

Floristic diversity of Theog Forest Division, Himachal Pradesh, Western Himalaya

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ABSTRACT: We provide a check list of the vascular plants of Theog Forest Division, Himachal Pradesh, Western Himalaya. Himachal Pradesh has been extensively surveyed in terms of flora by a large number of workers, albeit highly confined to prioritized areas. The floristic inventorization resulted in a total of 442 vascular plant species belonging to 311 genera and 117 families from an area of 512 km². Out of these, 408 species belonged to Angiosperms, 7 to Gymnosperms and 27 to Pteridophytes. The predominant families among Dicotyledons were Asteraceae, Rosaceae and Lamiaceae. Among the Monocotyledons, the most represented family was Poaceae, followed by Liliaceae and Cyperaceae. Pinaceae and Pteridaceae were found to be the most represented families among the Gymnosperms and Pteridophytes, respectively. Species richness was highest in shrubberies, which formed an ideal habitat for many herbaceous species within different habitat types. Strategic eradication of weed species, especially obnoxious species such as *Lantana camara* and *Parthenium hysterophorus* is required for effective management in the area.

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INTRODUCTION

The Indian Himalayan Region (IHR) comprises five bio-geographic zones including Trans, North-West, West, Central and East Himalaya (Rodgers and Panwar 1988), and supports more than 18,440 species of flowering plants – out of which 25 % are endemic to the region, covering an area of ca. 419,873 km² (Singh and Hajra 1996; Samant *et al.* 1998). In particular, Himachal Pradesh has been regarded as a veritable emporium of plant resources, rich in medicinal and aromatic plants (Chauhan 1999, 2003). The State is mountainous with an elevational range from 460 to 6,600 m. It has a deeply dissected topography, complex geological structure, wide elevational range and climatic conditions. There are six major forest types in the state, which include Tropical Dry Deciduous, Sub-tropical Pine, Sub-tropical Dry Evergreen, Himalayan Moist Temperate, Himalayan Dry Temperate, and Sub-alpine and Alpine forest types (Ministry of Environment and Forests 2001). The state is a rich repository of plant wealth and has been extensively surveyed in terms of flora by a large number of workers (Chauhan 1999, 2003). The earliest attempt to collect plants from Himachal Pradesh was made by William Moorcroft (1765–1825) who collected plants from Kangra, Kullu, Lahaul and Spiti in 1821; with these collections sent to Wallich (Chowdhery and Wadhwa 1984). The floristics and the vegetation of the state are broadly known through a number of studies (Collett 1902; Champion and Seth 1968; Nair 1977; Chowdhery and Wadhwa 1984; Aswal and Mehrotra 1994; Chauhan 1999; Dhaliwal and Sharma 1999; Kaur and Sharma 2004). As a result, about 3500 species of higher plants have been identified in the state flora. Collett (1902) collected plants from Shimla and adjacent areas in 1885, covering an area of ca. 804 km² with an elevational range of 600–3500 m

and reported 1326 species of flowering plants belonging to 113 families.

The exploration of floral resources holds importance; as otherwise unknown species may disappear without there ever having been knowledge of their existence (Singh and Minoo 2003). Subsequently, there is a vital need to identify our natural wealth, document it and raise awareness about its utility and the repercussions if it were to go to extinct. Therefore, it is essential to explore the currently little known microhabitats of Forest Divisions (FD), which represent the main unit in the hierarchy of forest departments for the management of forests in India. Hence, the present exploration for the inventory of plant species was conducted. The information can be used as a baseline by managers, conservationists and researchers for future studies.

MATERIALS AND METHODS

Study area

The Theog Forest Division, lies between 31°5' N and 31°10' N and 77°22.5' E and 77°30' E. The area is situated in the west of Shimla, the capital of Himachal Pradesh, located in Northern India (Figure 1). The division is surrounded by Rohru Forest Division in the east, Shimla Forest Division in the west, Kotgarh Forest Division in the north, and Rajgarh and Chopal Forest Divisions in the south. The total geographical area of the division is 64,000 ha (ca. 512 km²), out of which 32,045 ha (50.07%) of the total geographical area is under tree cover.

The entire tract is mountainous with moderate to steep slopes, which are at places precipitous, particularly in the northern and eastern aspects, namely Shali-Dhar and Chambi-Dhar, respectively. Elevation ranges from 1000–3160 m. The Narkanda-Kufri is the main ridge



FIGURE 1. Map showing the location of Theog Forest Division, Himachal Pradesh, India.

which forms the watershed between the Sutlej in the north and Giri in the south. Another main ridge is Shali-Dhar dividing Shimla and Theog Forest Divisions. The only river flowing through the study area is Giri, which originates from Garaog, near Kharapathar in Rohru Forest Division. It flows through the southern part and crosses over to Rajgarh Forest Division and drains into the river Yamuna, one of the main tributaries of the river Ganges.

The lithology is dominated by limestone, shale and quartzite in large areas of Theog and Balson ranges. Shale, phyllite, limestone, schist, gneiss and amphibolite are well exposed at Mahasu and Chambi areas while shale, sand, quartzite, limestone and shale conglomerates occur in areas just south of Kotgarh Division, at Chhaila, Ghund and near Deha. The soil type is more or less clayey or clayey-loam throughout the tract, except at few places where it tends to be sandy-loam. The climate is mostly temperate at the higher elevations and sub-tropical at the lower ones. The minimum and maximum temperatures remain between 16–26°C, and rise up to 35°C (summer) in the lower areas along the river Giri, but it remains between 15–22°C in monsoon season and drops to 0–10°C in winters. The precipitation in the form of snow is received in January-February and sometimes in November-December at higher elevations, whereas lower elevations receive rains in June-August. The area on average receives an annual rainfall of about 1200 mm. The major forests are *Deodar-Kail*, *Fir-Spruce*, *Chir* and *Oak*. The forests, throughout the tract are both coniferous and broad-leaved, grouped as dry-tropical, montane sub-tropical and montane temperate types (Champion and Seth 1968).

Floristic survey

Elevation is deemed most important among the various factors which combine to create contrasts in habitat,

climate and flora (Polunin and Stainton 1984). Our field visits were scheduled and the areas to be covered selected taking this into account. Extensive field surveys of the entire study area were conducted in different growing seasons between 2009 and 2010, including low-lying areas like Satog, Balag, Naina, Maipul and Sainj in the Giri Valley, as well as up to the highest peak of the division at Jaobag on Hatu Dhar. Field visits to these areas were planned to collect the plant species either in flowering or fruiting stage to facilitate the process of correct identification. Voucher specimen numbers for each collection were assigned and important field characters were recorded. Identification of the plant specimens was done based on field characters noted during the collection and with the aid of available monographs, taxonomic revisions and floras (Hooker 1872–1897; Collett 1902; Chowdhery and Wadhwa 1984; Polunin and Stainton 1984; Stainton 1988; Chauhan 1999; Khullar 1994, 2000). The plant specimens were cross-checked with authentic specimens housed in the herbarium of University of Horticulture and Forestry (UHF), and were deposited here for future reference. Unidentified specimens were confirmed by comparison with specimens housed in the Dehradun herbarium (DD). Specimens were collected and preserved following Jain and Rao (1977). Based on modern phylogenetic studies, APG III classification (Angiosperm Phylogeny Group 2009; Haston *et al.*, 2009) was followed to classify the Angiosperm species. Similarly, Gymnosperms and Pteridophytes were classified following Christenhusz *et al.* (2011a, b) respectively.

RESULTS

Floristic diversity

A total of 442 vascular plants belonging to 312 genera and 97 families, were collected and recorded (Tables 1 and

3). Out of these, 408 species were Angiosperms (352 species of Dicotyledons and 56 species of Monocotyledons), 7 were Gymnosperms and 27 were Pteridophytes. The most represented families among Dicotyledons were Asteraceae (31 genera and 45 species), Rosaceae (13 genera and 29 species), Fabaceae (17 genera and 27 species), Lamiaceae (20 genera and 25 species), Ranunculaceae (6 genera and 12 species), Amaranthaceae (7 genera and 11 species), Euphorbiaceae (6 genera and 10 species), Brassicaceae (7 genera and 8 species), Apiaceae (6 genera and 8 species) and Acanthaceae (5 genera and 8 species). Thirty one families were represented by only a single genus per species (*i.e.*, monospecific). Among the Monocotyledons, the most represented family was Poaceae (28 genera and 31 species), followed by Liliaceae (4 genera and 8 species), Cyperaceae (5 genera and 7 species) and Asparagaceae (3 genera and 4 species), whereas 5 families were monospecific. Pinaceae (4 genera and 5 species) and Pteridaceae (5 genera and 11 species) were found to be the most represented families among the Gymnosperms and Pteridophytes, respectively. The dominant families (in terms of total number of species) (Figure 2) included two monocot (Poaceae and Liliaceae) and one pteridophyte (Pteridaceae) family. As per the type of growth form, 13.8% were trees, 22.6% were shrubs, 52.5% were herbs, 5% were climbers and 6.1% were ferns (Table 2).

The number of families, genera and species and their respective percentage are accounted in Table 1. The enumerated plants were classified into their respective growth forms, including trees, shrubs (erect, under shrubs, epiphytic), herbs, climbers (woody and non-woody) and ferns (Table 2). Floristic details given in Table 3 include species and family, binomial and vernacular names, distribution and habitat specificity, flowering and fruiting times, elevational range and voucher specimen number.

DISCUSSION

Theog Forest Division revealed a total of 442 vascular plants that represents about 33.3% and 12.6% of the Flora of Shimla and Himachal Pradesh respectively. High diversity of vascular plants in the region is mainly attributed to climatic, topographic and edaphic factors. Annual rainfall of the Theog Forest Division was recorded at *ca.* 1200 mm annually, which is similar to other floristically rich areas present in the Greater Himalayan Range (*e.g.*, Kedarnath Wildlife Sanctuary and Valley of Flowers National Park).

TABLE 1. Number of families, genera and species documented in the study area.

NAME OF PLANT GROUP	FAMILIES	GENERA	SPECIES
	TOTAL (% OF THE TOTAL)	TOTAL (% OF THE TOTAL)	TOTAL (% OF THE TOTAL)
Angiosperms	85 (87.6)	291 (93.3)	408 (92.3)
a) Dicotyledons	76 (78.4)	245 (78.5)	352 (79.6)
b) Monocotyledons	9 (9.3)	46 (14.7)	56 (12.7)
Gymnosperms	3 (3.1)	6 (1.9)	7 (1.6)
Pteridophytes	9 (9.3)	15 (4.8)	27 (6.1)
Total	97 (100)	312 (100)	442 (100)

The elevational variation, irregular topography and intercepted valleys form various microhabitats, which in turn supports high floristic diversity. The dominant habitat types in the area were the forests (Chir Pine, Deodar-Kail, Ban Oak-Chir Pine mixed, Fir-Spruce and Kharsu Oak), shrubberies (*Berberis* spp., *Cotoneaster* spp., *Rubus* spp., *Euphorbia royaleana*), grassy and rocky open slopes (*Apluda* spp., *Themeda* spp., *Chrysopogon* spp., *Eulaliopsis* spp.) and cultivated/fallow areas. Species richness was higher in shrubberies (98 species), followed by cultivated/fallow areas (79 species), forests (62 species) and grassy and rocky open slopes (40 species). Shrubberies, the most frequent habitat in the region, transition to forests, grasslands and rocky open slopes and therefore were comparatively richer. These habitats also prevent livestock from grazing and therefore form ideal habitats for many herbaceous species. The high diversity in the cultivated/fallow areas in the region is due to the high representation of alien and opportunistic species. Subsequently, the grassy and rocky open slopes are mainly confined to southern aspects, which are devoid of woody elements and are therefore comparatively poorer in vegetation.

