

**PLANT DIVERSITY
IN
THE TEHRI DAM SUBMERSIBLE AREA**



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&
D. K. Singh**

BOTANICAL SURVEY OF INDIA

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BOTANICAL SURVEY OF INDIA
Ministry of Environment & Forests

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Back Cover: A view of New Tehri township.

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FOREWORD

The deteriorating environmental conditions, particularly because of various biotic activities leading to the diminishing of biological resources has aroused a sense of awareness and urgency all through the world. The Government of India also has taken a serious note of it and has made environmental impact studies mandatory in the areas where developmental projects are being initiated. The multipurpose Tehri Hydro Development Project at Tehri in Uttar Pradesh is one of such projects.

The earlier studies on the vegetation of Tehri, broadly encompassing the entire district as a whole, made by Dr. U.C. Bhattacharyya and Dr. A.K. Goel in 1982, included twelve rare and threatened species from the area. This prompted the Ministry of Environment & Forests to have a fresh look, especially on the rare and endangered plants, and the responsibility was once again assigned to the Northern circle, Botanical Survey of India, Dehra Dun. The present work by the scientists of the circle is an outcome of the explorations taken during 1992-93 exclusively in the submersible area of the proposed reservoir and study of earlier collections and literature. The report discusses thredbare the status of rare and endangered plant species and sets at rest all speculation about the impact of the proposed dam on these taxa. The report, along with a list of useful plants, may be helpful to the Tehri Hydro Development Authorities in planning and carrying out afforestation programmes.

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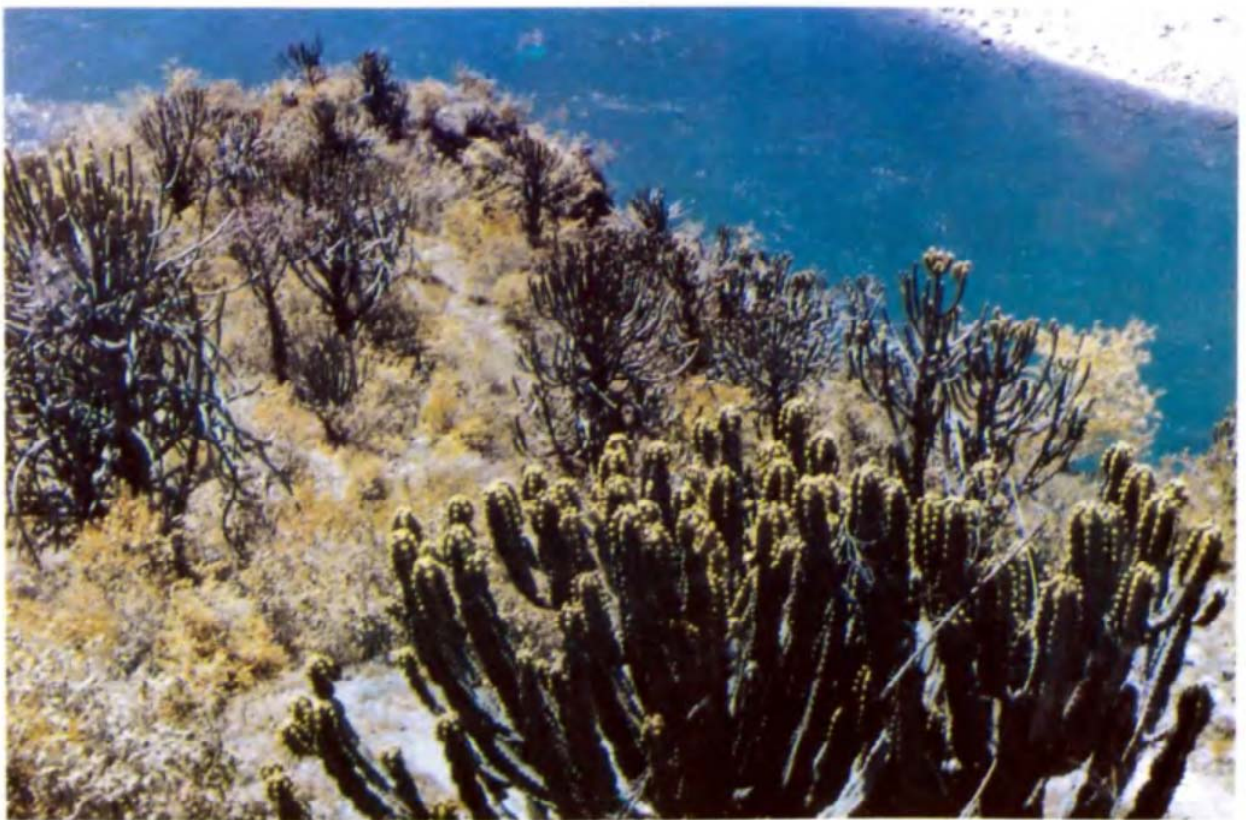
A view of the cultivated fields in the Bhilangna valley (Asena village)



A view of village Bandrakoti in the Bhagirathi valley



A view of vegetation near Siraingad



Euphorbia royleana Boiss. on slopes near Kandal



Phoenix humilis Royle on steep slopes in the lower Bhagirathi valley



A view of lower Bhagirathi valley



Acorus calamus Linn. near Chinyalisaur



Epipactis veratrifolia Boiss. - a terrestrial orchid



Schefflera venulosa (Wight & Arn.) Harms. hanging from rocks



Datisca cannabina Linn. - a monotypic genus



Carthamus tinctorius Linn. - an economically significant plant, locally traded as "Kesar"



Rosa brunonii Lindl. - a white flowered climber



Marsilea quadrifolia Linn. - an aquatic pteridophyte



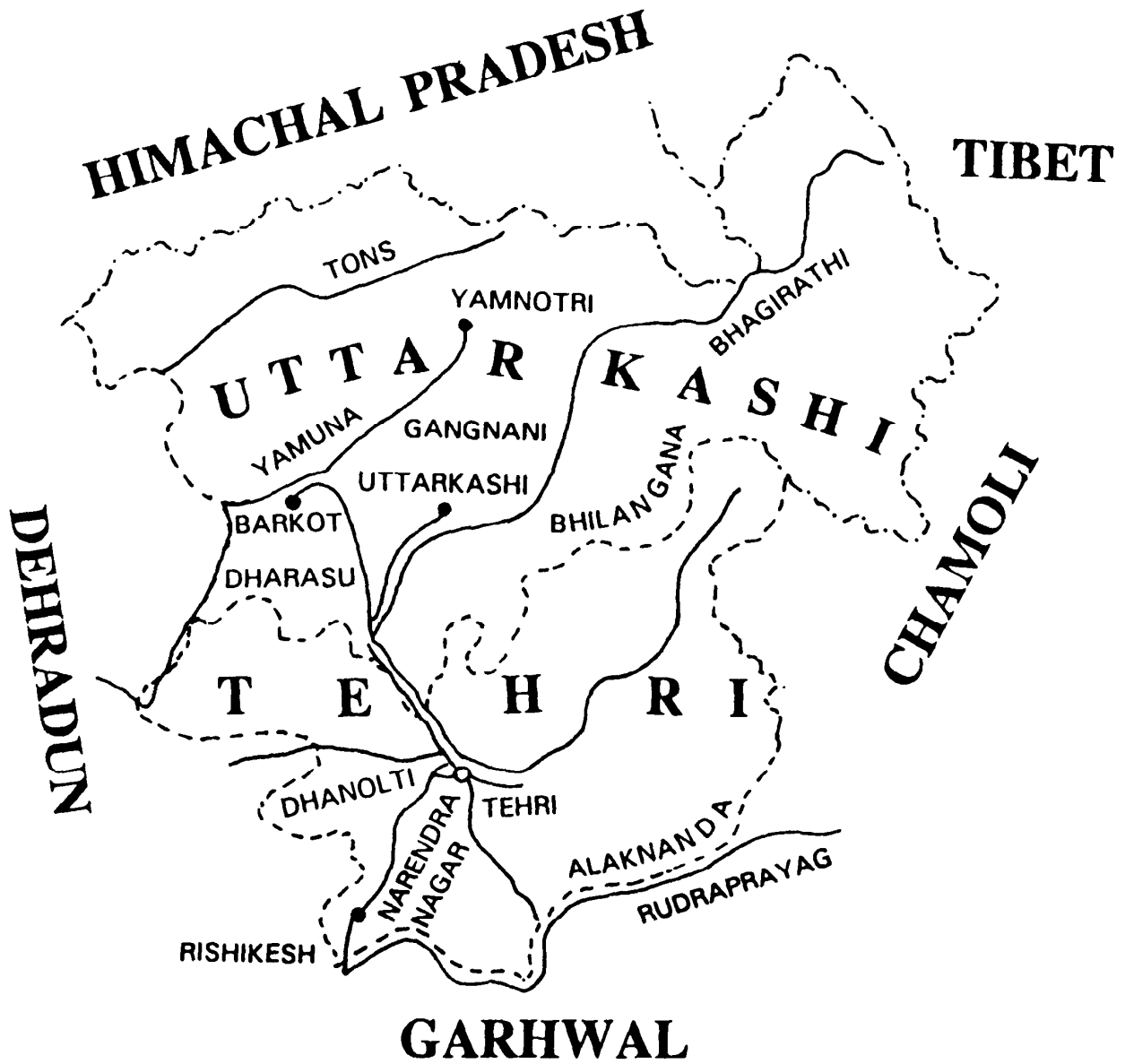
Ricciocarpus natans Corda - an interesting, aquatic bryophyte

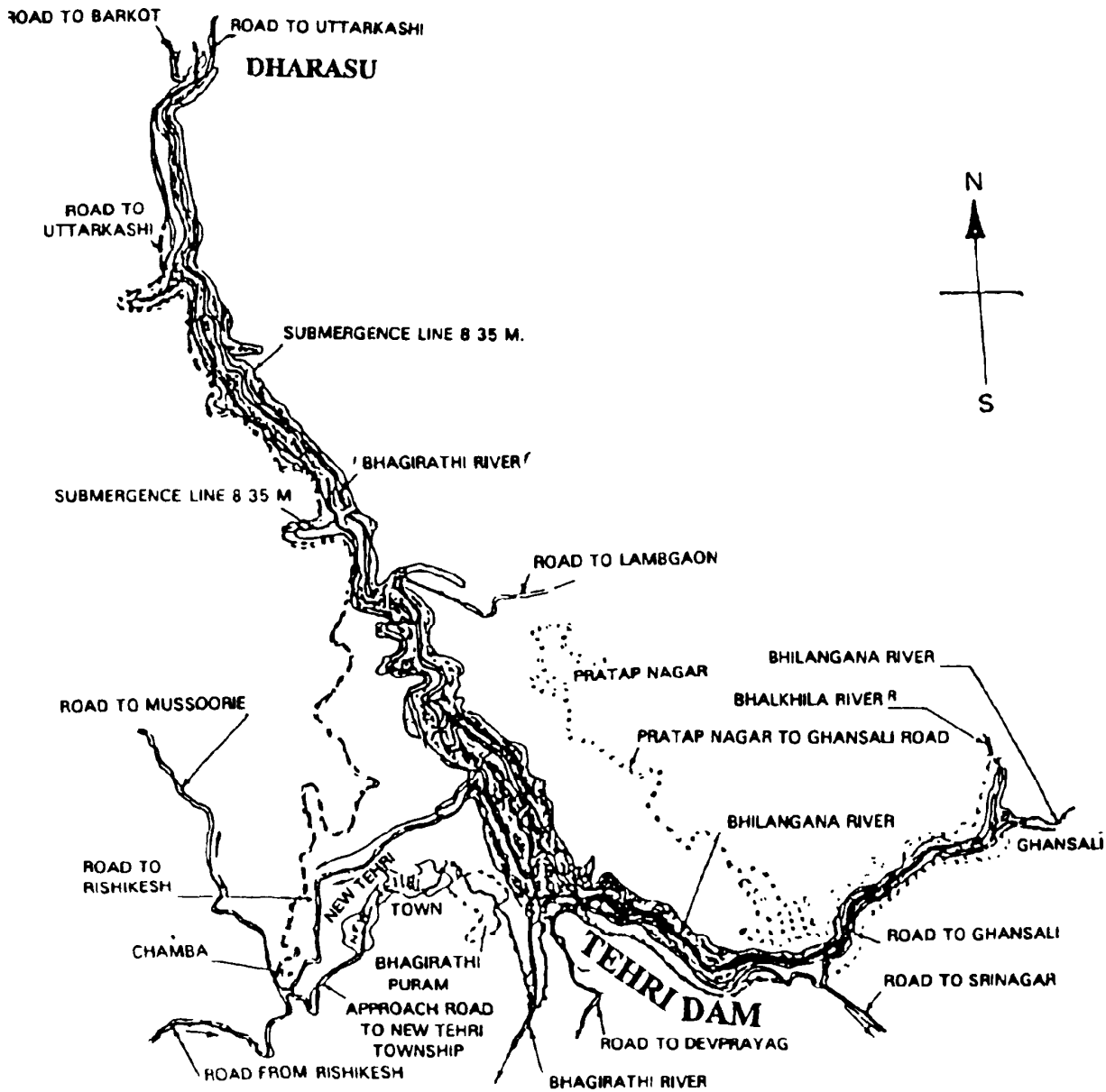


A view of old Tehri township showing confluence of Bhagirathi and Bhilangna rivers



A view of New Tehri township





KOTESHWAR RESERVOIR "DOWN STREAM"

FIG-2— PLAN OF RESERVOIR

INTRODUCTION

Nestled amidst the high mountain walls of the Himalayas is the town of Tehri, on the confluence of the Bhagirathi and Bhilangana rivers, that water the miles of fertile slopes of the embankments, dotted with tiny villages above the cultivated terraces, made with geometric precision. Tehri has always been the nerve-centre of the hills of Garhwal, that looked on it for all their matters social, political, etc.

Situated at an altitude of 640 m, between the coordinates 30 4' and 30 52.5 N and 77 50' and 79 3' E, the town of Tehri came into being on the 30th November 1815, when the Britishers were given the Nagpur Pargana and the Alaknanda valley by Sudershan Shah, as a reward for the help rendered by the aliens in driving out the hostile Gorkhas. The part taken away by the Britishers was later known as the British Garhwal, while the rest was more popular as Tehri Garhwal. Sudershan Shah selected Tehri as his capital, probably because of the geographical and strategic advantages in this difficult terrain.

Tehri remained as an independent State till the freedom of India in 1947, but during the post-independence course of events, it was finally merged with the State of Uttar Pradesh, by the then Chief Minister Sri Govind Vallabh Pant on the 9th August 1949. It was once again in 1962, after the Chinese aggression, that Tehri was further divided into two districts Tehri and Uttarkashi.

A little below the meeting point of the two rivers - Bhagirathi and Bhilangana, that originate from the well known glaciers of Gaumukh and Khatling-is now, the site of the proposed second largest dam of Asia. When completed, the Earth & Rockfill dam will stand 260.5 m high. The Lake thus formed will cover an estimated area of 605 square kilometers over the valleys of the two rivers. Initially okayed for the U.P. Government in 1972, the Tehri Dam Project was finally implemented as a joint venture of the U.P. State and Central Government, with an increased capacity of 1000 MW (Total capacity 2400 MW from all components). Thus, the Tehri Hydro-Development Corporation was setup on 12th July 1988. The following components of the dam are proposed to be completed in the project.

1. One 260.5 m high Rockfill Dam and a 1000 MW underground Hydro power plant on the Bhagirathi at Tehri, little below the confluence of the two rivers.
2. One 1000 MW Pump storage plant at Tehri.
3. One 103.5 m high concrete dam at Koteshwar, 22 km downstream of Tehri, with a 400 MW surface Hydro power plant.

4. The 800 KV Associate Transmission system for evacuation of power from the complex.

Adding 2400 MW (Peaking power) of power, the project would provide 6532 million units of energy annually. It would also provide irrigation to 2.7 lakh ha of land, besides providing stabilisation to 6.04 lakh ha of existing irrigated area. Delhi would get 300 cusecs of drinking water annually, sufficient for about 4 million people.

PREVIOUS WORK

Though not purely of botanical nature, the explorations in the Himalayas began as far back as eighteenth century. Thomas Hardwick in 1796, while on a mission, visited the Raja of Garhwal in Srinagar and earlier to this, Thomas Bogle had been able to travel through Bhutan to Lhasa.

The quest to solve the mysteries of the sources of the two great rivers, Ganga and Yamuna, impelled the Britishers to take up full-fledged explorations. As Burkill writes, "No active man likes to be debarred from knowledge, and the fact that the Himalayas were closed to visitors from Europe, had only intensified the desire to explore them". He further notes, "the plains depend so enormously on rivers from the hills for irrigating crops that there was a demand for exploring in particular to the sources of the Ganges and the Jamuna". Surveyors set off to the mountain of Garhwal and William Spencer Webb with Hyderjung Hearsay and Felix Vincent Raper succeeded in procuring a permit to travel in the domain of the Nepalese rulers who held suzerainty over Garhwal at that time. Although their expedition did not yield any results of botanical interest, yet they were able to reach the source of the Yamuna. To add to their adventures, William Moorcroft, unmindful of the repercussions of not obtaining permission, dared to tread beyond the source of the Ganges over the Niti pass and to the source of the Sutlej in Mansarover lake. He had with him Hearsay as a good companion and they returned with a bundle of dried plants, the plants which were to be the first botanical collections in the Himalayas.

The Nepalese withdrew their claim on the mountains west of the Kali after the 1814-15 war with them. Once again, William Spencer Webb proceeded to survey the mountains, west of Kali with Kamrup and Blinkworth as collectors, deputed by Wallich. This enabled Wallich to have properly dried specimens from the Himalayas.

In 1830 Victor Jacquemont travelled through Dehra Dun and Mussoorie to the sources of Yamuna and Tons rivers and then to Simla hill, collecting plants on the way. Duthie, Gamble, Keshvanand, and Mckinnon were the other botanists to have collected plants from Tehri Garhwal. The well known Forest Flora of Dehra Dun and Chakrata by Kanjilal too, has mentions of the shrubby elements and tree species

found in Tehri Garhwal. It is said that Walter Koelz also did collections in the district of Tehri.

During the sixties and seventies of this century, R.K. Gupta, Dey *et al.*, Juyal and Uniyal contributed considerably to the knowledge of plant wealth of Tehri District. After the establishment of the Northern Circle of the Botanical Survey of India at Dehra Dun in 1956, the scientists of the survey began full-fledged explorations of plant in the north-west Himalayas. M.A. Rau, B.V. Shetty, U.C. Bhattacharyya, M.V. Viswanathan, B.D. Naithani and B.S. Aswal took extensive plant collection tours to the district. A.K. Goel worked out the Herbaceous Flora of Tehri District and was awarded Ph.D. for this work.

Fearing the possible loss of some rare or endangered vegetation due to construction of the dam, the Botanical Survey of India was asked to present a report on the vegetation of Tehri dam in the early eighties. Accordingly Dr. U.C. Bhattacharyya and A.K. Goel from the Northern Circle, submitted the report, wherein twelve rare species of plants were reported from the area.

After the constitution of the Ministry of Environment and Forests, the government has once again taken up the task of environmental assessment around the proposed dam and as such, the Botanical Survey of India was once again asked to take up a full-fledged vegetational assessment project of the dam area. This report is the outcome of the project, which involved three extensive field-trips during the course of which the scientists and the staff of the department covered the total length and breadth of the area, especially the submersible area, during different seasons.

VEGETATION

"It is very hot place, devoid of trees and surrounded by bare high hills" (Himalayan Gazetteer III. pt. II 713. 1973 (Reproduced). "The Bhagirathi or as it is now called the Ganges Division comprise the forests on either bank of the river of that name in the Raja of Tehri's territories". "Noble forests of Chir extend from Sainsa, some twenty miles above Tehri, as far as Bhatwari, a distance of about fifty five miles along the valley" (Himalayan Gazetteer 1(2): 866-67. 1973 (Rep. ed.). That is how Atkinson described the vegetation around Tehri.

Today, only scattered trees of *Pinus roxburghii* can be seen around Tehri. But, well above the submergence line, good patches of Pine trees exist towards Syansu. The land on both the banks of the Bhagirathi is cultivated land. Patches of *Dalbergia sissoo* (SHISHAM) can be seen in the gullies, the seeds of which were airsovn in order to establish greenery in the valley.

The slopes in the valley are dominated by shrubby elements like *Dodonaea viscosa*, *Carissa opaca*, *Rhus parviflora*, *Lantana camara* and *Euphorbia royleana*. Mixed with these are found *Murraya koenigii* and *Woodfordia fruticosa* at places. The tree species commonly met with are *Dalbergia sissoo*, *Sapium insigne*, *Bombax ceiba* and *Lannea coromandelica*. A good patch of *Olea glandulifera* (Gile) can be seen on Tehri-Ghansali road near Gumethidhar. Around this spot were also noticed a few trees of *Engelhardtia spicata*, *Dalbergia sericea*, *Sapindus mukorossi* and *Mallotus philippensis*. Populations of the medicinally important plant *Zanthoxylum armatum* (Timur) are a common feature by the roadside. *Pinus roxburghii*, though of occasional occurrence in the submersible area, has good patches in the higher reaches in the Bhagirathi valley. *Acacia catechu*, *Albizia lebbek*, *Bauhinia retusa*, *B. variegata*, *Boehmeria rugulosa*, *Butea monosperma*, *Erythrina suberosa*, *Ficus* spp., *Pyrus pashia*, *Rhamnus triquetra*, *Syzygium cumini*, *Moringa oelifera*, *Terminalia tomentosa*, *Toona ciliata*, *Sterculia* spp., *Xylosma longifolium*, etc. are some other tree species found in the area of the study. trees of *Grewia optiva* (Bhyunl), *Celtis australis* (Kharik), *Ficus auriculata* and *Melia azedarach* are generally found near human inhabitations. Among the cultivated fruit trees are *Eriobotrya japonica*, *Citrus* spp., *Carica papaya*, *Mangifera indica*, *Juglans regia*, *Musa* sp., *Psidium guayava*, *Prunus armeniaca* and *Punica granatum*. A solitary tree of *Tamarindus indica* was also observed near the Ghonti market on the other side of the foot bridge. Trees planted for ornamental purpose are *Callistemon* sp., *Cassia glauca*, *Cupressus* sp., *Drypetes roxburghii*, *Eucalyptus* sp., *Jacaranda mimosifolia*, *Michelia champaca* and *Populus* sp.

The shrubs commonly met with are *Acacia* sp. *Buddleja asiatica*, *Calotropis procera*, *Myrsine africana*, *Rhamnus virgata*, *Pyracantha crenulata*, *Deeringia amaranthoides*, *Ziziphus mauritiana* and the medicinally important *Withania somnifera*. The last named is abundant around Tehri town.

Among the herbs *Eupatorium adenophorum*, *Parthenium hysterophorus* and *Rumex hastatus* are abundant. *Urtica urens* is also getting naturalised around Tehri. Some other common herbs are : *Anagallis arvensis*, *Capsella bursa-pastoris*, *Coronopus didymus*, *Euphorbia hirta*, *E. peplus*, *Oxalis corniculata*, *Portulaca oleracea*, *Solanum* spp., *Tridax procumbens*, *Ranunculus arvensis*, *R. sceleratus*, *Verbascum thapsus*, *Sonchus oleraceus*, *Youngia japonica*, *Micromeria biflora* etc.

The climbers are represented by *Caesalpinia decepetala*, *Rosa brunonii*, *Ipomoea hederifolia*, *Aspidopterys wallichii*, *Pueraria tuberosa*, *Toddalia asiatica*, *Cryptolepis buchmanii*, *Vallaris solanacea*, *Bauhinia vahlii*, *Merremia dissecta*, *Cissampelos pariera*, *Coccinia grandis*, *Clematis gouriana*, *Telosma pallida*, *Helinus lanceolatus* etc. Among these the white flowered *Rosa brunonii* and *Merremia*

disseca, the yellow flowered *Caesalpinia decapetala*, the red flowered *Ipomoea hederifolia*, and the light blue flowered *Pueraria tuberosa* (leafless during flowering) are very conspicuous when in blume. *Aspidopterys wallichii* is eye catching when in fruits.

At certain places, in both the valleys, are marshy areas and puddles by the side of the river. In such places grow *Acorus calamus*, *Alisma plantago-aquatica*, *Cyperus rotundifolius*, *Hydrilla verticillata*, *Justicia* sp., *veronica* spp., *Juncus bufonius*, *Oenanthe stolonifera* etc. But the most noticeable species are *Epipactis veratrifolia*, *Gentiana* sp., *Spiranthes sinensis*, *Ophioglossum nudicaule*, *Potamogeton natans*, and *Marsilea quadrifolia*. In the stagnant waters of paddy fields were collected *Blyxa aubertii*, *Eriocaulon cinereum* and *Ammannia* spp.

The insectivorous plants - a botanical curiosity, are represented by *Utricularia striatula* which was found growing on a moist moss laden rock near the bridge over Bhagirathi on Bhaldiyana-Lambgaon road.

Barring species of *Ficus*, some of which are epiphytic at early stages, some other epiphytic species of orchids, e.g. *Vanda* sp. and *Luisia* sp. were noticed growing over *Euphorbia royleana*, *Lansea coromandelica* and *Olea glandulifera*. A clump of *Luisia* was also seen growing over a rock near the bridge over Bhilangana at Ghonti Market.

Among the parasites only two genera viz. *Cuscuta* and *Scurrula* could be seen.

On the river bed and sandy river banks are found spp. of *Polygonum*, *Salix* sp., *Echinochloa* sp., *Viola betonicifolia*, *Imperata cylindrica*, *Saccharum spontaneum*, *Eragrostis atrovirens*, *Ziziphus mauritiana* etc.

Down in the valley towards Koteshwar the slopes are dominated by *Lantana camara* *Dodonaea viscosa*, *Parthenium hysterophorus* etc. The forests present a better look than those of Bhilangana valley and upper Bhagirathi valley. The tree species here are *Dalbergia sissoo*, *Acacia catechu*, *Sapium insigne*, *Lansea coromandelica*, *Ficus* spp., *Butea monosperma*, *Mallotus philippensis*, *Pistacia khinjuk* etc. Good patch of *Phoenix* sp. is eye catching in valley. the shrubby elements and the herbaceous elements are not different from those in the upper valleys. The forests are mostly at the higher level than the proposed reservoir site and thus are safe.

Apart from the phanerogams and pteridophytes, the area is also rich in lower cryptogams such as Algae, Fungi, Lichens and Bryophytes. the notable among them are : *Chara*, *Cladophora*, *Hydrodictyon*, *Mougeantia*, *Nitella*, *Nostoc*, *Oedogonium*, *Pithophora*, *Spirogyra*, *Ulothrix*, *Vaucheria*, *Zygnema* (Algae); *Amanita muscaria*,

Boletus edulis, *Ramaria chrysanthes*, *Fomes fomentarius*, *Geastrum geaster*, *Lycoperdon oblongum*, *Polyporus grammocephalus*, *Ganoderma applanatum*, *G. lucidum* (Fungi); *Cladonia*, *Gyrophora*, *Lobaria*, *Parmellia*, *Physcia*, *Usnea* (Lichens) and *Cyathodium cavernarum*, *Dumortiera hirsuta*, *Phaeoceros laevis*, *Notothylas indica*, *Ricciocarpus natans*, *Riccia himalayensis*, *Frullania*, *Marchantia*, *Plagiochasma*, *Porella*, *Funaria*, *Pogonatum*, *Mnium*, *Thuidium* etc. (Bryophytes).

ENUMERATION

In an earlier report Bhattacharyya & Goel (1982) enumerated 462 plants from the area. Recently Goverdhan (1993) reproduced the same list in his book entitled "Environmental Impact Assessment of Tehri Dam". The authors, on the basis of their own collections from the said area, have added more than 125 species to the list. A keen observation revealed that genera like *Cirrhopetalum*, *Quercus*, *Rhododendron*, *Saccolabium* etc. are much above the submergence level and have been deleted. The nomenclature also has been updated.

RANUNCULACEAE

Clematis gouriana Roxb. ex DC., Syst. 1: 138. 1817.

Shrubby climbers. Flowers white. Achenes tailed.

Fls. & Frts.: Sept. Feb.

Ranunculus arvensis L., Sp. Pl. 555. 1753.

