

Flora of Shaktikhor V.D.C, Chitwan District (Central Nepal)



A Dissertation submitted for the Partial Fulfillment of the Requirements for the
Masters's Degree in Botany

Department of Botany

Amrit Campus

Tribhuvan University

Lainchour, Kathmandu

By Bindu K.C

T.U. Registration No.: 5-2-54-645-2008

T.U. Exam Roll No.: 138 /071

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Plant Systematics and Biodiversity Unit

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DECLARATION

I hereby declare that the work presented in this dissertation is a genuine work done originally by me and has not been submitted anywhere for the award on any degree. All the sources of information have been specifically acknowledged by reference to the author(s) or institution(s).

.....

Bindu K.C

December, 2020



Tribhuvan University
Amrit Science Campus
Department of Botany
Thamel, Kathmandu

Tel. no.
4410408
4411637

RECOMMENDATION LETTER

This is to certify that Ms. Bindu K.C has completed this dissertation work entitled “Flora of Shaktikohr V.D.C, Chitwan District (Central Nepal)” as a partial fulfillment of the requirements for Masters” degree in Botany under my supervision. To the best of my knowledge, this research has not been submitted for any other degree, anywhere else.

I therefore, recommend the dissertation for acceptance and approval.

Supervisor

Prof. Dr. Devendra Mananda Bajracharya

Professor

Department of Botany

Amrit Campus



Tribhuvan University
Amrit Science Campus
Department of Botany
Thamel, Kathmandu

Tel. no.
4410408
4411637

LETTER OF APPROVAL

On the recommendation of supervisor “Prof. Dr. Devendra Mananda Bajracharya”, this dissertation submitted by “Ms. Bindu K.C” entitled “Flora of Shaktikohr V.D.C, Chitwan District (Central Nepal)” has been accepted for the examination and submitted to the Amrit Science Campus, Tribhuvan University for partial fulfillment of the requirements for Master’s degree in Botany.

Prof. Dr. Mohan Prasad Devkota

Head of the Department
Department of Botany
Amrit Campus
Tribhuvan University
Thamel, Kathmandu, Nepal

Dr. Laxmi Joshi Shrestha

M.Sc. Coordinator
Department of Botany
Amrit Campus
Tribhuvan University
Thamel, Kathmandu, Nepal



Tribhuvan University
Amrit Science Campus
Department of Botany
Thamel, Kathmandu

Tel. no.
4410408
4411637

CERTIFICATE OF ACCEPTANCE

This dissertation entitled “Flora of Shaktikohr V.D.C, Chitwan District (Central Nepal)” submitted by “Ms. Bindu K.C” has been examined and accepted for partial fulfillment of the requirements of Masters’ degree in Botany.

Evaluation Committee

Prof.Dr. Devendra Mananda Bajracharya

Supervisor

Amrit Campus

Tribhuvan University

Thamel, Kathmandu, Nepal

Prof.Dr. Sangeeta Rajbhandary

External Examiner

Central Department of Botany

Tribhuvan University

Kirtipur, Nepal

Prof.Dr. Mohan Prasad Devkota

Head of Department

Amrit Campus

Tribhuvan University

Thamel, Kathmandu, Nepal

Prof. Dr. Lokesh Ratna Shakya

Internal Examiner

Amrit Campus

Tribhuvan University

Thamel, Kathmandu, Nepal

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Bindu K.C

ABSTRACT

Shaktikhor is one of the biodiversity pocket areas of Chitwan district. The present study was carried out with an aim to enumerate the flowering plant species within the elevation range of 210-1250 m, of Chitwan District (Central Nepal). Five field visits were made covering all seasons from June 2017 to June 2019. Altogether 145 species (excluding 1 unidentified species) of flowering plants were recorded belonging to 111 genera and 41 families. The study area was found to be dominated by Fabaceae (17 spp.), Poaceae with 14 species (13 genera), followed by Asteraceae (10 spp.), Cyperaceae (9 spp) and Acanthaceae (11 spp. each), etc. One endemic species *Oroxylum indicum* was recorded from this area.

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ABBREVIATIONS AND ACRONYMS

Anno. Check. Fl. Pl. Nepal	Annotated Checklist of Flowering Plants Nepal
APG	Angiosperm Phylogeny Group
asl	Above sea level
Avera.	Average
BM	Natural History Museum, London, UK
C.N	Central Nepal
ca.	Circa; about (approximate)
E.N	Eastern Nepal
E	Royal Botanic Garden, Edinburgh, UK
Ed	Edition
e.g	<i>exempli grata</i> or, for example.
Enum. Fl. Pl. Nep.	Enumeration of the Flowering Plants of Nepal
<i>et al</i>	<i>et alia</i> or “ and others”
Fig.	Figure
Fl. Bhutan	Flora of Bhutan
Fl. Brit. Ind.	Flora of British India
Fl. China	Flora of China
Herb. Linn.	Linnean Herbarium
i.e	That is
KATH	National Herbarium and Plantm laboratories
KYO	Kyoto University herbarium, Kyoto, Japan
m	meter
mm	milimiter
Min.	Minimum
Max.	Maximum
No	number
p, pp.	Page, pages
P/ Ratio;	polar ratio
S.N	Serial number
Spp.	Species, as a species
TUCH	Tribhuwan University of Central Herbarium
µm	micrometer
Vol	Volume
W. N	Western Nepal

CHAPTER 1 INTRODUCTION

1.1 Background

Biodiversity refers to the number, abundance, composition, spatial distribution and inter-actions of genotypes, populations, species, functional types and traits and landscape units in a given system. (Diaz *et al.*, 2006). Nepal is exemplified as a biodiversity rich country that represents a significant share of global biodiversity, although it comprises 0.09% of global land area (Bhujju *et al.*, 2007).

Nepal's rich biodiversity is a reflection of its unique geographic position, diverse climatic conditions, complex topography, broader altitudinal range and great habitat variation.

Floras are a noble endeavour with a complex and interesting history. Floras are useful for identifying organisms; they are a source of pride for the areas they cover; useful for the environmental studies and excellent public relations. Floristic study is merely the observation of a phase in the development of floras as there is no final end point in plant evolution, extinction and dispersal (Good, 1974). The flora of a given area is not a random assemblage of taxa with similar ecological needs but it displays pattern that are unique for that area. Floristic diversity is never spread evenly but occurs in pockets of high diversity (Davis *et al.* 1994).

Floristic study helps in the exploration, documentation and understanding of plants that are pre-requisite for further research and development. It provides the baseline data needed for environmental studies, climate change modelling, biodiversity inventories, conservation planning and sustainable use of natural resources.

Nepal lies in central Himalayan region in biodiversity and is characterized by six floristic regions i.e. Asiatic in North, Sino-Japanese in the North-east, Asia-Malaysian in the South-East, Indian in the South, Sudano-Zambian in the South-West and IranoTuranian in the west. Based on wide altitudinal variation (60-8848 m) the climate is broadly classified into cold Arctic (above 3000 m), cold temperate (2000-3000 m), warm temperate (1500-2000 m), sub-tropical (1000-1500 m) and tropical (below 1000 m). The country is divided into 7 physiographical regions which occur in

the following order from South to North: Terai, Siwaliks, Mahabharat lekh, Midhills, Himalayas, Inner Himalayas and the Tibetan Marginal Mountain range (Hagen, 1998). Nepal extends over low land to higher Himalayan region and it has 35 forest types, 75 vegetation and 118 eco system (Rajbhandari *et al*, 2012). Nepal is endowed with a wide range of agro-ecological ones, large varieties in climatic and physiographic conditions, which have resulted in a rich flora (Olsen, 1998).

Climatic factor (rainfall, winter snow, temperature) and topography (aspect, altitude) have a significant influence on biodiversity and the distribution of the flora and fauna in Nepal. Aspects has also an important effect on the distribution of plants and animal species because north facing slopes receive much less solar radiation than those facing south (Bhujju *et al*, 2007).

1.2 Rationale

The history of botanical exploration in Nepal shows the exploration either have been carried in high Himalayas or mid lands (Rajbhandari 2012) while the mid hills have got less attention. An analysis and review of the literature available and deposited herbarium in the National Herbarium and Plant Laboratories show that the floristic study of Chitwan District is not explored completely. The works that has been done were confined to the enumeration and local floras mainly. The study helps to identify the diagnostic characters and possible suitable positioning of distinct species in the proper taxonomic and scientific way. The forest of Shaktikhor region comprises tropical and sub- tropical vegetation with moderate number of plant species.

Therefore, the complete list of plant taxa of this region is essential to address the deficiency of complete flora. The plant can be readily identified concerning floras and smaller the area it includes, the better is the flora. The present study will be the comprehensive account of flora representing the typical inner Terai of Nepal. Shrestha K.K (2003) and Siwakoti *et al* (1999) have explored western and eastern region of Nepal where as this area of central region has been left unexplored so this study may provide the actual potentialities of the central region.

1.3 Objective

- Enumeration and floral description of plants in Shaktikhor V. D. C.
- To identify the angiospermic plant group.
- To prepare the checklist of the flowering plants of the area.

1.4. Limitations of the study

Shaktikhor receives the significant amount of precipitation all around the year. Topographical factor is one of the major limitations for the plant exploration in these areas. Time is another limiting factor, since the study should be completed within the short duration; a detail picture is not possible within the short period of time. Due to poor representation of herbarium specimens, deposition of herbarium specimens and description of all the listed specimens is not included in the present study.

CHAPTER II: LITERATURE REVIEW

In Nepal, botanical exploration was started by Francis Buchanan- Hamilton in 1802-1803 followed by Dr. Nathalien Wallich (1820-1821) in the central region of Nepal.

D.Don (1825) published the first flora of Nepal, 'Prodromous Florae Nepalensis' consisting 93 families, 337 genera and 738 species.

Hara *et al* (1978, 1979 and 1982) enumerated 5,150 species of flowering plants of Nepal belonging to 1,475 genera and 257 families in three volumes. Significant contribution in the exploration of flora of Nepal was made by Japanese expeditors H. Obha and M. Sujuki after the publication of 'An enumeration of the Flowering plants of Nepal (Hara, 1978).

Dinerstein (1979) recorded 154 species that include 56 trees, 20 shrubs, 44 graminoides and 33 forbs in South-West sector of Royal Bardiya National Park.

Pokhrel (1993) studied the floristic composition, biomass production and biomass harvest in grassland of Royal Bardiya National Park and recorded 122 species of flowering plants.

DPR (1994) enumerated a total number of 1741 species of flowering plants comprising 1427 species of dicots and rest of monocots of west Nepal.

Kobha *et. al* (1994) enumerated 5,833 taxa of flowering plants belonging to 213 families and 1354 genera. Bista (1997) reported leguminosae to be the largest family with 35 sps and Asteraceae with 34 sps from Royal Bardiya National Park.

Mishra (1999) recorded 172 species belonging to 138 genera under 62 families of dicot plants from South-West Darchula District of west Nepal. In the study, largest families were Astereceae (21 sps), Fabaceae (17 sps), Rosaceae (10 sps), Lamiaceae (10 sps), Moraceae (9 sps), Euphorbiaceae (8 sps), Lauraceae (5 sps) and 4sps of Fagaceae, Polygonaceae and Rubiaceae.

Shrestha *et al.* (1999) reported 424 species of vascular plants belonging to 97 families and 193 genera from Royal Bardiya National Park.

Siwakoti, M (1999) reported 743 species with 128 families and 493 genera from Eastern Nepal.

Press *et. al* (2000) enumerated 6,076 flowering plants belonging to 216 families and 1354 genera.

The contribution of these workers have been significant and noteworthy in the history of exploration of Flora of Nepal (Rajbhandari, 2002).

Adhikari (2003) recorded 266 sps of Sympetalae and monocotyledonae from Terai and Siwalik of western Nepal.

Kshetri (2003) recorded 204 sps belonging to 173 genera and 63 families of flowering plants from Chisapanii Area, Tanahun, Central Nepal.

Sah *et. al*, (2002) recorded 401 plant sps belonging to 264 genera and 84 families from Ghodaghodi lake area of west Nepal. Among them, 269 sps were dicots and 132 were monocots. Among dicots, 36 sps were Fabaceae, 32 were Asteraceae, 17 sps of Euphorbiaceae, 14 sps of Scrophulariaceae, 12 sps of Acanthaceae.

Shakya (2003) recorded 249 sps of plants which include 148 genera and 53 families from Terai and Siwaliks of west Nepal. Among them 70 sps were trees, 65 were herbs, 50 shrubs and 34 climbers.

Shrestha (2003) reported 575 sps of flowering plants and 42 sps of pteridophytes from terai and churiya region of southwest Nepal.

Bhandari (2006) studies Flora of Dobhan Village Committee, palpa district and reported 223 sps of flowering plants.

Siwakoti (2006) recorded 720 sps of vascular plants including pteridophytes, gymnosperms and angiosperms from wetland and their adjoining ecosystem of Terai. Out of which 23 sps were pteridophytes, 2 gymnosperms and 469 sps of dicots while 226 were monocots.

Joshi (2014) reported 695 sps of angiosperms belonging to 472 genera and 124 families from Makwanpur District.

CHAPTER III: MATERIALS AND METHODS

3.1 Study Area

3.1.1 Location

Shaktikhor is situated in south-east of Mahabharat hill in central Nepal. It lies at latitude between 27°43'34'' N to 27°52'30'' N and longitude 83°54'45'' E to 84°48'15'' E. The total area of Shaktikhor V.D.C is 28 sq. km. Altitude ranges from 210m at Bhuteha river to 1250m at the Mandre Danda.

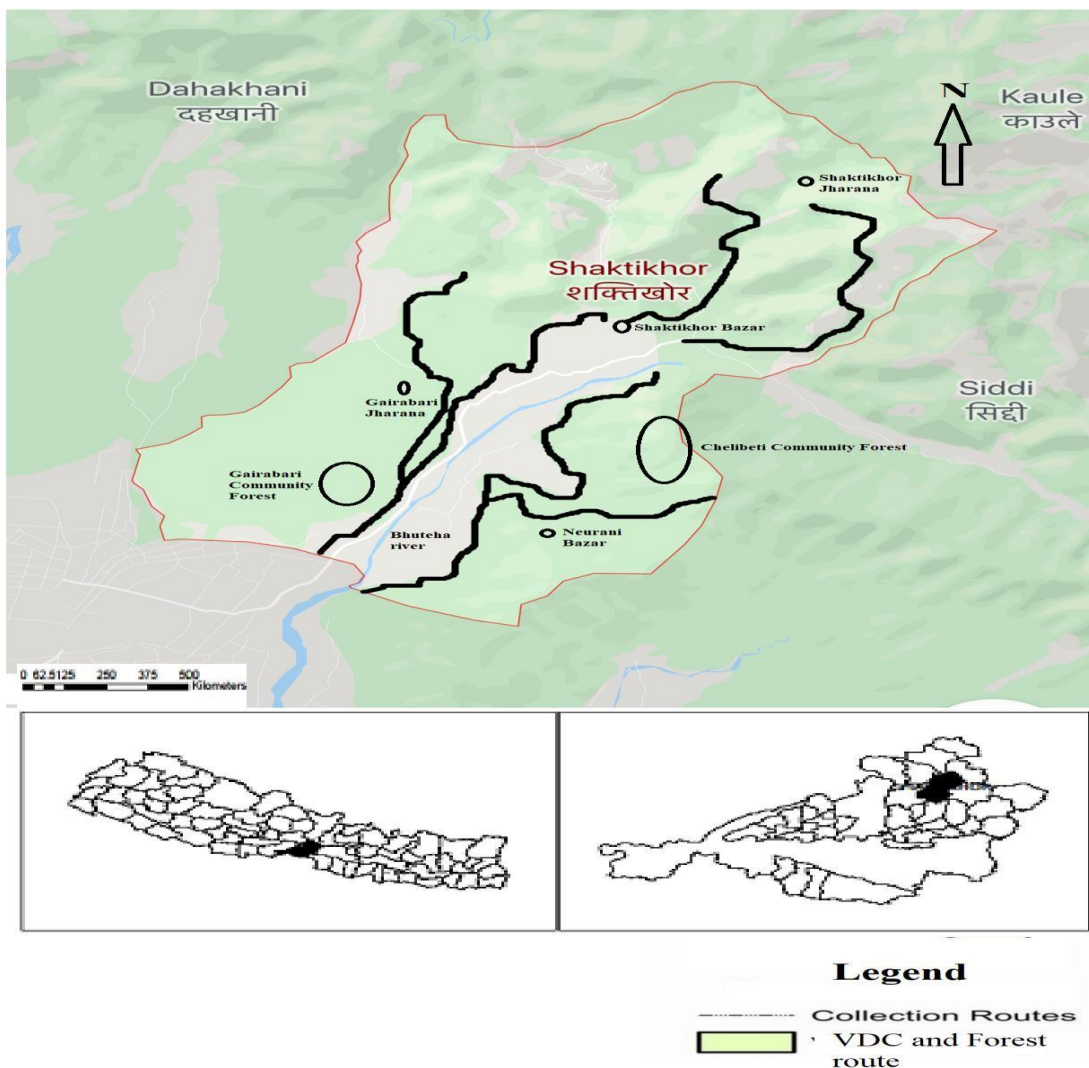


Figure 1: Map of Study Area

Table 1: Locality of Collection

S.N	Locality	Latitude	Longitude	Elevation (m)
1	Jutpani	27°42'57"	84°34'35"	239
2	Neureni village	27°43'106"	84°35'595"	300
3	Neureni forest	27°41'4"	84°34'39"	562
4	Gairabari	27°41'14"	83°34'47"	327
5	Chelibeti community forest	27°43'368"	84°36'117"	290
6	Shaktikhor bazar	27°42'13"	84°34'24"	271
7	Chepang Gau	27°41'1"	84°34'46"	510
8	Shaktikhor Jharana	27°41'0"	84°34'56"	634
9	Gadhi trail	27°40'58"	84°34'49"	450-1354
10	Gairabari Jharana	27°43'487"	84°36'058"	335

3.1.2 Climate

Climate is subtropical at lower altitudes and moist temperate above 2000 m (GoN 2013) with high amount of precipitation, the highest and lowest mean monsoon rainfall in the region is 1236 mm and 506 mm respectively over the past years. The mean winter rainfall is 63.13 mm, mean annual temperature varies from subtropical zone to temperate range of 10-35⁰ C to 20-25⁰ C respectively (GoN, 2013).

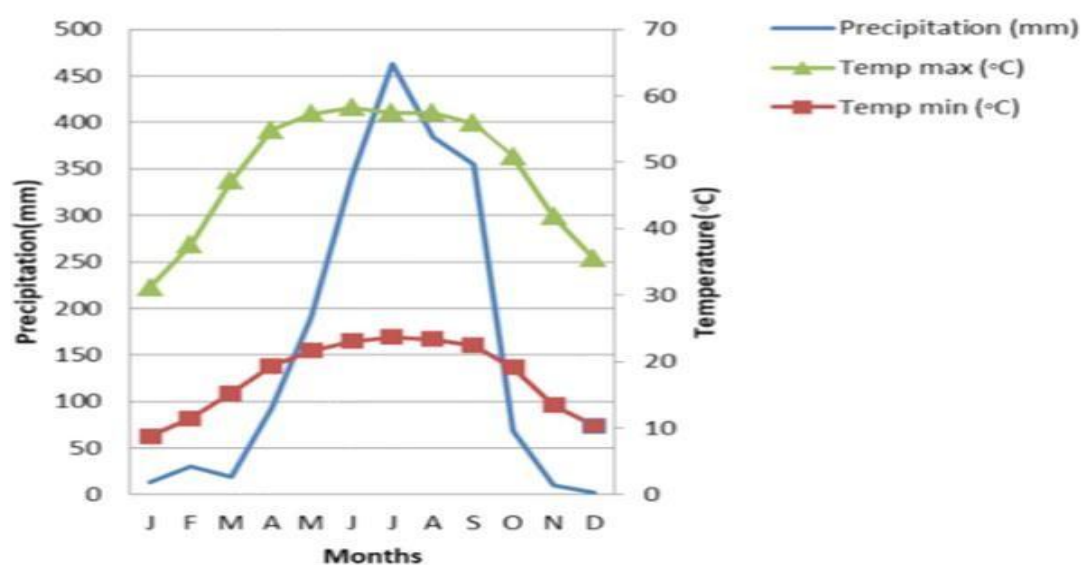


Figure 2: Ten years (2008-2018) average monthly temperature and rainfall (Chitwan station: nearest station from Shaktikhor)

(Source: Department of Hydrology and Meteorology, Kathmandu)

3.1.3 Vegetation

Sal forests occur throughout the flatland of Terai and also in the Siwaliks. The purest stands of Sal occur on well drained lowland ground in the centre. Bohner *et al* (2015) described 19 vegetation types in the inner valley of Nepal.

Sal is dominant species and other associated tree species such as *Terminalia bellerica*, *Terminalia chebula*, *Bauhinia variegata* etc in the elevation range 200- 400m. The common shrub species were *Calotropis* spp, *Sida* spp., *Jatropha curcas*, etc. and the herb species were *Achyranthus bidentata*, *Desmodium microphylla* etc. The main species in this type of forest is *Bombax ceiba* along with *Trewia nudiflora*, *Adina cordifolia*, etc.

From 400-600 m, mixed forest was found which included *Shorea robusta* along with *Acacia catechu*, *Cassia fistula*, *Dalbergia sisso*, etc. Sal forests are replaced by Tropical deciduous riverine forest along the bank of rivers and on river terraces. The common shrub species were *Murraya koenigii* etc. and the herb species were *Boerhavia diffusa*, *Commelina benghalensis*, etc.

However, the *Acacia catechu* and *Dalbergia sissoo* association tends to be dominant in areas prone to flooding where it forms a distinct riverine *Dalbergia-Acacia* forest.

From 600- 1200 m, the southern slope *Shorea robusta* is interspersed with *Mallotus* sp. Some species of *Sterulia* and *Ficus* sp. were recorded. The common shrubs were *Osbeckia nepalensis*, *Osbeckia stellate*, *Breynia retusa*, etc and the herbs like *Girardiana diversifolia*, *Galium* sp, *Ophiorrhza rugosa*, etc were recorded.

The vegetation of this area includes Sal (*Shorea robusta*) forest, *Dalbergia-Acacia* forest and Tropical deciduous riverine forest (Stainton 1972).

3.2. Plant collection and herbarium preparation

The plant specimens were collected within the altitudinal range of 210-1802 m covering all the habitat types and vegetation zones, wherever possible. The collection route followed was mainly the walking trail, river side, inner trails of forest etc. 50 m distance was entered on each side of the trail, in every 100 m elevation for collecting plant specimens. The plant specimens were tagged in the field during collection with

field notes. The plant collection, herbarium preparation and their preservation was based on the herbarium technique following Forman & Bridson (1989). The collected plant specimens were deposited at ASCOL.

Altogether there were five field visits concerning the collections of plant specimens.

Table 2: Method for description

FAMILY (Bold and capital)

Botanical/ Accepted name (Bold) followed by author

Synonym (s) Italics

Description

Flowering, Habitat

Distribution

Representative collection: *District* (Italic), locality, elevation (m), date of collection (day/month/year), tag number.

3.3. Identification of specimens

For the preliminary identifications of the specimens literature (Xuejun Ge *et al* (2011), Hooker J.D. (1882), Grierson *et al* (2001) were consulted and further cross checked with the herbarium deposited at National Herbarium Center (KATH). The plant specimens were also compared with the digital photographs of herbarium specimens of Royal Botanical Garden, Edinburgh (E), British Museum (BM), Digital Images, Royal Botanical garden, Kew (K), University Museum, University of Tokyo (TI), Natural Historical Museum (NHM). The online databases such as International Plant Name Index (www.ipni.org) and the plant name record of the world (www.theplantlist.org) were used to complete and accepted names of the genus. More over the additional data were obtained through virtual herbaria and other online databases such as Kew Herbarium Catalogue (www.kew.org), British Museum Virtual Herbarium (www.nhm.ac.uk), Royal Botanic garden Edinburgh Virtual Herbarium (rbge.org.uk), Chinese Virtual Herbarium Catalogue (www.cvh.org.cn), Global Biodiversity Index Faculty (www.gbif.org) along with the Flora of Himalaya Database (www.lec.univsavoie.fr). The locations detail of Nepal was collected from Google Earth. Different Floras like Flora of India (Hooker, J.D. 1882), Flora of Bhutan (Grierson *et al* 2001), Flora of China (Xuejun *et al.* 2011), etc were reviewed

for the identification of the species. Herbarium specimens were studied for complete documentation of different species within the genus. These surveys were fruitful to delimit the genus and species, to obtain the knowledge on the distribution and the field visits were planned on the basis of location details. The literatures available and the photographs were consulted for the further identification and confirmation of the species.

3.4. Morphological study

The herbarium specimens were collected from different parts of Nepal and herbarium at KATH was studied. Morphological characters along with vegetative parts (stem, leaf, inflorescence and the reproductive parts of plants such as Calyx, Corolla, Stamen, Carpel, Fruit, etc were observed in dicot. For monocot, the vegetative parts such as rhizome, stem/ clums, leaf, ligule, leaf blade, inflorescence, etc were observed and the reproductive parts such as spike, glumes, flower, stamen, nuts, etc were observed. To study details for some parts, the light microscope and dissecting microscope were used. For studying the morphological characters, the plant parts were soaked in the detergent solution for dried materials. APG IV has been followed for the identification and classification for the specimens.

CHAPTER IV: RESULT

From the present study, total number of 145 species has been recorded from Shaktikhor Village Development Committee.

4.1 Floristic composition:

Altogether 145 species of flowering plants were recorded. Most of the species were recorded in the altitude between 200-400 m along the road side and forest area.

Total number of 41 families belonging to 111 genera and 145 species were observed. Among 145 species, 60% (87 species) were represented by herbs, 26% (37 species) by shrubs, 11% (16 species) by Trees and 3% (5 species) by climbers.

Fabaceae was the dominant family with 12 genera and 17 species followed by Poaceae, Acanthaceae, Asteraceae, Cyperaceae and Lamiaceae. Largest genera recorded were Cyperus, Desmodium, Clerodendrum, each with 4 species followed by Justicia, Solanum, Pennisetum, Tornea each with two species.

Table 3: Number of taxa

Taxa	Number
Order	20
Family	41
Genus	111
Species	145

In detail following characteristics features are obtained and ordered according to APG IV (2016).

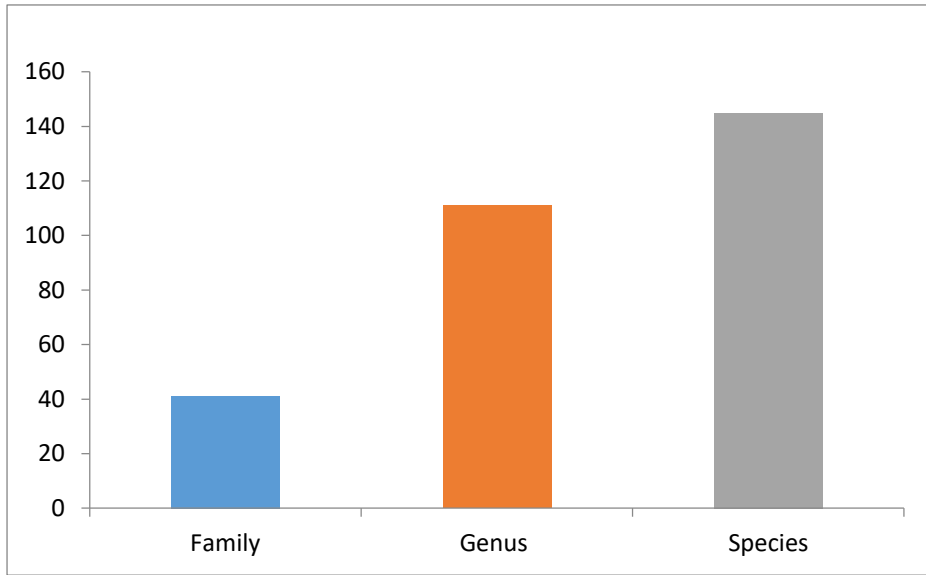


Figure 3: Bar diagram showing the composition of family, genus and species

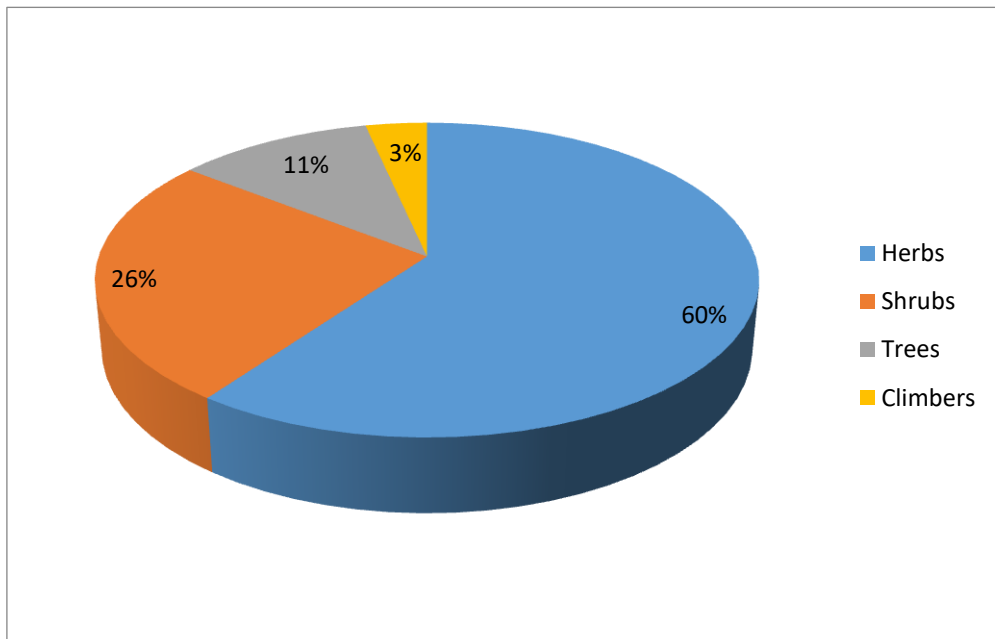


Figure 4: Pie chart showing the life forms of plants species in the study areas

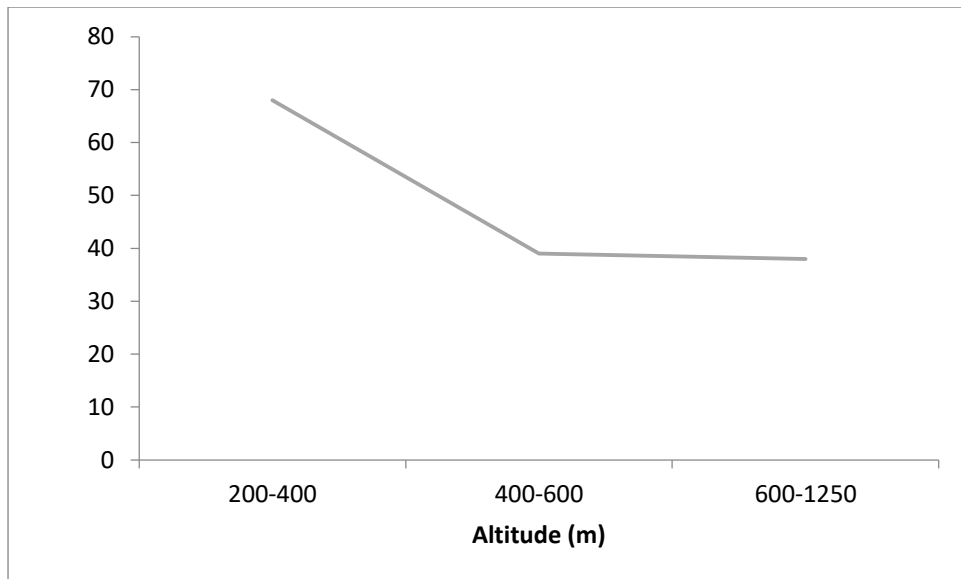


Figure 5: Line chart showing the number of species according to the altitudinal variations.

