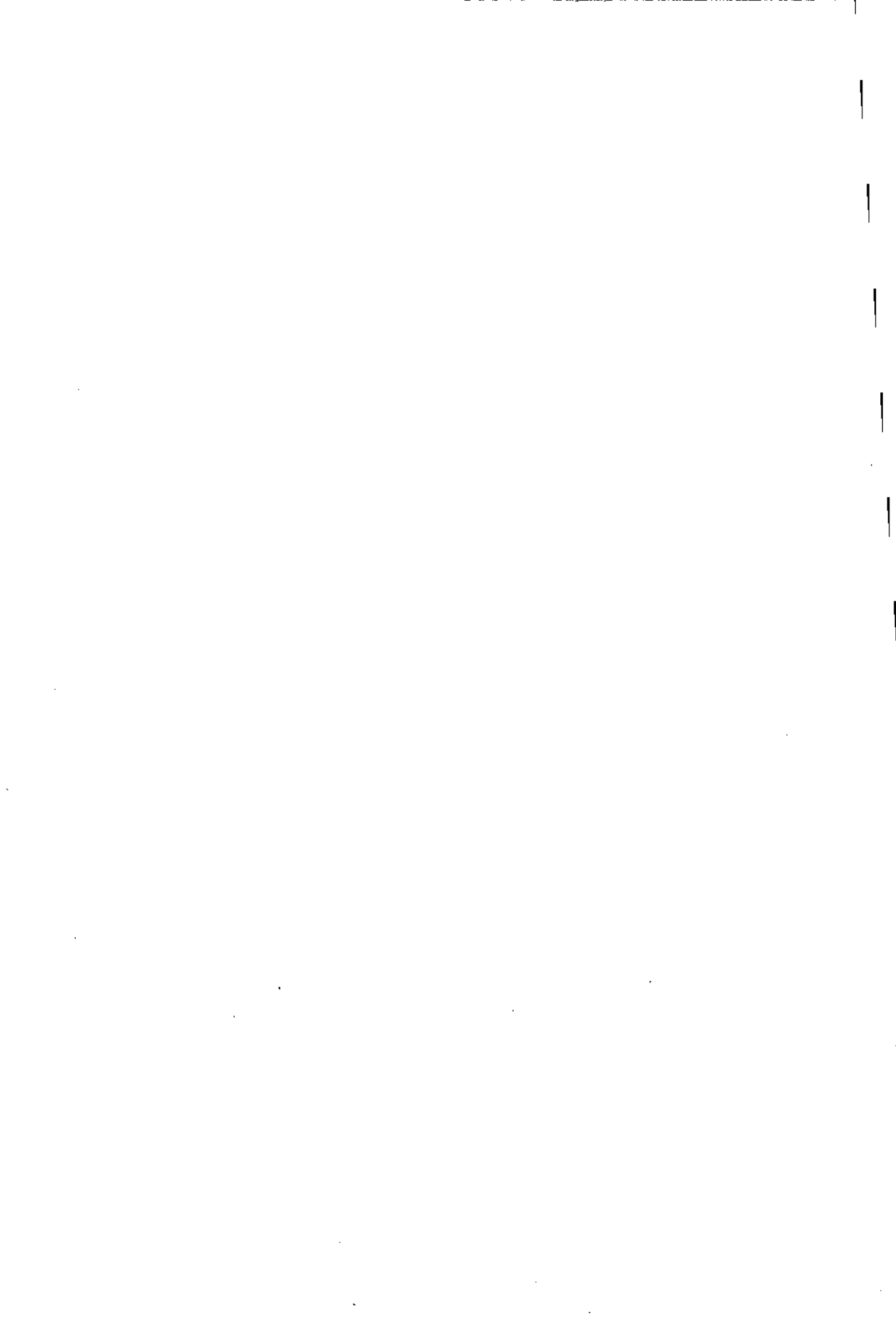


Chapter-VI



Enumeration

The plant with the most legitimate name as per the latest nomenclature code, through proper taxonomic treatments of species, collected from the Pangolakha Wildlife Sanctuary has been arranged in compliance with the classification presented by Arthur Cronquist (1988). Further, for more convenient the presentation of each species their enumeration the genera and species under the families are arranged in alphabetical order.

The following sequence of enumeration is taken into consideration while enumerating each identified plant.

- (a) Legitimate correct name, (b) Basionym, (c) Synonyms if any (selected ones only), (d) Homonym if any, (e) Protologue and other important publication references, (f) Vernacular name, (g) Description, (h) Flowering and fruiting periods, (i) Specimen cited, (j) Status (k) Local distribution, (l) General distribution, (m) Important note if any on some special features or of the traditional values of the taxon.

Most importantly, in the present study, an attempt has been made to include all the available taxonomic reference on the taxon. Mentioned below is the list of important books, selected scientific journals, papers, newsletters and periodicals that has been referred during the citation of the same.

6.1 Chronicles of literature used in the reference

Names of the important books referred.

Bengal Pl.	: Bengal Plants
En. Fl. Pl. Nepal	: An Enumeration of the Flowering Plants of Nepal
Fasc. Fl. India	: Fascicles, Flora of India
Ferns. S. India	: Ferns of south India
Fl. Brit. India	: Flora of British India
Fl. Bhutan	: Flora of Bhutan
Fl. E. Him.	: Flora of Eastern Himalaya

Fl. India	: Flora of India
Fl Indica	: Flora Indica
Fl. Sikkim	: Flora of Sikkim (Monocot).
Fl. West Bengal.	: Flora of West Bengal
Han. Ferns. Brt. Ind	: Handbook of the Ferns of British India, Ceylon and the Malay Peninsula (with supplement)
Lab. India	: Labiatae of India
Prodr. Fl. Nepal	: Prodromus florae Nepalensis
Pl. As. Rar.	: Plantae Asiaticae Rariores
Pl. Wilson	: Plantae Wilsonianae
Rhod. Sikkim Him.	: Rhododendron of Sikkim Himalayas
Tent. Fl. Nap	: Tentamen Florae Nepalensis Illustratae
Tr. N. Bengal	: The Trees of Northern Bengal
FOC	: Flora of China
Fl. Meg	: Forest flora by Meghalaya by K. Haridarsan and R. R. Rao.
FC. Asm	: Flora of Assam by U. N. Kanjilal and A. Das.
Orch. Sik. Him.	: The orchids of Sikkim Himalayas
WI	: The wealth of India.
Trs. Sik. Hil	: Tress of Sikkim hills by L.K. Rai.
HFD.	: Herbaceous flora of Dehradun.
S. Fl. Sikkim Him.	: Spring Flora of Sikkim Himalayas
Hi. Cob. Li.	: Himalayan Cobra-lilies (<i>Arisaema</i>) their botany and culture
Fl. Jow.	: Flora of Jowai
Fl. W. Pakistan.	: Flora of west Pakistan
Nam. Change. Flr. Pl.	: Name changes in flowering plants by S. S. R. Bennett.

Names of the journal referred

Bull.As.Soc.Beng.	: Bulletin of Asiatic Society of Bengal
Bull.Bot.Sur.Ind.	: Bulletin of Botanical Survey of India
Jour.Arn.Arb.	: Journal of Arnold Arboretum
Jour.Beng.Nat.Hist.Soc.	: Journal of Bengal Natural History Society
Jour.Bomb.Nat.Hist.Soc.	: Journal of Bombay Natural History Society
Jour.Econ.Tax.Bot.	: Journal of Economic and Taxonomic Botany
Jour.Hill Res.	: Journal of Hill Research

Jour.Him.Res.Dev.	: Journal of Himalayan Research and Development
Jour.Jap.Bot	: Journal of Japanese Botany
Jour. R.A.S. Beng. Sci	: Journal of Royal Asiatic Society of Bengal
Jour.Trop.Med.Pl.	: Journal of Tropical Medicinal Plants
Jour.Res.Ind.Med	: Journal of Research in Indian Medicine
Kew.Bull.	: Kew Bulletin
Nat.Acad.Sci.Letter.	: National Academy of Science Letter
Notes R.B.G.Edinb.	: Notes from the Royal Botanical Garden, Edinburgh
Rec.Bot.Sur.Ind.	: Records of Botanical Survey of India
Jour. Ind. For.	: Indian forester, Dehradun.
Jour. Ind. Forestry.	: Indian Journal of Forestry , Dehradun.
Jour. Plione	: Plieoine
Panda	: Biannual publication of forest dept. Govt of Sikkim.

6.2 Abbreviation used in Enumeration.

<i>agg.</i>	: aggregated species
<i>auct.</i>	: of various authors (<i>auctorum</i>)
<i>C.</i>	: about (<i>Circa</i>)
<i>Cf.</i>	: compare (<i>Confer</i>)
<i>f.</i>	: form (<i>forma</i>)
<i>nom.illeg.</i>	: Illegitimate name (<i>Nomen illegitimum</i>)
<i>nom.nud.</i>	: <i>Nomen nudum</i>
<i>p.p.</i>	: In Part (<i>pro parte</i>)
<i>Sensu.</i>	: In the sense of author indicated and not as originally intended
<i>ssp.</i>	: Sub-species
<i>Var.</i>	: Variety
<i>Var. nov.</i>	: New variety

Other abbreviations common used in enumeration

Acad.	: Academy	Ill.	: Illustration
Bull.	: Bulletin	Journ.	: Journal
Cat.	: Catalogue	n.	: Number
Contr.	: Contribution	Rep.	: Report
Faun.	: Fauna	Repert.	: Repertorium

Fl. : Flora
Ic. : Icones

S. : Society
Contr. : Contribution

Authorities of botanical names.

A.DC : Alphonse de Candolle
Anders : T. Anderson
Bung : Bunge
Benth. : Bentham
Baill : Baillon
Berh : Berhandi
Burm.f : Burman (*filius*)
CL. : Clarke
DC. : Augustine de Candolle
Decne. : Decaisne
Dumort. : Dumortier
Falcc. : Falconer
Fisch. : Fischer
Hutch. : Hutchinson
Haussk : Hausskal
Hk. : Hooker
Jeff. : Jeffery
Jacq. : Jacquin
kitam. : Kitamura
Kunz : Kuntze
L.f. : C. Linnaeus (*filius*)
Lour. : Loureiro
Mart. : Martius
Mill. : Miller
Muell. : Mueller
Meisn : Meisner
Planch. : Planchom
Rehd. : Rehder
Retz. : Retzius
Shult. : Roemer-Shultes
Ser. : Seringe
Steud. : Stewdal
R.Br. : R. Brown
Sieb & Zucc. : Siebold & Zuccarini
Thunb. : Thunberg
Vent. : Venttenat
Wettst. : Wettstein
Wt. : Wight

Aans. : Adanson
Arnt. : Arnott
Brow. : Browne
Bl. : Blume
Benn. : S.S.R. Benett
Buch-Ham. : Buchanan-Hamilton
Cogn. : Cogniaux
Cham. : Chamisso
Denns : Denstedt
Edgew. : Edgeworth
Forssk : Forsskal
Griff. : Griffith
Griseb. : Grisenbach
Hand-Mzt : Handel-Mazzetti
Humb. : Humboldt
Hook.f : J.D. Hooker (*filius*)
Juss. : Jussiew
Ker-Gawl. : Ker-Gawler
Koid. : Koidzumi
L. : C. Linnaeus
Lamk. : Lamarck
Maxim : Maximowicz
Merr. : Merrill
Mich. : Michaux
Miq. : Miquel
Pax. : Paxton
Reich. : Reichenbach
Roem : Roemer
Salisb. : Salisbury
Schr. : Schrader
Spreng. : Sprengel
Sieb. : Siebold
Roxb. : Roxburgh
Thoms. : Thomas Thomson
T. Anders. : Thomas Anderson
Wall. : Wallich
Willd. : Willdenow
Zucc. : Zuccarina

Local (Common) names.

Lep. : Lepcha Hind : Hindi Eng. : English
Nep : Nepali Sans : Sanskrit Beng : Bengali

Description:

- Diam. : Diameter
Fig. : Figure
Fem. : Female
Pl. : Photoplate
Exiccata : Exiccatus

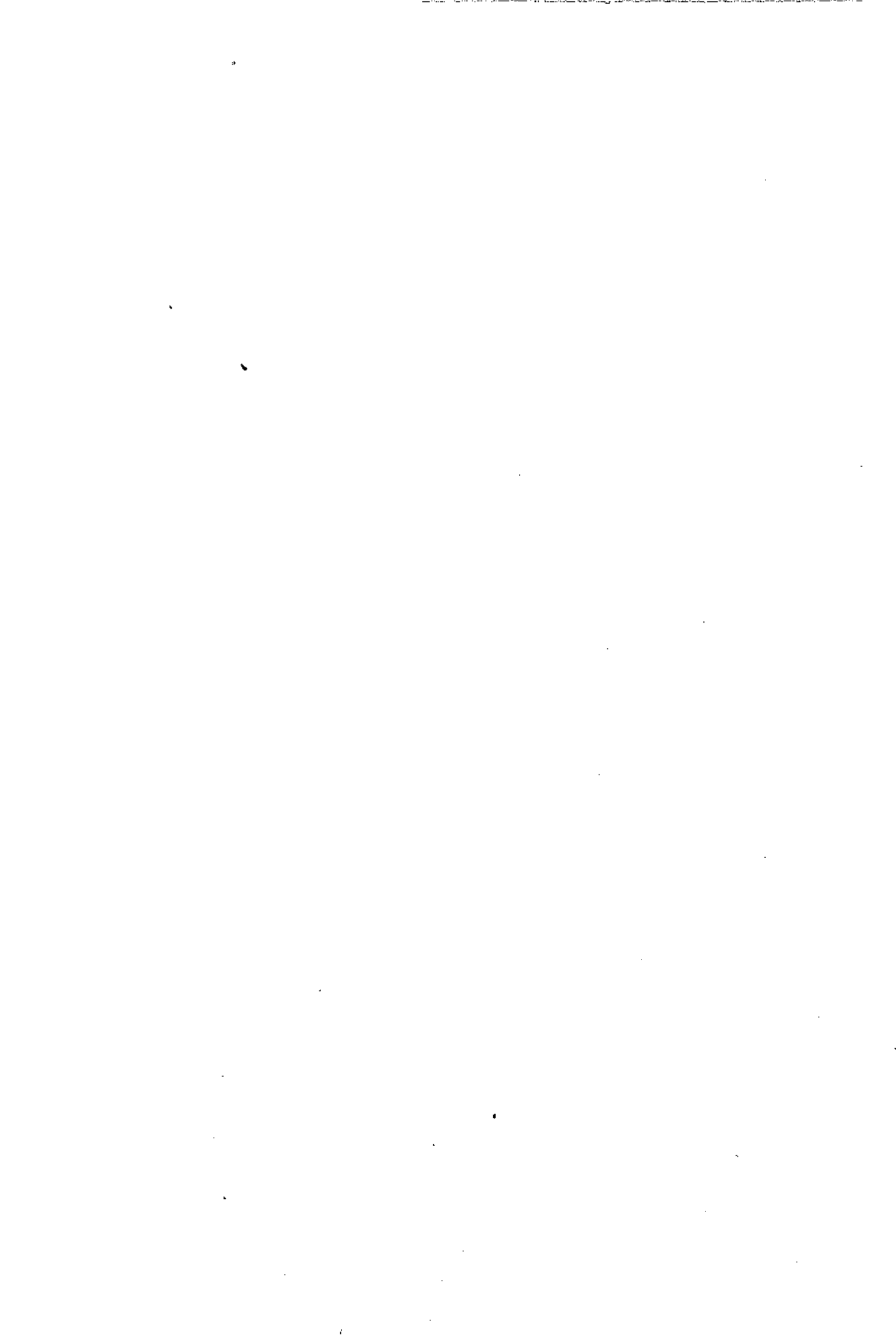
Distributions:

- C. : Central
E. : Eastern
S. : Southern
W : Western
N. : North
NE. : North-eastern

The measurement of the specimens during the study was made through metric unit system (m, cm & mm) for e.g. the dimensions of leaves are given as 6 x 4 the first figure indicating the length and the second breadth, the only one measurement indicates the length or height for e.g. fruit 2cm. . Measurements usually inside the brackets refers the specimens outside the average range e.g. trees 25 – 30m (-60m) indicates the normal range of height as 25- 30 m but sometime exceptionally up to 60m.

6.3. DETERMINATION OF ECOLOGICAL STATUS OF PLANTS IN THE WILD HABITATS

Status of plants in the wild is actually being determined through the eye estimation and through the consultation of Red Data lists of IUCN (1998, 2000) and Botanical Survey of India.



ENUMERATION OF THE FLORA OF PANGOLAKHA WILDLIFE SANCTUARY

6.4. PTERIDOPHYTES

While working on the study of angiospermic flora, many species of ferns and its allies were also collected and recorded from temperate to subalpine region. This includes 39 genera under 68 species belonging to 20 Pteridophytic families. The ferns and its allies constitute a significant component of the sanctuary's flora. They tend to possess equal important in regards to both animal and human beings. Significantly, some ferns are known to have considerable economic values and have good demand in local markets. The population of the ferns inside the sanctuary is extremely rich and diverse as well. The distribution pattern of ferns seems uniform from the lower temperate belt to the alpine region of the sanctuary. The enumeration of some of the prominent species of fern & ferns allies of the PWS is mentioned below.

ASPIDIACEAE S.F. Gray

Ctenitis C. Chr.

Ctenitis apiciflora (Wall. Ex Mett.) Ching in Bull. Fan. Mem. Inst. Biol., 8, 284, 1938; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.134. 2008.

Basionym: *Aspidium apiciflorum* Wall. (lists n. 345, 1828 ex Mett., Farngatt. Phleg. Et Aspid., 54, n. 128, 1858.

Exsiccatus : Dhorok 2300 m, **SR Lepcha & AP.Das**, 04035, dated 07.08.2003.

Driopteris Adanson

Driopteris chrysocoma (Christ) C. Chr., Index Fill.,257.1905; Mehra& Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.132.2008.