Erect herbs, Flowers solitary, yellow. Achenes tuberculate.

Fairly common

Fls. & Frts.: Feb. May

R. laetus Wallich. ex Royle, Ill. Bot. Himal. 53. 1834.

Perennial herbs, stems strigose. Flowers yellow. Achenes margined, not tuberculate.

Scarce.

Fls. & Frts.: Aug. Oct.

R. muricatus L., Sp. Pl. 555. 1753.

Glabrescent herbs. Stems hollow. Flowers yellow. Achenes tuberculate.

Fairly common.

Fls. & Frts.: Feb. May

R. sceleratus L., Sp. Pl. 551. 1753.

Herbs. Flowers yellow. Achenes small, not tuberculate.

Fairly common.

Fls. & Frts.: Feb. - June

MAGNOLIACEAE

Michelia champaca L., Sp. Pl. 536. 1753.

Evergreen trees. Flowers very fragrant.

Planted.

MENISPERMACEAE

Cissampelos pareira L., Sp. Pl. 1031. 1753.

Slender twiners. Leaves peltate or ovate-subreniform. Bracts prominent in fruiting. Fruits red.

Common.

Fls. & Frts.: July Oct.

Cocculus laurifolius DC., Syst. Nat. 1: 530. 1817.

Evergreen shrubs or small trees. Leaves shining above. Flowers in axillary panicles, minute. Fruits black when ripe.

Occasional.

Fls. & Frts.: April - June

Stephania glabra (Roxb.) Miers in Ann. Mag. Nat. Hist. Ser. 3. 18: 14. 1866.
Cissampelos glabra Roxb.

Slender, twining herbs. Flowers greenish yellow. Fruits transversely ridged dorsally.

Frequent around Chansali.

Fls. & Frts.: July Sept.

BERBERIDACEAE

Berberis lycium Royle in Trans. Linn. Soc. 17: 94. 1834.

Evergreen, armed shrubs, spines trifid. Flowers yellow. Fruits black, pruinose.

Common.

Fls. & Frts.: April - June

PAPAVERACEAE

Argemone mexicana L., Sp. Pl. 508. 1753.

Prickly, glaucescent laticiferous herbs. Leaves spinulose dentate on the margins. Flowers bright yellow. Stigma lobes appressed.

Fls. & Frts.: Major part of the year.

A. ochroleuca Sweet, Brit. Fl. Gard. 3. t. 242. 1828.

Like *A. mexicana* but flowers white or creamy. Stigma lobes spreading.

Fls. & Frts.: Feb. June

Papaver dubium L., Sp. Pl. 1196. 1753 var. *laevigatum* (M.B.) Elkan. Pflanz. 40: 318. 1909.

Annual, glabrous herbs with milky juice. Flowers scarlet. Fruits sessile.

Occasional.

Fls. & Frts.: March May

P. somniferum L., Sp. Pl. 508. 1753.

Large, glaucous herbs. Flowers large, white. Fruits stalked.

Planted.

Fls. & Frts.: April May

FUMARIACEAE

Fumaria indica (Hausk.) Pugsley in J. Linn. Soc. Bot. 44: 313. 1919. *Fumaria vaillantii* var. *indica* Hausk. "KHAIRIA"

Glaucous, annual herbs. Leaves dissected. Flowers pink, spurred.

Common.

Fls. & Frts.: Feb. - April

BRASSICACEAE

Arabidopsis thaliana (L.) Heynh. in Holl. & Heynh. Fl. Sachs. 2: 538. 1842.
Arabis thaliana L.

Slender, annual herbs. Flowers white.

Frequent in shady places.

Fls. & Frts.: Sept. Oct.

A. Wallichii (Hook.f. & Thomson) N. Busch. Fl. Cauc. Crit. 3: 457. 1909.
Sisymbrium wallichii Hook.f. & Thoms.

Annual-perennial herbs. Basal leaves lyrate-pinnatifid or irregularly toothed. Flowers in racemes, white, pinkish or pale lilac.

Fls. & Frts.: April - June

Arabis pterosperma Edgew. in Trans. Linn. Soc. 20: 33. 1851.

Perennials, Radical leaves spatulate or obovate-oblong, toothed. Flowers in racemes.

Scarce, near Baunr.

Fls. & Frts.: April - July

Brassica juncea (L.) Czern. et Coss. in Czern., Conspect. Fl. Chark. 8. 1859.
Sinapis juncea L. "SARSON"

Cultivated.

B. nigra (L.) Koch in Rohling, *Deutschl. Fl.* ed 3. 4: 713. 1933. *Sinapis nigra*
L. "RAI"

Cultivated

Capsella bursa-pastoris (L.) Medikus in *Pflanzen. Gatt.* 1: 85. 1792. *Thlaspi*
bursapastoris L.

Annual herbs with basal leaves in rosettes. Flowers white. Pods notched at the tip.

Common.

Fls. & Frts.: March Oct.

Cardamine flexuosa With., *Bot. Arr. Brit. Pl.* ed. 3: 578. t. 3. 1796.

Annual or biennial herbs. Branches usually many from the base. Flowers white.

Common, in shady places.

Fls. & Frts.: Feb. April

Coronopus didymus (L.) Sm., *Fl. Brit.* 2: 691. 1804.

Usually prostrate herbs. Leaves pinnatipartite. Flowers greenish.

Fairly common.

Fls. & Frts.: March - June

Lepidium sativum L., *Sp. Pl.* 644. 1753.

Erect, annual herbs. Lower leaves petiolate, upper sessile, nearly entire. Fruits ellipsoid.

Fls. & Frts.: Jan. April

L. virginicum L., *Sp. Pl.* 645. 1753.

Erect, annual herbs. Lower leaves lyrate-pinnatipartite, upper irregularly serrate. Flowers white. Fruits suborbicular.

Fls. & Frts.: April Sept.

Raphanus sativus L., Sp. Pl. 669. 1753.

Annual or biennial herbs. Flowers white-lilac. Pods indehiscent, terete, thick.

Cultivated.

Rorippa nasturtium-aquaticum (L.) Hayek. in Sched. Stir. Exs. 22. 1905.
Sisymbrium nasturtium-aquaticum L.

Glabrous, aquatic herbs. Leaves imparipinnate. Flowers white.

Fls. & Frts.: Feb. - June

CLEOMACEAE

Cleome gynandra L., Sp. Pl. 671. 1753.

Erect, glandular-pubescent herbs. Leaves digitately 5-foliolate. Flowers in corymbs, white. Stamens 6. Fruits with longitudinal striations.

Common.

Fls. & Frts.: Aug. Dec.

C. viscosa L., Sp. Pl. 672. 1753.

Erect, viscid glandular herbs. Leaves 3-5 foliolate. Flowers yellow. Stamens more than 10.

Common.

Fls. & Frts.: July Nov.

VIOLACEAE

Viola betonicifolia Smith in Rees, Cyclop. 37. n. 7. 1817. Subsp. *nepalensis* (Ging.) Becker in Bot. Jahrb. 54 (Beibl. 120). 166. 1917. *V. patrinii* var. *nepalensis* Ging.

Perennial herbs. Leaves in basal rosette, ovate, triangular-lanceolate-oblong. Flowers bluish.

Frequent, under boulders by the riverside.

Fls. & Frts.: Aug. Nov.

V. canescens Wallich ex Roxb., Fl. Ind. 2. 450. 1824.

Distinguished from *V. betonicifolia* by its ovate-cordate-subreniform leaves and fimbriate stipules.

Not common.

Fls. & Frts.: April Nov.

FLACOURTIACEAE

Casearia graveolens Dalz. in Hook., J. Bot. 4: 107. 1841.

Small trees. Twigs and leaves glabrous. Fruits yellow.

Fls. & Frts.: April - July

Flacourtia indica (Burm.f.) Merr., Interpret. Rumph. Herb. Amb. 377. 1917.
Gmelina indica Burm.f.

Deciduous, spinous, small trees. Flowers greenish yellow. Fruits globose, deep red or purple on maturity.

Fls. & Frts.: Feb. - June

Xylosma longifolium Clos. in Ann. Nat. Ser. 4. 8: 231. 1857.

Evergreen trees, occasionally spinous. Branches stout. Leaves thick, shining. Flowers yellow.

Frequent.

Fls. & Frts.: March Dec.

POLYGALACEAE

Polygala arvensis Willd., Sp. Pl. 3(2): 876. 1802.

Annual herbs. Leaves obovate or oblanceolate-linear lanceolate. Flowers in short, axillary racemes, yellow.

Fls. & Frts.: July Oct.

CARYOPHYLLACEAE

***Arenaria serpyllifolia* L., Sp. Pl. 423. 1753.**

Slender, glandular-hairy herbs. Flowers small, white. Fruits ovoid-subglobose.

Fairly common.

Fls. & Frts.: July Aug.

***Cerastium glomeratum* Thuill., Fl. Paris ed. 2: 226. 1799.**

Pubescent-viscid, branching herbs. Leaves sessile. Capsules cylindrical, much exserted.

Frequent.

Fls. & Frts.: Feb. - June

***Polycarpha corymbosa* (L.) Lamk., Tabl. Encycl. 2: 129. 1797. *Achyranthes corymbosa* L.**

Profusely branched herbs, stems hairy. Leaves linear. Flowers silvery white.

Seen along Jalkur gad.

Fls. & Frts.: Sept. Jan.

***Silene conoidea* L., Sp. Pl. 418. 1753.**

Erect, annual herbs, glandular hairy above. Calyx glandular hairy. Fruits abruptly narrowed towards the tip.

Common.

Fls. & Frts.: Feb. April

***Stellaria media* (L.) Vill., Hist. Pl. Dauph. 3: 615. 1789 *Alsine media* L.**

Annual herbs. Flowers whitish. Fruits ovoid.

Fls. & Frts.: Dec. April

PORTULACACEAE

Portulaca oleracea L., Sp. Pl. 445. 1753.

Prostrate, succulent herbs. Nodal hairs absent. Flowers yellow.

Common.

Fls. & Frts.: Aug. Dec.

P. pilosa L., Sp. Pl. 445. 1753.

Prostrate, succulent herbs. Nodal hairs long. Flowers reddish.

Fls. & Frts.: Aug. - Jan.

P. quadrifida L., Mant. Pl. 1: 73. 1767.

Fleshy herbs. Nodal hairs present. Flowers yellow.

Fls. & Frts.: March - June

TAMARICACEAE

Tamarix dioica Roxb. ex Roth, Nov. Pl. Sp. Ind. Or. 185. f. 22. 1821.

Shrubs or small trees. Leaves minute. Flowers pinkish.

Only one plant seen, on the river bed near tunnels.

Fls. & Frts.: April Aug.

HYPERICACEAE

Hypericum oblongifolium Choisy, Prodr. Monogr. Hyper. 42. t. 4. 1821.

Undershrubs. Flowers bright yellow. Stamens in 5 bundles. Styles 5.

Frequent.

Fls. & Frts.: Aug. - Jan.

H. perforatum L., Sp. Pl. 785. 1753.

Glabrous herbs. Differs from *H. oblongifolium* in smaller size of leaves and flowers.

Fairly common.

Fls. & Frts.: April Sept.

MALVACEAE

Abelmoschus crinitus Wallich, Pl. As. Rar. 1: 39. t. 44. 1830.

Erect herbs. Stems, petioles and pedicels densely hispid. Flowers solitary. Epicalyx and bracteoles linear-lanceolate, ciliate. Corolla yellow, purple in the centre.

Fls. & Frts.: Aug. Oct.

A. esculentus (L.) Moench, Meth. Pl. 617. 1794. *Hibiscus esculentus* "BHINDI"

Cultivated.

Abutilon bidentatum Hochst. ex A. Rich. Tent. Fl. Abyss. 1: 326. 1847.

Undershrubs. Leaves broadly ovate, serrate. Stellately tomentose. Flowers pale yellow.

Fairly common around Tehri.

Fls. & Frts.: Aug. Dec.

A. grandifolium (Willd.) Sweet Hort. Brit. ed. 1. 53. 1826.

A native of tropical America and Africa.

Naturalized.

A. hirtum (Lam.) Sweet, Hort. Brit. ed. 1. 53. 1826. *Sida hirta* Lam.

Shrubby. Stems with short gland tipped hairs mixed with long glandular hairs. Flower orange, dark in the centre.

Common around Tehri.

Fls. & Frts.: Oct. April

Hibiscus lobatus (Murray) O. Kuntze, *Rev. Gen. Pl.* ed. 3. 2: 19. 1878.

Erect, annual herbs. Leaves broadly ovate-orbicular, lower ones lobed or partite, upper entire. Flowers white. Fruits exceeding the calyx.

Fairly common.

Fls. & Frts.: Sept. Dec.

H. rosa-sinensis L., *Sp. Pl.* 694. 1753.

"GURAHAL"

Planted as an ornamental.

Kydia calycina Roxb., *Pl. Corom.* 3. 11. t. 215. 1811.

Deciduous trees. Panicles tomentose. Flowers white. Capsules 3-valved.

Fls. & Frts.: March Nov.

Malva parviflora L. in Haser, *Demonstr. Pl. Ups.* 18. 1753.

Prostrate or ascending herbs, branched from the base. Leaves ovate-orbicular to reniform, somewhat lobed. Flowers in axillary fascicles, purplish white.

Frequent.

Fls. & Frts.: Aug. Nov.

Malvastrum coromandelianum (L.) Garcke in *Bonplandia* 5: 295. 1857. *Malva coromandeliana* L.

Perennial herbs. Leaves ovate-lanceolate, dentate-serrate. Flowers axillary, yellow.

Common.

Fls. & Frts.: March Dec.

Sida acuta Burm.f., Fl. Ind. 147. 1768.

Perennial herbs or undershrubs. Leaves lanceolate-oblong, serrate-dentate. Stipules of each pair differently nerved. Flowers yellow.

Fls. & Frts.: Sept. May.

S. cordata (Burm.f.) Borssum Waalkes in Blumea 14: 182. 1966. *Melochia cordata* Burm.f.

Prostrate or ascending herbs. Leaves ovate-cordate, serrate. Stipules of each pair nerveless or 1-nerved. Flowers yellow. Styles and mericarps 5.

Fls. & Frts.: Major part of the year.

S. cordifolia L., Sp. Pl. 684. 1753.

Distinguished from *S. cordata* by the glabrous nature and numbers (10) of mericarps.

Fls. & Frts.: Throughout the year.

Urena lobata L., Sp. Pl. 692. 1753.

Herbs or undershrubs. Lower leaves angular lobed, upper entire or sinuate lobed. Flowers pinkish. Fruits with hooked bristles.

Fls. & Frts.: June Sept.

BOMBACACEAE

Bombax ceiba L., Sp. Pl. 511. 1753.

"SEMAL"

Tall trees. Easily distinguished during flowering by the large, red, leathery petals.

Fairly common.

Fls. & Frts.: Feb. - June

STERCULIACEAE

Melochia corchorifolia L., Sp. Pl. 675. 1753.

Erect, annual herbs. Leaves ovate-lanceolate, irregularly serrate. Flowers many in head like inflorescence. Fruits globose.

Fls. & Frts.: Aug. Oct.

Pterospermum acerifolium Willd., Sp. Pl. 3: 729. 1801.

Evergreen trees. Leaves bifarious, grey-tomentose beneath. Fruits woody, brown, 5-angled.

Scarce.

Fls. & Frts.: Aug. Oct.

Sterculia urens Roxb., Pl. Corom. 1: 25.f. 24.1795.

Trees. Leaves crowded at the end of branches, 5 lobed. Flowers yellowish.

Scattered.

Fls. & Frts.: Dec. April

S. villosa Roxb. ex Smith in Rees, Cyclo. 34: n. 16. 1816.

Trees. Flowers yellow tinged with pink. Fruits rusty villous.

Scattered.

Fls. & Frts.: Dec. April.

TILIACEAE

Corchorus aestuans L., Syst. Nat. ed 10. 2: 1079. 1759.

Annual herbs, pilose hairy. Leaves ovate-lanceolate-oblong, double serrate. Flowers small, yellow. Fruits angled.

Fls. & Frts.: July Oct.

Grewia optiva J.R. Drumm. ex Burrett in Notizbl. Bot. Gart. Berlin 9: 392. 1926.
"BHYUNL"

Medium sized trees. Mostly planted. a plant of multipurpose use.

Triumfetta rhomboidea Jacq., Enum. Pl. Craib. 22. 1760.

Erect, hirsute, annual herbs. Lower leaves deeply 2-lobed. Flowers yellow. Fruits with hooked prickles.

Common.

Fls. & Frts.: July Dec.

LINACEAE

Linum usitatissimum L., Sp. Pl. 277. 1753.

Erect, glaucous, annual herbs. Leaves linear-lanceolate. Flowers blue.

Escape.

Reinwardtia indica Dumort., Comm. Bot. 19. 1822.

Perennial herbs or undershrubs, glabrous. Leaves elliptic-oblong-ovate to oblong. Flowers yellow. Fruits globose, not exceeding the calyx.

Common.

Fls. & Frts.: Feb. April

MALPIGHIACEAE

Aspidopterys wallichii Hook.f., Fl. Brit. India 1: 421. 1874.

Climbers. Flowers white with one coloured petal. Fruits winged.

Frequent.

Fls. & Frts.: Feb. - June

Hiptage benghalensis (L.) Kurz in J. Asiat. Soc. Bengal 43(2): 136. 1874.
Banisteria benghalensis L.

Scandent shrubs. Flowers pale. Calyx with a gland outside. Fruits winged.

Occasional.

Fls. & Frts.: March May

ZYGOPHYLLACEAE

Tribulus terrestris L., Sp. Pl. 387. 1753.

Prostrate or decumbent, hairy herbs. Leaves compound. Flowers yellow. Fruits spiny.

Fls. & Frts.: Aug. Dec.

GERANIACEAE

Geranium nepalense Sweet, Geran. 1: 12. 1820.

Slender perennial herbs. Leaves 3-5 lobed. Flowers purple.

Fls. & Frts.: May Sept.

G. ocellatum Cambess in Jacquem. Voy. 4(Bot): 33. t. 38. 1835.

Weak herbs. Stems reddish purple-tinged. Flowers rose purple, darker at the centre.

Common.

Fls. & Frts.: March Nov.

G. rotundifolium L., Sp. Pl. 683. 1753.

Glandular hairy herbs. Leaves reniform, 7-fid.

Abundant around fort.

Fls. & Frts.: Feb. April

OXALIDACEAE

Oxalis acetosella L., Sp. Pl. 433. 1753.

Scapigerous herbs. Flowers solitary.

Fls. & Frts.: April May

O. corniculata L., Sp. Pl. 435. 1753.

Appressed hairy herbs. Leaves digitately 3-foliolate. Flowers yellow, 2-8 in cluster.

Common.

Fls. & Frts.: Major part of the year.

O. dehradunensis Raiz. in Suppl. Fl. Upp. Gang. plains 37. 1976.

Bulbous, acaulescent herbs. Leaflets broadly obdeltoid, glabrous. Flowers 5-6 in umbel, white or pink.

Fls. & Frts.: March Aug.

BALSAMINACEAE

Impatiens balsamina L., Sp. Pl. 938. 1753.

Flaccid, glabrous, or sparsely hairy herbs. Leaves alternate, lanceolate-oblong. Flowers pink. Fruits ellipsoid.

Naturalized.

Fls. & Frts.: Aug. Oct.

I. scabrida DC., Prodr. 1: 687. 1824.

Pubescent herbs. Flowers 3-3.5 cm long excluding the spur, spotted brown. Capsules linear.

Few.

Fls. & Frts.: July Sept.

RUTACEAE

Aegle marmelos (L.) Correa in Trans. Linn. Soc. London 5: 223. 1800. *Crateva marmelos* L. "BEL"

Medium sized, armed trees. Leaves 3-foliolate. Flowers greenish white. Fruits globose, hard.

Frequent.

Fls. & Frts.: May - July

Citrus medica L., Sp. Pl. 782. 1753.

"LIMBU"

Evergreen shrubs. Branches armed. Flowers white, tinged pink. Near the cultivated fields.

Fls. & Frts.: April Sept.

C. aurantifolia (Christm.) Swingle.

Cultivated.

C. maxima (Burm.f.) Merr.

Cultivated.

C. sinensis Osbeck

Cultivated.

Murraya koenigii (L.) Sprengel, Syst. Veg. 2: 315. 1828.

"GANDELLA"

Shrubs. Leaves imparipinnate. Flowers white. Fruits globose, black when mature.

Common throughout.

Fls. & Frts.: March Aug.

"KARIPATTA" of South Indian dishes.

M. paniculata (L.) Jackin Malay. Misc. 1: 31. 1820.

Evergreen shrubs or small trees. Leaflets 3-9. Flowers white. Fruits oblong or ovoid, deep orange on maturity.

Ornamental.

Fls. & Frts.: March - July

Toddalia asiatica (L.) Lam., Tab. Encycl. 2: 116. 1797. *Paullinia asiatica* L.

Armed, evergreen climbing shrubs. Leaves trifoliolate. Flowers greenish yellow. Young fruits green.

Occasional.

Fls. & Frts.: March - June

Zanthoxylum armatum DC., Prodr. 1: 727. 1824. *Z. alatum* Roxb.

"TIMROO"

Prickly shrubs or small trees. Leaves imparipinnate. Flowers yellow. Fruits red.

Common.

Fls. & Frts.: March June

MELIACEAE

Melia azedarach L., Sp. Pl. 384. 1753.

"BAKAIN"

Medium sized trees. Leaves 2-3 pinnate. Flowers lilac blue, in panicles, fragrant. Mature fruits yellow.

Common near inhabitation.

Fls. & Frts.: April May

Toona ciliata M. Roemer Syn. Hesp. 1: 139. 1846.

"TOON"

Tall deciduous trees. Leaves paripinnate. Flowers fragrant. Fruits oblong-oblongeolate, 5-valved.

Scarce.

Fls. & Frts.: March - July

CELASTRACEAE

Celastrus paniculatus Willd., Sp. Pl. 1: 1125. 1797.

Scandent shrubs, shoots lenticellate. Flowers yellowish green, in terminal drooping panicles. Mature fruits orange yellow.

Frequent, on rocky slopes.

Fls. & Frts.: April Nov.

Maytenus royleanus (Wall. ex Lawson) Cuf. in Senck Biol. 43. 313. 1962.
Gymnosporia royleana Wallich ex Lawson.

Evergreen, armed shrubs. Flowers greenish yellow.

Scarce.

Fls. & Frts.: Feb. Dec.

RHAMNACEAE

Helinus lanceolatus Brandis, For. Fl. 574. 1874.

Evergreen, tendril climbers. Flowers yellow. Fruits globose or ovoid.

Frequent on slopes.

Fls. & Frts.: Jan. Aug.

Rhamnus triqueter (Wallich) Lawson in Hook.f., Fl. Brit. India 1: 639. 1875.

Evergreen shrubs or small trees. Flowers yellowish green. Fruits 3 cornered.

Frequent, on slopes.

Fls. & Frts.: July Dec.

R. virgatus Roxb., Fl. Ind. 2: 351. 1824.

Deciduous shrubs, branches ending in a sharp thorn. Flowers pale green, clustered.

Common on shady slopes.

Fls. & Frts.: March Oct.

Ziziphus mauritiana Lam. *Encycl. Meth.* 3: 319. 1789.

"BER"

Armed shrubs or small trees. Thorns paired, one recurved. Leaves whitish beneath. Flowers yellowish green. Fruits globose, red or yellow.

Common.

Fls. & Frts.: May Sept.

Z. oenoplia (L.) Mill., *Gard. Dict.* ed. 8. no. 3. 1768.

Armed, straggling or climbing shrubs. Leaf base oblique. Flowers in axillary fascicles, greenish yellow.

Occasional.

Fls. & Frts.: Aug. Dec.

VITACEAE

Ampelocissus latifolia (Roxb.) Planchon in *J. Vigne Am.* 374. 1884.

Large climbers. Leaves 3-5 angled or lobed, rusty tomentose beneath. Flowers in thyrsoid cymes. Fruits black when mature.

Fls. & Frts.: May Aug.

Vitis flexuosa Thunb. in *Trans. Linn. Soc.* 2: 332. 1794. *V. parvifolia* Roxb.

Perennial, deciduous climbers. Leaves glabrous on both surfaces. Flowers minute, in umbellate fascicles. Fruits globose, black.

Rare, on shady slopes.

Fls. & Frts.: April Aug.

LEEACEAE

Leea edgeworthii Santapau in *Rec. Bot. Surv. India* 16: 54. 1953. *L. aspera* Edgew.

Perennial herbs or undershrubs. Leaves imparipinnate. Flowers whitish green. Fruits black when mature.

Not common.

Fls. & Frts.: Aug. Nov.

SAPINDACEAE

Cardiospermum halicacabum L., Sp. Pl. 366. 1753.

Tendrillar herbs. Leaves biternate. Flowers white. Fruits trigonous, inflated, winged.

Frequent, on open slopes.

Fls. & Frts.: Aug. Sept.

Dodonaea viscosa (L.) Jacq., Enum. Fl. Carib. 19. 1760. *Ptelea viscosa* L.

Evergreen shrubs. Flowers dioecious, greenish-yellow. Fruits winged.

Very common on rocky slopes.

Fls. & Frts.: Jan. May

Sapindus mukorossi Gaertner, Fruct. 1: 342. t. 70. f. 3 g.h. 1788. "RITHA"

Deciduous trees. Leaves usually even pinnate. Flowers small, in terminal panicles. Fruits globose, wrinkled.

Planted.

ANACARDIACEAE

Cotinus coggygria Scop., Fl. Carn. ed. 2. 1: 220. 1772. *Rhus cotinus* L.

Deciduous shrubs or small trees. Pedicels of sterile flowers elongating after flowering and covered with long hairs.

Fairly common.

Fls. & Frts.: April July

Lannea coromandelica (Houtt.) Merr. in J. Arn. Arb. 19. 353. 1938. *Dialium coromandelicum* Houtt. "KAIMIND"

Deciduous trees. Leafless during flowering. Leaves odd pinnate. Flowers crowded in fascicles. Fruits ovoid, succulent.

Very common on slopes.

Fls. & Frts.: March - July

Mangifera indica L., Sp. Pl. 200. 1753. "AAM"

Medium to large, evergreen trees. Flowers yellowish, in terminal panicles. Fruits with succulent mesocarp.

Planted.

Fls. & Frts.: March - July

Pistacia khinjuk Stocks in Hook., Kew J. 4: 143. 1852. "KAKRA" "KAKRA SINGHII" "JHINGAN".

Medium sized, deciduous trees. Flowers dioecious, greenish yellow, petals absent.

Frequent, mostly on rocks.

Fls. & Frts.: March - July

Rhus parviflora Roxb., Fl. Ind. ed. 2. 2: 100. 1832. "TUNG", "TUNGLA"

Large shrubs. Leaves 3-foliolate; leaflets irregularly crenate in the upper part. Flowers small, yellowish green. Fruits subglobose or ovoid.

Very common on slopes.

Fls. & Frts.: May - Nov.

MORINGACEAE

Moringa oleifera Lam., Encycl. 1: 398. 1785. *M. pterygosperma* Gaertn.

Medium sized trees. Leaves pinnate. Flowers pink. Fruits elongate.

Frequent, seen along the road sides and near the cultivated fields.

Fls. & Frts.: March - June

PAPILIONACEAE

***Abrus precatorius* L., Syst. Nat. ed. 12. 472. 1767.**

"RATTI"

Deciduous twiners. Leaves even pinnate. Flowers pale-violet turning reddish. Fruits oblong.

Common.

Fls. & Frts.: May - June

***Aeschynomene indica* L., Sp. Pl. 713. 1753.**

Fistular stemmed, annual herbs. Flowers 1-4 in short axillary racemes, yellowish. Pods muriculate on both faces.

Few, in moist open situation.

Fls. & Frts.: Aug. Nov.

***Alysicarpus bupleurifolius* (L.) DC., Prodr. 2: 352. 1825.**

Erect or ascending, annual herbs. Leaves linear-lanceolate to oblong. Flowers bluish pink.

Scarce.

Fls. & Frts.: Aug. Nov.

***A. vaginalis* (L.) DC., Prodr. 2: 353. 1825.**

Distinguished from *A. bupleurifolius* by corolla exceeding the calyx and shallowly or hardly indented pods.

Common.