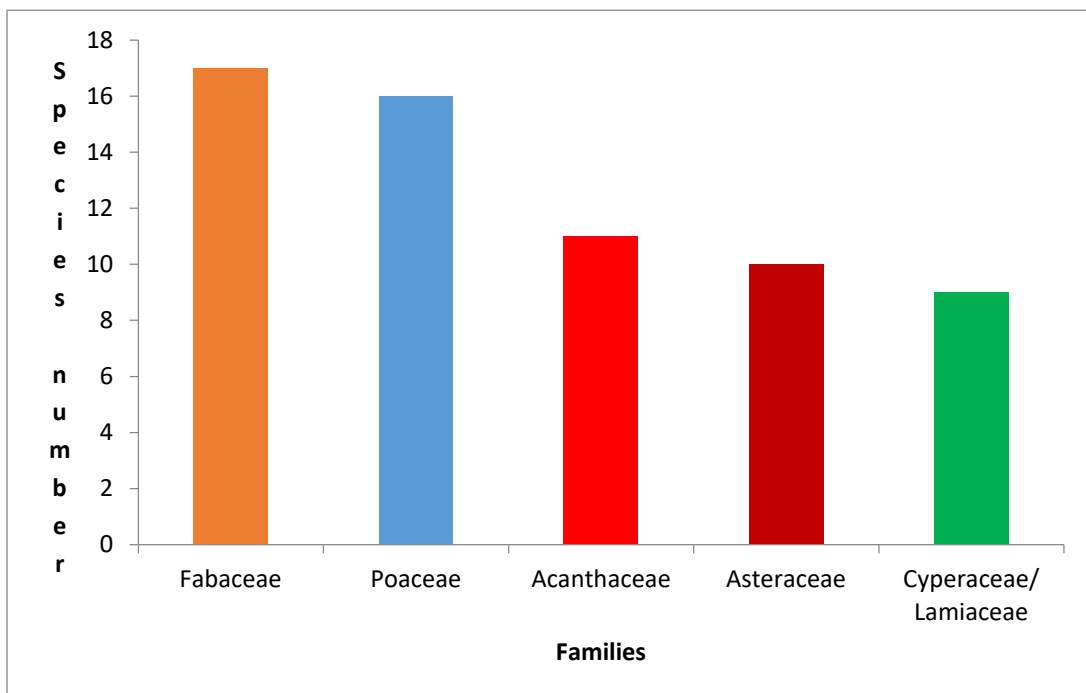


Figure 6: Top five families on the basis of species number in the study area

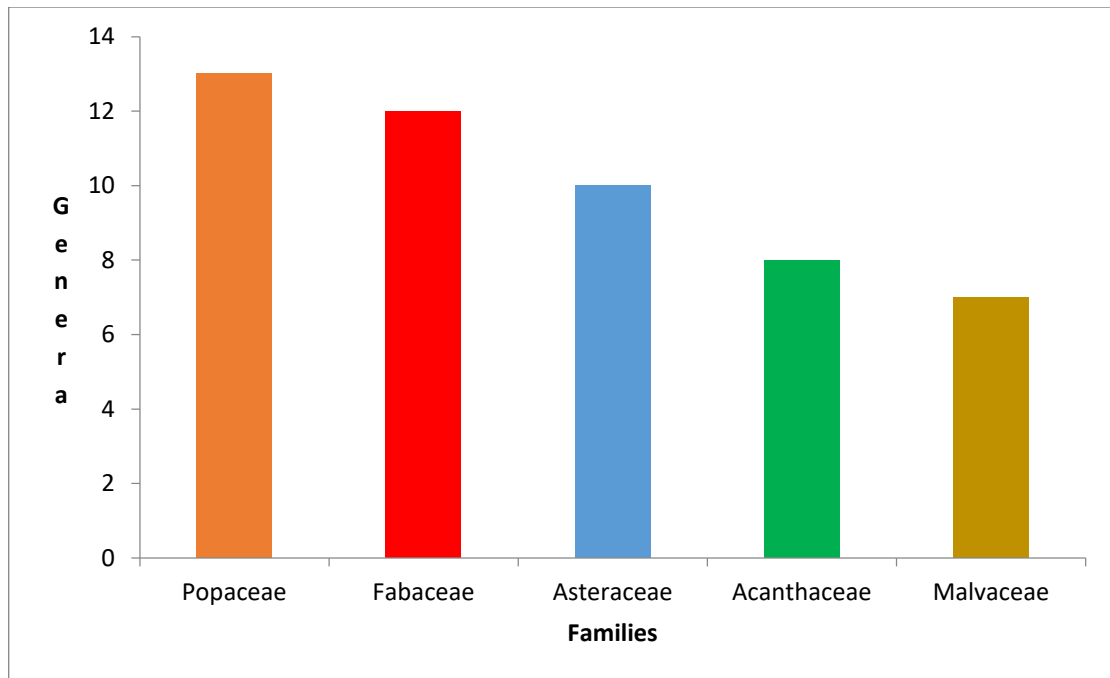


Figure 7: Top five families on the basis of genera in the study area

DESCRIPTION

MAGNOLIDS

ORDER: LAURALES

1. FAMILY: LAURACEAE

Trees or shrubs. Leaves alternate, exstipulate. Inflorescence cymose or racemose. Flowers unisexual or bisexual, actinomorphic. Perianth segments 4-6, often connate at base. Stamens multiple of perianth lobes. Ovule 1-celled. Fruit drupe.

1. *Cinnamomum* Schaeff.

Evergreen trees or shrubs. Shoots with terminal buds. Leaves 3-veined at base, bract absent. Flower: small, bi-sexual. Fruit: borne on perianth cup, berry.

1. *Cinnamomum tamala* (Buch.-Ham.) T. Nees & Eberm, *Handb. Med.-Pharm. B.*

2:426. 1831.

Cinnamomum albiflorum Nees, ; in Wall., *Pl. As. Rar.* 2: 75 (1831); 3: 32 (1832).

Tree, Ca.6m. Stem: branched, glabrous, buds present. Leaves 3-veined, ovate to elliptic, 5.6-13 × 2.3-4.7 cm, apex: acute -acuminate, base: cuneate, margin: slightly inrolled, upper surface: glabrous, underside glaucous. Inflorescence axillary or terminal panicles. Fruit obovoid or ellipsoid.

Fr: April. **Habitat:** Sal forest.

Distribution: Himalaya. Nepal (WCE: 450-2000) m.

Representative collection: *Chitwan*, Gairibari forest, 482m, 9 Dec 2017, B.K.C, S. Gyawali, S. Luintel, BS. 189.

Use value: leaves and bark used as spices.

MONOCOTS

ORDER: DIOSCOREALES

2. FAMILY: DIOSCORACEAE

Tuberous and rhizomatous climbing herb. Leaves: Usually alternate, cordate, palmately veined, entire and digitately parted. Petioles: twisted. Inflorescence: Racemose or panicles, unisexual. Tepals: 6 in two whorls. Stamens: 3-6, all fertile or 3 staminodes, epipetalous. Ovary: inferior, 3-celled. Fruit: capsule or berry.

Dioscorea L.

Climbing herb arising from tubers. Leaves: opposite or alternate, simple or compound. Male flower: clustered on spikes along leafless axes. Axes usually axillary or terminal. Flower: cup shaped, sessile. Bract and bracteole: present. Female flower: sessile on axillary spikes. Ovary: 3-loculed. Capsule: broadly 3 winged.

Key to species

- 1a. Sepals and petals whitish..... **1. D. bulbifera**
1b. Sepals and petals greenish..... **2. D. deltoidea**

1. Dioscorea bulbifera L., ; Sp. Pl.: 1033 (1753).

Climbing herb, glabrous, annual. Stem: twining to left. Bulbils: warty. Petiole: Ca. 25cm. Leaves: Ca. (4-12×3-7) cm, ovate, cordate, acuminate, entire. Male spike: elongated axillary axes. Female spike: 2-5 axillary in group, overlapping flowers. Sepals and petals: Ca. 2mm, whitish. Capsule: oblong. Wing: Ca. 5mm.

Fl: Jul-Oct, **Habitat:** Along Shorea robusta forest.

Distribution: Tropics of the Old World, Nepal (WCE: 150-2100) m.

Representative collection: *Chitwan*, Chelibeti community forest, 439m, 18 Oct 2017
B.K.C, S. Lamichhane, S. Simkhada, SW 182.

Use value: wild edible.

2. Dioscorea deltoidea Wall. ex Griseb., Fl. bras. 3(1):43, in nota. 1842 (Kunth, Enum. pl. 5:340. 1850).

Climbing herb, glabrous. Stem: twining to left, herbaceous, glabrous. Petiole: 2-5cm. Leaf: Ca. (5-7×2-5) cm, cordate, entire, acuminate-cuspidate. Male spikes: arranged in leafless branches, axillary with 2-4 clustered flower. Female spike: single. Sepal and petals: greenish, Ca.2mm, inconspicuous. Capsule: ovate, 1.6-2.7cm. Wing: Ca.1cm wide.

Fl: May- June, **Habitat:** Under Shorea robusta forest.

Distribution: Himalaya (Kashmir to Assam), Indo-China, W. China, Nepal (WCE: 450-3100) m.

Representative collection: *Chitwan*, Chelibeti community forest, 535m, 9 June 2018, B.K.C, S. Simkhada, SW 268.

Use value: Wild edible.

ORDER: ARECALES

3. FAMILY: ARECACEAE

Herbs, shrubs or trees. Monoecious or dioecious. Biennial or perennial. Stem: solitary or clustered. Leaves: pinnate or palmate. Inflorescence: above or below the leaves, solitary. Sepals:3. Petals: 3. Stamens: 6. Carpels: 3. Fruits: oblong, globose, variously shaped.

Phoenix L.

Erect, palms. Stem: covered with base of petiole. Leaves: pinnate, lanceolate. Inflorescence: axillary, branched. Flower: unisexual with drooping peduncle. Fruit: berry with fleshy pericarp.

Phoenix humilis Royle ex Becc. & Hook. f., ; Fl. Brit. Ind. 6: 416 (1892).

Erect, Ca. 1m, evergreen palm. Stem: Clustered from base with the petiole. Leaves: Ca. 80cm. Leaflets: Ca.17.3cm, attached on rachis, unipinnate, 2-3 in pairs attached to rachis in several interval, persistent scales. Peduncle: Ca. 45cm. Inflorescence:

axillary clustered at apex of peduncle. Fruit: oblong, globose, yellowish when ripe.
Seeds: woody.

Fl: Feb-March. **Habitat:** On dry slope under Sal forest.

Distribution: Himalaya (Kumaun, Nepal), India, Burma, Indo-China, China, Nepal
(WCE: 150-900) m.

Representative collection: *Chitwan*, Neurani forest, 342m, 6 March 2018, B.K.C,
Y.N. Paudel, 197.

Use value: Fruit edible.

ORDER: COMMELINALES

4. FAMILY: COMMELINACEAE

Herbs, commonly perennial, semi-succulent. Roots: fleshy. Stem: rooting from lower nodes, upper part erect. Leaves: alternate, leaf sheath present around stem. Inflorescence: axillary clusters, cymes, bisexual. Perianth: biseriate, outer segment 3, persistent, inner segment 3, tubular. Stamens: 3 or 6 in 2 whorls. Ovary: superior, 2-3 celled. Fruit: indehiscent capsule.

Key to genus

- 1a. Fertile stamens 3.....2
- 1b. Fertile stamens 6..... **2. Cyanotis**
- 2a. Inflorescence terminal, enclosed in a spathe..... **1. Commelina**
- 2b. Inflorescence umbel like, at apex of main stem or branch..... **3. Rhopalephora**

1. *Commelina* L.

Herb, erect or creeping. Leaves: petiolate or sessile, linear, lanceolate, lax- sheath present along the stem. Inflorescence: bifid cyme arising terminally. Upper flower: cyme small, deciduous, lower one fertile. Sepals: 3, membranous. Petals: 3, 2 small one large, clawed. Stamens: 3. Anther: oblong. Ovary: 3-celled. Fruit: capsule enclosed within the spathe.

***Commelina benghalensis* L. ; Sp. Pl.: 41(1753).**

Herb, Ca.70cm. Stem: highly branched from base. Leaves: Ca. (2.1-4.3×1-2.1) cm, oblog-elliptic, truncate, entire, rounded, surface bearing long hairs. Inflorescence: cymes, a single male flower with exerted pedicel. Petals: blue, 2 clawed, 1 lanceolate.

Capsule: oblong.

Fl: June-Oct, **Habitat:** Along roadside.

Distribution: Africa, Himalaya, India east- China, Japan, Malaysia, Nepal WCE (900-1800) m.

Representative collection: *Chitwan*, Neurani village, 989m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 239.

5. *Cyanotis* D. Don

Herbs erect or creeping. Rhizomes absent. Leaves spiral, sessile, succulent. Flowers bisexual, actinomorphic. Sepals 3, free. Petals 3, connate, tubular. Stamens 6, fertile filaments hairy. Ovary 3-celled, ovules 2 per cell. Capsules trigonous.

Cyanotis vaga (Lour.) J. A. & J. H. Schult., ; Syst. Veg. 2: 1153 (1830).

Cyanotis barbata D. Don , ; Prodr. Fl. Nepal.: 46 (1825).

Tonningia barbata (D. Don) Kuntze , ; Revis. Gen. Pl. 2: 722 (1891).

Tradescantia barbata (D. Don) Spreng., ; Syst. Veg. 4(2): 138 (1827).

Creeping herb, annual, Ca. 40cm. Stem decumbent, branched. Leaf sheath: pubescent.

Leaves: Ca. (2-6.5 x 0.4-0.7) cm linear or lanceolate, apex acute or acuminate, ciliate.

Inflorescence cymes scorpioid, terminal and axillary subtended by leaf like spathes.

Flowers purplish, filaments long exerted from corolla hairs bluish. Capsule quadrate.

Fl: Aug. **Habitat:** Moist area.

Distribution: W. Africa, C. Asia, Himalaya, Myanmar. Nepal (WCE: 800-2700) m.

Representative collection: *Chitwan*, way to gadhi, 945m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 209.

3. *Rhopalephora* (Blume) Faden.

Perennial herb. Stems: ascending distally. Leaves: spirally arranged. Inflorescence: corymbiform. Flowers zygomorphic. Sepals free. Petals free, white, upper two clawed. Fertile stamens: 3. Filament: glabrous. Ovary: 1-3 valved. Seed: rugose.

***Rhopalephora scaberrima* (Blume) Faden, *Phytologia* 37(5): 480 (1977).**

Commelina scaberrima Blume, Enum. P l. Javae 1: 4. 1827

Herb annual, Ca.40cm. Stems: creeping, ascending, sub-glabrous, glandular pubescent. Leaf sheath: Ca.3cm, pubescent. Petiole absent. Leaves: Ca. (4-7.3×2-3.7) cm, lanceolate, acuminate. Inflorescence: cincinnus. Bract: present. Pedicel: Ca.0.9cm. Sepals: Ca.3mm, persistent, glabrous. Petals: pale blue. Capsule: Ca. 0.3cm, hairy. Seeds: wrinkled.

Fl: Jun, **Habitat:** On grassland.

Distribution: India, Ceylin, East China, Taiwan, Malaysia, Nepal CE (800-2100) m.

Representative collection: *Chitwan*, gairibari community forest, 649m, 9 June 2018, B.K.C, S. Simkhada, SW 218.

ORDER: ZINGIBERALES

5. FAMILY: COSTACEAE

Perennial herb with fleshy rhizomes. Stems: simple, terete, leafy. Leaves: spirally arranged, broadly elliptic, glabrous or pubescent. Leaves sheath: tubular, closed. Ligule: present. Petiolate. Inflorescence: terminal on leafy shoots. Bract: present. Calyx: tubular, 2-3 lobed. Corolla: 2-3 unequal lobes. Staminodes: 5. Fertile stamen: 1. Fruit: 2-3 valved capsule. Seed: numerous.

Hellenia L.

Rhizomatous herb. Leaves arranged spirally, leaf sheath tubular. Inflorescence: dense, terminal on leaf apex. Calyx: 3-lobed. Filaments: broad and petal like. Ovule: trilobular. Capsule: dehiscent.

Hellenia speciosa (J.Koenig) S.R.Dutta

Costus speciosus (Koenig) Sm., ; Trans. Linn. Soc. London 1: 249 (1791).

Herb, Ca. 1m, annual. Leaves: Ca. (14.8-17.3×3.8-5.2) cm, elliptic, cuneate, acute, entire, spirally arranged. Inflorescence: terminal. Bract: Ca. (1.6-2.2×0.5-0.8) cm, red, sharp-tipped. Calyx: Ca. 3.2cm, lobes acute. Corolla: white, tubular. Fruit: ellipsoid.

Fl: Jul-Sept. **Habitat:** on moist slope.

Distribution: Himalaya (Nepal, Sikkim), south to Ceylon, Indo-China, Malaysia to New Guinea, Taiwan, Nepal (WCE: 400-700) m.

Representative collection: *Chitwan*, Chelibeti forest, 426m, 3 June, 2018, B.K.C, S. Gyawali, S. Luintel, BS 181.

6. FAMILY: ZINGIBERACEAE

Rhizomatous herbs. Leaves: Lanceolate, entire, acute, glabrous. Leaf sheath tubular. Inflorescence: terminal, base directly from rhizome. Flower: solitary in axil of bracts. Bracteoles: absent or present. Calyx: tubular. Petals: united at base, 3, dorsal lip larger.

Fertile stamen: 1. Ovary: inferior, 1-celled. Fruit: capsule or fleshy berry.

Key to genus

- 1a. Inflorescence terminal single flowered.....**1. Globba**
- 1b. Inflorescence terminal spike.....**2. Hedychium**

1. *Globba* L.

Slender shrub. Leaves distichous, oblong elliptic. Inflorescence: Terminal, single flowered. Calyx: 3 lobed. Corolla: tubular, dorsal petal noded. Stamens: attached to corolla tube. Stamens: long slender.

Globba racemosa Sm., ; Exot. Bot. 2: 115, t. 117 (1808).

Herb, Ca.50cm, annual. Leaves: Ca. 5.2-16.3× 2.4-5.2) cm, lanceolate, caudate, sessile, acuminate. Inflorescence: terminal. Calyx: 3 lobed. Corolla: tubular, dorsal petal hooked, twice the length of calyx. Stamens: attached to corolla tube. Filaments: long.

Ovary: unilocular. Fruit: small.

Fl: June-sept. **Habitat:** under sal forest in moist place.

Distribution: Himalaya (Kumaun to Sikkim), Nepal (CE: 150-1100) m.

Representative collection: *Chitwan*, Neurani forest, 548m, 16 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 152.

2. *Hedychium* Koenig

Leafy shoot many leaved. Inflorescence: terminal spike, many flowered. Bract: each holding 2-6 flowers. Bracteoles: tubular. Corolla: tube slender. Lip: bifid. Stamens: exerted long filaments slightly curved. Ovary: trilocular. Fruit: capsule.

Hedychium thyriforme Sm. A. Rees, Cycl. 17: 1811

Hedychium heteromallum Lindl., ; in Edwards, Bot. Regist. 9: t. 767 (1824).

Hedychium tocucho Buch.-Ham. ex Wall., ; in Hook., J. Bot. Kew Gard. Misc. 5: 327 (1853).

Rhizomatous, Perennial herb, Ca. 90cm. Leafy shoot many leaved. Inflorescence: terminal spike, many flowered. Bract: each holding 2-6 flowers. Bracteoles: tubular. Corolla: tube slender. Lip: bifid. Stamens: exerted long filaments slightly curved. Ovary: trilocular. Fruit: capsule.

Fl: Aug- oct. **Habitat:** On slope.

Distribution: Himalaya (Kumaun to Sikkim), Assam, Nepal (C: ca 1200) m.

Representative collection: *Chitwan*, way to gadhi. 1287m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 216.

ORDER: POALES

7. FAMILY: CYPERACEAE

Herb, annual or perennial. Stem: 3-angled. Leaves: usually basal, 3-rowed. Leaves: linear, sheathing base, ligulate. Inflorescence: terminal, few flowered spikelets. Bract: present. Flower: unisexual or bisexual. Perianth: scaly or absent. Stamens: 1-3. Ovary:

superior. Ovule: 1. Stigma: 2-3. Fruit: achene or nut.

Key to genus

- 1a. Culms noded.....2
- 1b. Culms not noded.....3
- 2a. Inflorescence axillary.....**2. Cladium**
- 2b. Inflorescence multiple spike.....**4. Eleocharis**
- 3a. Flower bisexual.....**4**
- 3b. Flower unisexual.....**5**
- 4a. Bristle present in perianth..... **6. Schoenoplectus**
- 4b. Bristles absent in perianth.....**5. Fimbristylis**
- 5a. Spike panicle.....**1. Carex**
- 5b. Spike compressed.....**3. Cyperus**

1. Carex L.

Perennial herbs. Rhizome usually stoloniferous. Culms tufted or sparse. Leaves basal or basal and cauline, flat, sheathed at base. Involucral bract leaflike. Flowers unisexual, subtended by a glume. Flowers arranged in spikes. Spikes arranged in panicles or racemes or single.

Carex indica Linnaeus, Mant. Pl. Alt. 574. 1771.

Perennial, rhizome thick. Clums: trigonous, smooth. Sheath: persistent. Leaves: longer than clums, flat. Inflorescence: panicle compound. Spike: numerous, bisexual, 2-8 flowered. Male glumes: pale yellow, lanceolate, awned. Female glume: yellowish white, 3-veined. Nut: trigonous, brown. Stigma: 3.

Fl: June- Aug. **Habitat:** In paddy field

Distribution: Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Australia, Pacific islands.

Representative collection: *Chitwan*, riverside, 256m, 9 jun 2017, B.K.C, S. Gyawali, S. Luintel, BS 135.

2. Cladium P. Browne.

Perennial stoloniferous herb. Clums: node, terete. Leaves: cauline. Inflorescence: axillary, clustered. Spikelets: 3-15. Spikes: fusiform. Glumes: spirally arranged, sterile.

Cladium mariscus (L.) Pohl. Sp. Pl. 42. (1753).

Perennial herb, Ca. 80cm. Rhizome: stoloniferous. Stem: bearing internodes. Leaves: spirally arranged in stem. Inflorescence: axillary on leaf axils. Spike: clustered in branches with bracts, 3-14. Glumes: bract like.

Fl: April-june. **Habitat:** river side.

Distribution: Europe, except NE, N Africa, Saudi Arabia, Israel, Lebanon, Syria, Turkey, Caucasus, Turkestan, Pakistan and Kashmir; NE to Kazakhstan.

Representative collection: *Chitwan*, neurani forest, 230m, 28 April 2018, B.K.C, S. Gyawali, S. Luintel.

3. *Cyperus* L.

Annual or perennial herbs. Stem trigonous with sheathing leaves. Leaves basal, 3-ranked, ligule absent. Involucral bracts leaflike, exceeding inflorescence. Inflorescence terminal. Flowers unisexual. Spikelets: compressed, glumes distichous. Perianth absent. Nut: trigonous.

Key to species

- 1a. Inflorescence decomposed anthela.....2
- 2b. Inflorescence compound or spikelet.....3
- 2a. Glumes pale green**C. alternifolius**
- 2b. Glumes rusty brown**C. diffusus**
- 3a. Glumes reddish purple.....**C. ciliaris**
- 3b. Glumes dark brown..... **C. iria**

Cyperus alternifolius Linnaeus, Syst. Nat., ed. 12. 2: 82; Mant. Pl. 28. 1767.

Perennial herb, Ca. 2m. Clums: 3-angled. Leaves: sub-equal to stem, linear. Inflorescence: decomposed anthela with 3-9 spikelet. Spikelet: clustered in apex. Glumes: pale green. Nut: 3-sided.

Fl: June-Aug. **Habitat:** Agricultural field.

Distribution: Naturalized in wetlands along river, Nepal (WCE: 100-300) m.

Representative collection: *Chitwan*, bank of bhuteha river, 234m, jun 9 2017, B.K.C, S. Gyawali, S. Luintel, BS 206.

Cyperus ciliaris L., ; Cent. Pl. 2: 6 (1756).

Annual herb, Ca. 40cm. Clums: tufted, smooth. Leaves: Ca. (30×1) cm, short than clums, linear. Inflorescence: compound. Spikelets: ovoid- linear, 8-28 flowered. Glumes: reddish purple, 3-veined. Nut: obovoid.

Fl: May-Aug, **Habitat:** open grassland near river bank.

Distribution: Tropical, subtropical and temperate regions of both hemispheres. Common in rice fields, Nepal (WCE:100-2700) m.

Representative collection: *Chitwan*, neurani village, 367m, Jun 9, 2017, B.K.C, S. Gyawali, S. Luintel, BS 251.

Cyperus diffusus Vahl, ; Enum. Pl. 2: 312 (1806).

Perennial herb, Ca.30cm. Clums: thick, densely leaved at base. Leaves: Ca. (25×1) cm, equal to clums, linear. Inflorescence: decomposed anthela. Spikelet: 1-5. Glumes: rusty brown. Nuts: ellipsoid.

Fl: April- June, **Habitat:** in paddy field.

Distribution: Himalaya (Nepal to Bhutan), India, Indo-China, S. China, Taiwan, Malaysia, Nepal (E, 200-900) m.

Representative collection: *Chitwan*, Jharana, 322m, April 29 2018, B.K.C, S. Lamichhane, S. Simkhada, SW 215.

Cyperus iria L., *Sp. Pl.* 1: 45. 1753.

Erect herb. Stem tufted. Leaves 35 cm long, acute. Inflorescence umbel, bearing irregularly fascicled. Spike with few flowered spikelets. Bracts leaf like, 2 in number.

Spikelet dark brown. Glume elliptic ovate.

Fl: Aug. **Habitat:** Grassland.

Distribution: Tropical, Subtropical (N. Hemisphere). Nepal (WCE: 200-18s00 m).

Representative collection: *Chitwan*, Bhutaha river, 219m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW201.

4. Eleocharis R. Br

Perennials, herb. Rhizome erect or ascending, short. Stem: rigid, terete. Leaves: basal; ligule absent. Inflorescence: multiple spike. Bracts: 2-6, longer than inflorescence. Spikes: spirally arranged glumes. Flower: bisexual; perianth bristles numerous, longer than glumes, smooth. Stamens: 2. Stigma: 3.

Eleocharis congesta D. Don, ; Prodr. Fl. Nepal.: 41 (1825).

Perennial herb, Ca.70 cm. Stem: terete or sub-terete, smooth. Leaves: overtopping stem; sheaths: brown or dark brown, glossy, mouth oblique. Inflorescence: 5-12 cm. Bracts: 4-6. Branches: single spike or cluster of 2-4. Spikes: sessile. Glumes: brown with redbrown. Nut: trigonous, black-brown.

Fl: March- April, **Habitat:** Along riverside.

Distribution: SE Iran, Afghanistan, Pakistan, east in Himalayas to Myanmar, China and N Vietnam, Nepal (WCE: 200-2300) m.

Type: Nepal, Wallich 3446 (K).

Representative collection: *Chitwan*, Neurani village, 320m, 7 March 2018, B.K.C, S. Gyawali, S. Luintel, BS 243.

5. *Fimbristylis* Vahl.

Annual or perennial, rhizomatous herb. Culms: tufted, slender, 3- 5-angled or flattened. Leaves: basal, bladeless sheath. Ligule: membranous. Leaf blade: linear, filiform. Inflorescences: terminal, a simple, reduced to 1 terminal spikelet. Spikelets: solitary or fascicled. Glumes: spirally imbricate. Flowers: bisexual. Perianth: bristles absent. Stamens: 1-3. Style: not persistent on nutlet, basally enlarged. Nutlet: 3-sided or almost terete.

Fimbristylis dichotoma (L.) Vahl, ; Enum. Pl. 2: 287 (1806).

Greyish green, perennial herb, Ca.50 cm. Stem: deeply grooved, glabrous. Leaves: half of stem length Sheaths: open, slightly villose. Ligule: a dense fringe of hairs. Inflorescence: solitary. Spikes: ovoid, terete, acute, light brown to brown. Glumes: widely ovate, brown; rachis: narrowly winged. Stamens: 1, flat, colourless. style: deciduous, flat, brown. Stigmas: 2, flat. Nut: yellowish, sometimes whitish.

Fl: Jul- Oct **Habitat:** In paddy field.

Distribution: Afghanistan, Bhutan, India, Indonesia, Japan, Korea, Kyrgyzstan, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Uzbekistan, Vietnam; Africa, SW Asia, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific islands.

Representative collection: *Chitwan*, Shaktikhor bazar, 234m, 16 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW.225.

6. *Schoenoplectus* (Roxb.) Palla.

Herbs with creeping rhizomes. Culms tufted. Stem terete to triquetrous, nodeless. Leaves reduced to basal bladeless sheaths. Inflorescence a dense, pseudolateral anthela or capitates. Glume many, spiral, each subtending a bisexual flower. Perianth bristles 0-6, needle like.

Schoenoplectus juncooides (Roxb.) Palla.; Bot. Jahrb. Syst. 10: 229 (1889).

Rhizome: short. Stem densely tufted, terete. Inflorescence 1-7, spike. Spikelets: narrowly ovoid with many spirally inserted glume. Glume ovate to suborbicular or concave, apiculate, golden brown. Nut compressed or trigonal.

Fl: Aug. **Habitat:** Open grassland.

Distribution: Himalaya, Indo-China, Japan, Malaysia. Nepal (WCE: 1500-2700) m.

Representative collection: *Chitwan*, Bhuteha river, 254m, 14 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 236.

8. FAMILY: POACEAE

Annual or perennial herb, rarely shrubs or trees. Leaves: basal in vegetative shoots. Leaves: linear, sheath open or closed membranous along the base of blade. Culms: jointed, intrnode hollow. Flowers: spikelets, either panicle or racemose. Spikelets with one or more florets. Florets: 2-keeled palea, with a single flower. Flowers: bisexual. Ovary: single. Stigma: 2, feathery. Stamens: usually 3 covered by small scales. Fruit: indehiscent grain.

Key to genus

- 1a. Rhizome present, culms erect.....2
- 1b. Rhizome absent, culms stoloniferous 3
- 2a. Inflorescence digitate raceme.....**5. Digitaria**
- 2b. Inflorescence Panicle.....4
- 3a. Ligule with hair.....5

3b. Ligule glabrous.....	6
4a. Both sessile and pedicillate spikelet present.....	2. Chrysopogon
4b. Only one either sessile or pedicillate spikelet present.....	7
5a. Upper fertile and lower sterile floret	1. Arundinella
5b. All floret sterile.....	8. Neyraudia
6a. Spikelet single	10. Paspalidium
6b. Spiklet clustered.....	8
7a. Involucre with bristle.....	13. Pennisetum
7b. Involucre with no bristle.....	9
8a. Spikelet sessile.....	6. Elusine
8b. Spikelet sessile, pedicillate.....	12. Sorghum
9a. Digitate spikelet.....	10
9b. Panicle or paniculate or spike.....	11
10a. Floret 1.....	3. Cynodon
10b. Floret 2-4.....	4. Dactyloctenium
11a. Clums tufted.....	12
11b. Clums leafy branched.....	9. Oplismenus
12a. Lower glume absent.....	7. Eulalia
12b. Lower glume present... ..	11. Paspalum

1. Arundinella Raddi

Perennials, plant tufted. Culms erect, simple or branched. Ligule membranous, with line of hairs. Inflorescence an open or contracted panicle. Spikelets laterally compressed. Florets 2 to several, uppermost fertile, lower sterile. Glumes persistent, herbaceous.

Arundinella nepalensis Trin., *Gram. Panic*: 62. 1826.

Herb, rhizome short perennial. Culm: Ca. 1.7 m, glabrous. Leaves: Ca.0.6cm broad, oblong, glabrous or pubescent. Sheath: glabrous. Inflorescence: Panicle, purplish, Ca.16 cm. Spikelet: 0.6 cm long. Glume: unequal, persistent. Lemma: narrowly lanceolate.

Fl: Sept. **Habitat:** Open grassland.

Distribution: Himalaya (Nepal, Sikkim), India, China. Nepal (WCE: 500-2500) m.

Representative collection: *Chitwan*, Gairibari stream, 667m, 17 Oct 2017, B.K.C, S. Gyawali, S. Luintel, BS 241.

2. *Chrysopogon* Trin.

Perennial, tufted or spreading rhizomes. Leaves: flat, ligule a ring of short hairs. Inflorescence: paniculate, whorled branches, 2 pedicelled and 1 sessile spikelet. Spikelet: differing. Pedicelled spikelet: awned or not, 1-2 florets. Sessile spikelet: awned, 2 florets.

Chrysopogon aciculatus (Retz.) Trin., ; Fund. Agrost.: 188 (1820).

Andropogon acicularis Retz. ex Roem. & Schult., ; Syst. Veg. 2: 812 (1817).

Perennial with creeping rhizome. Culms: Ca. 35cm, ascending. Sheath: glabrous. Leaf blade: Ca. (2-5.6×0.3-0.5) cm, linear, glabrous, serrate. Inflorescence: panicle. Pedicelled spikelet: staminate. Sessile spikelet: attached to branch. Glume: leathery. Lower glume: acuminate. Upper glume: mucronate.

Fl: June- Oct, **Habitat:** Gairibari forest.