Basionym: *Aspidium fructuosum* Christ in Bull. Herb.Boiss., 6, 966, 1898.

Exsiccatus : Dhorok 2300 m, **SR Lepcha & AP.Das**, 04099, dated 15..11.2004.

Driopteris sikkimensis (Bedd.) O. Ktze., Rev. Gen. Pl.,2, 813, 1891; Mehra& Bir, Pteridophy Fl. Darjeeling & Sikkim Him.133.2008.

Basionym: *Polystichum sikkimensis* Bedd., Ferns brit. India,t.127, 1866.

Exsiccatus : Phusrey, 2380 m, **SR Lepcha & AP.Das**, 04038, dated 07.08.2003.

Driopteris serrate-dentata(Bedd.) Hayata, Ic. Pl. Formos., 4, 179, 1914; Ching in Bull.Fan Mem. Inst Biol., 8, 433, 1938; Mehra& Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.131.2008.

Basionym: *Lastrea filix-mas* var. *serrate - dentate* Bedd., Handb. Ferns Brit. India, Suppl., 55, 1899.

Exsiccatus : Rachela below, 2750m, **SR Lepcha & AP.Das**, 04039, dated 08.08.2003.

*Driopteris barbiger*a (Moore) O.Ktze., Rev. Gen. Pl. 2, 812, 1891; Ching in Bull. Fam Mem. Inst. Biol., 8, 431, 1938; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.132.2008.

Basionym : *Nephrodium barbigerum* Hook., Spec. Fil., 4, 113, 1891; Clarke in Trans. Linn. Soc. London II Bot., 1, 522, 1880.

Exsiccata : Dhorok 2300 m, **SR Lepcha & AP.Das**, 04036, dated 07.08.2003.

Driopteris panda (Clarke) Chruvist in bull Geogr. Bot. mem., 20, 176, 1909; C.Chr., Index Fil. Suppl. III, 94, 1934; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.130. 2008.

Basionym: *Nephrodium filix-mas* var. *panda* Clarke in trans. Linn. Soc. London, II, Bot., 1, 519, Pl. 68, Fig. 1, 1880.

Exsiccatas : Hangey, 1900 m, **SR Lepcha & AP.Das**, 04041, dated 07.08.2003.

Driopteris palaceae (Don) Hand – Mazz., Verh. Zool. -Bot. Ges. Wien., 58:100. 1908 (*non-palaceae* (Swartz) Christensen, 1911; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.131. 2008.

Basionym: *Aspidium palaeceum* Don, Prodr. Fl. Nepal., 4.1825 (non Sw., 1806)

Exsiccatas: Subaney – Singhaney, 2700 m, **SR Lepcha & AP.Das**, 04042, dated 10.08.2003.

Driopteris splendens (Hook.) O.Ktze., Rev. Gen. Pl. 2 : 813. 1891; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.133. 2008.

Basionym: *Nephrodium splendens* Hook., spec. Fil., 4: 126. 1862.

Exsiccatas: Durpiney- Neora boundry, 2400 m, **SR Lepcha & AP.Das**, 04043, dated 07.08.2003.

Elaphoglossum Schott

Elaphoglossum petiolatum (Sw. Urban, symb. Ant., 4,61, 1903; C. Chr., Index Fil., 313, 1906; ; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.130. 2008.

Basionym : *Acrostichum petiolatum* Swartz, Prod., 128, 1788.

Exsiccatas : Beusa, 2200 m, **SR Lepcha & AP.Das**, 05000, dated 07.10.2004.

Polystichum Roth.

Polystichum nepalense (Spr.) C. Chr., Index Fil., 84, 1905 (585, 1906) Ching, Ie. Fil. Sinicarum 5, Pl. 243, 1958; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.126..2008.

Basionym: *Aspidium nepalense* Spreng, Syst., 4, 97, 1827.

Exsiccatas : Hangey, 2200 m, **SR Lepcha & AP.Das**, 04045, dated 08.08.2003.

Polystichum prescottianum (Wall.) Moore, Index Fil., 101, 1858; Bedd., Handb. Ferns Brit. India 210, t. 105, 1883; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.127.2008.

Basionym: *Aspidium prescottianum* Wall., List n. 363, 1828 (*nomen nudum*); Clarke in Trans. Linn. Soc. London, II, Bot., 1, 510, 1880.

Exsiccatas : Panglakha 2800 m, **SR Lepcha & AP.Das**, 05002, dated 10.10.2003.

Polystichum aculeatum (L.) Schott, Gen. Fil., ad.t. 9, 1834; Bedd., Handb. Ferns Brit. India, 207, 1883. Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.127.2008.

Basionym: *Polypodium aculeatum* Linn., Spec. Plant., 2, 1090, 1753.

Exsiccatas : Rachela below, 2600 m, **SR Lepcha & AP.Das**, 04044, dated 08.08.2003.

Polystichum thomson (Hook.fil.) edd., ferns Brit. India, t. 126, 1866; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.127. 2008.

Basionym : *Aspidium thomsonii* Hook., Fil. In Hook., 2nd Cent., t. Pl. 25, 1880 (*pro-parte*) ; Clarke in trans. Linn. London, II, Bot., 1, 508, 1880.

Exsiccatas : Singhaney, 2600 m, **SR Lepcha & AP. Das**, 05010, dated 11.10.2005.

Polystichum obliquum (Don) Moore, Index Fil., 87. 1858; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.126. 2008.

Basionym; *Aspidium obliquum* Don, Prodr. Fl. Nepal., 3. 1825.

*Exsiccatu*s : Dhorok 2200 m, **SR Lepcha & AP.Das**, 04046, dated 08.08.2003.

ASPLINIACEAE S.F. Gray

Asplenium Linnaeus

Asplenium ensiforme Wall., List n. 200, 1828 (*nom.- nud.*); Hook. & grev., Ic. Fil., t. 71, 1829; Bedd., ferns South. India, t. 125, 1863 and Handb, ferns Brit. India 141, t. 71, 1883; Clarke in Trans. Linn. Soc. London, II, Bot., 1, 476, 1880; ; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.156. 2008.

*Exsiccatu*s: Phusrey, 2000 m, **SR Lepcha & AP. Das**, 04000, dated 07.08.2003.

Asplenium tenuifolium Don, Prodr. Fl. Nepal., 8, 1825; Clarke in trans. Linn. Soc. London II, Bot., 1, 485, 1880; Bedd., Handb. Fern brit. India, 159, t. 78, 1883; hope in Journ. Bombay at. Hist. Soc. 13, 667.1901; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.158. 2008.

*Exsiccatu*s: Rachel, 2500 m, **SR Lepcha & AP. Das**, 04050, dated 07.08.2003.

Asplenium laciniatum Don, Prodr. Fl. Nepal., 8. 1825; Clarke in trans. Linn. Soc. London,II, Bot., 1, 481, 1880; (*pro-parte*); Bedd., Handb. Ferns Brit. India, 154, 1883 (*pro- parte*); Wu et al. , Polypod. Yaoshan, 184, 1932; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.157. 2008.

*Exsiccatu*s: Beusa,1800 m, **SR Lepcha & AP. Das**, 05007, dated 10.10.2004.

Asplenium planicaule Wallich in Met., Aspl., n. 158, 1828; Bedd., ferns South India t. 139, 1863; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.156. 2008.

Basionym: *Asplenium laciniatum* var. *planicaule* Clarke in Trans. Linn. Soc. London, II, Bot. , 1:482. 1880.

*Exsiccatu*s: Talkharka, 1800 m, **SR Lepcha & AP.Das**, 06035, dated 09.09.2006.

ATHYRIACEAE Alston.

Athyrium Roth

Athyrium rupicola (Hope) C. Chr. Index Fil., 145. 1905; Alston & Bonner in Candolles, 15: 213. 1956; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.137. 2008.

Basionym: *Asplenium rupicola* Hope in Journ. Bombay nat. Hist. Soc. 12, 531-32, Pl. 5, 1899.

*Exsiccatu*s: Dhorok 2300 m, **SR Lepcha & AP. Das**, 04055, dated 07.08.2003.

Note: Species of high altitude above Karponang.

Athyrium mehrae Bir in nova Hedwigia, 4, 166, 1962; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.140. 2008.

*Exsiccatu*s:

Athyrium nigripis (Bl.) Moore, Index Fil. Xlix, 1857, 98, 1858; sledge in bull. Brit. Mus (nat. hist.) 2: 285. 1962; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.141. 2008.

Basionym: *Aspidium nigripes* Bl., Enum. Fil. Jav., 2: 162. 1828.

*Exsiccatu*s: Hangay, 1900 m, **SR Lepcha & AP.Das**, 05010, dated 10.10.2004.

Exsiccata : Karponang – Kyonglasha 3200, **SR Lepcha & AP.Das**, 06010, dated 07.09.2006

Athyrium duthie (Bedd.) bedd., ferns Brit. India , suppl. 34, 1892; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.141. 2008.

Basionym: *Asplenium duthie* Bedd., in Journ. Bot., 27. 72. 1889.

*Exsiccatu*s : Dhorok 2300 m, **SR Lepcha & AP.Das**, 04059, dated 25.08.2003.

Diplazium Swartz

Diplazium polypodioides Blume, Enum. Pl. Jav., 194, 1828; Bedd., Handb. Ferns Brit. India, 184, t. 89.1883 (excl. var.) ; Bir in Bull. Bot Surv. India , 4, 5. 1862; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.147. 2008.

*Exsiccatu*s : Hangey, 1900 m, **SR Lepcha & AP. Das**, 05013, dated 13.13. 2004.

CYATHEACEAE Reichenb.

Alsophila A. Brown

Alsophila glabra (Bl.) Hook. Spec. Fil., 1: 51. 1844; Clarke in trans. Linn. Soc. London, II, Bot., 1: 433.1880; Bedd., Handb. Ferns Brit. India 14. 1883; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.123. 2008.

Basionym: *Gymnosphaera glabra* Bl., Enum.Pl. Jav. 242. 1828.

*Exsiccatu*s: Phusrey, 2200 m, **SR Lepcha & AP.Das**, 04066, dated 07.08.2003.

Cyathea Smith.

Cyathea spinulosa Wallich ex Hook., Spec. fil., 1: 25, t. 12C, 1844; Bedd., Handb. Ferns Brit. India 6, t. 3. 1883; Clarke in trans. Linn. Soc. London II, Bot., 1: 429.1880; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.124. 2008.

*Exsiccatu*s : Talkharka, 1700 m, **SR Lepcha & AP.Das**, 04070, dated 05..08.2003.

DAVALLIACEAE Reichenb.

Araiostegia Copel

Araiostegia pulchra (Don) Copel. In Phill. Journ. Sci. , 34: 241.1927; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.119. 2008.

Basionym : *Davallia pulchra* Don, Prodr. Pl. Nepal., II, 1825; Clarke in Trans. Linn. Soc. London, II, Bot .1: 443. 1880.

*Exsiccatu*s: Rachel, 2600 m, **SR Lepcha & AP.Das**, 005015, dated 14.10. 2003.

Athyrium multidentata (Bedd.) Copel in Phil. Jour, Soc. 34: 241. 1927; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.120. 2008.

Basionym: *Leucostegia multidentata* Bedd., Ferns Brit. India, suppl., 2. 1876 and Handb. Ferns Brit. India 50. 1883.

*Exsiccatu*s : Dhorok 235000 m, **SR Lepcha & AP.Das**, 04068, dated 10.08.2003.

DENNSTAEDTIACEAE Ching.

Dennstaedtia Bernh.

Dennstaedtia appendiculata (Wall.) J. smith, Hist. fil., 265, 1875; Bedd., Handb. Ferns brit. India (with uppl.) 26. 1892; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.116. 2008.

Basionym : *Dicksonia appendiculata* Wall., List n. 65. 1825; Clarke in Trans. Linn. Soc. London, II, Bot., : 436. 1880.

*Exsiccatu*s : Panglakha below, 2700m, **SR Lepcha & AP.Das**, 05020, dated 1610. 2004.

Dennstaedtia scabra (Wall.) Moore, Index Fil., 1861; Bedd., Handb. Ferns brit. India 24, t. 12. 1883; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.116. 2008.

Basionym: *Dicksonia scabra* Wall., List n. 2173. 1829; Clarke in Trans. Linn. Soc. London II, Bot., 1: 436.1880.

*Exsiccatu*s : Karponang – Kyongnosla, 2300 m, **SR Lepcha & AP.Das**, 06012, dated 10.09.2006.

GLEICHENIACEAE Gaudich.

Dicranopteris Bernh.

Dicranopteris linearis (Burm.) Underwood in bull. Torey Bot. Cl. , 34: 250.1907; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.122. 2008.

Basionym : *Polypodium lineare* Burm., Fl. India 235, t. e. 2. 1768.

*Exsiccatu*s : PWS, upto 2600 m, **SR Lepcha & AP. Das**, 05025, dated 25. 10. 2004.

Gleichenia Smith

Gleichenia glauca (Thbg.) Hook., Spec. fil., 1, 4, t. 3B, 1844; Clarke in trans. Linn. Soc. London II, Bot., 1, 428, 1880; Bedd., Handb. Ferns brit. India (with Suppl.), 2. 1892; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.122. 2008.

Basionym : *Polypodium galucum* Thbg. In Hoult., nat. Hist., 14, 177, 1783.

*Exsiccatu*s: Dhorok 2300 m, **SR Lepcha & AP.Das**, 04070, dated 07.08.2003.

GRAMMITACEAE Presl.

Ctenopteris Blume

Ctenopteris subfalcata (Bl.) Kunze in Bot. Ziet., 6: 120.1948; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.176. 2008.

Basionym: *Polypodium subfalcatum* Bl. Enum. Pl. Jav., 2: 130. 1828; Clarke in Trans. Linn. Soc. London II, Bot., 1: 549.1880.

*Exsiccatu*s: Hangay, 2000 m, **SR Lepcha & AP.Das**, 04072, dated 07.08.2003.

Ctenopteris trichomanoides J. Smith. Hist. Fil., 184. 1875; ; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.177. 2008.

Polypodium trichomanoides Sw. , Prodr. 131. 1788; Clarke in Trans. Linn. Soc. London , II. Bot., 1: 549.1880.

*Exsiccatu*s: Dhorok 2400 m, **SR Lepcha & AP.Das**, 04095, dated 25.08.2003.

HYMENOPHYLLACEAE Gaudich.

Mecodium Presl.

Mecodium exsertum (Wall. Ex. Hook.) Copel. In Phill. Journ. Sci. 67: 23.1938; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.115. 2008.

Basionym: Hymenophyllum exertum Wall., List n. 170, 1828 (*nom. – nud.*); Hook., Spec. Fil., 1: 109, Pl. 38A, 1844; Clarke in trans. Linn. Soc. London II, Bot., 1: 436. 1880.
Exsiccatus: PWS, upto 2700 m, **SR Lepcha & AP.Das**, 05027, dated 12. 10.2004.

Mecodium polyanthus (Sw.) Copel. In Phyll. Journ. Sci., 67: 19.1938; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.115. 2008.

Basionym: Trichomanes polyanthus Sw., Prod. Fil. India Occ., 137. 1788.

Exsiccatus: Rachela, 2400 m, **SR Lepcha & AP.Das**, 04077, dated 10.08.2003.

LINDSAEACEAE Presl.

Lindsaya Dryander

Lindsaya cultrata (Willd.) Swartz, Synopsis Fil., 119. 1806; Bedd., Handb. Ferns brit. India (with suppl.) 72, t. 36, 1892; Clarke in Trans. Linn. Soc. Lond., II, Bot., 1; 450. 1886; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.118. 2008.

Basionym: Adiantum cultratum Willd., Phytogra., 14,t. 10,f.2, 1794.

Exsiccatus: Rigu forests, 1800m, **SR Lepcha & AP.Das**, 04078, dated 13. 08.2003.

Note: Grows compactly on moist rocks or stony walls.

Sphenomeris Maxon

Sphenomeris chinensis (L.) Maxon in Wash, Acad. Sci. Journ. 3: 144. 1913; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.119. 2008.

Basionym: Trichomanes chinensis Linn., Spec. plant., 2: 1099. 1880.

Exsiccatus: Beusa, 1900 m, **SR Lepcha & AP.Das**, 04079, dated 07.08.2003.

LYCPODIACEAE Reichenb.

Lycopodium Linnaeus

Lycopodium selago Linn., Spec. Plant., 1753; Chaudary in trans. Nat. inst. Sci., India, 1: 190.1937; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.101. 2008.

Exsiccatus: Nathang, 3600 m, **SR Lepcha & AP.Das**, 06020, dated 23. 09. 2006..

Lycopodium sikkimensis Herter; Chaudary in trans. Nat. Inst. Sci., India 1: 192. 1937; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.101. 2008.

Exsiccatus: Jalepla – Kupup, 4000 m, **SR Lepcha & AP.Das**, 06021, dated 23.09.2006.

Lycopodium serratum Thunberg, Fl. japon., 341, t.38. 1784; Clarke in Trans. Linn. Soc. London, Bot., 1: 591. 1880; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.101. 2008.

Exsiccatus: Dhorok 2300 m, **SR Lepcha & AP.Das**, 04080, dated 19.08.2003.

Lycopodium phlegmaria Linn., Spec. Plant., 2, 1564. 1753; Clarke in trans. Linn. Soc. London II, Bot., 1: 2. 1880; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.102. 2008.

Exsiccatus: Subanay dara, 1800 m, **SR Lepcha & AP.Das**, 05030, dated 27. 10.2004.

Note: A rare epiphytic (Subanay dara)

OLEANDRACEAE Ching & Pich-serm.

Nephrolepis Schott

Nephrolepis cordifolia (L.) Tent. Pterid., 79, 1836; Bedd., Handb. Ferns Brit. India, 282, t. 144. 1883; Clarke in Trans. Linn. Soc. London, II, Bot., 1: 540.1880; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.121. 2008.

Basionym: *Polypodium cordifolium* Linn., Spec. plant., 2: 1089.1753.