Fls. & Frts.: Aug. Dec.

***Atylosia mollis* Benth. in Miq. Pl. Jungh. 243. 1852.**

Stout twiners. Leaves stipellate. Flowers yellow. Fruits 8-10 seeded.

Fls. & Frts.: June Sept.

A. scarabaeoides (L.) Benth. in Miq. Pl. Jungh. 243. 1852. *Dolichos scarabaeoides* L.

Slender twiners. Leaves exstipellate. Flowers yellow. Fruits 2-6 seeded.

Fairly common.

Fls. & Frts.: Aug. - Dec.

Butea monosperma (Lam.) Taub. in Nat. Pflanz. 3(3): 365. 1894. *Erythrina monosperma* Lam. "DHAK" or "TISSOO"

Medium sized trees. Leaves pinnately 3-foliolate. Flowers in racemes, bright orange. Fruits silky tomentose.

Scattered.

Fls. & Frts.: April - July

Cajanus cajan (L.) Mill. in Publ. Field Mus. Nat. Hist. Bot. Ser. 2: 53. 1900. *Cytisus cajan* L.

Cultivated.

Campylotropis stenocarpa (Klotzsch) Schindler in Fedde Repert. Sp. Nov. 11: 345. 1912. *Oxyramphis stenocarpa* Klotzsch

Undershrubs. Leaflets obovate-cuneate, white silky beneath. Flowers in short, dense, silky racemes. Fruits narrow oblong, densely grey silky.

Frequent.

Fls. & Frts.: March Nov.

Cicer arietinum L., Sp. Pl. 738. 1753. "CHANA"

Annual, glandular hairy herbs. Stems quadrangular. Flowers pink.

Cultivated.

Fls. & Frts.: Feb. April

Crotalaria albida Heyne ex Roth, Nov. Pl. Sp. 333. 1821.

Much branched, erect herbs. Flowers yellow. Corolla usually as long as the calyx. Fruits sessile.

Frequent, on open shady slopes.

Fls. & Frts.: Major part of the year.

C. calycina Schrank, Pl. Rar. Hort. Monac. t. 12. 1819.

Erect herbs, with appressed brownish hairs. Flowers in short racemes.

Calyx densely brown hairy. Pods enclosed within calyx.

Frequent.

Fls. & Frts.: Aug. Oct.

C. medicaginea Lam., Encycl. Meth. Bot. 2: 201. 1786.

Distinguished from other species of *Crotalaria* by 3-foliolate leaves and somewhat rounded fruits.

Frequent.

Fls. & Frts.: Aug. Dec.

C. mysorensis Roth, Nov. Pl. Sp. 338. 1821.

Erect, annual herbs. Stems with ferruginous hairs. Bracts foliaceous. Fruits subsessile.

Occasional.

Fls. & Frts.: Oct. Nov.

C. spectabilis Roth, Nov. Pl. Sp. 341. 1821. *C. sericea* Retz.

Distinguished from other species of *Crotalaria* by the foliaceous stipules and the bracts and corolla exceeding the calyx.

Growing as weed near the cultivated fields.

Fls. & Frts.: Sept. Dec.

C. tetragona Andrews B. Reposit. 10: t. 593. 1810.

Erect, perennial herbs. Stems tetragonous. Leaves oblong-lanceolate. Flowers in racemes, yellow. Fruits densely hairy.

Rare, on shady slopes.

Fls. & Frts.: Nov. April

Dalbergia sericea G. Don, Gen. Syst. 1: 375. 1832.

Small trees. Leaflets obtuse. Flowers in short, corymbose panicles, stamens in 2-bundles.

Few, on north facing shady slopes along the road side.

Fls. & Frts.: April Oct.

D. Sissoo Roxb. ex DC., Prodr. 2: 416. 1825.

"SHISHAM"

The seeds of this species are said to have been air-sown around the Bhagirathi and Bhilangana valley.

Common.

Fls. & Frts.: March - June

Desmodium gangeticum (L.) DC., Prodr. 2: 327. 1825. *Hedysarum gangeticum* L.

Erect or prostrate, perennial herbs. Leaves 1-foliolate. Flowers in racemes, purplish. Fruits curved, hooked hairy.

Common.

Fls. & Frts.: April Dec.

D. laxiflorum DC. in Ann. Sci. Nat. Paris Ser. 1. 4: 100. 1825.

Deciduous undershrubs or perennial herbs. Leaves 3-foliolate; leaflets ovate-elliptic to oblong. Flowers in racemes, lilac or purplish white. Fruits 10-jointed.

Not common.

Fls. & Frts.: Aug. Dec.

D. microphyllum (Thunb.) DC., Prodr. 2: 337. 1825. *D. parvifolium* DC.

Perennial herbs. Stems 3-angled. Leaves appearing 1-foliolate, the laterals mostly being absent. Flowers in terminal racemes, purple. Fruits 3-6 jointed.

Fls. & Frts.: July Oct.

D. motorium (Houtt.) Merr. in J. Arn. Arb. 19: 345. 1938. *Hedysarum motorium* Houtt.

Perennial herbs or undershrubs. Leaves 1-3 foliolate; laterals much shorter. Flowers in lax racemes. Fruits slightly curved, 8-10 jointed.

Not common.

Fls. & Frts.: Aug. Dec.

D. oojeinense (Roxb.) Ohashi in Ginkgoana 1: 117. t. 144. 1973. *Ougeinia dalbergioides* Benth. "SANDAN"

Medium sized trees. Leaves 3-foliolate. Flowers in fascicled racemes, white or light pink. Fruits flat, jointed.

Scattered.

Fls. & Frts.: March - June

D. triflorum (L.) DC., Prodr. 2: 334. 1825.

Prostrate herbs. Leaves 3-foliolate; leaflets obovate-obcordate. Flowers in leaf opposed fascicles, 3-4, pink. Fruits reticulate veined, 2-5 jointed.

Common.

Fls. & Frts.: April Sept.

D. velutinum (Willd.) DC., Prodr. 2: 228. 1825.

Suffruticose herbs or undershrubs. Leaves 1-foliolate. Flowers in long racemes, purplish. Fruits 3-6 jointed.

Occasional.

Fls. & Frts.: Aug. Dec.

Erythrina suberosa Roxb., Fl. Ind. ed. 2. 3: 253. 1832.

Armed, medium sized trees. Leaves 3-foliolate. Flowers crowded at the end of branches, scarlet. Fruits stipitate.

Scattered.

Fls. & Frts.: March - June

Galactia tenuiflora (klein ex Willd.) Wight. & Arn., Prodr. Fl. Ind. Or. 206. 1834.

Twining herbs. Leaves 3-foliolate. Flowers in pairs on distant nodes of elongated racemes. Fruits 6-8 seeded.

Scattered, on open grassy slopes.

Fls. & Frts.: July Nov.

Glycine max (L.) Merr., Interpr. Herb. Amboin. 274. 1917. *Phaseolus* "BHALLI"

Cultivated.

Indigofera astragalina DC., Prodr. 2: 228. 1825.

Much branched annual herbs. Stems densely brown hairy. Leaves pinnate. Flowers in dense racemes. Fruits pointed downwards.

Common in cultivated fields.

Fls. & Frts.: Aug. Oct.

I. cassioides Rottl. ex DC., Prodr. 2: 225. 1825.

Undershrubs. Stems zig-zag, appressed hairy. Leaves compound. Flowers in subsessile, axillary racemes, lax, purple. Fruits 8-10 seeded.

Fls. & Frts.: March - June

I. heterantha Wallich ex Brandis, For. Fl. 135. 1874.

Branched, deciduous shrubs. Branchlets white canescent. Leaves compound. Flowers in racemes, reddish.

Common on open hill slopes.

Fls. & Frts.: May - June

L. linnaei Ali in Bot. Notiser 111. 549. 1958.

Multicaulous herbs. Stems appressed hairy. Leaves compound. Flowers in dense, globose racemes, reddish. Fruits 2-seeded.

Fairly common.

Fls. & Frts.: Major part of the year.

Lablab purpureus (L.) Sweet, Hort. Birt. ed. 1: 481. 1827. ~~Desf., in GHANI~~

Cultivated.

Lathyrus aphaca L., Sp. Pl. 729. 1753.

Distinguished by foliaceous stipules. Flowers yellow.

Common, near the cultivated fields.

Fls. & Frts.: Jan. May

L. sativus L., Sp. Pl. 730. 1735.

Annual herbs. Stems winged. Tendrils generally branched. Flowers solitary.

Common, weed nearby cultivated fields.

Fls. & Frts.: Feb. May

L. sphaericus Retz., Obs. Bot. 3: 39. 1783.

Annual herbs. Leaflets linear-narrowly oblong. Flowers axillary, solitary, red.

Frequent.

Fls. & Frts.: Feb. April

Lens culinaris Medikus, Vorles Churpf. Phys. Ges. 2: 361. 1787. "MASUR"

Cultivated.

Macrotyloma uniflorum (Lam.) Verdcourt in Kew Bull. 24: 322. 1970. *Dolichos uniflorus* Lamk.

Cultivated.

Medicago lupulina L., Sp. Pl. 779. 1753.

Annual herbs. Leaves pinnately 3-foliolate. Flowers in capitate racemes, yellow. Fruits 1-seeded.

Common.

Fls. & Frts.: Dec. May

M. polymorpha L., sp. Pl. 779. 1753.

Distinguished from *M. lupulina* by 2-3 times coiled, armed, fruits which are more than 1-seeded.

Common.

Fls. & Frts.: Oct. May

Melilotus alba Medikus ex Desr. in Lam., Encycl. Meth. 4: 63. 1796.

Erect herbs. Leaves pinnately 3-foliolate. Flowers in long racemes, white. Fruits 1-seeded.

Fls. & Frts.: Feb. Sept.

Millettia extensa Benth. in Pl. Jungh. 249. 1852.

Woody climbers. Branches brown or velvety pubescent. Leaves odd pinnate. Flowers in racemes. Fruits covered with adpressed brown silky hairs.

Frequent, on hill slopes.

Fls. & Frts.: June Dec.

Mucuna nigricans (Lour.) Steudel, Nom. Bot. ed. 2. 163. 1841. *Citta nigricans* Lour.

Woody climbers. Leaves 3-foliolate. Flowers in racemes, lax, dull purple. Fruits plaited, clothed with irritating bristles.

Rare.

Fls. & Frts.: May Oct.

Phaseolus vulgaris L., Sp. Pl. 723. 1753.

Cultivated.

Pisum sativum L., Sp. Pl. 727. 1753.

Cultivated.

Pueraria tuberosa (Roxb. ex Willd.) DC. in Ann. Sci. Nat. 4: 97. 1825.

Tuberous, twining shrubs, leafless during flowering. Leaves 3-foliolate. Flowers bluish. Fruits contracted between the joints.

Common, on dry hill slopes.

Fls. & Frts.: March Dec.

Rhynchosia himalensis Benth. ex Baker in Hook.f., Fl. Brit. India 2: 225. 1876.

Viscidly glandular hairy climbers. Leaflets ovate, base rounded. Flowers less than 2 cm. Pods 3 cm long, pubescent.

Common around Ghonti.

Fls. & Frts.: July Nov.

R. minima (L) DC., Prodr. 2: 385. 1825.

Perennials, climbing. Leaves trifoliolate; leaflets glandular punctate beneath. Flowers yellow. Fruits 2-seeded.

Common.

Fls. & Frts.: April Oct.

Trifolium tomentosum L., Sp. Pl. 771. 1753.

Annual herbs. Flowers in axillary, globose peduncled heads. Fruiting calyx inflated, globose, densely hairy on the upper side.

Fls. & Frts.: Nov. April

Trigonella corniculata (L.) L., Syst. Nat. ed. 10: 1180. 1759.

Robust, glabrous, branched herbs. Flowers racemed. Pods glabrous, falcate-curved, transversely veined.

Fls. & Frts.: April Sept.

T. foenum-graecum L., Sp. Pl. 777. 1753.

"METHI"

Cultivated.

Uraria lagopus DC. var. neglecta (Prain) Ohashi in Fl. E. Himal. 3: 70. 1975.
Uraria neglecta Prain

Perennial herbs or small shrubs. Leaves 1-3 foliolate. Flowers in racemes.

Fruits 5-8 jointed.

Fls. & Frts.: Sept. Nov.

U. picta (Jacq.) Desv. ex DC., Prodr. 2: 324. 1825.

Distinguished from *U. neglecta* by 5-9 foliolate leaves.

Not common.

Fls. & Frts.: Aug. Sept.

Vicia faba L., Sp. Pl. 737. 1753.

"SHIV CHANA"

Cultivated.

Vicia hirsuta (L.) Gray Nat. Arr. Brit. Pl. 2: 614. 1821. *Ervum hirsutum* L.

Trailing herbs. Leaves paripinnately compound, ending in a tendril. Inflorescence axillary, 2-7 flowered raceme. Flowers pale blue or rose coloured.

Common, in cultivated fields.

Fls. & Frts.: Jan. May

V. sativa L., Sp. Pl. 736. 1753.

Differentiated from *V. hirsuta* by the sessile or subsessile inflorescence and lesser number of leaflet pairs.

Common.

Fls. & Frts.: Dec. May

Vigna calcarata (Roxb.) Kunze.

Cultivated.

V. mungo (L.) Hepper in Kew Bull. 11: 128. 1956. *Phaseolus mungo* L.

Cultivated.

V. sinensis (L.) Savi ex Hask. Cat. Hort. Bogor. 279. 1844. *Dolichos sinensis* L.

Cultivated.

V. vexillata (L.) A. Rich., Hist. Fis. Polit. mat. 1. Cuba 11: 191. 1845. var. **angustifolia** (Suhumach ex Thonn.) Bak.

Twining herbs. Leaves pinnately 3-foliolate. Flowers on long peduncled axillary racemes, pink.

Fls. & Frts.: Aug. Nov.

Zornia gibbosa Spanoghe in Linnaea 15: 192. 1841.

Annual herbs. Leaflets 2. Flowers in bracteate spikes, yellow. Fruits 1-6 jointed, muriculate.

Common.

Fls. & Frts.: May Sept.

CAESALPINIACEAE

Bauhinia semla Wunderlin in Taxon 25: 362. 1976. *B. retusa* Buch.-Hem. ex Roxb.

Medium sized trees. Leaves entire or slightly retuse at the tip. Flowers in terminal panicles, yellow, red spotted and purple veined. Perfect stamens 3. Fruits flat, oblanceolate.

Scattered.

Fls. & Frts.: Sept. Nov.

B. vahlii Wight. & Arn., Prodr. 279. 1834.

"MALU"

Large, woody climbers. Leaves cleft at the tip. Flowers white. Fruits flat, rusty-velvety.

Common.

Fls. & Frts.: April Dec.

B. variegata L., Sp. Pl. 375. 1753.

"KWIRAL"

Deciduous trees. Leaves cordate, orbicular. Flowers whitish-purple. Pods hard, dehiscent, flat, 10-25 seeded.

Fls. & Frts.: March May

Caesalpinia decapetala (Roth) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.): 89. 1931. *C. sepiaria* Roxb.

Scandent, prickly shrubs. Leaves bipinnate. Flowers yellow. Pods dark-brown, smooth, glabrous.

Common.

Fls. & Frts.: April - June

Cassia fistula L., Sp. Pl. 377. 1753.

"AMALTAS"

Easily distinguished by its yellow flowers in drooping racemes and long cylindrical fruits.

Fls. & Frts.: April Dec.

C. floribunda Cav. Descr. 132. 1802. *C. laevigata* Willd.

Shrubs. Leaflets 3-4 pairs. Rachis with a gland between each pair of leaflets except the terminal one. Flowers yellow.

Fls. & Frts.: Sept. Oct.

C. glauca Lam.

Planted as an ornamental.

Fls. & Frts.: Sept. Feb.

C. tora L., Sp. Pl. 1376. 1753.

Annual herbs. Leaflets about 3 pairs with a gland between the lowest pair of leaflet, ovate. Flowers orange yellow.

Common.

Fls. & Frts.: May Nov.

Tamarindus indica L., Sp. Pl. 34. 1753.

Unarmed trees. Leaves pinnate; leaflets linear-oblong, obtuse. Flowers in subterminal racemes, few. Fruits indehiscent.

Single tree seen at Ghonti in Bhilangana valley.

Fls. & Frts.: Oct. March

MIMOSACEAE

Acacia catechu (L.f.) Willd., Sp. Pl. 4: 1079. 1806. "KHAIR"

Armed, medium sized trees. Flowers creamy, in cylindrical spikes. Fruits flat, thin.

Common, on dry hill slopes.

Fls. & Frts.: May Sept.

A. farnesiana (L.) willd., Sp. Pl. 4: 1083. 1806. *Mimosa farnesiana* L.

Thorny shrubs. Leaves pinnate. Flowers yellow, in globose heads. Fruits cylindrical, turgid, dark brown.

Scattered.

Fls. & Frts.: Aug. March

A. gageana Craib in Kew Bull. 1915; 409. 1915.

Prickly, scrambling shrubs. Leaf rachis with a sessile gland near the base. Flowers creamy white, in globose heads. Fruits strap shaped.

Frequent, on slopes.

Fls. & Frts.: Aug. April

A. torta (Roxb.) Craib in Kew Bull. 1915; 410. 1915. *Mimosa torta* Roxb.

Differentiated from *A. gageana* by pubescent heads in flower buds and rusty velvety young pods.

Frequent.

Albizia lebbeck (L.) Willd., Sp. Pl. 4: 1066. 1806. *Mimosa lebbeck* L. "SIRIS"

Large, deciduous, unarmed trees. Leaves pinnate; leaflets oblong, oblique, rounded at tip. Flowers greenish white, in globose heads. Pods thin, flat.

Frequent, on hill slopes.

Fls. & Frts.: April Nov.

Leucaena leucocephala (Lam.) de Wit in *Taxon* 10(2): 54. 1961. *Mimosa leucocephala* Lam.

Shrubs or small trees. Leaves pinnate. Flowers in globose heads, whitish. Fruits clustered, flat.

Planted.

Mimosa himalayana Gamble in *Kew Bull.* 1920: 4. 1920.

Prickly shrubs. Leaf rachis prickly. Flowers in globose heads, pinkish. Fruits slightly curved, thin.

Common, on slopes.

Fls. & Frts.: July - Jan.

ROSACEAE

Agrimonia aitchisonii Schonbeck-Temesy in *Fl. Iranica* 66: 151. 1969. *A. pilosa* Ledeb. var. *aitchisonii*

Hairy, perennial herbs. Flowers yellow.

Scarce.

Fls. & Frts.: June Aug.

Duchesnea indica (Ander.) Focke, *Pflanzen.* 11. 3: 33. 1888. *Fragaria indica* Ander.

Trailing herbs. Flowers yellow. Fruits red.

Frequent.

Fls. & Frts.: April - June

Eriobotrya japonica (Thunb.) Lindl. in *Trans. Linn. Soc.* 13: 102. 1822. *Mespilus japonicus* Thunb.

Cultivated.

Potentilla fragarioides L., Sp. Pl. 496. 1753.

Perennial herbs. Leaves pinnately compound. Flowers yellow. Petals twice as long as the calyx.

Occasional

Fls. & Frts.: April May

P. sundaica (Blume) O. Kuntze., Rev. Gen. Pl. 1: 219. 1890. *Fragaria sundaica* Blume.

Annual herbs. Leaves digitately compound; leaflets 3-5. Flowers yellow.

Occasional.

Fls. & Frts.: April June

P. supina L., Sp. Pl. 497. 1753.

Herbs. Leaves pinnately compound. Flowers yellow. Petals shorter than the calyx.

Scarce.

Fls. & Frts.: July Sept.

Prunus armeniaca L., Sp. Pl. 474. 1753.

"CHULI"

Planted.

Pyracantha crenulata (D. Don) Roemer Syno., 3: 220. 1847. *Crataegus crenulata* Roxb. "CHINGARU"

Armed shrubs. Flowers white. Fruits orange red.

Scattered.

Fls. & Frts.: April Nov.

Pyrus pashia Buch.-Ham. ex D. Don., Prodr. Fl. Nepal. 236. 1825. "MEWAL"

Medium sized, deciduous trees. Leaves simple. Flowers white, appearing before the leaves. Fruits globose, white dotted.

Frequent.

Fls. & Frts.: March Dec.

Rosa brunonii Lindley, Monogr. Ros. 120. t. 14. 1820.

Large, prickly climbers. Flowers white. Fruits obovoid, dark brown.

Common on slopes.

Fls. & Frts.: April - July

Rosa cathayensis Bailey, Gentex Herbarum 29. 1920.

Naturalised.

Fls. & Frts.: April May

Rubus ellipticus Benth. in Rees, Cyclop. 30: Rubus no. 16 "HISOL", "HISAR"

Large, prickly shrubs covered with reddish hairs. Leaves 3-foliolate. Flowers white. Fruits yellow.

Frequent, in shady places.

Fls. & Frts.: March - June

R. niveus Thunb. Dessert. de. Rubo 749. f. 3. 1813. "KALI HISOL"

Prickly shrubs, stems white powdery. Leaves 4-5-foliolate. Flowers pink. Fruits black when ripe.

ITEACEAE

Itea nutans Royle, Ill. Bot. Himal. 226. 1835.

Shrubs or small trees. Leaves ovate or elliptic-oblong, denticulate or glandular serrate. Flowers in racemes much longer than the leaves, white.

Not common.

Fls. & Frts.: April Nov.

CRASSULACEAE

Kalanchoe integra (Medikus) O. Kuntze, Rev. Gen. Pl. 1: 221. 1891. *Cotyledon integra* Medik.

Glabrous, succulent herbs. Flowers in corymbose panicles, yellow.

Frequent, on open slopes.

Fls. & Frts.: Sept. Feb.

Crassula alata (Viv) Berger in Pamilien ed. 2. 18a. 389. 1930.

Small reddish herbs. Flowers axillary.

Fls. & Frts.: April Aug.

Rosularia rosulata (Edgew.) Ohba in J. Jap. Bot. 52: 9. 1977. *Sedum rosulatum* Edg.

Herbs. Leaves spatulate. Flowers white.

Frequent.

Fls. & Frts.: April

COMBRETACEAE

Terminalia alata Heyne ex Roth, Nov. Pl. Sp. 379. 1825. *T. tomentosa* Wt. & Arn.

Deciduous trees. Leaves subopposite, oblong-elliptic. Flowers in paniced spikes, dull yellow. Fruits 5-winged.

Frequent on slopes.

Fls. & Frts.: June April

T. bellirica Roxb., Pl. Corom. 2: 54. t. 198. 1805.

"BAHERA"

Large, deciduous trees. Leaves crowded towards the end of branches, obovate-elliptic. Flowers in spikes. Fruits ovoid-ellipsoid, not winged.

Scarce.

Fls. & Frts.: April Feb.

MYRTACEAE

Callistemon Sp.

Planted as ornamental.

Eucalyptus obliqua L'Her. *Serg.-Angl.* 18. t. 20. 1788.

Planted.

Psidium guajava L. *Sp. Pl.* 470. 1753.

"AMRUD"

Planted.

Syzygium cumini (L.) Skeels in *Dept. Agri. Bur. Pl. Indus. Bull.* 248. 25. 1912.

Myrtus cumini L.

"JAMAN"

Tall, evergreen trees. Leaves of various shape. Flowers in trichotomous panicles, creamy white. Fruits violet-red on maturity.

Occasional.

Fls. & Frts.: March - June

LYTHRACEAE

Ammannia baccifera L., *Sp. Pl.* 120. 1753.

Herbs. Leaves oblong or narrow-elliptic. Petals absent.

Frequent, in water logged (paddy) fields.

Fls. & Frts.: Major part of the year.

A. multiflora Roxb., *Fl. Ind.* 1: 447. 1820.

Erect, annual herbs. Stems quadrangular. Leaves sessile, lanceolate-oblong. Flowers minute, red. Fruits subglobose.

Frequent in marshy places.

Fls. & Frts.: Major part of the year.

Lagerstroemia parviflora Roxb., Pl. Corom. 48. t. 66. 1795.

Deciduous trees. Leaves oblong, coriaceous. Flowers in panicles, white. Fruits ovoid.

Occasional

Fls. & Frts.: April July

Rotala densiflora (Roth ex Roemer & Schultes) Koehne, Bot. Jahrb. 1: 164. 1880.
Ammannia densiflora Roth ex Roem. & Sch.

Annuals. Stem winged. Flowers axillary, solitary.

Fls. & Frts.: Sept. Oct.

R. mexicana Cham. & Schltr. in Linnaea 5: 567. 1830. *Ammannia pygmaea* Kurz.

Herbs. Leaves in whorls of 3 or more. Flowers axillary, solitary. Sepals red. Petals absent.

Fls. & Frts.: Aug. Nov.

R. rotundifolia (Roxb.) Koehne in Bot. Jahrb. 1: 175. 1880. *Ammannia rotundifolia* Roxb.

Erect herbs. Leaves sessile, orbicular. Flowers in spikes, pink.

Common in marshy places.

Fls.: March April

Woodfordia fruticosa (L.) Kurz in J. Asiat. Soc. Bengal 40(2): 56. 1871. *W. floribunda* Salisb. "DHAULU"

Spreading shrubs. Leaves subsessile. Flowers bright red. Fruits included in the calyx tube.

Common, on rocky slopes.

Fls. & Frts.: Feb. - June

PUNICACEAE**Punica granatum L., Sp. Pl. 472. 1753.****"DARIM"**

Thorny shrubs or small trees. Flowers scarlet. Fruits globose, with coriaceous rind.

Planted.

Fls. & Frts.: April Sept.

ONAGRACEAE**Epilobium Sp.**

Small, erect herbs, Flowers white and pink on the same plant.

Common, near bridge over Bhilangana near Tehri.

Fls.: Oct.

Oenothera rosea L'.Her. ex Aiton, Hort. Kew (ed. 1) 2: 3. 1789.

Perennial herbs. Flowers axillary, solitary, pink or red.

Common along the roadsides and waste places.

Fls. & Frts.: March Nov.

PASSIFLORACEAE**Passiflora suberosa L., Sp. Pl. 958. 1753.**

Perennial climbers. Leaves ovate-sub orbicular, entire or 3-fid. Flowers 1-2, corolla absent.

Occasional.

Fls. & Frts.: March Nov.

CARICACEAE**Carica papaya L., Sp. Pl. 1036. 1753.****"PAPITA"**

Cultivated.

CUCURBITACEAE

Citrullus lanatus (Thunb.) Matsumura & Nakai in Cat. Sem. Hort. Bot. Univ. 1920: 38. 1920.

Perennial climbers. Tendrils bifid. Leaves ovate, trifid. Flowers creamy. Fruits subglobose ovoid.

Cultivated.

Fls. & Frts.: Sept. Nov.

Coccinea grandis (L.) Voigt, Hort. Suburb. Calc. 59. 1845. *Bryonia grandis* L.

Twiners. Tendrils simple. Leaves 5-angular or partite. Flowers white.

Frequent.

Fls. & Frts.: July Oct.

Cucumis callosus (Rottb.) Cogn. in Engl. Das Pflanzenr. 88: 129. 1924.

Prostrate or trailing herbs. Tendrils simple. Flowers yellow. Fruits obovoid-rounded.

Fls. & Frts.: Aug. Nov.

Cucurbita maxima Duchesne in Lam., Encycl. 1, 2: 151. 1786.

Cultivated.

C. pepo L., Sp. Pl. ed. 1: 1010. 1753.

Cultivated.

Cyclanthera pedata Schrader, Ind. Sem. H. gotting 1831.

Extensive climbers. Flowers greenish yellow. Fruits echinate.

Cultivated.

Diplocyclos palmatus (L.) Jeffrey in Kew Bull. 15. 352. 1962. *Bryonia palmata* L.

Annual, climbing herbs. Tendrils 2-fid. Leaves broadly ovate-suborbicular, 5-7 palmatipartite. Flowers greenish yellow. Fruits globose, white striped.

Common, in waste places.

Fls. & Frts.: July Oct.

Luffa acutangula (L.) Roxb., Fl. Ind. 3: 712. 1832. "GUDARI"

Cultivated.

L. cylindrica (L.) Roemer Fam. Syn. 2: 63. 1846. *L. aegyptiaca* MGHIIATORI"

Cultivated.

Lagenaria siceraria (Molina) Standley in Publ. Field. Mus. Nat. Hist. Bot. 3: 435. 1930. "LAUKI"

Cultivated.