Distribution: Tropical Asia, Nepal, India, Ceylon, Burma, Indo-China, China, Malaysia, Polynesia, Australia, Nepal (CE: 150-1700) m.

Representative collection: *Chitwan*, Gairibari forest, 276m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 206.

3. *Cynodon* Rich.

Perennial, stoloniferous herbs. Rhizomes absent. Culms: leafy, nodes with 2-3 leaves. Leaf blades: linear, ligule membranous. Inflorescence: Racemes digitate, spikelets subsessile. Spikelets: compressed. Floret: 1, bisexual. Glumes shorter than spikelet.

Lemma: lanceolate.

Cynodon dactylon (L.) Pers., *Syn. Pl.* **1**: 85. 1805.

Prostrate, creeping perennial grass. Leaves: Ca. (0.6-4.3x 0.1-0.20 cm, linear-lanceolate, acute. Sheath: glabrous. Inflorescence: terminal panicle in a slender peduncle, 2.5 cm long, green or purplish. Spikelets: 0.15 cm long. Glume: lanceolate. Lemma: semiovate.

Fl: flowering all the year. **Habitat:** Open grassland.

Distribution: Cosmopolitan. Nepal (WCE: 100-3000) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 236 m, 7 Dec 2017, B.K.C, Y. N. Poudel, BY 267.

4. Dactyloctenium Wild.

Stoloniferous annual. Clums: branched. Sheath: kneeled, ligule membranous. Inflorescence: digitate, racemose, spikelets sessile. Spikelets: compressed, 2-4 bisexual florets, a terminal and sterile lemma. Glumes: short than spikelets. Lower glume: lanceolate-acute, upper glume: oblong. Lemmas: lanceolate. Palea: lanceolate, winged.

Grain: Rugose.

Dactyloctenium aegyptiacum Schumach

Eleusine aegyptica (L.) Desf., ; *Fl. Atlant.* **1**: 85 (1798).

Stolons creeping. Clums: ascending, erect. Sheath: glabrous. Leaves: Ca. (7-18x0.3-0.6) cm, tapered, acute, ciliated base. Inflorescence: racemose, 3-5 spikelet, Ca.0.4cm.

Fl: May- Oct. **Habitat:** Agricultural field.

Distribution: Tropical regions of Old World, introduced into Asia, Nepal (CE: 200-900) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 349m, 9 June 2018, B.K.C, S. Gyawali, S. Luintel, BS 239.

5. *Digitaria* Heist.ex Fabr.

Annual or perennial herbs. Culms erect or decumbent, occasionally stoloniferous. Leaf blades flat, linear, ligule membranous. Inflorescence of digitately arranged raemes, very rarely paniculate. Spikelets usually in groups of 2-3. Spikelets puberulous to villous.

Digitaria ciliaris (Retz.) Koeler, ; Descr. Gram.: 27 (1802).

Digitaria adscendens (Kunth) Henrard Blumea 1: 92 (1934).

Panicum adscendens Kunth, ; in H. B. K., Nov. Gen. Sp. 1: 97 (1816).

Annual herb, Ca. 80cm. Culms: branched at lower nodes. Leaf sheath: pilose. Leaf blade: Ca. (4-17×0.2-1) cm, linear-lanceolate. Inflorescence: digitate, racemes. Spikelets: paired. Spikelets; lanceolate. Lower glume: triangular. Upper glume: lanceolate, as long as spikelets. Lower lemma: 7-veined, long as spikelets. Upper lemma: elliptic, as long as lower lemma.

Fl: May-Oct. **Habitat:** Open grassland.

Distribution: Tropics of Old World, Nepal (CE 600-1500) m.

Representative collection: *Chitwan*, way to gadhi, 867m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 209.

6. *Eleusine* Gaertn.

Annual or perennial. Culms: compressed. Sheath: keeled. Leaf blade: linear, usually folded. Ligule: membranous. Inflorescence: spike, clustered at top. Spikelet: compressed. several florets. Glumes: shorter than lemma, persistent, 3-7 veined.

Lemma: glabrous, 3 veined. Grain: trigonous.

Eleusine indica (L.) Gaertn., ; Fruct. 1: 8 (1789).

Herb, Ca. 40 cm, annual. Culms: tufted, erect. Leaf sheath: glabrous. Leaf blade: Ca. 16-27 cm, flat, glabrous. Inflorescence: Racemose. Spikelet: 4-7mm, elliptic. Florets: 8. Glumes: Lanceolate, 1 veined. Lemmas: Ca. 3m, ovate. Grains: ovate, blackish.

Fl & Fr: Jun- Oct. **Habitat:** In rice field.

Distribution: Tropical and sub- tropical regions, Nepal (WCE: 600-2600) m.

Representative collection: *Chitwan*, Neurani village, 726m, 9 Jun 2018, B.K.C, S. Gyawali, S. Luintel, BS 243.

7. *Eulalia* Kunth

Herbs. Culms tufted. Leaf blades flat, linear, ligules very short, membranous, truncate, ciliate. Racemes elongate with many spikelets pairs. Spikelets dorsally compressed, similar, florets 2.

Eulalia leschenaultiana (Decne.) Ohwi, ; Bull. Sci. Mus. Tokyo 18: 2 (1947).

Pollinia cumingii Nees, ; in Hook., J. Bot. 2: 98 (1850).

Perennial herb, Ca. 60cm, with long trailing stolons. Culms: slender, pilose below inflorescence. Sheath: glabrous. Leaf blade: Ca. (3-8.3×0.1-0.5) cm, linear-lanceolate, acute, pubescent. Inflorescence: Racemose, solitary. Sessile spikelet: Ca. 0.3cm. Lower lemma: absent. Upper lemma: oblanceolate.

Fl: Sept. **Habitat:** Margin of forest.

Distribution: Plains of upper India, Nepal, Thailand, China, Malaysia, Micronesia, Australia, Nepal (WCE: 300-700) m.

Representative collection: *Chitwan*, Neurani village, 398 m, 16 Oct, 2017, B, K.C, S. Lamichhane, S. Simkhada, SW 112.

8. *Neyraudia* Hook. f.

Perennial herb. Culms: solid. Sheath: deciduous. Leaf: cauline, linear. Ligule: pubescent. Inflorescence: panicle, solitary in central axis. Spikelets: compressed, several florets. Glumes: lanceolate, shorter than lemma, 1-3 veined. Lemma: ovatelanceolate, 3-veined.

Neyraudia reynaudiana (Kunth) Keng ex Hitchc., ; Amer. J. Bot. 21: 131 (1934).

Arundo zollingeri Buese , ; in Miq., Pl. Jungh.: 243 (1852).

Neyraudia arundinacea var. *zollingeri* (Buese) Henrard , ; Blumea 3: 439 (1941).

Neyraudia madagascariensis var. *zollingeri* (Buese) Hook. f., ; Fl. Brit. Ind. 7: 305 (1896).

Herb, Ca. 1m. Clum: erect, noded, branched, clustered. Leaf sheath: glabrous. Leaf blade: Ca. 22-45cm, flat, linear. Inflorescence: spike. Pedicel: Ca. 3mm. Spikelet: Ca. 8 mm, compressed. Floret no: 7. Glumes: brownish. Lemmas: Ca. 3mm, ciliated, soft, whitish. Palea: absent.

Fl & Fr: Aug-Dec. **Habitat:** Open grassland.

Distribution: E. India, Burma, China, Taiwall, Malaysia, Nepal (CE: 400-900) m.

Representative collection: *Chitwan*, way to gadhi, 578m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 201.

9. Oplismenus P. Beauv.

Usually sprawling perennials. Clums: leafy, branched at base. Leaf blade: flat, lanceolate, ligule membranous. Inflorescence: terminal, paniculate, ascending. Spikelets: paired, compressed with 2 florets. Glumes: sub equal, short than spikelet. Lower floret: sterile or male, equal to spikelet. Upper floret: bisexual, lemma: creamy, lanceolate. Palea: similar to lemma.

Oplismenus compositus (L.) P. Beauv., ; Ess. Agrost.: 54, 168, 169 (1812).

Perennial herb. Clums: branched at base. Sheath: glabrous. Leaf blade: Ca. (3-13×0.41.3) cm, lanceolate, pubescent. Inflorescence: racemes. Spikelets: Ca. 0.3cm. Lower floret: lanceolate, 5-veined. Uper glume: gree, hairy, palea absent. Upper floret: acute, 3-veined. Palea: present.

Fl: Sept- Nov. **Habitat:**

Distribution: Tropics of Old & New Worlds, Nepal (CE 300-2800) m.

Representative collection: *Chitwan*, Neurani village, 459m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 246.

10. *Paspalidium* Stapf

Perennial herb. Culms: thick, rooted from lower nodes. Leaf blade: flat, ligule. Inflorescence: racemes, along the central axis. Spikelets: single, dorsally compressed. Florets: 2. Glumes: membranous-herbaceous. Upper floret: equal to spikelet. Lower floret: staminate. Lower palea: absent or present. Upper palea: apex reflexed.

Paspalidium flavidum (Retz.) A. Camus, ; Fl. Gen. Indo-Chine 7: 419 (1922).

Perennial herb, Ca. 50cm. Culms: compressed, branched. Sheath: smooth. Leaf blade: Ca. (4-33×0.3-1) cm, sub-cordate. Inflorescence: linear-lanceolate: racemes. Spikelets: ovate, milky white. Lower glume: ovate as long as spikelet. Upper glume: 7-veined, as long as spikelet. Lower lemma: 5-veined, long as spikelet. Upper lemma: bony.

Fl: Jul- Oct. **Habitat:** Agricultural field

Distribution: Tropical Asia, Nepal (C: 100-900) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 249 m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 205.

11. *Paspalum* L.

Culms tufted or with creeping rhizomes and stolons. Leaf blade flat, ligule membranous. Inflorescence in racemes. Spikelets single or paired, plano-convex, shortly pedicelled. Florets 2. Lower glume absent or rarely present, upper glume as long as spikelet or nearly so.

Paspalum distichum L., ; Syst. Nat. ed. 10, 2: 855 (1759).

Perennial herb with stolon. Culms: noded, pubescent. Sheath: glabrous, margin ciliated. Leaves: Ca. (4-8.6×0.3-0.5) cm, linear, acute, glabrous. Inflorescence: racemes separated by axis. Spikelets: single, ovate-oblong. Lower glume: triangular,

equal to spikelet. Upper glume: papery, 3-5 veined. Lower lemma: 3-5 veined, glabrous. Upper lemma: equal to spikelet, pubescent.

Fl: May- Sept. **Habitat:** Agricultural field.

Distribution: 200-2000 m; Tropic, Subtropics of Old World, Nepal (WCE: 200-2000) m.

Representative collection: *Chitwan*, Neurani village, 475m, 16 Oct 2017, B, K.C, S. Lamichhane, S. Simkhada, SW 209.

12. *Sorghum* Moench, *Methodus*. 207. 1794.

Annual or perennial, with or without rhizomes. Clums: erect. Leaf blade: linear-lanceolate. Inflorescence: terminal panicle. Spikelets: racemes. Sessile spikelets: dorsally compressed. Lower glume: leathery, winged upward. Upper glume: boat shaped. Pedicelled spikelet: narrow than sessile spikelet, awnless.

Sorghum nitidum (Vahl) Persoon, *Syn. Pl.* 1: 101. 1805.

Perennial, Ca. 1.3m. Clums: erect. Sheath: glabrous. Leaf blade: Ca. (8-35×0.2-1) cm, linear, glabrous, bearded at base. Inflorescence: panicle. Spikelets: 2-4 paired. Sessile spikelets: ovate-lanceolate. Pedicelled spikelets: staminate, elliptic, papery. **Fl:** Mar-June, **Habitat:** Along road side.

Distribution: Bhutan, India, Indonesia, Japan, Korea, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand; NE Australia, Pacific Islands, Nepal (WCE: 150-200) m.

Representative collection: *Chitwan*, shaktikhor village, 176m, 9 June 2018, B.K.C, S, Gyawali, S. Luintel, BS 231.

13. *Pennisetum* Rieh.

Annual or perennial. Clums: prostrate, rhizomatous. Leaf blade: folded or convolute with ciliate membrane. Inflorescence: spike, panicle, clustered of spikelets, subtended by involucre of bristles. Bristles: slender, unequal, outer shorter than other. Spilelets:

compressed, lanceolate, florets-2. Glumes: small. Upper lemma: equal to spikelets, obtuse-acute. Lower lemma: equal to spikelet or reduced.

Key to species

- 1a. 1 or 2 spikelet.....**P. flaccidum**
1b. 1 – 5 spikelet.....**P. purpureum**

Pennisetum flaccidum Griseb., ; Naehr. Ges. Wiss. Gettingen 1868: 86 (1868), reimpr. in Griseb., Gesamm. Abhandl.: 302 (1880).

Perennial with spreading rhizome. Clums: Ca.1.2m, tufted. Sheath: loose, rounded. Leaf blade: Ca. (2.4-23×0.1-1.4) cm, glabrous, acuminate, ligule 0.2cm. Inflorescence: terminal-axillary. Involucres: 1 or rarely 2 spikelets. Bristles: many, soft. Spikelets: Ca. 0.6cm, ovate-oblong. Lower glume: not equal to spikelet, acute. Upper glume: 3veined, not equal to spikelet. Lower lemma: 3-7 veined. Upper lemma: 5-veined.

Fl: Jul- Oct, **Habitat:** Along roadside.

Distribution: Himalaya, Tibet, Nepal (WCE 800-4300) m.

Representative collection: *Chitwan*, Gairibari village, 993m, 9 June 2018, B.K.C, S. Gyawali, S. Luintel, BS 236.

Pennisetum purpureum Schumach, Beskr. Guin. Pl. 44. 1827.

Perennial with short rhizome. Clums: rooting at base, ascending. Sheath: glabrous. Leaf blade: Ca. (98×3) cm, linear, glabrous. Ligule: Ca.0.4cm. Inflorescence: axillary. Involucre: 1-5 spikelets. Bristles: slender. Lower glume: absent. Upper glume: as long as spikelets. Lower lemma: staminate. Upper lemma: membranous, shiny. **Fl:** Aug-Sept, **Habitat:** Open grassland.

Distribution: Pakistan, Afghanistan; Tibet and southern China, Nepal (WCE: 460-1460) m.

Representative collection: *Chitwan*, Gairibari village, 579m, 7 Dec 2017, B.K.C, S. Gyawali, S. Luintel, BS 249.

EUDICOTS

ORDER: FABALES

9. FAMILY: FABACEAE

Herbs, shrubs, trees, twining or climbing. Leaves: Alternate, simple, often 2-3 foliate or unipinnate- bipinnate. Stipulate. Flower: zygomorphic-actinomorphic. Inflorescence: terminal, axillary, Calyx: tubular. Corolla: mostly 5, free. Stamens:

more or less than or numerous. Ovary: superior. Fruit: Pod.

Key to genus

1a. Stem armed.....	2
1b. Stem unarmed	3
2a. Stamens short	11. Senegalia
2b. Stamens double the length of corolla.....	9. Mimosa
3a. Leaves uni or bipinnate	4
3b. Leaves 1 or 3 foliate.....	5
4a. Inflorescence clustered.....	1. Abrus
4b. Inflorescence axillary	6
5a. Leaves bifoliate	3. Bauhinia
5b. Leaves 1-3 foliate.....	7
6a. Leaves even pinnate	5. Cassia
6b. Leaves odd pinnate.....	7
7a. Bracteoles absent.....	12. Senna
7b. Bracteoles present	8
8a. Fruit with stinging hairs	10. Mucuna
8b. Fruits not with stinging hairs	9
9a. Leaves one foliate.....	10
9b. Leaves more than one foliate	11
10a. Pods symmetric	2. Alysicarpus
10b. Pods not symmetric.....	8. Flemingia
11a. Bracts persistent	7. Desmodium
11b. Bracts caducous.....	12

- 12a. Pods oblong **4. Butea**
 12b. Pods compressed **6. Dalbergia**

1. Abrus L.

Slender shrub. Leaves: uni-pinnate. Leaflets: numerous, stipulate. Flower: racemose borne on clusters, 2-valved. Calyx: truncate, upper short, clawed. Corolla: pink. Stamens: 9. Ovary: sessile. Pods: oblong.

Abrus pulchellus Wall. ex Thwaites, Enum. Pl. Zeyl.: 91 (1859)

Climber, biennial, Ca. 5m. Stem: Branched, climber, cylindrical, glabrous. Petiole length: 0.3-2.8 cm. Leaves: (5.7-9.4× 2.1-4.6) cm, Unipinnate. Leaflets: 9 pair, oblong, rounded, mucronate, entire, reticulate. Inflorescence: racemose. Fruit: (4.1-6.3×0.9-1.2) cm. legume, 9 seeded.

Fl: Jul- Oct, **Habitat:** Along the trail of Shorea robusta forest.

Distribution: Tropical Himalaya, India, Sri Lanka, SE Asia, China, Malaysia, Nepal (WE: 200-1300) m.

Representative collection: *Chitwan*, shaktikhor mandir, 467m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhda, SW 241.

2. Alysicarpus Desv.

Erect, annual herb. Leaves: 1- foliate, stipules persistent. Inflorescence: axillary racemose. Pods: compressed, symmetrical on both sides.

Alysicarpus vaginalis (L.) DC., ; Prodr. 2: 353 (1825).

Alysicarpus nummularifolius .DC., ; Prodr. 2: 353 (1825).

Alysicarpus vaginalis var. *nummularifolius* . Miq., ; Fl. Ind. Bat. 1: 232 (1855).

Herb, Ca. 1m, Annual. Stem: branched, ascending, cylindrical, pubescent. Petiole length: (0.1-0.6) cm. Leaves: (2.9-4.7 ×0.4-0.9) cm, 1 foliate, rounded- oblong, rounded, mucronate, entire, reticulate. Pod: linear, glabrous, 3-8 elliptic segments.

Fl: Sept, **Habitat:** Along road side.

Distribution: Tropics of the Old World, introduced to tropical America, Nepal (WCE: 200-1200) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 323m, 17 Oct 2017, B, K.C, S. Lamichhane, S. Simkhada, SW 207.

3. *Bauhinia* L.

Tree, shrubs or climbers. Stipulate. Leaves: simple, bifoliate, palmately veined. Inflorescence: axillary. Sepals: 5, connate. Petals: 5, sub equal. Stamines. Pod: stalked, compressed.

***Bauhinia purpurea* L., ; Sp. Pl. 375 (1753).**

Bauhinia triandra Roxb., ; Fl. Ind. ed. 2, 2: 320 (1832).

Shrub, Ca.3m. Srem: cylindrical, glabrous. Petiole length: Ca. 2-3cm. Leaf blades: Ca. (3-10.4×2.3-8.9) cm, elliptic, cordate, deeply lobed. Inflorescence: racemose, 10-12 flowered. Calyx: Ca. 1.4×0.4 cm, elliptic. Corolla: Ca. 2.2×0.8 cm, pink, elliptic. Stamens: Ca. 3-4cm, 3. Pod: Ca.10.2cm, linear.

Fl: Sept- Nov, **Habitat:** Along stream.

Distribution: Tropical Himalaya (Kashmir to Bhutan), India, S.E. Asia, S. & W. China, and cultivated widely in tropics, Nepal (WCE: 300-1600) m.

Representative collection: *Chitwan*, Agricultural land, 320 m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW203.

Use value: Flower and leaves used as vegetable, also used as fodder.

4. *Butea* Roxb. ex Willd.

Erect, perennial herb or trees. Leaves: 3-foliate. Leaflets: entire, stipule deciduous. Flower: axillary racemose. Calyx: 5 toothed. Petals: clawed. Stamens: diadelphous. Pods: oblong.

Butea minor Buch.-Ham. ex Baker, ; Fl. Br. Ind. 2: 195 (1876).

Tree, Ca. 10m, perennial. Stem: branched, ascending, cylindrical, glabrous. Petiole length: (4.8-14.3) cm. Stipule: small. Leaves: (7.9×6.3) cm, trifoliate, ovate, aequilateral, obtuse, entire, reticulate, glabrous, shiny on both surface. Inflorescence: Racemose. Sepals: Ca. 0.8 cm, 4, fused, hairy, short tooth. Petals: (1.3-1.7×0.4-0.8) cm, orange, hairy, nerved, 4, wings narrow. Legumes: hairy.

Fl: Sept- Nov, **Habitat:** In open slope along roadside.

Distribution: Himalaya, Assam, Nepal (WCE: 300-2000) m.

Representative collection: *Chitwan*, Way to Gadhi, 1123m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW216 **Use value:** used as timber.

5. **Cassia L.**

Herbs, shrubs or trees. Leaves: even pinnate. Inflorescence: axillary racemose. Calyx:

5, short tubular. Petals: 5. Stamens: 4-10. Pods: flat- cylindric. Seeds: few or many.

Cassia fistula L., ; Sp. Pl. 377 (1753).

Tree, Ca. 7m, perennial. Stem: branched, ascending, cylindrical, glabrous. Petiole length: (0.2-0.7) cm. Leaves: Ca. (19.5×14.9) cm, unipinnate, 3pairs, opposite. Leaflet: oblanceolate, rounded, acute, entire, reticulate, smooth upper surface, whitish lower surface. Stamens: 10. Pod: Ca. 50cm long, 60 seeded.

Fl. May-June, **Habitat:** Moist shady place.

Distribution: Widely cultivated in Africa, W. Asia, Himalaya, India, S.E. Asia,

Malaysia, China, PolynesSia; probably a native of E. India, Burma, Malay Isl. (WCE: 150-1400) m.

Representative collection: *Chitwan*, chelibeti community forest, 453m, 9 Dec 2019, B.K.C, S. Gyawali, S. Luintel, BS264

Use value: Medicinal plant.

6. *Dalbergia* L. f.

Trees or shrubs. Stipules: deciduous. Leaves: odd-pinnate. Leaflets: alternate. Inflorescence: axillary. Calyx: campanulate, teeth-5. Petals: clawed. Stamens: 9-10. Pods: compressed.

Dalbergia sisso Roxb. ex DC., ; Prodr. 2: 416 (1825).

Tree, Ca.10m, perennial. Stem: cylindrical, rough dark grey bark. Petiole length: Ca. 0.9cm. Leaves: Ca. (1.8-5.9×1.3-4.2) cm, orbicular-ovate, cuneate, caudate-apiculate, entire. leaflet: 3-5. Legume: Ca. 8.2cm, opposite seeded, compressed.

Fl: Jun-Sept, **Habitat:** Forest.

Distribution: A native of tropical Himalaya (Kashmir to Sikkim), Assam, Bengal, but cultivated in tropical to subtropical Africa, W. Asia, Nepal (WCE: 200-1400) m.

Representative collection: *Chitwan*, Shaktikhor mandir, 437m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW213 **Use value:** used as timber.

7. *Desmodium* Desv.

Herbs, shrubs or trees. Stipules persistent or deciduous. Leaves: pinnately 1-3 foliate. Inflorescence: axillary racemose. Calyx: tube short, upper 2 connate, lower lip 3 dentatae. Pods: compressed.

Key to species

- 1a. Perennial tree.....**D. confertum**
- 1b. Binneial herb or sub shrubs.....**2**
- 2a. Inflorescence panicle..... **D. elegans**
- 2b. Inflorescence racemose.....**3**
- 3a. 2 flower at each node..... **D. multiflorum**
- 3b. Single flower at node.....**D. heterocarpon**

Desmodium confertum DC., ; Ann. Sci. Nat. 4: 101 (Jan. 1825). Baker in Fl. Br. Ind. 2: 167 (1876). Burkill in Rec. B. Surv. Ind. 4: 105 (1910). H. Ohashi in Fl. E. Him.

149 (1966); 2: 64 & 226, t. 27B (1971); in *Ginkgoana* 1: 110 (1973). H. Ohashi in H. Hara & Williams, Enum.

Desmodium diocum (Buch.-Ham. ex D. Don) DC., ; Prodr. 2: 338 (Nov. 1825).

Hedysarum dioicum Buch.-Ham. ex D. Don, ; Prodr. Fl. Nep. 244 (Feb. 1825).

Tree, Ca.4m, perennial. Stem: cylindrical, glabrous. Petiole length: Ca. 3.2cm. Leaves: alternate, trifoliate. Leaflets: Ca. (2.4-10.7×1.4-4.9) cm, oblanceolate, cuneate, acute, entire. Inflorescence: axillary racemose. Calyx: Ca. 0.5cm, fused, 5, hairy. Corolla: upper lobe Ca.1.2×0.3 cm and lower lobe Ca. 0.6×0.4 cm, free, lanceolate-ovate.

Stamens: Ca. 0.9cm, 10, fused at base. Carpel: Ca. 1.1cm, style hairy.

Fl: Sept- Nov. **Habitat:** In open slope.

Distribution: E. Himalaya (Nepal to Bhutan), Assam, Nepal (CE: 300-2000) m.

Representative collection: *Chitwan*, way to gadhi, 1156m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW235.

Desmodium elegans DC., ; Ann. Sci. Nat. 4: 100 (Jan. 1825). H. Ohashi in Fl. E. Him.

2: 64 & 278, t. 35 (1971); in *Ginkgoana* 1: 110 (1973); in Fl. E. Him. 3: 62 (1975).

Shrub, Ca. 20.2 cm, Annual. Stem: Branched, ascending, cylindrical, pubescent. Petiole length: Ca 2.1cm, Leaves: Ca. (2.4-2.9×0.6-2.1) cm, trifoliate, Orbicular, rounded, obtuse, entire, reticulate, stalked. Inflorescence: panicle, spike. Sepals: 0.2cm,4-lobed, fused, 1-nerved, fimbriate. Petals: 0.4cm, 2, purple. Stamens: 0.9cm, fused, 10 (5 long, 5 short), Carpel: 0.3cm, hairy, stigma capitate.

Fl: Sept- Oct. **Habitat:** On open grassland.

Distribution: Afghanistan, Himalaya (Kashmir to Bhutan), China, Nepal (WC: 1200-3000) m.

Representative collection: *Chitwan*, shaktikhor bazar, 349m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 217.

Desmodium heterocarpon (L.) DC., ; Prodr. 2: 337 (1825), 'heterocarpum'.

Shrub, Ca. 34cm. Annual. Stem: Branched, ascending, cylindrical, densely pubescent. Leaves: Ca. (1.4-2.8×1.3-1.4) cm, alternate, 3- foliate, obovate- oblong, rounded, obtuse, entire. Inflorescence: racemose. Sepals: Ca.1.8cm, 4 lobed, toothed at apex. Petals: Ca. 0.5cm, purple, obovate-oblong. Fruit: Ca. 1.4cm, erect, hairy, more than 37segment.

Fl: Sept- Oct. **Habitat:** Under Shorea robusta forest.

Distribution: Himalaya (Kashmir to Bhutan), Assam, S.E. Asia, China, Nepal (WCE: 400-1600) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 567m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW205.

Desmodium multiflorum DC., ; Ann. Sci. Nat. 4: 101 (Jan. 1825). Wall., Cat. 196, n. 5705A, B, C, p.p. (1831-1832). H. Ohashi in Fl. E. Him. 2: 65 & 272 (1971); in Ginkgoana 1: 110 (1973). H. Ohashi in H. Hara & Williams, Enum. Flow. Pl. Nep. 2: 118 (1979).

Desmodium angulatum DC., ; Ann. Sci. Nat. 4: 101 (Jan. 1825).

Desmodium dubium Lindl. ; B. Reg. 12: t. 967 (1826).

Shrub, Ca.1m. Stem: glabrous, cylindrical. Petiole length: Ca. 1-3.5cm. Leaves: Ca. (35×1.3-2.6) cm, 3 foliate, obovate-elliptic, cuneate, acute-obtuse, entire. Inflorescence: racemose. 2 flowered at node. Legume: crenate, undulate, 4-7 jointed pod, densely depressed.

Fl: Oct-Dec. **Habitat:** Under Sal forest.

Distribution: Himalaya (Kashmir to Bhutan), Assam, S.E. Asia, China, Nepal (WCE: 1800-2600) m.

Representative collection: *Chitwan*, Neurani village, 398m, 17 oct 2017, B. K.C, S. Lamichhane, S. Simkhada, SW238.

8. *Flemingia* Roxb. ex W. T. Aiton.

Erect branching shrub. Stipule present. Leaves: simple, 1-foliolate. Flower: axillary racemose. Bracts: deciduous or persistent. Calyx: campanulate, acute. Pods: short, not septate.

***Flemingia strobilifera* (L.) W. T. Aiton, ; H. Kew. ed. 2, 4: 350 (1812).**

Flemingia bracteata (Roxb.) Wight , ; Icon. Pl. Ind. Or. 1: t. 268 (1840)

Shrub, Ca. 1m, Stem: Cylindrical, pubescent. Petiole length: Ca. 0.2cm. Stipule: Ca. 0.6cm, 2 opposite. Leaves: Ca. (7.6-9.8×2.2-2.6) cm, alternate, lanceolate, rounded, acute, entire. Inflorescence: axillary cymose. Bract: Ca. 1.8 cm, hairy, whitish. Calyx: densely hairy. Corolla: white, wings oblong. Pods: ellipsoid.

Fl: Feb- Aug. **Habitat:** Under Shorea robusta forest.

Distribution: Tropics to subtropics in Asia, America (Jamaica, Trinidad). Nepal (WCE 300-2300) m.

Representative collection: *Chitwan*, Gairibari community forest, 347m, 7 march 2018, K.C, Y.N. Paudel, BY 270.

9. *Mimosa* L.

Herbs or shrubs, spiny. Stipules: persistent. Leaves: bipinnate. Leaflet: usually sensitive. Inflorescence: globose head. Calyx: minute, tubular. Corolla: connate. Stamens: 4 or 8, free, double the length of corolla. Ovules: sessile, 2. Pods: compressed.

Key to species

- 1a. Leaves sensitive..... **M. pudica**
1b. Leaves not sensitive.....**M. rubicaulis**

***Mimosa pudica* L., ; Sp. Pl. 518 (1853).**

Shrub, perennial, Ca.60cm. Stem: branched, pubescent, with pricks. Petiole length: 0.22.6 cm. Leaf: Sensitive, stipulate, 1-2 in pair. Leaf lets: Ca (4-7×3-5) cm, 12-2 in pairs, sessile, glabrous, cunate, hairy margin. Inflorescence: Axillary dense. Calyx: minute. Corolla: Ca. 0.3 cm, pink. Stamens: 4. Fruit: brownish, flat, spinous.

Fl: Aug- Nov. **Habitat:** on open grassland.

Distribution: Pantropic, native of tropical America, Nepal (WCE: 200-1200) m.

Representative collection: *Chitwan*, Neurani forest, 376m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW229.

Mimosa rubicaulis Lam., Encycl. 1:20 (1783).

Shrub, Ca. 4m, Perennial. Stem: Branched, spiny, ascending. Petiole length: (1.2-1.7) cm. Leaves: (7.8-17.2×4.2-9.2) cm, spiny, alternate, bipinnate. Leaf let: oblong, aequilateral, mucronate, entire, reticulate. Inflorescence: spike. Calyx: smooth. Petals: numerous, connate. Stamens: free, numerous, length twice of corolla. Fruit: legume, 8 seeded.

Fl: Jul-Nov. **Habitat:** On open grassland.

Representative collection: *Chitwan*, Shaktikhor mandir, 478 m, 17 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW247.

10. **Mucuna** Adans.

Climbing herbs. Leaf pinnately trifoliolate, stipules deciduous. Inflorescence racemose. Flower purple. Bracts caducous or small. Upper 2 teeth of calyx united, lower teeth longer. Stamens diadelphous. Ovary sessile, style thin, stigma terminal. Fruit covered with stinging hairs.

Mucuna pruriens (L.) DC., ; Prodr. 2: 405 (1825).

Carpopogon pruriens (L.) Roxb. ., ; Hort. Beng. 54; Fl. Ind. iii. 283.

Mucuna utilis Wall. ex Wight, ; Ic. Pl. Ind. Or. 1: t. 280 (1840).

Stizolobium pruriens (L.) Medik., ; Vorles. Churpf. Phys. Ges. 2: 399 (1787).

Climber, Ca. 2m, Annual. Stem: Branched, Cylindrical, Pubescent. Petiole length: 2.12.6 cm, Hairy. Leaves: (3.1-5.6×2.7-3.6) cm, alternate, trifoliate. Leaf lets: Linear, oblique, mucronate, entire, reticulate. Inflorescence: axillary, 2 flowers together. Sepals: 4, fused, 3.4cm. Petals: 4, purple. Stamens: 10, 3.1cm, diadelphous. Carpel: 0.7cm, ovary sesile. Fruit: irritating, hairy.

Fl: Nov-Dec, **Habitat:** On the river bank.

