Fodder
<i>Ranunculus laetus</i> Wall. ex D. Don	-	700-1000	H	Lf, Fl	Reh Himal	Medicinal (Conjunctivitis, eye diseases)
<i>Thalictrum foliolossum</i> DC.**	-	800-1000	H	Rt, Lf	Reg Himal	Medicinal (Diuretic, dyspepsia, peptic ulcers, indigestion, fevers, toothache, haemorrhoids, boils, pimples and ophthalmia)
Rhamnaceae						
<i>Rhamnus triqueter</i> (Wallich) Brandis****	-	800-1000	T	Bk	Reg Himal	Medicinal (Astringent, antidiarrhoeal, menorrhagia, hypertensive)
<i>Ziziphus mauritiana</i> Lamk.	Jangli ber	600-1000	T	WP	Ind Or Malaya	Edible; Fodder; Religious
Rosaceae						
<i>Prunus armeniaca</i> L.	Khumani	500-1000	T	Fr, Bk, Lf	China	Medicinal (Massage, beverages); Fuel; Fertilizer; Edible; Fodder
<i>P. domestica</i> L.	Alubukhara	600-1000	T	Fr, Wd	Europe Asia	Medicinal (Demulcent, laxative, refrigerant, tonic, heart diseases); Fodder; Edible;
<i>P. persica</i> Batsch	Aru	600-1000	T	Fr, Wd	As Temp	Medicinal (Laxative, purgative, anthelmintic, beverages); Timber; Fodder; Edible; Miscellaneous (Dye)
<i>Pyrus communis</i> L.	Nashpati	500-1000	T	Fr	Europe As Bor Reg Himal	Edible
<i>P. pashia</i> Buch. - Ham.ex D. Don	Kainth	500-1000	Sh	Fr, Wd	Ind Burma	Medicinal; Edible; Fodder; Agricultural tools
<i>Rubus ellipticus</i> Sm.	Aakhae	700-1000	Sh	Fr	Ind	Wild edible, Medicinal (Dysentery, malaria, stomach, worms); Edible
Rubiaceae						
<i>Hymenodictyon excelsum</i> (Rox.) Wall.	-	600-1000	T	Rt, Lf	Ind Or Malaya	Medicinal (Abortificant, cholera, fever, gout, lactation, malaria, menalstral); Edible
<i>Leptodermis lanceolata</i> L.	-	600-900	Sh	Bk, Lf	Reg Himal	Medicinal (Anthelmintic, diuretic, expectorant, liver tonic, jaundice, heat eruption, constipation, colic, cough)
<i>Rubia cordifolia</i> L.****	-	500-1000	H	Rt, St	As Trop et Temp Afr Trop	Medicinal (Tonic, astringent, antipode, dysentery)
<i>Wendlandia heynei</i> (Roem. and Schult.) Sant. and Merch.	-	500-900	T	St	As Trop	Miscellaneous (Toothbrush)
Rutaceae						
<i>Aegle marmelos</i> L. Corr.**	Bael	800-1000	T	Fr, Rt,	Ind Or	Medicinal (diabetes, antiseptic, astringestoma, diarrhoea, dysentery, fevers, narcotic); fuel; religious
<i>C. aurantium</i> L.	Khatta	600-1000	T	Fr	Ind Or	Wild eatable; wood; fuel
<i>C. limon</i> (L.) Burm.f.	Neembu	600-1000	T	Fr	Ind Or	Medicinal (stomachic, carminative, antiscorbic, rheumatism, diarrhoea); eatable

Appendix 1. Contd.