A total of 21 species were recorded as weed species. The most obnoxious and abundant species were *Lantana camara* (Verbenaceae) and *Parthenium hysterophorus* (Asteraceae). Other common weed species confined to wastelands near habitations and along roadside were *Capsella bursa-pastoris*, *Stellaria media*, *Alternanthera sessilis*, *Cynoglossum glochidiatum*, *Veronica persica*, *Bidens*

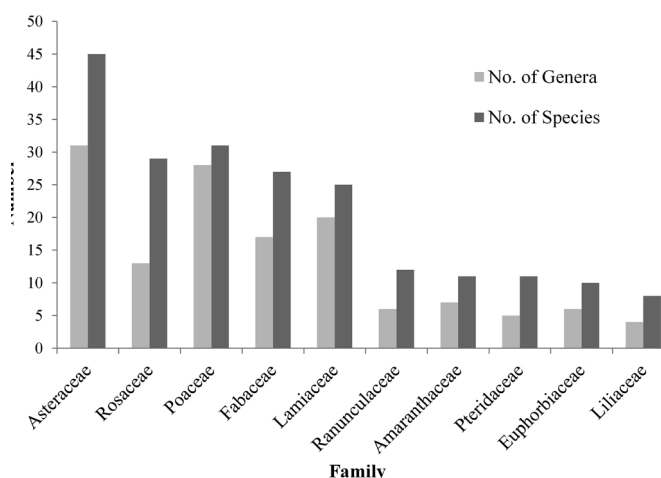


FIGURE 2. Ten dominant families with their respective genera and species in Theog Forest Division, Himachal Pradesh, India.

TABLE 2. Analysis of habit-forms of the documented flora.

HABIT-FORM	NO. OF SPECIES	% OF TOTAL
Trees	61	13.8
Shrubs	100	22.6
Erect	75	17.1
Under shrubs	22	5.0
Epiphytic	03	0.7
Herbs	232	52.5
Annuals	81	18.5
Perennials	151	34.4
Climbers	22	5.0
Woody	08	1.8
Non-woody	14	3.2
Ferns	27	6.1
Total	442	100



pilosa, *Rumex nepalensis*, *Cannabis sativa*, *Cirsium verutum*, *Bidens pilosa*, *Malva verticillata* and *Trifolium repens*. The major ornamental tree species planted in the area were *Jacaranda mimosaeifolia* (Bignoniaceae), *Grevillea robusta* (Proteaceae), *Robinia pseudoacacia* (Fabaceae) and *Acacia mearnsii* (Fabaceae). Widespread plant species near to cultivated areas included *Medicago polymorpha*, *Trifolium pratense*, *Trifolium repens*, *Eleusine indica*, *Cannabis sativa*, *Oxalis corniculata*, *Euphorbia hirta*, *Ricinus communis*, *Malva verticillata*, *Polygonum nepalense*, *Rumex nepalensis*, *Solanum nigrum*, *Dicliptera bupleuroides*, *Bidens pilosa* and *Digitaria sanguinalis*. A total 28 plants were recorded as cultivated species, of which 6 were tree species, namely; *Prunus armeniaca*, *Prunus persica*, *Pyrus communis*, *Juglans regia*, *Punica granatum* and *Sapindus mukorossi*, which were planted in orchards and agricultural fields; 3 were shrubs (*Dodonaea viscosa*, *Leucaena leucocephala*, *Nerium indicum* and *Jasminum mesneyi*) and 12 were herb species (including *Fagopyrum esculentum*, *Amaranthus paniculatus*, *Phytolacca acinosa*, *Solanum melongena*, *Ocimum basilicum*, *Cosmos bipinnatus*, *Tagetes patula*, etc). Most of the Poaceae and Cyperaceae members are relished as fodder by livestock and mountain ungulates and act as good soil binders, such as *Apluda mutica*, *Arthraxon lanceolatus*, *Bromus mollis*, *Chrysopogon fulvus*, *Cynodon dactylon*, *Eleusine indica*, *Heteropogon contortus*, *Themeda anathera*, *Phragmites communis*, *Carex* sp. and *Cyperus michelianus*.

Threatened taxa

Acer caesium Wall. ex Brandis (Sapindaceae), which is listed as vulnerable in IUCN Red Data Book of Indian Plants, and *Podophyllum hexandrum* Royle (Berberidaceae) which is Critically Endangered in Appendix II of CITES, were also recorded from the area. Both species are endemic to the Himalaya.

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LITERATURE CITED

APG III. 2009. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. *Botanical Journal of the Linnean Society* 161(2): 105–121. (doi: 10.1111/j.1095-8339.2009.00996.x).

- Aswal, B.S. and B.N. Mehrotra. 1994. *Flora of Lahaul-Spiti (A cold desert in North West Himalaya)*. Bisen Singh Mahendra Pal Singh, Dehradun, India. 761 pp.
- Champion, H.G. and S.K. Seth. 1968. *A Revised Survey of the Forest Types of India*. Government of India Press, New Delhi. 404 pp.
- Chauhan, N.S. 1999. *Medicinal and Aromatic Plants of Himachal Pradesh*. Indus Publishing Company, New Delhi. 632 pp.
- Chauhan, N.S. 2003. Important medicinal and aromatic plants of Himachal Pradesh. *Indian Forester* 129(8): 979–998.
- Christenhusz M.J.M., J.L. Reveal, A. Farjon, M.F. Gardner, R.R. Mill and M.W. Chase. 2011a. A new classification and linear sequence of extant gymnosperms. *Phytotaxa* 19: 55–70. (<http://www.mapress.com/phytotaxa/content/2011/f/pt00019p070.pdf>).
- Christenhusz M.J.M., X. ZHANG and H. Schneider. 2011b. A linear sequence of extant families and genera of lycophytes and ferns. *Phytotaxa* 19: 7–54. (<http://www.mapress.com/phytotaxa/content/2011/f/pt00019p054.pdf>).
- Chowdhery, H. J. and B. M. Wadhwa. 1984. *Flora of Himachal Pradesh: An analysis*. Vols. 1–3. Department of Environment, Government of India, Botanical Survey of India, Howrah, India. 860 pp.
- Collett, H. 1902. *Flora Simlensis*. Thacker Spink and Co., London (Reprinted 1971). Bisen Singh Mahendra Pal Singh, Dehra Dun, India. 652 pp.
- Dhaliwal, D. S. and M. Sharma. 1999. *Flora of Kullu District (Himachal Pradesh)*. Bisen Singh Mahendra Pal Singh, Dehradun India. 744 pp.
- Haston E., J. E. Richardson, P. F. Stevens, M. W. Chase and D. J.Harris. 2009. The Linear Angiosperm Phylogeny Group (LAPG) III: A linear sequence of the families in APG III. *Botanical Journal of the Linnean Society* 161(2): 128–131. (doi: 10.1111/j.1095-8339.2009.01000.x).
- Hooker, J.D. 1872–1897. *Flora of British India*, vols. 1–7. L. Kent, England: Reeve & Co. (Reprint edition).
- Jain, S. K. and R. R. Rao (eds.). 1977. *Handbook of Field and Herbarium Methods*. New Delhi: Today & Tomorrow's Printers & Publishers. 157 pp.
- Kaur, H. and M. Sharma (2004). *Flora of Sirmaur (Himachal Pradesh)*. Dehradun: Bisen Singh Mahendra Pal Singh. 770 pp.
- Khullar, S. P. 1994. *Illustrated fern flora of the West Himalaya*, Vol. 1. Dehradun: International Book Distributors. 506 pp.
- Khullar, S. P. 2000. *Illustrated fern flora of the West Himalaya*, Vol. 2. Dehradun: International Book Distributors. 544 pp.
- Kurian, A. and M. A. Sankar. 2007. *Medicinal Plants*. New Delhi: New India Publishing Agency. 356 pp.
- Ministry of Environment and Forests. 2001. State of Forest Report 2001. Forest Survey of India. Dehradun: Ministry of Environment and Forests.
- Nair, N. C. 1977. *Flora of Bashahr Himalayas*. International Biosciences Publishers, Hissar, Madras, India. 360 pp.
- Polunin, O. and A. Stainton. 1984. *Flowers of the Himalaya*. Delhi: Oxford University Press. 580 pp.
- Samant, S.S., U. Dhar, and L.M.S. Palni. 1998. *Medicinal Plants of Indian Himalaya. Diversity Distribution Potential Values*. Nainital: Gyanoghaya Prakashan. 163 pp.
- Singh, D.K. and P.K. Hajra. 1996. *Floristic diversity*; pp. 25–38, in: Gujral, G. and V. Sharma (eds.), *Changing Perspectives of Biodiversity Status in the Himalayas*. New Delhi: British Council Division, British High Commission publication. 186 pp.
- Singh, A. P. and P. Minoo. 2003. The floral diversity of Gujarat State: A review. *Indian Forester* 129(12): 1461–1469.
- Stainton, A. 1988. *Flowers of the Himalaya: A Supplement*. New Delhi: Oxford University Press. 86 pp.

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TABLE 3. The floristic details of Theog Forest Division, Shimla, Western Himalaya with their Family, binomial, vernacular name, distribution and habitat, flowering and fruiting, elevational range and Voucher specimen number. WC: Woody climber; C: Non-woody climber; AH: Annual herb; PH: Perennial herb; T: Tree; S: Shrub; F: Fern; TY: Throughout the year; *: Threatened plant.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
Schisandraceae						
<i>Schisandra grandiflora</i> (Wall.) Hook. f. & Thoms.	Klandru	WC	In temperate forests and shrubberies	May-June	2000-3000	12783, 12784
Lauraceae						
<i>Neolitsea pallens</i> (D. Don) Momiyama & Hara	Chirudi, Chindi,	T	Near water-courses in shady areas of forests	April-Oct	1000-2500	12864
Araceae						
<i>Arisaema flavum</i> (Forsskal) Schott	Samp-alu, Jhangush	PH	Shady areas	June-Sept	1800-3000	12288
Dioscoreaceae						
<i>Dioscorea deltoidea</i> Wall. ex Griseb.	Singli-mingli	C	Shrubberies	May-Aug	1800-3000	12870
<i>Dioscorea melanophyllum</i> Prain & Burkill	Sohnu	C	Occasionally found in shrubberies	July-Oct	1200-2400	12244
Liliaceae						
<i>Aloe barbadensis</i> Mill.	Gwar-patha	PH	Cultivated and naturalized in the dry valleys	July-Oct	upto 1500	12628
<i>Polygonatum cirrhifolium</i> (Wallich) Royle	Meda	PH	Shrubberies and open slopes	Apr-June	1800-3500	12118
<i>Polygonatum multiflorum</i> (Linn.) Allioni		PH	Shrubberies and open slopes	May-Sept	1800-3000	12893, 12814
<i>Polygonatum verticillatum</i> (Linn.) Allioni	Mahameda	PH	Shrubberies and open slopes	May-July	2000-3500	12937, 12916
<i>Smilacina purpurea</i> Wall.		PH	Fairly common on the forest floor and open slopes	May-Aug	2500-3500	12902
<i>Smilax aspera</i> Linn.		C	Common climber in the shrubberies	Mar-June	1000-2400	11293, 12103
<i>Smilax glaucophylla</i> Klotzsch	Shondu-ri-lo, Kukardari	C	Common climber in forests and shrubberies	May-Aug	1500-2600	12142, 12643
<i>Smilax vaginata</i> Decne.		C	Shrubberies	May-Sept	1500-2500	12818
Orchidaceae						
<i>Habenaria intermedia</i> D. Don	Ridhi	PH	Grassy slopes and meadows	May-Aug	1800-3000	12936
Iridaceae						
<i>Iris nepalensis</i> D. Don	Shalbo	PH	Shallow places on the mountain-slopes	June-Aug	1800-3000	12789
Asparagaceae						
<i>Agave angustifolia</i> Haw.	Ramban	S	Planted and sometimes as an escape, on dry exposed slopes	May-Sept	upto 1500	12963
<i>Agave cantula</i> Roxb.	Ramban	S	Planted and naturalized in India, generally on dry exposed slopes	July-Sept	upto 2000	--
<i>Asparagus adscendens</i> Roxb.	Kleunti, Kelti	S	Grasslands and shrubberies	Aug-Nov	upto 1600	12221
<i>Yucca gloriosa</i> Linn.		S	Ornamental crop or as a live-hedge	Aug-Oct	upto 2200	12754
Zingiberaceae						
<i>Rostoea purpurea</i> J. E. Smith var. <i>gigantea</i> Wall.	Sharduli	PH	Dry open slopes and grasslands	June-Aug	1500-3000	12186
Cyperaceae						
<i>Carex breviculmis</i> R. Br.		PH	Common on rocks and cliffs in damp shady areas	May-Nov	2000-3500	12793
<i>Carex cardiolipsis</i> Nees		PH	Moist shady areas and near ravines	TY	2000-3500	12794
<i>Carex remota</i> Linn. subsp. <i>rochebrunii</i> (Franch. & Savat.) Kulk.		PH	Damp shady areas in forests	TY	2200-3500	12182
<i>Cyperus michelianus</i> (Linn.) Link		AH	In fields, near villages, along roadsides and in wastelands, especially in moist shady areas	June-Nov	upto 1500	12659
<i>Eriophorum comosum</i> (Wall.) Wall. ex Nees	Gor-baggar	PH	Dry open slopes and grasslands	Aug-Nov	upto 3500	11298, 12621
<i>Scirpus roylei</i> (Nees) Parker		PH	Near lakes, springs and ponds	April-Nov	upto 3500	12792