Distribution: Himalaya, India, Ceylon, S.E. Asia, Malaysia, Nepal (WCE: 150-1200) m.

Representative collection: *Chitwan*, Bhuteha khola, 234m, 8 Dec 2018, B.K.C, S. Gyawali, S. Luintel, BS 271.

11. *Senegalia* Mill.

Tree. Stem: armed or stipular spines. Leaves: bipinnate. Inflorescence: globose head, cylindrical spike. Bract: 2, scale like. Calyx: dentate, campanulate. Petals: united, rarely absent. Stamens: short, free. Pods: oblong, compressed.

Senegalia catechu (L.f.) P.J.H.Hurter & Mabb.

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

Tree, Ca. 7m, Perennial. Stem: Branched, ascending. Petiole length: (0.2-1.4) cm. Stipule: spiny. Leaves: (4.6-8.2×2.7-3.4) cm, alternate, bipinnate. Leaflet: 21 pairs, oblong, rounded, obtuse, entire, reticulate. Pods: compressed, 6-8.

Fl: April-Aug, **Habitat:** Open dry place.

Distribution: Tropical Himalaya, India, Burma, Thailand, S. China, Nepal (WCE: 80-400) m.

Representative collection: *Chitwan*, Bhuteha khola, 245m, 7 Dec 2017, B.K.C, S. Gyawali, S. Luintel, BS 248.

Use value: Used as timber and powder used as medicine for bone fracture.

12. Senna Miller, Gard. Dict. Abr., ed. 4. 1754.

Herbs, shrubs or small trees. Leaves: Pinnate; leaflets: opposite. Flowers: axillary or terminal racemose. Bracteoles: absent. Sepals: 5. Petals: 5, unequal, usually yellow. Stamens: 7-10, green or brown, fertile. Seeds: numerous.

1a. Stem reddish brown, stamens 10..... **S. sophera**

1b. Stem green, stamens 7..... **S. tora**

Senna sophera Linn., Sp. Pl. 379. 1753. Baker in Hook. f., Fl. Brit. Ind. 2: 262. 1878; de Wit. l.c. 265; Ali & S. Quraishi l.c.

Shrub, Ca. 2m, Perennial. Stem: branched, glabrous, reddish-brown. Petiole: Ca. 0.4cm, glandular. Stipule: Ca.0.4cm. Leaf: 8-19cm long. Leaflets: (2-5×1.3-2.5) cm, oblong, cuneate, mucronate, entire, 4-10 in pairs. Inflorescence: axillary. Bract: 0.4cm. Sepals: Ca 0.5cm, ovate. Petals: Ca. 0.8 cm, yellow. Stamens: 10. Pod: Ca. 8cm long.

Fl: March-June **Habitat:** Along road side.

Distribution: Cultivated or naturalised in Africa, W. Asia, Himalaya, India, S.E. Asia, Malaysia, China, Australia, Polynesia, Nepal: WCE (750-1000) m.

Representative collection: *Chitwan*, gairibari community forest, 829m, 9 June 2019, B.K. C, S. Simkhada, SW 205.

Senna tora L., ; Sp. Pl. 376 (1753).

Herb, Ca. 30 cm, annual. Stem: branched, ascending, cylindrical, glabrous. Petiole length: (1.7-3.8) cm. Leaves: (3.1-5.6×2.2-4.1) cm, alternate, stipulate. Leaf let: obovate, cuneate, obtuse, entire, reticulate. Leaflet: 3 in pair. Inflorescence: Racemose. Sepals: (0.7×0.4) cm, rotund, 3 nerved, fimbriate. 3 pairs. Petals: (0.9×0.4) cm, yellow, 3 nerved, obovate-deltoid, entire. Stamens: 0.2cm, 7, brownish, hairy.

Fl; Aug- Oct, **Habitat:** Open dry place.

Distribution: Tropics, probably of S. American origin, Nepal: (WCE: 450-1300) m

Representative collection: *Chitwan*, way to Shaktikhor jharana, 541m, 18 Oct 2017,

B.K.C, S. Lamichhane, S. Simkhada, SW219.

ORDER: ROSALES

10. FAMILY: RHAMNACEAE

Trees or shrubs. Stipules: present. Leaves: simple, alternate or opposite. Inflorescence: cymes, often arranged in panicles or racemes, actinomorphic, bisexual. Calyx: 4-5 lobed. Petals: 4-5, free. Stamens: 4-5. Ovary: 2-4 celled. immersed in disc or free. Fruit: capsule, fleshy drupe.

Gouania Jacquin.

Climbing shrub, unarmed. Leaves: alternate, stipulate, petiolate, 3-veined from base. Inflorescence: terminal or axillary, racemose or racemose panicle, tendril at base. Calyx: short tube. Sepals: 5, ovate. Petals: 5. Stamens: 5, dorsifixed. Disk: glabrous. Ovary: inferior. Capsule: 3 winged, split at maturity. Seed: 3, reddish brown.

Gouania leptostachya Candolle, Prodr. 2: 40. 1825.

Shrubs climbing, Ca.4m. Stem: glabrous. Leaves: alternate. Petiole: Ca.1-2.5 cm. Leaf: Ca. (3-7.2 × 1.5-3.4) cm, pale green, ovate or ovate-oblong, papery, lateral veins 5 or 6 pairs, base cordate, margin crenate-serrate, apex acuminate. Inflorescence: axillary racemose. Sepals: ovate-triangular, apex acuminate. Petals: white, obovate, hooded, ca. as long as stamens, clawed at base. Ovary: 3-fid. Capsule: crowned by persistent calyx tube, 3-winged. Seeds brownish, shiny, obovoid.

Fl. Aug-Sep, **fr.** Oct-Dec.

Habitat: along riverside in dry slope.

Distribution: Himalaya (Kumaun to Assam), Burma, Indo-China, Malaysia, Nepal (CE: 200-2000) m.

Representative collection: *Chitwan*, Neurani khola, 234m, 8 Dec 2017, B, K.C, S. Gyawali, S. Luintel, BS 184.

11. FAMILY: CANNABACEAE

Herb, annual, erect herb. Stem: cylindrical, pubescent, furrowed. Leaves: alternate, palmately lobed, serrate. Stipules: persistent. Male inflorescence: axillary, bracteate. Petals: absent. Female inflorescence: cone like, bracteate. Male flower: perianth 5 free.

Stamens: 5. Female flower: sessile unilocular. Fruit: achene, compressed or flattened.

Cannabis L.

Herb annual. Stem: furrow. Leaves: long petiolate, palmately compound, 3-11 leaflet, aromatic. Stipules: 2, free. Male inflorescence: axillary-bracteate, sub-sessile, shorter than leaves. Seed: curved, cotyledon thick.

Cannabis sativa L, Sp. pl. 2:1027. 1753.

Herb, Ca. 2m, annual, dioecious. Stem: cylindrical, pubescent. Petiole length: Ca. 0.22-0.6 cm. Stipulate. Leaf: alternate, pubescent. Leaflet: Ca. (0.9-6.8×0.2-0.4) cm, 3-foliate, lanceolate, cunate, acuminate, serrate. Inflorescence: axillary, bracteate and bracteolate. Male flower, Calyx: Ca. 0.3cm, yellowish green, pubescent, petal absent, filaments: ca. 0.2 cm. Female flower: Calyx: pubescent, green surrounded by bract. Achene: flattened.

Fl: April- Sept. **Habitat:** agricultural field.

Distribution: Widely cultivated in temperate and tropical areas, Nepal: (WCE: 200-2700) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 238m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 164.

Used value: leaves used as medicine.

12. FAMILY: MORACEAE

Shrub or trees or woody climber with milky latex. Leaves: alternate, rarely opposite, deciduous. Stipules: 2. Inflorescence: Racemose or spikes, unisexual, actinomorphic, enclosed in hollow receptacle (figs). Perianth: united or free, often fleshy in fruit. Stamens: 1-4, opposite to perianth lobes. Ovary: superior. Fruit: achene.

Ficus L.

Trees or shrubs with milky juice. Leaves: alternate rarely opposite. Stipules: caduceous. Inflorescence: enclosed in fleshy globose. Male flower: 1-3 stamens. Female flower: straight or oblique ovary. Achenes: enclosed in figs.

Key to genus

- 1a. Leaves sub-cordate..... 1. **F. benghalensis**
1b. Leaves rounded..... 2. **F. religiosa**

1. Ficus benghalensis L.,

Ficus indica L., Amoen. Acad. ed. 3, 1 : 2, n. 69 (1753).

Tree Ca. 17m, with numerous prop roots. Stem: woody, glabrous. Petiole: Ca.1-3cm. Leaves: Ca. (4-16×10-14) cm, rounded – subcordate, obtuse, entire, glabrous, shiny. Figs: subglobose, axillary pairs, sessile.

Fl: March-April, **Habitat:** Along road side.

Distribution: Pakistan, India, widely cultivated, Nepal WCE (500-1200) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 624m, 17 Oct 2017, B.K.C, S. Simkhada, SW 193.

Use value: leaves used for religious purpose for praying.

2. Ficus religiosa L.,

Tree, perennial, Ca.15m. Stem: branched, glabrous, woody. Petiole length: 4-7cm. Leaves: Ca. (2-6×3-8) cm, rounded, undulate, caudate, acuminate, acumen 2-5.3cm, surface glabrous. Figs: smaller. 6-11 mm, reddish-purple.

Fl: March-April, **Habitat:** Along road side.

Distribution: Widely cultivated in India, SE Asia and Nepal: WCE (150-1500) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 346m, 17 Oct 2017, B.K.C, S. Simkhada, SW 192.

Use value: leaves used for religious purpose for praying.

13. FAMILY: URTICACEAE

Monoecious or dioecious herb, shrubs or tree. Leaves: stipulate, alternate or opposite, petiolate or sessile, simple, epidermis with cystoliths. Flower: minute, numerous, cymose, clustered at heads. Perianth: 2-5 lobed. Stamens: 2-5. Ovary: superior, 1 celled. Fruit: drupes.

Key to genus

- 1a. Stinging hair present.....2
- 1b. Stinging hair absent..... 3
- 2a. Leaves opposite..... 4. **Urtica**
- 2b. Leaves alternate..... 2. **Girardinia**
- 3a. Leaves lanceolate..... 3. **Pilea**
- 3b. Leaves ovate..... 1. **Boehmeria**

1. **Boehmeria** Jacq.

Small tree or shrubs, perennial. Leaves: alternate or opposite, 3 veined, lower surface pale green. Stipule: free.

Flower: dense clusters in spike. Male flower: 4-5 merous, perianth free. Female flower: perianth tubular. Achene: persistent.

Boehmeria platyphylla D. Don, ; Prodr. Fl. Nep. 60 (1825).

Boehmeria macrostachya Wedd. ex Blume , ; Mus. B. Lugd.-Bat. 2: 224 (1857).

Splitgerbera macrostachya Wight , ; Ic. Pl. Ind. Or. 6: 10, t. 1977 (1853).

Urtica scabrella Roxb. ., ; Fl. Ind. ed. 2, 3: 581 (1832).

Shrub, Ca. 2m, perennial. Stem: cylindrical, pubescent. Stipule: lanceolate. Petiole length: Ca. 1.3-8.3 cm. Leaves: Ca. (8.2-16.1×4.3-11.6) cm, ovate, rounded, acuminate, dentate, membranous. Inflorescence: spiklet. Achene: hooked.

Fl: July-Oct, **Habitat:** In agricultura field.

Distribution: Tropical Africa, Pakistan eastwards to China and Japan, Nepal (WCE: 150-1400) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 238m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada.

2. *Girardinia* Gaudich.

Herbs with stinging hairs. Leaves 3-costate, petiolate, alternate, lobed. Stipulate. Inflorescence: racemose, arranged in cluster. Flowers unisexual, male pedicellate; female sessile. Calyx: 4-5-lobed in male, tubular; 2-3-toothed in female flower.

Stamens 4-5. Ovary: upright.

Girardinia diversifolia (Link) Friis, ; Kew Bull. 36: 143 (1981).

Girardinia armata Kunth, ; Ann. Sci. Nat. ser. 3, 7: 184 (1847); nom. illeg.

Girardinia heterophylla Decne; in Jacquem., Voy. 4 (Bot.): 151, t. 153 (1835), excl. basionym. Hook. f. in Fl. Br. Ind. 5: 550 (1888).

Herb, Ca. 80 cm, annual. Stem: angled, with stinging hairs. Petiole length: Ca. 0.3-1.8 cm. Leaves: Ca. (3.4-9.3×3.2-6.8) cm, alternate, 3 lobed, cordate, acuminate, serrate.

Stipulate. Inflorescence: axillary-racemose. Achene: dark brown.

Fl: Sept- Oct. **Habitat:** on open moist grassland.

Distribution: Himalaya (Punjab to Bhutan), India, Ceylon, Burma, east to C. China, Malaysia, Nepal (WCE: 1700-3000) m.

Representative collection: *Chitwan*, way to gadhi, 487m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada. SW 147.

Use value: Fibre is obtained from young stem bark.

3. *Pilea* Lindl.

Herbs or subshrubs, without stinging hairs. Leaves: opposite, lanceolate, rarely alternate, petiolate. Stipules: deciduous or persistent. Leaf blade: 3- veined.

Inflorescence: solitary or in pairs. Bracts: present. Male flower: perianth lobe 2-4, stamens: 2-5. Female flower: perianth lobe 2-5, subequal. Ovary: straight. Stigma: sessile. Achene: ovoid. Seed: endospermic.

Pilea glaberrima (Blume) Blume, Mus. Bot. 2: 54. 1856.

Urtica glaberrima Blume, Bijdr. Fl. Ned. Ind. 493. 1826;

Herb, Ca. 70 cm, perennial. Stem: angular, without stinging hairs. Leaves: 3-costate, lanceolate, petiolate, opposite, entire or dentate. Stipulate. Inflorescence axillary, clusters. Flowers minute, green, sessile; bracteate. Calyx (2-3-) 4-lobed or truncate and cupular in male flowers, lobes horned outside below the apex; unequally 3-lobed in female, median lobe largest, cucullate or gibbous. Stamens (2-3) 4; staminodes scalelike, inflexed in female flowers. Ovary straight. Achenes flattened.

Fl: Sept-Oct. **Habitat:** on moist slope of agricultural field.

Representative collection: *Chitwan*, Shaktikhor bazar, 230 m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 255.

4. *Urtica* L.

Monoecious or dioecious herbs, covered with stinging hairs. Stem: angular. Leaves petiolate, opposite, 3-costate, serrate. Stipulate. Inflorescence: axillary racemes, spikes or panicles. Flowers: green, minute, unisexual. Calyx of 4, free. Stamens: 4, opposite to sepals, staminodes absent in female flowers. Ovary: ovoid. style: absent or very short. stigma: capitate.

***Urtica dioica* L., ; Sp. Pl. 984 (1753).**

Herb, Ca. 80cm, perennial. Stem: angled, with stinging hairs. Petiole length: Ca. 0.3-4.2 cm. Leaves: Ca. (2.3-9.2×0.9-3.4) cm, opposite, lanceolate, cordate, acuteacuminate, serrate. Stipule: ciliate. Inflorescence: Racemose-axillary, pubescent, with scattered stinging hairs. Flowers: greenish. Bracteate. Sepals: pubescent. Achene: ovoid.

Fl: May- Sept. **Habitat:** On moist slope.

Distribution: Europe, N. Africa, W. Siberia, C. Asia, Himalaya, Tibet, W. China, naturalised widely in other temperate regions, Nepal (WC:3000-4500) m

Representative collection: *Chitwan*, Shaktikhor bazar, 256m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 254

Use value: Leaves used as vegetable.

ORDER: CUCURBITALES

14. FAMILY: BEGNONIACEAE

Trees or shrubs, often climbers, rarely herbs. Leaves: usually opposite, simple or compound, exstipulate. Flowers: showy, bisexual, hypogynous. Calyx: campanulate, truncate or 5-lobed. Corolla: campanulate or tubular, 2-lipped; upper lip 2-lobed. Stamens: 4- 5. epipetalous, staminodes present or not. Anthers: bilocular. Disk: present or absent. Ovary: 1 or 2 locular with many ovules. Fruit: a capsule or a berry. Seeds: winged.

Oroxylum Vent.

Small glabrous trees. Leaves: opposite, 3-4-pinnate, leaflets entire. Flowers: terminal racemes, purplish to white. Calyx: campanulate, 5-lobed, persistent. Corolla: campanulate, unequally 5-lobed. Stamens: 5. Disk: present. Ovary: bilocular, with many ovules. Capsule elongated, compressed and large. Seeds large, many, discoid, with a broad membranous wing.

Oroxylum indicum (L.) Kurz , ; For. Fl. Br. Burma 2: 237 (1877).

Calosanthus indica (L.) Blume, ; Bijdr. 761 (1826).

Trees up to 10 m or more. Leaves very large, 3-pinnate, 60-180 cm long, imparipinnate, rachis stout ribbed; leaflets opposite, elliptic-ovate, 7-14 x 5-8 cm, entire, subacuminate, base oblique or rounded, nerves inconspicuous above, prominent and minutely pubescent on lower surface. Flowers not seen. Capsule elongated, 30-100 cm, compressed, brown, valves woody. Seeds discoid, with wing 35-40 × 58-60 mm; wing transparent, yellowish-white.

Fl: May-August. **Habitat:** Along road side.

Distribution: Tropical Himalaya, India to Indo-China, Malaysia, W. & S. China, Nepal (WCE: 400-1400) m.

Representative collection: *Chitwan*, neurani village, 527 m, 7 March 2018, B.K.C, Y.N. Poudel, BY 256.

ORDER: OXIDALES

15. FAMILY: OXALIDACEAE

Herbs. Leaves: alternate, compound, trifoliolate. Stipulate or exstipulate. Flowers: axillary, bisexual, actinomorphic. Sepals: 5. Petals: 5. Stamens: 10 in 2 whorls, united or free. Ovary: superior, 5 celled. Fruit: capsule.

Oxalis L.

Herbs with creeping stem. Stem: cylindrical, pubescent. Leaves: 3-foliolate, stipulate or exstipulate. Leaflet: sessile. Inflorescence: umbel or axillary. Filaments: longer with dorsal tooth. Ovary: 1-10 ovules per cell.

Oxalis corniculata L., ; Sp. Pl. 435 (1753).

Oxalis pusilla Roxb. ., ; Fl. Ind., ed. 2, 2: 457 (1832).

Oxalis repens Thumb., ; Dissert. Oxal. 16, fig. (1781).

Herb, Ca. 30m. Stem: erect, angular, pubescent. Petiole: Ca. 1-3-5cm. Leaves: alternate. Leaflets: (Ca. 0.3-1.2×0.4-1) cm, cordate-ovate, cuneate, entire, lobes rounded. Peduncles: axillary, 1-5 flowered. Sepals: linear-elliptic. Petals: Ca. 0.4-0.8mm, yellow.

Pod: Ca. 1-1.3×0.3cm, capsule.

Fl: Feb-Oct. **Habitat:** along roadside.

Distribution: Almost cosmopolitan, Nepal (WCE:300-2900) m

Representative collection: *Chitwan*, Gairibari Chowk, 339m, 7 March 2018, B.K.C, Y.N. Paudel.

ORDER: **MALPIGHIALES**

16. FAMILY: EUPHORBIACEAE

Herb, annual-perennial. Stem: glabrous –pubescent. Leaves: alternate, sometimes opposite-whorled. Petiole present. Stipule present. Latex present or absent. Flowers: small solitary or in clusters, spikes, unisexual, actinomorphic. Perianth: dissimilar in two sexes. Male flower: forming a disc glands, lobes alternate. Stamens: 1-many, anthers 2-celled. Female flower: sepals usually larger. Disc: hypogynous. Staminodes often present. Fruit: capsule, 2-3 segmented.

Key to genus

- 1a. Tree.....**5. Mallotus**
- 1b. Herb or shrub**2**
- 2a. Milky latex present.....**3**
- 2b. Milky latex absent.....**4**
- 3a. Latex milky, succulent herb **3. Euphorbia**
- 3b. Latex clear, perennial shrub **4. Jatropha**
- 4a. Ovule 2 lobed **2. Bridelia**
- 4b. Ovule 3 lobed **5**
- 5a. Stem hollow..... **6. Ricinus**
- 5b. Stem not hollow **1. Baliospermum**

1. Baliospermum Blume

Shrub, monoecious or dioecious. annual. Leaves: alternate, 3-5 nerved, petiolate, stipulate, pubescent. Inflorescence: axillary racemose. Male inflorescence: many flowered. Female inflorescence: one flowered. Male flower: sepals 4 or 5 or 6. Petals: absent. Stamens: 10-20. Female flower: Sepals: 5 or 6. Petals: absent. Ovary: 3 or 4 locular. Fruit: trilobed separated by woody endocarp.

Baliospermum solanifolium (J.Burm.) Suresh Regnum Veg. 119:106. 1988

Baliospermum montanum (Willd.) Mull. Arg., ; in DC., Prodr. 15(2): 1125 (1866).

Herb, Ca. 50cm, annual. Stem: Branched, ascending, cylindrical, glabrous. Petiole length: (0.2-4.9) cm. Leaves: (1.9 -11.8 × 1.1-5.3) cm, alternate, lanceolate, obtuse, acuminate, warsely serrate. Inflorescence: Racemose. Fruit: trilobite, divided into 6 valves, endocarp woody. Seeds: ovoid.

Fl: April- Sept, **Habitat:** Moist and shady place under Sal forest.

Distribution: Himalaya (Kumaun to Bhutan), India, Indo-China, Malaysia Nepal (WCE: 300-1000) m.

Representative collection: *Chitwan*, Neurani khola, 487m, 8 Dec 207, B.K.C, S. Gyawali, S. Luintel, BS 123.

2. *Bridelia* Willd.

Tree or shrubs. Leaves: simple, alternate, pinnately veined, stipulate. Flower: unisexual.

Inflorescence: grouped in axile glomerules. Sepals:5, Petals: 5. Male flower: stamens 5, filaments connate at base. Female flower: ovary 2 loculed, 2 ovules in each cell.

Seeds: 1 or 2.

Bridelia retusa A.Juss. Euphorb. gen. 109. 1824

Tree, perennial. Stem: branched, cylindrical, glabrous. Petiole length: 0.3cm. Leaves: Ca. (2.3-9.4×0.8-3.6) cm, lanceolate, cuneate, acute, entire. Fruit: drupe, bilocular

Fl: April- Sept. **Habitat:** on moist slope along river.

Distribution: Nepal, India, Ceylon, Burma, Indo-China, Malay Peninsula, Sumatra, Nepal (WCE: 100-1200) m.

Representative collection: *Chitwan*, Neurani resort, 341m, 8 Dec 2017, B.K.C, S. Gyawali, S. Luintel, BS 183.

3. *Euphorbia* L.

Succulent herb, annual. Stem: pubescent. milky latex present. Leaves: opposite, pinnately veined at base. Flower: monoecious, forming cup like involucre, each cup having a single female flower surrounded by male flowers. Male flower: stamen-1, perianth absent. Female flower: pedicel short, style bilobed. Fruit: trigonous

***Euphorbia hirta* L.**, Sp. Pl. 1:145 454 (1753).

Chamaesyce hirta (L.) Millsp. ., ; Publ. Field Mus., B. 2: 303 (1909).

Euphorbia pilulifera L ., ; Sp. Pl. 454 (1753).

Prostrate herb, Ca. 15cm, annual. Stem: branched, ascending, pubescent. Petiole length: 0.2cm. Milky latex present. Leaves: (0.7-2.2×0.2-0.8) cm, opposite, lanceolate, attenuate, acute, coarsely serrate, reticulate, purplish red above and green beneath.

Fruit: Ca.0.2cm, trigonous. Seeds: ovoid, with transverse ridges on faces.

Fl: June- Dec. **Habitat:** Along roadside.

Distribution: Pantropical weed Nepal (WCE:150-1500) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 324m, 16 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, BS 104.

Use value: latex is used in small cuts to stop bleeding.

4. *Jatropha* L.

Shrub, perennial. Stem: Cylindrical, glabrous. Leaves: alternate, palmately lobed, veined at base. Inflorescence: cymose with female towards centre. Male flowers: sepals: 5. Petals: 5. Stamens: 6-10. Female flower: sometime corolla absent. Fruit: 2-4 celled, capsule.

***Jatropha curcas* L.**, ; Sp. Pl. 1006 (1753).

Shrub, Ca. 4m, soapy latex. Petiole: 4-9 cm. Leaf: Ca (2.8-12×3.8-11) cm, alternate, ovate-sub-orbicular, 7 veined at base, cordate, acute, entire. Inflorescence: cymose. Male flower: sepals: elliptic. Petals: yellowish green, hairy. Stamens: 10, inner 5 united at base. Female flower: corolla absent. Capsule: 3-lobed.

Fl: Sept- Oct, **Habitat:** along road side.

Distribution: Native of New World Tropics, cultivated in other tropical areas, Nepal (WCE:500-1200) m

Representative collection: *Chitwan*, Gairibari Jharana, 634m, 8 Dec 2017, B. K.C, S. Gyawali, S. Luintel BS12

5. **Mallotus** Lour.

Trees or shrubs. Leaves: alternate, palmately lobed, 3-9 veined. Dioecious: Flower: terminal-axillary, spikes. Male flower: sepals 3-. Petals: absent. Stamens: free, 25-50.

Female flower; Calyx: 3-6 lobed, ovary: 3-celled. Styles: 2-3, 3 seeded.

Mallotus philippensis (Lam.) Mull. Arg., ; *Linnaea* 34: 196 (1865).

Tree, Ca. 9m. Stem: cylindrical, woody, glabrous. Petiole length: Ca. 1-5cm. Leaves:

Ca. (4-11×3-7) cm, alternate, rounded or cuneate with 2 sessile glands, entire, acute.

Inflorescence: spikes, slender, 5-15cm. Male flower: clustered, green, subsessile.

Sepals:

3-4. Stamens: 20-30. Female flowers: Sessile, not clustered, sepals: lanceolate. Ovary: exerted, Styles: 3. Capsule: 3-lobed.

Fl: March- May. **Habitat:** Along *shorea robusta* forest.

Distribution: Himalaya (Uttar Pradesh to Bhutan), India, Sri-lanka, Indo-China, China, Malaysia, Australia, Polynesia, Nepal (WCE: 100-1800) m

Representative collection: *Chitwan*, way to gadhi, 569m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, BS 165

Use value: used as timber.

6. *Ricinus L.*

Herb, perennial. Stem: hollow. Leaves: alternate, stipulate, palmately lobed. Inflorescence: terminal, branched or unbranched. Bracteate. Male flower: Calyx: 3-5 lobed, Petals: absent, Stamens: numerous, united. Female flower: 5, valvate, Petals absent. Ovary: 3-locular. Fruit: trilobed. Seed: large.

Ricinus communis L., Sp. Pl. 2: 1007 (1753).

Herb, perennial, Ca. 2m. Stem: glabrous, branched. Petiole length: Ca. 16cm. Stipule present. Leaves: Ca. (5-16× 3-14) cm, alternate, palmate, acuminate, serrate. Inflorescence: paniculate. Sepals: Ca. (0.7×0.2) cm, 5, free, obovate. Petals absent.

Stamens: Numerous, united. Fruit: trilobed.

Fl: Jan-feb **Habitat:** Along river bank.

Distribution: Believed to be native of N.E. Tropical Africa; widely cultivated and occasionally naturalised throughout the tropics, Nepal: WCE (100-2400) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 435m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, BS 123.

Use value: seed are used to obtain oil.

17. FAMILY: LINACEAE

Herb or shrub. Annual or perennial. Leaves: alternate, simple, stipulate or exstipulate. Inflorescence: axillary, axillary clusters. Sepals: 5, free. Petals: 5, free. Stamens: 5, alternating with staminodes. Ovary: superior, 3-5 celled. Fruit: capsule.

Reinwardtia Dumort.

Shrub. Leaves: entire or serrulate, Stipulate. Flowers: axillary. Corolla: funnel shaped, showy. Style: 3-5, filiform, free-connate at base. Capsule: globose, 6-8 seeded.

Reinwardtia indica Dumort., ; Comm. Bot. 19 (1822).

Linum repens Buch.-Ham. ex D. Don., ; Prodr. Fl. Nep. : 217 (1825).

Shrub, Ca.1m, perennial. Stem: glabrous, ascending. Petiole length: Ca. 0.6cm.
Stipule:

Ca.0.3cm. Leaf: Ca. (2-7.3×0.5-2.9) cm, alternate, elliptic, cunate, acute, entire.
Inflorescence: axillary. Sepal: Ca. 1.2×0.3 cm, 5, lanceolate, free, bristles like hair.
Petals: Ca.1.4-3×1.4 cm, yellow, fused, tubular. Stamens: Ca.12cm, 4. Carpel:
globose, 2 ovules per locules.

Fl: April- Jan, **Habitat:** On slopy grassland.

Distribution: Himalaya, India, Myanmar, Thailand, Indo-China, China, Nepal:
(WCE: 300-2300) m.

Representative collection: *Chitwan*, Bhuteha khola, 387m, 17 Oct 2017, B.K.C, S.

Gyawali, S. Luintel, BS172.

18. FAMILY: PHYLLANTHACEAE

Trees, shrubs or herbs. Leaves alternate or opposite or whorled, stipulate.
Inflorescence axillary. Flowers actinomorphic. Sepals 3-8, free. Petals 4-6 or absent.
Stamens 3-10, free or fused. Ovary superior, 3-5 celled, apical placentation. Fruit
schizocarp, drupe or berry.

Key to Genera

- 1a. Stamens three.....**1. Breynia**
1b. Stamens five..... **2. Phyllanthus**

1. *Breynia* J.R. Forst. & G. Forst.

Shrubs or trees, monoecious. Leaves simple, alternate, distichus, stipulate.
Inflorescence axillary, clustered or sometimes in racemes, bracteate. Flowers solitary
or clustered. Sepals 6. Petals absent. Stamens 3, connate. Ovary 3-celled. Fruit fleshy,
indehiscent.

Breynia retusa (Dennst.) Alston, ; in Trimen, Handb. Fl. Ceyl. 6:261 (1931).

Breynia patens (Roxb.) Benth ., ; Gen. Pl. 3: 277 (1883).

Melanthesa turbinata Wight , ; Ic. Pl. Ind. Or. 5: 26, t. 1897 (1853).

Phyllanthus patens Roxb, ; Fl. Ind. ed. 2, 3: 667 (1832).

Shrub, Ca. 2m, perennial. Stem: cylindrical, glabrous. Leaves: Ca:(0.6-2.4×0.3-0.9) cm, alternate, elliptic, rounded, acute, entire. Inflorescence: axillary. Sepals: Ca. 0.6cm, 6, fused, maroon red. Petals: absent. Male and female flower in different pedicel. stamens: 3. Almost blackening on drying.

Fl: March- Oct, **Habitat:** Under Sal forest.

Distribution: India, Ceylon, Burma, Nepal: (CE: 1100-1800) m.

Representative collection: *Chitwan*, Way to gadhi, 1194m, 16 Oct 2017, B.K.C, S. Simkhada SW 270.

2. *Phyllanthus* L.

Herbs, shrubs or trees. Stipule present. Leaves: alternate, pinnately veined. Monoecious; flower axillary or clustered. Male flower; sepals: 4-6. petals: absent, disc glandular. Stamens: 5. Female flower; Calyx: 4-6, disc glandular. Ovary: 3 celled.

Style: free or connate, bifid. Fruit: capsule or berry like.

Key to species

1a. Fruit drupe.....**P. debilis**

1b. Fruit globose..... **P. glaucus**

Phyllanthus debilis Klein ex Willd., Sp. Pl. 4 (1) : 582. 1805. Kurosawa, Newslett.

Himal. Bot. no. 22: 17. 1988.

Herb, Ca.40cm, annual. Stem: branched, herbaceous, cylindrical, glabrous. Petiole length: (0.1-0.8) cm. Leaves: (2.6-7.8×0.3-0.4) cm. Leaflet: oblong, cuneate, entire, reticulate. Sepals: (0.2×0.1) cm, 6, mainly 1 mid- veined. Fruit: drupe, 3 celled.

Fl: Sept, **Habitat:** In rice field.

Distribution: S. India, Sri Lanka, Nepal (WC: 400-1100 m)

Representative collection: *Chitwan*, Chelibeti community forest, 1017m, 16 Oct 2017, B.K.C, S. Simkhada SW 105

Phyllanthus glaucus Wall. ex Mull. Arg., ; *Linnaea* 32: 14 (1863).

Flueggeopsis glauca (Wall. ex Mull. Arg.) A. Das , ; in Kanjilal et al., *Fl. Assam* 4: 158 (1940).