Exsiccatus: *Mulkharka upto 1800m, SR Lepcha & AP.Das, 04082*, dated 25.08.2003.

Oleandra Cavanilles

Oleandra wallichii(Hook.) presl, Tent. Pterid., 78, 1836; Bedd., Handb. Ferns Brit. India , 287,t. 147. 1883; Clarke in Trans. Linn. Soc. London II, Bot., 1. 542.1880; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.121. 2008.

Basionym : *Aspidium waliichianum* Hook., Exotic Fl., 1, t, 5. 1823.

Exsiccatus : *Dhorok 2300 m, SR Lepcha & AP.Das, 04083*, dated 25.08.2003.

Oleandra neriformis Cav. In Ann. Hist. nat., 1, 115. 1799; Bedd., Hanb, Ferns Brit. India, 285,t. 146. 1883; Clarke in trans. Linn. Soc. London ii, Bot., 1. 541.1880; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.121. 2008.

Exsiccatus: *Phusrey, 2200 m, SR Lepcha & AP.Das, 04084*, dated 25.08.2003.

POLYPODIACEAE S.F. Gray(s.str.)

Arthromeris J. Smith

Arthromeris himalayensis (Hook.) Ching in Contrib. Inst. Bot. nat. Acad. Peiping, 2: 99.1933; Alston & Bonner in Candollea 15: 207.1956; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.173. 2008.

Basionym : *Polypodium himalayensis* Hoo., Spec.Fil., 5: 91.1863.

Exsiccatus : *Panglakha,2400 – 3000 m, SR Lepcha & AP.Das, 05055*, dated 27.09.2004.

Arthromeris wallichiana (Spr.) Ching in Contrib. Inst. Bot. nat. Acad. Peiping, 2: 92.1933; Alston & bonner in candollea, 15: 207. 1827; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.173. 2008.

Basionym: *Polydpodium wallichianum* Spr. , Syst., 4: 53. 1872.

Exsiccatus : *Rachela, 2400 m. SR Lepcha & AP.Das, 04085*, dated 25.08.2003.

Phymatodes Presler

Phymatodes griffithiana (Hook.) Ching in Contrib. Inst. Nat. Acad. Peiping, 2, 71. 1933; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.170. 2008.

Exsiccatus: *Dhorok 2300 m, SR Lepcha & AP.Das, 04088*, dated 27.08.2003.

Phymatodes hastata (Thunb.) Ching in Sinensis , 3: 344. 1933; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.170. 2008.

Basionym : *Polypodium hastatum* Thunb., Fl. Japan, 335, 1784; Clarke in trans. Linn. Soc. London, II, Bot., 1, 562. 1880.

Exsiccatus: *Premlakha, 1900 m, SR Lepcha & AP.Das, 05056*, dated 28.098.2004.

Phymatodes malacodon (Hook.) Ching in Contrib. in Ist. Bot. nat. Acad. Peiping, 2:83.1933; Alston & Bonner in Candollea, 15:207.1956; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him. 172. 2008.
Basionym: *Polypodium malacodon* Hook., Spec. Fil., 5:87.1863; Clarke in Trans. Linn. Soc. London., II, Bot. 1, 564.1880.

Exsiccatus: Nathula – Kupup upto 4300 m. *SR Lepcha & AP.Das, 06063*, dated 28.10.2006.

Phymatodes stracheyi Hing in Contrib. Inst. Bot. nat. Acad. Peiping, 2: 83.1933; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him. 172. 2008.

Exsiccatus: Dhorok 2360 m, *SR Lepcha & AP.Das, 04087*, dated 25.08.2003.

Note: A new record for India (Mehra & Bir, 2001),

Polypodium Linnaeus

Polypodium argutum Wallich, List n. 308, 1828 (nom. nud.); Hook., Spec. Fil., 5, 32, 1863; Clarke in Trans. Linn. Soc. London II, Bot., 1, 551. 1880; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him. 167. 2008.

Exsiccatus: Kupto 2700 m. Dhorok 2300 m, *SR Lepcha & AP.Das, 04083*, dated 25.08.2003.

Polypodium microrhizoma Clarke ex Bak. In Hook. & Bak., Syn. Fil., Ed. 2, 511, 1874; Clarke in Trans. Linn. Soc. London, II, Bot. 1, 551. 1880; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him. 167. 2008.

Exsiccatus: Kyongosla 2800 m, *SR Lepcha & AP.Das, 06040*, dated 29.10.2006.

Polypodium lucida (Roxb.) Ching in Contrib. Inst. Bot. nat. Acad. Peiping, 261; 1933; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him. 173. 2008.

Basionym: *Polypodium lucidum* Roxb. In Cal. Journ. Nat. Hist., 4, 486. 1844.

Exsiccatus: Talkharka, 1700 m. *SR Lepcha & AP.Das, 04089*, dated 25.08.2003.

Pyrrosia Mirbel

Pyrrosia mollis (Kze.) Ching in Bull. Chinese Bot. Soc., 1, 53. 1935; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him. 163. 2008.

Basionym: *Niphobolus mollis* Kunze, Bot. Zeit., 121. 1848.

Exsiccata: Rachel, 2600 m, *SR Lepcha & AP.Das, 05080*, dated 27.10.2006.

Pyrrosia stigmosa (Sw.) Ching in Bull. Chinese Bot. Soc. 1, 67. 1935; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him. 165. 2008.

Basionym: *Olypodium stigmatum* Sw., Schrad. Journ., 1800, 21. 1801; Clarke in Trans. Linn. Soc. London. I. Bot., 1, 553. 1801 (p.p.)

Exsiccatus: Phusrey- Dhorok 2300 m, *SR Lepcha & AP.Das, 04090*, dated 25.08.2003.

PTERIDACEAE (S.F. Gray) Gaudich.

Pteris Linnaeus

Pteris erecta Linn., Mant., 130, 1767; Clarke in Trans. Linn. Soc. London II, Bot., 1, 462. 1880; Bedd. andb., Ferns. Brit. India (with Suppl.) 106, 1892; Alston & Bonner in Candollea, 15. 2002. 1956; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him. 113. 2008.

Exsiccatus: Rachel 2600 m, *SR Lepcha & AP.Das, 05083*, dated 27.10.2004.

Pteris wallichiana Ag., Rec. Spec. Gen. Pterid., 69. 1839, type from Himalayas; Alston & Bonner in Sandollea, 15: 203. 1956; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.115. 2008.
*Exsiccatu*s: Dhorok 2300 m, **SR Lepcha & AP.Das**, 04092, dated 25.08.2003.

SELAGINELLACEAE Mett.

Selaginella Spring

Selaginella monosperma Spring in Mem. Acad. Roy. Sci. , Belgique, 24.135.1850; Alston in Proc. Nat. Inst. Sci., India 2: 228. 1945; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.101. 2008.
*Exsiccatu*s: Panglakha, 2600 m, **SR Lepcha & AP.Das**, 05084, dated 25.08.2003.

Selaginella chrysorrhizos Spr. In Mem. Acad. Roy. Sci. Belgique 24, 189.1850; Alston in Proc. Nat. Inst. Sci. India 11:226.1945; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.101. 2008.
*Exsiccatu*s: Dhorok 2300 m, **SR Lepcha & AP.Das**, 04098, dated 25.08.2003.

THYLYPTERIDACEAE

Thylypteris Schmidel

Thylypteris elwesii (Bak.) Ching in Bull. Fan. Mem. Inst. Boil., 6: 308.1936; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.150. 2008.
Basionym : *Nephrodium elwesii* Baker in Hoover & Baker, syn. Fil., 497, 1874; Clarke in Trans. Linn. Soc. London II, Bot., 1: 516.1880.
*Exsiccatu*s: Singhaney -Dhorok 2200 m, **SR Lepcha & AP.Das**, 04093, dated 25.08.2003.

Thylypteris uliginosa (Kunze) Ching in Bull. Fan. Mem. Inst. Biol. , 6: 342.1936; Holtt., Fl. Malaya. II, 241. 1954; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.152. 2008.
Basionym : *Aspidium uliginosum* Kunze in Linnaea, 20: 6. 1847.
*Exsiccatu*s : Rachela, 2500 m, **SR Lepcha & AP.Das**, 05088, dated 27.10.2004..
Note : Collected from the base of tree trunk (upto 3900 m)

VITTARIACEAE Presl.

Vittaria J. Smith

Vittaria elongata Swartz, Syn. Fil., 109, 302, 1806; Clarke in trans. Linn. Soc. London II, Bot., 1, 573. 1880; Bedd., Handb. Ferns Brit. India (with Supl.) 404, t238, 1892; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.106. 2008.
*Exsiccatu*s : On way to Singhaney, 2300 m, **SR Lepcha & AP.Das**, 05090, dated 29.10.2004..

Vittaria flexuosa Fee, 3 me. Mem., 16. 1851 – 52; Clarke in trans. Linn. Soc. London , II, Bot. 1: 574. 1880; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.107. 2008.
*Exsiccatu*s Dhorok 2300 m, **SR Lepcha & AP.Das**, 04096, dated 25.08.2003.

Vittaria himalayensis Ching in Sinensia 1; 190. 1931; Alston & Boner in Candollea 15: 199. 1956; Bir in Trans. Bull. Punjab Univ. (N.S.) 13: 20. 1962b. Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.106. 2008.

*Exsiccatu*s: Phusrey - Dorok 2300 m, *SR Lepcha & AP.Das*, 04097, dated 25.08.2003.

WOODSIACEAE Ching.

Daicalpe Blume

Daicalpe aspidiodes Bl., Enum. Pl. Jav., 241, 1828; Bedd., Handb. Ferns Brit. India 18, 1883; Clarke in Trans. Linn. Soc. London, II, Bot., 1, 434, 1880; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.125. 2008.

*Exsiccatu*s : Karponang – Kyongnosla, 2700 m, *SR Lepcha & AP.Das*, 06038, dated 20.09.2006.

Paranema D. Don

Paranema cyatheoides D. Don, Prodr. Fl. Nepal, 12, 1825; Clarke in Trans. Linn. Soc. London II, Bot., 1, 435, 1880; Bedd., Handb. Ferns Brit. India, 22,t. 11, 1883; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.125. 2008.

*Exsiccatu*s Dhorok – Rachel, 2500 m, *SR Lepcha & AP.Das*, 04099.dated 29.08.2003.

Woodsia R. Brown

Woodsia elongata Hook., Spec. Fil., 1, 62,t. 21C, 1844; Clarke in Trans. Linn. London, II, Bot., 1, 435, 1880; Bedd., Handb. Ferns Brit. India 22, t. 11, 1883; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.125. 2008.

*Exsiccatu*s: Chhangu – Sherabthang, 3200 m, *SR Lepcha & AP.Das*, 05087, dated 29.10. 2004.

Note : Extremely common

Woodsia lanosa hook., Syn. Fil., 47, 1866; Clarke in Trans. Linn. Soc. London, 1, 435, 1880; Bedd., Handb. Ferns Brit. India, 22,1883; Mehra & Bir, Pteridophyt. Fl. Darjeeling & Sikkim Him.125. 2008.

*Exsiccatu*s : Nathula – Kupup, 4200m, *SR Lepcha & AP.Das*, 06058, dated 29. 10.2006.

6.5. GYMNOSPERMS

The forest of alpine East Sikkim including PWS also do possess some conifer species. *Taxus baccata* and *Tsuga dumosa* are the most prominent species of the sanctuary in altitude ranging between 2300 – 3500 m altitude. The aril of *Taxus baccata* are used medicinally (Biswas & Chopra 1956). Also, the arils are crushed and eaten as expectorant, carminative and tonic (Rai *et al* 1998). However, the leaves are poisonous to cattle.

Significantly, the *Cryptomeria japonica* and *Pinus longifolia* are two exotic species and often put into extensive plantation near by road sides and also inside the forests area in large scale in the altitude ranging between 2400 - 3600m. These plantations support very little undergrowth (Das & Lahiri 1997). Leaves and twigs of *Cryptomeria japonica* are used as incense during the Buddhist religious ceremonies in the monasteries, *chorten* in the morning and also in evening prayers It is locally called *dhup* or sang. Other than this, the species are of equally important for the people residing in the vicinity of the sanctuary. The enumerations of the some prominent

CUPRESSACEAE Bartl.

Cupressus corneyana Hort. ex (Knight & Perry, Syn. Conif. 19. 1850, *nom.nud.*) Carriere, Traite, Gen. Conif. 128. Jun.1855; Hara *et al*, Enum. Fl. Pl. Nepal 1: 27. 1978; Grierson & Long, Fl. Bhutan 1(1): 52. 1983. *Cupressus cashmeriana* Royle ex Carriere, Traite Gen. Conif.ed.2: 161.1867. *Cupressus funebris auct. non.* Endl. K. Koch, Dendr. 2(2): 160.1873; Hook.f., in Fl. Brit. Ind.5: 646. 1888.

English Name: :Weeping-cypress.

Evergreen tree up to 30m, stem bark fissured, branches pendulous. Leaves scale like on branchlets, ovate, smaller than those of main shoots. Male cone oblong, pale brown. Female cone globose when young, 0.3-0.5cm across; stalks 0.5-0.6cm; scales 0.5-0.8cm across on their outer face, flat with a blunt plug at center.

Flower & Fruit : July – November
Exsiccatus : Padamchen, 2000m. **SR Lepcha & AP. Das 3550**, dated 27.10.2008.
Status : Plantation
Local Distribution : Gangtok, Karponang, 1800 – 2500 m.
General Distribution : E.HIMALAYA, INDIA, NEPAL, BHUTAN, S.TIBET. **Endemic to Bhutan.**
Uses : Cultivated as noted sacred tree in other places.

Juniperus recurva Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 55. 1825; Hook.f., Fl. Brit. India 5: 647. 1888; Hara, Fl. E. Him. 2: 13. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 28. 1978; Grierson & Long, Fl. Bhutan 1(1): 54. 1983. *J. exelsa auct. non.* Bieb: Brandis, For. Fl. Ind. 538. t. 68. 1874. *J. macropoda auct. non.* Boiss., Hook.f. in Fl. Brit. India 5: 647.1888.

Local name: *Bhairung-pati* (Nep.) *Chukboo*, *Song- Yang* (Lep.) .

Shrubs spreading or prostrate stem. Bark flaky brown; shoots long or recurved. Leaves in whorls of 3, appressed, 0.10 - 0.2cm broad, 0.3 - 0.6cm long and scarcely overlapping on shoot apex. Male cones

oblong, 0.4 - 0.3 x 1.8 - 2.5 cm of 8 - 12 ovate scales. Female cones globose, ovoid at maturity, black with tips of 3 scales at apex.

- Flower & Fruit* : May - October
Exsiccatus : KAS, 3600m, **SR Lepcha & AP. Das 3552**, dated 27. 10. 2008.
Status : Threatened due to excessive collection.
Local Distribution : Dongkyala, KAS, not below 3600 m.
General Distribution : HIMALAYA (KASHMIR-BHUTAN), ASSAM, MYANMAR, W.CHINA.
Note : Dried twigs are being used as incense, during Buddhist ceremonies.

Thuja orientalis L., Sp. Pl. 1002. 1753; Sahni, Gymn. Ind. 110. t. 26. f. 2. 1990; Grierson & Long, Fl. Bhutan 1(1): 54. 1983. *Biota orientalis* (L.) Endl. syn. conif. 47. 2847. *Platycladus stricta* Spach., Hist. Veg. Phan 11: 335. 1842.

Local name: Chapte-dhupi (Nep.)

Tree upto 13 m tall. Stem forming roughly conical crown, brown, fissured horizontally; bark dull red brown. Leaves evergreen, decussate, lamina 0.3 - 0.4 cm long, broadly ovate, triangular scale like, bluntly pointed. Female cone 2 x 1 cm, blue-glaucous to gray, flask shaped; scales upto 8, decussate, oblong-elliptic, basally attached, thinly woody with a down curved hooked tip, each bearing 1 - 2 ovules. Seeds wingless.

- Flower & Fruit* : Most of the year.
Exsiccatus : Padamchen, 1900m, **SR Lepcha & AP. Das 3555**, dated 28.10.2008.
Status : Planted for its beautiful foliage and crown.
Local Distribution : Padamchen, 100 - 2400 m.
General Distribution : A native of CHINA and JAPAN.

TAXACEAE S.F. Gray

Taxus baccata L., Sp. Pl. 1040. 1753; Hook.f., Fl. Brit. Ind. 5: 648. 1888; Hara *et al*, En. Fl. Pl. Nepal 1: 8.1978; Grierson & Long, Fl. Bhutan 1(1): 56.1983. Subsp *wallichiana* (Zucc.) Pilger in Engler, fl.reich IV-5, Ht.18: 112. 1903; Satake in Hara, Fl. E. Him.40. 1966; Op.at.2: 11. 1971. *Taxua nucifera* act.non.L.Wall; Tent.Fl. Nepal:57,t.44.1826. *Taxus wallichiana* Zucc. In Abh,Bayar kad.Wiss.3:803,1:5.1843; Kitamura in Kihara in Fauna.Fl.Nepal Himal 81.1955.

Local name: Cheongboo (Lep.) Dhyengre-salla (Nep.)

Tree up to 12m. Leaves linear flattened, 1- 2.5 x 0.13 - 0.20 cm, spiny tipped, curved, dark green above, silver beneath. Male cones ovoid, 0.7 - 0.9 cm across. Female cones ovoid, 0.2 - 0.6 cm. Fruits red, fleshy, often concealing the single seed.

- Flower & Fruit* : April - October
Exsiccatus : Nathang towards Chukya Cho, 3600 m, **SR Lepcha & AP. Das 3556**, dated 28.10. 2008.
Status : Less common
Local Distribution : Nathang towards Chukya Chu, upto 3700 m.
General Distribution : HIMALAYAS, INDIA, NEPAL, BHUTAN, N.MYANMAR, INDO-CHINA, W. CHINA, MALAYSIA.