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
<i>Scleria</i> sp. Berg.		PH		TY	upto2200	12845
Poaceae						
<i>Apluda mutica</i> Linn.	Ponai	PH	In forests, shrubberies, river banks, along roadsides, on poor soil, in waste grounds	TY	upto2200	12658
<i>Arthraxon lanceolatus</i> (Roxb.) Hochstetter	Nagri	PH	Moist ground and near cultivated areas	TY	upto 2400	12200
<i>Arundinella bengalensis</i> (Spreng.) Druce		PH	Along roadsides, in open places, under pine forests	TY	upto 1800	12948
<i>Arundinella nepalensis</i> Trinus	Dundi	PH	In dry woodland and grassland, moist areas	TY	upto 1500	12619
<i>Avena fatua</i> Linn.	Joi	AH	Common near the fields	April-Oct	1200-3000	12169, 12181
<i>Bromus mollis</i> Linn.		AH	Common near cultivated areas and along roadsides	TY	2000-3500	12791
<i>Capillipedium assimile</i> (Steudel) A. Camus		AH	Gregariously in abandoned places, open grassy places and riverbanks	TY	upto 2000	12662
<i>Chrysopogon fulvus</i> (Spreng.) Chiov.	Goria, Guria, Dholu	AH	Common in grasslands; on stony soils, along roadsides and in dry sandy soils	TY	upto 1800	12949
<i>Cymbopogon martinii</i> (Roxb.) J. F. Watson	Jhimra	PH	Warmer aspects in grasslands, and on well-drained fertile soils	TY	upto 1801	12620
<i>Cynodon dactylon</i> (Linn.) Pers.	Joob, Doob	PH	Widely distributed in all warm places	TY	upto 2500	12198
<i>Dendrocalamus hamiltonii</i> Nees & Arn. ex Munro	Kaghzi bans	S	A common bamboo of Eastern Himalaya and Assam; often cultivated in lower hills of Western Himalaya	Sporadic	upto 1200	12622
<i>Dendrocalamus strictus</i> (Roxb.) Nees	Lathi-bans, Nar-bans,	S	Occurs throughout India; on dry slopes	Sporadic	upto 1500	12664
<i>Dichanthium annulatum</i> (Forssk.) Stapf		PH	Along roadsides, in grasslands, waste ground and open forests	TY	upto 2000	12945, 12944
<i>Digitaria sanguinalis</i> (L.) Scop.	Rai, Safed Rai	AH	Cultivated fields, waste places, poor soils and along roadsides	TY	upto 2000	12196
<i>Echinochloa crus-galli</i> (Linn.) P. Beauv.	Samak, Sanwak	AH	Very common near watery places	TY	upto 2000	12657
<i>Eleusine indica</i> (Linn.) Gaertner	Mandla	AH	Common near cultivated areas, wastelands and along roadsides, especially in damp conditions	TY	upto 1800	12655
<i>Eragrostis gangetica</i> (Roxb.) Steud.	Drabh	AH	Found in open habitats; grasslands and waste places	TY	upto 1500	12950, 12661
<i>Eulaliopsis binata</i> (Retz.) C. E. Hubbard	Munji	PH	Hot and dry areas	April-Oct	upto 2000	12951, 12618
<i>Festuca arundinacea</i> Schreber		PH	Usually found on both wet and dry sites, along roadsides, in fields and open grounds	TY	upto 2000	12168, 12176
<i>Heteropogon contortus</i> (Linn.) Beauv. ex Roem. & Schult.	Kamrodhi	PH	On exposed dry slopes and grazeries	June-Oct	upto 1600	12278
<i>Imperata cylindrica</i> (Linn.) P. Beauv.	Kusha	PH	Common on dry open slopes	TY	upto 1800	12663
<i>Koeleria cristata</i> (Linn.) Pers.	Khadar	PH	Common on dry open slopes, especially on the southern aspects	TY	1700-4000	12173, 12175
<i>Neyraudia arundinacea</i> (Linn.) Henr.	Bichhru, Naltura	PH	Throughout the plains	TY	upto 1800	12946
<i>Pennisetum flaccidum</i> Griseb.	Flaccid grass	PH	Common alongside fields	June-Oct	1500-3800	12193
<i>Pennisetum orientale</i> L. C. Rich.	Khadar	PH	Rich moist soils, near cultivated areas and along streams; but drought resistant too and occurring on dry hill slopes	June-Oct	500-2200	12947
<i>Phalaris paradoxa</i> Linn.	Chiriyi Bajra	AH	In disturbed places and open habitats, in shallow drainage, roadsides, waste ground and deep loamy soils.	Apr-July	upto 1600	12174
<i>Phragmites communis</i> Trin.	Dar, Narikul,	PH	Widespread in temperate regions	TY	upto 3200	12179
<i>Polypogon fugax</i> Nees ex Steudel	Beard-grass	AH	Common; growing in damp and swampy places	TY	above 1000	12656
<i>Saccharum filifolium</i> Steud.		PH	Throughout the north-western Himalaya	TY	1200-2800	12617
<i>Thamnochlamus spathiflorus</i> (Trin.) Munro	Ringal, Parikh	S	Common as undergrowth in montane conifer forests, especially in moist shady areas	gregarious	2300-3000	12912, 12913

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
<i>Themeda anathera</i> (Nees ex Steud.) Hack.	Dhonlu, Ghatira,	PH	Abundant on open dry slopes	TY	1200-2500	12199
Papaveraceae						
<i>Argemone mexicana</i> Linn.	Bharband	AH	Roadsides and in fields	May-Sept	upto 1500	12968
<i>Corydalis govaniana</i> Wall.	Bhutjata, Bhutkis	PH	Common on open slopes and shrubberies, in moist sub-alpine areas	April-Aug	2600-4000	12882, 12877
<i>Fumaria indica</i> (Hausskn.) Pugsley	Jhinchra, Pitpapra	AH	Common in fields as a weed of cultivation in the temperate regions	April-June	upto 2500	12719, 11267
Menispermaceae						
<i>Cissampelos pareira</i> Linn. var. <i>hirsuta</i> (DC.) Forman	Patendu, Patha	C	Common in shrubberies, grasslands and near cultivated areas	April-Sept	upto 1800	12259
Berberidaceae						
<i>Berberis aristata</i> DC. var. <i>aristata</i> Hook. f.	Chotra, Kashmal	S	Common in shrubberies	April-June	2000-3500	11240, 12289
<i>Berberis lycium</i> Royle	Kashmal	S	Common in shrubberies on dry exposed slopes	April-July	1000-3000	11258
* <i>Podophyllum hexandrum</i> Royle	Bankakri	PH	On the forest floor in moist shady areas	May-Sept	2600-4200	12891
Ranunculaceae						
<i>Anemone obtusifolia</i> D. Don	Rattanjog, Padar	PH	Very common in open pastures and shrubberies	Sept-Oct	2100-3500	12904, 12717
<i>Anemone vitifolia</i> Buch.-Ham. ex DC.		PH	Occasionally found in shrubberies	July-Oct	2000-3000	12873
<i>Aquilegia fragrans</i> Benth.		PH	Common in shrubberies and meadows of alpine and temperate western Himalaya	May-Sept	2700-4000	12898, 12899
<i>Clematis barbellata</i> Edgew.		WC	Occasionally found in shrubberies and forests of temperate western Himalaya	May-Oct	2400-3200	12895
<i>Clematis buchananiana</i> DC.		WC	Common in forests and shrubberies	July-Oct	1800-3000	12706, 12280
<i>Clematis gauriana</i> Roxb. ex DC.	Belkangu	C	Common in shrubberies in lower Himalaya	July-Nov	500-1300	12603
<i>Clematis grata</i> Wall.	Budlu-ri-lo	WC	Common in shrubberies in sub-tropical and temperate Himalaya	July-Sept	800-2600	12246, 12626
<i>Clematis montana</i> Buch.-Ham. ex DC.	Khari bel	WC	Quite common in forests, shrubberies and open hillsides	April- May	1800- 4000	12743, 11251
<i>Delphinium denudatum</i> Wall. ex Hook. f. & Thoms.	Nirbisi, Jadwar	AH	Occasionally found in shrubberies and grassy places of temperate western Himalaya	April-Sept	1800-2800	12861
<i>Ranunculus hirtellus</i> Royle ex D. Don		AH	Frequently found at damp places in forests and alpine pastures	April-Aug	2200-3500	12919
<i>Ranunculus laetus</i> Wall. ex D. Don	Badailtu	PH	Common in shrubberies and near cultivated areas, in damp conditions	Apr-Sept	1500-2800	12862, 11241
<i>Thalictrum foliolosum</i> DC.	Pili-jari, Mamiri	PH	Fairly common in shrubberies and forests	Jun-Oct	1200-3000	12668, 12805
Proteaceae						
<i>Grevillea robusta</i> Cunn. ex R. Br.		T	Often planted as an avenue tree along the roads	April-May	upto 1500	12999
Buxaceae						
<i>Sarcococca saligna</i> (D. Don) Muell.-Arg.		S	Common in moist areas in temperate forests	May-Oct	1500-2800	12812
Grossulariaceae						
<i>Ribes emodense</i> Rehd.		S	In forested areas	May-Sept	2500-3500	12892
Saxifragaceae						
<i>Astilbe rivularis</i> Buch.-Ham. ex D. Don		PH	Common on the forest floor; on shady aspects	Jun-Oct	2000-3000	12886, 12782
<i>Bergenia ciliata</i> (Haw.) Sternb.	Pashanbhed	PH	Common on rocks in shady places of the forests	April-June	1500-3000	12139, 12138
<i>Bergenia stracheyi</i> (Hook. f. & Thoms.) Engl.	Pashanbhed	PH	On rocks in damp forests	May-Aug	2500-4500	12920
Crassulaceae						
<i>Kalanchoe integrifolia</i> (Medik.) Kuntze	Haiza, Tatar	PH	On open slopes and grazeries	Sept-Nov	400-1600	12194