Momordica charantia L., Sp. Pl. ed. 1: 1009. 1753. "KARELA"

Cultivated.

Sechium edule (Jacq.) Sw. "ISKOSH"

Cultivated.

Trochosanthes anguina L., Sp. Pl. 1008. 1753. "CHACHINDA"

Cultivated.

T. cucumerina L., Sp. Pl. 1008. 1753.

Extensive hairy annuals, scandent. Tendrils 3-fid. Leaves 3-7 angular or lobed. Flowers yellow. Fruits with long beak.

Occasional, along road side.

Fls. & Frts.: July Oct.

BEGONIACEAE

Begonia picta Smith, Exot. Bot. 2: 81. t. 101. 1805.

Perennials. Rootstock tuberous. Leaves broadly ovate-cordate. Flowers in peduncled cymes, few. Fruits trigonous, winged.

Frequent, in rock crevices.

Fls. & Frts.: July Oct.

DATISACEAE

Datisca cannabina L., Sp. Pl. 1037. 1753.

Branching herbs or undershrubs. Leaves pinnate. Flowers dioecious.

Seen at Chham & near Gadolia, on moist rocky slopes.

Fls. & Frts.: Aug. Oct.

CACTACEAE

Opuntia elatior Mill., Gard. Dict. ed. 8. n. 4. 1768. "NAG-FANI"

Areoles with 1-3 prickles. Flowers yellow.

Frequent.

Fls. & Frts.: April Oct.

MOLLUGINACEAE

Mollugo nudicaulis Lam., Encycl. 4: 234. 1797.

Slender herbs. Leaves radical. Flowers on scapes trichotomously branched above.

Common.

Fls. & Frts.: July Nov.

M. Pentaphylla L., Sp. Pl. 89. 1753.

Herbs. Leaves opposite or whorled at nodes. Flowers greenish white.

Common.

Fls. & Frts.: July Nov.

AIZOACEAE

Trianthema portulacastrum L., Sp. Pl. 223. 1753.

Prostrate, somewhat succulent herbs. Leaves opposite. Flowers axillary, solitary, pink.

Common in fields.

Fls. & Frts.: Aug. Dec.

APIACEAE

Apium leptophyllum (Pers.) F. Muell. ex Benth. Fl. Austr. 3: 372. 1866.

Herbs. Leaves dissected; segments linear. Flowers yellow.

Not common, growing near the cultivated fields.

Fls. & Frts.: March - June

Bupleurum hamiltonii Balakr in J. Bombay Nat. Hist. Soc. 63: 328. 1966.

Erect, glaucescent, perennial herbs. Leaves lanceolate-oblong. Umbels with 3-6 rays. Flowers yellow.

Common, on grassy hill slopes.

Fls. & Frts.: July Feb.

Centella asiatica (L.) Urban in Mart. Fl. Bras. 11: 287.t. 78.f.11. 1879.
Hydrocotyle asiatica L. "BRAHMI"

Creeping herbs. Leaves reniform.

Frequent.

Fls. & Frts.: March Nov.

Coriandrum sativum L., Sp. Pl. 256. 1753.

"DHANIYA"

Cultivated.

Foeniculum vulgare Mill., Gard. Dict. ed. 8. no. 1. 1768.

"SAUNF"

Cultivated.

Hydrocotyle sibthorpioides Lam., Encycl. 3: 153. 1789. *Hydrocotyle rotundifolia* Roxb.

Creeping herbs. Leaves rounded, 3-5 lobed. Inflorescence leaf opposed, solitary, petals red.

Scarce.

Fls. & Frts.: May Aug.

Oenanthe javanica (Blume) DC., Prodr. 4: 138. 1830.

Perennial, ascending herbs. Leaves 1-2 pinnate. Umbels terminal or leaf opposed.

Few, in marshy places.

Fls. & Frts.: June Sept.

Torilis japonica (Houtt.) DC., Prodr. 4: 219. 1830. *Caucalis japonica* Houtt.

Distinguished by densely bristly fruits.

Occasional.

Fls. & Frts.: June Oct.

ARALIACEAE

Schefflera venulosa (Wight. & Arn.) Harms in Engl. Pflanzenfam. 3(8): 39. 1894. *Paratropia venulosa* Wight & Arn.

Evergreen, scandent shrubs climbing by adventitious roots. Leaves digitate. Flowers creamy. Fruits yellow or orange, globose, 5-ridged.

Occasional, on steep rocks.

Fls. & Frts.: March - June.

RUBIACEAE

Borreria brachystema (R. Br. ex Benth.) Valet in Lorantz. Nova. Guinea 8: 516. 1911. *B. stricta* (L.) K. Schum.

Annual herbs. Leaves linear-lanceolate to oblong; stipules bristly. Flowers in clusters, white or pale purple.

Common.

Fls. & Frts.: Aug. Nov.

Galium aparine L., Sp. Pl. 108. 1753.

Annual, climbing herbs. Stems quadrangular, retrorsely bristly on angles. Leaves 6-8 in a whorl. Fruits with hooked bristles.

Frequent, in shady situations.

Fls. & Frts.: Feb. Oct.

G. asperifolium Wallich ex Roxb., Fl. Ind. 1: 381. 1820.

Perennial herbs. Leaves 4-6 in a whorl. Peduncles 3-flowered. Fruits glabrous.

Common, in shady places.

Fls. & Frts.: July Oct.

G. elegans Wallich ex Roxb., Fl. Ind. 1: 382. 1820.

Herbs. Leaves in a whorl, 3-nerved. Flowers in cymose panicles. Fruits with hooked bristles.

Not common.

Fls. & Frts.: Aug. Nov.

Oldenlandia corymbosa L., Sp. Pl. 119. 1753.

Herbs. Stems acutely angled. Leaves sessile, linear-lanceolate. Flowers in axillary cymes, white. Fruits didymous.

Few, along Jalkurgad.

Fls. & Frts.: March Nov.

Pavetta tomentosa Roxb. ex Smith in Rees, Cyclop. 26: 2. 1819.

Large shrubs or small trees. Leaves opposite, sub-coriaceous, pubescent or villous beneath. Flowers in corymbs, white.

Occasional, on slopes by the riverside.

Fls. & Frts.: April Nov.

Randia tetrasperma (Roxb.) Benth. & Hook.f. ex Brandis, For. Fl. 272. 1874.
Gardenia tetrasperma Roxb.

Shrubs. Leaves crowded towards the end of branches. Flowers sessile at the end of branchlets.

Occasional.

Fls. & Frts.: June Sept.

Rubia manjith Roxb. ex Flem. in As. Res. 11. 177. 1810. *Rubia cordifolia* non L.,
sensu Hook.f. p.p.

Climbers, stems quadrangular. Leaves 3-4 in a whorl. Flowers greenish yellow. Fruits bluish or black, 1-seeded.

Common, amidst bushes.

Fls. & Frts.: Aug. Nov.

Spermadietyon suaveolens Roxb., Pl. Corom. 3: 32. t. 236. 1815.

Shrubs. Leaves elliptic-oblong, coriaceous. Flowers in panicles, bluish.

Fls. & Frts.: Aug. Nov.

Leaves and stems foetid smelling when bruised.

Xeromphis spinosa (Thunb.) Keay in Bull. Jard. Bot. Brux. 28: 37. 1958.

Armed shrubs. Leaves mostly fascicled, obovate. Flowers 1-2 at the end of leafy branchlets, greenish yellow or white. Fruits globose or ovoid.

Occasional.

Fls. & Frts.: May Sept.

ASTERACEAE

Acanthospermum hispidum DC., Prodr. 5: 522. 1836.

Erect, hispid hairy herbs. Heads yellowish. Achenes with hooked spinules.

Naturalized.

Fls. & Frts.: Aug. Oct.

Adenostemma lavenia (L.) O. Ktze., Rev. Gen. Pl. 1: 104. 1891.

Annual herbs. Heads white. Pappus hairs 3.

Scarce, in marshy situations.

Fls. & Frts.: Aug. Nov.

Ageratum conyzoides L., Sp. Pl. 839. 1753.

Erect, annual herbs. Heads white or bluish. Achenes with 5-pappus scales.

Common.

Fls. & Frts.: May Sept.

A. houstonianum Mill., Gard. Dict. ed. 8. n. 2. 1768.

Distinguished from *A. conyzoides* by more number of flowers in the head and densely hairy involucre bracts.

Common.

Fls. & Frts.: Major part of the year.

Anaphalis adnata DC., Prodr. 6: 274. 1838.

Erect, woolly tomentose herbs. Leaves thick. Heads white.

Occasional, on moist slopes.

Fls. & Frts.: Sept. Nov.

A. busua (Buch.-Ham. ex G. Don) DC., Prodr. 6: 275. 1838.

Herbs. Stems winged. Leaves linear, 3-5 cm long. Heads creamy white.

Frequent, on shady slopes.

Fls. & Frts.: Aug. Oct.

Artemisia capillaris Thunb., Fl. Jap. 309. 1784.

Erect, perennial herbs. Lowerleaves 3-pinnatifid; segments of upper leaves linear-filiform. Heads in panicles.

Common, along the road sides.

Fls. & Frts.: Oct. - Jan.

A. indica Willd., Sp. Pl. ed. 4. 3: 1846. 1804. *A. nilagirica* (C.B. Clarke) Pamp.

Erect, subdeciduous shrubs. Upper leaves sessile, linear-lanceolate. Heads brownish yellow.

Common.

Fls. & Frts.: Aug. Oct.

A. japonica Thunb., Fl. Jap. 310. 1784.

Erect, perennial herbs. Leaves spatulate-cuneate, often tripinnatifid. Heads in panicles.

Common.

Fls. & Frts.: Sept. Dec.

Bidens biternata (Lour.) Merr. & Sherff. ex Sherff. in Bot. Gaz. 88: 293. 1928.

Erect herbs. Leaves variable. Ray florets white, disc florets yellow. Achenes with pappus of 3-4 unequal, barbed bristles.

Frequent, in waste places.

Fls. & Frts.: Aug. Dec.

Blainvillea acmella (L.) Philipson in Blumea 6: 150. 1950. *Verbesina acmella* L.

Erect, annual herbs. Leaves ovate-lanceolate or rhomboid-ovate. Heads white.

Few.

Fls. & Frts.: Aug. Sept.

Blumea aromatica DC., Prodr. 5: 446. 1836.

Herbs or undershrubs. Stems viscid. Leaves pilose beneath, villous above. Heads in panicles, yellow. pappus pale red.

Frequent, along the roadsides.

Fls. & Frts.: Oct. Feb.

B. mollis (D. Don) Merr. in Philip. J. Sci. Bot. 5: 395-1910. *Erigeron molle* D. Don

Erect, viscid herbs. Leaves ovate-obovate, rounded, densely villous. Flowers in panicles, pale yellow.

Not common.

Fls. & Frts.: March May

Carpesium nepalense Less. in Linnaea 234. 1831.

Tall, erect, pubescent herbs. Leaves lanceolate. Heads solitary yellow.

Not common.

Fls. & Frts.: Aug. Oct.

Carthamus tinctorius L., Sp. Pl. 830. 1753.

"KESAR"

Cultivated in Pendars village.

Cichorium intybus L., Sp. Pl. 813. 1753.

Herbs. Lower leaves lyrate-pinnatifid, upper sessile, sagittate. Heads blue.

Few, in fields.

Fls. & Frts.: Feb. May

Cirsium wallichii DC., Prodr. 6: 643. 1838.

Thistle like herbs. Leaves sinuate-pinnatifid, glabrous on both the surfaces or cottony beneath. Outer involucre bracts spine tipped.

Common.

Fls. & Frts.: May Oct.

Conyza japonica (Thunb.) Less. ex DC., Prodr. 5: 282. 1836. *Erigeron japonicum* Thunb., Fl. Jap. 312. 1784.

Erect herbs. Leaves oblong-spathulate, serrate-denticulate in the upper part. Involucre bracts white villous.

Common, on slopes.

Fls. & Frts.: March Oct.

Cyathocline purpurea (Buch. Ham. ex D. Don) O: Kuntze., *Rev. Gen. Pl.* 1: 338. 1891.

Erect, glandular hairy herbs. Leaves pinnatipartite. Heads pink. Pappus absent.

Common in moist shady places by the river side.

Fls. & Frts.: March May

Echinops cornigerus DC., *Prodr.* 6: 525. 1838.

Tall erect, branched herbs. Leaves pinnatifid; segments spiny. Heads large, globose. Involucral bracts many, hairy.

Occasional on grassy slopes.

Fls. & Frts.: Aug. Oct.

Eclipta prostrata (L.) L., *Mant. Pl.* 2: 286. 1771. *Verbesina prostrata* L.

Prostrate or ascending herbs. Heads axillary and terminal, white. Achenes tuberculate, with a thickened margin.

Frequent, near moist places.

Fls. & Frts.: Sept. Nov.

Emilia sonchifolia (L) DC. in Wight, *Contrib.* 24. 1834. *Cacalia sonchifolia* L.

Erect, glaucescent herbs. Leaves sessile, upper leaves sagittate with rounded basal auricles. Heads purple.

Frequent.

Fls. & Frts.: April Sept.

Erigeron alpinus L., Sp. Pl. 264. 1753.

Erect, hairy or glabrous herbs. Cauline leaves ovate oblong. Heads subsolitary, hispid; involucral bracts subulate-lanceolate.

Frequent, on slopes.

Fls. & Frts.: July Sept.

E. canadensis L., Sp. Pl. 863. 1753.

Erect, annual herbs. Stems ribbed. Leaves linear-lanceolate. Pappus of achenes dirty white.

Common, along the roadsides and in waste places.

Fls. & Frts.: May-Nov.

E. floribundus (Kunth) Sch.-Bip. in Bull. Soc. Bot. Fr. 12: 81. 1865. *Conyza floribunda* H.B.K.

Erect herbs. Stems corymbosely branched at the top. Heads in leafy panicles, yellowish.

Frequent.

Fls. & Frts.: May Nov.

E. karvinskianus DC., Prodr. 5: 285. 1836.

Perennial herbs. Leaves obovate-elliptic; upper ones linear-lanceolate. Heads solitary on a peduncle. Corolla of marginal flowers white.

Frequent.

Fls. & Frts.: Oct. April

Eupatorium adenophorum Sprengel, Syst. 3: 420. 1826.

Erect, branched, woody herbs. Leaves ovate or ovate-rhomboid. Heads in leafy panicles, white. Achenes 5 angled, black.

Common, on slopes.

Fls. & Frts.: March May

Filago spathulata Presl, Dalic. Prog. 99. 1822.

Ascending, woolly, annual herbs. Leaves crowded towards the end of the branches, oblanceolate-spathulate. Heads in terminal clusters.

Common, in waste places and along the foot paths.

Fls. & Frts.: Sept. Nov.

Galinsoga parviflora Cav., Icon. Descr. Pl. 3: 41. t. 281. 1795.

Erect herbs. Leaves opposite, ovate-lanceolate or ovate-oblong. Heads in corymbiform panicles. Ray florets white, disc florets yellow.

Frequent.

Fls. & Frts.: May Oct.

Gnaphalium affine D. Don, Prodr. Fl. Nepal. 173. 1825.

Erect, tufted, woolly, branched herbs. Stems appressed-woolly. Leaves oblanceolate. Heads in leafless clusters, golden yellow.

Few.

Fls. & Frts.: May Oct.

G. pensylvanicum Willd., Enum. Hort. Berol. 867. 1809.

Annual, sparsely cottony herbs. Leaves spathulate. Heads densely white woolly at base. Pappus hairs connate at base into a ring.

Rare.

Fls. & Frts.: Sept. April

Inula cappa (Buch.-Ham. ex D. Don) DC., Prodr. 5: 469. 1836.

Undershrubs or shrubs. Leaves densely grey silvery tomentose on the lower surface. Heads in corymbiform panicles, yellow.

Frequent, on shady slopes.

Fls. & Frts.: Sept. Nov.

***I. cuspidata* (DC.) C.B. Clarke, Comp. Ind. 125. 1876.**

Differentiated from *I. cappa* by the leaves being glabrous on the lower surface.

Few, on slopes.

Fls. & Frts.: Sept. Dec.

***Lactuca dissecta* D. Don, Prodr. Fl. Nepal, 164. 1825.**

Glabrous, erect herbs. Basal and lower leaves lyrate-pinnatifid. Heads pink or violet. Achenes transversely rugose.

Common, in open shady places.

Fls. & Frts.: April - June

***Launaea procumbens* (Roxb.) Ramayya & Rajgopal in Kew Bull. 23(3): 465. 1969.**
Prenanthes procumbens Roxb.

Perennial herbs with many branches from the base. Leaves in a basal rosette, pinnately lobed or pinnatifid. Heads yellow.

Common.

Fls. & Frts.: March May

***Myriactis nepalensis* Less. in Linnaea 6: 128. 1831.**

Erect, much branched herbs. Heads paniculate. Achenes flat, epappose.

Few, in moist shady places.

Fls. & Frts.: Aug. Nov.

***Parthenium hysterophorus* L., Sp. Pl. 988. 1753.**

Erect herbs. Heads white.

Fls. & Frts.: March Aug.

Pentanema indicum (L.) Ling in Act. Phyt. Sin. 19: 179. 1965. *Vicoa indica* (L.) DC.

Erect, viscid, perennial herbs. Leaves sessile. Heads yellow.

Common, on grassy hill slopes.

Fls. & Frts.: March - June

P. vestita (Wallich ex DC.) Ling in Act. Phyt. Sin. 19: 180. 1965. *Vicoa vestita* (Wall. ex DC.) Benth.

Distinguished from *P. indica* by long villous involucre bracts.

Few.

Fls. & Frts.: March - June

Saussurea heteromalla (D. Don) Hand. Mazz, Symb. Sin. 7: 1152. 1936.

Erect, cottony herbs. Basal leaves in a rosette, lyrate pinnatifid. Heads in corymbiform panicles, pink. Achenes quadrangular, muricate.

Frequent, on slopes.

Fls. & Frts.: Aug. Nov.

Senecio nudicaulis Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 178. 1825.

Erect herbs, basal leaves in a rosette. Heads in panicles, yellow. Achenes glandular hairy.

Common towards Ghansali, on shady slopes.

Fls. & Frts.: April - June

Siegesbeckia orientalis L., Sp. Pl. 900. 1753.

Erect, branched herbs. Leaves opposite, ovate-triangular to rhomboid. Heads terminal, yellow. Involucre bracts glandular hairy.

Common, in waste places.

Fls. & Frts.: March Nov.

Silybum marianum Gaertner, Fruct. Sem. 2: 378. t. 168. 1791.

Large, thistle like herbs, with cottony stems. Leaves spinescently dentate. Heads solitary, terminal.

Few.

Fls. & Frts.: March - June

Soliva anthemifolia (Juss.) R. Br. in Trans. Linn. Soc. 12: 102. 1818.

Prostrate herbs. Leaves 2-pinnatifid. Heads many, sessile.

Frequent, on moist soil.

Fls. & Frts.: Oct. May

Sonchus asper (L.) Hill, Herb. Br. 1: 47. 1761.

Annual herbs. Basal leaves in rosette, base with rounded auricles. Outer involucre bracts eglandular.

Fls. & Frts.: Feb. May

S.brachyotus DC., Prodr. 7; 186. 1838.

Erect herbs. Basal leaves in a rosette; basal auricles of the cauline leaves rounded. Heads yellow. Outer involucre bracts glandular hairy.

Fls. & Frts.: March Nov.

S. oleraceus L., Sp. Pl. 794. 1753.

Annual herbs. Leaves sagittate at base, irregularly dentate. Heads on glandular hairy peduncles, yellow.

Common.

Fls. & Frts.: Feb. May

S. wightianus DC., Prodr. 7: 187. 1838.

Lower leaves runcinate-pinnatifid, spinous toothed. Heads yellow.

Frequent.

Fls. & Frts.: Aug. Oct.

Sphaeranthus senegalensis DC., Prodr. 5: 370. 1836.

Viscid herbs. Stems appearing winged. Heads in globose inflorescence.

Scarce, in the harvested fields.

Fls. & Frts.: March - June

Tagetes minuta L., Sp. Pl. 887. 1753.

Erect herbs. Leaves pinnate. Heads in corymbs, yellow.

Fls. & Frts.: Sept. Nov.

Taraxacum officinale Wigg., Prim. Fl. Holsat. 56. 1780.

Perennial herbs. Leaves basal, entire or lyrate-pinnatifid. Heads yellow. Achenes beaked.

Common, in open places.

Fls. & Frts.: Jan. - June

Tridax procumbens L., Sp. Pl. 900. 1753.

Procumbent-ascending herbs. Heads solitary on long peduncles, yellow.

Common, in waste places.

Fls. & Frts.: April May

Vernonia cinerea (L.) Less. in Linnaea 4: 291. 1829.

Erect herbs. Heads in corymbs, pink.

Common.

Fls. & Frts.: April Dec.

Xanthium strumarium L., Sp. Pl. 987. 1753.

Erect, aromatic, robust herbs. Leaves ovate-triangular, angled or lobed. Achenes with incurved heads and prickles.

Common, in waste places and along the roadsides.

Fls. & Frts.: July Sept.

Youngia japonica (L.) DC., Prodr. 7: 194. 1838.

Erect herbs with fistular stems. Basal leaves in a rosette. Heads on filiform peduncles, yellow.

Common, in shady situations.

Fls. & Frts.: March May

CAMPANULACEAE

Campanula wallichii Babu in J. Bombay Nat. Hist. Soc. 65: 808. 1969.

Hispid hairy herbs. Flowers forming spiciform panicles, bluish.

Frequent.

Fls. & Frts.: Jan. May

Wahlenbergia marginata (Thunb.) A. DC., Mono. Camp. 143. 1840. *Campanula marginata* Thunb.

Erect-ascending herbs. Leaves sessile. Flowers solitary or few in panicles, pale-blue.

Few.

Fls. & Frts.: Dec. May

PLUMBAGINACEAE

Plumbago zeylanica L., Sp. Pl. 151. 1753.

Undershrubs. Flowers in panicles, white, rachis glandular.

Scattered, amidst bushes.

Fls. & Frts.: July March

PRIMULACEAE

Anagallis arvensis L., Sp. Pl. 148. 1753.

Annual herbs. Stems 4-angled. Leaves sessile, opposite. Flowers axillary, common, in cultivated fields.

Fls. & Frts.: March Oct.

A. pumila Swartz., Prodr. Veg. Ind. Occ. 1: 40. 1788.

Differs from *A. arvensis* mainly in having white flowers.

Few.

Fls. & Frts.: Sept. Dec.

Lysimachia lobelioides Wallich in Roxb., Fl. Ind. 2: 29. 1824.

Herbs. Leaves ovate or ovate-lanceolate. Pedicels longer than the bracts. Flowers pink, turning white.

Fls. & Frts.: July Aug.

L. pyramidalis Wallich ex Roxb., Fl. Ind. 2: 28. 1824.

Differs from *L. lobelioides* in having pedicels shorter than the bracts.

Fls. & Frts.: June Oct.

Primula floribunda Wallich, Tent. Fl. Nepal. 43. t. 33. 1826.

Scapigerous, annual herbs. Leaves in basal rosette. Flowers yellow.

Rare, seen at one place only.

Fls. & Frts.: Oct. - July

P.umbellata (Lour.) Bentvelzon in Fl. Males. Ser. 1. 26. 191. 1962.

Scapigerous, annual herbs. Leaves in basal rosette, orbicular-subreniform. Flowers in umbels, white.

Frequent.

Fls. & Frts.: Feb. May.

MYRSINACEAE

Maesa montana A. DC., Prodr. 8: 79. 1844.

Shrubs. Leaves distantly toothed. Flowers in short panicles, white. Fruits pinkish white when ripe.

Occasional, on rocky hill slopes.

Fls. & Frts.: Dec. April

Mysine africana L., Sp. Pl. 196. 1753.

Small, evergreen shrubs. Leaves cuspidate-serrate. Flowers in axillary fascicles. Fruits red.

Fls. & Frts.: March Dec.

SAPOTACEAE

Mimusops elengi L., Sp. Pl. 349. 1753.

Planted trees.

OLEACEAE

Jasminum multiflorum (Burm.f.) Andrews, Bot. Repos. 8. t. 496. 1807.
Nyctanthes multiflora Burm.f.

Scandent shrubs. Leaves simple, opposite. Flowers in dense, capitate cymes, white, fragrant.

Not common.

Fls. & Frts.: Nov. April

J. officinale L., Sp. Pl. 7. 1753.

Twining shrubs. Leaves imparipinnate. Flowers white.

Fls. & Frts.: April Sept.

Nyctanthes arbor-tristis L., Sp. Pl. 6. 1753.

Shrubs or small trees. Leaves very rough to touch. Flowers very fragrant. Corolla tube orange red; limb white.

Occasional, on dry rocky slopes.

Olea europaea L., Sp. Pl. 8. 1753.

Cultivated, near Chamiyala bridge.

Olea glandulifera Wallich ex G. Don, Gen. Syst. 4: 49. 1837. "GILE"

Trees. Leaves ovate-lanceolate, main lateral nerves with glands at their base. Flowers in trichotomous cymes.

Common, towards Ghansali.

Fls. & Frts.: April Oct.

APOCYNACEAE

Carissa opaca Stapf ex Haines in Indian For. 47. 378. 1921.

Evergreen, spiny shrubs. Flowers white or tinged with pink. Fruits dark purple when mature.

Common, throughout the area.

Fls. & Frts.: April Sept.

Catharanthus pusillus (Mur.) G. Don, Gen. Syst. 4. 95. 1837.

Erect, annual herbs. Stems quadrangular. Flowers white.

Occasional.

Fls. & Frts.: July Nov.

Ichnocarpus frutescens (L.) R. Br. in Mem. Wern. Nat. Hist. S. 1: 62. 1811.

Climbing shrubs. Flowers white.

Occasional.

Fls.: Oct.

Plumeria Sp.

Planted.

Thevetia peruviana (Pers.) K. Schumann in Engl. & Prant. Pflanzenfam. 4: 159. 1895.

Evergreen, glabrous shrubs or small trees. Flowers yellow.

Planted as an ornamental.

Fls. & Frts.: June Sept.

Vallaris solanacea (Roth) O. Kuntze., Rev. Gen. Pl. 417. 1891. *Peltanthera solanacea* Roth

Twiners. Petioles with gland in the axil. Flowers creamy.

Common.

Fls. & Frts.: Jan. May

Wrightia arborea (Dennst.) Mabb. in Taxon 26: 533. 1977.

Small, deciduous trees. Flowers in terminal dichotomous cymes lax.

Few, on open slopes.

Fls. & Frts.: Jan. March

ASCLEPIADACEAE

Asclepias curassavica L., sp. Pl. 215. 1753.

Erect herbs. Leaves oblong-lanceolate. Flowers orange coloured.

Occasional, in moist situations by the river side.

Fls. & Frts.: Sept. Dec.

Calotropis procera (Willd.) Dryand in W. Ait., Hort. Kew ed. 1. 2: 78. 1811.

Evergreen, erect undershrubs. Leaves thick, white tomentose beneath. Flowers lilac or purple.

Fls. & Frts.: March Nov.

Cryptolepis buchanani Roemer et Schultes, Syst. Veg. 4: 409. 1819.

Twiners. Leaves dark green above, glaucous beneath. Flowers in short, axillary paniced cymes, greenish yellow.

Common.

Fls. & Frts.: May Sept.

Marsdenia roylei Wight, Contrib. Bot. Ind. 40. 1834.

shrubby. Leaves broadly ovate, velvety beneath. Flowers in corymbose cymes. Fruits transversely rugose.

Few, on slopes.

Fls. & Frts.: May Oct.

Telosma pallida (Roxb.) Craib in Kew Bull. 1911. 418. 1911.

Twiners. Leaves ovate-cordate. Flowers in peduncled cymes, creamy.

Few, on dry slopes.

Fls. & Frts.: July Oct.

Tylophora hirsuta Wight. & Arn. in Wight, Contrib. Bot. Ind. 49. 1834.

Twiners. Stems densely patent villous. Leaves ovate-lanceolate. Flowers in cymes, greenish.

Few.

Fls. & Frts.: July Oct.

BUDDLEJACEAE

Buddleja asiatica Lour., Fl. Cochinch. 72. 1790.