TAXODIACEAE Warming

Cryptomeria japonica (L.f.) D. Don in Trans. Linn. Soc.18: 167, t. 13. f. 1. 1841; Wilson, Conif & Tax. Jap. 66. 1916; Journ. Arn. Arb.7: 59. 1926; Hara, Fl. E. Him. 41. 1966; Hara *et al*, Enum. Fl. Pl. Nepal 1: 27. 1978; Grierson & Long, Fl. Bhutan 1(1): 51. 1983. *Cupressus japonica* L.f., Suppl. Pl. 421. 1781.

Local name: Chunden (Lep.) Dhupi (Nep.)

Evergreen tree to 30 m. Stem brown, peeling off in long strips. Branches spreading, forming a narrow conical crown towards apex. Leaves in wardly curved, 0.6 - 1 cm, 4-angular, acuminate, shortly decurrent at base, arranged spirally on twigs. Male cones oblong, 0.3 - 0.5 x 0.2 - 0.3 cm, pale brown. Female cone 1.2 - 1.6 cm, scales divided apically into 3-6 teeth, bracts exserted, mostly adnate to scale but free at triangular apex.

Flower & Fruit : February – May.

Exsiccatus : Kyongnosla, 2700 m, *SR Lepcha & AP. Das 3560*, dated 03.11.2008

Status : Planted by the department of Forest

Local Distribution. : Karponang, Kyongnosla, 1000 – 2200 m.

General Distribution : E.HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, MALAYSIA, JAPAN, CHINA.

PINACEAE Lindley

Abies Miller

Abies densa Grieff Notol.4: 19; Grierson & Long, Fl. Bhutan 1(1): 50. 1883. *Abies spectabilis* (D.Don.) Mirb.in Mem.Mus.Hist.Nat.Paris.13:70.1825; *Pinus spectabilis* D.Don.in Lambert.Descr.Gen.Pinus.2:3, t.1824.*Pinus webbiana* Wall ex D.Don.Prodr.Fl.Nepal.55.1825. *Abies webbiana* Lindl in Penny.Cycl.1:30.1833.nom.illegit; Hook.f. Fl.Brit.Ind.5:654.1888..

Local name: Tungshing kung (Lep.) Gobre-salla (Nep.)

Tree evergreen up to 30m tall. Branches wide spreading. Leaves linear, flattened, spirally arranged, 2.5 – 5 x 0.4 - 0.6cm, green above, whitish beneath, apex rounded and notched. Malecones c3 x 0.6cm. Female cones ovoid at first, cylindrical on maturity, 6.5 -13 x 2.5 - 9cm; ovuliferous scales c3cm broad. Seeds ovoid, bearing a spatulate wing.

Flower & Fruit : April – July

Exsiccatus : Chhukya cho area, 3550 m, *SR Lepcha & AP. Das 3561*, dated 03.11.2008

Status : Frequent

Local Distribution : Chhukya chu, 2200 – 3600 m.

Geneneral Distribution : AFGANISTHAN, HIMALAYAS; INDIA, NEPAL BHUTAN, TIBET.

Note : The species is a potential wood for making valuable furniture.



6.6. ANGIOSPERMS

The angiospermic flora presented here following the classification of Arthur Cronquist (1988). A schematic arrangement of the recorded families in the Flora of Pangolakha Wildlife Sanctuary has been presented below following this system of classification.

Class: Magnoliopsida

Subclass: Magnoliidae

Order: *Magnoliales*

Magnoliaceae

Order: *Laurales*

Lauraceae

Order: *Piperales*

Piperaceae

Order: *Aristolochiales*

Aristolochiaceae

Order: *Illiciales*

Schisandraceae

Order: *Ranunculales*

Ranunculaceae

Berberidaceae

Podophyllaceae

Lardizabalaceae

Menispermaceae

Order: *Papaverales*

Papaveraceae

Fumariaceae

Subclass: Hamamelidae

Order: *Daphniphyllales*

Daphniphyllaceae

Order: *Urticales*

Moraceae

Urticaceae

Order: *Juglandales*

Juglandaceae

Order: *Fagales*

Fagaceae

Betulaceae

Subclass: Caryophyllidae

Order: *Caryophyllales*

Phytolaccaceae

Chenopodiaceae

Amaranthaceae

Caryophyllaceae

Order: *Polygonales*

Polygonaceae

Subclass: Dilleniidae

Order: *Theales*

Theaceae

Hypericaceae

Order: *Malvales*

Elaeocarpaceae

Malvaceae

Order: *Nepentales*

Droseraceae

Order: *Violales*

Flacourtiaceae

Stachyuraceae

Violaceae

Cucurbitaceae

Begoniaceae

Order: *Salicales*

Salicaceae

Order: *Capparales*

Brassicaceae

Order: *Ericales*

Ericaceae

Vacciniaceae

Monotropaceae

Order: *Ebenales*

Symplocaceae

Order: *Primulales*

Myrsinaceae

Primulaceae

Subclass: Rosidae

Order: *Rosales*

Hydrangeaceae

Grossulariaceae

Crassulaceae

Saxifragaceae

Parnassiaceae

Rosaceae

Order: *Fabales*

Mimosaceae

Fabaceae

Caesalpiniaceae

Order: *Proteales*

Elaeagnaceae

Order: *Myrtales*
Sonneratiaceae
Onagraceae
Melastomataceae

Order: *Cornales*
Nyssaceae
Cornaceae

Order: *Santalales*
Santalaceae
Loranthaceae

Order: *Celastrales*
Celastraceae
Aquifoliaceae

Order: *Euphorbiales*
Buxaceae
Euphorbiaceae

Order: *Rhamnales*
Rhamnaceae
Leeaceae
Vitaceae

Order: *Linales*
Linaceae

Order: *Sapindales*
Staphyleaceae
Aceraceae
Burseraceae
Anacardiaceae
Rutaceae

Order: *Geraniales*
Oxalidaceae
Geraniaceae
Balsaminaceae

Order: *Apiales*
Araliaceae
Apiaceae

Subclass: Asteridae

Order: *Gentianales*
Gentianaceae
Asclepiadaceae

Order : *Solanales*
Solanaceae
Convolvulaceae
Cuscutaceae

Order: *Lamiales*
Boraginaceae
Lamiaceae

Order: *Plantaginales*
Plantaginaceae

Order: *Scrophulariales*
Buddlejaceae

Oleaceae
Scrophulariaceae
Gesneriaceae
Acanthaceae
Lentibulariaceae

Order: *Campanulales*
Campanulaceae
Lobeliaceae

Order: *Rubiales*
Rubiaceae

Order : *Dipsacales*
Sambucaceae
Caprifoliaceae
Valerianaceae
Dipsacaceae
Morinaceae

Order: *Asterales*
Asteraceae

Class: **Liliopsida**

Subclass: Arecidae

Order: *Arales*
Araceae

Subclass: Commelinidae

Order: *Commelinales*
Commelinaceae

Order : *Juncales*
Juncaceae

Order : *Cyperales*
Cyperaceae
Poaceae

Subclass: Zingiberidae

Order: *Zingiberales*
Zingiberaceae
Musaceae

Subclass: Liliidae

Order: *Liliales*
Convallariaceae
Hypoxidaceae
Uvulariaceae
Liliaceae
Uva
Melanthiaceae
Trilliaceae
Iridaceae
Smilacaceae
Dioscoreaceae

Order : *Orchidales*
Orchidaceae

6.6.1. ENUMERATION OF ANGIOSPERMIC FLORA

Class: Magnoliopsida

Subclass: Magnoliidae

Order: Magnoliales

MAGNOLIACEAE A.L. Jussieu

Key to the Genus:

- 1. Flowers terminal, carpels densely crowded on receptacle *Magnolia*
- + Flower axillary, carpels forming a loose spike *Michelia*

Magnolia Linnaeus

Key to the species:

- 1. Tree upto 10m tall, lateral nerves upto 8 pairs *M. globosa*
- + Tree upto 45 m tall, lateral nerves upto 14 pairs *M. campbellii*

Magnolia campbellii Hook.f.& Thoms., Fl. India 1: 77. 1855; in Hook.f., Fl. Brit. India 1: 41. 1872; Hara & Ohashi in Fl. E. Him.95. 1966; 2: 36. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 24. 1972; Grierson in Grierson & Long, Fl. Bhutan 1(2): 234. 1984; Sharma *et al.*, Fl. India 4: 166. 1997

Local Name: Ghoge champ (N).

Trees perennial upto 45m tall. **Lamina** 22 – 33 x 8 – 12 cm, elliptic-oblong subovovate to ovate base, cordate or rounded, apex acute or acuminate, glaucous pubescent or silky beneath; lateral nerves 11 - 14 pair petioles ca. 4.2cm long. pilose stipules. **Flowers** appears before leaves, solitary terminal erect bract spathaceous ovate to obovate, caducous perianth part 12 - 16 obovate, outer yellow inner one white with purple or pink at base, **stamens** numerous, purplish, free; **anthers** connectives produce into an appendage; **carpels** sessile, numerous, purplish, ovoid; fruiting carpels compresses laterally; **seeds** ovoid.

<i>Flower</i>	: February	<i>Fruit:</i>	August
<i>Exsiccatus</i>	: Singaney, <i>SR Lepcha & AP Das</i> 250, dated 16.05.2003.		
<i>Status</i>	: Threatened		
<i>Local distribution</i>	: Singaney, 2250-2700m		
<i>General distribution</i>	: HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, MYANMAR, YUNNAN.		

- Note* : 1. The timber is immensely durable and has a great demand for planking, doors, window frames, furniture.
2. The species is also of ornamental importance.

Magnolia globosa Hook.f. & Thoms, Fl. India 1: 77. 1855; in Hook.f., Fl. Brit. India 1: 41. 1872; Hara & Ohashi in Fl. E. Him. 95. 1966; Grierson in Grierson & Long, Fl. Bhutan 1(2): 234. 1984; Sharma *et al.*, Fl. India 4: 167. 1997

Trees small; young branches tomentose. **Leaves** glabrous, ovate elliptic, base rounded or obtuse acute and mucronate, subcoracious glaucous and brownish tomentose at nerve beneath, lateral nerve 8 pair petioles long flower buds globose, appearing with leaves. **Flowers** pendulous cream to white colored odor. **Perianth** parts ca 9, broadly ovate, **stamens** numerous crimson coloured; anthers oblong, truncate at apex ca 0.8cm long. **Carpels** free, 12-20, elliptic ovoid; fruiting carpels ellipsoid, compressed angular, rounded at base, ca 23 mm long beaked at apex, dorsally dehiscent; **seeds** 2 rounded at base.

Flower : May. *Fruit:* August.
Exsiccatus : Dohrok, **SR Lepcha & AP. Das** 31156, dated 03.10.2004.
Status : Threatened
Local Distribution : On way to Rachel, in between 2800 – 3400 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, TIBET, MYAMAR, YUNNAN.

Note : 1. The timber is used in house building.
 2. The species is also cultivated for an ornamental.

Michelia Linnaeus

Key to the species:

1. Tree upto 30m tall, buds lanceolate, perianth 12 part *M. doltsopa*
 + Tree upto 15 m tall, buds oblong, perianth 9 part *M. cathcartii*

Michelia doltsopa Buch.-Ham, ex D. Don, Cyst Nat 1: 448. 1817; Hara & Ohashi in Fl. E. Him. 96 1996.; 2: 37. 1971; Hara *et al.* Enum Fl. Pl. Nepal, 2: 25. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 235. 1984; Sharma *et al.*, Fl. India 4: 177. 1997. *Magnolia excelsa* Wall., Tent. Fl. Nepal, s, t. 2. 1824. *Sampacca excelsa* (Wall.) Kuntze, Rav, Gen, Pl. 1: 6. 1891. *Michelia excelsa* (Wall.) Blume, Fl. Jav .9. 1824.

Local Name: Rani champ (Nep.)

Trees perennial upto 30m tall deciduous. **Leaves** elliptic to ovate lanceolate, cuneate to slightly rounded at base acute to acuminate at apex glabrous shiny glaucous and minutely pubescent beneath, lateral nerves usually 7 - 10, pairs arched; petioles upto 3 cm long, glabrous stipules oftenly oblong-acuminate, silky outside stipular sears 3.5mm long. **Flowers** axillary rarely spuriously terminal, fairly scented, white, buds lanceolate, apiculate, **bracts** 2, oblong ovate **perianth** parts 12, spatulate to obovate, while outer ones larger, gradually, narrower, towards center; **stamen** 45 - 80, yellowish, filaments short, connective produced into short appendage; receptacles elongate; carpels stipulate, minutely tomentose, **ovules** 2 - 4 in carpel, fruiting carpel shortly beaked; seeds 1 - 2, red, compressed.

Flower : July – August *Fruit:* September – October
Exsiccatus : Dohrok – Phusrey, **SR Lepcha & AP. Das** 30247, dated 06.10.2004.
 NNP& PWS border, **SR Lepcha & AP. Das** 31175, dated 03.10.2004.
Status : Rare & Threatened
Local Distribution : Dhorok, Singhaney, ; 2100 – 2500 m.
General Distribution : INDIA, NEPAL, BHUTAN, TIBET, MYAMAR, YUNNAN.
Note : The timber is remarkably durable for making furniture..

Michelia cathcartii Hook.f., Thoms., Fl. India 79.1855 & in Fl. Brit. India 1:42.1872; Sharma *et al.* Fl. India 4: 177. 1997. *Alcimandra cathcartii* Hook.f. & Thoms. in Fl. India 79.1855 & in Hook.f., Fl. Brit. India 1: 42.1872; Grierson in Grierson & Long, Fl. Bhutan 1(2): 237.1984.

Local Name: Gok (Lep.), Tite Champ (Nep.)

Trees ever green upto 15m tall, **branches** tomentose when young. **Lamina** 8 – 12 x 2.5 – 6 cm, elliptics to lanceolate, cuneate, acute to acuminate apex subcoriaceous, base rounded or cuneate. **Flowers** creamy white – usually reddish when dried, terminal fragrant, buds oblong, pedicel stout ca-2.5cm long, perianth 9 parts. **Stamens** ca 40 or more. **Filaments** short. **Gynoecium** stipitate. **Carpels** sessile.

Flower & Fruit : March – August

Exsiccatus : Dohrok **SR Lepcha & AP. Das** 30268, dated 07.10.2004.

Status : Rare & Threatened

Local Distribution : Phusrey

General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, VIETNAM.

Note : Timber is used in house construction.

Order: Laurales

LAURACEAE A.L. Jussieu

Key to the Genera:

1. Shoots with conspicuous terminal vegetative buds 2
- + Shoots without conspicuous terminal vegetative buds 3
2. Flower unisexual 4
- + Fruit bisexual 3
3. Leaves pinnately veined 5
- + Leaves strongly 3-veined *Neocinnamomum*
4. Umbels sessile 7
- + Umbels pedunculate *Actinodaphne*
5. Perianth cup shaped or tubular 6
- + Perianth ovate..... *Cinnamomum*
6. Perianth cup shaped *Phoebe*
- + Perianth tubular *Litsea*
7. Leaves pinnately veined *Litsea*
- + Leaves 3- veined from above base *Neolitsea*

Litsea Lamarck (*nom. cons.*)

Key to the species:

1. Leaves lanceolate, elliptic lanceolate in outline; Fruit sub-globose 2
- + Leaves obovate in outline; fruit ellipsoid *L. elongata*
2. Shrubs or small tree strongly aromatic; lateral nerves 8 - 13 pairs *L. cubeba*
- + Trees non -aromatic; lateral nerves 10 - 17 pairs *L. sericea*

Litsea elongata (Nees) Hook.f., Fl. Brit. India 5: 165. 1885; Hara in Fl. E. Him 2: 101. 1966; 2: 39. 1971; 3:42. 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 185. 1982; Long in Grierson & Long, Fl. Bhutan 1(2): 275. 1984. *Daphnidium elongatum* Nees in Wallich, Pl. Asiat. Rar. 2: 63. 1831.
Local Name: Thulo Pahenlay (Nep.).

Trees robust upto 18 m tall. Branch-lets often tomentose, brownish. **Leaves**; petioles to 1.5cm long; obovate, **lamina** 6.5 - 15 x 3 - 7.5 cm, acute or obtuse, base cuneate, tomentose, pinnately veined, lateral nerves upto 13 pairs, distinct in lower surface; peduncles to 2.3 cm long. **Umbels** solitary with silky pubescent; pedicels to 0.8 cm long. **Perianth** segments oblong; **filaments** 0.45 cm, slightly villous. **Fruits** to 1.5 cm, ellipsoid.

Flower : September - November *Fruit*: June - April.
Exsiccatus : Rachela below 2240m, **SR Lepcha & AP. Das** 32908, dated 27.10. 2004

Status : Common.

Local Distribution : Middle Rachela, 1800 - 2600 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, W. & S. CHINA.

Note : The species is a good fodder for cattle.

Litsea cubeba (Lour.) Persoon, Pl. 2(1): 4. 1806; Hara *et al.* Fl. E. Him. 1: 101. 1966; 2: 38. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 3: 185. 1982; Long in Grierson & Long, Fl. Bhutan 1(2): 274. 1984. *Laurus cubeba* Lour., Fl. Cochinch. 1: 252. 1790. *L. citrata* Bl., Bijdr. 565. 1825; Hook.f. in Fl. Brit. India 5: 155. 1885.

Local Name: Siltimbur (Nep.).

Shrubs or a small trees aromatic upto 5m tall. **Stem** usually glabrous, blackened when dry. **Lower leaves** opposite, upper alternate; petioles to 0.13 cm, slender; **lamina** lanceolate, entire-half lanceolate, entire-half contortate 5.5 - 13 x 1.8 - 2.5 cm, acuminate, cuneate, upper surface green above, lower surface glaucous, glabrous both sides, nerves distinct, lateral veins obliquely ascending, 10 - 17 pairs. **Inflorescence** usually umbels in clusters of 3 - 4, 4 - 10 flowered, in short peduncled; pedicels white, pubescent. **Flowers** hairy; **perianth** toothed, tube slightly reduced at base. **Fruits** subglobose.