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
<i>Rosularia rosulata</i> (Edge.) Ohba	Mushe Re Kan	PH	Common in forests on damp rocks and walls	April-June	1800-3000	12742, 11237
Vitaceae						
<i>Ampelocissus latifolia</i> (Roxb.) Planchon	Pambel	C	Occasionally encountered on shady aspects in grazeries and shrubberies	June-Sept	upto 1800	12247
<i>Parthenocissus himalayana</i> (Royle) Planchon	Ban-Io, Phlankar	WC	Common in coniferous forests	April-May	1800-3000	11261, 12808
Fabaceae						
<i>Acacia catechu</i> Willd.	Khair	T	Hot valleys	May-Nov	upto 1300	12675, 12982
<i>Acacia mearnsii</i> de Wild		T	As an avenue tree in hot valleys	Apr-Aug	upto 1500	12977
<i>Acacia nilotica</i> (Linn.) Willd. ex Delile subsp. <i>indica</i> (Benth.) Brenan	Babul, Kilkar	T	Only a few shrubby individuals were encountered, perhaps planted; cosmopolitan in distribution	July-Oct	upto 1300 m	12958
<i>Albizia chinensis</i> (Osbeck) Merr.	Siran	T	Occurs throughout India	May-June	upto 1300	12975
<i>Albizia julibrissin</i> Durazz.		T	Often planted along roadsides or growing along riversides; occurs throughout Outer Himalaya	May-Sept	upto 2400	12838
<i>Argyrolobium flaccidum</i> (Royle) Jaub. et Spach		S	Fairly common in grasslands	May-Oct	upto 2500	12606
<i>Alyxia scarabaeoides</i> (Linn.) Benth.		PH	Common in grasslands		upto 1800	12184
<i>Bauhinia variegata</i> Linn.	Karail	T	Commonly planted in villages or wild in forests	Mar-Apr	upto 1300	12532
<i>Cassia floribunda</i> Cav.	Bankola, Shershu	AH	Common in wastelands and near cultivated areas	July-Oct	upto 1800	12210, 12647
<i>Cassia mimosoides</i> Linn.		PH	On grassy slopes	May-Sept	upto 1800	12250
<i>Dalbergia sissoo</i> Roxb.	Shisham	T	Commonly planted in villages or wild in woods	Mar-May	upto 1300	12997
<i>Desmodium concinnum</i> DC.	Barachi	S	Common in shrubberies and forests	Aug-Sept	400-2000	12601
<i>Desmodium elegans</i> DC.	Mooti	S	Common in shrubberies and forests	Apr-Oct	500-2800	12254, 12790
<i>Flemingia macrophylla</i> (Willd.) O. Kuntze ex Merrill	Bara-salpan	S	Fairly common on open grassy slopes	Aug-Oct	upto 1600	12208
<i>Indigofera atropurpurea</i> Buch.-Ham ex Horn.	Kathi	S	Common in grazeries and shrubberies; temperate Himalaya	June-Nov	1200-2800	12276
<i>Indigofera dosua</i> Buch.-Ham. ex D. Don	Kathi	S	Common in grazeries and shrubberies; temperate Himalaya	May-Oct	1500-2500	12273, 12274
<i>Indigofera heterantha</i> Wallich ex Brandis	Kathi	S	Common in shrubberies and open forests; throughout temperate Himalaya	May-Oct	1500-2500	12855, 12856
<i>Lespedeza gerardiana</i> Graham ex Maxim.		S	Common on open grassy slopes; throughout Himalaya	Aug-Oct	1200-3000	12665
<i>Lespedeza juncea</i> (L. f.) Pers.		S	Fairly common in grazeries of the temperate regions of Himalaya	Aug-Oct	upto 2500	12788
<i>Lespedeza stenocarpa</i> Maxim.	Mahori	S	Common in shrubberies and grasslands; throughout Northern India	July-Dec	up to 2200	12781
<i>Leucaena leucocephala</i> (Lamk.) de Wit	Subabul	T	Introduced and widely cultivated	TY	upto 1500	12955
<i>Lotus corniculatus</i> Linn.		PH	Common in grasslands, near cultivated areas and on the forest floor; temperate Himalaya	May-Oct	1500-3500	12811, 11253
<i>Medicago polymorpha</i> Linn.		AH	Common in wasteland, roadsides and near cultivated areas	Apr-Aug	upto 1500	12616
<i>Rhynchosia himalensis</i> Benth. ex Baker		PH	Fairly common in grasslands; throughout Western Himalaya	Aug-Oct	500-1800	12234
<i>Robinia pseudoacacia</i> Linn.		T	Cultivated as an ornamental plant and as an avenue tree	Apr-Oct	upto 2300	12765
<i>Trifolium pratense</i> Linn.		PH	Fairly common near cultivated areas	Apr-Aug	1200-2500	11263
<i>Trifolium repens</i> Linn.		PH	Common at moist-shady places near cultivated areas and in the forests	Apr-Sept	1200-2500	12772, 11242
Polygalaceae						
<i>Polygala abyssinica</i> R. Br. ex Fresen.		PH	Common on open grasslands	Aug-Oct	1000-2500	12667

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
Rosaceae						
<i>Agrimonia pilosa</i> Ledeb. var. <i>nepalensis</i> (D. Don) Nakai		PH	Common on forest floor in shady areas	May-Aug	1200-3000	12778
<i>Cotoneaster bacillaris</i> Wallich ex Lindley	Rheunsh	S	Common in shrubberies and open slopes	April-June	1800-2800	12713
<i>Cotoneaster microphylla</i> Wallich ex Lindley	Jhwarwa	S	Common on open dry slopes, rocks and grazeries; temperate Himalaya	April-June	1800-4000	12115
<i>Duchesnea indica</i> (Andr.) Focke	Phophile	PH	Common on forest floor, open slopes and field bunds	April-May	upto 2500	12148, 12847
<i>Fragaria nubicola</i> Lindley ex Lacaite	Bhumke	PH	Very common in forests, shrubberies, roadsides and shady slopes	April-June	1800-3500	11249, 12914
<i>Potentilla argrophylla</i> Wallich ex Lehm.		PH	Commonly occurring in shrubberies and open slopes, abundant in alpine pastures	Jun-Oct	2000-3200	12926
<i>Potentilla atrosanguinea</i> Lodd.		PH	Common in shrubberies and open slopes; abundant on alpine grazing grounds	Jun-Oct	2000-3200	12925
<i>Potentilla fragarioides</i> Linn.	Banakru	PH	Commonly occurring in grazeries and open slopes	Apr-Aug	1800-2500	12741, 12135
<i>Potentilla teschenaultiana</i> Ser.	Banakru	PH	Common on open slopes and grazeries	Apr-Aug	2000-3000	12795, 12796
<i>Potentilla nepalensis</i> Hook.	Rattanjot, Laljari	PH	Sporadic in distribution; temperate Western Himalaya	May-Oct	1800-3000	12901, 12242
<i>Prinsepia utilis</i> Royle	Bekhal, Bekhli	S	Common on dry slopes; forests and shrubberies	Apr-Nov	1000-2800	12112, 12766
<i>Prunus armeniaca</i> Linn.	Khurmani, Chuli	T	Cultivated in or near villages	Mar-Apr	1000-2500	12768, 11284
<i>Prunus cerasoides</i> D. Don	Paza	T	Often cultivated and wild	Nov-May	1000-2000	11291
<i>Prunus cornuta</i> (Wall. ex Royle) Steud.	Chopru	T	Common in forests; throughout temperate Himalaya	Apr-Aug	1800-3000	11232
<i>Prunus persica</i> (Linn.) Batsch	Gatheru	T	Commonly cultivated	Feb-July	upto 3000	12844, 11286
<i>Pyrus communis</i> Linn.	Nakh, Nashpati	T	Commonly cultivated	Apr-Aug	800-2600	12868
<i>Pyrus pashia</i> Buch.-Ham. ex D. Don	Kainth	T	Common in shrubberies and near cultivated areas	Apr-Nov	800-2800	11292, 12101
<i>Rosa brunonii</i> Lindley	Kuja, Khajin	WC	Common in forests and shrubberies	April-June	1200-2500	11257, 12849
<i>Rosa macrophylla</i> Lindl.	Peepli	S	Common in forests and shrubberies	May-Sept	2000-3500	12854, 12807
<i>Rosa sericea</i> Lindl.	Jangli Gulab	S	Fairly common in forests and shrubberies	May-Sept	2700-4000	12887
<i>Rubus biflorus</i> Buch.-Ham. ex Smith	Bhasm-dhoru	S	Common in forests, shrubberies and open slopes	Apr-May	2200-3000	12126, 12204
<i>Rubus ellipticus</i> Sm.	Heinra, Heinser	S	Common in forests and shrubberies	March-May	1000-2100	11262
<i>Rubus foliolosus</i> D. Don	Klainchha	S	Common in shrubberies	April-June	2000-3000	12128, 12867
<i>Rubus hypargyryus</i> Edgew.		S	Common in preferably shady areas in forests and shrubberies	May-July	2000-3200	12180, 12156
<i>Rubus macilentus</i> Camb.		S	Common in shrubberies and forests, especially on shady aspects	Apr-Sept	2000-2600	12753, 12810
<i>Sibaldia cuneata</i> Kuntze		PH	Abundant on alpine grazing grounds and open slopes	July-Oct	2700-4500	12924
<i>Sorbaria tomentosa</i> (Lindl.) Rehder		S	Common in shrubberies	March-Sept	2000-3000	12122
<i>Spiraea bella</i> Sims		S	Common in woods and shrubberies	May-Aug	2500-3500	12879
<i>Spiraea canescens</i> D. Don.	Taku, Chaku	S	Common in shrubberies and around cultivated fields	May-June	2000-3000	12799, 12236
Elaeagnaceae						
<i>Elaeagnus parvifolia</i> Wall. ex Royle	Ghain	S	Common in shrubberies, forests and near cultivated areas	Jun-Oct	800-3000	12804
Rhamnaceae						
<i>Rhamnus triquetra</i> (Wallich ex Roxb.) Lawson	Gardhan, Gaunt	T	Distributed in forests and shrubberies of low-lying warmer parts	Jun-Oct	800-1800	12953
<i>Rhamnus virgatus</i> Roxb.	Thalt	S	Fairly common in forests, shrubberies and near villages	Apr-Aug	1200-3000	12803, 12764
<i>Sageretia thea</i> (Osbeck) M. C. Johnston	Patairo	S	Found in forests, shrubberies and near cultivated areas	July-Oct	800-2500	12609

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
<i>Zizyphus mauritiana</i> Lamk.	Baer, Ber	T	Wild in forests and shrubberies; also cultivated and self-sown near villages	July-Jan	upto 1500	12961
<i>Zizyphus oxyphylla</i> Edgew.	Chirlu, Kair	S	Fairly common; wild in forests and shrubberies	July-Dec	500-2000	12226
Ulmaceae						
<i>Celtis australis</i> Linn.	Kharki	T	Generally planted near villages	Apr-Oct	500-2400	11268
Cannabaceae						
<i>Cannabis sativa</i> Linn.	Bhang	AH	Very common; near houses and cultivated fields, and on wastelands	June-Sept	upto 2800	12769
Moraceae						
<i>Ficus auriculata</i> Lour.	Tramble	T	Common near villages; Outer Himalaya	Apr-Aug	upto 1500	12973
<i>Ficus nerifolia</i> J. E. Smith var. <i>nemoralis</i> (Wall. ex Miq.) Corner		T	Not very common	May-Oct	500-2000	12255
<i>Ficus palmata</i> Forssk.	Phegra	T	Common near cultivated areas	May-Sept	upto 2000	11265
<i>Ficus religiosa</i> Linn.	Pipal	T	Occurs wild in the sub-Himalayan tract and Central India; planted throughout India	Mar-June	upto 1500	12971
<i>Ficus sarmentosa</i> Buch.-Ham. ex J. E. Smith	Kamedu	S	Climbing and creeping on steep banks	April-July	800-2200	11259
<i>Morus australis</i> Poir.	Kimu	T	Often cultivated as a fodder tree; throughout India and sub-tropical as well as temperate Himalaya	Feb-May	upto 2000	12941
<i>Morus serrata</i> Roxb.	Kimu	T	Often planted near villages	Apr-June	1200-2800	12869, 11294
Urticaceae						
<i>Boehmeria platyphylla</i> D. Don		S	Common in shrubberies	Apr-Aug	upto 1800	12612
<i>Debregeasia salicifolia</i> (D. Don) Rendle	Siaru, Sansaru	S	Common in forests and shrubberies	Apr-Aug	upto 2400	11287, 12104
<i>Girardinia diversifolia</i> (Link) Fries	Bhabhar	PH	Common in wastelands, shrubberies, forests and near cultivated areas	May-Oct	1200-3000	12291, 12292
<i>Urtica ardens</i> Link.	Bichhu-buti	PH	Common in forests, shrubberies and wastelands	May-Oct	1500-3500	12201
<i>Urtica dioica</i> Linn.	Bichhu-buti	PH	Wide-spread in shrubberies, wastelands and near cultivated areas	May-Oct	1200-3000	12290
Fagaceae						
<i>Quercus floribunda</i> Lindley ex A. Camus	Mohru	T	Often found mixed with other oaks in moist-shady forests	April-May	2000-2800	12107, 12129
<i>Quercus leucotrichophora</i> A. Camus	Ban	T	Common; often gregariously in moist hill-forests	Apr-Oct	1200-2500	11296
<i>Quercus semecarpifolia</i> Smith	Banchar, Kharshu	T	Common; generally gregariously in high altitude mixed forests or more often forming pure stands	May-June	2500-3800	12922
Juglandaceae						
<i>Juglans regia</i> Linn.	Khrot, Akhrot	T	Wild in the forests as well as widely cultivated	Apr-Aug	1300-3000	11285
Betulaceae						
<i>Alnus nitida</i> (Spach) Endl.	Kaunish, Kunish	T	Common along riversides	Aug-Nov	1000-2800	11281
Coriariaceae						
<i>Coriaria nepalensis</i> Wallich	Aira	S	Common in forests and shrubberies	Mar-May	1000-2500	12871
Cucurbitaceae						
<i>Solena amplexicaulis</i> (Lamk.) Gandhi	Mokhri	PH	Common in shrubberies and grasslands	May-Oct	upto 2400	12110
<i>Trichosanthes bracteata</i> (Lam.) Voigt.	Lal-indrayan	C	Common in shrubberies	May-Oct	upto 2050	12232
Oxalidaceae						