Evergreen, undershrubs or shrubs. Leaves lanceolate-oblong, white beneath. Flowers in panicles, white.

Frequent, on rocky hill slopes.

Fls. & Frts.: Nov. May

GENTIANACEAE

Centaurium pulchellum (Sw.) Druce, Fl. Berks, 342. 1897.

Erect, annual herbs. Basal leaves in a rosette. Flowers in leafy cymose panicles, pinkish.

Common, near the swampy or marshy places in open grounds.

Fls. & Frts.: March May

Gentiana aprica Decne. in Jacq., Voy. 4. (Bot.) 112. t. 118. 1844.

Erect, annual, small herbs. Basal leaves in a rosette, white margined, silvery white beneath. Flowers blue.

Scattered, in moist places.

Fls. & Frts.: Feb. May.

G. pedicellata (D. Don) Wallich ex Griseb., Gentian. 273. 1839.

Small, much branched herbs. Leaves green, not silvery white beneath. Flowers bluish.

Few, in moist places.

Fls. & Frts.: March May

BORAGINACEAE

Bothriospermum tenellum (Hornem.) Fischer & Mey., Ind. Sem. H. Petrop. 1: 23. 1836.

Small, adpressedly hispid herbs. Flowers blue or white, small.

Included on the authority of Bhattacharya & Goel.

Cynoglossum glochidiatum Wallich ex Benth. in Royle, Illustr. Bot. Himal. 306. 1836.

Hispid herbs. Leaves broadly lanceolate. Flowers blue.

Common.

Fls. & Frts.: July Nov.

C. lanceolatum Forsskal., Fl. Aegypt.-Arab. 41. 1775.

Annual herbs. Leaves appressed hispid with white tubercle based hairs. Flowers whitish. Fruits glochidiate.

Common, on open hill slopes.

Fls. & Frts.: July Nov.

Ehertia laevis Roxb., Pl. Cor. 42. t. 55. 1795.

Medium sized, deciduous trees. Leaves dark-green above, paler beneath. Flowers white.

Few, on slopes.

Fls. & Frts.: Jan. - June

Heliotropium strigosum Willd., Sp. Pl. 1: 743. 1798.

Prostrate herbs. Leaves linear-lanceolate. Flowers white.

Common, in open fields.

Fls. & Frts.: July Oct.

Trichodesma indicum (L.) R. Br., Prod. Fl. Nov. Holl. 496. 1810. *Borago indica* L.

Annual, hairy herbs; hairs bulbous based. Leaves stem clasping. Flowers pale-blue, turning pink.

Fls. & Frts.: May Sept.

CONVOLVULACEAE

Convolvulus arvensis L., Sp. Pl. 153. 1753.

Prostrate, twining herbs. Leaves hastate or sagittate. Flowers pink or white.

Scattered.

Fls. & Frts.: Aug. Sept.

Ipomoea hederifolia L., Syst. Nat. ed. 10. 925. 1759.

Herbaceous twiners. Leaves entire or 3-5-angular. Flowers red.

Abundant.

Fls. & Frts.: July Nov.

I. pes-tigridis L., Sp. Pl. 162. 1753.

Herbaceous twiners. Leaves palmatifid-partite. Flowers in capitate, involucrate cymes, white or lilac.

Common.

Fls. & Frts.: Sept. Dec.

I. purpurea (L.) Roth, B. Abh. 27. 1787. *Convolvulus purpureus* L.

Hairy twiners. Leaves ovate, cordate, acute. Flowers large, pink.

Common.

Fls. & Frts.: Aug. Sept.

I. quamoclit L., Sp. Pl. 159. 1753.

Glabrous, annual climbers. Leaves pinnately compound, segments linear. Flowers red, funnel shaped.

Common.

Fls. & Frts.: May Sept.

Merremia dissecta (Jacq.) Hallier f. in Bot. Jahrb. 16. 552. 1893. *Convolvulus dissecta* Jacq.

Twiners. Leaves palmate. Flowers white.

Common.

Fls. & Frts.: July Sept.

Porana paniculata Roxb., Pl. Cor. 3. 31. t. 235. 1819.

Twiners. Leaves ovate-cordate. Flowers in panicles, white.

Common.

Fls. & Frts.: Oct. - Jan.

CUSCUTACEAE

Cuscuta reflexa Roxb., Pl. Corom. 2: 3. t. 104. 1798.

"AKASH BEL"

Parasites. Flowers sessile or subsessile, clustered, whitish.

Fls. & Frts.: Sept. Dec.

SOLANACEAE

Capsicum annum L. Sp. Pl. 188. 1753.

"MIRCH"

Cultivated.

Cestrum nocturnum L., Sp. Pl. 191. 1753.

"RAT KI RANI"

Planted.

Datura innoxia Mill., Gard. Dict. ed. 8 no. 5. 1768.

Annual, large herbs. Flowers white or creamy.

Few, in waste places.

Fls. & Frts.: July Oct.

D. metel L., Sp. Pl. 179. 1753.

Herbs or undershrubs. Flowers usually white. Fruits nodding, prickly.

Occasional.

Fls. & Frts.: April Sept.

D. stramonium L., Sp. Pl. 179. 1753.

Distinguished from *D. metel* by its erect fruits.

Common.

Fls. & Frts.: Dec. May

Lycopersicon esculentum Mill., Gard. Dict. ed. 8. no. 2. 1768.

"TAMATAR"

Cultivated, as well as escape.

Nicotiana plumbaginifolia Viv., Elench., Pl. Hort. Bot. 26. t. 5. 1802.

Viscid herbs. Stems glandular hairy. Flowers in leafy panicles, greenish white.

Frequent, in open situations.

Fls. & Frts.: March Nov.

N. tabacum L., Sp. Pl. 180. 1753.

"TAMAKHU"

Differentiated from *N. plumbaginifolia* by larger size and presence of filaments.

Escape.

Fls. & Frts.: Nov. May

Physalis angulata L., Sp. Pl. 183. 1753.

Erect, annual herbs. Flowers solitary, yellow, with five brown spots inside.

Scarce, in waste places.

Fls. & Frts.: March Nov.

P. minima L., Sp. Pl. 183. 1753.

Erect, annual herbs. Flowers solitary, yellow.

Common, near the village.

Fls. & Frts.: July Oct.

Solanum erianthum D. Don, Prodr. Fl. Nepal. 96. 1825.

Unarmed herbs or undershrubs. Leaves ovate-oblong or elliptic, stellate tomentose beneath. Flowers white.

Frequent.

Fls. & Frts.: July Sept.

S. incanum L., Sp. Pl. 188. 1753.

Erect, prickly, yellowish pubescent shrubs, midrib of the leaves prickly. Peduncles usually paired. Flowers blue. Fruits globose, yellow when ripe.

Rare, by the side of path.

Fls. & Frts.: Oct. April

S. nigrum L., Sp. Pl. 186. 1753.

Unarmed herbs. Leaves entire or sinuate, nearly glabrous. Flowers in umbelliform extra axillary inflorescence, nodding. Fruits black when mature.

Very common.

Fls. & Frts.: Major parts of the year.

S. surattense Burm.f., Fl. Ind. 57. 1758.

Armed, prostrate or ascending herbs. Leaves pinnatifid. Flowers blue. mature fruits yellow.

Fairly common.

Fls. & Frts.: Major part of the year.

S. viarum Dunal in DC., Prodr. 13: 240. 1852.

Erect, armed, glandular villous herbs. Flowers in cymose corymbs, white. Fruits yellow.

Common throughout the area.

Fls. & Frts.: Major part of the year.

Withania somnifera (L.) Dunal in Dc., Prodr. 13: 453. 1852.

Erect, greyish herbs or undershrubs. Leaves elliptic-oblong, ovate, entire. Flowers in fascicles. Fruits globose, enclosed in the calyx.

Common, on slopes around Tehri.

Fls. & Frts.: Oct. - June

SCROPHULARIACEAE

Antirrhinum orontium L., Sp. Pl. 617. 1753.

Erect, glandular hairy herbs. Leaves sessile, linear. Flowers in spike like racemes, lax, whitish.

Fairly common.

Fls. & Frts.: Dec. May

Bacopa monnieri (L.) Pennell in Proc. Acad. Nat. Sci. Philad. 98: 94. 1946.

Trailing herbs. Leaves oblong-cuneate to obovate. Flowers light blue.

Frequent, in marshy situations.

Fls. & Frts.: June Sept.

B. procumbens (Mills) Greenm. in Field Columb. Mus. Bot. Soc. 2: 261. 1907.

Erect, ascending herbs. Stems quadrangular. Leaves elliptic or ovate-elliptic. Flowers axillary, solitary, yellow.

Common, in marshy places.

Fls. & Frts.: Major part of the year.

Dopatrium junceum (Roxb.) Buch.-Ham. ex Benth., Scroph. Ind. 31. 1835.

Annual herbs. Leaves sessile, parallel nerved. Flowers axillary forming leafy terminal racemes.

Few.

Fls. & Frts.: Sept. Nov.

Kickxia ramosissima (Wallich) Janchen. in Ost. Bot. Zeitschr. 82: 152. 1933.
Linaria ramosissima Wall.

Perennial herbs. Leaves lanceolate or triangular-hastate. Flowers yellow, spurred.

Frequent, on open grassy slopes.

Fls. & Frts.: July Sept.

Lindenbergia indica (L.) O. Kuntze, Rev. Gen. Pl. 462. 1891.

Tufted, glandular hairy herbs. Leaves broadly ovate. Flowers axillary, solitary or clustered.

Common.

Fls. & Frts.: Sept. Dec.

L. macrostachya Benth., Scroph. Ind. 22. 1835.

Tall, erect, glabrous herbs. Leaves ovate or oblong-lanceolate. Flowers in crowded, 1-sided spikes.

Fls. & Frts.: May - June

Lindernia anagallis (Burm.f.) Pennell in J. Arn. Arb. 24. 252. 1943.

Laxly spreading, glabrous herbs. Leaves ovate-orbicular, rounded or cordate, crenate. Flowers pinkish blue.

Common, in moist situations.

Fls. & Frts.: July Sept.

L. crustacea (L.) F.V. Mueller, Cens. Austral. Pl. 1: 97. 1882.

Diffusely branched, glabrous herbs. Leaves ovate. Flowers pale purple.

Common, in moist shady places.

Fls. & Frts.: Aug. Oct.

L. nummularifolia (D. Don) Wettst. in Pflanzenf. 4. 38: 79. 1891. *Vandellia nummularifolia* D. Don, Prodr. Fl. Nepal. 86. 1825.

Erect herbs. Stems tetragonous. Leaves sessile. Flowers racemose, white or pale-purple. Fruits longer than the calyx.

Frequent.

Fls. & Frts.: Sept. Nov.

L. parviflora (Roxb.) Haines, Bot. Bihar & Orissa 635. 1922.

Erect, annual herbs. Stems 4-angular. Leaves sessile. Flowers solitary, axillary, white.

Common.

Fls. & Frts.: Oct. March

Mazus pumilus (Burm.f.) Steen. in Nova Guinea N.S. 9: 31. 1958. *Lobelia pumila* Burm.f., Fl. Ind. 186.t. 60.f. 3. 1768.

Erect, ascending herbs, non-stoloniferous. basal leaves in a rosette, oblanceolate-obovate. Flowers in racemes, whitish or lilac.

Common.

Fls. & Frts.: Major part of the year.

M. surculosus D. Don, Prodr. Fl. Nepal. 87. 1825.

Differs from *M. pumilus* in having stolons.

Common, in marshy places.

Fls. & Frts.: April Oct.

Scoparia dulcis L., Sp.Pl. 116. 1753.

Erect herbs. Leaves opposite or whorled, oblanceolate, oblong or obovate. Flowers 1-3 in the axils. Fruits globose.

Common.

Fls. & Frts.: Major part of the year.

Torenia cordifolia Roxb., Pl. corom. 2: 52. t. 1161. 1798.

Erect, annual herbs. Stems quadrangular, winged. Flowers bluish.

Fls. & Frts.: Sept. Dec.

Verbascum chinense (L.) Santapau, Fl. Pur. 90. 1958. *Scrophularia chinensis* L.

Erect, annual herbs. Basal leaves in a rosette. Flowers in racemes, lax, yellow.

Frequent.

Fls. & Frts.: April Aug.

V. thapsus L., Sp. Pl. 177. 1753.

Differs from *V. chinensis* in having densely stellate tomentose leaves and flowers in dense racemes.

Common.

Fls. & Frts.: Feb. - June

Veronica agrestis L., Sp. Pl. 1: 13. 1753.

Annual herbs. Leaves ovate-rounded, serrate-dentate. Flowers solitary, axillary, blue. Fruits didymous, deeply emarginate at apex.

Frequent, in shady moist places.

Fls. & Frts.: Dec. May

V. anagallis-aquatica L., Sp. Pl. 1: 12. 1753.

Erect herbs. Leaves sessile with a semi-amplexicaule base. Flowers in racemes, bluish.

Common, in marshy places.

Fls. & Frts.: May Sept.

V. javanica Blume, Bijdr. 742. 1826.

Erect herbs. Leaves crenate-serrate. Flowers in spike like racemes, bluish. Fruits obcordate.

Few, in moist places by the riverside.

Fls. & Frts.: March May

V. persica Poiret. in Lam., Encycl. Meth. Bot. 8. 542. 1808.

Like *V. agrestis* but pedicels shorter and fruits not deeply emarginate.

Frequent.

Fls. & Frts.: May Aug.

V. verna L., Sp. Pl. 14. 1753.

Small, puberulous herbs. Flowers pale blue. Fruits glandular.

In open fields at Chham.

Fls. & Frts.: April - July

LENTIBULARIACEAE

Utricularia striatula Smith in Rees, Cyclop. 37. n. 17. 1819.

Herbs with filiform stolons. Leaves orbicular-rounded. Flowers in scapose racemes.

Rare, seen at one place, growing over moist, moss laden rock near bridge over Bhagirathi on Lambgaon road.

Fls. & Frts.: July Nov.

GESNERIACEAE

Corallodiscus lanuginosus (Wallich ex DC.) Burt in Gard. Chron. Ser. 3. 122. 212. 1947. *Didymocarpus lanuginosa* Wallich ex DC.

Scapigerous herbs. Leaves crowded at the base. Flowers pale-blue or purple.

Few in rocky situations.

Fls. & Frts.: July Oct.

BIGNONIACEAE

Incarvillea emodi (Lindley) Chatterjee in Kew Bull. 1948(2): 185. 1948.
Amphicome emodi Lindley

Erect, perennial herbs. Leaves compound; leaflets 9-15. Flowers pink or white.

Rare. Seen on the walls of a house at Bhagirathipuram.

Fls. & Frts.: April May

Jacaranda mimosifolia D. Don in Bot. Reg. t. 631. 1822.

Medium sized trees. Leaves compound. Flowers fleshy. Fruits long, flat.

Scarce, on open slopes.

Fls. & Frts.: May July

PEDALIACEAE

Sesamum orientale L., Sp. Pl. 634. 1753. *S. indicum* L.

"TIL"

Cultivated.

MARTYNIACEAE

Martynia annua L., Sp. Pl. 618. 1753.

Viscid herbs. Leaves dentate, glandular hairy. Flowers in axillary racemes. Fruits with upturned beak.

Common, in open waste places.

Fls. & Frts.: July Oct.

ACANTHACEAE

Adhatoda zeylanica Medikus, Hist. & Common. Acad. Theod. Pal. 6. 393. 1790.

A. vasica Nees

Undershrubs or shrubs. Flowers white.

Frequent on open slopes.

Fls. & Frts.: Nov. - July

Barleria cristata L., Sp. Pl. 636. 1753.

Herbs or undershrubs. Stems quadrangular. Flowers bluish. Best distinguished by spine tipped bracts and bracteoles.

Common, in shady places.

Fls. & Frts.: Sept. March

Dicliptera roxburghiana Nees in Wall., Pl. As Rar. 3: 111. 1832.

Perennial herbs. Flowers purplish or lilac.

Common.

Fls. & Frts.: April Nov.

Justicia procumbens L., var. *simplex* (D. Don) Yamaz. in Fl. East Hima. 302.
1966. *J. simplex* D. Don

Erect herbs. Leaves strongly lanceolate. Flowers in axillary and terminal spikes, dense, pale-purple.

Common.

Fls. & Frts.: Feb. Oct.

Peristrophe bicalyculata (Retz.) Nees in Wallich, Pl. As. Rar. 3: 113. 1832.
Dianthera bicalyculata Retz.

Erect herbs. Leaves ovate-lanceolate. Flowers purple. Fruits hairy. Beaked.

Common, around kandal & Ghonti.

Fls. & Frts.: Sept. Nov.

Pteracanthus angustifrons (Clarke) Bremek. in Verh. Kon. Ned. Acad. Wetens.
Sect. 2. 41(1): 200. 1944. *Strobilanthes angustifrons* Clarke

Herbs. Leaves in unequal pairs; petiole winged. Flowers blue or violet.

Few, near Chamiyala Bridge.

Fls. & Frts.: Sept. Nov.

Rostellularia quinqueangularis (Koenig ex Roxb.) Nees var. *peploides* (Nees)
Babu Herb. Fl. D. Dun. 392. 1977.

Annual herbs. Leaves ovate-lanceolate-oblong. Flowers in interrupted spikes.

Common around the spot.

Fls. & Frts.: Feb. April

Rungia pectinata (L.) Nees in DC., Prod. 11: 469. 1847. *Rungia parviflora* Nees
var. *pectinata* (L.) Clarke

Herbs. Best distinguished by the scarious margined bracts and bracteoles and flowers in dense secund spikes.

Scarce.

Fls. & Frts.: Sept. Oct.

VERBENACEAE

Callicarpa macrophylla Vehl, *Symb. Bot.* 3. 13. t. 53. 1794.

Erect shrubs. Leaves densely white tomentose beneath. Flowers in axillary peduncled cymes. Fruits white.

Common, in shady places.

Fls. & Frts.: June Oct.

Caryopteris odorata (D. Don) Robinson in *Proc. Ann. Acad. Arts & Sci.* 51: 531. 1916.

Clerodendrum odoratum D. Don

Aromatic undershrubs or shrubs. Flowers in leafy panicles, bluish pink. Fruits globose.

Frequent, on slopes.

Fls. & Frts.: Jan. - June

Clerodendrum indicum (L.) Kuntze, *Rev. Gen. Pl.* 506. 1891.

Erect herbs or undershrubs. Best distinguished by long corolla tube and ternate leaves.

Planted.

Fls. & Frts.: Sept. Nov.

C. serratum (L.) Moon, *Cat. Ceylon Pl.* 46. 1824. *Volkameria serrata* L.

Undershrubs or shrubs. Flowers violet; calyx minutely 5-dentate.

Fls. & Frts.: Major part of the year.

Holmskioldia sanguinea Retz., Obs. Bot. 6. 31. 1791.

Straggling shrubs. Leaves ovate, acuminate. Calyx scarlet, much enlarged in fruits.

Scarce, on slopes by the riverside.

Fls. & Frts.: Oct. Dec.

Lantana camara L., Sp. Pl. 627. 1753.

Undershrubs or shrubs. Best distinguished by the presence of recurved prickles on the branches.

Abundant on slopes.

Fls. & Frts.: Major part of the year.

L. indica Roxb., Fl. Ind. ed. 2. 3: 89. 1832.

Shrubs. Branches scabrid-pubescent. Flowers in axillary, peduncled heads, variously coloured.

Common.

Fls. & Frts.: July Nov.

Lippia nodiflora (L.) A. Rich. in Michx. Fl. Bor. Am. 2: 15. 1303. *Verbena nodiflora* L.

Creeping herbs. Leaves obovate-spathulate or cuneate. Flowers in dense globose, peduncled heads, pale pink.

Common, in open places.

Fls. & Frts.: Major part of the year.

Premna latifolia Roxb. var. *mucronata* C.B. Clarke in Hook.f., Fl. Brit. India 4: 578. 1885.

Small trees. Leaves 2-3 at nodes, entire. Flowers in corymbs. Fruits globose, black when dry.

Few, on slopes in the forest.

Fls. & Frts.: March Aug.

***Verbena officinalis* L., Sp. Pl. 20. 1753.**

Herbs. Leaves pinnatifid-partite. Flowers in spike which often are paniculate, lilac or white.

Few, in open fields.

Fls. & Frts.: Major part of the year.

***Vitex negundo* L., Sp. Pl. 638. 1753.**

Shrubs or small trees. Leaves 3-5 foliate. Flowers in panicles, bluish. Fruits black when mature.

Scattered, along the river bed and near inhabitation.

Fls. & Frts.: Major part of the year.

LAMIACEAE

***Ajuga bracteosa* Wallich ex Benth. in Wallich, Pl. As. Rar. 1: 59. 1830.**

Pubescent villous herbs. Lower leaves long petioled: upper sessile. Flowers sessile, bluish.

Frequent.

Fls. & Frts.: Major part of the year.

***A. macrosperma* Wallich ex Benth. in Wallich, Pl. As Rar. 1: 58. 1830.**

Differs from *A. bracteosa* in having acute calyx lobes and corolla tube inflated at base.

Frequent, in open grassy fields.

Fls. & Frts.: Feb. - June

Anisochilus carnosus (L.) Wallich, Pl. As. Rar. 2: 18. 1831. *Lavandula carnososa* L.

Erect, annual herbs. Flowers in dense, compact spikes, pale purple.

Few, along Jalkurgad.

Fls. & Frts.: Aug. Oct.

Anisomeles indica (L.) O. Kuntze, Rev. Gen. Pl. 2: 512. 1891.

Erect herbs. Stems acutely 4-angled. Flowers bluish-purple.

Not common.

Fls. & Frts.: Major part of the year.

Clinopodium umbrosum (M. Bieb.) Koch in Linnaea 21: 673. 1848. *Melissa umbrosa* M. Bieb.

Erect, ascending herbs. Leaves thinly to densely hairy, gland dotted beneath. Flowers purple, hairy. Bracteoles linear-filiform, hairy.

Common on shady forest slopes.

Colebrookea oppositifolia Smith, Exot. Bot. 2: 111. t. 115. 1805.

Pubescent villous to tomentose undershrubs. Leaves densely tomentose beneath. Flowers in tomentose, spiciform panicles.

Common, on slopes.

Fls. & Frts.: Jan. May

Lamium amplexicaule L., Sp. Pl. 809. 1753.

Herbs. Best distinguished by the sessile, orbicular floral leaves.

Common, in cultivated fields.

Fls. & Frts.: April Oct.

Leucas aspera (Willd.) Sprengel, Syst. 2: 743. 1825. *Phlomis aspera* Willd.

Annual herbs. Flowers in axillary and terminal whorls. Calyx mouth oblique.

Common on slopes.

Fls. & Frts.: March Sept.

L. cephalotes (Roth) Sprengel, Syst. Veg. 2: 743. 1825. *Phlomis cephalotes* Roth

Erect, rough hairy herbs. Leaves stalked, ovate-lanceolate, toothed. Flowers white. Calyx hairy.

Common, in cultivated fields and in waste places.

Fls. & Frts.: July Nov.

L. lanata Benth. in Wallich, Pl. As. Rar. 1: 61. 1830.

Erect, woolly herbs. Leaves sessile. Flowers white. Calyx mouth not very oblique.

Common.

Fls. & Frts.: May Oct.

L. mollissima Wallich, Pl. As. Rar. 1: 62. 1830.

Erect, perennial herbs. Leaves petioled. Flowers white.

Frequent.

Fls. & Frts.: Major part of the year.

Mentha longifolia (L.) Huds., Fl. Angl. 221. 1762. *Mentha sylvestris* L.

Hoary pubescent, aromatic herbs. Leaves lanceolate, ovate or oblong. Flowers small, lilac.

Common in marshy places.

Fls. & Frts.: Aug. Sept.

Micromeria biflora (Buch.-Ham. ex D. Don) Benth., Lab. Gen. Sp. 378. 1834.
Thymus biflorus Buch.-Ham. ex D. Don

Erect, ascending herbs. Leaves subsessile. Flowers pinkish. Calyx 13-ribbed.

Common, in shady moist places.

Fls. & Frts.: March Oct.

Nepeta graciliflora Benth. in Wallich, Pl. As. Rar. 1: 65. 1830.

Erect, annual herbs. Leaves long petioled, verticillasters few flowered. Flowers pale lilac.

Scattered, on grassy slopes.

Fls. & Frts.: April May

N. hindostana (Roth) Haines, Bot. Bihar & Orissa 744. 1922.

Pubescent, erect, perennial herbs. Leaves stalked, broadly ovate or orbicular. Flowers blue or purple.

Frequent, along water course.

Fls. & Frts.: March May

Origanum vulgare L., Sp. Pl. 590. 1753.

Erect herbs. Flowers crowded in numerous spikes, pink.

Seen at Dikiyargad only.

Fls. & Frts.: Aug. Oct.

Ocimum tenuiflorum L., Sp. Pl. 597. 1753.

Softly hairy, erect herbs. Leaves oblong, obtuse or acute. Nutlets smooth, pale-brown.

Planted.

Fls. & Frts.: Sept. Dec.

Perilla frutescens (L.) Britton in Mem. Torr. Bot. Club 5: 277. 1894. *Ocimum frutescens* L.

Strongly aromatic biennial herbs. Flowers white.

Common, on the river beds.

Fls. & Frts.: Oct. Dec.

Pogostemon benghalensis (Burm.f.) O. Kuntz., Rev. Gen. Pl. 529. 1891. *Ocimum benghalensis* Burm.f.

Erect undershrubs. Stems often purple tinged. Leaves doubly serrate. Flowers in paniculate spikes, purple.

Common, on forest slopes.

Fls. & Frts.: Jan. May

Rabdosia rugosa (Wallich ex Benth.) Hara in J. Jap. Bot. 47: 199. 1972. *Plectranthus rugosus* Wallich ex Benth.

Stellate, pubescent herbs. Leaves obtuse, lower surface white or grey tomentose. Calyx elongated and curved in fruits.

Common.

Fls. & Frts.: March Oct.

Roylea cinerea (D. Don) Baillon, Hist. Des. Pl. 11: 36. 1891.

Erect or clambering shrubs. Leaves coarsely serrate-dentate, gland punctate on the lower surface. Flowers whitish.

Common, on slopes in shady situations.

Salvia coccinea Juss. ex Murr. in Comm. Soc. Reg. Sci. Goetting. 1: 86. t. 1. 1779.

Distinguished by red flowers.

Planted as an ornamental.

S. plebeia R. Br., Prodr. Fl. Nov. Holl. 501. 1810.

Rough, pubescent, erect herbs. Leaves stalked, ovate or oblong, toothed. Flowers white.

Common.

Fls. & Frts.: March - June

Scutellaria linearis Benth. in Wallich, Pl. As. Rar. 1: 66. 1830.

Stems numerous. Leaves linear. Flowers pale purple.

Occasional.

Fls. & Frts.: April - June

S. repens Buch. Ham. ex D. Don, Prodr. Fl. Nepal. 110. 1825.

Distinguished from *S. linearis* by ovate leaves.

Common.

Fls. & Frts.: Major part of the year.

Teucrium royleanum Wallich ex Benth. in Wall., Pl. As. Rar. 1: 58. 1830.

Erect, ascending herbs. Leaves doubly crenate-serrate. Flowers white.

Few, on slopes amidst bushes.

Fls. & Frts.: April - June

PLANTAGINACEAE

Plantago major L., Sp. Pl. 112. 1753.

Scapose herbs. Leaves in a basal rosette. Flowers spicate.

Occasional, in moist places by the side of water course.

Fls. & Frts.: March Nov.

NYCTAGINACEAE

Boerhavia diffusa L., Sp. Pl. 3. 1753.

Viscid herbs. Flowers in cymose panicles, dark pink.

Scattered, in sandy places.

Fls. & Frts.: Major part of the year.

Mirabilis jalapa L., Sp. Pl. 117. 1753.

Erect, annual herbs. Leaves ovate-lanceolate. Flowers in lax, leafy corymbs, white, yellow or pink.

Common, in waste places.

Fls. & Frts.: Aug. - Nov.

AMARANTHACEAE

Achyranthes aspera L., Sp. Pl. 204. 1753.

Erect, stiff herbs. Leaves opposite. Bracts and bracteoles spinescent. Pseudostaminodes truncate or irregularly dentate at apex.

Common, in shady situations.