Phyllanthus flueggeiformis Mull. Arg ., ; in DC., *Prodr.* 15(2): 349 (1866).

Shrub, Ca. 2m, perennial, monoecious. Stem: cylindrical, glabrous. Stipulate: ovate. Petiole length: Ca. 0.3cm. Leaves: Ca. (1.3-4.8×0.6-2.6) cm, alternate, oblong, rounded, acute, entire. Inflorescence: axillary. Fruit: Ca. 0.7cm, globose, black, 3-celled.

Fr: July- Oct. **Habitat:** Under Sal forest.

Distribution: Himalaya (Nepal to Bhutan), Nepal (C: 1600-2100 m).

Representative collection: *Chitwan*, Way to gadhi, 879m, 16 Oct 2017, B.K.C, S. Simkhada SW 154.

ORDER: MYRTALES

19. FAMILY: ONAGERACEAE

Annual or perennial herbs, shrubs or rarely trees. Leaves: simple, opposite or spirally arranged. Stipules: absent or present. Inflorescence: solitary or axillary, racemose. Sepals: 2-7, valvate. Petals: as many as sepals. Samens: twice as sepals. Ovary: inferior, 1-5 locular. Fruit: capsule.

Ludwigia L.

Shrub, perennial. Leaves: alternate, elliptic. Calyx: hooked. Petals: yellow, free. Seeds: separated by woody endocarp.

Ludwigia perennis L., ; *Sp. Pl.* 119 (1753).

Ludwigia parviflora Roxb., ; Fl. Ind. 1: 440 (1820).

Shrub, Ca. 1.5m, perennial. Stem: cylindrical, glabrous. Petiole length: Ca. 0.5cm. Leaf: Ca. (1- 9×0.3-2.3) cm, alternate, elliptic, cunate, acuminate, entire. Inflorescence: racemose. Sepals: Ca. 1.8cm, 4, fused, linear, hooked. Petals: (Ca. 1- 2.7×0.4-1.8) cm, 4, yellow, free. Stamens: Ca.0.5mm, 4. Carpel: obovoid. Seeds: numerous, smooth, 2 per locule, separated by woody endocarp.

Fl: Jul-Nov, **Habitat:** In paddy field.

Distribution: Africa, Afghanistan, India, east to S. Japan, Malaysia, Australia, New Caledonia, Nepal: (WCE: 200-1400) m.

Representative collection: *Chitwan*, Bhuteha khola, 312m, 9 June 2017, B.K.C, S. Gyawali, S. Luintel, BS 109.

20. FAMILY: MELASTOMATACEAE

Perennial shrub, Stem: angled, pubescent. Stipules: absent. Leaves: simple, opposite, lanceolate, 1-5 secondary vein on each side of vein originated near base. Inflorescence: terminal, cymose, umbellate. Bracteate. Flower: bisexual. Calyx: 3-6 lobed. Petals: 4-5, equal to sepals. Stamens: 8-10. Ovary: inferior. Fruit: capsule.

Osbeckia L.

Herbs or shrubs. Stem: 3-4sided, pubescent. Leaves: opposite or whorled, petiolate or sessile, secondary vein 1-3 on each side of mid vein. Inflorescence: terminal, capitata or paniced. Flower: 4-5 merous, purple or white. Sepals: free, pubescent. Petals: 4-5, free. Stamens: double to the no of calyx and corolla. Ovary: 4-5 celled. Seeds: numerous.

Key to species

- 1a. Leaves 3 veined.....**1. O. nepalensis**
- 1b. Leaves 5-7 veined.....**2. O. stellate**

1. Osbeckia nepalensis Hook., ; Exot. Fl. 1: t. 31 (1822); Wall., Cat. 143, n. 4061 (1831).

Shrub, Ca. 3m, perennial. Stem: branched, ascending, pubescent. Petiole length: 0.10.2 cm. Leaves: (1.2-6.8 × 1.6-0.4) cm, opposite, lanceolate, cuneate, aristulate, entire, reticulate. Main veins: 3. Sepals: 0.7×0.4 cm, 5, free, fimbriate. Petals: 1.6×0.8 cm, 5 free, pink. Stamens: 1.3 cm, 10, free, Carpel: 2.3 cm. ovary inferior.

Fl: Aug- Oct. **Habitat:** On open grassland.

Distribution: Himalaya, Assam, N. Burma, Thailand, Indo-China, Malay, W. China, Nepal (CE: 450-2300) m. Cent.: leg.? (lectotype of *O. nepalensis*, K); Buch.-Ham. s.n. (type of *O. chulesis*); SSW 6490. East: Williams 1066; TI 6303391.

Representative collection: *Chitwan*, way to gadhi, 1034m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 161

2. *Osbeckia stellata* Buch.-Ham. ex D. Don, ; B. Reg. 8: t. 674 (1822); Prodr. Fl. Nep. 221 (1825).

Small shrub, Ca. 2m, perennial. Stem: angled, pubescent. Petiole length: Ca.0.7-2.1 cm. Leaves: Ca. (7-10×2-4.5) cm, lanceolate, sub-cordate, acute, entire, pubescent. Main vein: 5-7. Inflorescence: terminal, paniculate in upper axils. Calyx: 4, densely hairy. Petals: Ca.1.7-2.5cm, 4, pinkish broadly obovate. Stamens: 8. Fruit: capsule hairy at apex.

Fl: Jul- Nov. **Habitat:** On moist slope.

Distribution: Himalaya, Nepal (WCE: 100-2600) m.

Cent.: Buch.-Ham. s.n., ann. 1802 (lectotype of *O. stellata*); SSW 6701.

Representative collection: *Chitwan*, way to gadhi, 1186m, 16 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 162.

ORDER: SAPINDALES

21. FAMILY: MELIACEAE

Shrubs or tree, perennial. Leaves: alternate, exstipulte, pinnately compound, leaf-lets opposite. Stem: glabrous with brown bark. Stipules: absent. Inflorescence: thyrses.

Sepals: 3-6, connate or free. Petals: 3-6, free. Stamens: 3-12. Ovary: 1-6 loculed. Fruit: berry or drupe. Seeds: many, sometimes winged.

Cipadessa Blume

Shrub or tree, perennial. Leaflets: 6-8 in pairs. Inflorescence: thyrses axillary. Calyx: cup-shaped, 5-lobed. Petals: 5. Stamens: 10, tip covered with trichomes. Ovary: globose, 1-5 locular. Fruit: 5 locular, seed enclosed with indehiscent pericarp

Cipadessa baccifera (Roth) Miq., ; Ann. Mus. B. Lugd.-Bat. 4: 6 (1863).

Cipadessa fruticose Blume,; Bijdr. 162 (1825).

Tree, Ca.6m, perennial. Stem: cylindrical, glabrous. Leaf: Unipinnate, Ca. 23cm, alternate. Leaflets: Ca. (1.3-6.4×0.4-3.1) cm, pubescent, oblong, oblique, acuminate, serrate. Inflorescence: Thyrses. Fruit: 5locular, blackish, drupe, seed enclosed with indehiscent pericarp.

Fl: April- Oct, **Habitat:** Sal forest.

Distribution: Himalaya, India, Ceylon, Burma, Thailand, Indo-China, W. China, Malaysia, Nepal: (WCE: 250-1700) m.

Representative collection: *Chitwan*, Neurani khola, 457m, 9 june 2018, B.K.C, S. Gyawali, S. Luintel, BS 191.

22. Family: RUTACEAE

Tree or shrubs, bearing oil glands. Stem: cylindrical, glabrous, dark brown bark. Stipule: present. Leaf: opposite or alternate, simple or compound. Inflorescence: axillary, corymbs. Calyx: 4-5 lobed. Corolla: 4-5 free. Stamens: 4-10 or more. Fruit: berry or drupe.

Murraya J. Konig ex L.

Shrub or small trees. Leaves: compound. Inflorescence: terminal corymbs. Calyx: cupshaped, 5 lobed. Petals: free. Stamens: 10. Berry: oblong.

Murraya koenigii (L.) Spreng., ; Syst. Veg. 2: 315 (1817).

Chalcas koenigii (L.) Kurz.; J. As. Beng. 44(2): 132 (1875)

Small tree, Ca.7m. Stem: cylindrical, glabrous. Leaves: Ca. 9-23.6 cm. Leaflets: Ca. (14.2×1-1.7) cm, unipinnate, alternate, base: cuneate, apex acuminate. Inflorescence: corymb. Calyx: Ca.0.1cm. Petals: Ca. 0.4×0.1 cm. Stamens: Ca. 0.5cm. Fruit: crimson. **Fl:** March-April, **Habitat:** In open land.

Distribution: Himalaya (Garhwal to Sikkim), India, Ceylon, Burma, Indo-China, China. Frequently cultivated, Nepal: (WCE: 100-1800) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 259m, 18 Oct 2017, B.K.C, S. Simkhada, SW 139.

Use value: leaves used as spice.

ORDER: MALVALES

23. FAMILY: MALVACEAE

Herbs, shrubs or tree. Stipules present. Leaves: alternate, simple or lobed, palmate, 3-7 veined at base. Flower: axillary, solitary or clustered, bisexual, actinomorphic. Epicalyx usually present. Sepals: 5. Petals: 5. Ovary: 2 celled. Fruit: capsule.

- 1a. Stem armed with prickles **3. Bombax**
- 1b. Stem unarmed, pubescent **2**
- 2a. Epicalyx present **3**
- 2b. Epicalyx absent **4**
- 3a. Epicalyx 5 lobed **7. Urena**
- 3b. Epicalyx more than 5 lobed **4. Hibiscus**
- 4a. Anther dithecous **5**
- 4b. Anther monothealous **6**
- 5a. Petals absent **6. Sterculia**
- 5b. Petals present..... **1. Abroma**
- 5a. Ovule one per locule..... **5. Sida**
- 5b. Ovule 2 or more per locule..... **2. Abutilon**

1. **Abroma Jacq.**

Shrub, annual or perennial. Stem: pubescent. Leaves: petiolate, alternate, 5-veined.

Inflorescence: axillary cymose. Sepals: 5, free. Petals: 5. Capsule: 5 winged, villous.

Abroma augusta (L.) L. f., Suppl. Pl.:341 (1781)

Shrub, Ca. 3m, annual. Stem: Branched, ascending, cylindrical, pubescent. Petiole length: (0.4-1.3) cm. Leaf: (3.5-8.7× 2.7-5.3) cm, 5-veined from base, oblong, Cordate, acute, serrate, pubescent, reticulate. Inflorescence: cymose. Sepals: Ca.1.4cm, 5, free, lanceolate. Capsule erect, Ca.6 cm in diameter, stellate hairy, 5-winged, cuplike after structure, margins villous.

Fr: Oct- Dec. **Habitat:** Along the river side, open palce.

Distribution: Himalaya, N. India, east to China, Micronesia, Malaysia, Nepal

(CE: 300-1100) m.

Representative collection: *Chitwan*, Neurani village, 254m, 8 Dec 2017, B.K.C, Y.N. Paudel, BY 170.

2. **Abutilon** Miller, Gard. Dict. Abr., ed. 4. 1754.

Perennial herbs, shrubs or trees. Stem: Pubescent, covered with hairs. Leaves: petiolate, alternate, stipulate, lobed. Inflorescence: axillary or solitary. Epicalyx: absent. Calyx: 5 lobed. Corolla: 5, connate at base. Stamens: clustered at filament tube. Carpel: 5 locule.

Abutilon indicum (L.) Sweet, ; Fl. bras. 12: 385 1891

Abutilon indicum var. *populifolium* (L.) Sweet, ; Fl. Br. Ind. 1: 326 (1874).

Abutilon populifolium (Lam.) Sweet, ; H. Brit. ed. 1: 53 (1826).

Sida populifera Lam. ., ; Encycl. 1: 7 (1783).

Herb, Ca.1m, annual. Stem: ascending, cylindrical, pubescent. Petiole length: (0.1-0.3) cm. Leaf: (1.6-3.8× 0.7-2.1) cm, alternate, cordate, acute, undulate.

Inflorescence: axillary, Sepals: (1.1× 0.6) cm, 6, lanceolate, entire. Petals: orange, 5, entire. Stamens: arranged in whorl. Fruit:

Fl: Jul- Oct, **Habitat:** On open slope

Distribution: Himalaya, India, Ceylon, Burma, Thailand, S. China, Taiwan, S. Japan, Malaysia, Australia, Loyalty Island, Myanmar, Nepal (WCE: 65-1500) m.

Representative collection: *Chitwan*, Neurani khola, 234m, 8 Dec 2017, B.K.C, S. Gyawali, S. Luintel, BS 187.

3. *Bombax* L.

Trees. Leaves digitate, deciduous. Peduncles: axillary or clustered, 1- flowered. Bracteole absent. Calyx: 5-7 lobed. Petals: obovate. Stamens: 5 bundles, opposite to petals. Ovary 5- celled.

***Bombax ceiba* L., ; Sp. Pl. 511 (1753).**

Bombax malabaricum DC. ., ; Prodr. 1: 479 (1824).

Salmalia malabarica (DC.) Schott & Endl., ; Melet. Bot. 35 (1832).

Tree, Ca. 14m. Stem: cylindrical with large conical spines. Petiole length: 8.3—21 cm. Leaves: 5-7 leaflets. Leaflets: Ca. 5.2-12.5×2-4.3) cm, elliptic, cuneate, caudate, entire, glabrous. Inflorescence: axillary. Calyx: Ca. (6.8-9.6×2.4.3) cm, 3-5 lobes, cup-shaped, 3.2-4.1 cm long, smooth outside, inside silky. Corolla: Ca. (6.2-10.3×2-4.1) cm, crimson, oblong-obovate. Stamens: Ca. 4.3 cm, 11-16 joined in several bases. Carpel: Ca. 0.5-2.1cm, conical, green. Capsule: Ca. 9-14.2cm, thick wooly inside.

Fl: March- April, **Habitat:** Found in Sal forest.

Distribution: Himalaya (Kashmir to Bhutan), India, S. China, S.E. Asia, Nepal (WCE: 200-1200) m.

Representative collection: *Chitwan*, Chelibeti community forest, 435m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW247.

Use value: Timber.

4. **Hibiscus** L.

Herb, annual or perennial. Stem: pubescent. Leaves: petiolate, 5-7 lobed, alternate. Inflorescence: axillary. Epicalyx present. Flower: yellow. Calyx: 5- toothed. Corolla: yellow. Stamens: shorter than corolla. Carpel: 5.

Hibiscus cancellatus Roxb. ., ; Fl. Ind. ed. 2, 3: 201 (1832).

Abelmoschus crinitus Wall., ; Pl. As. Rar. 1: 39, t. 44 (1830).

Bamia cancellata Wall. ., ; Cat. 53, n. 1920 (1829).

Herb, annual, Ca. 1m, annual. Stem: cylindrical, pubescent. Petiole length: 7.3cm.

Leaves: Ca. (2.2-6.7×2.4-7.3) cm, alternate, palmate, cordate, acute, serrate, pubescent, 7-lobed. Inflorescence: solitary. Pedicel: Ca. 1.2 cm. Epicalyx: Ca.2.4cm, 15, pubescent. Calyx: Ca. 2.3cm, 5- toothed. Corolla: 6.3cm, funnel shaped, 5 yellow.

Stamens: Ca. 3cm, short. Carpel: globular, 5 locule.

Fl: May- Sept. **Habitat:** In open grassland.

Distribution: Himalaya, India, Burma, Indo-China, S. China, Malaysia, Nepal (WC: 100-2100) m.

Representative collection: *Chitwan*, Neurani bazar, 276m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 187.

5. **Sida** L.

Herbs or shrubs. Leaves: simple, palmately veined. Stipule: persistent. Flower: crowded at end of branches, 1- many flowered. Epicalyx: absent. Sepals: connate. Petals: 5. Stamens: divided into many filaments. Ovary: 5-12 celled. Fruit: globose.

Key to genus

1a. Leaves lanceolate **S. acuta**

1b. Leaves cordate **S. cordata**

Sida acuta Burm. f., ; Fl. Ind. 147 (1768).

Shrub, Ca. 1m, perennial. Stem: branched, cylindrical, glabrous. Petiole: (0.1-0.6) cm.

Leaf: (0.8-4.7×0.3-1.9) cm, alternate, oblanceolate, cunate, aristulate, serrulate. Inflorescence: racemose. Sepals: (0.8 × 0.3) cm, 5, fused, obovate, hairy. Petal: (0.6×0.3) cm, yellow, free, base fused, obovate, entire, 3-nerved. Stamens: 0.4cm. Carpel: 0.2cm, hairy.

Fl: Sept-Feb. **Habitat:** Along roadside.

Distribution: Pantropical, Nepal (E: 100-2700) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 231m, 16 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 131.

Sida cordata (Burm. f.) Borss. Waalk., ; Blumea 14: 182 (1966).

Sida humilis Willd.; Cav. Diss. 5: t. 134, f. 2 (1788).

Sida multicaulis Cav., ; Diss. 1: 10, t. 1, f. 6 (1785).

Sida veronicifolia Lam. ; Encycl. 1: 5 (1783).

Shrub, Ca.1m, perennial. Stem: branched, cylindrical, pubescent. Petiole: (0.4-2.6) cm, hairy. Leaf: (1.6-7.8× 0.6-7.3) cm, simple, alternate, cordate, acuminate, dentate, fimbriate, reticulate. Inflorescence: racemose. Sepals: (7×3) mm, fused, ovate, hairy. Petals: (0.7- 0.3) cm, Yellow, obovate. Stamens: 0.6cm **Fl:** Jul- Feb. **Habitat:** In open grassland.

Distribution: Pantropical, Nepal (WCE: 100-1800) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 324m, 16 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 248.

6. *Sterculia* L.

Deciduous tree. Leaves: simple or palmately compound, alternate. Inflorescence: axillary or terminal racemose. Flower: unisexual or bisexual. Calyx: tubular, 4-5 lobed. Petals: absent. Stamens: 10-30. Carpel: 2- many lobed.

Sterculia hamiltonii (Kuntze) Adelb., ; in Backer, Bekn. Fl. Java Afl. ivb, fam. 107: 23 (1944), in clave. Whitmore in H. Hara & Williams, Enum. Flow. Pl. Nep. 2: 70 (1979).

Sterculia indica Merr.,; J. Arn. Arb. 33: 246 (1952), in obs.

Tree, Ca. 5-6m, perennial. Stem: Branched, ascending, cylindrical, glabrous. Leaf: (18.3- 24.7× 5.2-6.9) cm, oblanceolate, attenuate, acuminate, entire, reticulate. Inflorescence usually axillary, usually paniculate, rarely racemose. Flowers unisexual.

Calyx 5-lobed or 5-partite, fused at apex. Petals absent.

Fl: Sept-Oct, **Habitat:** In forest, on side of Stream.

Distribution: Subtropical Himalaya (Nepal to Bhutan), Assam, Burma, Nepal (CE: 300-1200) m.

Representative collection: *Chitwan*, Shaktikhor jharana, 419m, 16 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 157.

7. *Urena* L.

Herbs or shrubs. Leaves: unlobed or deeply palmately lobed. Stipules: deciduous. Flower: axillary. Epicalyx: present, 5, connate at middle. Sepals: 5, lobes triangular.

Petals: 5. Ovary: 5- celled. Fruit: subglobose.

Urena lobata L., ; Sp. Pl. 692 (1753).

Shrub, Ca 1m, perennial. Stem: branched, cylindrical, glabrous. Petiole length: (0.56.2) cm. Leaf: (2.9-7.3×1.6-8.1) cm, alternate, cordate, acute, serrate. Inflorescence: Racemose. Bracts: 03 cm, 6, free, acute, shiny, short hairs. Sepals: (0.3× 0.1), 5, lanceolate, free, white shiny long hair, margin hairy. Petals: (0.7× 0.3)

cm, pink, obovate, hairy, free. Stamens: Pinkish brown, numerous, 0.4 cm. Carpel: 0.2cm, 5 lobed.

Fl: Jul- Oct. **Habitat:** Along roadside.

Distribution: Pantropical, Nepal (WCE: 200-1400m).

Representative collection: *Chitwan*, way to Shaktikhor jharana, 315m, 16 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 115.

24. FAMILY: DIPTEROCARPACEAE

Tree, perennial. Leaves alternate, oblong, simple, entire. Inflorescence: panicle, bracteates. Flower: bisexual. Sepals: free, ovate, winged like in fruit. Petals: 5, free. Stamens: many. Ovary: superior, 3- celled.

Shorea Roxb.

Tree, deciduous. Leaves: entire. Panicles: axillary. Calyx: short. Petals: elongate. Stamens: numerous. Ovary: conical, densely pubescent. Fruit: closed by calyx segments, developed into large veined wings.

Shorea robusta C. F. Gaertn, , Suppl. Carp. 48 (t. 186, f.1) (1805).

Tree, Ca. 10m, Perennial, deciduous. Stem: Branched, glabrous. Bark: reddish brown. Petiole length: Ca. 1.3 cm. Leaf: Ca. (7-29×5-18) cm, alternate, oblong, cordate, acuminate, entire. Inflorescence: panicle. Bract: Ca.0.2cm, caducous. Sepals: Ca. 0.3×0.2 cm, 5, free, ovate, pubescent. Petals: Ca. 1.2×0.3 cm, 5, creamy yellow, free, lanceolate. Stamens: Ca. 0.2cm, yellowish, 22. Carpel: Ca. 0.4cm, ovoid **Fl:** Feb-May, **Habitat:**

Distribution: Subtropical Himalaya (Garhwal to Assam), India, Nepal (WCE: 60-1400) m.

Representative collection: *Chitwan*, Chelibeti community forest, 567m, 7 March 2018, B.K.C, Y.N, Paudel., BY 198.

Use value: Used as timber and leaves and branch use for religious purpose.

SUPER-ASTERIDS

ORDER: CARYOPHYLLALES

25. FAMILY: PLUMBAGINACEAE

Herb, annual- perennial. Stem: angular, glabrous. Stipules: absent. Leaves alternate, ovate- lanceolate. Inflorescence: racemose. Calyx: tubular, usually ribbed, 5-lobed glandular. Petals: 5, free or connate at base. Stamens: 5, free. Ovary: superior, 1-celled. Fruit: capsule.

Plumbago L.

Herb or sub shrubs, annual. Petioles: clasping at base. Leaves: alternate, lanceolate, entire or merely toothed. Spike: terminal or axillary. Calyx: glandular. Corolla: tubular, long, lobes spreading, white. Stamens: free. Capsule: splitting.

Plumbago zeylanica L. , ; Sp. Pl. 151 (1753).

Plumbago rosea L , ; Sp. Pl. ed. 2, 215 (1762).

Herb, Ca. 80cm, annual. Stem: branched, ascending, angular. Petiole length: 0.7-1.3 cm. Leaves: (5.4-8.9×2.6-4.1) cm, alternate, ovate- lanceolate, attenuate, acute, entire, reticulate. Inflorescence: racemose. Bract: 0.5 mm, ovate. Sepals: 1.2 cm, tubular, covered by stalk of glands, 5 toothed. Petals: Ca. 2.9 cm, white, tubular. Stamens:

Ca.2.1 cm, 5, free. Carpel: glandular inside. **Fl:** Oct- Mar, **Habitat:** Along road side.

Distribution: Tropical Africa, Tropical Asia, Nepal (WCE: 100-1300m).

Representative collection: *Chitwan*, On way to Shaktikhor jharana, 578m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 166.

26. FAMILY: POLYGONACEAE

Herb or shrub, annual. Leaves: simple, entire, Stipules: sheathing the stem. Inflorescence: racemose, clustered, bisexual. Perianth: 3-6 segments, connate below. Stamens: 1-9, adantate to perianth. Ovary: superior, unilocular. Styles:2-3, capitate.

Fruit: trigonous.

PERSICARIA Mill.

Herbs. Stem: branched, sometimes recurved spines present. Leaves: ovate, ellipticlanceolate. Inflorescence: racemose, spikes or capitate heads. Perianth: 4-5 parts. Stamens: 5-8, style 2-3, elongate, capitate. Achenes: biconvex, compressed or trigonous.

Key to species

- 1a. Inflorescence capitate, Stamens 6 **1. *P. capitata***
1b. Inflorescence spike, stamens 5 **2. *P. barbata***

1. *Persicaria capitata* (Buch.-Ham. ex D.Don) H.Gross Bot. Jahrb. Syst. 49:277. 1913

Herb, Ca. 37cm, annual. Stem: branched, ascending, cylindrical, glabrous. Ochrea: Ca. 0.5cm. Leaves: (1.4-2.8× 0.6-1.6) cm, simple, linear-ovate, aequilateral, acute, entire, reticulate. Inflorescence: capitate. Tepals: 2mm-1mm, four, purple-pinkish, entire.

Stamens: 2.5mm, 6, white- pinkish, anther: purple, Carpels: bifurcate.

Fl: Aug-Sept, **Habitat:** Moist slope at river bank.

Distribution: Himalaya (Punjab to NEFA), Tibet, Assam, east to W. China, Nepal (WCE: 600-2400) m.

Representative collection: *Chitwan*, Agricultural land of bhuteha river, 739m, B.K.C, S. Gyawali, S. Luintel, SW 148.

2. *Persicaria barbata* (L.) H. Hara Fl. E. Himalaya 1:70. 1966, nom. cons.

Herb, Ca. 1m, perennial. Stem: branched, ascending, cylindrical, glabrous. Ochrea: 2cm, setose. Leaves: (2.7-5.6× 0.4-1.2) cm, aequilateral, aristulate, entire, reticulate. Inflorescence: spike, racemose. Tepals: 5, 3 large outer, 2 small inner. Stamens: 5.

Carpel: trifurcate. Fruit:

Fl: Aug-Sept, **Habitat:** Along the river bank.

Distribution: Himalaya (Punjab to NEFA), Tibet, Assam, east to W. China, Nepal (WCE: 200-1100) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 370m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 176.

27. FAMILY: CARYOPHYLLACEAE

Herb, annual. Stem: prostrate, angled. Leaves: ovate-cordate, opposite, stipule absent.

Inflorescence: axillary. Sepals: 4-5. Petals: sub-equal to sepals. Stamens: 2-5.

Key to genus

- 1a. Stipule present.....1. **Drymaria**
1b. Stipule absent.....2. **Stellaria**

1. **Drymaria** Willd. ex Roem. & Schult.

Herb annual or perennial. Stem: suberect, dichotomous branching. Leaves: opposite, petiolate, ovate-cordate, 3-5 veined. Stipule: present. Inflorescence: terminal. Flower: pedicellate, small. Sepals: free. Petals: 2-lobed. Stamens: 2-5, opposite to sepals. Ovary: with few ovules. Fruit: many seeded.

Drymaria cordata (L.) Willd. ex Roem. & Schult., ; Syst. Veg. 5: 406 (1819).

Herb, Ca. 50 cm, annual, rooted at lower nodes. Stem: glabrous, papillose near inflorescence. Stipule: whitish membranous. Petiole length: Ca. 0.5cm. Leaves: Ca. 2.8×0.3 cm, ovate, 3-5 veined from base. Bracts: present. Sepals: Ca. 0.2-0.4cm. lanceolate, 3-veined, pubescent. Petals: Ca.0.3cm, 2-cleft. Stamens: 3. Style: 3.

Fl. Apr- Oct. **Habitat:** Agricultural field.

Distribution: Africa, America, naturalised in India, Pacific Is, Nepal (WCE: 2200-4300) m.

Representative collection: *Chitwan*, shaktikhor bazar, 254m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 149.

2. *Stellaria* Kuntze.

Prostrate herb, annual. Leaves: opposite, ovate-oblongate. Stipule: absent. Inflorescence: solitary. Sepals: free, 4-5. Petals: 4-5, 2 petals arising from single base.

Stamens: 2-5. Style: 3, splitting to base.

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

Stellaria monogyna D. Don , ; Prodr. Fl. Nep. 215 (1825).

Herb, Ca.30cm, annual. Stem: prostrate herb, angled, glabrous. Petiole length: Ca. 0.1-1.2 cm. Leaves: Ca. (1.2-3.9×0.6-1.9) cm, opposite, ovate, cordate, acuminate, entire, shiny white surface. Sepals: Ca. 0.4cm, 5, lanceolate, free, fimbriate outer surface. Petals: Ca.0.2cm, 10, white, 2 petals from a single base. Stamens: 5, Ca. 0.2cm. Carpel: Ca. 0.2Cm, ovoid. Style: 3.

Fl: June- July, **Habitat:** along roadside.

Distribution: Afghanistan, Bhutan, India, Japan, Korea, Pakistan, Russia, Sikkim; Europe, Nepal (WC: 1800-2700) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 237m, 9 June 2017, B.K.C, S.

Gyawali, S. Luintel, BS128.

28. FAMILY: AMARANTHACEAE

Herbs, shrubs or woody climbers. Stipules absent. Leaves alternate or opposite, simple or entire. Flowers: heads, racemes, spikes or panicles, actinomorphic, usually bisexual; bract papery or hard; bracteoles: 2. Perianth: 3-5 segments, usually free or connate, filaments in tube. Ovary: superior, 1-celled. Fruit: capsule rarely berry.

Key to genera

- 1a. Stem pubescent..... **1. Achyranthes**
- 1b. Stem glabrous.....**2. Alternanthera**

1. Achyranthes L., Sp. Pl. 1:204 (1753), nom. cons.

Annual herb, Stem: cylindrical, pubescent, woody. Leaves: opposite, ovate-lanceolate. Inflorescence: racemose, axillary spikelet, dense. Bracteole: spiny, perianth green or reddish. Stamens: 5

Key to species

- 1a. Leaves obovate-elliptic, perianth light red..... **A. aspera**
1b. Leaves lanceolate, perianth green..... **A. bidentata**

Achyranthes aspera L., ; Sp. Pl. 204 (1753).

Achyranthes aspra Wall., Numer. List [Wallich] n. 6924 H (1832).

Achyranthes aspera J.Jacq., Ecl. Pl. Rar. 109. t. 74.

Achyranthes aspera Duss, Ann. Inst. Colon. Marseille 3: 53 (1897).

Herb, Ca. 40cm, Stem: Branched, ascending, cylindrical, pubescent. Petiole length: (0.2-0.9) cm. Leaves: (1.2-4.7×0.6-2.9) cm opposite, obovate-elliptic, aequilateral, acute, entire, reticulate, fimbriate. Inflorescence: Racemose, dense at apex, spike hairy. Bracts: 0.5cm, 2, lanceolate. Bracteoles: 0.4cm, 2, spiny. Perianth: 2mm, light red. Stamens: 0.5cm, 5. Capsule: 0.3cm

Fl: Jun- Aug. **Habitat:** Along trail, open place.

Distribution: Pantropical, Nepal (WCE: 100-2900m).

Representative collection: *Chitwan*, Gairibari community forest, 245m, 17 OCT 2017, B.K.C, S. Lamichhane, S. Simkhada. SW 118.

Use Value: Juice of rhizoides used for typhoid and diabetes.

Achyranthes bidentata Blume,; Bijdr. 545 (1826).

Herb, Ca. 70 cm, Annual. Stem: Branched, ascending, cylindrical, pubescent. Petiole length: (0.2-0.9) cm. Leaves: (4.1-5.6× 1.2-1.4) cm, opposite, lanceolate, cunate, arisstulate, entire, reticulate, fimbriate. Inflorescence: Racemose, dense. Bract:

lanceolate, 0.4cm. Bracteoles: 0.3cm, outwardly curving spines. Perianth: 3mm, 5, green, entire. Stamens: 1.5mm, 5. Capsule: 0.1cm. **Fl:** Jul- Sept. **Habitat:** On shaddy slopy grassland.

Distribution: Bhutan, China, India, Indonesia, Korea, Laos, Malaysia, Myanmar, New Guinea, Philippines, Russia, Sikkim, Thailand, Vietnam, Nepal (CE: 1200-2100) m.

Representative collection: *Chitwan*, Chelibeti community forest, 987m, 16 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW.

2. Alternanthera Forssk., Fl. Aegypt- Arab. 28 (lix) (1775).

Prostrate herb, annual. Stem: glabrous, herbaceous, cylindrical. Leaves: opposite, simple. Inflorescence: axillary. Perianth: white. Stamens: 5

Alternanthera sessilis (L.) DC., ; Cat. Pl. Horti. Monsp. 77 (1813).

Alternanthera sessilis R. Br., Prodr. Fl. Nov. Holland. 417 (1810), nom. inval.

Alternanthera sessilis Lem., III. Hort: (1865) t.447.

Prostrate herb, Ca. 20cm, Annual. Stem: Branching, ascending, cylindrical, glabrous.