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
<i>Oxalis corniculata</i> Linn.	Khat-maroli	AH	Common weed, abundant in cultivated places and wastelands	Apr-Oct	upto 2500	12866, 12853
Euphorbiaceae						
<i>Andrachne cordifolia</i> (Decne.) Muell.-Arg.	Gurguli	S	Occasionally found in shrubberies	May-Oct	1800-2500	12286
<i>Euphorbia heterophylla</i> Linn.		AH	Cultivated in gardens and also as an escape in the wild	May-Sept	upto 1500	12649
<i>Euphorbia hirta</i> Linn.	Bari dudhi	AH	Common near cultivated areas and along roadsides; throughout the hotter parts of India	Apr-Oct	upto 1500	12636
<i>Euphorbia maddeni</i> Boiss.		AH	A weed in cultivated areas	May-Sept	1500-2800	12689
<i>Euphorbia royleana</i> Boiss.	Sru, Saru, Surai	S	Common on dry exposed hill-slopes	June-July	upto 1800	12959
<i>Euphorbia thymifolia</i> Linn.	Chhoti dudhi	AH	Common on roadsides and near cultivated areas	May-Sept	upto 1500	12652
<i>Glochidion velutinum</i> Wight	Padeura, Sama	T	Near cultivated areas and in shrubberies	Apr-Aug	upto 1500	12644
<i>Mallotus philippensis</i> (Lam.) Muell.-Arg.	Kaimbal, Kamal	T	Throughout India	Oct-Feb	upto 1500	12261
<i>Ricinus communis</i> Linn.	Arand, Erandi	S	Cultivated throughout India	May-Aug	upto 2000	12972
<i>Sapium insigne</i> (Royle) Benth. ex Hook. f.	Baloza, Biloza	T	Common in forests of low-lying hot valleys	June-Aug	upto 1500	12650
Salicaceae						
<i>Flacourtia indica</i> (Burm. f.) Merrill	Kangu, Bilangra	S	Occurs throughout India, wild or sometimes cultivated; in sub-Himalayan tract and Outer Himalayas	Mar-Apr	upto 1300	12608
<i>Populus ciliata</i> Wall. ex Royle	Chalun, Chalan	T	Temperate forests	April-July	2000-3500	12124, 12798
<i>Salix babylonica</i> Linn.	Majnu	T	Introduced and often planted in gardens and near water-channels	Feb-May	upto 2000	12773
<i>Salix denticulata</i> Andersson	Bahila	S	Very common in forests, shrubberies and open slopes	Mar-June	1800-3500	12736, 12900
<i>Salix tetrasperma</i> Roxb.	Besu, Laila	T	Common along the rivulets or planted near villages	Mar-Apr	upto 2000	12872
Violaceae						
<i>Viola canescens</i> Wallich	Banaksha	PH	Common on forest floor, shrubberies and meadows	Apr-Nov	1500-2600	12809, 12851
Hypericaceae						
<i>Hypericum dyeri</i> Rehder		S	Occasionally found in forests and shrubberies	Apr-Sept	1500-2500	12876
<i>Hypericum oblongifolium</i> Choisy	Pina	S	Common in forests and shrubberies	Apr-Oct	800-2400	12817, 12177
Geraniaceae						
<i>Geranium lucidum</i> Linn.		AH	Common in moist-damp places in the forests, generally gregariously	April-May	1800-2800	12161
<i>Geranium mascatense</i> Boiss. var. <i>himalaicum</i> Babu		AH	Fairly common in shady areas near fields and on roadside walls; temperate and subtropical Himalaya	Apr-Oct	500-1800	12624
<i>Geranium nepalense</i> Sweet	Bhanda	PH	Common on open slopes, gregariously in orchards and fields	Apr-Sept	1500-2800	12735, 12850
<i>Geranium wallichianum</i> D. Don ex Sweet	Laljhari	PH	Commonly occurring on open-slopes and near fields and orchards	Jun-Oct	2200-3500	12213, 12734
Lythraceae						
<i>Punica granatum</i> Linn.	Daru	S	Commonly cultivated throughout India, also wild in outer Western Himalaya	May-Sept	500-2000	12633
<i>Woodfordia fruticosa</i> (Linn.) Kurz	Dhavsha, Dhai	S	Common in shrubberies, especially on drier aspects	Feb-April	upto 1500	13000, 12957
Onagraceae						
<i>Oenothera rosea</i> L'Heritier ex Aiton	Phulnia	PH	Commonly occurring on open-slopes and near fields	April-June	upto 2500	12241, 12802
Myrtaceae						
<i>Callistemon citrinus</i> (Curtis) Stapf	Safeda	T	Often planted as an ornamental tree along roadsides	Mar-Apr	upto 1500	12534
<i>Eucalyptus umbellata</i> Domin		T	Successfully introduced both in the plains and hills	Aug-Nov	upto 1800	12535

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
Anacardiaceae						
<i>Cotinus coggygria</i> Scop.	Tung, Thumba	S	Common in forests and shrubberies	Mar-June	800-1500	12611, 11297
<i>Lannea coromandelica</i> (Houtt.) Merrill	Pechka, Ithingan	T	Common in lower hot and arid valleys	Mar-June	upto 1500	12672
<i>Pistacia chinensis</i> Bunge subsp. <i>integerrima</i> (Stewart) Rech. f.	Kakarsinghi	T	Common in inhabited areas	Mar-May	500-2400	12533
Sapindaceae						
* <i>Acer caesium</i> Wall. ex Brandis	Mandar	T	On shady aspects in the forests	April-Dec	2400-3000	12905
<i>Aesculus indica</i> Colebr. ex Camb.	Bankhor, Pangar	T	Wild in shady areas of forests, sometimes planted	May-Sept	1300-3000	11239
<i>Dodonaea viscosa</i> (Linn.) Jacq.	Nokhi dali	S	Common on dry open slopes, often gregariously as a weed of grasslands	Feb-Nov	upto 1500	12983
<i>Sapindus mukorossi</i> Gaertn.	Doda, Reetha, Ritha	T	Often cultivated	Apr-Sept	upto 1500	12976
Rutaceae						
<i>Murraya koenigii</i> Spreng	Kurry patta	S	Common in forests and shrubberies	Apr-Oct	upto 1500	12629
<i>Skimmia laureola</i> (DC.) Sieb., Zucc. ex Walp.	Ner	S	Common in forests, shrubberies and shady places	April-June	2000-3000	12710
<i>Zanthoxylum armatum</i> DC.	Timri, Timru	S	Common in shrubberies and near cultivated areas	April-June	1000-2500	12986, 11260
Simarubaceae						
<i>Ailanthus altissima</i> (Miller) Swingle	Chatrawla, Dalli	T	Along roadsides and for reclamation of wastelands and landslips	April-May	upto 2000	12837
Meliaceae						
<i>Melia azadirach</i> Linn.	Jek, Bakain	T	Commonly planted in villages and along roadsides	Mar-May	upto 1600	12995
<i>Toona ciliata</i> M. Roem.	Tuni; Tunsh	T	Occurring throughout India	April-June	upto 1500	12279, 12531
Malvaceae						
<i>Bombax ceiba</i> Linn.	Koki, Shaimbal	T	Common in forests of lower valleys	Feb-March	upto 1500	12673
<i>Grewia optiva</i> J. R. Drum. ex Burret	Beol, Beul	T	Commonly planted in villages and wild	April-May	upto 1800	12536
<i>Malva rotundifolia</i> Linn.	Khubasi	AH	Common; as weed of cultivation and in wastelands	May-Oct	upto 3000	12759
<i>Malva verticillata</i> Linn.	Beoli	PH	Common near cultivated areas	Apr-Aug	2000-3500	12712, 12761
<i>Malvastrum coromandelianum</i> (Linn.) Garcke		PH	Common on wastelands and along roadsides	Apr-Oct	upto 2500	12640, 12758
Thymelaeaceae						
<i>Daphne papyracea</i> Wall. ex Steud.	Bursha	S	Common in <i>Cedrus deodara</i> forests	Mar-May	1800-2500	12703
<i>Wikstroemia canescens</i> Meisn		S	Throughout temperate Himalayas	Jun-Oct	1800-2800	12785
Brassicaceae						
<i>Arabis amplexicaulis</i> Edgew.		PH	Occasionally found in shrubberies and open slopes	May-Sept	1500-3200	12880, 12863
<i>Capsella bursa-pastoris</i> (Linn.) Medik.		AH	A weed of cultivation and waste ground	May-Nov	upto 2400	12962, 12806
<i>Erysimum hieracifolium</i> Linn.		PH	Seldom encountered on open slopes and near cultivated areas	Jun-Oct	1800-4000	12239
<i>Lepidium apetalum</i> Willd.		AH	A weed of cultivation and waste ground	April-July	2000-4000	12757
<i>Nasturtium officinale</i> R. Br.	Aalam, Halim	PH	Very common along the streams and on the marshes	May-Aug	upto 2500	11288
<i>Sisymbrium irio</i> Linn.	Khubkalan	PH	Occasionally found in wastelands	April-June	upto 2400	12750
<i>Thlaspi arvense</i> Linn.		AH	A weed of cultivation, sometimes on waste ground	April-June	1000-4000	12816
<i>Thlaspi cochleariforme</i> DC.		PH	A weed of cultivation and waste ground	April-June	2000-4000	12714
Santalaceae						
<i>Osyris quadripartita</i> Salz ex Decne.	Dalmi	S	Common in shrubberies and grazeries, especially on dry open slopes	Feb-June	upto 2000	12980, 12979

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
Loranthaceae						
<i>Scurrula elata</i> (Edgew.) Danser	Banda, Vanda	S	Quite common; a stem parasite, mostly on oaks	April-July	1800-3000	12120
<i>Taxillus vestitus</i> (Wall.) Danser	Garnat	S	A common stem parasite of sub-tropical & temperate forests	April-Jan	1000-3000	12780
<i>Viscum album</i> Linn.	Narata, Banda	S	A common stem parasite of sub-tropical & temperate forests	May-Oct	1000-2200	12170
Plumbaginaceae						
<i>Plumbago zeylanica</i> Linn.	Chitraka	S	Occurs throughout India; also cultivated; perhaps as an escape near villages	July-Oct	upto 1500	12202
Polygonaceae						
<i>Bistorta amplexicaulis</i> (D. Don) Greene		PH	Common; often gregariously in shruberies and meadows	Jun-Oct	2000-3500	12284, 12111
<i>Fagopyrum dibotrys</i> (D. Don) Hara		PH	Common in woods, shruberies and near cultivated areas	Jun-Oct	1500-3500	12219
<i>Fagopyrum esculentum</i> Moench	Phaphra, Phaphla	AH	Sometimes cultivated or as an escape	Apr-Sept	1500-3500	11231, 11290
<i>Polygonum hydropiper</i> Linn.		PH	Common near water-sources	July-Oct	upto 2000	12298
<i>Polygonum nepalense</i> Meissn.	Manana, Satbalon	AH	Common in shady areas in forests and near cultivated fields	Apr-Nov	upto 3000	12237
<i>Polygonum recumbens</i> Royle ex Bab.	Barik jhawarwa	PH	Common in shruberies and near cultivated areas	June-Nov	1200-2500	12240
<i>Rumex hastatus</i> D. Don	Khat-marora	PH	Common near cultivated areas	Apr-Oct	300-2500	11269
<i>Rumex nepalensis</i> Sprengel	Marmaila	PH	Common near cultivated areas; along roadsides and in meadows; more vigorous in moist shady areas	Apr-Oct	800-4000	12767, 12702
Caryophyllaceae						
<i>Gypsophila cerastioides</i> D. Don		PH	Occurs gregariously on forest floor and open slopes	Apr-Oct	2000-4000	12884
<i>Silene griffithii</i> Boiss.	Dhunpri	PH	Common in shruberies, meadows and orchards	May-Aug	2000-3500	11277
<i>Silene vulgaris</i> (Moench) Garcke	Dhunpri	PH	Commonly occurring in meadows and orchards	April-July	1800-3500	12209, 11276
<i>Stellaria media</i> (Linn.) Vill.	Safed phulkee	AH	A very common and most variable weed; a widely colonized plant in temperate Himalayas	Apr-Oct	upto 4000	11248, 12859
Amaranthaceae						
<i>Achyranthes aspera</i> Linn.	Puthkanda	PH	Common in wasteland and near habitations	May-Oct	upto 2400	12223, 12222
<i>Achyranthes bidentata</i> Blume	Puthkanda	PH	Common in wasteland and near habitations	May-Oct	upto 2500	12224
<i>Aerva sanguinolenta</i> (Linn.) Blume		PH	Common in shruberies	May-Oct	upto 1800	12615
<i>Alternanthera sessilis</i> (Linn.) R. Br. ex DC.	Kanchari	PH	Common in moist areas and along water channels; a weed throughout the warmer parts of India	July-Oct	upto 1500	12687, 12981
<i>Amaranthus blitum</i> Linn. var. <i>oleraceus</i> Hook. f.	Chaulai	AH	Common on wasteland and near cultivated areas	April-June	upto 1800	12613
<i>Amaranthus paniculatus</i> Linn.	Bathu	AH	Cultivated throughout India or as an escape	July-Sept	upto 3000	12183, 12249
<i>Amaranthus spinosus</i> Linn.	Katali Chaulai	AH	A field weed throughout India	July-Oct	upto 1800	12192, 12217
<i>Chenopodium ambrosioides</i> Linn.		PH	Frequently found in moist areas	Aug-Oct	upto 1500	12214
<i>Chenopodium opulifolium</i> Schrad.	Shanathu	AH	Common in waste places and fields as a weed	May-Oct	2000-3000	12739
<i>Cyathula tomentosa</i> (Roth.) Moq.	Sila	PH	Common in shruberies	July-Oct	700-2200	11270
<i>Deeringia amaranthoides</i> (Lam.) Merr.	Latman	S	Common in shruberies	May-Oct	upto 1500	12178
Phytolaccaceae						
<i>Phytolacca acinosa</i> Roxb.	Narail, Jharka	PH	Occasionally seen as an escape into forests near villages, sometimes cultivated	May-June	1500-3000	12745
Nyctaginaceae						