Fls. & Frts.: March - Nov.

Aerva sanguinolenta (L.) Blume, Bijdr. 547. 1825. *Achyranthes sanguinolenta* L.

Erect or rambling herbs or undershrubs. Leaves alternate. Spikes densely tomentose. Bracts and bracteoles ovate, mucronate.

Common.

Fls. & Frts.: Major part of the year.

Alternanthera pungens Kunth, Nov. Gen. et Sp. 2: 206. 1817.

Prostrate herbs. Leaves elliptic-obovate, obtuse. Flowers in heads.

Common, in open sandy places.

Fls. & Frts.: Aug. Sept.

A. sessilis (L.) DC., Cat. Hort. Monsp. 77. 1813. *Gomphrena sessilis* L.

Usually prostrate herbs. Leaves opposite. Spikes axillary, globose-cylindric. Pseudostaminodes entire or 2-3 dentate.

Common.

Fls. & Frts.: Major part of the year.

Amaranthus spinosus L., Sp. Pl. 991. 1753.

Usually armed herbs. Leaves alternate. Flowers in dense clusters. Fruits rugose.

Common.

Fls. & Frts.: Major part of the year.

A. viridis L., Sp. Pl. ed. 2. 1405. 1763.

Unarmed herbs. Flowers in axillary clusters. Tepals 3.

Frequent, in waste places.

Fls. & Frts.: April - June

Celosia argentea L., Sp. Pl. 205. 1753.

Erect herbs. Leaves alternate, lower leaves petioled; upper sessile. Flowers in dense, cylindrical spikes.

Scattered, on slopes by the roadside.

Fls. & Frts.: Sept. Nov.

Deeringia amaranthoides (Lam.) Merr., Interpret. Herb. Amboin. 211. 1917.
Achyranthes amaranthoides Lam.

Rambling or ascending undershrubs or shrubs. Leaves alternate. Flowers in panicles, white.

Scattered, on rocky slopes.

Fls. & Frts.: April Nov.

Digera muricata (L.) Mart., Beitr. Amar. 2: 77. 1825.

Annual herbs. Leaves alternate. Flowers in axillary racemes. Tepals 5, pink. Fruits with bidentate apex.

Rare.

Fls. & Frts.: Sept. Nov.

Gomphrena celosioides Mart., Beitr. Amar. 2: 93. 1825.

Usually prostrate herbs. Leaves opposite. Flowers in subglobose heads, whitish.

Common, in open places.

Fls. & Frts.: March Nov.

Pupalia lappacea (L.) Juss. in Ann. Mus. Paris 2: 132. 1803. *Achyranthes lappacea* L.

Perennial herbs. Leaves opposite. Flowers in clusters forming spikes, with fascicled hooks.

Frequent on rocky south facing slopes.

Fls. & Frts.: Sept.- Nov.

CHENOPODIACEAE

Chenopodium album L., Sp. Pl. 219. 1753.

"BATHUA"

Annual, erect herbs, white mealy in young parts. Clusters of flowers in panicles. Fruits finally papillate.

Common weed.

Fls. & Frts.: Dec. May

C. ambrosioides L., Sp. Pl. 219. 1753.

Aromatic herbs. Flowers in axillary clusters, combined into panicles. Ovary and fruits with yellow glands. Stigmas 5.

Common.

Fls. & Frts.: Major part of the year.

C. botrys L., Sp. Pl. 219. 1753.

Aromatic, glandular pubescent herbs. Leaves pinnately lobed or upper ones entire.

Seen at one place at Dikiyarangad, on the stream bed.

Fls. & Frts.: June Oct.

C. murale L., Sp. Pl. 219. 1753.

Annual herbs. Flowers in cymose clusters forming panicle. Seeds dull black.

Fls. & Frts.: May Sept.

Spinacia oleracea L., Sp. Pl. 1027. 1753.

Annual herbs, Cultivated.

BASELLACEAE**Basella alba L., Sp. Pl. 272. 1753.**

Fleshy climbing herbs. Flowers sessile, combined into panicles.

Cultivated.

POLYGONACEAE**Persicaria barbata (L.) Hara in Fl. E. Himal. 70. 1966. *Polygonum barbatum* L.**

Slender, glabrous herbs. Leaves linear-lanceolate. Flowers white or pinkish.

Frequent, in moist places.

Fls. & Frts.: Major part of the year.

P. capitata (Buch.-Ham. ex D. Don) H. Gross in B. Jahrb. 49. 277. 1913.
Polygonum capitatum Buch.-Ham. ex D. Don.

Ascending from a creeping base. Ochreae short ciliate or eciliate. Flowers in heads, not subtended by involucral leaves.

Frequent.

Fls. & Frts.: April Oct.

P. hydropiper (L.) Spach, Hist. Veg. 10: 536. 1841. *Polygonum hydropiper* L.

Occasional in marshy places.

Fls. & Frts.: June Oct.

P. nepalensis (Meissner) H. Gross. in B. Jahrb. 49. 277. 1913. *Polygonum nepalensis* Meisn.

Erect, annual herbs. Ochreae tubular, glabrous. Petioles winged. Flowers pink.

Only one plant seen, in moist places.

Fls. & Frts.: Feb. Sept.

Polygonum donii Meissner, Monogr. Polyg. 72. 1826.

Tall, slender herbs rooting at nodes. Leaves petioled, elliptic or lanceolate, sparsely hairy beneath. Flowers white or pink.

Occasional in marshy situations.

Fls. & Frts.: Sept. Nov.

P. plebejum R. Br., Prodr. 420. 1810.

Small, erect or prostrate herbs. Ochreae membranous, irregularly lacerate. Flowers white or pink.

Common, in open fields.

Fls. & Frts.: Nov. June

Rumex dentatus L., Mant. Pl. 2: 226. 1771.

Annual herbs. Flowers in whorls. Fruiting tepals irregularly toothed.

R. hastatus D. Don, Prodr. Fl. Nepal. 74. 1825.

Perennial, suffruticose herbs, distinguished by triangular hastate leaves and inner orbicular fruiting tepals.

Abundant, on rocky slopes.

Fls. & Frts.: Nov. June

R. nepalensis Sprengel., Syst. Veg. 2: 159. 1825.

Erect, perennial herbs. Basal leaves long petioled. Flowers in whorls. Inner fruiting tepal with hooked teeth.

Common.

Fls. & Frts.: May Oct.

PIPERACEAE

Peperomia tetraphylla (Forst.f.) Hook.f. & Arn., Bot. Beech. Voy. 97. 1832.
Piper tetraphyllum Forst.f.

Succulent herbs. Leaves in whorls of 4. Flowers in erect spikes, green.

Few, under shade of boulders.

Fls. & Frts.: Oct. Nov.

PROTEACEAE

Grevillea robusta A. Cunn. ex R. Br., Prodr. Nov. 24. 1830.

Large trees, planted.

LORANTHACEAE

Scurrula pulverulenta (Wall.) G. Don, Gen. Syst. 3: 421. 1834.

Herbs or undershrubs. Young parts and inflorescence with mealy tomentum. Leaves thick. Flowers purple-brown.

Few, parasites on trees.

Fls. & Frts.: Sept. March

SANTALACEAE

Osyris wightiana Wallich ex Wight., *Icon. Pl. Ind. Or.* 5: t. 1853. 1852.

Large, erect shrubs. Leaves thick. Flowers minute, polygamous.

Few, on rocky slopes.

Fls. & Frts.: Aug. Oct.

EUPHORBIACEAE

Acalypha ciliata Forsskal, *Fl. Aegypt.-Arab.* 162. 1775.

Annual herbs. Stems ribbed. Leaves long petioled. Bracts with ciliate teeth.

Common, in waste places.

Fls. & Frts.: Aug. Nov.

Arachne cordifolia (Decne.) Hurusawa in *J. Fac. Sci. Univ. Tokyo B.* 6: 339. 1954. *Leptopus cordifolia* Decne.

Undershrubs or shrubs. Male flowers in axillary clusters; female solitary. Fruits globose.

Occasional, on slopes.

Fls. & Frts.: Major part of the year.

Baliospermum montanum (Willd.) Muell.-Arg. in *DC., Prodr.* 15(2): 1125. 1866. *Jatropha montana* Willd.

Small, deciduous shrubs. Lower leaves often 3-5 fid. Male flowers in inflorescence; female solitary.

Few, near the cultivated fields.

Fls. & Frts.: Nov. May

Bridelia verrucosa Haines in *J. Bot.* 59: 193. 1921.

Evergreen shrubs. Leaves elliptic-obovate, lateral nerves 10-20 pairs. Flowers yellowish-green, in axillary clusters. Drupes ellipsoid.

Few, on rocky slopes by the side of river.

Fls. & Frts.: Nov. Feb.

Croton bonplandianum Baillon in *Adansonia* 4: 339. 1864.

Annual herbs. Leaves with 2 glands at base. Female flowers in the lower part of inflorescence and male in the upper, creamy. Fruits trigonous.

Common, in waste places around Tehri.

Drypetes roxburghii (Wallich) Hurusawa in *J. Fac. SC. Univ. Tokyo Sect. 3. Bot.* 4: 335. 1954.

Planted.

Emblica officinalis Gaertner, *Fruct.* 2: 122. t. 108. 1790. *Phyllanthus emblica* L.
"AONLA"

Middle sized trees. Leaves small, distichously arranged along the branchlets giving pinnate appearance. Flowers greenish yellow. Fruits globose, fleshy.

Scarce, on slopes.

Fls. & Frts.: Major part of the year.

Euphorbia geniculata Ortega Nov. *Rar. Fl. Hort. Martr. Decad.* 18. 1797.

Fistular stemmed herbs. Leaves variable. Involucre with a single well developed gland.

Common, in cultivated fields.

Fls. & Frts.: July Aug.

E. helioscopia L., Sp. Pl. 459. 1753.

Erect, annual herbs. best distinguished by leafy bracts. Involucre with 4-5 glands along the upper margins.

Not common.

Fls. & Frts.: Feb. May

E. hirta L., Sp. Pl. 454. 1753.

Erect-ascending herbs. Leaves opposite, long hairy beneath. Involucre in dense, globose, axillary and terminal cymes.

Common, in open places.

Fls. & Frts.: Major part of the year.

E. hypericifolia L., Sp. Pl. 454. 1753.

Prostrate or decumbent-ascending herbs. Leaves opposite. Gland appendages petioled.

Frequent, on grassy slopes.

Fls. & Frts.: Major part of the year.

E. peplus L., Sp. Pl. 456. 1753.

Tender herbs. Seeds pitted.

Frequent, in waste places.

Fls. & Frts.: July Feb.

E. royleana Boiss. in DC., Prodr. 15(2): 83. 1862.

Deciduous shrubs or small trees. Branches whorled, 5-7 angled, ridged, ridge with stipular spines. Leaves spatulate, thick. Capsules pale grey, lobed.

Common, throughout the area.

Fls. & Frts.: March April

E. thymifolia L., Sp. Pl. 454. 1753.

Prostrate-ascending, usually coppery tinged herbs. Leaves opposite, stipules elongate, fimbriate. Involucres axillary, solitary or 2-3 together.

Frequent.

Fls. & Frts.: April Sept.

Glochidion velutinum Wight, Icon. Pl. Ind. Or. 5. t. 1907. 1852.

Small trees. Young branches, petioles and leaves beneath velvety pubescent. Flowers in axillary cluster, greenish yellow. Fruits 4-7 lobed.

Common, on shady slopes.

Fls. & Frts.: May Oct.

Jatropha curcas L., Sp. pl. 1006. 1753.

Erect shrubs. Leaves divided less than halfway down. Flowers greenish. Fruits yellow turning to black.

Fls. & Frts.: May Oct.

Mallotus philippensis (Lam.) Muell.-Arg. in *Linnaea* 34: 196. 1865. *Croton philippensis* Lam.

Shrubs or small trees. Petiole with a sessile gland on each side. Flowers dioecious. Fruits 3-lobed, covered with the red powder.

Fairly common.

Fls. & Frts.: Sept. Dec.

Phyllanthus fraternus Webster in *Contrib. Gray Herb.* 176: 53. 1955.

Erect, annual herbs. Male flowers 1-3 together; female solitary. Fruits smooth.

Few, in cultivated fields.

Fls. & Frts.: July Nov.

P. virgatus J.G. Forst., Prodr. 65. 1786.

Perennial herbs. Stipules peltate. male and female flowers solitary. Fruits rough.

Few, along the foot path.

Fls. & Frts.: July Oct.

Ricinus communis L., sp. Pl. 1007. 1753.

Shrubs or small trees, Stems fistuler. Leaves peltate, orbicular, palmatifid. Fruits muricate.

Common, in waste places.

Fls. & Frts.: May Dec.

Sapium insigne (Royle) Benth. ex Hook.f. in Fl. Brit. India 5: 471. 1888.

Falconeria insigne Royle

Medium sized trees. Leaves crowded towards the end of branches. Flowers in spikes appearing before the leaves, greenish.

Common.

Fls. & Frts.: Feb. - July

Securinega virosa (Roxb. ex Willd.) Baillon in Adansonia 6: 334. 1886.

Phyllanthus virosus Roxb. ex Willd.

Evergreen undershrubs. Stipules scarious. Flowers in axillary cluster, yellow-green. Fruits succulent, white.

Few, on open slopes.

Fls. & Frts.: May - June

URTICACEAE

Boehmeria platyphylla D. Don, Prodr. Fl. Nep. 60. 1825.

Undershrubs. Leaves opposite, coarsely crenate-serrate. Flower clusters in spikes.

Common.

Fls. & Frts.: Aug. Jan.

B. rugulosa Wedd., Monog. Urtic. 378. 1856.

Medium sized, evergreen trees. Leaves alternate, hoary beneath. Clusters of flowers in spikes.

Few, on open slopes.

Fls. & Frts.: July Oct.

Debregeasia salicifolia (D. Don) Rendle in Prain, Fl. Trop. Africa 6(2): 295. 1917.

Boehmeria salicifolia D. Don

Large, evergreen shrubs. Branches and leaves beneath white. Stipules bifid. Flowers usually dioecious, arranged in axillary heads.

Few, in shady moist situations near water course.

Fls. & Frts.: March Aug.

Maoutia puya (Hook.f.) Wedd. in Ann. Sci. Nat. Ser. 4. 1: 193. 1854. *Boehmeria puya* Hook.f.

Undershrubs. Leaves white lanate beneath. Stipules connate at base. Female flowers without perianth.

Frequent, on slopes in moist places.

Fls. & Frts.: July Nov.

Oreocnide frutescens (Thunb.) Miq. in Ann. Mus. Bot. Lugd. Bat. 3: 131. 1867.

Urtica frutescens Thunb.

Shrubs. Leaves grey or white beneath. Flowers in clusters or short cymes in the axil of the previous years leaves. Stigma sessile.

Occasional, on rocks near water source.

Fls. & Frts.: Sept. Oct.

Pilea microphylla (L.) Liebm. in Vidensk. Selsk. Skr. 5(2): 296. 1851. *Parietaria microphylla* L.

Small, somewhat fleshy annual herbs. Leaves small, appearing as whorled, sessile, with shining glands on the lower surface.

Few, in moist, shady places.

Fls. & Frts.: Major part of the year.

Pouzolzia zeylanica (L.) Bennett & Brown, Pl. Jav. Rar. 67. 1854. *Parietaria zeylanica* L.

Erect, branched herbs. Stems tetragonous. Leaves opposite or alternate. Flowers in axillary clusters.

Few.

Fls. & Frts.: Aug. Nov.

Urtica ardens Link, Enum. Hort. Berol. 2: 385. 1822. *U. parviflora* Roxb.

Erect, perennial herbs with stinging hairs. Leaves crenate-serrate. Stipules connate. Flowers monoecious.

Common.

Fls. & Frts.: Aug. Oct.

U. dioica L., Sp. Pl. 984. 1753.

Perennial herbs, stems robust, grooved. Leaves ovate or lanceolate, pointed. Stipules usually free.

Common, in waste places.

Fls. & Frts.: Sept. March

U. urens L., Sp. Pl. 984. 1753.

Distinguished from *U. ardens* in having glabrous incised leaves.

Common, in waste places.

Fls. & Frts.: March - June

ULMACEAE

Celtis australis L., Sp. Pl. 1043. 1753. "KHARIK"

Large, deciduous trees. Leaves elliptic, ovate, caudate-acuminate, serrate. Drupes ellipsoid.

Common along the cultivated fields.

Fls. & Frts.: April Oct.

Holoptelea integrifolia Planchon in Ann. Sci. Nat. Ser. 3. 10: 266. 1843.

Large, deciduous trees. Leaves elliptic. Fruits with reticulate veins. Scattered.

Fls. & Frts.: March. Aug.

Trema politoria Planchon in Ann. Sci. Nat. Ser. 3, 10: 326. 1848.

Small, evergreen trees. Leaves very rough to touch. Flowers usually monoecious, in compound cymes.

Few, on slopes.

Fls. & Frts.: Major part of the year.

CANNABACEAE

Cannabis sativa L., Sp. Pl. 1027. 1753. "BHANG"

Tall, annual herbs. Dioecious. Leaves 3-11 foliolate or partite.

Common, in waster places.

Fls. & Frts.: June Oct.

MORACEAE

Ficus auriculata Lour., Fl. Cochinch. 666. 1790. "TIMLA"

Small, evergreen trees. Leaves broadly ovate or rounded, strongly 5-7 nerved at base. Receptacles 7 cm across.

Frequent, near inhabitations.

Fls. & Frts.: Feb. June

F. benghalensis L., Sp. Pl. 1059. 1753.

"BARGAD"

Large trees. Leaves coriaceous, 3-7 nerved at base. Figs red when mature. Frequent.

Fls. & Frts.: May Aug.

F. clavata Wallich ex Miq. Lond. J. Bot. 7. 431. 1848.

"CHHANCHARY"

Evergreen shrubs or small trees. Leaves obovate-lanceolate. Figs rough, globose or obovoid.

Common, near the cultivated fields.

Fls. & Frts.: June Oct.

F. hispida L.f., Suppl. 442. 1781.

Shrubs or small trees. Leaves usually opposite, 3-5 nerved at base. Receptacles up to 2.5 cm across. Peduncles in pairs or in fascicles from short and tuberculate branches at base.

Occasional, on shady slopes.

Fls. & Frts.: May Aug.

F. palmata Forsskal, Fl. Aegypt.-Arab. 179. 1775.

"BEDU"

Shrubs or small trees. Leaves entire or 3-5 lobed, 3-nerved at base. Receptacles solitary, axillary.

Common, throughout the area.

Fls. & Frts.: April - July.

F. racemosa L., Sp. Pl. 1059. 1753.

"GULAR"

Tall trees. Leaves thin, ovate-oblong or elliptic-lanceolate, 3-nerved at base. Receptacles on short leafless branches.

Occasional.

F. religiosa L., Sp. Pl. 1059. 1753. "PIPAL"

Large trees, epiphytic in early stages. Leaves caudate, 5-7 nerved at base. Receptacles axillary, in pairs.

Common, throughout the area.

Fls. & Frts.: May Oct.

F. sarmentosa Buch.-Ham. ex J.E. Smith in Rees, Cyclop. 14. n. 45. 1810. "BEDULI"

Extensive, evergreen climbers or creepers. Differs from *F. scandens* in having sessile or subsessile receptacles and the length of the leaves which is more than twice of the breadth.

Few, on rocks.

Fls. & Frts.: June Oct.

F. scandens Roxb., Fl. Ind. 3: 536. 1832.

Scandent or creeping shrubs. Leaves ovate or elliptic-ovate, 3-nerved at base. Receptacles 1-2 in the axils, long peduncled.

Occasional, creeping on rocks.

F. semicordata Buch.-Ham. ex J.E. Smith in Rees, Cyclop. 14: no. 71. 1810. "KHAINA"

Trees. Best distinguished by the very unequal sided leaf base. Figs globose on aerial roots.

Common.

Fls. & Frts.: April Aug.

Morus alba L., Sp. Pl. 986. 1753. "TOOT"

Small or medium sized trees. Monoecious. Leaves ovate, dentate or lobed. Flowers on short, ovoid spikes.

Common, near the villages.

Fls. & Frts.: March May

JUGLANDACEAE

Engelhardtia spicata Leschen. ex Blume var. *colebrookeana* (Lindl. ex Wall.)
Koord. & Valet., Bijdr. 5: 169. 1900.

Trees. Leaves opposite, elliptic-oblong, obtuse, entire. Nuts small, globose, hairy, within long fruiting bracts.

Occasional, on slopes.

Fls. & Frts.: April - June

Juglans regia L., Sp. Pl. 997. 1753.

"AKHAROT"

Planted along the road sides.

SALICACEAE

Populus alba L., Sp. Pl. 1034. 1753.

Planted along the road sides.

Saix tetrasperma Roxb., Pl. Corom. 1: 66. t. 97. 1795.

Shrubs or small trees. Leaves lanceolate or ovate-lanceolate, glaucous beneath. Flowers in catkins.

Occasional on river beds.

Fls. & Frts.: March May

CUPRESSACEAE

Cupressus torulosa Don in Lambert, Descr. Gen. Pinus 2: 18. 1824.

Planted.

Thuja occidentalis L., Sp. Pl. 1002. 1753.

Planted.

T. orientalis L., Sp. Pl. 1002. 1753.

Planted.

PINACEAE

Pinus roxburghii Sargent, Silva N. Amer. 2. 9. 1897.

Large, evergreen trees. Trunks deeply furrowed. Leaves (needles) in bundles of 3. Cones solitary or 2-5 together.

Common on higher reaches.

HYDROCHARITACEAE

Blyxa aubertii Roch. in Mem. Acad. Sci. Inst. France 12(2): 19 & 77. t. 4. 1812.

Submerged, acaulescent herbs. Leaves linear, dentate.

Few, in stagnant water in paddy fields.

Fls. & Frts.: Sept. Nov.

Hydrilla verticillata (L.f.) Royle, Ill. Bot. Himal. 1: 376. 1839. *Serpicula verticillata* L.f.

Submerged, fresh water herbs. Leaves in whorls of 3-8. Flowers unisexual.

Scarce, in running water.

Fls. & Frts.: Dec. March

ORCHIDACEAE

Epipactis veratrifolia Boiss., Diagn. Pl. Orient. Ser. 1. 11. 1842.

Terrestrial orchids. Leaves lanceolate-oblong. Lip of the flowers purplish tinged.

Frequent, in marshy places by the river side.

Fls. & Frts.: March April

Gastrochilus inconspicuus (Hook.f.) O. Kuntze., Rev. Gen. 2: 661. 1891. *Luisia inconspicua* (Hook.f.) Hook.f. ex King & Pantl.

Slender herbs, 10-15 cm tall. Leaves slender, 3-5 cm long. Spikes 1-3 flowered, pale or yellow green, lip flat, purple spotted.

Restricted, epiphytic over *Euphorbia royleana* on dry slopes.

Fls. & Frts.: Aug. Sept.

Luisia zeylanica Lindley, *Fol. Orch.* Luisia 3. 1853. *L. teretifolia* auct. non Gaudich

Stout, branching herbs. Leaves terete, spreading, 6-15 cm long. Flowers green. Lip with dark maroon bands.

Few, epiphytic on *Euphorbia royleana*.

Fls. & Frts.: May Sept.

Spiranthes sinensis (Pers.) Ames, *Orch.* 2: 53. 1908. *Neottia sinensis* Pers.

Terrestrial orchids with thick, fibrous roots. Leaves clustered near the base. Flowers in secund or subsecund spikes, white or pink.

Fls. & Frts.: March April

Vanda testacea (Lindley) Reichb.f. in *Gard. Chron.* 2: 166. 1877.

Epiphytic. Leaves channelled, 2-3 toothed at apex. Flowers pale yellow.

Frequent, on *Euphorbia royleana* and *Lanea coromandelica* etc.

Fls. & Frts.: May July

ne strateumatica (L.) Schltr. in *Fedde Repert.* 1: 77. 1911.

Terrestrial orchids. Leaves linear-lanceolate. Lip panduriform.

Frequent, in moist grassy open fields by the river side.

Fls. & Frts.: March April

ZINGIBERACEAE

Elettaria cardamomum (L.) Maton in *Trans. Linn. Soc. Lond.* ~~1817~~ **BARIZLAICHI**.

Planted, at Pendars village.

Hedychium spicatum Buch.-Ham. ex Smith, var. **acuminatum** (Roscoe) Wallich in *Hook. J. Bot. Kew Gard. Misc.* 5: 328. 1853.

Tall, robust herbs. Leaves broadly lanceolate, ending in a tail like tip. Flowers fragrant, white.

Few.

Fls. & Frts.: July Sept.

Zingiber officinale Roscoe in Trans. Linn. Soc. London 8: 348. 1807. "AADU"

Cultivated.

CANNACEAE

Canna indica L., Sp. Pl. 1. 1753.

Rootstock tuberous; stems tall. Flowers bright red.

Planted.

MUSACEAE

Musa paradisiaca L., Sp. Pl. 1043. 1753.

"KELA"

Planted.

AMARYLLIDACEAE

Zephyranthes carinata Herbert in Bot. Mag. t. 2594. 1825.

Bulbous herbs. Flowers pink.

Escape.

Fls.: Oct.

AGAVACEAE

Agave cantula Roxb., Fl. Ind. 2: 167. 1832.

"RAM BANS"

Easily distinguished by thick, spiny margined leaves. Bulbils present.

Common, on open slopes.

Fls. & Frts.: Aug. Sept.

DIOSCOREACEAE

Dioscorea belophylla (Prain) Voigt ex Haines, For. Fl. Chota Nagpur 530. 1910.

Glabrous climbers, twining to the right. Leaves simple. Capsules 2.5 cm, as long as broad.

Common, twining over bushes.

Fls. & Frts.: July Sept.

D. bulbifera L., Sp. Pl. 1033. 1753.

"GAINTHI"

Glabrous climbers, twining to the left. Leaves simple. Capsules oblong. Seeds winged at the base.

Common, throughout the area.

Fls. & Frts.: Aug. Sept.

LILIACEAE

Allium cepa L., Sp. Pl. 300. 1753.

"PYAZE"

Cultivated.

A. rubellum M. Bieb., Taur. Cauc. 1: 264. 1808.

Bulbous herbs. Leaves filiform. Flowers in subglobose heads, rosy.

Fls. & Frts.: July Oct.

Included on the authority of Bhattacharyya & Goel (1982).

A. sativum L., Sp. Pl. 296. 1753.

"LAHSUN"

Cultivated.

Aloe vera (L.) Burm.f., Fl. Ind. 83. 1768.

Herbs with fleshy leaves.

Fls. & Frts.: Sept. - June

Not common, in waste places.

Asparagus curillus Buch.-Ham. ex Roxb., Fl. Ind. 2: 152. 1832.

Armed shrubs. Flowers white.

Few, on slopes.

Fls. & Frts.: Aug. Nov.

A. gracilis Royle, Ill. Bot. Himal. 393. 1840.

Unarmed shrubs. Flowers dirty white.

Few, on hill slopes.

Fls. & Frts.: Aug. Oct.

Asphodelus tenuifolius Cav. Anal. Scienc. Nat. 3: 46. t. 27. f. 2. 1801.

Annual herbs. Leaves in basal rosette, fistular. Scapes many. Flowers whitish.

Few, near marshy places.

Fls. & Frts.: July Oct.

Gagea pseudoreticulata Ved. in Fl. Tunan. 1(2): 268. 1932. *G. reticulata* Schultes f.

Small, bulbous herbs. Stem short, usually overtopped by leaf. Flowers in umbels, yellow.

Frequent.

Fls. & Frts.: April - June

Gloriosa superba L., Sp. Pl. 305. 1753.

Biennial herbs. Leaves cirrhose. Flowers showy, crispy undulate margined.

Few, amidst bushes.

Fls. & Frts.: Sept. Nov.

Notholirion thomsonianum (Royle) Stapf in Kew Bull. 1934: 95. 1934. *Fritillaria thomsonianum* Royle

Biennial herbs. Leaves oblong-linear, sessile. Flowers pale pink.

Fairly common, on slopes at Pendars vilalge.

Fls. & Frts.: April May

Tulipa clusiana DC., f. *stellata* (Hook.) S. Das Gupta & Deb in Candollea 40(1): 165. 1985.

Bulbous herbs. Flowers usually solitary, white, tinged red.