Leaves: (0.7-2.3× 0.3-0.8) cm, Oblanceolate, cunate, obtuse, entire, reticulate. Inflorescence: axillary, spike. Bract: Ca. 1.5mm, white. Bracteoles: 1mm. Tepals: 1.5mm, white, glabrous. Stamens: 0.4cm, 5, white, shiny, glabrous. Carpel: 0.2cm,

Fl: May- Jul. **Habitat:** River bank.

Distribution: Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Sikkim, Thailand, Vietnam, Nepal (WCE: 200-2000M).

Representative collection: *Chitwan*, Shaktikhor Bazar, 257m, 9 June 2018, B.K.C, S. Gyawali, S. Luintel, BS 239.

29. FAMILY: NYCTAGINACEAE

Herb or climbing herbs. Stipule present. Leaves: opposite, simple. Inflorescence: Bracteate cymes. Perianth: tubular, 5 petals fused. Stamens: 1-10. Ovary: superior, 1 celled. Fruit: 1 seeded.

Boerhavia L.

Herbs, erect. Leaves: opposite. Flowers: axillary dense, cymose. Bracteate. Perianth: Campanulate, 5-lobed. Stamens: 1-3. Ovary: style slender, stigma capitate. Fruit: obovoid.

Boerhavia diffusa L., Sp. PL.; 3(1753)

Herb, Ca. 1m, annual. Stem: branched, glabrous. Petiole length: 0.1-0.6 cm. Leaf: Ca. (0.7-2.4× 0.3-1.4) cm, opposite, ovate, rounded, acute, entire, pubescent. Inflorescence: capitate. Bract: Ca. 0.2cm, pubescent. Perianth: Ca. 1.7mm, purple. Stamens: 3. Anthocarp: glandular

Fl: March- Sept. **Habitat:** On agricultural field.

Distribution: Tropical and sub-tropical regions of world, Nepal (WCE:300-1200) m

Representative collection: *Chitwan*, Shaktikhor bazar, 378m, 18 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 111.

ASTERIDS

ORDER: ERICALES

30. FAMILY: MYRSINACEAE

Trees, shrubs, rarely herbs. Leaves: simple, alternate. Stipules: absent. Inflorescence: terminal, axillary, cymose. Flowers: bisexual, 4- or 5(or 6)-merous, actinomorphic. Sepals: basally connate or free, persistent. Petals: basally connate or rarely free, usually glandular. Stamens: as many as and opposite to petals. Anthers: 2-celled. Ovary: superior, 1-celled. Ovules 1 or many. Style: 1. Seeds: 1 or many.

Key to genus

1a. Seed one **1. Ardisia**

1b. Seed many **2. Maesa**

1. *Ardisia* Sw.

Shrub, perennial. Leaves: opposite. Inflorescence: corymb racemose. Flower: bisexual, 4merous- 5merous. Calyx: free. Corolla: united at base. Stamens: fused at base of corolla. Fruit: fleshy. Seed: 1.

Ardisia solanacea Roxb., ; Pl. Corom. 27, t. 27 (1795).

Shrub, Ca.3m, perennial, Stem: cylindrical, glabrous. Petiole length: Ca. 0.3cm. Leaves: Ca. (5.6-16.2×2.1-7.4) cm, alternate, oblanceolate, cuneate, acute, entire. Inflorescence: corymbose racemose. Flower: Ca. 1.3 cm, pink. Calyx: 0.2cm, 5. Corolla: Ca. 0.8cm, base fused, lobed. Stamens: Ca. 0.2mm, fused,5. Carpel: ovary globose. Fruit: reddish, globose.

Fl: March- June. **Habitat:** Under sal forest in moist slope.

Distribution: Tropical Himalaya (Kumaun to Sikkim), India, Ceylon, Burma, W. China, Malaya, Nepal (WCE: 200-1100) m.

Representative collection: *Chitwan*, Bhuteha khola, 532m, 9 June 2018, B.K.C, S. Gyawali, S. Luintel, BS 263.

2. *Maesa* Forssk.

Shrubs or tree. Leaves serrate. Inflorescence: axillary. Calyx: 4-5 toothed, persistent. Corolla: 4-5 lobed, campanulate. Stamens: 5, attached in corolla tube. Fruit: globose, berry, many seeded.

Maesa chisia Buch.-Ham. ex D. Don, ; Prodr. Fl. Nep. 148 (1825).

Maesa dioica A. DC. ., ; in DC., Prodr. 8: 79 (1844).

Tree, Ca. 6m, perennial. Stem: branched, ascending, cylindrical, glabrous. Petiole length: (0.8-1.9) cm. Leaves: (3.4-9.8×1.6-2.7) cm, alternate, oblanceolate, cuneate, acute, serrate, reticulate. Bracteoles: 2. Fruit: Drupe, globose, many seeded.

Fl: Sept-Oct. **Habitat:** On moist sloppy area of forest.

Distribution: Himalaya (Nepal to Bhutan), Assam, N. Burma, Nepal (WCE: 1200-2600) m.

Representative collection: *Chitwan*, way to gadhi, 769m, 18 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 250.

ORDER: GENTIANALES

31. FAMILY: APOCYNACEAE

Shrub or tree. Stem: branched or unbranched, glabrous. Stipules: absent. Leaves: opposite or whorled, elliptic- lanceolate. Inflorescence: axillary-cymose. Flower: bisexual. Calyx: free- fused, 5-lobed. Corolla: tubular, 5-lobed, overlapping to left-right. Stamens: short. Stamens: 5. Ovary: superior, 1-celled. Fruit: drupe follicle.

Key to genus

- 1a. Leaves opposite 1. **Holarrhena**
1b. Leaves in whorl 2. **Rauvolfia**

Holarrhena R. Br, Mem. Wern. Nat. Hist. Soc. i. (1809) 62.

Tree or shrubs. Leaves: opposite. Inflorescence: terminal or axillary. Calyx: 5-lobed, pubescent. Corolla: white tubular, overlapping to right. Stamens: short, Carpels: 2 fruit paired follicles.

Holarrhena pubescens (Buch.-Ham.) Wall. ex G. Don, ; Gen. Syst. 4: 78 (1837).

Echites antidysenterica Roxb. ex Fleming , ; As. Res. 2: 166 (1810).

Holarrhena antidysenterica Wall. ex DC. ., ; Prodr. 8: 413 (1844).

Holarrhena codaga G. Don , ; Gen. Syst. 4: 78 (1837).

Nerium antidysentericum L., ; Sp. Pl. 209 (1753), nom. ambig.

Tree, Ca. 6m, perennial. Stem: cylindrical, glabrous. Petiole length: Ca. 0.2cm. Leaves: Ca. (4.8-11.3×1.1-4.6) cm, opposite, lanceolate, obtuse-oblique, acuminate, entire. Inflorescence: axillary, many flowered. Sepals: Ca. 0.2×0.1 cm, 5, free, lanceolate, pubescent. Petals: Ca. 1.9 cm, 5, tubular, lobed, pubescent, white, overlapping at right. Stamens: Ca. 0.4 cm, 5.

Fl: Jan- April, **Habitat:** Sal forest.

Distribution: Tropical Himalaya, India, Burma, Indo-China, Malaya, Nepal: (WCE:100-1500) m.

Representative collection: *Chitwan*, gairibri community forest, 567m, 9 march 2018, B. K. C, Y.N. Paudel BY236.

2. *Rauvolfia* L., Genera Plantarum ed. 5 (1754).

Shrub. Leaf: Whorled, 3-5. Inflorescence: cymose. Calyx: deeply 5-lobed. Corolla: red, tubular, lobes overlapping to left. Stamens: long as corolla tube. Ovary: 2, carpels fused. Fruit: drupe.

Rauvolfia serpentina (L.) Benth. ex Kurz, ; For. Fl. Br. Burma 2: 171 (1877).

Rauvolfia serpentina Baill., Hist. Pl. (Baillon) 10: 170 (1889).

Shrub, Ca.55cm, annual. Stem: unbranched, glabrous. Petiole length: Ca. 2.4cm. Leaves: Ca. (12.3-16.5×4.2-4.6) cm, whorled, dense at apex, elliptic, cuneate, acuminate, entire. Inflorescence: Cymose. Sepals: Ca. 0.2cm, free, red. Petals: Ca. 1.3cm, red, tubular overlapping to left. Fruit: drupe.

Fl: Aug- Oct. **Habitat:** Along road side.

Distribution: Tropical Himalaya, India, Ceylon, Malaya, Nepal: (WCE: 100-900) m.

Representative collection: *Chitwan*, way to shaktikhor mandir, 437m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 247.

Use value: Leaves use for medicinal purpose.

32. FAMILY: GENTIANACEAE

Herbs. Stipule absent. Leaves: opposite, simple. Flower: solitary, actinomorphic. Calyx: tubular, 4-5 lobed. Corolla: tubular, 4-5 lobed. Stamens: 4-5, attached to corolla. Ovary: superior. Stigma: 2 lobed.

Canscora Lam.

Annual or perennial. Leaves: sessile, opposite. Flower: 4merous – 5merous. Calyx: tubular. Corolla: Tubular or salverform. Stamens: attached to corolla tube. Ovary: 1 locular.

Canscora diffusa (Vahl) R. Br., ; Prodr. Fl. Nov. Holl. 451 (1810).

Exacum diffusum (Vahl) Wild, ; Sp. Pl. 1: 637 (1798).

Pladera virgate Roxb., ; Fl. Ind. 1: 417 (1820), nom. illegit.

Herb, Ca. 32cm, annual. Stem: branched into 2 from each node, angular, pubescent. Leaves: Ca. (0.6-4.2×0.4-1.1) cm, ovate- lanceolate, cuneate, acute, entire. Veins: 3 veined from base. Sepals: Ca. 0,3cm, 4 lobed. Corolla: Ca. 1.5cm, tubular, 4 lobed. Stamens: 2. Carpel: Ca. 0.3cm, ovoid.

Fl: Nov- Dec , **Habitat:** On moist slope along river side

Distributin: Old World Tropics, Nepal (WCE: 150-750) m

Representative collection: *Chitwan*, bhuteha khola, 340m, 9 june 2017, B.K.C, S. Gyawali, S. Luintel, BS 239

33. FAMILY: RUBIACEAE

Herbs, shrubs or tree. Stipules: interpetiolar. Leaves: opposite or whorled, simple. Flower: clustered in heads, bisexual. Sepals: 4-5, usually free. Corolla: tubular. Stamens: 4-5, attached to corolla tube, alternating with corolla lobes. Ovary: 2 celled. Fruit: drupe, berry or capsule.

Key to genus

- 1a. Succulent herb **1. Agrostemma**
1b. Prostrate herb or climbing shrub **2**
2a. Stem angled **3**
2b. Stem cylindrical **4**
3a. Leaves opposite **2. Borreria**
3b. Leaves whorled **3. Galium**
4a. Plant with stinking odour **7. Paederia**
4b. Plants not with stinking odour **5**
5a. Inflorescence terminal, on axil of leaves **5. Mussaenda**
5b. Inflorescence panicle **6**
6a. Stigma linear **6. Ophiorrhiza**
6b. Stigma bifurcate **4. Hedyotis**

1. *Agrostemma* Wall

Succulent subhyaline herb. Stem: cylindrical, glabrous. Leaves: opposite, unequal, elliptic- rounded. Stipule: persistent. Inflorescence: peduncled. Flower: white. Calyx: 3-7 lobed. Corolla: rotate, 4-5 lobed, valvate. Stamens: 4-5. Ovary: 2-loculed, membranous.

Argostemma sarmentosum Wall., ; in Roxb., Fl. Ind. 2: 324 (1824).

Succulent herb, Ca. 15 cm, annual. Stem: Unbranched, cylindrical, glabrous. Petiole length: Ca. 0.2cm. Leaves: (6.8-7.7×2.4-2.9) cm, obovate, cunate, obtuse, entire, reticulate. Inflorescence: racemose. Petals: white, 4 lobed, tubular. Stamens: 0.4cm, 4.

Carpel: 0.2mm, obovoid.

Fl: June-oct, **Habitat:** Under sal forest, on moist steep slope.

Distribution: Himalaya (Mussoorie to Bhutan), Assam, Burma, Nepal (WCE: 300-2100) m.

Representative collection: *Chitwan*, way to neurani, 386m, 18 oct 2017, B.K.C, S. Lamichhane, S. Simkhada SW 223.

2. *Borreria* G. F. W Mey

Erect or prostrate perennial herb. Leaves: opposite, sessile or shortly petiolate, stipulate. Inflorescence: axillary, bract present. Calyx: tubular, 2-4 lobed. Corolla: 4 lobed. Stamens: 4. Stigma: bifid. Capsule: bilocular. Seed: oblong-ovate.

Borreria alata (Aubl.) DC., ; Prodr. 4: 544 (1830).

Borreria latifolia (Aubl.) K. Schum. ; in Mart., Fl. Bras. 6: 61, t. 80 (1888).

Spermacoce latifolia Aubl.; Pl. Gui. 1: 55, t. 19, f. 1 (1775).

Herb, Ca. 22-48cm, annual. Stem: branched, angled, pubescent. Petiole length: (0.10.9) cm. Leaves: (1.6-5.2×0.7-2.3) cm, opposite, oblong, attenuate, broadly acute, entire, pubescent. Inflorescence: axillary, enclosed by leafy bracts. Calyx: 0.5 cm. 4 lobed, fused, pubescent. Calyx teeth 0.4cm, filiform. Corolla: 0.2cm, white, fused. Stamens: 0.6mm, long filamentous. Carpel: 2 mm, pubescent.

Fl: Jun-Oct, **Habitat:** Along roadside.

Distribution: Tropical America, naturalised widely in tropical Asia, Nepal (WCE: 200-2000) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 345m, 16 Oct 2017. B.K.C, S. Lamichhane, S. Simkhada, SW 219.

3. *Galium* L.

Scandent weak herb. Stem: terete. Leaves: whorled rarely opposite. Inflorescence: axillary or terminal cymes. Bract and bracteoles absent. Flower: 3-4 merous, minute. Calyx: fused, ovoid. Corolla: cup shaped. Styles: 2. Stigma: capitate. Fruit: small, pubescent with hooked hairs, sometimes glabrous.

Galium acutum Edgew., Trans. Linn. Soc. London 20:61 (1846)

Galium himalayense Klotzsch , ; B. Reise Pr. Waldem. 88, t. 73 (1862).

Prostrate herb, Ca. 65cm, perennial. Stem: branched, ascending, 4 angled, pubescent. Leaves: (0.3-1.1×0.1-0.1) cm, 6 in a whorl, sessile, lanceolate, attenuate, mucronate, entire. Inflorescence: thyrsoid. Corolla: 0.2 cm, creamy white, lanceolate. Stamens: 4.

Fruit: 1mm, smooth.

Fl: May- aug , **Habitat:** under moist shady place.

Distribution: Himalaya (Kashmir to Bhutan), China, Nepal (WCE: 2000-4100) m.

Representative collection: *Chitwan*, way to gadhi, ,987m, 17 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 216.

4. **Hedyotis L.**

Herb or undershrubs. Stem: herbaceous or woody, branch quadrangular. Leaves: opposite, stipulate. Inflorescence: axillary or terminal cyme. Flower: small, white. Calyx: tubular, 4-lobed. Corolla: 4 lobed, ovate. Stamens: 4. Ovary: 2 loculed, ovary numerous. Capsule: small. Seed: numerous.

Hedyotis scandens Roxb., ; Fl. Ind. 1: 369 (1820).

Oldenlandia scandens (Roxb.) Kuntze ; Rev. Gen. Pl. 1: 292 (1891).

Herb, Ca. 60 cm, Annual. Stem: Branched, cylindrical, glabrous. Petiole length: (0.10.4) cm. Leaves: (2.4-10.2× 0.6-3.3) cm, opposite, lanceolate, attenuate, acuminate, entire. Inflorescence: Panicle. Sepals: 0.3 cm, 4, base fused, shiny hair present. Petals: 0.5cm, 4, creamy white, obtuse, hairy. Stamens: 0.4cm, 4, staminoid. Carpel: 0.4 cm, stigma bifurcate.

Fl: Sept. **Habitat:** On grassland

Distribution: Himalaya (Nepal to Bhutan), Khasia, Burma, Indo-China, Nepal (CE: 400-1800) m.

Representative collection: *Chitwan*, way to gadhi. 984m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 237.

5. *Mussaenda* L.

Small shrub. Leaves opposite, petiolate. Inflorescence: terminal or from uppermost of leaf axils, many flowered. Calyx: short cylindrical tube, 5 lobed. Corolla: tube greenish with orange 5 lobes. Anthers: linear. Ovary: 2 celled.

Mussaenda macrophylla Wall., ; in Roxb., Fl. Ind. 2: 228 (1824).

Shrub, Ca.1m, annual. Stem: cylindrical, pubescent. Petiole length: Ca. 0.2cm. Stipulate. Leaves: Ca. (4.5-13.2×1.9-6.4) cm, oblong-oblanceolate, cuneate, acuminate, entire, pubescent. Inflorescence: corymb, on axil of leaves. Calyx: 0.6 cm, lanceolate. Corolla: Ca. 2.6 cm, tubular, 5 lobed, orange.

Fl: Jul- Sept, **Habitat:** On moist slope.

Distribution: Himalaya (Nepal to Sikkim), Assam, Burma, Yunnan, Nepal (C).

Representative collection: *Chitwan*, gairibari community forest, 256 m, 17 Oct 2017, B.K.C, S. Simkhada, SW 234.

6. *Ophiorrhiza* L.

Annual or biennial herb mostly succulent. Leaves: opposite, stipulate. Inflorescence: terminal, cymose to capitate. Calyx: 5 lobed. Corolla: 5 lobes, white. Stamens: 5-6 below corolla tube. Ovary: 2 celled.

Ophiorrhiza rugosa Wall., ; in Roxb., Fl. Ind. 2: 547 (1824)

Ophiorrhiza harrisiana var. *rugosa* (Wall.) Hook. f. ., ; Fl. Br. Ind. 3: 78 (1800).

Ophiorrhiza prostrata D. Don ; Prodr. Fl. Nep. 136 (1825).

Herb, Ca. 21 cm, Annual. Stem: Branched, ascending, cylindrical, glabrous. Petiole length: (0.4- 3.7) cm. Leaves: (6.7- 16.8× 0.7- 1.6) cm, opposite, oblanceolate, attenuate, acute, entire, reticulate. Inflorescence: Panicle. Bract: 0.9cm. Sepals: ca. 0.3cm, cup shaped, 6, hairy, pubescent. Petals: 1.4 cm, white, tubular, lobes attached.

Carpel: 0.4cm.

Fl: Aug- sept, **Habitat:** Moist slope under Sal forest.

Distribution: Himalaya (Nepal to Bhutan), India, Ceylon, Indo-China, Malaysia, Nepal (CE: 700-2600m).

Representative collection: *Chitwan*, way to gadhi 1018m, 17 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 113.

7. *Paederia* L.

Shrubs, usually twining with fetid odor. Leaves: opposite, 3-4 in whorls, stipulate. Inflorescence: axillary in main stem or branches. Flower: bisexual. Calyx: 4-5 lobed. Corolla: 4-5 lobed, pink. Stamens: 4-6. Ovary: 2-3 celled. Ovules 1 in each cell. Fruit: globose.

***Paederia foetida* L.;** Mant. Pl. 1: 52 (1767).

Climbing shrub, Ca. 2-3m, Perennial. Stem: Branched, cylindrical, glabrous. Leaves: (0.3- 3.2 × 1.2-7.4) cm, Opposite, linear- lanceolate, cordate, acuminate, entire. Inflorescence: Panicle, Bract present. Sepals: 0.2cm, 5, fused. Petals: 0.4cm, 4, fused, villous, pinkish red, entire. Stamens: 3mm, 5. Carpel: 5mm, stigma hairy, bifurcate.

Fl: Sept-Oct, **Habitat:** In open grassland.

Distribution: Himalaya, C. & E. India, Indo-China, Malaysia, Nepal (CE: 300-1800) m.

Representative collection: *Chitwan* way to gadhi, 1178m, 17 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 215.

ORDER: SOLANALES

34. FAMILY: CONVULVACEAE

Climbing herbaceous or woody plants or sometimes erect or prostrate. Stipules usually absent. Leaves alternate, simple or lobed or pinnate. Flowers axillary or terminal cymes, regular with involucral bracts, bisexual. Calyx: 5- lobed. Stamens: 5, epipetalous. Ovary: superior, 2-celled. Fruit: a capsule or a fleshy berry.

Key to genus

- 1a. Stem pubescent.....**2. Merremis**
1b. Stem glabrous.....**2**
2a. Plant non woody climber, petals red..... **1. Ipomoea**
2b. Plant woody climber, petals white.....**3. Dinetus**

1.Ipomoea Linnaeus, Sp. Pl. 1: 159. 1753.

Herbs or shrubs often twining. Leaves: opposite, petiolate, divided. Inflorescence: axillary, 1- many flowered, bracteate. Sepals: equal- unequal, persistent. Corolla: coloured, rarely yellow, 5- lobed. Stamens: unequal. Ovary: 2-4 loculed. Stigma: capitate. Seed: 4-6.

Ipomoea quamoclit L., ; Sp. Pl. 159 (1753).

Climber, Ca. 3m, Annual. Stem: Branched, Climber, Glabrous. Petiole length: (0.3-2.1) cm. Leaves: Ca. (3.4×1.2) cm, Petiolate, alternate, unipinnate. Inflorescence: Racemose. Sepals: (0.6×0.2) cm, 5, free, lanceolate. Petals: 3.4cm, fused, 5, tubular, upper lobe free, red. Stamens: 5. Carpel: 2.8cm. Fruit: obovoid, 0.9cm. Seeds: black

Fl: Aug- Oct, **Habitat:** On grassland.

Distribution: Believed to be native of the New World tropics; cultivated as an ornamental and now naturalised throughout most of tropical Asia, Nepal (WCE: 4601100) m.

Representative collection: *Chitwan*, Shaktikhor bhagawati mandir, 673m, 18 Oct

2017, B.K.C, S. Lamichhane, S. Simkhada, SW 101.

2. Merremia Dennst.

Herb or shrub, prostrate or twining. Stem: pubescent. Leaves: Peiolate rarely sessile, palmately lobed, entire. Inflorescence: solitary, 1 or many flowered, cymose, bracteate. Sepals: outer 2 small persistent. Corolla: often yellow or white, campanulate, 5 lobed. Stamens: unequal. Capsule: 4 ovuled.

Merremia vitifolia (Burm. f.) Hallier f., ; B. Jahrb. 16: 552 (1893).

Ipomoea vitifolia (Burm. f.) Blume ; Bijdr. 709 (1825).

Creeper, Ca. 2m, Annual. Stem: Branched, cylindrical, pubescent. Petiole length: (0.10.7) cm. Leaves: Ca. (2.4-3.6× 3.1-3.9) cm, palmate, hastate, acute, palmatisect, palmate. Inflorescence: Racemose. Sepals: 1.8cm, fused, 5, pubescent in outer surface. Petals: 4.3 cm, fused, tubular, 5, yellow. Stamens: 1.6cm, 5, yellow. Carpel: 1.1cm.

Fl: Feb-April, **Habitat:** On open slope, associated with *Mikania micrantha*.

Distribution: India, Nepal, Ceylon, Indo-China, Malaysia, Nepal (CE: 270-460) m.

Representative collection: *Chitwan*, Neurani village, 340m, 7 March 2018, B.K.C, Y.N. Paudel, BY 101.

3. **Dinetus** Buch.-Ham. ex Sweet

Large woody herbaceous twiner. Stem: cylindrical, pubescent. Leaves: Petiolate, ovate, palmately nerved, entire. Inflorescence: racemose, rarely solitary. Bract: leaf like, minute. Sepals: 5, falling with fruit. Petals: regular, white, campanulate, 5-lobed. Fruit: subglobose. Seed: usually 1.

Dinetus racemosus Sweet Brit. fl. gard. 2: t. 127. 1825

Porana racemosa Roxb., ; Fl. Ind. 2: 41 (1824); ed. 2, 1: 466 (1832).

Climber, Ca. 4m, Perennial. Stem: Branched, Climber, glabrous. Petiole length: (0.40.9) cm. Leaves: (2.3-6.1 × 0.9-3.8) cm, Alternate, linear, cordate, caudate, entire, palmate. Inflorescence: Racemose.

Fl: Aug-Dec, **Habitat:** climbing on a mango tree.

Distribution: Himalaya, Assam, N. Burma, China, Malaysia, Nepal (WCE: 610-2400) m.

Representative collection: *Chitwan*, Gairibari jharana, 767m, 8 Dec 2017, B.K.C. S. Gyawali, S. Luintel, BS 259.

35. FAMILY: SOLANACEAE

Herbs, Shrubs, climbers. Stipules absent. Leaves opposite or alternate, simple, lobed.

Flower: racemose or cymose, spikes, actinomorphic or zygomorphic. Calyx: tubular, 4-6 lobed, persistent. Corolla: tubular, usually 5 lobed. Stamens: 5, epipetalous. Ovary: superior. Fruit: berry.

Key to genus

- 1a. Calyx toothed, stamens unequal..... **1. Hyoscyamus**
2b. Calyx entire, stamens exerted..... **2. Solanum**

1. *Hyoscyamus* L.

Herbs, annual. Leaves: alternate or clustered at apex. Inflorescence: subsessile. Calyx: tubular, lobe toothed. Corolla: campanulate. Stamens: unequal. Carpel: ovoid.

***Hyoscyamus niger* L.**, ; Sp. Pl. 179 (1753).

Herb, annual, Ca. 20cm. Stem: cylindrical, pubescent. Leaves: Ca. (1.2-3.3 × 0.4- 1.6) cm, alternate, sessile, oblong-lanceolate, acute, pubescent. Inflorescence: subsessile, on pedicel. Calyx: Ca.1.3cm, tubular, lobes triangular. Corolla: Ca.2.5cm, campanulate, yellow with vein. Stamens: unequal. Carpel: ovoid.

Fl: May-august. **Habitat:** In agricultural land.

Distribution: N. America, N. Africa, Europe, Caucasus, Siberia, S.W. & C. Asia, Iraq, Iran, Afghanistan, Himalaya eastward to Japan, Nepal (WCE: 150-1400) m

Representative collection: *Chitwan*, gairibari community forest, 467m, 9 June 2018, B.K.C, Y.N. Paudel, BY 266.

2. *Solanum* L.

Herbs, shrubs or small trees, armed or unarmed with prickles or spines. Leaves: simple or lobed. Inflorescence: cymose or racemose, sometimes axillary or leaf opposed. Calyx: cup-shaped, 5-lobed. Corolla: 5-lobed. Stamens: exerted. Fruit: berry. Seeds: compressed.

Key to species

- 1a. Inflorescence 3-8 flowered..... **S. nigrum**
1b. Inflorescence 2-4 flowered..... **S. torvum**

Solanum nigrum L., ; Sp. Pl. 186 (1753).

Herb, Ca. 40cm, annual. Stem: cylindrical, pubescent. Petiole length: Ca. 0.3-2.4cm. Leaves: Ca. (1.8-6.3×0.6-2.8) cm, alternate, ovate, attenuate, acute, entire, glabrous. Inflorescence: pedunculated, 3-8 flowered. Calyx: Ca. 0.1cm, 5lobed. Corolla: Ca. 0.6cm, 5 lobed. Berry: Globose.

Fl: May- Aug, **Habitat:** Along roadside.

Distribution: Almost cosmopolitan, Nepal (WCE:900-2900) m.

Representative collection: *Chitwan*, way to Shaktikhor bazar, 1036m, B.K.C, Y.N. Paudel, BY 267.

Use value: edible fruit.

Solanum torvum Sw. Prodr. 47. 1788.

Herb, Ca. 85cm, annual. Stem: Prostrate, armed, pubescent, cylindrical. Petiole length: Ca.0.4-3.2 cm. Leaves: Ca. (1.2-6.5×1.4-6.1) cm, alternate, truncate, acute, pubescent. Inflorescence: Racemose pedunculated, 2-4 flowered. Calyx: Ca. 0.4cm. Corolla: Ca. 1.1cm, purple. Stamens; linear. Fruit: yellow, globose, berry.

Fl: Nov-May. **Habitat:** In open grassland.

Distribution: Himalaya, N. India, China, SE Asia, Malaysia, Australia, Polynesia, Nepal (CE: 250-750) m.

Representative collection: *Chitwan*, way to gadhi, 764m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 253.

ORDER: LAMIALES

36. FAMILY: ACANTHACEAE

Herbs or shrubs rarely climbers. Stipules absent. Leaves: opposite, simple. Inflorescence: racemose or spike. Each flower on axil of bracts, bisexual. Bracteoles: 2. Calyx: 4-5 lobed. Corolla: 2-lipped or 5 lobed. Stamens: 2 or 4 inserted in corolla tube. Ovary: superior, 2 celled. Stigma: bifid.

Key to genus

- 1a. Cystoliths present **1. Barleria**
- 1b. Cystoliths absent **2**
- 2a. Inflorescence axillary terminal **3**
- 2b. Inflorescence spike **4**
- 3a. Stamens 4 **8. Strobilanthes**
- 3b. Stamens 2 **5**
- 4a. Bracteoles 2 **6**
- 4b. Bracteoles 4 **2. Hypoestes**
- 5a. Ovules 2 per locule **7. Rungia**
- 5b. Ovules more than 2 per locule **7**
- 6a. Stamens 2 **. Justicia**
- 6b. Stamens 4 **4. Lepidagathis**
- 7a. Bracteoles present **6 Ruellia**
- 7b. Bracteoles absent **5. Nelsonia**

1. Barleria L., Genera Plantarum ed. 5 (1754).

Barleria L., Sp. Pl. 2: 636 (1753).

Under shrubs. Leaves: petiolate, entire, opposite. Inflorescence: axillary cymes. Calyx: deeply 4-lobed, 2 outer lobe larger 2 inner lobe smaller. Corolla: funnel shaped, 5lobed. Fertile stamens: 2. Anther: 2 celled. Capsule: 2-4 seeded.

Key to species

- 1a. Bracteoles 3-7 veined **B. cristata**
- 1b. Bracteoles 1 veined **B. strigosa**

Barleria cristata L., ; Sp. Pl. 1: 636 (1753).

Barleria ciliata Roxb., ; Fl. Ind. ed. 2, 3: 38 (1832).

Barleria cristata Lam., Encycl. [J. Lamarck & al.] 1(2): 380 (1785).

Herb, Ca. 1m, annual. Stem: branched, ascending, angled, pubescent. Petiole length: (0.1-1.2 cm). Leaf: (1.9-5.9 × 0.7-3.8 cm), Linear- oblanceolate attenuate, acuminate, fimbriate, reticulate. Bracts: absent, Bracteoles: 3-7 veined, spiny. Sepals: Outer calyx (1.8-0.9 cm), ovate-oblanceolate, Inner calyx: (3-8mm), linear-lanceolate, 1 veined, scarious. Petals: (3.5-5.1 cm), lobes (1.2cm), purpulish blue, tubular, lobes oblong, linear. Stamens: Ca. 1.9cm, 4. Carpel: Ca.3.1 cm.

Fl: Nov, **Habitat:** Along the side of stream, below the Sal forest.

Distribution: India, Myanmar, Indo-China, S. China, Philippines, Nepal (WCE: 200-2000) m.

Representative collection: *Chitwan*, Chelibeti community forest, 248m, 8, Dec, 2017, B.K.C, S. Gyawali, S. Luintel, BS 235.

Barleria strigosa Willd., ; Sp. Pl. 3: 379 (1800).

Barleria caerulea Roxb., ; Fl. Ind. ed. 2, 3: 39 (1832).

Herb, Ca.50cm, annual. Stem: branched, ascending, cylindrical, pubescent. Petiole length: 0.3-1.4cm. Leaf: (7.2-1.6×0.8-4.5 cm), Lanceolate- elliptic, aequilateral, acuminate, entire, reticulate. Bracts: oblong. Bracteoles: 1 veined, ciliate. Sepals: Outer calyx Ca. (2.9-1.7cm), Ovate, Inner calyx Ca. (1.2-0.2 cm), lanceolate, entire. Petals: Ca. 3.1 cm, tubular, light purple, lobes (1.9×1 cm), obovate, subequal. Stamens: 4.

Fl: Nov, **Habitat:** Along the side of stream, below the Sal forest.

Distribution: E. India, Myanmar, Indo-China, Nepal (WCE: 300-600) m.

Representative collection: *Chitwan*, Chelibeti community forest, 253m, 8, Dec, 2017, B.K.C, S. Gyawali, S. Luintel, BS 173.