Flower : December - February *Fruit*: March - May .

Exsiccatus : Below Rachela 2400 m, **SR Lepcha & AP. Das** 31179, dated 3.10. 2004.

Status : Less Common.

Local Distribution : Middle Rachela. 2200 - 2550 m.

General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, JAVA, TONKIN, W. & C. CHINA.

Note : The fruit is edible and also medicinal.

Litsea sericea (Nees) Hook.f, Fl. Brit. India 5: 156. 1885; Hara in Fl. E. Him. 1: 102. 1966; 2: 39. 1971; 3: 42. 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 186. 1982; Long in Grierson & Long, Fl. Bhutan 1(2): 273. 1984. *Tetranthera sericea* Nees in Wallich, Pl. Asiat. Rar. 2: 67. 1831; Prodr. 15 (1): 181. 1864. *Litsea oreophila* Hook. f., Fl. Brit. India 5: 156. 1885.

Local Name: Lekh Timbur (Nep.).

Trees with stout branches. Juvenile shoots often hairy, silky. **Leaf-buds** slightly punctuate; petioles to 2.4 cm long; **lamina** elliptic-lanceolate, 5 - 9.8 x 1.6 - 4.2 cm, acute to acuminate, base acute, silky tomentose; lateral nerves 8 - 13 pairs, slightly impressed in upper surface,

distinct prominent in lowers surface; peduncles brownish, hairy.; bracts glabrous. **Flowers** in umbels; perianth segments rounded, basally hairy within; **stamens** 12; filaments hairy; **ovary** ovoid; style short. **Fruits** sub-globose with persistent small flat perianth tube; Fruit pedicel with both stout and longer.

Flower & Fruit : March – April *Fruit*: September - October
Exsiccatus : Jorepokhri 2650 m, **SR Lepcha & AP. Das 32909**, dated 27.10. 2004.
Status : Common
Local distribution : Jore pokhri 2100 – 3200 m.
General distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Actinodaphne Nees

Actinodaphne longipes Kosterm. in Reinwardtia 9: 98. 1974; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 182. 1982; Long in Grierson & Long, Fl. Bhutan 1(2) : 281. 1984. *A. reticulata* Meisn. var. *glabra* Meisn. in DC. Prodr. 15: 1. 212. 1864; Hook.f. in Fl. Brit. India 5: 147. 1885; Hara in Fl. E. Him. 1: 99. 1966.

Local Name: Lali Kawlo (Nep.).

Trees with juvenile branches often tomentose. **Leaves** usually in whorl; petiole to 1.2 cm, glabrous, pubescent; lamina 6 – 27 x 1 – 4 cm, narrowly elliptic-lanceolate, entire, acuminate, cuneate, coriaceous, glabrous, upper surface dark green, lower slightly pale, distinct reticulate nerves on both sides, lateral nerves 13 - 24 pairs. **Flowers** unisexual, clustered, light yellow; **perianth** segments 6, sub-equal, tube short; **stamens** 6, introrse; filaments glabrous; **anthers** 4-loculate. **Fruits** broadly ellipsoid; Fruit pedicels to 3 cm.

Flower : November *Fruit*: March – May
Exsiccatus : Singhaney 2350 m, **SR Lepcha & AP. Das 32912**, dated 27.10.2004.
Status : Common
Local Distribution : Rigu, Hangey, 1800 – 2500 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : Endemic to Eastern Himalaya.

Cinnamomum Schaeffer *

Cinnamomum impressinervium Meisn. in DC., Prodr. 15(1): 21. 1864; Hara in Enum. Fl. Pl. Nepal 3: 183. 1982; Long in Grierson & Long, Fl. Bhutan 1(2): 258. 1984.

Local Name: Khorsanay (Nep.).

Trees stout. **Branches** spreading, slender; juvenile buds silky. **Leaves** opposite; petiole to 1.3 cm, slender; **lamina** elliptic-lanceolate, 5 - 13 x 15 – 4 cm, curved downwards, entire, long acuminate, base slightly acute, lower surface pale, both surfaces glabrous, -3 nerved, nerves prominent in upper surface. **Panicles** with few flowered, oftenly pubescent. **Flowers** greenish-yellow; **Fruit perianth** cupular, segments 0.3 cm. **Fruits** obovoid to globose.

Flower : June - July *Fruit*: October - December.
Exsiccatus : Rachila below, 2450 m, **SR Lepcha & AP. Das 32913**, dated 27.10. 2004.
Status : Common.
Local Distribution : Rachela Durpinay, 2100 – 2600 m.

General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Neocinnamomum Liou

Neocinnamomum caudatum (Wall. ex Nees) Merr. in Contrib. Arn. Arb. 8: 64. 1934; Hara et al., Enum. Fl. Pl. Nepal 3: 186. 1982; Long in Grierson & Long, Fl. Bhutan 1(2): 260. 1984. *Cinnamomum caudatum* Wallich ex Nees in Wallich, Pl. Asiat. Rar. 2:76. 1831; Hook.f. in Fl. Brit. India 5:134. 1886.

Local Name: Khorsanay (Nep.).

Shrubs with slender, spreading branching. Stem brownish-red, glabrous. **Petioles** to 15 cm, slender; lower leaves alternate, sub-opposite towards apex; **lamina** 8.8 - 13 x 3.3 - 5.7 cm, narrowly elliptic, entire, half contorted, obtusely caudate-acuminate, base acute, 3-nerved, nerves distinct and slightly elevated in lower surface. **Inflorescence** with reduced cymes, axillary, with few flowered. **Flowers** bisexual; **perianth** usually 6-lobed, funnel-shaped; stamens 9 (6 introrse + 3 extrorse); **anthers** 4-celled. **Fruits** globose.

Flower & Fruit : July – January

Exsiccatus : Sokpa pokhri 1900 m, **SR Lepcha & AP. Das 32911**, dated 29.10.2004

Status : Frequent.

Local Distribution : Beusa, Bekchung, Subaney 1700 – 2300 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA

Neolitsea (Bentham) Merrill

Neolitsea cuipala (D. Don) Kosterm. in Bull. Bot. Surv. India 10: 287. 1968; Momiyama in Hara in Fl. E. Him. 3: 42. 1972; Chater in Enum. Fl. Pl. Nepal 3: 186. 1982; Long in Grierson & Long, Fl. Bhutan 1(2): 278. 1984. *Tetranthera cuipala* D. Don, Prodr. 65. 1825. *Litsea lanuginosa* (Wallich ex Nees) Nees, Syst. Laurin. 634. 1836; Hook.f. in Fl. Brit. India 5: 178. 1886. *L. cuipala* (D. Don) Nees, Syst. Laurin. 638. 1836; Journ. Bomb. Nat. Hist. Soc. 63: 329. 1966.

Trees small, deciduous. Stem slightly with whitish hairs. **Leaves** alternate or sometimes crowded in terminal whorls; petiole 0.4-1.3 cm; **lamina** oblanceolate, 3.3 - 13 x 0.5 - 3.8 cm, entire, long acuminate, base attenuate, coriaceous, glabrous both surfaces, 3-nerved. **Umbels** sessile, to 3 cm across, globose and clustered, 4-flowered. **Perianth** segments yellow. **Fruits** with persistent small perianth cup, ellipsoid, **Fruits** pedicels to 0.6 cm.

Flower : February – March *Fruit*: March – October

Exsiccatus : Neora patak 2700 m, **SR Lepcha & AP. Das 32910**, dated 29.10.2004.

Status : Less Common.

Local Distribution : Chitray, Thami dara 2000 – 2700 m.

General Distribution : HIMALAYA; INDIA, (Kashmir to BHUTAN)

Note : Endemic to Eastern Himalaya.

Persea Miller

Key to the species:

1. Leaves elliptic or elliptic-lanceolate; perianth linear-oblong 2
- + Leaves oblanceolate; perianth segments obtuse *P. gammieana*
2. Mid-nerve slightly swollen and raised in lower surface *P. clarkeana*
- + Mid-nerve neither swollen nor raised in lower surface *P. duthiei*

Persea clarkeana (King ex Hook.f.) Kosterm., in Reinwardtia 6: 191. 1962; Hara in Enum. Fl. Pl. Nepal 3: 186. 1982; Long in Grierson & Long, Fl. Bhutan 1(2): 265. 1984. *Machilus clarkeana* King ex Hook.f., Fl. Brit. India 5: 137. 1886. *M. gammieana* Hook. f., Fl. Brit. India 5: 137. 1886; Hara in Fl. E. Him. 2: 39. 1971; 3: 42. 1975.

Local Name: Chiplay Kawlo, Seto kawlo (Nep.).

Trees evergreen. **Leaves** alternate; petioles to 1cm long; **lamina** narrowly elliptic-lanceolate, 7.5 -16 x 1 - 3.2 cm, acuminate, base narrowed, glabrous, brownish on both surface, mid-nerve slightly swollen and prominently raised on lower surface. **Panicles** to 8cm, few flowered, glaucous, in maturity; **peduncles** and pedicels often stout. **Flowers** large; **perianth** to 1 cm across, linear-oblong, glabrous; **filaments** hairy at the base; anthers linear-oblong. **Fruits** globose.

Flower : May - July *Fruit:* August - December.
Exsiccatus : Tungsay 2690m, **SR Lepcha & AP. Das 32914**, dated 29.10. 2004.
Status : Less Common.
Local Distribution : Dorok - Rachel, Premlakha 2400 - 2700 m.
General Distribution : INDIA (Sikkim - Darjeeling), BHUTAN
Note : Endemic to E. Himalaya

Persea duthiei (Hook. f.) Kosterm., Reinwardtia 6: 191. 1962; Hara *et al.*, Enum. Fl. Pl. Nepal 3:186.1982; Long in Grierson & Long, Fl. Bhutan 1(2):266. 1984. *Machilus duthiei* Hook.f. in Fl. Brit. India 5: 861. 1886; Hara in Fl. E. Him. 102. 1966; 2: 39. 1971; 3: 42. 1975.

Trees evergreen to 22 m tall. Branches often compact bud scale scars. **Petioles** to 1.6 cm long; **lamina** elliptic, 13 - 19 x 2.5 - 4.3 cm, acuminate, base cuneate-attenuate, lateral nerves upto 10 - 20 pairs, silky hairy. **Panicles** to 17 cm, sub-erect, usually few flowered and pubescent. **Flowers** to 1cm across; **perianth** segments to 0.6 cm, linear-oblong, greenish. **Fruits** globose.

Flower : February - May *Fruit:* August - November.
Exsiccatus : Phusrey dara, 2250 m, **SR Lepcha & AP. Das 32915**, dated 29.10.2004
Status : Sparse / Less common
Local Distribution : Durpiney NNP border, Hangey, 2000 - 2450 m.
General Distribution : HIMALAYAS, INDIA (Chamba to Sikkim, Meghalaya).
Note : Endemic to Himalaya.

Persea gammieana (King ex Hook.f.) Kosterm. in Reinwardtia 6: 191. 1962; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 186. 1982. *Machilus gammieana* King ex Hook.f., Fl. Brit. India 5: 137. 1886.

Local Name: Seto Kawlo (Nep.).

Tree upto 20m tall with stout branches. **Petioles** upto 3.3 cm long; **lamina** oblanceolate, 9 -19 x 2.4 - 5.5 cm, acuminate, base attenuate, glabrous, lateral veins 10 - 20 pairs. **Panicles** usually with short peduncled, corymbose, few flowered, with spreading branches. **Perianth** segments greenish, obtuse, silky. **Fruits** upto 3.5 cm in diam.

Flower : April - July *Fruit:* August - November.
Exsiccatus : Deorali dara NNP border 2300 m, **SR Lepcha & AP. Das 32916**, dated 29.10.2004.
Status : Less common
Local Distribution : Chandaney, Gumsay 1900 - 2260 m .
General Distribution : E. HIMALAYA; INDIA,(Darjeeling & Sikkim), NEPAL, BHUTAN
Note : Endemic to Eastern Himalaya.

Phoebe Nees

Phoebe lanceolata (Nees) Nees, Syst. Laurin. 109. 1836; Momiyama in Fl. E. Him. 2: 40. 1971; Hook.f. in Fl. Brit. India 5: 141 1886; Long in Grierson & Long, Fl. Bhutan 1(2): 261. 1984. *Ocotea lanceolata* Nees in Wallich, Pl. Asiat. Rar. 2: 71. 1831. *Phoebe angustifolia* Meissn. in DC., Prodr. 15 (1): 34. 1864; Fl. Brit. India 5: 141 1886.

Trees medium sized upto 15 m tall. Bark whitish. **Leaves** alternate; petioles to 3cm, clustered on the branch ends; **lamina** narrowly elliptic or lanceolate, 4.8 - 18 x 2 - 5.8 cm, acuminate, base attenuate, glabrous or thinly pubescent in lowers surface, lateral nerves 6-10 pairs. **Panicles** to 18 cm, aggregated at branch tips. **Flowers** to 0.60 cm in diam., greenish white or yellow; perianth segments ca 0.22 cm, ovate, glabrous. **Fruits** ellipsoid, blackish-purple

Flower & Fruit : April - December.
Exsiccatus : Beusa 1750 m, **SR Lepcha & AP. Das** 32917, dated 29. 10. 2004.
Status : Less Frequent.
Local Distribution : Sikkim-Neora Border. 1200 - 1600 m.
General Distribution : HIMALAYAS; INDIA, BHUTAN, BURMA.

PIPERACEAE C.A. Agardh

Key to the Genera:

1. Erect or diffused herbs; leaf opposite or whorls; drupes sessile *Peperomia*
+. Climber or erect shrubs; leaf alternate; drupe shortly stalked rarely sessile *Piper*

Peperomia Ruiz et Pavon

Key to the species

1. Leaf base rounded; spike terminal; 3 veined form base *P. tetraphylla*
+ Leaf based attenuate; pinntaely veined; spike terminal or axillary *P. heyneana*

Peperomia heyneana Miq., Syst. Pip. 123. 1843; Hook.f. in Fl. Brit. India 5: 99. 1885; Hara in Fl. E. Him. 42. 1966; 2:14. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 181. 1982; Long in Grierson & Long, Fl. Bhutan 1(2): 344. 1984.

Herbs, tufted epiphytic, succulent, glabrous, usually prostrate, upto 20 cm long branches. **Leaves** opposite, 2-4 nate; fleshy, petioles 0.40 - 0.7 cm, glabrous; **lamina** 1 - 2.2 x 0.5 - 1.6 cm, oblanceolate or narrowly obovate, obtuse, base attenuate, pinnately veined with distinct midrib. **Spikes** terminal and axillary, fascicled, to 3.8 cm long, often glabrous.

Flower & Fruit : May - June
Exsiccatus : Rachela, 2680 m, **SR Lepcha & AP. Das**, 02700. 13. 10. 2003
Status : Common
Local Distribution : Phusrey, Rachela below, NVNP border 1500 - 2200 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN.
Note : Endemic to Himalaya.

Peperomia tetraphylla (Forst.) Hook. *et* Arnt., Bot. Beech. Voy. 97. 1832; Hara in Fl. E. Him. 42. 1966; 2: 14. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 181. 1982; Long in Grierson & Long,

Fl. Bhutan 1(2): 344. 1975. *Piper tetraphyllum* Forst. f., Prodr. 5:1786. *P. reflexa* (L.f.) Dietrich, Sp. Pl. 1:180. 1831, non Kunth, Fl. Brit. India 5: 99. 1886.

Herbs succulent, profusely branched upto to 24 cm tall, like epiphytes. **Stem** rooting at lower nodes, ribbed. **Leaves** opposite or in whorls of 4; petioles to 0.5 cm; **lamina** 0.7 - 1.8 x 0.35 - 1cm, obovate-orbicular, obtuse, base rounded, fleshy, 3-veined from base, pubescent. **Spikes** solitary, erect, terminal, densely pubescent. **Flowers** bisexual; stamens 2, reniform. **Drupe**s sessile, ellipsoid.

Flower & Fruit : July – September
*Exsiccatu*s : Rachela middle 2500 m, **SR Lepcha & AP. Das** 30235, dated 07.10.2004.
Status : Abundant.
Local Distribution : Rachela, Panglakha 1400 – 2600 m.
General Distribution : AMERICA, AFRICA, HIMALAYAS; INDIA, NEPAL, BHUTAN, SRI LANKA, CHINA, MALAYSIA.

Piper Linnaeus

Key to the Species:

1. Shrubs 2
- + Climbing *P. mullesua*
2. Leaf base oblique; veins 6 – 10 *P. boehmerifolium*
- + Leaf base rounded; veins upto 5 *P. hamiltonii*

Piper boehmerifolium Wall. [Cat no. 6654 A (1832), *nom. nud.*] ex C. DC., prodr. 16(1): 348. 1869; Hook.f. in Fl. Brit. India 5: 85. 1885; Hara in Fl. E. Him. 1:43.1966: *Chavica boehmerifolia* Miquel, Syst. Piperac. 265. 1843.

Local Name: Bhalay Chabo (Nep.).

Shrubs erect, upto 5m tall. Stems terete or ridged. **Leaves**: petiole to 10 mm, glabrous or sparsely pubescent; lamina 2.5 - 7 x 0.6 – 2cm, elliptic, narrowly elliptic, oblong-lanceolate, or ± ovate, densely glandular, abaxially glabrous, adaxially glabrous, base oblique, apex acute to long acuminate; veins 6 - 10, alternate. **Spikes** mostly leaf-opposed, often terminal in male plants. **Male spikes**, bracts ± orbicular, peltate, glabrous, obconical, shorter than wide; **stamens** 2; **filaments** thick, short; anthers reniform. **Female spikes**; peduncle and bracts as in male spikes; rachis sparsely pubescent; **stigmas** deciduous. **Drupe**s densely clustered, subglobose.

var. *boehmerifolium*

Subshrubs upto 5m tall, glabrous to ± uniformly hairy. Stems ridged when dry, rarely minutely papillate. Petiole 4.5 - 12 mm; **leaf lamina** 9 - 23 x 3.5 - 10 cm, blades elliptic, oblong, oblong-lanceolate, or ± ovate, papery, veins (6 or)7 or 8(or 9). **Female spikes** upto 13cm.