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
<i>Boerhavia diffusa</i> Linn.	Sant, Punarnava	PH	Found in shrubberies and open slopes	Apr-Oct	upto 1800	12960
<i>Mirabilis jalapa</i> Linn.	Gulabbas, Gulabash	PH	common on farm edges and wastelands, especially in moist shady areas, as an escape from gardens	July-Oct	500-2000	12267
Cactaceae						
<i>Opuntia stricta</i> (Haw.) Haw. var. <i>dillenii</i> (Ker-Gawler) Benson	Chapte-sru, Nagphana	S	Naturalized in waste places and sometimes planted as a hedge plant	April-June	upto 2200	12954
Hydrangeaceae						
<i>Deutzia compacta</i> Craib	Dalichi	S	Occasionally found in shrubberies	May-July	2100-3300	12744, 12779
<i>Deutzia staminea</i> R. Brown ex Wallich	Dalichi	S	Occasionally found in shrubberies	April-May	1800-3000	12116, 12117
Balsaminaceae						
<i>Impatiens scabrida</i> DC.	Tilgra	AH	Gregariously occurring in damp places on the forest floor and in shrubberies	July-Oct	2000-3500	12287
Primulaceae						
<i>Androsace lanuginosa</i> Wall.		PH	Common on rocks and cliffs	May-Oct	1800-3000	12132, 12134
<i>Androsace rotundifolia</i> Hardwicke		PH	Common on rocks and open slopes	April-June	1800-3000	12874
<i>Androsace sarmentosa</i> Wall.		PH	On rocks and cliffs	May-Aug	2500-4000	12917
<i>Myrsine africana</i> Linn.	Jhimjru, Jhurlu	S	Common in shrubberies and on forest floor	July-Nov	500-2800	12671, 12763
<i>Primula denticulata</i> Sm.		PH	Common on open slopes and shrubberies	May-Aug	2000-4000	12918, 12800
<i>Primula floribunda</i> Wallich		PH	Occurring near water bodies and on shady damp rocks	April-July	1000-2000	12166
<i>Primula petiolaris</i> Wallich		PH	Common on rocks and grassy slopes	April-May	2500-3500	12927
Ericaceae						
<i>Lyonia ovalifolia</i> (Wall.) Drude	Ayar	T	Temperate forests	May-Aug	1500-2500	12858
<i>Rhododendron arboreum</i> Sm.	Buransh, Bras	T	Fairly common in temperate forests	Apr-Sept	1800-2500	12819
Rubiaceae						
<i>Galium aparine</i> Linn.	Barik-munjtu	AH	Occurs in temperate Himalayas	July-August	upto 3500	12722, 12235
<i>Galium asperuloides</i> Edgew.		AH	Sporadic in occurrence; on the forest floor	May-Aug	2400-3000	12896
<i>Randia tetrasperma</i> (Roxb.) Benth., Hook. f.	Kikra	S	In shrubberies and grasslands	May-Sept	1200-1800	12943, 12625
<i>Rubia cordifolia</i> Linn.	Munjtu, Manjith	C	In shrubberies	July-Oct	1200-2500	12225, 12678
Gentianaceae						
<i>Halenia elliptica</i> D. Don		AH	Common on forest floor in shady areas	July-Oct	2000-4000	12733, 12908
<i>Swertia cordata</i> (G. Don) Wall. ex Clarke		AH	Occasionally found in shrubberies and meadows	July-Oct	1200-3000	12243
Loganiaceae						
<i>Buddleja asiatica</i> Lour.	Sadraila	S	Common in shrubberies, forests and grazeries	Apr-Oct	upto 2400	12694
<i>Buddleja crispa</i> Benth.	Sadraila	S	Common in forests and shrubberies, and on open slopes	Mar-May	1500-2800	12133, 12715
Apocynaceae						
<i>Asclepias curassavica</i> Linn.	Kakatundi	S	A native of tropical America; naturalised in Himalaya	Apr-Oct	upto 1800	12265, 12264
<i>Carissa carandas</i> Linn.	Karaunda	S	Common in shrubberies forests and near cultivated areas	Sept-Feb	upto 1500	12942, 12967
<i>Catharanthus roseus</i> (Linn.) G. Don	Sadabahr	PH	Cultivated throughout India as an ornamental crop, and sometimes seen as an escape	Apr-Oct	upto 2000	12631
<i>Cryptolepis buchanani</i> Roem., Schult.	Karanta	C	Common on dry open slopes and shrubberies	May-July	upto 1500	12676, 12993

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
<i>Marsdenia roylei</i> Wight	Kurang	C	Occasionally found in shrubberies	Jun-Oct	500-2000	12602
<i>Nerium indicum</i> Mill.	Kaner	S	Often cultivated as an ornamental crop	Apr-Nov	upto 1500	12632
<i>Vallaris solanacea</i> (Roth) O. Kuntze	Kali Bainshti	C	Often cultivated as an ornamental plant; also, wild in shrubberies	Feb-May	upto 1500	12604
Boraginaceae						
<i>Cynoglossum glochidiatum</i> Wall. ex Benth.		AH	A common weed near cultivated areas, in grazeries and wasteland	Aug-Oct	1200-3000	12206
Convolvulaceae						
<i>Cuscuta reflexa</i> Roxb. var. <i>reflexa</i> Roxb.	Akash-bel	C	Common in shrubberies and forests	July-Oct		12238
<i>Ipomoea purpurea</i> (Linn.) Roth		C	Naturalized throughout India; common in wastelands and cultivated areas	Aug-Oct	upto 2400	12233
Solanaceae						
<i>Datura stramonium</i> Linn.	Safed dhatura	AH	Common on wastelands, along roadsides and near cultivated areas	Apr-Oct	500-2500	12266, 12992
<i>Nicandra physaloides</i> (Linn.) Gaertn.		AH	Common on roadsides, near cultivated areas and in wastelands	July-Oct	1000-2000	12260, 12970
<i>Nicotiana tabacum</i> Linn.	Tambaku	AH	Cultivated throughout India, or as an escape	May-Sept	upto 2000	12648
<i>Solanum erianthum</i> D. Don	Asheta	S	Occasionally found in shrubberies, wasteland and near cultivated areas	May-Aug	upto 1500	12966
<i>Solanum melongena</i> Linn.	Baingan, Bhanta	AH	The local wild brinjal variety; often cultivated for its edible fruits	May-Sept	upto 1500	12653
<i>Solanum myriacanthum</i> Dunal	Ban-bhata	S	Common on wasteland and along roadsides	Apr-Nov	upto 2000	12263
<i>Solanum nigrum</i> Linn.	Makoi	PH	Common in moist shady places, along the roads, near cultivated areas and in wastelands	Jun-Oct	upto 2000	12996
Oleaceae						
<i>Jasminum humile</i> Linn.	Peeli chameli, Pitmalti	S	Common in shrubberies	May-Sept	500-2800	12813
<i>Jasminum mesneyi</i> Hance		S	Commonly cultivated as an ornamental crop and as a live-hedge	Mar-May	upto 1500	12607
<i>Jasminum officinale</i> Linn.	Chameli, Jati	S	Occasionally encountered in forests and shrubberies	Apr-Oct	800-2800	12245
Plantaginaceae						
<i>Plantago depressa</i> Willd.	Thande pindi	PH	Common on roadsides and dry slopes	Apr-Oct	1500-3000	12145, 12137
<i>Plantago erosa</i> Wall.	Lahuriya	PH	Common on roadsides and open slopes	Apr-Oct	800-3500	12705
<i>Plantago lanceolata</i> Linn.	Baltanga	PH	Common on roadsides and near cultivated areas	Apr-Oct	1200-2500	11273, 12149
Scrophulariaceae						
<i>Pedicularis hoffmeisteri</i> Klotzsch and Garcke		AH	Common on open slopes and grazeries	July-Aug	2400-4000	12907
<i>Scrophularia himalensis</i> Royle ex Benth.		AH	Common in shrubberies and on wasteland	Jun-Oct	1500-3000	12248
<i>Verbascum thapsus</i> Linn.	Ban-tamaku, Phulla	AH	Common in shrubberies and open slopes	Apr-Oct	1200-3500	12258, 12989
<i>Veronica persica</i> Poir.		AH	A common weed in fields	April-June	1500-2800	12746
Lamiaceae						
<i>Ajuga bracteosa</i> Wallich ex Benth.	Ratpacha	AH	Commonly occurring on open slopes and shrubberies	Jun-Oct	1000-3500	12271, 12933
<i>Ajuga parviflora</i> Benth.		AH	Occasionally encountered in forests and shrubberies	Mar-Oct	1200-2600	12716
<i>Anisomeles indica</i> O. Ktze.		PH	Fairly common in shrubberies	Apr-Oct	upto 1500	12605
<i>Clinopodium vulgare</i> Linn.		PH	Occasionally encountered on open slopes	Apr-Oct	1500-3500	12885
<i>Colebrookia oppositifolia</i> Sm.	Bhumera, Binda	S	Common in shrubberies and near cultivated areas	Apr-Oct	upto 1300	12964
<i>Eisholtzia fruticosa</i> (D. Don) Rehder	Bhinchi	S	Common in shrubberies	Aug-Nov	2000-2800	12227