<i>C. reticulata</i> Blanco	Santra	600-1000	T	Fr, Lf,Wd	Ind Or	Medicinal (blood purifier, liver accelerant, thirst tonic, cures catarrh, improve appetite and diarrhoea); fuel; edible
<i>C. sinensis</i> (L.) Osbeck	Mausambi	600-1000	T	Fr, Lf,Wd	Ind Or	Edible; Fuel
<i>Murraya paniculata</i> L. Jack.	Gandhela	500-1000	T	St, Lf,Sd	As et Austr Trop	Medicinal (Stimulant, antiseptic and rheumatism); Miscellaneous (Instruments)
<i>Zanthoxylon armatum</i> DC.**	Tirmir	900-1000	Sh	Sd,Lf	Reg Himal China	Medicinal(Carminative, stomachic, anthelmintic, tonic, disinfectant, antiseptic and gum troubles); Cosmetic
Sapindaceae						
<i>Sapindus mukorossi</i> L.	Reetha	500-1100	T	Sd, Lf	As Trop	Medicinal (Tonic, alexipharmic, anthelmintic, asthma, indigestion, cholera, limb paralysis, Antibacterial and antiseptic); Fodder; Fuel; Miscellaneous (Boxes, combs, carts)
Scrophulariaceae						
<i>Bacopa monnieri</i> (L.) Pennell	Brahmi	600-1000	H	Lf	Trop Am	Medicinal (Nerviness tonic, epilepsy, insanity, neuralgia, asthma); Edible; Religious
<i>Verbascum thapsus</i> L.	Janglitambakhu	700-1000	H	Sd	Europe, Afr Reg Himal	Medicinal (Asthma, cough, inflammation, leucoderma, veterinary diseases)
Solanaceae						
<i>Capsicum annum</i> L.	Lalmirchi	500-1000	H	Fr	Reg Trop	Edible
<i>Datura metal</i> L.	Kala datura	600-1000	H	Sh, Rt,Fr	Amer Trop Cosmop	Medicinal (Insanity, skin diseases, antiseptic, nervous disorders); Miscellaneous (Dye)
<i>Lycopersicon esculentum</i> Mill.	Tamatar	600-1000	H	Fr	Am Austr	Medicinal (Tonic); Edible
<i>Solanum indicum</i> L.		500-800	H	Fr	Reg Trop	Medicinal (Asthma, fever, colic)
<i>S. nigrum</i> L.	Makoi	500-1000	H	Fr, Lf, Fl	Amphig	Medicinal (Antidote, boils, cough, dysentery, ear complaints, fever, eye complaints, skin diseases, urinary complaints)
<i>S. melongena</i> L.	Baingun	550-1000	H	Fr	Geront Trop	Medicinal (General stimulant, obits, toothache, ulcers, nose bleed, leave sialagouge, narcotic, cholera, liver diseases)
<i>Withania somnifera</i> Dunal*	Ashwagandha	600-800	Sh	Fr, Lf	Ind Or	Medicinal (Aphrodisiac, tonic, deobstruent, abortive, rheumatism, debility, fevers, hypotonic and diuretic); Edible; Fodder
Tiliaceae						
<i>Grewia asiatica</i> L.	Beul	800-1000	T	Wd,Lf	Reg Himalya	Fodder; Wood; Fiber; Miscellaneous (Ropes)
<i>G. opposifolia</i> Buch.- Ham.****	Beul	900-1000	T	Wd, Lf	Reg Himal	Fodder; Wood; Fiber; Miscellaneous (Ropes)
Ulmaceae						
<i>Celtis australis</i> L.	Khirak	700-1000	T	Lf, Rt, Bk	Europe As Temp Ind Or	Fodder; Fuel
<i>Trema politoria</i> (Planch.) Bl.	-	450-800	Sh	WP	Reg Himal	Fodder; Fuel
<i>T. orientalis</i> (L.) Bl.	-	450-1000	T	WP	Grant Trop	Fodder; Fuel
Urticaceae						
<i>Boehmeria rugulosa</i> Wedd.	-	600-1000	T	Rt	Reg Himal Burma	Medicinal (Rheumatism, gout)
<i>B. platyphylla</i> D. Don	-	600-1000	T	Rt	Reg Himal Burma	Fodder
<i>Urtica dioica</i> L.	Bichoo Booti	900-1000	H	WP	Reg Bor Temp	Medicinal (Antiseptic, dandruff, dysentery, hematoma, jaundice, sprain, throat disorder)

Appendix 1. Contd.