Flower & Fruit : April- July
*Excisecat*us : Dohrok 2300 m, **SR Lepcha & AP. Das** 30235, dated 07.10.2004.
Status : Abundant.
Local Distribution : Dohrok- Phusrey 1500 – 2200 m.
General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, MALAYSIA, THAILAND, VIETNAM

Note : Used as medicine.

Piper hamiltonii C.DC. prodr. 16. 1. 360; Hook.f. in Fl. Brit. India 5: 88.1885; Long in Grierson & Long, Fl. Bhutan 1(2): 351. 1984.

Shrubs, large, climbing. **Stem** deeply striate, when dry. **Leaf**; petiole to 2.4 cm ; coriaceous, pale in dry, elliptic or elliptic obovate, **lamina** 6 – 13 x 3.5 – 7 cm, obtuse, base rounded, 5 – veined, in lower most, 4.5 mm, without lateral veins. **Fruiting spike** interrupted, 10 – 16 cm, on peduncle 1- 2.5 cm. **Drupe** ovoid- subglobose, to 2.8 mm.

Flower : February - May
Excisscatus : Rachela 3000 m, *SR Lepcha & AP. Das* 30288, dated 13.09. 2006.
Status : Frequent.
Local Distribution : Panglakha, Rachela,, Kyongnosla Rachela upto 3100 m.
General Distribution : INDIA, NEPAL, BHUTAN.

Piper mullesua D. Don, Prodr. 20. 1825; Ohashi in Hara Fl. E. Him. 43. 1966; Long in Grierson & Long, Fl. Bhutan 1(2): 347. 1984. *P. brachystachyum* Wall. ex Hook.f., Fl. Brit. India 5: 87. 1885.

Local Name: Peepla (Nep.).

Climbers, branched, ascending. Stems warty in maturity. **Leaves**: petioles to 1.5 cm long; **lamina** 4.5 -13 x 3 – 5.5 cm, ovate-cordate or elliptic-ovate, long acuminate, base rounded or cuneate, glabrescent, basally 5-nerved, lateral nerves 1-2 pairs, prominent. **Inflorescence** in spike , male spikes upto 8.5cm long, erect. Peduncles 0.22 - 0.6 cm long; **bracts** sub-sessile. **Male flowers**: **stamens** 2; **anthers** 2-celled, kidney -shaped. **Female spikes** cylindric or globose. **Stigma** 3. Fruiting spikes much elongated. **Drupes** densely clustered.

Flower & Fruit : March – October.
Excisscatus : NNP boundary 1750 m, *SR Lepcha & AP. Das* 333, dated 03.06. 2004.
Status : Frequent.
Local Distribution : Neora Valley-Sikkim Border, Sakam Forest. 1500 – 2400 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN.
Note : Endemic to Himalaya

ARISTOLOCHIACEAE A. Jussieu

Aristolochia Linnaeus

Key to the species:

1. Plants glabrous; leaf ovate – orbicular *A. tagala*
+ Plants hairy; leaf lanceolate *A. griffithii*

Aristolochia griffithii Ducharte, in DC., Prodr. 15(1): 437. 1864; Hara in Fl.E.Him. 1: 66. 1966; 2: 21. 1971; Hara *et al.* Enum.Fl. Pl. Nepal 3: 180. 1982; Grierson & Long, Fl.Bhutan 1(2): 353. 1984. *Isotrema griffithii* (Ducharte) Fischer in Kew Bull. 1940: 98. 1940.

Climbers. **Leaves** ; petiole upto 1.9 cm long, wooly hairy; leaves lamina 3 - 6 x 1.2 – 6.5m, broadly ovate to orbicular-cordate, entire, acute, base articulate-cordate, pubescent above, shining wooly haired beneath, nerves 6 - 9 from base. **Bracteoles** small, leafy. Pedicels upto 3.5cm long. **Flowers** in solitary, axillary, pendulous. **Perianth** curved, ribbed, tube folded, pubescent, green

with purple veins, limb enlarged into a broad rhombic-orbicular yellow spotted mouth, warted and brownish-purple within. **Column** trilobed with 12 light brown anthers. **Ovary** narrow cylindrical. **Fruit** long upto 22cm long, oblong, ribbed into 6; seeds many, ovate.

Flowering & Fruiting : April – August

Exsiccatus : Phusrey, 2160 - 2490m, **SR Lepcha & AP. Das** 1001, dated 08.10.2004

Status : Common.

Local Distribution : Rachelia middle, border to NNP, WB. 1600 – 2300 m.

General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN.

Note : Endemic to Himalaya.

Aristolochia tagala Chamisso, in Linnaea 7: 207, t. 5 f. 3. 1832; Hara in Fl. E. Him.3: 29.1975, Hara *et al.* Enum. Fl. Pl. Nepal 3: 180. 1982; Grierson & Long in Fl. Bhutan 1(2): 354. 1984. *A. roxburghiana* Klotzsch in Monatsb. Berl. Akad. 596. 1859; Hara *et al.* Fl. E. Him.1: 66. 1966.

Twinnings or climbers. **Leaves** ; petiole 1.5 – 4.5cm long, often coiled; leaves lamina 6.5 x 3-7.5cm, ovate-oblong, upper one lanceolate, acuminate, base cordate, cordate-sagitate in upper leaves, margin entire, 5-nerved, thinly pubescent beneath. **Flowers** in cymes, lax, pubescent, flowers dark-brown. **Peduncles** and pedicels slender. **Bracts** oblong. Perianth swollen base, tube inflated, glabrous and with purple marks, mouth curved, white-yellow, lip 2.- 3.5 cm long, villous. **Stamens** 6; filaments united. **Anthers** 6, extrorse. **Capsule** pyriform or oblong, 6-angled, seeds winged and triangular.

Flower & Fruit : April - June

Exsiccatus : Haticherey towards WB border, 1150m, **SR Lepcha & AP. Das**, 1000, dated 03.08.2002.

Status : Rare

Local Distribution : Haticheray area.

General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MALAYSIA.

SCHISANDRACEAE Blume

Schisandra Michaux

Key to the species:

1. Leaf margin denticulate or rarely sinuous; lateral nerves 4 - 5 pair *S. grandiflora*
- + Leaf margin remotely cartilaginous-denticulate; lateral nerves 6 - 10 pairs..... *S. neglecta*

Schisandra grandiflora A.C.Smith in Sargentia 7: 127, t. 17 g 1947; Hara & Ohashi in Fl. E. Him. 96. 1996. Hara *et al.*, Enum, Fl. Pl. Nepal 2: 26. 1979. Grierson in Grierson & Long, Fl. Bhutan 1(2): 248. 1984. *Sphaerostema elongatum* auct. non Blume; Hook.f. & Thomson, Fl. India 1: 85. 1855. *Schizandra elongata* Hook.f. & Thomson in Fl. Brit. India 1: 44. 1872; Sharma *et al.* Fl. India 1: 191-192.1993

Climbers woody, with thin branchlets. **Lamina** ovate oblong lanceolate, rounded, 5 – 12 x 2 - 5cm, cuneate, entire, unequal at base denticulate or rarely sinuous along margins acute or shortly acuminate at apex membranous glabrous above varicose subglaucous beneath; **lateral nerves** 4 - 5 pair petiole usually channel above. **Flowers** yellowish, pedicels slender. **Perianth** segments 7 - 8 orbicular, green outside, yellowish inside. **Male flower**; stamens spirally arranged; outer ones long; filaments often monodelphous 1 - 2mm long with thick connective. **Female flowers** carpels 20 – 24 column ellipsoid. **Fruitlets** 10 - 30 sessile, oblong ellipsoid or globose, not beaked, 1 - 2 Seeded.

Flower : April *Fruit:* September.
Exsiccatu : Rachela 2800 m , **SR Lepcha & AP. Das 31085**, dated 02.10.2004.
Status : Common
Local Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN.
Note : Endemic to Himalaya

Schisandra neglecta A.C.Smith in *Sargentia* 7:127.f.17,g.1947; Hara in *Fl.E.Him.* 1:96.1966; Hara *et al.* *Enum. Fl. Pl. Nepal* 2: 26. 1979; Grierson in Grierson & Long, *Fl. Bhutan* 1(2):249. 1984; Sharma *et al.* *Fl. India* 1:193. 1993.

S. elongata Hk.f. & Thoms.in *Fl. Brit. India* 1:44.1872, excl. *syn.*

Local Name: Sighatta Lahara (Nep.).

Climber shrubby. Branches short. Stem glabrous. **Leaves;** petiole to 2 cm; **lamina** 3.5 – 10 x 1 - 3cm, ovate to oblong-lanceolate, remotely cartilaginous-denticulate, acuminate, base acute or cuneate, glabrous, glaucous beneath, nerves much prominent below, **lateral nerves** 6 - 10 pairs. **Pedicel** borne on axils of scale on leafy short lateral branch, glabrous. **Flowers** solitary, axillary, drooping, unisexual. **Petaloid**, outer ones larger, nearly round, glabrous, vertically nerved; **stamens** numerous, in a fleshy head.

Flower : May –June *Fruit:* August - September.
Exsiccatu : Rachela below, 2550 m , **SR Lepcha & AP. Das 03054**, dated 15.06. 2005.
Status : Not Common
Local Distribution : Middle Rachela, Singhaney – Panglakha upto 2600 m.
Local Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.
Notes : Fruit edible; used in local traditional medicine.

RANUNCULACEAE A.L. Jussieu

Key to the Genera:

1. Erect or scandent herbs or shrubs 2
 - + Climbing shrub or sub-shrub ***Clematis***
2. Plants rhizomatous 3
 - + Plants non-rhizomatous 4
3. Fruits elliptic achene ***Anemone***
 - + Fruits oblong follicle ***Caltha***
4. Flowers actinomorphic 5
 - + Flowers zygomorphic 6
5. Leaves sheathing at base ***Thalictrum***
 - + Leaves non-sheathing at base ***Ranunculus***
6. Petals usually – 4 ***Delphinium***
 - + Petals usually – 2 ***Aconitum***

Aconitum Linnaeus

Key to the Species:

1. Leaves 5 lobed; spur recurved 2
+ Leave with many pointed segment; spur not recurved *A. bisma*
2. Lamina deeply cut into segment; follicles usually – 3, linear oblong *A. laciniatum*
+ Lamina less deeply dissected; Follicle usually – 5, oblong *A. spicatum*

Aconitum bisma (Buch-Ham.) Rapaics in Nov. Kozlem. 6: 164. 1907; Hara & Ohashi in Fl. E. Him. 86. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 9. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 320. 1984; Hajra *et al.*, Fl. India (4): 7. 1997. *Caltha bisma* Buch-Ham. in Edinburgh J. Sci. 1: 251. 1824. *Aconitum palmatum* D. Don, Prodr. Fl. Nepal 196. 1825. Hook. f. & Thoms., Fl. India 1: 56. 1855; in Fl. Brit. India 1: 28. 1872. *Aconitum ferox* Subsp. *palmatum* (D. Don) Bruhl in Ann. B.G. Calc. 5: 111, t. 111. f. 9-13, 24, 25, 31. 1895.

Local Name: Nyingmon (Lep), Seto Bikhuma. (Nep.)

Herbs, biennial; root paired, tuberous; **Stems** erect, 50 - 150cm high, glabrous. **Petioles** slender, 2 - 12cm long; **lamina** upto 17 cm in diam, reniform to cordate., deeply 5 lobed, sub-glabrous; Segment sharply cut, ovate, cuneate at base. Flowers usually in loose panicle, pedicels 3 – 11 cm. **Calyx** bluish white or greenish blue; uppermost sepal helmet-shaped, oblique, very shortly beaked, ca 2 x 1.6cm; upper lateral sepal ca 1.5 x 2 cm, obovate; lower lateral sepals elliptic. Petal head S-shaped glabrous; limb very short, ca 1.5 mm long. **Filaments** and nectaries glabrous. Carpel 5, glabrous. **Follicles** oblong, glabrous, thick.

Flower & Fruit : August - September.
Exsiccatus : Kupup 4250 m, **SR Lepcha & AP. Das 107**, dated 13.10.2005.
Status : Rare & Threatened
Local Distribution : Kupup, 4000 – 4500 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, S.E. TIBET.
Note : Use in traditional medicine

Aconitum laciniatum (Bruhl) Stapf in Ann. B.G. Calc 10: 168. t. 108. 1905 ; Hara & Ohashi in Fl. E. Him. 86. 1966; 2: 27. 1971; Hara *et al.*, Enum Fl. Pl. Nepal 2: 10. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 319. 1984; Hajra *et al.*, Fl. India (1): 17. 1993. var *laciniatum*. *Aconitum ferox* Wall. ex Seringe var *laciniata* Bruhl in Ann R.B.G. Calc. 5: 111. 1895. Hajra & Sharma *et al.*, Fl. India 1: 17. 1993.

Local Name: Re Nyingmon (Lep.), Seto Bikhuma (Nep.)

Herbs, roots paired, tuberous; **Stems** 0.7 - 1.8m, erect, finely pubescent. **Lamina** less deeply dissected, upto 18cm diam. scattered, basal one decayed at flowering time, uniform fleshy., 5-partite. **Flowers** in a lax raceme or panicle widely spaced few to many flowered. **Calyx** pubescent, dark red or reddish purple; uppermost sepal helmet shaped, 1.5 - 2.3 x 1.4 - 1.6cm; upper lateral sepals obovate, Ca 1.3 x 1.2cm in lower lateral sepals 1.2 x 0.6cm. **Corolla** head c 10mm, spur shortly recurved, hispidulous, filaments hisped, Carpels 3., rarely 4 - 5, densely pubescent. **Follicles** usually 3, linear oblong, divergent, finely pubescent.

Flower & Fruit : July. - September
Exsiccatus : Baba mandir, 3600 m, **SR Lepcha & AP. Das 142**, 10.10. 2006.
Status : Rare
Local Distribution : Kupup, Kyongnosla 3800 – 4600 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, S.E. TIBET, CHINA.

Note : Roots used medicinally and for poisoning arrow.

Aconitum spicatum (Bruhl) Stapf in Ann. Bot. Gard. Calc. 10: 165. t. 106 & 107. 1905; Hara & Ohashi in Fl. E. Him. 86. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 11. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 320. 1984; Hajra *et al.*, Fl. India (4): 22. 1997. *Aconitum ferox* var. *spicata* Bruhl in Ann. Bot. Gard. Calc. 5: 110. 1895. *Aconitum ferox auct. non* Wall. ex Seringe : Hook. f. & Thoms., Fl. India 1: 56. 1855, p.p. in Fl. Brit. India 1: 28. 1872 pp.

Local Name: Lungzyi nying (Lep.)

Herbs, biennial upto 2 m tall. Roots paired, tuberous. **Stems** erect, simple pubescent. **Basal leaves** usually decayed while flowering; **lamina** reniform, cordate to orbicular, 5.5 - 10.5cm in diam., ovate, lobes deeply cut into toothed or pointed segments. **Flowers** racemose, multi-flowered, 12 - 45 cm long. **Flowers** violet blue to dark blue, usually white, purple tinged. Upper most **sepal** helmet shaped with a stout beak, 2 x 1.5 cm; upper lateral sepals orbicular Ca, 2cm across; lower sepals elliptic, petals hairy or sometimes glabrous, head S-shaped; **Spur** recurved. **Follicles** 5, oblong, hairy.

Flower : July - September *Fruit:* July - September
Exsiccatus : Kupup 4250 m, *SR Lepcha & AP. Das 107*, dated 13. 10. 2005.
Status : Common
Local Distribution : Kupup, Memenchu, Sherathang 1800 - 4200 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, CHINA.
Note : The root contain valuable alkaloids (Stapf in Ann. RBG Calc. 10 (2). 1905)

Anemone Linnaeus

Key to the Species:

1. Plants with woody root stock; leaves compound; leaflet margin serrated *A. rivularis*
+ Plants with fibrous root stock; leaves simple; leaflet margins 3 sect or 3 dentate. *A. obtusiloba*

Anemone obtusiloba D. Don. Prodr. Fl. Nepal 194. 1825; Hook.f. & Thoms., Fl. India. 1: 22 1855; in Hook.f., Fl. Brit. India. 1: 8. 1872; Hara & Ohashi in Fl. E. Him. 87. 1966; Hara *et al* Enum. Fl. Pl. Nepal 2: 12. 1979; Grierson in Grierson & Long, Fl. Bhutan. 1(2): 293. 1984; Hajra *et al.*, Fl. India 1: 33. 1993. *Anemone govaniiana* Wall., Cat 166, n. 4688. 1831, *nom. nud.*
Anemone discolor Royal. Ill. Bot. Him. t. ii, f. 1. 1833; 52. 1834.

Var *obtusiloba*.

Herbs, villous; rootstock fibrous, clothed with old leaf remains. **Leaves** simple; **lamina** usually broadly ovate, sub orbicular, deeply cordate, 2 - 4.5cm across, 3 sect or 3 dentate, terminal leaflet not distinctly stalked, lobes ± obtusely toothed, usually with bracts similar to leaves but smaller, pedicels 2 - 14cm. **Flowers** actinomorphic solitary; scapes erect, ascending, or prostrate, 2 to 3 flowered; **involucral bracts** similar to leaves, 3 partite; pedicels slender 2 - 9cm. **Calyx** 5, elliptic, obovate or oblong, 0.6 - 1.5 x 0.9 - 1.4cm, blue to whitish on both sides or silky to golden yellow outside. **Stamens** many. **Carpels** hairy, sometime glabrous. **Achenes** elliptic, compressed, tip with short hooked beak, densely strigose hairy.