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
<i>Lamium album</i> Linn.		AH	Common in shrubberies and along roadsides	May-Oct	1800-3000	12191, 12155
<i>Leucas lanata</i> Benth.	Bhuna, Dhurlu-ghas	PH	Common on dry-precipitous slopes	Apr-Oct	upto 2800	12256, 12635
<i>Mentha longifolia</i> (L.) Hudson	Jungli Pudina	PH	Common in wet places near stream sides, nullahs, irrigation channels, rivulets	Aug-Oct	1000-3500	12277, 12106
<i>Meriandra strobilifera</i> Benth.	Buthi	S	Common on dry open slopes, shrubberies, grazeries and near cultivated areas	Apr-Oct	500-1800	12985, 11283
<i>Micromeria biflora</i> (Buch.-Ham. ex D. Don) Benth.	Jungli ajwain	PH	Common on dry slopes	Apr-Oct	1000-2500	12215
<i>Nepeta laevigata</i> (D. Don) Hand.-Mazz.		PH	Common in shrubberies	May-Oct	1800-3000	12153
<i>Nepeta leucophylla</i> Benth.		PH	Common in shrubberies and grazeries	Aug-Oct	1200-2500	12162, 12623
<i>Ocimum basilicum</i> Linn.	Gulal tulsi	PH	Often cultivated, sometimes as an escape into wild	Jun-Oct	upto 1800	12645, 12651
<i>Origanum vulgare</i> Linn.	Sathra	PH	Common on open slopes and in shrubberies	May-Oct	1800-3500	12185
<i>Plectranthus japonicus</i> (Burm. f.) Koidz.		PH	Common in damp areas in forest and shrubberies	Sept-Oct	1200-3000	12218
<i>Pogostemon mollis</i> (Ait.) Spreng.		PH	In shrubberies; in hilly regions	Aug-Oct	upto 2200	12841
<i>Pogostemon benghalensis</i> (Burm. f.) O. Ktze.		S	Common in shrubberies and grazeries	Jan-Aug	upto 1500	12614
<i>Rabdosia rugosa</i> (Wallich ex Benth.) Hara	Chhichhri	S	Common on dry open slopes and shrubberies	Apr-Oct	800-2800	12669, 11271
<i>Roylea cinerea</i> (D. Don) Baillon	Karwi	S	Fairly common in shrubberies and near cultivated areas	Apr-Oct	500-2000	12637, 11275
<i>Salvia lanata</i> Roxb.		PH	Common on open slopes, grazing lands and drier areas	April-July	1800-2600	11289, 12698
<i>Salvia nubicola</i> Wallich ex Sweet		PH	Common on forest floor and open slopes	July-Oct	2200-4000	12911
<i>Scutellaria linearis</i> Benth.	Mastiara	PH	Occasionally encountered on open slopes and in shrubberies	April-June	1000-2000	12154
<i>Scutellaria scandens</i> Buch.-Ham. ex D. Don		PH	Common in shrubberies and forests	Apr-Sept	1500-2800	12775, 12840
<i>Thymus linearis</i> Benth.	Pipli, Ban-ajwain	PH	Common on open dry slopes	Apr-Oct	1800-3500	12707, 11250
Acanthaceae						
<i>Barleria cristata</i> Linn.	Tadrelu	PH	Common in shrubberies and near cultivated areas	May-Oct	upto 1800	12677, 12642
<i>Dicliptera bupleuroides</i> Nees	Bouna	PH	Abundantly occurring in hilly areas	May-Dec	upto 2600	12928
<i>Dicliptera roxburghiana</i> Nees	Kirch, Somni	PH	Common along roadsides, on wastelands and near cultivated areas	May-Nov	upto 1800	12269
<i>Justicia adhatoda</i> Linn.	Basuti	S	Common in shrubberies and wastelands	March-May	upto 1500	12998
<i>Justicia japonica</i> Thunb.		AH	Common in shady areas, meadows and near cultivated areas	July-Oct	upto 2200	12297
<i>Pteracanthus urticifolius</i> (Kuntze) Bremek.		S	Common on forest floor and in shrubberies	Aug-Oct	1800-3000	
<i>Strobilanthes atropurpurea</i> Nees		S	Common on forest floor, generally gregariously	June-Sept	2000-3000	12842
<i>Strobilanthes dalhousiana</i> C. B. Clarke		S	Frequently occurring, generally gregariously, as undergrowth in temperate forests	July-Oct	2200-2600	12700
Bignoniaceae						
<i>Jacaranda mimosifolia</i> D. Don		T	Cultivated in India as an avenue tree	Mar-Sept	upto 2000	12974, 12991
<i>Tecoma stans</i> (Linn.) Juss. ex Kunth		T	Introduced into India and grown as an ornamental plant	April-June	upto 1500	12627
Verbenaceae						
<i>Caryopteris bicolor</i> (Hardw.) Mabblerley	Phool-lakri,	S	Common in shrubberies and grazeries; in Outer Himalayas	Mar-May	upto 1800	12638, 12965
<i>Lantana camara</i> L. var. <i>aculeata</i> (L.) Moldenke		S	Widely naturalized in India, as a highly invasive and obnoxious weed in forests, shrubberies and cultivated areas	May-Nov	upto 1500	12285, 12674
<i>Verbena bonariensis</i> Linn.	Nirgandi	PH	A native of Brazil, naturalized in the Himalaya and Nilgiris	Jun-Oct	upto 2000	12666
<i>Vitex negundo</i> Linn.		S	Throughout India	April-June	upto 1500	12670, 12956

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
Aquifoliaceae						
<i>Ilex dipyrrena</i> Wall.		T	Occasionally found in damp shady places of the forests	May-Oct	1500-2500	12762
Asteraceae						
<i>Ainsliaea aptera</i> DC.	Karwi Buti	PH	Common on forest floor	Mar-May	2000-3000	12921, 12797
<i>Anaphalis adnata</i> DC.		AH	Occasionally occurring in shrubberies, grazeries and open slopes	Aug-Oct	1800-2500	12203
<i>Anaphalis busua</i> (Buch.-Ham. ex D. Don) DC.	Bhoon	AH	Quite common in temperate forests; generally gregariously occurring on the forest floor	Sept-Oct	1500-2500	12721
<i>Anaphalis contorta</i> (D. Don) Hook. f.	Darari, Bharari	PH	Common in shrubberies and grazing grounds	Aug-Oct	2200-4000	12897&12940
<i>Arctium lappa</i> Linn.	Jangli kuth	PH	Sporadic; in meadows and moist-shady places in forests	Jun-Oct	1800-2800	12760
<i>Artemisia indica</i> Willd.	Chhambar, Nagadouna	PH	Common in shrubberies	Jun-Oct	upto 3000	12136
<i>Artemisia roxburghiana</i> Wall. ex Besser	Chhambar	PH	Common on wastelands and open slopes	May-Oct	1000-4000	12257, 12296
<i>Artemisia vestita</i> Wall. ex DC.	Chhambar	PH	Common in shrubberies and forests	Aug-Oct	1200-3000	12787, 12843
<i>Aster molluscus</i> Wall. ex Clarke	Chhambar	AH	Fairly common on dry open disturbed areas and wastelands	May-July	1800-3000	12108
<i>Bidens biternata</i> (Lour.) Merrill, Sherff	Shorlu	AH	Common on wastelands and near cultivated areas	July-Oct	upto 2500	12251
<i>Bidens pilosa</i> Linn.	Kumber	AH	Common as a weed of cultivated areas and on wastelands, often gregariously	Aug-Nov	upto 2000	12641
<i>Carduus nutans</i> Linn.	Kalbir	PH	Common; near cultivated areas, in grazeries and shrubberies	Apr-Sept	1800-3500	11278, 12187
<i>Chrysanthemum leucanthemum</i> Linn. var. <i>leucanthemum</i> Steyermark		AH	Growing gregariously in pastures, waste places, roadsides and disturbed sites	May-Oct	2200-2600	12727, 12123
<i>Cirsium verutum</i> (D. Don) Sprengel	Bhuan	AH	Common; near cultivated areas, in shrubberies and on road-sides	May-July	1000-2500	12756
<i>Cirsium wallichii</i> DC.		AH	Common on open slopes, along road sides and near fields	July-Oct	1800-3000	12732
<i>Conyza japonica</i> (Thunb.) Less. ex DC.		AH	Common on wasteland and along roadsides	April-June	300-2400	12144, 12151
<i>Cosmos bipinnatus</i> Cav.		AH	Cultivated as an ornamental crop in home-gardens; also as an escape into the meadows; occurring gregariously on open grassy slopes	May-July	upto 2500	12207
<i>Crepis sancta</i> (L.) Babcock		PH	Seldom found in damp areas on forest floor	April-June	2000-3000	12171
<i>Echinops niveus</i> Wall. ex Royle		PH	Common in open grasslands	July-Oct	1200-2500	12231
<i>Erigeron bellidioides</i> (Buch.-Ham. ex D. Don) Benth. ex C. B. Clarke	Karyunshi	PH	Common in meadows, open slopes and near cultivated areas	Apr-Sept	1800-3500	12939
<i>Erigeron bonariensis</i> Linn.		AH	Common on wasteland and along roadside	Apr-Aug	upto 2400	12777, 12646
<i>Erigeron multicaulis</i> Wall. ex DC.		AH	Common on open slopes	May-Sept	1000-3000	12839, 12159
<i>Galinisoga parviflora</i> Cav.		AH	A native of America; introduced into India and occurs throughout Himalaya as a weed	Apr-Oct	1200-2500	12786
<i>Gerbera gossypina</i> (Royle) Beauv.	Kapasi	PH	Common on rocks and dry open slopes	March-May	1200-2400	12102, 11299
<i>Gnaphalium affine</i> D. Don	Nanehi	AH	Common in grazeries and open slopes	May-Sept	upto 3000	12860
<i>Gnaphalium hypoleucum</i> DC.		AH	Common in grazeries and open slopes	May-Oct	1500-2500	12270
<i>Hieracium vulgatum</i> Koch	Dudhli	PH	Common near cultivated areas, along roadsides and in wastelands	May-Sept	1800-3000	12160, 12820
<i>Inula cappa</i> (Buch.-Ham. ex D. Don) DC.		S	Occasionally encountered in shrubberies and open slopes	Sept-Oct	1000-1800	12295
<i>Inula cuspidata</i> C. B. Clarke		S	Common in shrubberies and pastures	Sept-Oct	1400-2500	12692, 12229
<i>Myriactis nepalensis</i> Less.		AH	Common on open slopes	July-Nov	1500-3000	12688, 12878

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
<i>Parthenium hysterophorus</i> Linn.		AH	An obnoxious weed; in cultivated areas, along roadsides and on wasteland	July-Nov	upto 1500	12639
<i>Senecio alatus</i> Wall. ex DC.		PH	Common in sub-alpine meadows	Aug-Oct	2200-3000	12935
<i>Senecio chrysanthemoides</i> DC.		PH	Common on open slopes	July-Oct	2400-3500	12883
<i>Senecio nudicaulis</i> Buch.-Ham. ex D. Don		AH	Common on dry open slopes and shrubberies	April-June	1800-3000	12119, 11295
<i>Serratula pallida</i> DC.		PH	Common on open slopes and grazeries	April-June	1500-2800	12130, 12691
<i>Sonchus asper</i> (Linn.) Hill		AH	Common on wasteland and along roadsides	July-Oct	upto 3500	12751
<i>Sonchus oleraceus</i> Linn.	Dudhli, Dodak	AH	Common in fields, wastelands and along roadsides	Aug-Oct	upto 2500	12205
<i>Tagetes minuta</i> Linn.	Gandhal-phool	AH	A native of South America, naturalized near waste places and dry slopes	July-Oct	1200-2500	12755, 12211
<i>Tagetes patula</i> Linn.	Genda	AH	A native of America; cultivated as an ornamental crop or as an escape near human habitations	May-Oct	upto 2500	12630
<i>Taraxacum officinale</i> Weber ex Wiggers	Dudhli, Kanphul	PH	Very common on open dry slopes and shrubberies	Mar-Oct	500-5500	12105, 12150
<i>Tragopogon gracilis</i> D. Don		PH	Common on grassy slopes	May-Aug	1800-3000	12146
<i>Tricholepis elongata</i> DC.		PH	Common in grasslands, shrubberies and wastelands, especially on drier aspects	Aug-Oct	1200-2500	12268
<i>Tridax procumbens</i> Linn.		PH	Fairly common on wastelands and near roadsides	April-June	upto 1300	12994
<i>Xanthium strumarium</i> Linn.	Banokra, Gokhru, Adhasisi	AH	Common on wastelands, near human habitations, and along roadsides	Apr-Nov	upto 2000	12969
<i>Youngia japonica</i> (Linn.) DC.		AH	Common at shady places in forests	May-Aug	upto 3000	12865
Adoxaceae						
<i>Viburnum cotinifolium</i> D. Don	Bankunch	S	Common in forests and shrubberies	April-June	2000-3000	12748, 12113
<i>Viburnum foetens</i> Decne.	Guch, Kunch	S	Sporadic in distribution in temperate forests	May-Oct	2200-3000	12857, 11252
<i>Viburnum mullaha</i> Buch.-Ham. ex D. Don	Richi	S	Sporadic in distribution in temperate forests	Jun-Oct	2000-3200	12749
<i>Viburnum nervosum</i> D. Don	Anrola	S	Occasionally encountered in temperate forests	May-Nov	2400-3200	12894
Caprifoliaceae						
<i>Lonicera angustifolia</i> Wallich ex DC.	Pilru, Pirlu	S	Common in forests and shrubberies	April-June	2200-3000	12704
<i>Lonicera quinquelocularis</i> Hardw.		S	Common in shrubberies and forests	Apr-Sept	1500-3500	11247
<i>Valertiana jatamansi</i> Jones	Mushkbala, Tagar	PH	Common on forest floor, shrubberies and open slopes	Mar-Aug	1800-3200	12888, 12846
<i>Valertiana pyrolaeifolia</i> Decaisne	Nihani	PH	Occurring only on Hatoo peak in this forest division in moist shady areas on forest floor	April-June	2200-3000	12923, 12915
Araliaceae						
<i>Hedera nepalensis</i> K. Koch	Kaneri, Lablab	WC	A common woody climber, especially in deodar forests	Sept-Oct	1800-2800	12114, 12283
Apiaceae						
<i>Angelica glauca</i> Edgew.	Chora	PH	Sporadic in forests and open slopes	July-Oct	2400-3000	12852
<i>Bupleurum falcatum</i> Linn.	Kalizewar, Sipil	AH	Common in grazeries and open slopes	July-Oct	1000-3000	12300
<i>Bupleurum hamiltonii</i> Balakr.		AH	Common in grasslands and open slopes	July-Oct	upto 2800	12252
<i>Heracleum candicans</i> Wall. ex DC.	Patrala, Padara	PH	Common in grasslands, shrubberies and open slopes	May-Sept	1800-3500	11274
<i>Pimpinella diversifolia</i> DC.		PH	Common in grasslands and open slopes	June-Nov	1200-3000	12230
<i>Selinum candollii</i> DC.	Bhootakeshi	PH	Quite common on open slopes and pastures	May-Oct	2000-4000	12731, 12220
<i>Selinum vaginatum</i> (Edgew.) Clarke	Bhogli, Muramansi	PH	Common in grasslands and open slopes	June-Oct	1800-3500	12190