Frequent, at Pendars village, on grassy slopes.

Fls. & Frts.: April May

SMILACACEAE

Smilax aspera L., Sp. Pl. 1021. 1753.

Prickly climbers. Leaves ovate-triangular. Fruits green.

On shady slopes.

Fls. & Frts.: June Nov.

COMMELINACEAE

Commelina benghalensis L., Sp. Pl. 41. 1753.

Annual herbs. Leaves ovate-elliptic or oblong-lanceolate. Spathes 2-3, ending the branches. Flowers blue. Staminodes present.

Common.

Fls. & Frts.: July Nov.

Cyanotis cristata (L.) D. Don, Prodr. Fl. Nepal. 46. 1825. *Commelina cristata* L.

Annual herbs. Stems with single line of hairs. Leaves sessile. Bracts foliaceous. Flowers blue, staminodes absent.

Common, in waste places.

Fls. & Frts.: Sept. Nov.

Murdannia nudiflora (L.) Brenan in Kew Bull. 1952. 189. 1952: *Commelina nudiflora* L.

Annual herbs. Leaves sessile, linear-lanceolate to oblong. Flowers in cymose panicles, pink or purplish.

Common.

Fls. & Frts.: Aug. Nov.

JUNCACEAE

Juncus bufonius L., Sp. Pl. 328. 1753.

Erect, tufted annual herbs. Leaves linear. Flowers sessile, 1-6 in the cluster.

Common, in marshy places.

Fls. & Frts.: Jan. May

ARECACEAE

Phoenix humilis Royle ex Becc. & Hook.f., Fl. Brit. Ind. 6: 416. 1892.

Tall, erect palms up to 5 m. Crown spreading. Leaflets opposite. Flowers dioecious, pale yellow or yellowish green.

Common, towards Koteshwar.

Fls. & Frts.: Oct. - June

ARACEAE

Acorus calamus L., Sp. Pl. 324. 1753.

Perennial herbs. Rootstock rhizomatous. Leaves equitant, suboblique at apex. Spathe linear, foliaceous.

Common, in marshy places.

Fls. & Frts.: April - July

Colocasia esculenta (L.) Schott in Schott & Endl., Melet. Bot. 18. 1832. *Arum esculentum* L. "PINDALU"

Cultivated.

Sauromatum venosum (W. Ait.) Kunth, Enum. Pl. 3: 28. 1841. *Arum venosum* Ait.

Perennial, tuberous herbs. Leaves appearing after flowers, pedately partite. Spathe lanceolate-oblong.

Few, in waste places.

Fls. & Frts.: July Aug.

LEMNACEAE

Lemna perpusilla Torrey, Fl. New York 2: 245. 1843.

Small, floating, green, scale-like plants. Fronds with single root, flat, on both surfaces.

Not common, in running water.

Fls. & Frts.: Aug. - Nov.

Spirodela polyrhiza (L.) Schleiden in Linnaea 13: 392. 1839. *Lemna polyrhiza* L.

Floating in still waters.

Fls. & Frts.: May Aug.

ALISMATACEAE

Alisma plantago-aquatica L., Sp. Pl. 342. 1753.

Erect herbs. Leaves linear to ovate-lanceolate. Flowers in whorled panicles, white or pink.

Common, in marshy situations.

Fls. & Frts.: April Aug.

POTAMOGETONACEAE

Potamogeton natans L., Sp. Pl. 126. 1753.

Leaves floating, ovate-oblong, entire. Flowers crowded in spikes.

Common.

Fls. & Frts.: April - June

ERIOCAULACEAE

Eriocaulon cinereum R. Br., Prodr. Fl. nov. Holl. 254. 1810.

Annual, small herbs. Leaves basal, in a rosette, scapes many, erect. Heads blackish white.

Common in stagnant water in paddy fields.

Fls. & Frts.: Aug. Oct.

CYPERACEAE

Bulbostylis barbata (Rottb.) C.B. Clarke in Hook.f., fl. Brit. Ind., 6. 651. 1893.
Scirpus barbatus Rottb.

Slender herbs. Leaves filiform. Spikelets in dense, globose, clusters.

Fls. & Frts.: Aug. Nov.

Carex sp. (near *C. stenophylla* Wahlenb)

Spikelets young.

Carex sp. (near *C. wallichiana* Presc.)

Specimen with young spikelets.

Cyperus brevifolius (Rottb.) Hassk. Cat. Hort. Bogor. 24. 1844. *Kyllinga brevifolia* Rottb.

Sedges with stoloniferous rhizomes. Spikes solitary. Fertile glumes concave, keeled.

Cyperus compressus L., Sp. Pl. 46. 1753.

Annuals. Stems trigonous. Leaves basal. Inflorescence umbellate. Style arms 3. Nuts trigonous.

Occasional, in moist places.

Fls. & Frts.: Sept. - Nov.'

C. corymbosus Rottb., Descr. Pl. 19. 1772.

Tall, glabrous rhizomatous herbs. Primary bracts 2-3, leaf like, up to half the length of the inflorescence. Spikelets 10-40 flowered.

Scarce, in marshy places.

Fls. & Frts.: Aug. Dec.

C. difformis L., Cent. Pl. 2: 6. 1756.

Annual herbs. Stems triquetrous. Leaves basal, shorter than the stems. Spikelets in dense, globose heads.

Occasional, in marshy situations.

Fls. & Frts.: Aug. Nov.

C. esculentus L., Sp. Pl. 67. 1753.

Erect sedges. Leaves shorter than the stems. Glumes boat shaped.

Fls. & Frts.: Aug. Oct.

C. flavidus Retz., Obs. Bot. 5. 13. 1788.

Annuals. Leaves often longer than the stems. Inflorescence compound umbel. Bracts overtopping the inflorescence.

Fls. & Frts. : Major part of the year.

C. niveus Retz., Obs. Bot. 5. 12. 1788.

Distinguished by white spikelets.

Common.

Fls. & Frts.: April Aug.

C. paniceus (Rottb.) Boeck. in Linnaea 36: 381. 1870. *Kyllinga panicea* Rottb.

Stems 15-60 cm long. Leaves as long as the stems. Fertile flower one. Nut black.

Frequent.

Fls. & Frts.: Aug. Sept.

C. rotundus L., Sp. Pl. 45. 1753.

Perennial with woody, stoloniferous rhizomes. Leaves basal. Bracts 3, unequal.

Frequent.

Fls. & Frts.: Major part of the year.

C. squarrosus L., Cent. Pl. 2: 6. 1756.

The recurved mucro of the glumes is very characteristic of this species.

Fls. & Frts.: July Nov.

Eleocharis atropurpurea (Retz.) Kunth, Enum. Pl. 2: 151. 1837.

Annual, glabrous herbs. Spikelets ovoid-cylindric. Nuts dark brown, biconvex.

Common in stagnant water in rice fields.

Fls. & Frts.: Aug. Nov.

E. congesta D. Don, Prodr. Fl. Nepal. 41. 1825.

Annuals or perennials, tufted. Sheaths mucicous or with a minute mucro at the mouth. Nuts trigonous.

Few, in marshy situations.

Fls. & Frts.: Aug. Dec.

E. palustris (L.) Roemer & Schultes, Syst. Veg. 2: 151. 1817.

Rhizomes creeping. Stems 15-60 cm tall. Nuts pale yellow or brown, smooth, flattened.

Fls. & Frts.: July Oct.

Eriophorum comosum (Wallich) Wallich ex C.B. Clarke in Hook.f., Fl. Brit. Ind. 6: 664. 1893.

Glabrous, tufted, slender sedges. Leaves many. Bristles divided into hairs. Spikelets numerous, brown. Nuts slender, Pointed.

Common, hanging from rocks.

Fls. & Frts.: Aug. Oct.

Fimbristylis bisumbellata (Forsskal) Bub., Dodec. 30. 1850.

Annuals. Leaves basal, somewhat falcate, usually half as long as the stems. Inflorescence compound umbel. Style arms 2. Nuts biconvex.

Common.

Spikes : July Nov.

F. dichotoma (L.) Vahl, Enum. Pl. 2: 287. 1806. *Scirpus dichotomus* L.

Like *F. bisumbellata* but with longer spikelets and nuts.

Common.

Spikelets : July - Nov.

F. falcata (Vahl) Kunth, Enum. Pl. 2: 239. 1837. *Scirpus falcatus* Vahl

Small, tufted, glabrous sedges. Leaves short, stiff, obtuse. Spikelets linear, red-brown. Style arms 3. Nuts smooth, trigonous.

Scattered, on open slopes along the footpaths.

Spikelets: July Oct.

F. ferruginea Vahl, Enum. Pl. 2: 291. 1806.

Tufted sedges. Leaves half as long as the stems or less. Spikelets in umbels. Glumes puberulous. Stigmas 2. Nuts biconvex.

Frequent.

Fls. & Frts.: April Oct.

POACEAE

Acrachne racemosa (Heyne ex Roemer & Schultes) Ohwi in Bull. Tokyo Sci. Mus. no. 18: 1. 1947. *Eleusine racemosa* Heyne ex Roemer & Schultes

Annual herbs. Inflorescence digitate-subdigitate. Spikelets 6-12 flowered.

Fls. & Frts.: July Oct.

Alopecurus aequalis Sobol, Fl. Petrop. 16. 1799.

Annuals. Panicles cylindrical. Glumes jointed at base.

Common, on open slopes.

Fls. & Frts.: Dec. May

Apluda mutica L., Sp. Pl. 82. 1753.

Perennials. Inflorescence spathaceous. Spikelets one sessile and other two pedicelled.

Common, on open slopes.

Fls. & Frts.: Major part of the year.

Aristida adscensionis L., Sp. Pl. 82. 1753.

Slender grasses. Inflorescence contracted. Awn of the lemma trifold.

Scarce.

Fls. & Frts.: Aug. Oct.

A. cyanantha Nees ex Steud., *Syn. Pl. Glum.* 1: 141. 1854.

Bushy perennials. Panicles effuse. Awn of the lemma trifid.

Fls. & Frts.: Aug. Oct.

Arthraxon lanceolatus (Roxb.) Hochst. in *Flora* 31: 1856.

Glumes ascending. Leaves ovate-lanceolate. Lower glume of the sessile spikelets pectinate on the keels.

Scattered.

Fls. & Frts.: Aug. Dec.

A. lancifolius (Trin.) Hochst. in *Flora* 39: 188. 1856. *Andropogon lancifolius* Trin.

Culms decumbent-ascending. Leaves lanceolate-oblong. Racemes 3-6.

Common, in moist situations by the side of water.

Fls. & Frts.: Aug. Nov.

Arundinella nepalensis Trin., *Gram. Panic.* 62. 1826.

Perennials. Leaves and sheaths tubercle based hairy. Panicles up to 40 cm long. Awn of the lemma geniculate.

Fls. & Frts.: Sept. Nov.

Avena fatua L., *sp. Pl.* 80. 1753.

Stout annuals. Leaves rough. Panicles 15-25 cm long. Spikelets drooping. Lemma 2-toothed, hairy on back.

Common, in cultivated fields.

Fls. & Frts.: Feb. April

Bothriochloa pertusa (L.) A. Camus in Ann. Soc. Lin. Lyon. 1930. n.s. 76. 114. 1931.

Perennials. Distinguished by the pitted lower glume of the sessile spikelet.

Frequent.

Fls. & Frts.: March Sept.

Brachiaria distachya (L.) Stapf in Prain, Fl. Trop. Afr. 9: 565. 1919. *Panicum distachyon* L.

Creeping or decumbent annuals or perennials. Sheaths ciliate along one margin. Pedicels of the spikelets triquetrous.

Occasional.

Spikelets : Oct. March

B. ramosa (L.) Stapf in Prain, Fl. Trop. Afr. 9: 542. 1919. *Panicum ramosum* L.

Annuals. Leaves ovate-lanceolate. Spikelets in racemes. Pedicels with 1-3 hairs.

Fls. & Frts.: July Oct.

Chloris dolichostachya Lagasca, Gen. et Sp. Pl. 5. 1816.

Perennials. Spikes 4-6, digitate. Lemmas awned.

Few, in shady places.

Fls. & Frts.: Aug. Oct.

Chrysopogon serrulatus Trin., in Mem. Acad. Sci. Petersb. 6(2): 318. 1832.

Perennials. Spikelets in panicles, 3-together, 1-sessile, 2-pedicelled. Upper glume of the sessile spikelets ciliate.

Common, on slopes.

Fls. & Frts.: July Nov.

Cymbopogon jwarancusa (Jones) Schultes Subsp. *olivieri* (Boiss.). Soenarko in *Reinwardtia* 9: 307. 1972.

Perennials. Panicles interrupted by spathes. Pairs of racemes unequal. Joints and pedicels long hairy.

Common, on shady slopes.

C. martinii (Roxb.) Wats. in *Atkins., Gaz.* N.W. Prov. India 392. 1882.
Andropogon martinii Roxb.

Distinguished by linear-lanceolate leaves with semiamplexicaule, rounded-cordate base.

Common on shady slopes.

Fls. & Frts.: Aug. Nov.

Cynodon dactylon (L.) Pers., *Syn. Pl.* 1: 85. 1805. *Panicum dactylon* L.

Perennials with underground rhizomes. Spikes 2-4, digitate. Spikelets awnless.

Common, throughout.

Fls. & Frts.: Major part of the year.

Actyloctenium aegyptium (L.) Willd., *Enum. Hort. Berol.* 1029. 1809.
Cynosurus aegyptius L.

Annuals. Culms creeping and rooting at the nodes. Spikes 2-6, digitate. Upper glume awned.

Fairly common.

Spikelets : July Oct.

Dendrocalamus strictus (Roxb.) Nees in *Linnaea* 9: 476. 1834. "BANS"

Differentiated from the other genera by arborescent habit and globose heads of spikelets (when present).

Occasional, on rocky slopes.

Dichantium annulatum (Forsskal) Stapf in Prain, Fl. Trp. Africa 9: 178. 1917.
Andropogon annulatus Forsskal

Perennial grasses. Nodes bearded. Racemes 2-4, subdigitate. Lower glume of the sessile spikelets 2-keeled, ciliate on keels.

Common.

Fls. & Frts.: Major part of the year.

Digitaria abludens (Roemer & Schultes) Veldk. in Blumea 21: 53. 1973.

Annuals. Racemes 2-4, subdigitate, spikelets with clavate hairs. Lower glume absent.

Fls. & Frts.: May Aug.

D. longiflora (Retz.) Pers., Syn. Pl. 1: 85. 1805.

Annuals. Leaves lanceolate-linear. Racemes 2-3. Spikelets hairy; hairs verrucose.

Fls. & Frts.: Major part of the year.

D. setigera Roth ex Roemer et Schultes, Syst. Veg. 2: 474. 1817.

Tufted annuals. Leaf sheaths covered with white tubercle based hairs. Spikelets in panicles.

Fls. & Frts.: Major part of the year.

D. stricta Roth ex Roemer et Schultes, Syst. Veg. 2: 474. 1817.

Annuals. Leaves ciliate at base. Spikelets elliptic-lanceolate. Lower glume absent.

Occasional.

Fls. Frts.: Aug. Oct.

Echinochloa colona (L.) Link, Hort. Berol. 2: 209. 1833. *Panicum colonum* L.

Annuals. Ligules absent. Spikelets in panicles, hispid. Lower glume 5-nerved; upper glume 7-nerved.

Common, in moist or marshy places.

Fls. & Frts.: Major part of the year.

E. crus-galli (L.) P. Beauv., Ess. Agrost. 53: 161. 1812. *Panicum crus-galli* L.

Erect annuals. Nodes glabrous. Panicles up to 15 cm long. Spikelets awned.

Common, in rice fields.

Fls. & Frts.: Sept. Oct.

E. frumentacea Link, Hort. Berol. 1: 204. 1827.

"JHANGORA"

Cultivated.

Fls. & Frts.: Aug. Oct.

Eleusine coracana (L.) Gaertner, Fruct. 1. 8. t. 1. f. 11. 1789. *Cynosurus coracana* L.

Cultivated.

Eragrostis atrovirens (Desf.) Trin. ex Steud., Nom. Bot. ed 2. 1: 502. 1840.
Poa atrovirens Desf.

Perennials. Spikelets many flowered, breaking up from below upwards.

Frequent in moist shady places by the river side.

Fls. & Frts.: Aug. Nov.

E. minor Host, Gram. Austr. 4: 15. 1809.

Annuals. Leaves glandular along the margins. Pedicels with a crateriform gland.

Frequent.

Fls. & Frts.: July Nov.

E. tenella (L.) P. Beauv. ex Roemer & Schultes, Syst. Veg. 2: 576. 1817. *Poa tenella* L.

Annuals. Spikelets breaking up from above downwards, keels of palea ciliate.

Common, on open slopes.

Fls. & Frts.: March Nov.

Eulaliopsis binata (Retz.) Hubb. in Hook., Ic. Pl. 33. subtab. 3262. 1935.
Andropogon binatus Retz.

Perennials, woolly at the base. Leaves narrow, rigid, sharp pointed. Spikes clustered.

Common, on rocky open slopes.

Fls. & Frts.: March Aug.

Hemarthria compressa (L.f.) R. Br., Prodr. 207. 1810. *Rottboellia compressa*
L.f.

Perennials. Racemes solitary. Joints and pedicels fused.

Occasional.

Fls. & Frts.: Major part of the year.

Hordeum vulgare L., Sp. Pl. 84. 1753.

"JAU"

Cultivated.

Imperata cylindrica (L.) Raeuschel., Nom. Bot. ed. 3: 10. 1797. *Lagurus*
cylindricus L.

Perennials. Rootstock creeping, rhizomatous. Panicles cylindric, silky hairy.

Common.

Spikelets : March Sept.

Ischaemum rugosum Salisb., Ic. Strip. Rar. 1. t. 1. 1791.

Annuals. The transversely ridged lower glume of the sessile spikelets is the best distinguishing character of the species.

Occasional in cultivated fields.

Fls. & Frts.: July Nov.

Leptochloa chinensis (L.) Nees in Syll. Ratisb. 1: 4. 1824. *Poa chinensis* L.

Annuals. Ligule lacerate. Florets 3-6 in the spikelets.

Occasional.

L. panicea (Retz.) Ohwi in Bot. Mag. Tokyo 55. 311. 1941. *Poa panicea* Retz.

Annuals. Florets usually 2.

Occasional.

Fls. & Frts.: July Oct.

Lolium temulentum L., Sp. Pl. 83. 1753. var. *temulentum*

Annuals. Spikes solitary. Spikelets awned. Lower glume absent.

Common.

Fls. & Frts.: Nov. March

L. temulentum L., Sp. Pl. 83. 1753. var. *arvense* Lilj., Sv. Fl. 80. 1816.

Differs from var. *temulentum* in the absence of awns.

Occasional.

Fls. & Frts.: Nov. March

Mnesithea laevis (Retz.) Kunth, Rev. Gram. 1: 154. 1829. *Rottboellia laevis* Retz.

Perennials. Best distinguished by the presence of two sessile spikelets at each node.

Frequent.

Fls. & Frts.: Aug. - Jan.

Neyraudia arundinacea (L.) Henr. f. in Meded. Herb. Leid. no. 58. 8. 1929.
Aristida arundinacea L.

Tall, perennials. Panicles spreading, plumose. Florets 5-6 in the spikelets.

Common, on slopes.

Fls. & Frts.: Oct. Dec.

Oplismenus burmannii (Retz.) P. Beauv., Ess. Agrost. 54: 168-169. 1812.
Panicum burmannii Retz.

Annuals. Glumes awned; awns capillary, barbellate.

Common in shady places.

Fls. & Frts.: Aug. Nov.

O. compositus (L.) P. Beauv., Ess. Agrost. 54: 168-169. 1812. *Panicum compositum* L.

Annuals. Glumes awned; awns viscid, smooth.

Common in shady situations.

Fls. & Frts.: Aug. Nov.

Oryza sativa L., Sp. Pl. 1. 333. 1753.

"SAATTI"

Cultivated.

Panicum miliaceum L., Sp. Pl. 58. 1753.

"BHANGNA"

Tufted annuals, branching. Leaves glabrous, ciliate or hirsute. Panicles with filiform branches. Spikelets green, turgid.

Cultivated.

Fls. & Frts.: June - July

Panicum psilopodium Trin., Gram. Panic. 217. 1826.

Annuals or perennials, usually distinguished by purplish coloured spikelets.

Fls. & Frts.: Aug. Oct.

Paspalidium flavidum (Retz.) A. Camus in Lecomte, Fl. Gen. de Indo-Chine 7: 419. 1922.

Tufted annuals or perennials. Inflorescence spiciform, spikes 3-10.

Fairly common.

Fls. & Frts.: July Oct.

Paspalum distichum L., Syst. Nat. ed. 10. 2. : 855. 1759.

Annuals or perennials, creeping and rooting at nodes. Racemes usually 2, rarely 3.

Common, in moist or marshy places.

Fls. & Frts.: Aug. - Dec.

Pennisetum orientale L.C. Rich. in Pers., Syn. Pl. 1: 72. 1805.

Distinguished by villous rachis and ciliate inner bristles at the base of spikelets.

Common.

Fls. & Frts.: March Oct.

Phalaris minor Retz., Obs. Bot. 3: 8. 1783. var. *minor*.

Annuals. Glumes with winged keels is the best identifying character.

Common in fields.

Fls. & Frts.: Feb. May

Phleum himalaicum Mez. in Fedde Rep. 17: 293. 1921.

Annuals. Best distinguished by the pectinate-ciliate glumes of the spikelets.

Common.

Spikelets : March May

Phragmites karka (Retz.) Trin. ex Steud., Nom. Bot. ed. 2. 2: 324. 1841. *Arundo karka* Retz.

Perennial with fistular culms. Panicle effuse, plumose. Rachilla long hairy.

Common.

Fls. & Frts.: Sept. Nov.

Poa annua L., Sp. Pl. 68. 1753.

Annuals. Spikelets more than 2 flowered, Lemma hairy on the nerves.

Common, in moist places.

Fls. & Frts.: Jan. May

Poa Sp. Specimen with too young spikelets.

Pogonatherum paniceum (Lam.) Hack. in Allg. Bot. Zeit. 12: 178. 1906.
Saccharum paniceum Lam.

Perennials, tufted. Racemes solitary. Spikelets awned.

Common.

Fls. & Frts.: July Nov.

Polypogon fugax Nees ex Steud., Syn. Pl. Glum. 1: 184. 1854.

Annuals. Panicles dense. Spikelets 1-flowered. Awns about as long as or little longer than the glumes.

Common, in moist situation.

Fls. & Frts.: Feb. April

P. monspeliensis (L.) Desf., Fl. Atlant. 1: 67. 1798. *Alopecurus monspeliensis* L.

Like *P. fugax* but awns much longer than the glumes.

Common.

Fls. & Frts.: Feb. April

Saccharum spontaneum L., Mant. 2: 283. 1771.

Tall perennials. Panicle silvery white.

Common on the river beds.

Fls. & Frts.: Aug. Nov.

Setaria glauca (L.) P. Beauv., Ess. Agrost. 51. 169. 178. 1812. *Panicum glaucum* L.

Annuals or biennials. Panicles cylindric. Spikelets subtended by bristles. Lemmas rugose.

Common.

Fls. & Frts.: Major part of the year.

S. intermedia Roemer & Schultes, Syst. Veg. 2: 489. 1817.

Annuals. Panicles lobulate. Involucral bristles 1-3.

Common, on open grounds in shady situations.

Fls. & Frts.: Aug. Nov.

S. italica (L.) P. Beauv., Ess. Agrost. 51: 170. 178. 1812. *Panicum italicum* L.
"KAUNI"

Cultivated throughout the area.

S. verticillata (L.) P. Beauv., Ess. Agrost. 51:178. 1812. *Panicum verticillatum* L.

Tall annuals. Bristles retrosely scabrid. Panicles dense, cylindrical.

Common.

Fls. & Frts.: Aug. Sept.

Sporobolus fertilis (Steud.) Clayton in Kew Bull. 19: 291. 1965.

***Themeda anathera* (Nees ex Steud.) Hack. in DC., Monogr. Phan. 6: 669. 1889.**

Perennials. Involucral spikelets clothed with tubercle based bristles.

Fls. & Frts.: July Oct.

***Thysanolaena maxima* (Roxb.) O. Kuntze., Rev. Gen. Pl. 2: 794. 1891. *Agrostis maxima* Roxb.**

Perennials. Culms reed like. Panicle spreading. Spikelets small, 2-flowered.

Common.

Fls. & Frts.: Nov. May

***Tragus roxburghii* Panigrahi in Kew Bull. 29: 495. 1974.**

The armed glumes of the spikelets are characteristic of this species.

Scarce, by the road sides.

Fls. & Frts.: Aug. Oct.

***Tripogon filiformis* Nees ex Steud., Syn. Pl. Glum. 301. 1854.**

Perennials. Spikes solitary. Lemmas 4-lobed, awns 3.

Occasional.

Fls. & Frts.: Sept. Nov.

***T. purpurascens* Duthie in Ann. Roy. Bot. Gard. Calc. 9: 75. 1901.**

Like *T. filiformis* but lemmas only two lobed.

***Triticum aestivum* L., Sp. Pl. 85. 1753.**

"GEHUN"

Widely cultivated.

***Zea mays* L., Sp. Pl. 1: 971. 1753.**

"MUNGRI", "MAKKI"

Cultivated.

FERNS AND FERN-ALLIES

SELAGINELLACEAE

***Selaginella involvens* (Sw.) Spring.**, Bull. Acad. Brux. 10: 136. 1843. *Lycopodium involvens* Sw.

Terrestrials. Stems rigid, branches from the middle of the erect stems. Rhizophores wide creeping. The branches get involutely rolled up during dry period.

Occasional, on moss covered rocky situations.

Strobilus: Sept. Oct.

***S. pallidissima* Spring**, Bull. Acad. Brux. 10: 231. 1843.

Slender, prostrate, branching dichotomously. Rhizophores arising from the joints of dichotomies. Leaves dimorphic, yellowish-green. Strobilus very short.

Common, on moist rocks.

Strobilus: Sept. Oct.

EQUISETACEAE

***Equisetum diffusum* D. Don**, Prodr. Fl. Nepal. 19. 1825.

Tufted, up to 40 cm tall. Stems firm, erect. Fertile and sterile branches alike, short, diffused. Strobilus stalked. Spores reddish brown.

Common, near the streams.

Strobilus : Sept. Oct.

E. ramosissimum* Desf.**, Fl. Atlant. 2: 398. 1800. Subsp. ***ramosissimum

Rhizomes creeping, slender. Stems erect, irregularly branched. Sheaths 5-8, teeth black pointed. Strobilus dense, oblong, apiculate, sessile.

***E. ramosissimum* Subsp. *debile* (Roxb. ex Vouch.) Hauke** in Amer. Fern. J. 52. 1962. *E. debile* Roxb. ex Vouch.

Terrestrials. Sterile and fertile branches alike, lax, simple or irregularly branched. Branches in a whorl, long, slender. Sheaths tight. Strobili terminal, oblong.

Common, along the rice fields or on marshy grounds.

Strobilus : Aug. Sept.

OPHIOGLOSSACEAE

Ophioglossum nudicaule L.f., Suppl. Syst. t. 443. 1781.

Rhizomes short or small, slightly tuberous. Fronds 3-12 cm. The steriles not from the base, up to 3 cm long.

Rare, near moist shady situations, along the Bhilangana river bed.

Fertiles : March May.

LYGODIACEAE

Lygodium japonicum (Thunb.) Sw. in Schrad. J. Bot. 1800. 12: 106. 1801.
Ophioglossum japonicum Thunb.

Fronds flexible, with climbing habit, glabrous or slightly hairy. The fertile pinnules often contracted.

Abundant, on shady forest slopes.

Sori: Aug. Nov.

POLYPODIACEAE

Lepisorus nudus (Hook.) Ching in Bull. Fam. Mem. Inst. Biol. 4: 83. 1933.
Pleopeltis nuda Hook.

Rhizomes wide creeping, branched. Fronds lanceolate with obtuse apex, narrowly tapering at base. Sori small, medial.

Common. Epiphytic on tree trunks or in rock crevices.

Sori: Major part of the year.