Flower : April - July
Exsiccatus : Donkyala 3850 m, *SR Lepcha & AP. Das 2814*, dated 16.08. 2004.
Status : Sparse
Local Distribution : Donkyala, KAS 3200 - 4200 m.
General Distribution : PAKISTAN, INDIA, NEPAL, BHUTAN, CHINA, TIBET, MYANMAR.

Anemone rivularis Buch-Ham. ex DC., Syst. Nat. I: 211. 1817; Hook. f & Thoms., Fl. India 1: 23. 1855 ; in Fl. Brit. India 1: 9. 1872; Hara *et al*, Enum. Fl. Pl. Nepal 2: 12. 1979; Grierson in Grierson & Long, Fl. Bhutan. 1(2): 292. 1984; Hajra *et al*, Fl. India 1: 35. 1993. *Anemone geraniifolia* Wallich., Cat. 167, n. 4693. 1831, *nom. nud.* *Anemone hispida* Wallich., Cat. 167. n. 4698. 1831. (*nom. nud.*). *Anemome rivularis* Var. *parviflora* Tamura In Acta. Phyt. Geobot. 23: 102. 1968.

Herbs, perennial, upto 1m tall. Rootstock woody, stout. **Leaves** wide in smaller leaflets, 28 - 32cm in larger ones, 3 to 5 deeply lobed, each lobe again 3 - 5 lobed, hairy on both surface, serrate; cauline leaves palmately dissected into many linear lobes; leaflets broadly elliptic or rhombic, 3 - 6.5 x 3 - 6cm, acute, base cuneate, deeply trilobed, stiffly pubescent, margins serrate; petiole usually 8 - 28cm. **Flowers** actinomorphic solitary; scape 5 - 32cm; involucre bracts usually similar to leaves, segments linear. **Calyx** 12 - 16 x 3 - 10mm; **Achenes** compressed, glabrous, broadly elliptic, style persistent and hooked.

Flower : April-August.
Exsiccatus : KAS upto 3900 m, **SR Lepcha & AP. Das 2813**, dated 25. 08. 2004
Status : Less common
Local Distribution : KAS, PWS, 1980 - 3960 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, CHINA, SRI LANKA, MYANMAR.

Caltha Linnaeus

Key to the species:

1. Herbs less than 20 cm tall; Leaf deltoids; stamens more than 40 *C. palustris*
- + Herbs more than 20 cm tall; Leaf obtuse; stamens 20 - 40 *C. scaposa*

Caltha palustris L., Sp. Pl. 588. 1753; Hook. f. & Thoms., Fl. India 1: 40. 1855, in Fl. Brit. India 1: 21. 1872; Hara in Fl. E. Him. (2): 356. 1971; Hara *et al*, Enum. Fl. Pl. Nepal 2: 13. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 305. 1984; Hajra *et al*, Fl. India 1: 47. 1993. *C. govianana* Wall. (Cat. 167. no. 4710. 1831, *nom. nud.*) ex Royle, Illus. Bot. Him. 54. 1834.

Herbs perennial, rootstock creeping. **Stems** 11-50(-70) cm. erect, branched. **Lamina** deltoid, reniform, 2.5 - 16 (-18) cm long, broad, base cordate, sharply dentate along margins, obtuse at apex. Peduncles short upto 60cm long. **Flowers** with few, bright yellow or pink. **Calyx** 5 - 8, oblong - ovate elliptic or broadly obovate, obtuse or rarely sub-acute. **Stamens** more than 40. **Carpels** 1 or more, free linear oblong

Flower & Fruit : April - September
Exsiccatus : Bhimbase 4280 m, **SR Lepcha & AP. Das 30982**, dated 27.07. 2005.
Status : Common
Local Distribution : Bhimbase, Lampokhri, upto 4400 m.
General Distribution : INDIA, BHUTAN, NEPAL; ASIA, EUROPE, AND N.AMERICA.
Note : Roots are very poisonous.

Caltha scaposa Hook.f. & Thoms., Fl. India. 1: 40. 1855; in Fl. Brit. India 1: 21. 1872; Hara in Fl. E. Him. 2: 29. 1971; Hara *et al*, Enum. Fl. Pl. Nepal 2: 13. 1979; Grierson in Grierson & Long Fl. Bhutan 1(2): 305. 1984; Hajra *et al*, Fl. India. (1): 49. 1993

Herbs perennial erect upto 15cm tall. **Rootstock** with branched main roots. **Leaves** usually all radical; petiole narrow, upto 2.3cm long, base with membranous sheath; lamina obtuse, entire or dentate, ovate-cordate, 2 - 2.5 x 1 - 2.5cm. **Scapes** usually leafless or sometime with one small

leaf; **Flowers** solitary or rarely 2. **Calyx** 5 - 9, commonly 6, obovate, obtuse, yellowish. **Stamens** 20 - 40; filaments usually flattened. Carpel upto 20, unequal, linear oblong, prolonging into style; stigma curved, oblique. **Folicles** oblong, flattened, shortly beak, Ca 2 x 8 mm. **Seeds** 2 - 6, black ovoid.

Flower : June – August.
Exsiccatus : Donkyala 3960 m, **SR Lepcha & AP. Das 31448**, dated 27.07.2005.
Status : Common
Local Distribution : Bhimbase, Donkyala 2700 – 5500 m.
General Distribution : INDIA, NEPAL, BHUTAN, TIBET, W. CHINA

Clematis Linnaeus

Key to the Species:

- 1. Stem branches glabrous 2
- + Stem branches hairy or villous 3
- 2. Leaf margins coarsely toothed; sepals white *C. montana*
- + Leaf margins serrate; sepal yellowish – brown *C. connata*
- 3. Stem branches villous - tomentose; filament usually clothed with spreading hairs *C. buchaniana*.
- + Stem branches with coarsely gray- brownish hairs; filament hairy ... 4
- 4. Leaf margins coarsely serrate; puberulous or nearly glabrous on both surface; achenes ovate or obovate elliptic, wooly *C. acuminata*
- + Leaf margins dentate; brown villous on both sides; achenes ovate compressed hairy *C. wightiana*

Clematis acuminata D.C., Syst. Nat. 1: 148. 1817; Hook.f.& Thoms. In Fl. Brit. India 1: 5. 1872; Hara in Fl. E. Himal. 2: 29. 1974; Hara *et al.* Enum. Fl. Pl. Nepal 2: 14. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 289. 1984; Hajra *et al.* Fl. India 1: 54. 1993.ssp. *sikkimensis* (Hook. f. & Thoms.) Bruhl in Ann. Roy. Bot. Gard. Cal. 5: 75. 1896

Climbers, woody but slender glabrous, base woody. **Leaves** ternate, usually 3 - 5 foliate, leaflets ovate to lanceolate, 3 - 8.5 x 2 - 3.5cm, rounded, acuminate and 5 veined at base, margin finely serrate, sparsely pubescent, reflexed. **Panicles** rarely few flowered, branches usually slender, glabrous; **Sepals** ovate, yellowish, 1.5 - 2 x 0.5 - 0.8cm, erect or recurved at lip, densely pubescent; filament usually clothed with spreading hairs. **Achenes** hairy and silky.

Flower : September
Exsiccatus : Subaney – Panglakha 2800 m, **SR Lepcha & AP. Das 125**, dated 17.09.2004.
Status : Frequent.
Local Distribution : Subaney, Singhaney, Phusrey upto 2700 m.
General Distribution : HIMALAYA; INDIA, NEPAL, BHUTAN.

Note: 1. Endemic to Himalaya
 2. Fume produced through heating of freshly collected roots over the oven is inhaled through to relieve from sinus pain.

Clematis buchananiana DC., Syst. Nat. 1: 140. 1817; Hook.f. & Thoms. in Fl. Brit. India 1: 6. 1872; Hara *et al* Fl. E. Him. 88. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 4. 1979; Grierson in Grierson & Long, Fl. Bhutan 1 (2): 289. 1984; Hajra *et al.*, Fl. India 1: 60. 1993. *Clematis tortuosa* (Hook. f. & Thoms.) Fischer in Kew. Bull. 1929: 1. 1929.

Local Name: Pinasey lahara (Nep.)

Climber woody, coarsely brown hairy throughout. **Leaves** ternate to pinnate; leaflets 3 broadly ovate 4.5 - 12 x 2.8 - 5.5 cm, acute, base rounded, coarsely serrate, usually 3-5 lobed, pubescent. **Flowers** in panicles; bracts dentate, foliaceous. **Sepals** often 4-6, cream to greenish yellow, ovate acute, 1.8-3.1cm, densely brownish hairy outside, recurved, filaments hairy; **styles** usually 2.5-3.5cm. **Achenes** wooly.

Flower : October.

Fruit: November – January

Exsiccatus : On way to Panglakha 2700 m, **SR Lepcha & AP. Das 20216**, dated 08.10.2004.

Status : Frequent.

Local Distribution : Singhaney – Rachel 1200 – 2800 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, CHINA, MYANMAR.

Note : The fume produced through fleshly collected root by heating over

Clematis connata DC., Prodr. 1: 4. 1824; Hook.f. & Thoms. in Fl. Brit. India 1: 6. 1872; Hajra *et al.*, Fl. India. 4: 61. 1997; Grierson in Grierson & Long, 1(2): 290. 1984; Hara *et al.*, Fl. E. Him. 88. 1966

Climber large woody, branches sulcate, glabrous. **Leaves** pinnate; **petiole** base winged, connate; leaflets 2 - 7, simple, of 2-4 lobed broadly ovate-cordate, elliptic or ovate lanceolate, cordate or rounded at base, serrate, acute to acuminate at apex, 3-10 x 2-10 cm, glabrous, pubescence along nerves beneath, with hairs on both surface. **Flowers** in cymose, panicle 3-8cm long; peduncle short 2-4cm, bracts trilobed, lanceolate hairy on surface, without rib; pedicel upto 3.5cm long, flowers showy, light yellowish creamy or white. **Calyx** 4, not ribbed, ovate, acute, tip recurved, yellowish pubescent, brown outside. **Stamens** short 5-7.5 mm; filament, hairy. **Achenes** compressed, with feathery silky hairy tail.

Flower : July – October.

Fruit: August – October.

Exsiccatus : Rachel 2800 m, **SR Lepcha & AP. Das 31164**, dated 03.09.2004.

Status : Less common

Local Distribution : Panglakha, Subaney, Rachel upto 3200 m.

General Distribution : PAKISTAN, INDIA, NEPAL, BHUTAN, CHINA, TIBET.

Clematis montana Buch-Ham. ex DC., Syst. Nat. 1: 164. 1817; Hook.f.& Thoms. in Fl. Brit. India 1: 2. 1872; Hara & Ohashi in Fl. E. Him. 89. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 15. 1979; Grierson in Grierson & Long .Fl. Bhutan 1 (2): 286. 1984; Hajra & Sharma *et al.*, Fl. India 1: 69. 1993.

Local Name: Kaneshi Lahara (Nep.).

Climber, woody deciduous. **Leaves** ternate, rarely 2 foliate; leaflets ovate-lanceolate, 2.5 - 6.8 x 2 - 3.8cm, coarsely toothed, acute, glabrescent; **petioles** 3 - 9cm. **Flowers** 2 - 4 in axillary fascicles, 2.5 - 6.8cm across. **Pedicels** 3 - 4.5 cm. **Calyx** usually 4, acute, petaloid, pubescent outside, white elliptic. **Stamens** many; filament glabrous; **anthers** yellow, introrse. **Styles** plumose. **Achenes** ovate, glabrous or sparsely hairy.

Flower : June – October.

Fruit: August –December.

Exsiccatum : Bhimbase 4350 m, **SR Lepcha & AP. Das 31439**, dated 27.07.2005;
Status : Sparse.
Local Distribution : Kupup, Bhimbase, Lampokhri upto 4500 m.
General Distribution : INDIA, NEPAL, BHUTAN, W. & C. CHINA, TAIWAN.
Note : The fume produced from heating over oven is inhaled through nose to get relieve from sinus pain (Bhujel,1996).

Clematis wightiana Wall. (Cat.no. 4674. 1828, *nom. nud.*) ex Wight & Arns., Prodr. 2. 1834; Hook.f.& Thoms. in Fl. Brit India 1: 5.1872; Hajra *et al.*, Fl. India 1: 80.1993

Climbers woody; branches covered by grayish or brownish hairs. **Leaves** pinnately 3 – 5foliate; petiole short 10 – 12 cm long hairy; leaflets oblong –ovate or orbicular, rarely 3 -5 lobes, dentate, brown villous on both sides, usually prominent beneath.; **Flowers** usually axillary paniculate , bracts and bracteole ovate to linear. **Flower** 1.5 -5 cm across, white or pale or golden yellow. **Sepals** 4, ovate, glabrous inside, filament hairy in middle. **Achenes** ovate, compressed hairy.

Flower : November – March *Fruit*: January - May.
Exsiccatum : Rachela 2860 m, **SR Lepcha & AP. Das 31042**, dated 07.10.2004.
Status : Less common
Local Distribution : Singhaney, Rachela to 3150 m.
General Distribution : E..HIMALAYA; INDIA
Note : Endemic to Eastern Himalaya

Delphinium Linnaeus

Key to the species:

1. Plant more than 40 cm tall; leaf lamina reniform or suborbicular; lower petals oblong; Seeds winged on angles *D. viscosum*
- + Plant less than 40 cm tall; leaf lamina suborbicular, with fewer lanceolate segments; lower petals broadly elliptic; Seeds winged or wingless *D. candelabrum*

Delphinium viscosum Hook.f. & Thoms., Fl. India 1: 52. 1855; in Fl. Brit. India 1: 27. 1892; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 18. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 31. 1984; Hajra *et al.*, Fl. India 1: 101.1993. *Delphinium trilobatum* Huth in Bull. Herb. Boiss. 1: 330. 1893. *Delphinium conocentrum* Chatterjee in Kew Bull. 1948: 47. 1948.

Herbs perennial, erect. **Stem** upto 55 cm tall, with yellowish glandular hairs. **Leaves** radical palmately 6 - 7 lobed; lower leaves with petiole upto 18 cm upper sessile or shortly petiolated; lamina reniform, suborbicular longer; lobes cuneate, toothed at apex. **Flowers** very few, in lax corymbs or racemes; pedicels upto 8 cm long, ascending with glandular hairs; bracts entire or lobed; oblong; bracteoles borne near flowers. **Calyx** violet blue to purple; lamina of upper calyx broadly ovate. **Spurs** incurved. **Corolla** dark purple, lower bearded; lamina of upper corolla divided into 2 narrow lobes; lamina of lower corolla. oblong, bifid upto middle into linear lobes, stiff pubescent. **Stamens** 6 – 7 mm long, glabrous. **Follicles** 3, glabrous. Seeds winged on angles.

Flower : July – October.
Exsiccatum : Bhimbase 4350m, **SR Lepcha & AP. Das 2811**, dated 12.08.2004.
Status : Not Common
Local Distribution : Sherapthang, Chhangu, Bhimbase above 3500 - 4500m.
General Distribution : INDIA, NEPAL, BHUTAN, TIBET.

Delphinium candelebrum Ostenfield in Hedin, S. Tibet, 6(3): 80.1922. Grierson in Grierson & Long, Fl. Bhutan 1(2): 312. 1984

Herbs perennial, erect. Stem upto 50 cm. **Leaves** suborbicular, with fewer lanceolate segments, ultimate segments of leaves elliptic – lanceolate, 2.5 – 4 x 2.5 – 4 mm. **Flowers** few – many in terminal raceme. Pedicel to 5cm; **bracteole** to 5mm, lamina of **upper calyx** broadly ovate, spur straight or uncurved; **lateral calyx** ovate elliptic. Lamina of **upper corolla** straight, curved; lamina of **lower corolla** broadly elliptic, pubescent, stamen many, Seeds winged or wingless.

Flower : October.
Exsiccatu : Donkyala 3900 m, *SR Lepcha & AP. Das 2812*, dated 16.08.2004.
Status : Not common
Local Distribution : Donkyala upto 4570 m.
General Distribution : E.HIMALAYA; INDIA, BHUTAN.
Note : Endemic to Eastern Himalaya

Ranunculus Linnaeus

Key to species:

1. Plants erect 2
+ Plants decumbent or prostrate 3
2. Calyx purplish or yellow, anther basified *R. pulchellus*
+ Calyx yellowish- green, anther dorsified *R. brotherusii*
3. Achenes globose, suborbicular 4
+ Achenes ellipsoid *R. ficarifolius*
4. Corolla oblong- ovate, flowers yellow *R. diffuses*
+ Corolla obovate, flowers white or yellow *R. hirtellus*

Ranunculus pulchellus C.A. Meyer in Ledeb., Fl. Alt. 2: 333. 1830. Hook. f. & Thoms. Fl. India 1: 31. 1855; in Fl. Brit. India 1: 17. 1872; Hara in Fl. E. Him. 2: 32. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 20. 1979; Grierson in Grierson & Long. Fl. Bhutan. 1(2): 302. 1984 ; Hajra *et al.*, Fl. India 1: 113, 128. 1993. *Ranunculus salsuginosus auct. non.* Pallas: Wall., Cat. 167.n. 4708. 1831. *Ranunculus flammula auct. non.* L., D. Don in Royle. Ill. Bot. Him. 53. 1831. *Ranunculus lingual. var. subvillosus* Tamura in Acta Phyt. Geobot. 23: 32. 1968.

Herbs, perennial, upto 30cm tall. Stem erect, simple, or branched. **Petioles** longer than blades, 2 - 10cm; basal leaves 1 - 5; **lamina** reniform or ovate-elliptic oblong, entire or usually of 3 lobed, crenate. Leaves bases subtruncate or round; lower and middle leaves narrowly elliptic or deeply 3 lobed, sheathing at base, sometime leaves linear-elliptic. **Flowers** solitary or 1 - 3 per leaf, yellow; pedicels sulcate, seraceous. **Calyx** 5, oblong, elliptic, purplish along margins, blackish at tip, hairy. **Corolla** 5, obovate to ovate, entire or slightly emarginate, yellow, nectarines cup shaped. **Anthers** long 0.6 - 1.4 mm, basifixed. **Achenes** obovoid, inflated; stylar beak straight or curved.