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
<i>Vicatia conijfolia</i> DC.		AH	Occurring gregariously on forest floor in moist shady places	May-Aug	1800-3500	12881
Pinaceae						
<i>Abies pindrow</i> Royle	Thaneira, Tosh	T	Usually forming mixed forests with <i>Picea smithiana</i> , especially on shady aspects	Apr-May & Sept-Oct	2200-3500	11243
<i>Cedrus deodara</i> (Roxb. ex D. Don) G. Don	Dyars, Deodar	T	Common in W. Himalaya ; usually occurring gregariously and forming pure forests	Jun-July & Oct-Nov	1800-3500	11255, 12718
<i>Picea smithiana</i> (Wallich) Boiss.	Rai, Rau	T	Common; often forming mixed forests with <i>Fir</i> , <i>Deodar</i> , <i>Blue Pine</i> and <i>Kharsu Oak</i>	Apr-May & Oct-Nov	2100-3300	11238
<i>Pinus roxburghii</i> Sargent	Chil, Chir	T	Gregariously occurring, forming extensive forests; sub-tropical and temperate Western Himalaya	Feb-May (Fl.)	800-2000	12978
<i>Pinus wallichiana</i> A. B. Jackson	Kail	T	A widely distributed species over a wide range of altitudes, in the drier as well as moist aspects; temperate Himalaya	Apr-Jun (Fl.)	1800-4000	11234
Cupressaceae						
<i>Cupressus torulosa</i> D. Don	Galla, Gallu	T	Occurring in drier areas, usually on limestone; sometimes planted	Oct-Nov	1500-2500	12701
Taxaceae						
<i>Taxus baccata</i> Linn. subsp. <i>wallichiana</i> (Zucc.) Pilger	Thuner, Birmi	T	Usually forming the under-storey of the high level mixed forests, especially on shady aspects	Mar-May & Sept-Nov	2200-3500	12140
Selaginellaceae						
<i>Selaginella</i> sp.		F	Occasionally found on water-courses, forming a mat-like formation	-	above 2800	12934
Dennstaedtiaceae						
<i>Pteridium aquilinum</i> (L.) Kuhn var. <i>wightianum</i> (Ag.) Tryon	Kakhash	F	Fairly common in temperate areas on the forest floor or as a weed in orchards	-	1500-2400	12875, 12143
Pteridaceae						
<i>Adiantum incisum</i> Forsskal	Kanghai, Gunkeri	F	A very common low altitude fern growing in rock-crevices, slopes and walls	-	upto 1400	12683, 12684
<i>Adiantum venustum</i> D. Don	Dummi, Hansraj	F	A fairly common fern of the forest floor	-	2000-3000	11235
<i>Cheilanthes albomarginata</i> Clarke		F	A common fern in the temperate Western Himalayan mid-hills	-	1200-2000	12726
<i>Cheilanthes bicolor</i> (Roxb.) Fraser-Jenkins		F	Fairly common at lower altitudes	-	upto 1500	12682
<i>Cheilanthes brevifrons</i> (Khullar) Khullar		F	Fairly common around 1500m altitude	-	1400-1800	12680, 12681
<i>Cheilanthes dalhousiae</i> Hook.		F	A frequently found fern, on rocks and moist forest floor of temperate forests	-	upto 2600	12932
<i>Gymnopteris vestita</i> (Wall. ex Moore) Underwood		F	Occurring on exposed rocks in the temperate forest floors	-	1800-2500	12831
<i>Onychium fragile</i> Verma et Khullar	Sulu	F	Grows in rock crevices in shady places	-	1800-2500	12824
<i>Onychium lucidum</i> (D. Don) Spr.		F	A fern encountered occasionally between 1000-1600 m altitude in shady places	-	1000-1600	12272
<i>Pteris cretica</i> L.		F	In open and shaded areas on forest floor	-	upto 3000	11236
<i>Pteris vittata</i> L.		F	Often growing on roadsides, on walls and on the banks of rivers and rivulets	-	upto 1500	12685
Aspleniaceae						
<i>Asplenium dalhousiae</i> Hook.		F	A very common fern growing abundantly in shady areas	-	upto 3000	12827, 11280
<i>Asplenium trichomanes</i> L. subsp. <i>quadrivalens</i> D.E. Meyer		F	In crevices of rocks and cliffs in shady areas	-	1800-3000	12832

TABLE 3. Continued.

FAMILY & SPECIES	VERNACULAR/ COMMON NAME	HABIT	DISTRIBUTION & HABITAT	FLOWERING & FRUITING	ELEVATIONAL RANGE	VOUCHER SPECIMEN NUMBER
Thelypteridaceae						
<i>Glaphyroidopsis erubescens</i> (Wallich ex Hooker) Ching		F	Fairly common besides water-falls and ravines	-	1000-2500	12822
Blechnaceae						
<i>Woodwardia unigenmata</i> (Makino) Nakai		F	Occurring in damp forests near springs and beds of hilly ravines and other wet places in shade	-	upto 2400	12830
Athyaceae						
<i>Athyrium flabellatum</i> (Clarke) Tardieu-Blot		F	A rare fern found in damp forests	-	2200-2600	12823
<i>Deparia japonica</i> (Thunb. ex Murray) Kato		F	A rare fern occurring near water bodies	-	2000-2500	12826
Hypodematiaceae						
<i>Hypodematium crenatum</i> (Forsk.) Kuhn subsp. <i>crenatum</i>		F	Common in crevices of rocks	-	upto 1500	12679
Dryopteridaceae						
<i>Dryopteris caroli-hopei</i> Fraser-Jenkins		F	A very common fern growing abundantly in shady areas	-	1800-2500	12833
<i>Dryopteris nigropaleacea</i> (Fraser-Jenkins) Fraser-Jenkins		F	A common fern along the roadsides and on the forest floor	-	1800-2500	12724, 11256
<i>Dryopteris xanthomelas</i> (Christ) C. Chr.		F	A very common fern growing abundantly in shady areas	-	1800-2500	12930
<i>Polystichum neolobatum</i> Nakai		F	Occurring in moist shady areas; plants of the forest floor	-	upto 2800	12725, 12828

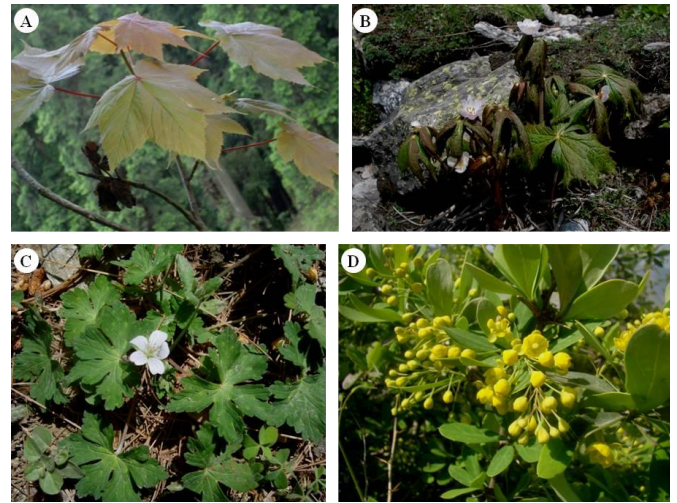


FIGURE 3. (A) *Acer caesium* (B) *Podophyllum hexandrum* (C) *Geranium nepalense* (D) *Berberis lycium* in Theog Forest Division, Himachal Pradesh, India.

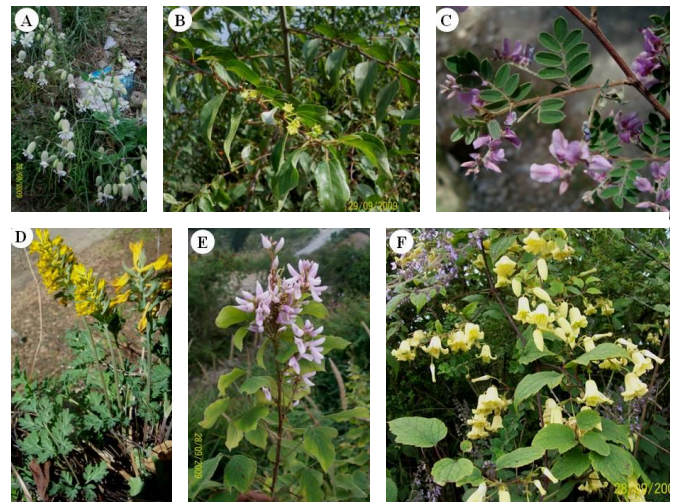


FIGURE 4. (A) *Silene vulgaris* (B) *Zizyphus oxyphylla* (C) *Indigofera heterantha* (D) *Corydalis govaniiana* (E) *Desmodium elegans* (F) *Clematis buchananiana* in Theog Forest Division, Himachal Pradesh, India.

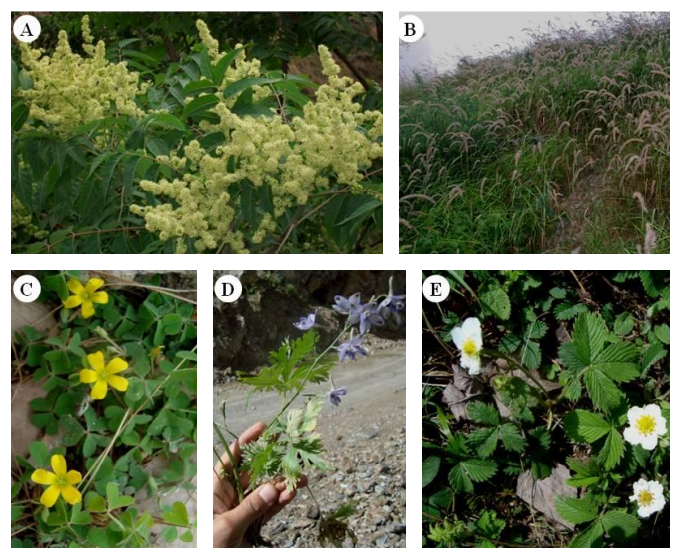


FIGURE 5. (A) *Ailanthus altissima* (B) *Pennisetum flaccidum* (C) *Oxalis corniculata* (D) *Delphinium denudatum* (E) *Fragaria nubicola* in Theog Forest Division, Himachal Pradesh, India.



FIGURE 6. *Quercus semecarpifolia* forest at 2600 m in Theog Forest Division, Himachal Pradesh, India.



FIGURE 8. Fir-spruce forest, 2600–3100 m in Theog Forest Division, Himachal Pradesh, India.



FIGURE 7. *Yucca gloriosa* with typical southern aspect treeless mountain grassland at 2200 m in Theog Forest Division, Himachal Pradesh, India.



FIGURE 9. Pure *Cedrus deodara* (Deodar) stand at 2500 m in Theog Forest Division, Himachal Pradesh, India.



FIGURE 10. Alpine pasture in the forefront with alpine *Abies pindrow* (Fir)-*Picea smithiana* (Spruce) forest in the back view at 3150 m in Theog Forest Division, Himachal Pradesh, India.