2. Hypoestes Solander ex R. Brown, Prodr. 474. 1810.

Herbs or shrubs, annual or perennial. Leaves: opposite, petiolate, entire or dentate. Inflorescence: axillary spike. Bracteoles: 4. Calyx: 5, equal or sub-equal. Corolla: 2-lipped, purplish- pink. Stamens: 2. Anthers: 1- thecous. Ovary: 2 ovary per locule. Stigma: 2-lobed. Capsule: 2-seeded. Seed: smooth.

Hypoestes triflora (Forssk.) Roem. & Schult., ; Syst. Veg. 1: 141 (1817).

Herb, Ca. 80cm, annual. Stem: angled, pubescent. Petiole length: Ca. 0.1-0.4cm. Leaves: Ca. (1.3-2.6×0.2-1.6) cm, opposite, linear, aequilateral, acute, entire, pubescent. Inflorescence: axillary. Bract: Ca. 0.1×0.2 cm. Bracteole: Ca. 0.1×0.3 cm, Sepals: Ca. 0.1×0.35 cm, 5, shiny, caudate. Petals: Ca. (0.4×0.2) cm, Stamens: Ca. 0.2cm, 5. Carpel: Ca. 0.3cm.

Fl: Jul- Sept, **Habitat:** On open grassland.

Distribution: Abyssinia, W. Asia, Himalaya (Nepal to Bhutan), W. China, Nepal (WCE: 1200-2600) m.

Representative collection: *Chitwan*, Gairibari forest, 489m, 7 Dec, 2017, B.K.C, S.

Gyawali, S. Luintel, BS 236.

2. JUSTICIA Linnaeus, Sp. Pl. 1: 15. 1753.

Herbs or shrubs. Leaves: entire. Inflorescence: spikes. Bracteate. Bracteoles: linear or absent. Calyx: subequal, 5-lobed. Corolla: 2 lipped, upper lip: notched, lower lip: 3 lipped. Stamens: 2. ; anther 2-celled. Capsule: 4-seeded.

Key to species

1a. Corolla pinkish white, spotted in lower lip**J. procumbens**

1b. Corolla purplish, spot absent in lower lip**J. simplex**

Justicia procumbens Linnaeus, Sp. Pl. 1: 15. 1753.

Annual, procumbent herb, Ca. 38cm. Stem: 4-angled, pubescent. Petiole: Ca. 5cm. Leaves: Ca. (1.4-3.2×0.6-1.6) cm, opposite, aequilateral, acute, entire,

fimbriate. Inflorescence: axillary. Bract: ovate. Bracteoles: lanceolate, larger than bract. Calyx: Ca. 0.4cm, 4-lobed, 1-veined. Corolla: pinkish, spotted in lower lip, 3-lobed. Stamens: 2, glabrous. Ovary: pubescent. Capsule: 4-seeded.

Fl: All year, **Habitat:** On open grassland.

Distribution: Himalaya, India, Ceylon, Burma, Thailand, Nepal (WE: 1000-2300) m.

Representative collection: *Chitwan*, chelibeti community forest, 479m, 9 Dec, 2017, B.K.C, S. Lamichhane, S. Simkhada, SW140.

Justicia simplex D. Don, ; Prodr. Fl. Nep. 118 (1825).

Justicia simplex Lindau, Nat. Pflanzenfam. [Engler & Prantl] iv. III B. 349. Herb, Ca. 60cm, annual. Stem: branched, ascending, cylindrical, pubescent. Petiole length: (0.1-0.4) cm. Leaf: (0.9-2.1 × 0.4-1.3) cm, Simple, opposite, linear, cunneate, acute, entire, reticulate. Inflorescence: Axillary. Sepals: (0.4-0.3 × 0.3-0.1 cm), 4, lanceolate, acuminate, pubescent. Petals: 0.3cm-0.1cm, 4, purpulish-white, linear, hairy. Stamens: 0.2cm, 2. Carpel: 2.5mm.

Fl: Nov. **Habitat:** Shaddy place under the Sal forest.

Distribution: India, Malaysia, Myanmar, Sri Lanka, Thailand; E. Africa, Nepal (WCE: 700-2500) m.

Representative collection: *Chitwan*, Neurani forest, 856m, Dec 8, 2017, B.K.C, S. Gyawali, S. Luintel, BS 237.

4. Lepidagathis Willd., Sp. Pl., ed. 4 [Wildenow] 3(1):400 (1800).

Herbs or under shrubs. Leaves: entire or toothed. Inflorescence: Spike. Bract and bracteoles present. Calyx: 4-5 lobed. Corolla: 2 lipped. Stamens: 4. Capsule: 2-4 seeded. Seeds: flattened, hairy.

Lepidagathis incurva Buch.-Ham. ex D. Don, ; Prodr. Fl. Nep. 119 (1825).

Herb, Ca. 70cm, perennial. Stem: branched, ascending, cylindrical, glabrous. Leaves: (1.7-5.2 × 1.8-2.3) cm, opposite, sessile, lanceolate, attenuate, acute, entire, reticulate. Inflorescence: spike. Bract: 0.9cm, pubescent. Bracteolate: 0.5cm, lanceolate. Sepals:

Ca.1cm, 5, free, unequal. Petals: 0.8cm, light purple, fused, 2 lipped, lower larger than upper. Stamens: 4, unequal. Carpel: 0.5mm, hairy.

Fl: Oct- March, **Habitat:** Along roadside.

Distribution: Subtropical Himalaya (Punjab to Bhutan), India, east to S. China, Malaysia, Nepal (WCE: 200-1400) m.

Representative collection: *Chitwan*, Neurani forest, 248m, 9 Dec, 2017, B.K.C, S. Gyawali, S. Luintel, BS 264.

5. *Nelsonia* R. Brown, Prodr. 480. 1810.

Herbs, biennial, pubescent. Leaves: opposite, petiolate, pinnately veined, pubescent. Inflorescence: axillary spiklet. Bract: compressed axillary. Bracteoles: absent. Calyx: 4, unequally lobed. Corolla: 5 lobed, upper 2-lipped, lower 3 lipped. Stamens: 2 exerted, pubescent. Ovary: 8-28 ovule in 2-4 rows. Stigma 2 lobed. Seed: small, flat.

Nelsonia canescens (Lam.) Spreng., Syst. Veg. 1;42 (1825)

Herb, Ca. 30cm, biennial. Stem: branched, ascending, cylindrical, pubescent. Petiole length: (0.1-0.4) cm. Leaf: (0.7-3.2× 0.3-1.1) cm, petiolate, opposite, oblong, attenuate, obtuse, entire, pubescent. Inflorescence: axillary. Bracts: compactly arranged. Sepals: 0.3×0.1 cm, 5. Corolla: 0.4cm, 5, lobed, purple, nerved, obovate, entire. Stamens: Ca. 0.2cm, 2. Ovary: 0.2cm, many ovuled, stigma bilobed.

Fl: Oct- March, **Habitat;** Under Sal forest.

Distribution: Himalaya Africa, India, Sri Lanka, Thailand, China, Malaya, Australia, America, Nepal (WCE: 200-600) m.

Representative collection: *Chitwan*, Gairibari community forrest, 234m, March 7, 2018, B.K.C, Y.N. Paudel, BY 124.

6. *Ruellia* L., ; Sp. Pl. 2: 634 (1753).

Ruellia L., *Genera Plantarum* ed. 5 (1754).

Herbs or herbs, perennial. Leaves: sessile or petiolate, entire or dentate. Inflorescence: axillary or panicles. Flower: solitary, pedicellate. Bract: opposite. Bracteoles: 2. Calyx: 5-lobed. Corolla: 5-lobed, tubular. Stamens: 4, didynamous, anther: 2-theous. Carpel: ovules 10 per locule, stigma: 2-lobed. Capsule: many seeded.

***Ruellia beddomei* C. B. Clarke, ; Fl. Br. Ind [J. D. Hooker] 4(11): 413 (1884)**

Herb, Ca. 50 cm, annual, prostrate. Stem: Branched, cylindrical, glabrous. Petiole length: (0.1-0.9) cm. Leaf: (2.3-9.4×0.2-1.4) cm, opposite, attenuate, acuminate, entire. Inflorescence: axillary. Bract: (0.1-0.4) cm, 2, pubescent. Sepals: (0.6×0.2) cm, 5, free, pubescent. Petals: 3.5 cm, fused, tubular, entire. Stamens: 4, ca.2.5cm. Carpel: 2.3cm, pubescent.

Fl: March, **Habitat:** Along roadside.

Distribution: Tropical Himalaya, India, Nepal (WC: 150-1000) m.

Representative collection: *Chitwan*, Neurani forest, 342m, March 6 2017, B.K.C, Y.N. Paudel, BY 15.

7. *Rungia* Nees, ; Pl. Asiat. Rar. 3: 77, 109 (1832).

Herbs or shrubs. Leaves: opposite, petiolate, entire. Inflorescence: axillary or spike. Bracts: small, 2-4 rowed. Corolla: 2-lipped; upper lip acute, Lower lip: 3 lipped. Stamens: 2. Ovary: 2 ovule in each cell. Fruit: ovoid, 4 seeded.

***Rungia pectinata* (L.) Nees, ; in DC., Prodr. 11: 470. Wood, Fl. Bhuta 2(3): 1291 (2001).**

Rungia parviflora (Retz.) Nees, Pl. Asiat. Rar. 3(12):110 (1832)

Herb, Ca.30cm, annual. Stem: Branched, ascending, angled, glabrous. Petiole length; 0.3cm. Leaf: (0.8-4.5×0.7-2.4cm), Opposite, oblong, obovate, cordate, acute, dentate, fimbriate. Sterile bract: (0.8-0.2 cm), fused. Fertile bract: (0.6-0.1cm), elliptic-

obovate, pubescent. Sepals: 5, (2×0.5 cm), lanceolate. Corolla: 0.4 cm, bluish, fused, 5 lobes, pubescent. Stamens: 0.4cm, 5, staminoid, hairy base. Carpel: 5cm

Fl: Nov- Jan, **Habitat:** Along road side.

Distribution: Himalaya, India, Indo-China, China, Malaysia, Nepal (WCE: 300-2000) m.

Representative collection: *Chitwan*, Neurani forest, 442m, Dec 8 2017, B.K.C, S. Simkhada, SW 238.

8. *Strobilanthes* Blume, ; Bijdr. Fl. Ned. Ind. 14: 781, 796 (1826).

Herb or shrubs, annual. Stem: quadrangular. Leaves: opposite, petiolate, oblanceolate, serrate- dentate. Inflorescence: bracteates. Flower: whitish, purpulish-blue, axillary-terminal, heads. Bracts: solitary, persistent-caducous, bracteoles: 2. Calyx: 5 lobed.

Corolla: campanulate, tubular, base curved, 5 lobed. Stamens: 4, free. Ovary: oblong. Capsule: oblong, 4-8 seeded.

Key to species

1a. Stem glabrous, leaf petiolate **S. *extensa***

1b. Stem sub glabrous, leaf sub-sessile **S. *pentstemonoides***

Strobilanthes extensa (Nees) Nees, ; Prodr. [A. P. de Candolle] 11: 195 (1847).

Strobilanthes extensa Bedd., Icon. PL. Ind. Or. [Beddome] 47, t. 202.

Herb, Ca.1m, annual. Stem: Branched, ascending, angled, pubescent. Petiole length: (0.7-2.4) cm, hairy. Leaf: (2.9-8.2× 0.7-4.1) cm, Simple, opposite, oblanceolate, cuneate, acute, dentate, reticulate. Inflorescence: bracteates heads. Bract: 3, outer 2 (1.4×0.7) cm, 1small (0.6× 0.2) cm. Sepals: (1.4×0.2) cm, 5, oblanceolate, fimbriate. Petals: 2.4cm, Fused, 5-lobed at apex, tubular, veined. Stamens: 4, 2 long (1.7cm), 2 short (1.3 cm). Anther: 4 lobed. Carpel: 2.9 cm, ovary superior,

Fl: Nov, **Habitat:** Shaddy place under the Sal forest.

Distribution: Himalaya, North India, Nepal (WC: 1500-2100) m.

Representative collection: *Chitwan*, Chelibeti community forest, 324m, 9 Dec 2017, B.K.C, S. Gyawali, S. Luintel, BS 146.

Strobilanthes pentstemonoides Nees.

Herb, Ca. 30 cm, annual. Stem: branched, ascending, cylindrical. Petiole length: (0.23.1) cm. Leaves: (9.9-1.6× 4.1-0.3 cm), oblanceolate, attenuate, acuminate, serrate, fimbriate, reticulate. Bract present, Sepals: 0.9 cm, 5, tubular, fimbriate. Petals: 3.9× 0.9 cm, purple, tubular, fused, nerved, entire. Stamens: 3.2 cm, 4. Carpel: 0.1 cm, ovary superior.

Fl: Aug- Nov, **Habitat:** Shaddy slope

Representative collection: *Chitwan*, Chelibeti community forest, 354m, 9 Dec 2017, B.K.C, S. Gyawali, S. Luintel, BS 178.

37. FAMILY: GESNERIACEAE

Herb, shrubs or rarely trees, annual, biennial or perennial. Leaves: opposite or alternate, exstipulate, simple, oblanceolate. Inflorescence: racemose-cymose. Calyx: 4or 5. Corolla: 2 lipped with distinct tube. Stamens: 2-4, rarely 5, epipetalous. Staminodes: 1-3. Ovary: superior. Seeds: numerous.

Rhynchoglossum Blume

Terrestrial herb, annual or perennial. Stem: branched. Leaves: alternate, base oblique, cuneate. Inflorescence: racemose. Bracteate. Calyx: 5- lobed, sometimes winged. Corolla violet blue, 2- lipped, lobes unequal. Stamens:2-4. Ovary: ovoid, 1-loculed. Seeds: unappendaged.

Rhynchoglossum obliquum Bijdr. 741. 1826

Herb, Ca. 40cm, annual. Stem: cylindrical, glabrous, ascending. Petiole length: Ca.2.4 cm. Leaf: Ca. (6.2-8.6×2.3-4.5) cm, alternate, oblanceolate, oblique, acute, entire. Inflorescence: racemose. Sepals: Ca. 0.6cm, 5, fused, lobe free, lanceolate. Petals: Ca.

1.2cm, tubular, purple, sub-equal. Stamens: Ca. 0.3cm, 2, free. Carpel: Ca. 1.2cm, ovoid, 1 loculed. Stigma: hairy.

Fl: Jul- Nov, **Habitat:** On moist slope.

Distribution: Himalaya (Garhwal to NEFA), India, Ceylon, Burma, W. & S. China, Malaysia, Nepal (WCE: 800-2100) m.

Representative collection: *Chitwan*, way to shaktikhor jharana, 974m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 133.

38. FAMILY: LAMIACEAE

Herbs, shrubs, rarely climber or trees, usually aromatic. Stems: quadrangular. Leaves; opposite or whorled, simple, exstipulate. Flowers: verticillasters of various arrangement, bracteates, usually bisexual. Calyx: tubular, 4-5 lobed or 2-lipped. Stamens: 2 or 4, epipetalous. Ovary: superior, 2 celled, style: gynobasic. Fruit: 4 nutlets enclosed in persistent calyx.

Key to genus

- 1a. Bract present..... 2
- 1b. Bract absent..... 3
- 2a. Plant aromatic..... **5. Pogostemon**
- 2b. Plant not aromatic **6. Leucas**
- 3a. Stamens four..... **4**
- 3b. Stamens five..... **5**
- 4a. Ovary 2 celled **1. Callicarpa**
- 4b. Ovary 4 celled **4. Holmskioldia**
- 5a. Stamens curved **2. Clerodendrum**
- 5b. Stamens exerted **3. Colebrookea**

1. *Callicarpa* L.

Tree, Ca.5m. Leaves opposite, rarely whorled. Inflorescence: axillary cymose. Calyx: small, campanulate, 4-lobed. Corolla: small, tubular, 4 lobed. Stames: 4, equal. Ovary:

2 celled. Fruit: globose drupe.

Callicarpa macrophylla Vahl, ; Symb. B. 3: 13, t. 53 (1794).

Callicarpa incana Roxb , ; Fl. Ind. ed. 2, 1: 393 (1832).

Trees or shrubs, Ca. 4m. Stem: pubescent, angular. Leaves: opposite, dentate, rarely entire. Inflorescence: axillary, many-flowered. Flowers usually small, red or purple. Calyx: campanulate, 4-lobed apex. Corolla small, tubular with 4. Stamens: 4. Carpel: 2celled. Fruit small drupe.

Fl: April- Dec **Habitat:** In open grassland.

Distribution: Himalaya (Kashmir to Bhutan), India, Burma, S. China, Indo-China, Nepal (WCE: 300-1500) m.

Representative collection: *Chitwan*, Gairibari forest, 434m, 8 Dec, 2017, B.K.C, S. Simkhada, 153.

2. *Clerodendrum* L.

Shrubs or small trees. Leaves: opposite or whorled. Flower: terminal axillary, corymbose. Calyx: 5 teethed, tubular, 5- toothed. Corolla: slender tube, 5 subequal lobes. Stamens: 5, filaments curved, longer than corolla tube. Ovary: 4-celled. Fruit: fleshy, globose.

Key to species

- 1a. Stem pubescent4. **C. viscosum**
- 1b. Stem glabrous..... 2
- 2a. Leaves sessile 1. **C. indicum**
- 2b. Leaves petiolate..... 3
- 3a. Sepals glabrous..... 3. **C. serratum**
- 3b. Sepals villous2. **C. japonicum**

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

Clerodendrum siphonanthus R. Br. , ; in Aiton, H. Kew 4: 65 (1812).

Clerodendrum verticillatum Roxb. ex D. Don ; Prodr. Fl. Nep. 102 (1825).

Shrub, Ca. 40cm, Annual. Stem: Branched, ascending, angled, glabrous. Leaf: (10.3-23.7× 0.1-1.3) cm, sessile, opposite, linear, attenuate, acute, entire. Inflorescence: Racemose. Sepals: 1.3cm, 5-dentate, fused, caudate, entire. Petals: 4.9cm, creamy white, fused. Stamens: 4, 0.6cm. Carpel: 0.9cm, stigma bifurcate.

Fl: Aug-Oct. **Habitat:** On open grassland.

Distribution: Himalaya, India, Sri Lanka, Myanmar, S. China, Indo- China, Malaya, Nepal (WCE: 200-1400) m.

Representative collection: *Chitwan*, gairibari forest, 450m, 16 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, 159.

Clerodendrum japonicum (Thunb.) Sweet, ; H. Br. 322 (1827).

Clerodendrum squamatum Vahl ; Symb. B. 2: 74 (1791).

Volkameria dentate Roxb.; Fl. Ind. ed. 2, 3: 61 (1832).

Volkameria kaempferi Jacq., ; Collect. B. 3: 207 (1789); Ic. Pl. Rar. 3: t. 500 (1793).

Shrub, Ca.1m, annual. Stem: branched, ascending, angled, glabrous. Leaf: (2.216.7×1.3-15.9) cm, opposite, cordate, sagittate, acuminate, dentate. Inflorescence: racemose. Sepals: 1.9cm, 5, villous, fused, nerved. Petalss: tubular, 0.9cm. Lobes: 0.8cm, 5, red, hairy. Stamens: 2.5cm, 4, unequal. Carpel: 5.3cm.

Fl: Aug-sept. **Habitat:** Along roadside.

Distribution: Himalaya (Nepal, Sikkim), India, tropical Asia, Nepal (CE: 300-1600) m.

Representative collection: *Chitwan*, Shaktikhor mandir, 456m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, 113.

Clerodendrum serratum (L.) Moon, ; Cat. Ceylon Pl. 46 (1824).

Shrub, Ca. 2m, Annual. Stem: Branched, ascending, angled, glabrous. Leaf: (2.8-10.6 × 2.3-6.2) cm, opposite, oblong, cunate, acute, entire. Inflorescence: Sepals: 0.4cm, fused, acute, cup-shaped. Petals: Ca. 1cm, 5, obtuse, entire. Stamens: 0.2cm, 4. Carpel: 0.4cm.

Fl: Jul- Nov, **Habitat:** on open grassland.

Distribution: Himalaya (Nepal, Sikkim), India, tropical Asia, Nepal (WCE: 200-1400) m.

Representative collection: *Chitwan*, Way to gadhi, 1078m, 18 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, 119.

Clerodendrum viscosum Vent., ; Gard. Malm. t. 25 (1803); in B. Mag. 43, t. 1805 (1816).

Shrub, Ca.2m. Stem: Branched, ascending, angled, pubescent. Petiole length: (1.2-4.1) cm. Leaf: (4.3-13.1 × 2.8-9.7) cm, opposite, cordate, acute, dentate, pubescent. Inflorescence: , Sepals: 0.9×0.4 cm, 5, free, oblanceolate. Petals: tube: 1.1 cm. lobe: 0.9cm. 5, hairy. Stamens: Ca. 4.2cm, 4. Carpel: 1.8cm.

Fl: Aug- Oct, **Habitat:** On open grassland.

Representative collection: *Chitwan*, way to Neurani village, 478 m, 17 Oct 2017 B, K.C, S. Lamichhane, S. Simkhada, SW245.

3. **Coelbrookea** Sm.

Shrubs, perennial. Leaves: petiolate, opposite, serrulate. Inflorescence: numerous spikes, many flowered. Calyx: deeply divided, 5 toothed. Corolla: 5 lobed. Stamens: 5, exerted. Anther: 1- celled.

Colebrookea oppositifolia Sm., ; Exot. B. 2: 111, t. 115 (1805).

Colebrookea ternifolia Roxb. ; Pl. Corom. 3: 40, t. 245 (1819); Fl. Ind. ed. 2, 3: 25 (1832),

Shrub, Ca. 2m, perennial. Stem: pubescent, yellowish-brown bark. Petiole length: Ca. 0.8cm. Leaves: Ca. (3.2-11.8×0.8-4.9) cm, opposite, elliptic, lanceolate, cuneate, acuminate, lower surface whitish pubescent. Inflorescence: dense spike, axillary. Calyx: Ca. 0.4cm, 5, hairy. Corolla: Ca. 0.2mm, whitish. Stamens: 4. Anthers: 1 celled. Carpel: Ca.0.5cm, bifid.

Fl: April-June. **Habitat:** On trail.

Distribution: Punjab, Himalaya (Kashmir to Bhutan), India, Burma, S. W. China (Yunnan), Indo-China, Nepal (WCE: 250-1700) m.

Representative collection: *Chitwan*, neurani village, 378m, 17 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, 269.

4. Holmskioldia Retz.

Shrubs. Leaves: opposite. Flower: axillary pedicillate, racemose. Calyx: cup-shaped, showy. Corolla: funnel shaped, 5-lobed limb. Stamens: 4, 2 paired. Ovary: 4-celled. Fruit: drupe.

Holmskioldia sanguinea Retz., ; Obs. B. 6: 31 (1791).

Hastingia coccinea Sm., ; Exot. B. 2: 41, t. 80 (1806).

Hastingia scandens Roxb. ; Fl. Ind. ed. 2, 3: 65 (1832).

Evergreen, shrub, Ca.3m, perennial. Stem: Quadrangular, pubescent. Petiole length: Ca. 1.7-3.4 cm. Leaves: Ca. (8.1-12.2×4.4-5.9) cm, deltoid, cordate, acuminate, entire. Inflorescence: axillary, pedunculated. Flower: orange. Calyx: Ca. 1.7 cm, petaloid. Corolla: Ca. 1.2 cm, tubular, 5 lobed.

Fl: Oct-Feb. **Habitat:** On moist slope along river bank.

Distribution: Himalaya (Kumaun to Bhutan), India, Nepal (WCE: 300-1500) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 289m, 9 june 2017, B.K.C, S. Gyawali, S. Luintel, 195.

5. *Leucas* R. Br.

Herbs or sub-shrubs, annual or perennial. Stem: angular, pubescent. Leaves: simple or dentate. Inflorescence: many flowered in axil of leaves. Calyx: tubular, toothed apex. Corolla: tubular, 2 lipped. Stamens: 4. Nutlet: ovoid.

Leucas cephalotes (Roth) Spreng.

Leucas capitata Desf., ; Mem. Mus. Paris 11: 8, t. 4 (1824).

Prostrate herb, Ca.70cm, annual. Stem: angular, pubescent. Petiole length: Ca. 0.2-0.7 cm, pubescent. Leaves: Ca. (0.6-1.2×1.8-5.9) cm, opposite, oblanceolate, aequilateral, acute, serrate, pubescent. Inflorescence: axillary. Bracteate. Calyx: Ca. 0.7 cm, tubular, 10-toothed. Corolla: Ca.1.6cm, upper lip curved downward, white. Stamens: 4. Fruit: trigonous.

Fl: August-Nov **Habitat:** Along trail.

Distribution: Afghanistan, Punjab, Himalaya (Simla to Bhutan), India, Nepal (WCE: 150-2400) m.

Representative collection: *Chitwan*, way to Shaktikhor mandir, 347m, 17 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, 246.

6. *Pogostemon* Desf.

Herb or shrub, aromatic. Stem: angular, pubescent. Leaves: opposite. Inflorescence: axillary. Bract and bracteole present. Calyx: tubular. Corolla: tubular. Stamens: 4, base with long hairs.

Pogostemon benghalensis (Burm. f.) Kuntze, ; Rev. Gen. Pl. 529 (1891).

Pogostemon plectranthoides Desf. ; Ann. Mus. Paris 2: 155 (1815).

Shrub, Ca. 2m, perennial, aromatic. Stem: angular, pubescent. Petiole length: Ca.3.9 cm. Leaves: (Ca.2.6- 15.3× 1.1-8.9) cm, opposite, ovate- oblanceolate, cuneate, acuminate, serrate, pubescent. Inflorescence: axillary. Bracts: Ca. 1.3 cm. Bracteoles present. Calyx: Ca 0.4cm, tubular, pubescent. Corolla: Ca. 0.7cm, pinkish light

purple, tubular, lobes folded outwards. Stamens: 1.3cm, free, with long purple hairs. Carpel: 1.5cm, bifurcate.

Fl: March- May. **Habitat:** Open grassland.

Distribution: Himalaya (Kumaun to Nepal), India, Neapl (WCE: 150-1300) m.

Representative collection: *Chitwan*, Neurani village, 340m, 17 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, 265.

39. FAMILY: LINDERNIACEAE

Herbs, shrubs and rarely trees. Stipules absent. Leaves alternate, opposite. Inflorescences racemes, flowers solitary. Calyx: persistent, 5-lobed, connate. Corolla: 5-lobed, 2-lipped. Stamens mostly 4, staminod. Ovary superior. Fruit: capsule. Seeds: minute.

Torenia L.

Annual herb. Stem branched from base-middle. Inflorescence: Solitar-terminal. Calyx: winged, persistent. Corolla: 2 lipped. Stamens: 4. Capsule: ellipsoid.

Key to species

- 1a. Stem quadrangular, corolla purplish blue **1. Torenia fournieri**
1b. Stem cylindrical, corolla yellow **2. Torenia violacea**

1. Torenia fournieri Linden ex Fourn., ; Ill. H. 23: 129, t. 249 (1876).

Herb, Ca. 30cm, annual. Stem: quadrangular, pubescent, branched from middle. Petiole length: Ca. 1.4cm. Leaves: Ca. (1.2-2.9×0.4-1.5) cm, opposite, ovate, acute-rounded, acute, coarsely serrate. Inflorescence: racemose terminal. Pedicel: Ca.1.4cm. Sepals: Ca. 1.3cm, 5 winged, tubular. Petals: Ca. 2.3 cm, purplish blue. Stamens: unappended, 4. Fruit: Ca. 0.9cm, ellipsoid. Seed: yellow.

Fl: Jun-Dec. **Habitat:** In agricultural land.

Distribution: Indo-China, cultivated in India and Malaysia, Nepal (C: 1200) m.

Representative collection: *Chitwan*, Neurani village, 589m, 9 June, 2018, B.K.C, S. Gyawali, S. Luintel, BS 190.

2. *Torenia violacea* (Azaola ex Blanco) Pennell, ; J. Arn. Arb. 24: 255 (1943).

Torenia peduncularis Benth. ex Hook. f. , ; Fl. Br. Ind. 4: 276 (1884).

Herb, Ca. 20cm, annual. Stem: glabrous, branched from base. Petiole length: 0.3cm. Leaves: Ca. (0.4-1.7×0.3-0.9) cm, opposite, oblong-ovate, cuneate, acuminate, serrate. Inflorescence: solitary on leaf axils, racemose. Pedicel: Ca. 1.8cm. Calyx: Ca. 0.4×0.1 cm, lanceolate. Corolla: Ca. 0.8 cm, yellow, tubular, 5 lobed. Stamens: Ca.0.8 cm, staminoid, 4. Carpel: Ca. 0.7cm. Capsule: Ca. 1.5cm.

Fl: Aug-Nov. **Habitat:** In agricultural land.

Distribution: Himalaya (Kumaun to Bhutan), Tibet, Assam, N. Burma, Malaysia, Nepal (WCE: 400-1800) m.

Representative collection: *Chitwan*, Gairibari community fores, 765m, 18 Oct 2017, B.K.C, S. Lamichhae, S. Simkhada, SW 233.

40. FAMILY: VERBENACEAE

Perennial shrub. Stem: spiny, cylindrical. Leaves: linear- oblanceolate. Inflorescence: racemose. Sepals: fused. Petals: Tubular, purple. Stamen: 4, staminoid.

Key to genus

- 1a. Stem armed.....**1. *Duranta***
1b. Stem unarmed**2. *Vitex***

***Duranta* L.**

Shrub. Stem: spiny, angular. Leaves: opposite, oblanceolate. Inflorescence: axillary.

Sepals: dentate. Petals: purple.

***Duranta repens* L., ; Sp. Pl. 637 (1753).**

Duranta plumieri Jacq., ; Select. Stirp. Amer. 186 (1763).

Shrub, Ca. 3-4m, Perennial. Stem: branched, spiny, ascending, glabrous. Petiole length: 0.1-0.4cm, hairy. Leaf: (0.8-3.4× 0.4-1.5) cm, opposite, Linear- oblanceolate, attenuate, cute, entire, reticulate. Inflorescence: Racemose. Sepals: 0.6 cm, fused, 5-dentate. Petals: 1.3cm, 5, tubular, purple. Stamens: 0.5cm, 4. Carpel: 0.2mm, glabrous.

Fl: Aug-Sep. **Habitat:** Along road side.

Distribution: Native to C. America, India, China, Nepal (WCE: 200-1100) m.

Representative collection: *Chitwan*, way to shaktikhor jharana, 439M, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 167.

3. *Vitex L.*

Shrub. Stem: cylindrical, glabrous. Leaves: opposite, oblanceolate, aromatic. Sepals: fused, tomentose. Corolla: 5, one lobe large other equal.

Vitex negunda L., ; Sp. Pl. 638 (1753).

Shrub, Ca. 6m, Perennial. Stem: branched, cylindrical, glabrous. Petiole length: (1.4-3.2) cm. Leaf: (4.1- 8.3× 3.4-5.6) cm. Leaflet: (1.4-6.6× 0.5-2.4) cm, opposite, oblanceolate, attenuate, acuminate, serrate. Inflorescence: racemose. Sepals: 0.4cm, 5, fused, tomentose, acute. Petals: 0.5cm, 5, light purple, fused, one large and 4 equal, base hairy. Stamens: 0.5-0.7cm, 4, staminoid. Carpel: 0.8cm, stigma bifurcate.

Fl: Sept- Oct. **Habitat:** Along roadside.

Distribution: Himalaya, Afghanistan, India, Sri Lanka, China, Myanmar, Indo-China, Malaysia, Nepal (WCE: 100-1200) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 367m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 16.

ORDER: ASTERALES

41. FAMILY: ASTERACEAE

Herbs, shrubs rarely trees. Stipules absent. Leaves: alternate, opposite, simple or compound. Inflorescence: capitulum subtended by involucre. Bracts: whorled. Flowers: unisexual or bisexual. Calyx: absent or scales. Corolla: tubular, ray and bilabiate. Heads: tubular, radiate or ligulate. Stamens: 4-5, connate. Ovary: 1-celled. Fruit: achene, surrounded by pappus.

Key to genus

1a. Leaves opposite	2
1b. Leaves alternate.....	3
2a. Leaves sessile	5. Eclipta
2b. Leaves petiolate.....	4
3a. Plant aromatic.....	5
3b. Plant not aromatic	6
4a. Leaves simple, capitula clustered around branch.....	1. Ageratum
4b. Leaves 3-lobed, capitula with long peduncle.....	9. Tridax
5a. Leaves pinnate.....	2. Artemisia
5b. Leaves simple.....	7
6a. Leaves lobed, phyllaries hooked	10. Xanthium
6b. Leaves unlobed, phyllaries not hooked.....	8
7a. Capitula clustered	3. Blumea
7b. Capitula not clustered.....	6. Elephantopus
8a. Stem sticky	4. Crassocephalum
8b. Stem not sticky.....	9
9a. Involucre campanulate	8. Sonchus
9b. Involucre cylindric	7. Emilia

1. **Ageratum L**

Herb, annual. Leaves: opposite, simple, toothed, petiolate. Cpitula: clustered around branch end, phyllaries: 2-3 seriate. Corolla: tubular, 5-toothed. Achenes: linear-oblong. Pappus 5-6 scales, bristled.