***Pyrrrosia beddomeana* (Gies.) Ching** in Bull. Chinese Bot. Soc. 1: 68. 1935.
Niphobolus beddomeana Gies.

Rhizomes short. Lamina acuminate at apex, sparsely clothed with stellate hairs. Sori globose, in close rows towards the apex of the lamina.

Occasional, in shady rock crevices.

Sori: Throughout the year.

***Cheilanthes brevifrons* (Khullar) Khullar** in Indian Fern. J. 1: 90. 1984. *C. anceps* var. *brevifrons* Khullar.

Rhizomes short. Stipes densely scaly. Lamina oblong-lanceolate. Lower surface farinose. Sori confluent along the margin of lobes.

Rare, on wet moss covered rocks near the bridge to Lambgaon on Bhagirathi river.

Sori: Major part of the year.

***C. farinosa* (Forsskal) Kaulf.**, Enum. Fil. 212. 1824. *Pteris farinosa* Forsskal

Rhizomes short. Stipes glabrous. Fronds deltoid-lanceolate, 2-pinnate at base, pinnatifid at apex. Sori scarious, rounded, continuous on margin.

Common, in shady places.

Sori : Major part of the year.

ACTINIOPTERIDACEAE

***Actiniopteris radiata* (Sw.) Link**, Fil. Sp. 80. 1841. *Asplenium radiatum* Sw.

A pretty, small, erect, rather stiff, fanshaped fern. Stipes densely tufted. Fronds repeatedly dichotomously divided. Sori in a continuous line on the margins.

Rare, on dry open rocks.

Sori: Aug. Sept.

PTERIDACEAE

***Pteris biaurita* L., Sp. Pl. 2: 1076. 1753.**

Rhizomes short, suberect, with dark brown scales. Fronds unipinnate. Stipes and rachis glabrous. Sori confluent all along the margins.

Common, on shady hill slopes.

Sori: Throughout the year.

***P. cretica* L., Mant. Pl. 130. 1767.**

Rhizomes creeping. Fronds dimorphic; fertile fronds narrower, erect, with long, stronger stipes. Sori confluent along the margins.

Common, on shady, moist slopes.

Sori: Major part of the year.

***P. vittata* L., Sp. Pl. 1074. 1753.**

Rhizomes suberect, hairy. Scales silky. Fronds imparipinnate, covered with whitish hairs. Pinnae elongate-linear. Sori marginal.

Common, in moist, shady situations.

Sori: Major part of the year.

ADIANTACEAE

***Adiantum capillus-veneris* L., Sp. Pl. 2: 1096. 1753.**

Rhizomes creeping. Stipes and rachis blackish. Pinnules petiolate, fan shaped. Sori large, on margins of lamina.

Common, in rock crevices near the streams.

Sori: Major part of the year.

A. incisum Forsskal, Fl. Aegypt.-Arab. 187. 1775.

Rhizomes short. Fronds generally radiating from the centre. Stipes short, brown, hairy or scaly. Sori on the apical margin of pinnae lobes.

Common.

Sori: Aug. Oct.

A. philippense L., Sp. Pl. 2: 1094. 1753.

Rhizomes short. Stipes black, glossy. Rhachis with a broad terminal pinnae. Sori linear, along the margin of pinna-lobes.

Common, on shady hill slopes.

Sori: Aug. Oct.

MARSILEACEAE

Marsilea minuta L., Mant. 308. 1771.

Small, submerged ferns. Rhizomes slender, rooting at base. Sporocarps more than 3 on the rhizomes.

Common, in swampy places.

Sporocarps: Oct. Dec.

M. quadrifolia L., Sp. Pl. 1099. 1753.

Large, aquatic. Rhizomes wide creeping on the surface of ponds. Sporocarps 1-3 on creeping rhizomes.

Rare, in ponds.

Sporocarps: Jan. March

THELYPTERIDACEAE

Ampelopteris prolifera (Retz.) Copel., Gen. Fil. 144. 1947. *Hemionitis prolifera* Retz.

Rhizomes wiry, creeping. Lamina linear-lanceolate, 1-pinnate. Stipes and rachis with few forked hairs. Axillary vegetative buds present. Sori submarginal towards the upper half of the lamina.

Common, growing in moist places along the water courses.

Sori: Major part of the year.

Christella appendiculata (Presl) Holtt. in Kew Bull. 31(2): 311. 1977.
Nephrodium appendiculatum Presl

Rhizomes widely creeping. Stipes angled. Fronds up to 60 cm long. Sori minute, near the midrib of the pinnae.

Frequent, on edges of forests in shady places.

Sori: Nov. Feb.

C. arida (D. Don) Holttum in Nayar & Kaur, Comp. to Bedd. Handb. 206. 1976.
Aspidium aridus D. Don

Scarcely tufted ferns. Stipes 30 cm or more long. Rhachis and lower surface of pinnae pubescent or hairy. Sori in rows.

Scattered, by the side of the streams.

Sori: Aug. Nov.

C. dentata (Forsskal) Brown et Jermy in British Fern Gaz. 10: 338. 1973.
Polypodium dentatum Forssk.

Rhizomes short, creeping. Stipes hairy, scaly at base. Lamina up to 90 cm long, pinnae 15-25 pairs. Sori medial on vein.

Few, in shady and moist situations.

Sori: Oct. March

C. parasitica (L.) Lev. Fl. Kouy-Tescheon 475. 1915. *Polypodium parasiticum* L.

Rhizomes long creeping. Stipes 20-40 cm long. Lamina deltoid. Sori median or submedian on veins.

Common, in moist shady places.

Sori: Feb. May

Pronephrium articulatum (Houlst. & Moore) Holtt. in *Blumea* 20: 116. 1972.
Nephrodium articulata Houlst. & Moore.

Rhizomes creeping. Stipes up to 60 cm long covered with the scales. Lamina unipinnate. Sori small, round, medial.

Scattered, on moist, shady forest floor.

Sori: Sept. - Jan.

ASPLENIACEAE

Asplenium dalhousiae Hook., *Icon. Pl.* t. 105. 1837.

Lamina single, margins variously lobed approaching a pinnate condition. Sori linear-oblong, elongate.

Quite common, on moist, shaded rocks.

Sori: Throughout the year.

A. yoshinaga Makino, *Phan. Pterid. Jap. Icon.* 3. Pl. 64. 1900. var. **indicum** (Sledge) Ching et Wu, *Fl. Xixangica* 182. 1983.

Rhizomes short, erect, scaly. Lamina lanceolate, pinnate, pinnae 15-25 pairs having acute apex. Sori slightly oblique, linear-elongate.

Few, in rock crevices.

Sori: Oct. March

ATHYRIACEAE

Diplazium esculentum (Retz.) Sw. in *Schrad. J. Bot.* 1801 (2): 312. 1803.
Hemionitis esculenta Retz.

Rhizomes erect. Stipes almost glabrous. Lamina 1-2 pinnate. Sori linear, short, parallel, on both sides of the veins.

Common, growing in moist shady places.

Sori: Oct. Feb.

D. frondosum (Wallich ex C.B. Clarke) Christ, Nat. Hist. Syst. Leconite 1: 46. 1909. *Asplenium latifolium* D. Don var. *frondosum* Wallich ex Clarke

Rhizomes short, creeping. Stipes stramineous to light brown, base blackish, longer than the lamina. Lamina 2-pinnate. Sori in two oblique rows, linear. Common, along the streams in shady situations.

Sori: Oct. March

HYPODEMATACEAE

Hypodematium crenatum (Forsskal) Kuhn, Von. Deck. Reis. Ost. Agr. 33. Bot. 37. 1879. *Polypodium crenatum* Forssk.

Rhizomes short, densely clothed with bright brown, linear-lanceolate, hair pointed scales. Fruits approximate. Stipes grooved. Lamina deltoid, 4-pinnatifid. Sori large, rounded.

Common, in rock crevices.

Sori: Sept. - Jan.

ASPIDIACEAE

Tectaria coadunata (J. Smith) C. Chr. Contrib. U.S. Nat. Herb. 26: 331. 1931. *Sagenia coadunata* J. Smith

Lamina large, 1-2 pinnate, thin, green, hairy. Sori rounded.

Common, on shady forest slopes.

Sori: Oct. April

DRYOPTERIDACEAE

Dryopteris cochleata (Ham. ex D. Don) C. Chr. Index. Fil. 1: 258. 1905. *Nephrodium cochleata* Ham. ex D. Don

Fronds dimorphic, sterile fronds many, one or two fertile fronds standing stiffly erect in the middle. Sori rounded.

Common, on slopes in shady situations.

Sori: Oct. April

D. nigropaleacea (F. Jenkins) F. Jenkins in Bull. Brit. Mus. (Nat. Hist.) Bot. 14: 193. 1986. *D. pallida* ssp. *nigropaleacea* F. Jenkins.

Rhizomes thick, short, scaly. Stipes 15-40 cm long, scaly at base. Lamina lanceolate, acuminate, bipinnate. Pinnae pigmented at base. Sori kidney shaped.

Few, on shady forest slopes.

Sori: Sept. March

AZOLLACEAE

Azolla pinnata R. Br., Prodr. Fl. Nov. Holl. 167. 1810.

Small, pretty, free floating aquatic ferns, usually reddish. Sori paired.

Common, in marshy situations.

Sori: Nov.

USEFUL PLANTS

Every plant on the earth is useful in a way or other. It may or may not be of direct use to man or the animal world, but it definitely contributes significantly towards ecosystem to which it belongs. Sometimes, however, even most unpopular adventive weeds may turn out to be of considerable potential application. As such *Lantana camara*, the growing menace as an obnoxious weed has also been found a useful source of energy. Another unwanted plant *Agave cantula* has become the source of income in the village Kimsar or Pauri Garhwal. The plant grows on unirrigated coarse wasteland, and does not require any care. The fibre obtained from this plant is being used for making bags, file covers, mats, purses, etc. Both the plants are of common occurrence around Tehri. *Urtica parviflora*, generally avoided by the people, becomes life saving during times of famine. The brooms made out of the leaves of *Phoenix* and spikes of *Thysanolaena maxima* are a common sight in the market.

In the submersible areas there are many plants, used for different purposes. Noticeable among the timber yielding trees is *Dalbergia sissoo* (SHISHAM) seeds of which were air-sown years back, which at places form good patches. *Toona ciliata* (TOON) is also of frequent occurrence. Some other timber yielding trees in the zone are : *Albizia lebeck*, *Pinus roxburghii*, *Olea glandulifera* (GAIL), *Bombax ceiba* and *Terminalia alata* (ASAIN). The wood of *Murraya koenigii*, *Zanthoxylum armatum*, *Mallotus philippensis*, etc. are made into walking sticks, whereas their young twigs are used as toothbrush. Besides, *Mallotus philippensis* is also used as a source of indigenous dye, whereas *Zanthoxylum armatum* is a venerated plant well known for its medicinal virtues. Apart from that, the wood of *Boehmeria rugulosa*, *Bauhinia variegata*, *Desmodium ougeinense*, etc. is used for making household and agricultural implements.

On the other hand plants like *Grewia optiva* and *Ficus auriculata* are used in many ways. The leaves of *Grewia optiva* are much valued for fodder. The bark is used as shampoo and the fibre obtained from the bark is made into ropes. The fruits are eaten and the wood, after removing the bark, provides an excellent fuel. Similarly the leaves of *Ficus auriculata* are used, besides fodder as plates. The young figs are cooked as vegetable while the mature ones are eaten raw. The other species of *Ficus* which are used as fodder and wild fruits are *F. palmata*, *F. racemosa* and *F. semicordata*.

Apart from that *Rumex hastatus*, *Dodonaea viscosa*; *Agave cantula*, etc. are some of the species which help in soil binding and may be utilized for checking the soil erosion resulting from the construction of new roads, etc.

Special mention can be made of *Carthamus tinctorius*. The species, grown in Pendars village situated towards Koteshwar in the Bhagirathi valley, provides a good source of income for the villagers. The plants of *Elettaria cardomomum* (Bari Ilaichi) are also grown in the village.

Following is the tables of plants which serve the mankind in various ways :

Name of the plant	Agricultural Implements	Dye	Fibre	Fodder	Fuel	Gum	Medicinal	Timber	Wild Edible	Other Uses	Remarks
	1	2	3	4	5	6	7	8	9	10	
<i>Abrus precatorius</i> L.							+			+	As weight by the Jewellers
<i>Abutilon indicum</i> (L.) Sw.			+				+				
<i>Acacia catechu</i> Willd.					+		+	+			
<i>Achyranthes aspera</i> L.							+				
<i>Acorus calamus</i> L.							+				
<i>Adhatoda zeylanica</i> Medicus							+		+		
<i>Adiantum capillus-veneris</i> L.							+				
<i>A. incisum</i> Forskal							+				
<i>A. philippense</i> L.							+				
<i>Aegle marmelos</i> (L.) Correa					+		+	+	+	+	Sacred
<i>Agave cantala</i> Roxb.			+								
<i>Ageratum conyzoides</i> L.							+				
<i>Albizia lebbek</i> Benth.	+				+		+	+			
<i>Anagallis arvensis</i> L.			-				+			+	Fish poison
<i>Anisomeles indica</i> (L.) O. Kuntze						-	+				

	1	2	3	4	5	6	7	8	9	10	
<i>Artemisia indica</i> Willd.				+			+				
<i>Asparagus filicinus</i> Ham.							+				
<i>Bacopa hiltoniana</i> (Benth.) Wettst.							+				
<i>Bauhinia retusa</i> Ham.				+	+	+	+	+			
<i>B. vahlii</i> Wight & Arn			+	+					+	+	as plates
<i>B. variegata</i> L.				+	+		+	+	+		
<i>Berberis lycium</i> Royle		+					+		+		
<i>Boehmeria rugulosa</i> Wedd.				+	+		+				
<i>B. platyphylla</i> D. Don				+							
<i>Boerhavia diffusa</i> L.							+				
<i>Bombax ceiba</i> L.	+			+	+		+	+	+	+	
<i>Bridelia verrucosa</i> Haines				+							
<i>Callicarpa macrophylla</i> Vahl							+		+		
<i>Calotropis procera</i> Ait.f.			+				+				
<i>Cannabis Sativa</i> L.			+				+		+	+	
<i>Carissa opaca</i> Stapf ex Haines							+		+		
<i>Cassia fistula</i> L.					+		+				
<i>Celastrus paniculatus</i> Willd.						+					

	1	2	3	4	5	6	7	8	9	10
<i>Celtis australis</i> L.				+	+			+	+	-
<i>Centella asiatica</i> (L.) Urb.							+			
<i>Cissampelos pariera</i> L.			+				+			
<i>Clematis gouriana</i> Roxb. ex DC.							+			
<i>Cleome viscosa</i> L.									+	
<i>Cocculus laurifolius</i> DC.					+		+			
<i>Colebrookea oppositifolia</i> Smith							+			
<i>Convolvulus arvensis</i> L.	-						+			
<i>Crotalaria albida</i> Heyne ex Roth				+			+			
<i>Crotalaria medicaginea</i> Lam.							+			
<i>C. tetragona</i> Roxb.			+	+						-
<i>Cryptolepis buechanani</i> Roemer & Schultes							+			
<i>Cymbopogon martinii</i> (Roxb.) Wats.				+			+			
<i>Cyperus esculentus</i> L.							+			
<i>C. rotundus</i> L.							+			
<i>Dalbergia sericea</i> G. Don	+			+	+			+		
<i>D. sissoo</i> Roxb.	+				+		+	+		
<i>Datisca cannabina</i> L.		+		-			+			
<i>Datura stramonium</i> L.							+		-	

	1	2	3	4	5	6	7	8	9	10	
<i>Dendrocalamus strictus</i> (Roxb.) Nees			+			+	+	+		+	
<i>Debregeasia hypoleuca</i> Wedd.				+					+		
<i>D. velutina</i> Gaudich				+					+		
<i>Deeringia amaranthoides</i> (Lam.) Merr.			+		+						
<i>Desmodium gangeticum</i> (L.) DC.							+				
<i>D. oojeinense</i> (Roxb.) Ohashi	+			+	+			+			
<i>D. triflorum</i> (L.) DC.							+				
<i>Dioscorea bulbifera</i> L.			-				+		+		
<i>Dodonaea viscosa</i> L.							+			+	
<i>Duchesnea indica</i> (Andr.) Focke							+		+		
<i>Dryopteris nigropaleacea</i> (Jenkins) Jenkins							+				
<i>Drypetes roxburghii</i> (Wall.) Hurusawa				+							
<i>Eclipta prostrata</i> (L.) L.							+			+	Hair Oil
<i>Ehretia laevis</i> Roxb.					+						
<i>Emblica officinalis</i> Gaertner		+			+		+		+	+	Ink, Pickle
<i>Engelhardtia spicata</i> Lesch.					+						Fish Poison
<i>Erythrina suberosa</i> Roxb.	+		+		+		+				
<i>Eulaliopsis binata</i> (Retz.) Hubb.			+	+							
<i>Euphorbia helioscopia</i> L.							+				

	1	2	3	4	5	6	7	8	9	10	
<i>E hirta</i> L.							+				
<i>E. hypericifolia</i> L.					-		+				
<i>E. royleana</i> Boiss.							+				
<i>Ficus auriculata</i> Lour.				+	+			+	+		
<i>F. benghalensis</i> L.	-								+	+	Sacred tree
<i>F. cunia</i> Hanb. ex Royle			+	+			+		+		
<i>F. carica</i> L.				+					+		
<i>F. glomerata</i> Roxb.									+		
<i>F. palmata</i> Forsk.				+	+				+		
<i>F. semicordata</i> Buch.-Ham.			+	+		-			+		
<i>Flacourtia indica</i> (Burm.f.) Merr.			+	+					+		
<i>Fumaria indica</i> Pugsley					-		+			+	Fish Poison
<i>Galium aparine</i> L.							+				
<i>Geranium nepalense</i> Sweet							+				
<i>G. ocellatum</i> Camb.							+				
<i>G. rotundifolium</i> L.							+				
<i>Gloriosa Superba</i> L.							+				
<i>Grewia optiva</i> Drumm. ex Burrett.	+		+	+	+		+		+	+	Locally used as shampoo
<i>Hedychium spicatum</i> Buch.-Ham. ex Smith							+			+	Perfuming tobacco
<i>Heliotropium strigosum</i> Willd.							+				
<i>Hiptage benghalensis</i> (L.) Kurz					+						
<i>Holoptelea integrifolia</i> Planchon								+		+	Wood pulp for paper
<i>Hydrocotyle sibthoroides</i> Lam.				-			+				
<i>Hypericum perforatum</i> L.							+				Oil

	1	2	3	4	5	6	7	8	9	10	
<i>Ichnocarpus frutescens</i> (L.) R. Br.			+				+				Stems are used for
<i>Impatiens balsamina</i> L.							+		+		making ropes
<i>Indigofera heterantha</i> Wallich ex Brandis									+		
<i>Ipomoea hederifolia</i> L.							+				
<i>I. purpurea</i> (L.) Roth							+				
<i>Jasminum multiflorum</i> (Burm.f.) Andrews							+				
<i>J. officinale</i> L.							+			+	Hair Oil
<i>Jatropha curcas</i> L.							+			+	
<i>Kydia calycina</i> Roxb.			+		+		+	+		+	Paper & Rayon grade pulp
<i>Lannea coromandelica</i> (Houtt.) Merr.	+		-		+	+		+		+	" " " " "
<i>Leucas lanata</i> Benth.							+				
<i>Lygodium japonicum</i> (Thunb.) Sw.							+				
<i>Mallotus philippensis</i> Muell.-Arg.		+		+	+		+			+	
<i>Melia azedarach</i> L.					+		+				
<i>Maoutia puya</i> (Hook.f.) Wedd.			+								
<i>Marsdenia roylei</i> Wight.			+		-						
<i>Millettia extensa</i> Benth.			+	+	+		+				Fish Poison
<i>Moringa oleifera</i> Lam.			+		+		+		+	+	Paper pulp
<i>Morus alba</i> L.				+	+		+		+		
<i>Mucuna nigricans</i> (Lour.) Steud.							+	-			
<i>Murraya koenigii</i> (L.) Sprengel							+		+		Used in curries
<i>Myrsine africana</i> L.							+		-		
<i>Notholirion thomsonianum</i> (Royle) Stapf							+				
<i>Nyctanthes arbor-tristis</i> L.					+		+				
<i>Olea glandulifera</i> Wallich							+	+			

	1	2	3	4	5	6	7	8	9	10	
<i>Oreocnide frutescens</i> Miq.			+								
<i>Oroxylum indicum</i> Vent.							+				
<i>Oxalis corniculata</i> L.							+		+		
<i>Perilla ocimoides</i> L.							+		+	+	Edible oil yielding
<i>Phoenix humilis</i> Royle ex Becc.				+					+		
<i>Pinus roxburghii</i> Sarg.	+				+	+	+	+	+		
<i>Pistacia khinjuk</i> Stocks				+	+		+				
<i>Plantago major</i> L.						+	+				
<i>Plumbago zeylanica</i> L.							+				
<i>Portulaca oleracea</i> L.									+		
<i>Pterospermum acrifolium</i> Willd.				+	+		+	+		+	Leaves are used as plates
<i>Punica granatum</i> L.	+				+		+	-	+		
<i>Pyracantha crenulata</i> (D. Don) Roemer					+				+		
<i>Pyrus pashia</i> Ham.	+			+	+				+		
<i>Reinwardtia indica</i> Dumort							+		+	-	
<i>Ricinus communis</i> L.							+				
<i>Rhus parviflora</i> Roxb.							+			+	Used as tobacco
<i>Roylea cinerea</i> (D. Don) Baillon							+				
<i>Rubia manjuh</i> Roxb. ex Flem.							+				
<i>Rubus ellipticus</i> Smith		+							+		
<i>Rumex hastatus</i> D. Don									+		
<i>Salix tetrasperma</i> Roxb.				+	+			+		+	Making baskets
<i>Salvia plebeia</i> R. Br.		-					+				
<i>Sapindus mukorossi</i> Gaertner							-			+	Used in preparation of soap or substitute of
<i>Sida acuta</i> Burm.f.		-					+				

	1	2	3	4	5	6	7	8	9	10		
<i>Sterculia villosa</i> Roxb.			+	+		+						
<i>Syzygium cumini</i> (L.) Skceels	+			+	+		+	+	+			
<i>Terminalia alata</i> Heyne ex Roth				+	+							
<i>T. bellirica</i> Roxb.					+		+					
<i>Toddalia asiatica</i> Lam.					+							
<i>Toona ciliata</i> Roem.					+			+				
<i>Trema politaria</i> Planchon			+	+								
<i>Tridax procumbens</i> L.							+					
<i>Triumfetta rhomboidea</i> Jacq.							+					
<i>Tulipa clusiana</i> f. <i>Stellata</i> (Hook.f.) Das Gupta-							+					
<i>Urena lobata</i> L.			+				+					
<i>Urtica parviflora</i> Roxb.							+					
<i>Viola canescens</i> Wall. ex Roxb.							+					
<i>Vitex negundo</i> L.					+		+			+	Baskets	
<i>Wuhania somnifera</i> (L.) Dunal							+					
<i>Woodfordia fruticosa</i> (L.) Kurz							+		+			
<i>Xylosma longifolium</i> Clos.					+							
<i>Zanthoxylum armatum</i> DC.							+			+	Twigs as tooth brush,	
<i>Ziziphus mauritiana</i> Lam.									+	+	Preparation of local drink	

RARE AND INTERESTING PLANTS

Like other parts of the Western Himalayas, Tehri District too has altitude variation ranging from *ca* 600 m to snowy heights, and accordingly a varied flora. As such the district has an interesting flora including rare and endemic plants as well. However, as the altitudinal limit in the submersible area is below 1000 m, the plants collected in this area alone are discussed here.

During the course of the impact assessment study three plant collection tours were undertaken in the area in different seasons, i.e. August and October 1992 and April 1993. In addition, the specimens collected during earlier exploration in the area by other scientists of the Botanical Survey of India since the establishment of the Northern Circle at Dehra Dun were also consulted. The investigations have revealed taxa, thereby adding *ca* 125 species to the earlier published report (Bhattacharyya-Goel 1982) on the area. These include some plants which are interesting from distributional point of view. *Marsilea quadrifolia* L., known from Jammu & Kashmir, was collected near Chham. *Cheilanthes bervifrons* (Khullar) Khullar, earlier known to occur in Kashmir, Himachal Pradesh and Kumaon hills, was also found growing in the area. *Urtica urens* L., a plant first recorded in India from Punjab and later from Dehra Dun district, has also set foot around Tehri. *Soliva anthemifolia*, reported as new to India from other parts of Uttar Pradesh and Rajasthan, has also been collected from Chham. *Ricciocarpus natans*, a monotypic genus of liverworts (Bryophyte), was seen growing in ponds near Chham. The genus was first recorded from Dal lake, J. & K. and later was collected from localities in Manipur, Bhimtal and Chamoli. The species grows abundantly in many parts of N.W. region. *Datisca cannabina* L., usually found around a height of 1000 m has descended down to *ca* 700 m at Chham. This species was also noticed growing on sandy slopes about 2 km before Gadolia. *Blyxa aubertii*, a species usually growing in plains was collected from paddy fields along the Jalkurgad. Some other plants usually found above 1000 m but collected in the submersible area are *Chenopodium botrys*, *Veronica verna* and *Origanum vulgare*. Since the rivers Bhagirathi and Bhilangana are snow fed rivers, the number of species descending down is not quite uncommon. However, it may be stated again that the plants mentioned above are of taxonomic interest only.

In an earlier report Bhattacharyya & Goel (1982) recorded twelve rare and threatened species from the area. A study of literature and the specimens collected reveal that some of those species occur at higher altitude, not coming in the submersible area, while the others are widely distributed in other parts of India. Nevertheless, to avoid any confusion, their distribution is briefly discussed.

1. *Allium rubellum* M. Bieb.

The species grows between 500 m to 2500 m and is distributed in Western Himalayas from Kashmir to Kumaon, and is also known from Caucasus, Siberia, Ural etc.

2. *Bulbophyllum hookeri* (Duthie) J.J. Sm. *Cirrhopetalum hookeri* Duthie

The species is known to occur in Garhwal, Kumaon, Arunachal Pradesh, Assam & Nepal.

3. *Eulophia dabia* (D. Don) Hochr. *E. hormusjae* Duthie

It shows a wide range of distribution from Kashmir to Arunachal Pradesh, W. Bengal, Manipur and plains of Uttar Pradesh, besides many neighbouring countries.

4. *Gagea pseudoreticulata* Ved. *G. reticulata* Sensus Hook.f.

Usually common in Punjab plains, the species ascends to 1800 m in Western Himalayas. Outside India it is distributed westwards to Greece, N. Africa and Turkistan.

5. *Gastrochilus distichus* (Lindl.) O. Kuntze.

This species was found growing as an epiphyte over *Quercus* sp. near Ghuttu which is well above the submergence level. The species is commonly distributed in Arunachal Pradesh, Meghalaya, Mizoram, Manipur and Nagaland also.

6. *Gastrodia orobanchoides* (Falc.) Benth.

This species usually grows in temperate Himalayas between 2300-3000 m and is not to be found in the area of the proposed dam. The range of distribution for the species is from Kashmir to Garhwal.

7. *Glyceria tonglensis* C.B. Clarke

The grass has its range of distribution from N.W. Himalayas to Sikkim and Manipur above 1000 m altitude. It has also been reported from China and Japan.

8. *Neottia microglottis* (Duthie) Schltr. *Listera microglottis* Duthie

The species is usually confined to Tehri Garhwal between an altitude of 1800-2000 m. Other localities for the species are Nag Tibba, Mussoorie and Nainital.

9. *Pecteilis triflora* (D. Don) Tang & Wang. *Habenaria triflora* D. Don

Distributed in the Himalayas up to 1200 m from Garhwal to Nepal and Bihar.

10. *Poa rhadina* Bor.

The species is based on the collection from Jankabah, Srikanta, situated at an altitude of about 3500 m, much above the height of the reservoir level.

11. *Pseudodanthonia himalaica* (Hook.f.) Bor *Danthonia himalaica* Hook.f.

The species was originally described on the basis of plants collected from Lalondi Peak, (2500-3000 m) Jaunsar. Also collected from Deoban.

12. *Tulipa clusiana* DC. var. *stellata* (Hook.) Regel. *T. stellata* Hook.

Distributed in Temperate Western Himalaya from Kumaon westwards.

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