Valerianaceae							
<i>Valeriana jatamansi</i> Jones	Nihanu	800-1000	H	Fr, Lf, Sd	Reg Himal	Burma	Medicinal (Hysterical remedy, nervous unrest, hypochondriacs, carminative, ayurvedic drugs, urinary trouble)
Verbenaceae							
<i>Lantana camara</i> L.	-	500-1000	Sh	Lf, Fr	Am Trop		Medicinal (Itching, malaria, rheumatism, ringworm); Edible; Fuel
<i>Vitex negundo</i> L.	Bana	500-1000	Sh	Wd, Ft, Fr	As Trop	Subtrop	Medicinal (Catarrhal fevers, headache, rheumatism, arthritis, antibacterial, tonic, diuretic, anthelmintic, dyspepsia, dysentery, fever and liver complaints)
Violaceae							
<i>Viola canescens</i> Wall. ex Roxb.****	Banafsha	900-1000	H	Lf, Fr	Ind Or	Malaya	Medicinal (Asthma, bronchial, cold, cough, eye disorders and malaria)
<i>V. pilosa</i> Bl.	Vanaksa	900-1000	H	Lf, Fr	Ind Or	Malaya	Medicinal (Asthma, bronchial, cold, cough, eye disorders and malaria)
Vitaceae							
<i>Vitis parviflora</i> Baker	-	600-900	Sh	St	Reg Or	China	Medicinal (Asthma, bronchial, cold, cough, eye disorders and malaria)
<i>V. vinifera</i> L.	Angoor	600-900	Sh	Fr	Ind	China	Edible; Medicinal (Boils, toothache, epilepsy); Edible
Zingiberaceae							
<i>Amorphophalus campanulatus</i> Roxb. B.	Jamikand	600-900	H	Tb	Ind Or	Himal	Medicinal (Tubers, stomachic, restorative, piles and rheumatic); Edible
<i>Curcuma longa</i> Val.	Haldi	600-900	H	Rh	As	Trop	Medicinal (Tonic, carminative, blood purifier, anti periodic, antiseptic, alterative, sprains, cuts, swellings, skin diseases and, bladder diseases); fodder; edible; religious
<i>Hedychium spicatum</i> Sm.**	Ban haldi	600-1000	H	Rh, Lf	Reg	Himal	Medicinal (Asthma, blood purifier, bronchitis, nausea); Fodder; Miscellaneous (mats)
<i>Zingiber officinale</i> Rosc.	Adrak	600-1000	H	Rh	Temp		Medicinal (cold infection, restorative tonic, Bronchitis, antinarcotics, antioxidant, stimulant, and carminative)

Lf = Life Form; H = Herb; Sh = Shrub; T = Tree; Lf = leaf; Fr = Fruit; Fl = Flower; WP = Whole Plant; Wd = Wood; Ra = Rasin; Sd = Seed; Bk = Bark; St = Stem; Rh = Rhizome; Tb = Tuber; AP = Aerial Parts; Cl = Climber; Arab = Arabia; Afr = Africa; Am = America; Amphig = Amphigaea; As = Asia; Austr = Australia; Bor = Boreal; Centr = Central; Cosmop = Cosmopolitan; et = And; Geront = Gerontia; Himal = Himalayan; Ind = India; Mongol = Mongolia; Or = Oriental; Orient = Oriental; Reg = Region; Subtrop = Subtropical; Temp = Temperate; Trop = Tropical; Ins = Insular; Malaya = Malaysia; Oc = Occasional; Co = Common; Afghan = Afghanistan; Arab = Arabia; Fr = France; Europ = Europe; Cauc = Caucasus; Occ = Occidentalis; Braz = Brazil; Meditr = Mediterranean; Moluca = Moluccan ; Phillip = Phillipine; * = Endemic; ** = Vulnerable; *** = Critically Endangered; and **** = Near Endemic.