Ageratum conyzoides :L. Sp. Pl.; 839 (1753).

Herb, Ca. 1m. Petiole: 0.2-1.3cm. Stem: cylindrical. Leaves: Ca. (1.3-3×1-1.5) cm, ovate, cuneate, acute, serrate, pubescent. Involucre: Ca.2-6mm. Phyllaries: oblong. Corolla: Ca. 1.3-2.4mm, blue or white. Style: Ca.1mm. Achenes: 5 bristled at tip.

Fl: all around year, **Habitat:** On open grassland.

Distribution: Pantropical, widespread weed, Nepal (WCE: 200-2000) m.

Representative collection: *Chitwan*, shaktikhor bazar, 267m, 17 oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 171.

2. Artemisia Linnaeus, Sp. Pl. 2: 845. 1753.

Herbs, annual or perennial, subshrubs with strong pleasantly aromatic. Leaves: alternate, pinnate. Synflorescence: racemose, usually grouped into panicles; capitula usually many. Involucres: globose. Phyllaries: 3 or 4 rows. Receptacle: convex or flat, glabrous or pubescent. Marginal florets: 1(or 2) series, 3-10 or more, female; corolla tubular, cup-shaped, or conical. Disk florets: 2 or more series, male or bisexual; corolla tubular, apex 5-toothed. Anthers with 2 obtuse basal appendages. Achenes: obovoid, ovoid, or oblong, faintly striate.

Artemisia dubia Wall. ex Besser, ; Nouv. Mem. S. Imp. Nat. Mosc. 3: 39 (1834).

Artemisia vulgaris Linnaeus, Sp. Pl. 2: 848. 1753.

Perennial herb, Ca. 1m. Stem: cylindrical, pubescent. Leaves: Ca. (2-13.5×1.2-9) cm, lower leaves shortly petiolate, upper leaves: sessile, ovate- elliptic, 2 pinnatisect. Involucre: oblong. Phyllaries: pubescent. Achenes: ovoid.

Fl: Aug-Oct. **Habitat:** along river bank.

Distribution: Himalaya, China, Korea, Japan, Nepal (WCE: 1200-3400) m.

Representative collection: *Chitwan*, Bhuteha river bank, 249m, 8 Dec, B.K.C, S. Gyawali, S. Luintel, BS 185.

3. *Blumea* DC.

Herbs, shrubs or small trees. Annual, biennial or perennial, mostly strongly aromatic. Leaves: alternate, simple. Inflorescence: axillary. Flower: numerous, bisexual, 3-5 merous. Phyllaries: ovate. Anthers: tailed. Achenes: pubescent.

Blumea fistulosa (Roxb.) Kurz, ; J. As. S. Beng. 46(2): 187 (1877).

Blumea glomerata DC., ; in Wight, Contr. B. Ind. 15 (1834); Prodr. 5:443 (1836)

Blumea leptoclada DC.; Prodr. 5: 443 (1836).

Blumea racemose DC., ; Prodr. 5: 442 (1836).

Herb, Ca.37cm, annual. Stem: cylindrical, pubescent. Leaves: (1.3-4.6×0.6-1.8) cm, alternate, oblanceolate, attenuate, bidentate, pubescent. Capitula: clustered, spike racemose. Involucres: 4-5 seriate. Phyllaries: Ca. 0.4cm, purplish-brown. Corolla: Ca. 0.4cm, glandular. Pappus: white.

Fl: Oct-April. **Habitat:** Along riverside.

Distribution: Himalaya (Nepal to Bhutan), India, Burma, China, Thailand, Indo-China, Nepal (WCE:100-1200) m.

Representative collection: *Chitwan*, Shaktikhor bazar, 243m, 7 March 2018, B.K.C, Y.N. Paudel, BY 231.

4. *Crassocephalum* Moench.

Herbs, annual or perennial. Leaves: alternate. Capitula: pendulous. Florets: numerous, bisexual. Phyllaries: linear, subequal. Corolla: tubular, 5-lobed. Anthers: obtuse. Style: slender. Achenes: cylindric, ribbed, grey-white. Pappus: numerous, white.

Crassocephalum crepidioides (Benth.) S. Moore, ; J. B. 50: 211 (1912).

Herb, Ca.65cm, erect, annual. Stem: cylindrical, glabrous. Petiole length: Ca.1.3cm. Leaves: (Ca. 7.6-13.3×2.1-5.2) cm, alternate, membranous, elliptic, cuneate, acuminate, double serrate, glabrous. Capitula: numerous, pedunculated, cymes.

Phyllaries: Ca. 0.2cm, uniserrate. Floret: tubular. Corolla: reddish, Achenes: brownish, hairy. Pappus: Ca0.8cm, deciduous.

Fl: Jul-Dec. **Habitat:** Along roadside.

Distribution: A pantropic weed of American origin, Nepal (CE: 400-1900) m.

Representative collection: *Chitwan*, Way to shaltikhor jharana, 341m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 240.

5. *Eclipta* L.

Prostrate herb. Leaves: opposite, sessile. Capitula: small, in upper axil of leaves. Involucres: campanulate. Phyllaries: 2- seriate. Ray florets: many. Disc: bisexual. Corolla: campanulate. Achenes: oblong. Pappus: black.

Eclipta alba (L.) Hassk ; Pl. Jav. Rar. 528 (1848).

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

Eclipta erecta L., ; Mant. Pl. 2: 286 (1771).

Verbesina alba L.; Sp. Pl. 902 (1753).

Prostrate herb, Ca. 30cm, annual. Stem: cylindrical, pubescent. Leaves: Ca. (1.22.6×0.2-0.6) cm, opposite, sub-sessile, elliptic-lanceolate, attenuate, acute, serrate. Peduncles: Ca.1.1cm. Involucres: Ca. 1.1cm. Phyllaries: Ca. 0.4cm. Achenes: Ca.0.2cm. Pappus: black.

Fl: June- Sept. **Habitat:** On river bank, moist place.

Distribution: A pantropical weed, Nepal (WCE:200-1200) m.

Representative collection: *Chitwan*, Neurani village, 432m, 9 June 2018, B.K.C, S. Gyawali, S. Luintel, BS 132.

6. *Elephantopus* L.

Perennial herb. Leaves: alternate, sessile or petiolate, entire or serrate, pinnately veined. Synflorescence: terminal, dense clusters of capitula, head surrounded by leafy

bracts. Involucre: cylindric. Phyllaries: 8, outer 4 shorter than inner 4. Florets:4. Corolla: purplish white, 5 lobed. Anthers: acute. Achene: 10-ribbed, oblong-obovoid. Pappus: sparse, bristle many.

Elephantopus scaber Linnaeus, Sp. Pl. 2: 814. 1753.

Herb, Ca. 45 cm, perennial. Stem: erect, pubescent. Petiole length: Ca. 0.3cm. Leaves: Ca. (0.8-2.7×0.3-1.5) cm, oblanceolate, serrate, shortly acute. Synflorescence: aggregated in compound heads, surrounded by leaflike bracts. Capitula: many. Involucre: narrow. Phyllaries: purple red, 1-3 veined, oblong. Achenes: Ca. 0.3cm, oblong-linear. Pappus: white with bristles.

Fl: Jun- Nov **Habitat:** Along river bank .

Distribution: India, Himalaya, Nepal (WCE: 200-1500) m.

Representative collection: *Chitwan*, neurani khol, 249m, 9 June 2018, B.K.C, Y.N. Paudel, BY 257.

7. **Emlia** Cass.

Herbs, annual or perennial. Stem: cylindrical, glabrous, branched Leaves: radical. alternate, petiolate. Capitula: radiate or corymbs. Phyllaries: free or connate. Ray floret: bisexual, pink, purple. Corolla: tubular. Achene: 5 ribbed. Pappus: white.

Emlia sonchifolia (L.) DC., ; in Wight, Contr. B. Ind. 24 (1834); Prodr. 6: 302 (1838).

Herb, Ca. 35cm. Stem: cylindrical, glabrous. Petiole length: Ca. 1.3-6.8 cm. Leaves: Ca. (4.1-7.3×1.9-3.4) cm, crowded at base, lower leaves large and more, upper leaves less, ovate, obtuse, more or less dentate. Capitula: Ca.3.6cm, pendulous. Phyllaries: 0.2cm, 8-9. Florets: purplish, Corolla: Ca. 0.8cm. Achenes: cylindric. Pappus: bristled, white.

Fl: Jul- Oct. **Habitat:** In open grassland along Sal forest.

Distribution: Tropical and sub-tropical regions of Asia and Africa, Nepal (WCE: 500-1500) m.

Representative collection: *Chitwan*, Gairibari community forest, 287m, 9 June 2018, B.K.C, S. Gyawali, S. Luintel, BS 107.

8. *Sonchus* L.

Annual or perennial herbs. Leaves: alternate, rounded around base, petiolate or sessile. Inflorescence: terminal, 1-several heads of capitula. Capitula: ligulate. Phyllaries: linear-lanceolate. Flower: numerous. Achenes: obovoid, distinctly winged. Pappus: white.

Sonchus asper (L.) Hill, ; Herb. Br. 1: 47 (1769).

Sonchus oleraceus var. *asper* L., ; Sp. Pl. 794 (1753).

Herb, Ca. 35cm, annual. Stem: cylindrical, glabrous, branched, milky latex present. Leaves; basal leaves: Ca. (6.2-11.8×1.7-5.3) cm, ovate-elliptic, acute. Upper leaves: Ca. (5.3-9.8×0.4-1.4) cm, Capitula: many flowered. Peduncle: Ca.1.5cm. Phyllaries: hairy, lanceolate. Corolla: Ca. 0.8cm. Achenes: Ca. 3cm. Pappus: white.

Fl: May-Oct. **Habitat:** Along roadside.

Distribution: A cosmopolitan weed.

Representative collection: *Chitwan*, shaktikhor bazar, 340m, 9 june 2018, B.K.C, S. Gyawali, S. Luintel, BS 258.

9. *Tridax* L.

Perennial herb, runner. Leaves: simple, opposite, weakly 3 lobed. Capitula: long peduncule. Involucres: campanulate. Ray flowers: female. Disc flower: bisexual. Achenes: narrow oblong, unequal bristles.

Tridax procumbens L., ; Sp. Pl. 900 (1753).

Prostrate herb, Ca. 29 cm. Stem: branched, cylindrical, pubescent. Petiole length: Ca. 0.3-1 cm. Leaves: Ca. (0.5-1.3×1.4-2.8) cm, opposite, lanceolate, more or less 3 lobed, attenuate, narrowly acute, dentate, scabrous to touch. Peduncles: Ca. 8.3cm. Involucres: Ca. 0.4cm. Achenes: Ca. 0.2cm. Pappus: shiny.

Fl: June- Sept. **Habitat:** Along roadside.

Distribution: A pantropic weed of S. American origin, Nepal (WCE: 100-1500) m.

Representative collection: *Chitwan*, Bhuteha khola, 450m, 16 OCT 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 109.

10. *Xanthium* L.

Monoecious herb, annual. Leaves: alternate, petiolate, lobed and unlobed, toothed. Inflorescence: terminal. Male capitula: many flowered, branched inflorescence; Phyllaries: numerous. Female capitula: 2- flowered, borne in base of inflorescence branches; Phyllaries: outer free, inner connate with hooked spines. 1 pair conic spine at apex. Achene: 2. Pappus: absent.

Xanthium strumarium Lour. L., ; Sp. Pl. 987 (1753)

Herb, Ca. 1m, annual. Stem: rough, cylindrical, erect. Petiole length: Ca. 8.2cm. Leaves: broadly ovate, 3-lobed, cordate, acute, dentate. Male capitula: 1-7. Female capitula: ellipsoid, greenish. Phyllaries: few, spiny, hooked at apex.

Fl: July- Aug. **Habitat:** In open grassland, along river side.

Distribution: Eurasia, Nepal (WCE: 100-2500) m.

Representative collection: *Chitwan*, way to gadhi, 784m, 17 Oct 2017, B.K.C, S. Lamichhane, S. Simkhada, SW 138.

CHAPTER V. DISCUSSION

The floristic study of any area serves as the fundamental source of biodiversity conservation, monitoring and its sustainability. The floristic study documents all the plant species in a given geographical boundary. The main aim of present study is to contribute to the Flora of Shaktikhor which will contribute to flora of Nepal. Shaktikhor is a critical linkage between the low land of Terai and hence the flora is a typical representation of mid hills of Nepal. This present study will provide the link between the eastern and western flora and know the status of flora of terai region.

The present finding is compared here with in Nepal and related areas, which shows more or less similar results. In the world, Asteraceae (24000 spp.) is the largest family followed by Orchidaceae (20,000 spp.) and Fabaceae (18,000 spp.) (Shrestha 2001), but in case of Shaktikhor this trend is quite different as the area is dominated by Fabaceae (16 spp), Poaceae (14 spp.) followed by and Asteraceae (10 spp. each), Acanthaceae (10 spp.)

Vista, S (1997) reported Leguminosae to be the largest family (35) sps followed by Asteraceae (34) species from Royal Bardiya National Park, this study is similar to Shaktikhor which may be due to the similar climatic condition.

Mishra (1999) recorded 172 species belonging to 138 genera under 62 different families of dicot plants from South-west Darchula district of West Nepal. In the study, the largest families were Asteraceae with 21 species, Fabaceae with 17 sps, Rosaceae (10 sps), Lamiaceae (10 sps), Moraceae (9sps), Euphorbiaceae (8 sps), Lauraceae (5 sps), Acanthaceae (4 sps) and 4 sps of Fagaceae, Polygonaceae and Rubiaceae, this is similar to study of Shaktikhor V.D.C which may be due to the similarity in altitudinal variation.

Sah *et. al.* (2003) recorded 401 plant species that belong to 264 genera and 84 families from Ghodaghodi lake area of west Nepal. Among them, 269 species were dicots and 132 monocots. Among dicots, 36 species were fabaceae, 32 sps were Asteraceae, 17 sps of Euphobiaceae, Scrophulariaceae (14 sps), Acanthaceae (12 sps), this finding is almost similar to shaktikhor V.D.C but their member varies.

The present study reported *Dalbergia sisso*, *Dioscorea deltoidea*, *Rauwolfia serpentina*, *Senegalia catechu* which are enlisted in CITES (Joshi *et al* 2017). *Rauwolfia serpentina* is categorised as endangered species and *Senegalia catechu*, *Shorea robusta* as threatened species in IUCN (Shrestha, T. B 1999).

Genus like *Clerodendrum*, *Dryaria*, *Stellaria* and *Strobilanthes* were found below their elevation range which may be due to the various factors like dispersal of seeds, landslides, soil erosion, etc.

CHAPTER VI: CONCLUSION

The flora of Shaktikhor V. D. C has been prepared based on the herbarium specimens collected from the respective study area. Identified records enumerated both the monocots and dicots plants from that area, showing the high floral diversity and abundant valuable tropical plants. Artificial keys and the checklist of flora for the study area has been prepared according to the observed detail characteristics.

Recommendations

As this area is easily accessible, firing and illegal trade of timber and medicinal plants is the serious problem. The following recommendations have been proposed for the overall program in conservation efforts and in the sustainability of natural resources.

- a. This area is occupied by different ethnic group mostly chepang who are rich in ethno ecological knowledge. Their local and traditional knowledge should be integrated to scientific world which will be beneficial to the local as well as explorers.
- b. Strict rule should be implemented to control forest fire as well as illegal trade of timber and important medicinal plants.
- c. A through study should be implemented by the government for long term strategy plan to conserve the pristine habitat and biologically important species of that area.

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Appendix 1: List of Families with number of Genera asnd Species

S.N	Family	Number Genus	Number species
1	Acanthaceae	8	11
2	Amaranthaceae	2	3
3	Apocynaceae	2	2
4	Arecaceae	1	1
5	Asteraceae	10	10
6	Begoniaceae	1	1
7	Cannabaceae	1	1
8	Caryophyllaceae	2	2
9	Commelinaceae	3	3
10	Convolvulaceae	3	3
11	Costaceae	1	1
12	Cyperaceae	6	9
13	Dioscoraceae	1	2
14	Dipterocarpaceae	1	1
15	Euphorbiaceae	6	6
16	Fabaceae	12	17
17	Gentianaceae	1	1
18	Gesneriaceae	1	1
19	Lamiaceae	6	9
20	Lauraceae	1	1
21	Linaceae	1	1
22	Linderniaceae	1	2
23	Malvaceae	7	8
24	Melastomataceae	1	2
25	Meliaceae	1	1
26	Moraceae	1	2
27	Myrsinaceae	2	2
28	Nyctaginaceae	1	1
29	Onageraceae	1	1
30	Oxalidaceae	1	1
31	Phyllanthaceae	3	4
32	Plumbiginaceae	1	1
33	Poaceae	13	14
34	Polygonaceae	1	2
35	Rhamnaceae	1	1
36	Rubiaceae	7	7
37	Rutaceae	1	1
38	Solanaceae	2	3
39	Urticaceae	4	4
40	Verbenaceae	2	2
41	Zingiberaceae	2	2

Appendix 2: Checklist of Flowering Plant Species recorded from Shaktikhor Forest

S.N	Family	Latin Name	Life form	Elevation (m)
1	Acanthaceae	<i>Barleria cristata</i> L.	herb	248
2	Acanthaceae	<i>Barleria strigosa</i> Willd.	herb	253
3	Acanthaceae	<i>Hypoestes triflora</i> Forssk	herb	489
4	Acanthaceae	<i>Justicia procumbens</i> L	herb	479
5	Acanthaceae	<i>Justicia simplex</i> D. Don,	herb	456
6	Acanthaceae	<i>Lepidagathis incurve</i> Buch.- Ham	shrub	248
7	Acanthaceae	<i>Nelsonia canescens</i> Lam.	shrub	234
8	Acanthaceae	<i>Ruellia beddomei</i> C. B. Clarke	herb	342
9	Acanthaceae	<i>Rungia pectinata</i> L.	herb	242
10	Acanthaceae	<i>Strobilanthes extensa</i> Nees	herb	324
11	Acanthaceae	<i>Strobilanthes pentstemonoides</i> Nees	herb	354
12	Amaranthaceae	<i>Achyranthes bidentata</i> Blume,	shrub	245
13	Amaranthaceae	<i>Achyranthes aspera</i> L.	shrub	987
14	Amaranthaceae	<i>Alternanthera sessilis</i> (L.) DC.	herb	257
15	Apocynaceae	<i>Holarrhena pubescens</i> Buch.-Ham.	tree	234
16	Apocynaceae	<i>Rauwolfia serpentina</i> L.	shrub	321
17	Arecaceae	<i>Chamaerops humilis</i> L	herb	342
18	Asteraceae	<i>Ageratum conyzoides</i> L.	herb	267
19	Asteraceae	<i>Artemisia dubia</i> Wall	herb	249
20	Asteraceae	<i>Blumea fistulosa</i> Roxb.	herb	243
21	Asteraceae	<i>Crassocephalum crepidioides</i> Benth	herb	341
22	Asteraceae	<i>Eclipta alba</i> L	herb	432
23	Asteraceae	<i>Elephantopus scaber</i> L	herb	249
24	Asteraceae	<i>Emlia sonchifolia</i> L	herb	287
25	Asteraceae	<i>Sonchus asper</i> L	herb	340
26	Asteraceae	<i>Tridax procumbens</i> L	herb	450
27	Asteraceae	<i>Xanthium strumarium</i> L	shrub	784
28	Begoniaceae	<i>Oroxylum indicum</i> L	tree	248
29	Cannabaceae	<i>Cannabis sativa</i> L,	shrub	238
30	Caryophyllaceae	<i>Drymaria cordata</i> (L) Willd	herb	254
31	Caryophyllaceae	<i>Stellaria media</i> L.	herb	237

32	Commelinaceae	<i>Commelina benghalensis</i> L	herb	489
33	Commenlinaceae	<i>Cyanotis Vaga</i> L	herb	645
34	Commenlinaceae	<i>Rhopalephora scaberrima</i> Blume	herb	549
35	Convolvulaceae	<i>Ipomoea quamoclit</i> L	climber	673
36	Convolvulaceae	<i>Merremis vitifolia</i> Burm. f	climber	340
37	Convolvulaceae	<i>Dinetus racemosa</i> Sweet Brit	woody climber	567
38	Costaceae	<i>Hellenia speciose</i> L	herb	426
39	Cyperaceae	<i>Carex indica</i> L	herb	256
40	Cyperaceae	<i>Cyperus alternifolius</i> L	herb	322
41	Cyperaceae	<i>Cyperus ciliaris</i> L	herb	219
42	Cyperaceae	<i>Cyperus diffusus</i> Vahl	herb	345
43	Cyperaceae	<i>Cyperus iria</i> L	herb	219
44	Cyperaceae	<i>Eleocharis congesta</i> D. Don	herb	320
45	Cyperaceae	<i>Fimbristylis dichotoma</i> (L) Vahl	herb	234
46	Cyperaceae	<i>Schoenoplectus juncoides</i> Roxb.	herb	254
47	Dioscoraceae	<i>Dioscorea bulbifera</i> L.	climber	439
48	Dioscoraceae	<i>Dioscorea deltoidea</i> Wall.	climber	235
49	Dipterocarpaceae	<i>Shorea robusta</i> Gaertn.	tree	387
50	Euphorbiaceae	<i>Baliospermum montanum</i> Willd.	shrub	341
51	Euphorbiaceae	<i>Bridelia retusa</i> A. Juss.	tree	324
52	Euphorbiaceae	<i>Euphorbia hirta</i> L.	herb	234
53	Euphorbiaceae	<i>Jatropha curcas</i> L.	shrub	569
54	Euphorbiaceae	<i>Mallotus philippensis</i> (Lam.) Mull.	tree	435
55	Euphorbiaceae	<i>Ricinus communis</i> L.	herb	349
56	Fabaceae	<i>Abrus pulchellus</i> Wall.	herb	467
57	Fabaceae	<i>Alysicarpus vaginalis</i> (L.) DC.	herb	323
58	Fabaceae	<i>Bauhinia purpurea</i> L.	tree	320
59	Fabaceae	<i>Butea minor</i> Buch.-Ham.	tree	1123
60	Fabaceae	<i>Cassia fistula</i> L.	tree	453
61	Fabaceae	<i>Dalbergia sisso</i> Roxb.	tree	1156
62	Fabaceae	<i>Desmodium confertum</i> D. C.	tree	349
63	Fabaceae	<i>Desmodium elegans</i> DC.	shrub	398
64	Fabaceae	<i>Desmodium multiflorum</i> DC.	shrub	567
65	Fabaceae	<i>Desmodium heterocarpon</i> L.	shrub	347

66	Fabaceae	<i>Flemingia strobilifera</i> L.	shrub	376
67	Fabaceae	<i>Mimosa pudica</i> L.	shrub	478
68	Fabaceae	<i>Mimosa rubicaulis</i> , Lam.	tree	234
69	Fabaceae	<i>Mucuna pruriens</i> (L.) DC.	climber	267
70	Fabaceae	<i>Senna sophera</i> Linn.	herb	341
71	Fabaceae	<i>Senna tora</i> L.	herb	437
72	Fabaceae	<i>Senegallia catechu</i> (L. f.) Willd.	tree	245
73	Gentianaceae	<i>Canscora diffusa</i> L.	herb	239
74	Gesneriaceae	<i>Rhynchoglossum obliquum</i> Blume.	herb	674
75	Lamiaceae	<i>Callicarpa macrophylla</i> Vahl.	shrub	456
76	Lamiaceae	<i>Clerodendrum indicum</i> L.	shrub	1078
77	Lamiaceae	<i>Clerodendrum japonicum</i> Thunb.	shrub	378
78	Lamiaceae	<i>Clerodendrum serratum</i> L.	herb	478
79	Lamiaceae	<i>Clerodendrum viscosum</i> Venl.	shrub	289
80	Lamiaceae	<i>Colebrookea oppositifolia</i> Sm.	shrub	347
81	Lamiaceae	<i>Holmskioldia sanguinea</i> Retz.	shrub	340
82	Lamiaceae	<i>Leucas cephalotes</i> Roth.	herb	320
84	Lamiaceae	<i>Pogostemon benghalensis</i> Burf.	shrub	267
85	Lauraceae	<i>Cinnamomum tamala</i> Buch.-Ham.	tree	219
86	Linaceae	<i>Reinwardtia indica</i> Dumort.	shrub	387
87	Linderniaceae	<i>Torenia fournieri</i> Linden ex Fourn.	herb	589
88	Linderniaceae	<i>Torenia violacea</i> Azola ex Blanco.	herb	765
89	Malvaceae	<i>Abroma augusta</i> L.	shrub	276
90	Malvaceae	<i>Abutilon indicum</i> L.	herb	254
91	Malvaceae	<i>Bombax ceiba</i> L.	tree	435
92	Malvaceae	<i>Hibiscus cancellatus</i> Roxb.	herb	234
93	Malvaceae	<i>Sida acuta</i> Burm.	shrub	231
94	Malvaceae	<i>Sida cordata</i> Burm. f.	shrub	324
95	Malvaceae	<i>Urena lobata</i> L.	shrub	219
97	Melastomataceae	<i>Osbeckia nepalensis</i> Hook.	shrub	1034
98	Melastomataceae	<i>Osbeckia stellate</i> Buch.-Ham.	shrub	1186
99	Meliaceae	<i>Cipadessa baccifera</i> Roth.	shrub	457
100	Moraceae	<i>Ficus benghalensis</i> L.	tree	324
101	Moraceae	<i>Ficus religiosa</i> L.	tree	346
102	Myrsinaceae	<i>Ardisia solanacea</i> Roxb.	Herb	532

103	Myrsinaceae	<i>Maesa chisia</i> Buch. –Ham.	Tree	769
104	Nyctaginaceae	<i>Boerhavia diffusa</i> L.	shrub	312
105	Onageraceae	<i>Ludwigia perennis</i> L.	shrub	239
106	Oxalidaceae	<i>Oxalis corniculata</i> L.	herb	1024
107	Phyllanthaceae	<i>Phyllanthus debilis</i> Klein ex Willd.	herb	1017
108	Phyllanthaceae	<i>Phyllanthus glaucus</i> Wall.	shrub	879
109	Phyllanthaceae	<i>Breynia retusa</i> Dennst.	shrub	537
110	Plumbiginaceae	<i>Plumbago zeylanica</i> L.	herb	578
111	Poaceae	<i>Arundinella nepalensis</i> Trin.	herb	367
112	Poaceae	<i>Chrysopogon aciculatus</i> Retz.	herb	276
113	Poaceae	<i>Cyanodon dactylon</i> L.	herb	236
114	Poaceae	<i>Dactyloctenium aegypticum</i> Schumach.	herb	349
115	Poaceae	<i>Digitaria ciliaris</i> Retz.	herb	567
116	Poaceae	<i>Eleusine indica</i> L.	herb	326
117	Poaceae	<i>Eulalia leschenaultiana</i> Decne.	herb	298
118	Poaceae	<i>Neyraudia reynaudiana</i> Kunth.	herb	378
119	Poaceae	<i>Oplismenus compositus</i> L.	herb	459
120	Poaceae	<i>Paspalidium flavidum</i> Retz.	herb	249
121	Poaceae	<i>Paspalum distichum</i> L.	herb	475
122	Poaceae	<i>Sorghum nitidum</i> Vahl.	herb	376
123	Poaceae	<i>Pennisetum faccidum</i> Griseh.	herb	593
124	Poaceae	<i>Pennisetum purpureum</i> Schumach.	herb	529
125	Polygonaceae	<i>Persicaria barbata</i> L.	herb	439
126	Polygonaceae	<i>Persicaria capitata</i> Buch.-Ham.	herb	370
127	Rhamnaceae	<i>Gouania leptostachya</i> Cndolle.	woody climber	234
128	Rubiaceae	<i>Argostemma sarmentosum</i> Wall.	herb	340
129	Rubiaceae	<i>Borreria alata</i> Aubl.	herb	286
130	Rubiaceae	<i>Galium acutum</i> Edgew.	herb	345
131	Rubiaceae	<i>Hedyotis scandens</i> Roxb.	shrub	984
132	Rubiaceae	<i>Mussaenda macrophylla</i> Wall.	shrub	256
133	Rubiaceae	<i>Ophiorrhiza rugosa</i> Wall.	herb	1018
134	Rubiaceae	<i>Paederia foetida</i> L.	woody climber	1178
135	Rutaceae	<i>Murraya koenigii</i> L.	shrub	259

136	Solanaceae	<i>Hyoscyamus niger</i> L.	herb	467
137	Solanaceae	<i>Solanum torvum</i> Sw.	herb	236
138	Solanaceae	<i>Solanum nigrum</i> L.	shrub	764
139	Urticaceae	<i>Urtica dioica</i> L.	herb	238
140	Urticaceae	<i>Girardinia diversifolia</i> Link.	herb	487
141	Urticaceae	<i>Pilea glaberrima</i> Lindl.	herb	230
141	Urticaceae	<i>Boehmeria platyphylla</i> D. Don.	herb	256
142	Verbenaceae	<i>Duranta repens</i> L.	shrub	439
143	Verbenaceae	<i>Vitex negunda</i> L.	shrub	367
144	Zingiberaceae	<i>Globba racemosa</i> Sm.	herb	548
145	Zingiberaceae	<i>Hedychium thyrsiforme</i> Sm.	herb	987

Appendix 3: Photo plates of some species



Eclipta alba (L.)



Cleome viscosa (L.)



Drymaria cordata (L.) Wild.



Commelina benghalensis (L.)



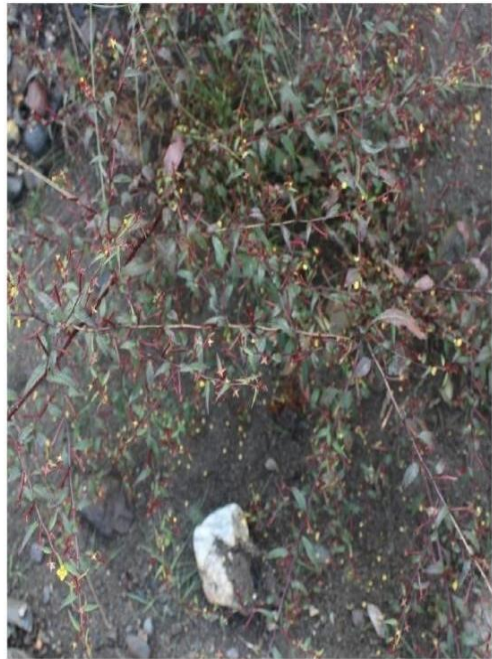
- *Merremia vitifolia*
(Burm.f) Hallier



Reinwardtia indica Dumart



Pennisetum flassidum Griseb



Ludwigia pereniss (L)



Grewia optiva J.R
Drumm



Hellenia speiiose (Koenig) Sm.



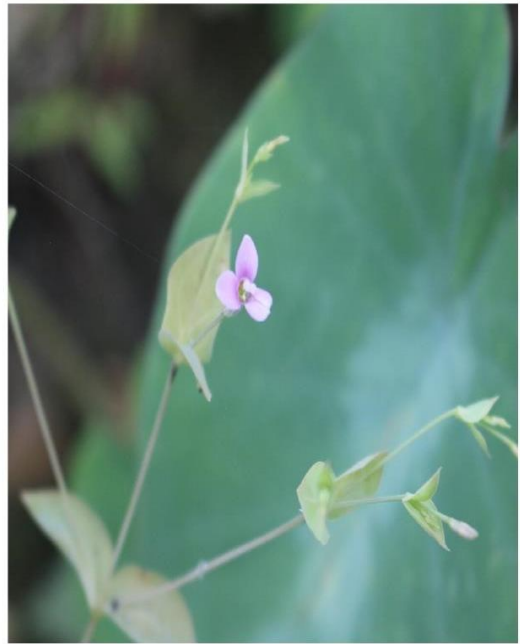
Cassia fistula (L.)



Bridelia retusa (L) Spreng



Gouania leptostachya D.C



Canscora diffusa (Vahl) R.



Globba racemosa Sm



Breyina retusa (Dennst) Alston



*Mussaenda
macrophylla* Wall



Dioscorea bulbifera L.



Oroxylum indicum (L) Kurz - Fruit



Oroxylum indicum (L) Kurz- Flower