Flower : May - July
Exsiccatu : Kupup 4280 m, *SR Lepcha & AP. Das 30939*, dated 24.07.2005.,
Status : Not Common
Local Distribution : Kupup, Bhimbase to 4400 m.
General Distribution : C. ASIA, SIBERIA, HIMALAYA; INDIA, TIBET, MONGOLIA,

AND W & C. CHINA

Ranunculus diffuses DC., Prodr. 1: 38. 1824; Hook. f. & Thoms., Fl. India 1: 36. 1855; in Hook.f., Fl. Brit. India 1: 19. 1872; Hara & Ohashi in Fl. E. Him. 90. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 19. 1979; Grierson in Grierson & Long. Fl. Bhutan. 1(2): 303. 1984; Hajra *et al.*, Fl. India 1: 119. 1993. *Ranunculus hydrocotyloides* Wall., Cat. 167, n. 4703. 1831, *nom. nud.* *Ranunculus mollis* Wall. (Cat. 167, n., 4704. 1831, *nom. nud.*) ex D. Don in Royle. Ill. Bot. Him.. 53. 1834.

Herbs, perennial, prostrate or decumbent. **Stems** usually procumbent, covered by densely hirsute spreading brownish hair. **Lamina** broad and long, orbicular to ovate, usually cordate, mostly divided into 3 obovate lobes; lobes, cuneate, scarcely segmented, sometime sharply and shallowly dentate-deltoid, pubescent beneath; petioles narrowly upto 12cm long, hirsute, auricle brown scarious. **Flowers** usually solitary, small, axillary, white, or yellowish. Calyx elliptic spreading. **Corolla** obovate, yellow. **Achenes** globose heads, sub-orbicular, acute, compressed; style hooked.

Flower : April – October.

Exsiccatae : Ramitey dara (Rachela) 2700 m, *SR Lepcha & AP. Das 31169*, dated 04.09.2004. Nathang – Panglkhā 2950 m, *SR Lepcha & AP. Das 32971*, dated 28.07. 2005.

Status : Common

Local Distribution : Rachela, Singhaney, Premlakha 1400 – 2700 m.

General Distribution : INDIA, NEPAL, BHUTAN, CHINA, MYANMAR.

Ranunculus hirtellus Royle ex D. Don in Royle, Ill. Bot. Him. 53. 1834; Hook. f. & Thoms., Fl. India 1: 34. 1855; in Hook.f., Fl. Brit. India 1: 18. 1872; Hara *et al.*, Enum Fl. Pl. Nepal 2: 19. 1979; Hajra *et al.*, Fl. India 1: 121. 1993. *Ranunculus attenuatus* Royle ex D. Don in Royle, Ill: Bot. Him. 53. 1834. *Ranunculus nivalis auct. non L.*: Hook.f. & Thoms., Fl. India. 1: 35. 1855. *Ranunculus dielsianus auct. non.* Ulbr.: Tamura in Acta Phyt. Geobot. 23: 32. 1968.

Herbs perennial, erect, or sometime decumbent. **Stem** ascending, erect or decumbent. **Petioles** vaginate at base ; basal leaves oftenly 3 or more; **lamina** reniform to orbicular, 4.5 - 16 x 4.5 - 18mm, deeply 3-partite; segments not more than 3 toothed; middle lobes large, oblong to obovate, entire or tricuspidate; lateral lobes obliquely ovate, coarsely toothed or entire; leave base cordate-truncate. Cauline leaves vaginate and amplexicaul at base, 3 partite, lobes linear lanceolate. **Flowers** solitary or several, yellow; pedicel sulcate-pilose. **Calyx** navicular, hairy. **Corolla** 5 clawed, oblong to ovate, obtuse rounded; nectaries cup shaped or forked. **Anthers** basifixed; filament flattered. Achenes oblong to suborbicular, glabrous, styler beak hairy.

Flower & Fruit : June - September

Exsiccatae : Bhimbase 4350 m, *SR Lepcha & AP. Das 31417*, dated 27.07. 2005.
Lampokhri 4400 m, *SR Lepcha & AP. Das 30992*, dated 27.07. 2005.

Status : Status

Local Distribution : Kupup, Bhimbase, Lampokhri upto 4450 m.

General Distribution : INDIA, NEPAL, BHUTAN

Ranunculus brotherusii Freyn in Bull.Herb.Boiss.6:885.1898; Hara *et al.* in Fl.E.Him.1:90 .1966; Grierson & Long Fl. Bhutan 1(2): 302. 1984; Hajra *et al.* Fl. India 1: 116. 1993; Hajra *et al.*, Fl. India 1: 116. 1993. *R. affinis* Hook.f.& Thomson in Fl.Brit. India 1: 18. 1872 p.p.(non.R.Br.). *R. brotherusii* Freyn var.*lasisectus* H.Riedi in Kew Bull. 34: 362. 1979.

Herbs perennial. **Stem** erect upto 27cm long, white hairs or glabrous. **Basal leaves** 1-3.5 cm long and broad leafy cut into linear lanceolate segments 1.5-25 mm , broad, sparsely hirsute beneath

glabrous above, reniform 1.5 – 25 (4) x 0.5 – 3 (-4)cm, partially 3-lobed, lateral lobes deeply lobes, sessile, oblong ovate or oblong cordate at base, petioles 2-6, yellow. **Calyx** spreading ovate to oblong, yellowish green. **Corolla** 5 broadly ovate. **Anthers** long dorsified and obovoid; filament dilated. **Carpel** glabrous. **Achenes** glabrous or pubescent.

Flower : April *Fruiting*: September
Exsiccatus : Panglakha- Nathang 3400m, **SR Lepcha & AP. Das 30817**, dated 29.07.2005.
Status : Sparse
Local Distribution : Nathang, Kupup, 3200 – 4200 m.
General Distribution : C. ASIA, HIMALAYA; INDIA, NEPAL, BHUTAN, TIBET, CHINA; RUSSIA.

Ranunculus ficariifolius Leveille & Veniot in Bull. Soc. Bot. Fr. 51. 289. 1904. Grierson in Grierson & Long Fl. Bhutan 1(2): 301. 1984; **Ranunculus flacidus** Hook.f. & Thomson, Fl. Ind. 1: 38. 1855 & Hook.f., in Fl. Brit. India 1: 20. 1872, non Pers. 1795; Hajra *et al.*, Fl. India 1: 120. 1993.

Herb perennial, tuft prostrate or decumbent often rooting at nodes. **Lamina** 3.5 – 13 mm long, broadly ovate or suborbicular, acute or subacute, base truncate or cordate, margins with 5 -7 rounded teeth. **Flower** solitary, leaf opposed. **Calyx** to 3.5 mm long, reflexed. **Petals** upto 3 mm long. **Achenses** ± 1.8 mm, ellipsoid, compressed; style weakly hooked, deciduous.

Flower : May *Fruit*: July
Exsiccatus : Sherathang lake 4290 m, **SR Lepcha & AP. Das 2829**, dated 12. 08. 2004.
Status : Common
Local Distribution : Sherathang, Kupup 3200 – 4200 m.
General Distribution : INDIA, NEPAL, BHUTAN, TIBET, CHINA; RUSSIA.

Thalictrum Linnaeus

Key to the species:

1. Plant with prominent stem 2
- + Plant stemless *T. alpinum*
2. Plant more than 1 m tall 3
- + Plant less than 1 m tall 4
3. Petiole sheathed; flowers polygamous usually in dense terminal clusters; calyx greenish white, mauve within *T. foliolosum*
- + Petiole non-sheathed; flowers in lax panicle; calyx-tinged purple to greenish. .. *T. chelidonii*
4. Anthers mucronate or rounded at apex; achene glabrous 5
- + Anthers apiculate; achene finely glandular – pubescent *T. foetidum*
5. Leaf elliptic – obovate; achenes obovate, incurved beak *T. elegans*
- + Leaflet broadly orbicular or obovate; achene elliptic, tapered beak *T. virgatum*

Thalictrum alpinum L., Sp. Pl. 545. 1753; Hook. f. & Thorns. in Fl. India 1: 18. 1855; in Hook.f., Fl. Brit. India 1: 12. 1972; Hara in Fl. E. Him. 3: 39. 1975; Grierson in Grierson & Long. Fl. Bhutan 1(2): 295. 1984. **Thalictrum Microphyllum** Royle. Ill. Bot. Him. 51. 1834.

Herbs perennial, glabrous; stemless very short or leaves all radical, 3.5 – 12 cm, across, bipinnate or pinnate. **Leaves** ; leaflets small, broadly obovate, usually 3-lobed, 3-partite, pale beneath, lobes subacute or rounded at apex, veins usually with permanent beneath. **Flowers**; **scapes** simple, greenish flowers in racemes; pedicel short, reflexed in fruit. **Calyx** 4, elliptic. **Stamens** 5 - 10; **anthers** beaked. **Achenes** 5 - 7, elliptic or narrowly oblong, styles triangular, erect-recurved-erect-recurved.

Flower : May-August
Exsiccatus : Lampokhri 4400 m, *SR Lepcha & AP. Das* 30906, dated 24.07.2005.
Status : Less common
Local Distribution : Bhimbase, Lam- Pokhri 2800 – 5000 m.
General Distribution : INDIA, BHUTAN, N. AMERICA, ARTIC & ALPINE EUROPE.

Thalictrum chelidonii DC., Prodr. 1: 11. 1824. Hook. f. & Thoms. in Hook.f., Fl. Brit. India 1: 11. 1872; Hara in Fl. E. Him. 3: 41. 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 21. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 297. 1984; Hajra *et al.*, Fl. India 1: 134. 1993. *T. reniforma*. Wall. Pl. Asiat. Rar. 2: 261. 1831. 1 (2): 279. 1984; Hajra *et al.*, Fl. India 1: 134. 1993. *Thalictrum cysticarpum* Wall., Pl. Asiat. Rar. 2: 26, t. 129. 1831. *Thalictrum chelidonii* var *cysticarpum* (Wall.) Hook.f. & Thoms., Fl. India 1: 13. 1855.

Herbs perennial upto 2.5m tall, multi branched. **Leaves** 2-pinnate, 3.5 - 8cm long; leaflets suborbicular - codate, coarsely blunt or tooth, pale beneath. Sheaths expanded to adnate stipules. **Flowers** in lax panicle, Ca 1.5cm across, greenish white, **Calyx** elliptic, tinged purple to greenish. **Corolla** purple-mauve, elliptic, stalk often with bulbets. **Stamens** many; anthers shortly mucronate. **Achenes**, obliquely obovate, membranous, with 3 branched vein on each side.

Flower : July – September. *Fruit*: October – December.
Exsiccatus : Sighaney – Rachel 2880 m, *SR Lepcha & AP. Das* 27743, dated 30.09.2004.
Status : Sparse
Local Distribution : Sighaney – Rachel, 2300-3500m.
General Distribution : HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : 1. Endemic to Himalaya.
2. Leaf extract is applied on cuts and wounds by local people.

Thalictrum elegans Wall. (Cat. 167, n. 4728. 831, *nom. nud.*) ex Royle III. Bot. Him. 51. 1834; Hook. f. & Thoms in Fl. India 1: 13. 1855; Hara & Ohashi in Fl. E. Him. 91. 1966; Grierson in Grierson & Long, Fl. Bhutan 1(2): 296. 1984; Hajra *et al.*, Fl. India 1: 135. 1993

Herbs perennial. **Stems** slender upto 42cm tall. **Leaves** usually 2 - 3 pinnate, glaucous beneath; leaflets oftenly elliptic - obovate 1.4 - 4.5 X 1 - 3.5mm, 3-lobed or partite, veins minutely glandular at beneath. **Flowers** in racemose, oftenly sparingly branched panicles. **Calyx** elliptic, greenish purple. **Achenes** obovate, narrowly winged on back, purplish, glabrous, incurved beak.

Flowering : July – October.
Exsiccatus : Kupup 4230 m, *SR Lepcha & AP. Das* 050, dated 15. 64.2004.
Status : Less common
Local distribution : Kupup, Bhimbase, 3100 – 4500 m.
General distribution : HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : Endemic to Himalaya

Thalictrum foetidum L., Sp. Pl. 545. 1753; Grierson in Grierson & Long. Fl. Bhutan 1(2): 298. 1984; Hajra *et al*, Fl. India 1: 143. 1993. *T. minus* var. *foetidum* (L.) Hook. f. & Thoms., Fl. Ind. 1: 17. 1855; in Hook.f., Fl. Brit. India 1: 14. 1872. *T. vaginatum* Royle, Ill. Bot. Him. 52. 1834.

Herbs perennial, upto 80 cm tall. **Lamina** obovate, 4 – 11 x 4 – 9 mm acute, toothed, lobed rounded or cuneate at base, veins prominent below, glandular, pubescence. **Sepals** often narrowly elliptic, 3.2 x 2.4 mm; **anthers** apiculate, **Achenes** many, elliptic, slightly compressed, 2- 2.5 mm, finely glandular – pubescent.

Flower : June – July
Exsiccatus : Bhimbase 4250 m, **SR Lepcha & AP. Das** 026, dated 15.07.2005.
Status : Less common
Local Distribution : Bhimbase 2000 – 3900 m.
General Distribution : EASTERN HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : Endemic to Himalaya

Thalictrum foliolosum DC., Syst. Nat. 1: 175. 1817; Hook.f. & Thoms. in Fl. India 1: 14. 1855; in Hook.f., Fl. Brit. India 1: 14. 1872; Hara & Ohashi in Fl. E. Him. 91. 1966; 2: 33. 1971; Hara *et al*, Enum. Fl. Pl. Nepal 2: 21. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 298. 1984 ; Hajra *et al*, Fl. India 1: 136. 1993. *Thalictrum falconeri* Lecoyer in Bull. Soc. Bot. Belge 24: 192 & 271, t. 4, f. 12. 1855.

Herbs perennial robust upto 2.5 m tall. **Stems** usually branched leafy. **Leaves** pinnately decompose; **petioles** sheathing and auricled at base, stipulated, 1 - 2.5cm, 3 lobed, obtusely toothed. **Flowers** polygamous usually in dense terminal clusters, bracteate. **Calyx** greenish white, mauve within, deciduous, ovate-obovate. **Stamens** exceeding sepals; filaments filiform; **anthers** 2 – 3 mm long acute, mucronate, sessile; style deciduous.

Flower : June – October.
Exsiccatus : Memenchu lake 3800 m, **SR Lepcha & AP. Das** 163, dated 15.07. 2004.
Status : Common
Local Distribution : Memen chu lake 1300-3600m.
General Distribution : HIMALAYA:INDIA, NEPAL, BHUTAN.
Note : 1. Endemic to Himalaya
2. Root extract used as tonic, purgative, febrifuge and in ophthalmia (Bhujel, 1996).

Thalictrum virgatum Hook.f. & Thoms. in Fl. India 1: 14. 1855; in Hook.f., Fl. Brit. India 1: 12. 1872; Hara & Ohashi in Fl. E. Him. 91. 1966; 2: 34. 1971; Hara *et al*, Enum. Fl. Pl. Nepal 2: 22. 1979; Grierson & Long, Fl. Bhutan 1(2): 298. 1984; Hajra *et al* Fl. India 1: 143. 1993

Herbs perennial, upto 30cm tall, glabrous. **Leaves** simple or simply ternate, subsessile; lamina broadly orbicular or obovate, 1 - 3.5cm across, obtusely toothed or lobed above, base rounded or cordate, glabrous above, usually glaucous beneath; petioles 4 - 12mm long. **Flowers** small, white in spreading panicles. **Calyx** often narrowly elliptic. **Anthers** rounded at apex. **Achene** many, prominently 1-ribbed, compressed, elliptic, beak tapering.

Flower : June – October
Exsiccatus : Panglakha 2980 m, **SR Lepcha & AP. Das** 32993, dated 28.07.2005.
Status : Less common
Local Distribution : Panglakha, KAS 2400 – 4500 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL – BHUTAN) s. Tibet, and W. CHINA.

BERBERIDACEAE A. Jussieu

Key to the Genera:

1. Shrubs armed with spines; bracts absent *Berberis*
1. Shrubs strictly unarmed; bracts present *Mahonia*

Berberis (Tournefort) Linnaeus

Key to the Species;

1. Flowers 3 - 6 or many in axillary fascicles 2
+ Flowers solitary or in fascicle of 2 *B. angulosa*
2. Calyx (in 2 whorls) inner elliptic 3
+ Calyx (in 2 whorls) inner obovate *B. umbellata*
3. Stem grooved; berry ovoid to oblong *B. hookeri*
+ Stem not grooved; berry ellipsoid *B. insignis*

Berberis angulosa Hook.f. & Thoms. ex Wallich Cat. N. 1475; Grierson & Long., Fl. Bhutan 1(2): 323. 1984.

Local Name: *Tungbum muuk* (Lep.), *Chutro* (Nep).

Shrubs erect deciduous upto 1.5 m tall. **Stems** strongly grooved, brown. Spine 3 fid, internodes to 2.5 cm. **Leaves** herbaceous, elliptic - obovate, 1.5 - 2 x 0.4 - 1.5 cm, acute, base attenuate, margin entire or rarely spinous toothed. **Flowers** solitary or 2 - 3 in fascicle. **Sepals:** outer ovate, 13 x 8 mm, inner broader, to 8.5 mm. **Petals** obovate 5 x 6 mm. **Fruits** ellipsoid, style short or absent.

Flowering : May *Fruit:* July
Exsiccata : Mid-Rachela 2650 m, *SR Lepcha & AP. Das* 0251, dated 16.09.2005
Status : Common.
Local Distribution : Jorepokri, Kyong nosla, 3000 - 4200 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : Endemic to E. Himalaya

Berberis hookeri Lemaire in *Illust. Hort.* 6: 207. 1859; Hara in *Fl. E. Him.* 1: 93. 1966; Hara *et al.* *Enum. Fl. Pl. Nepal* 2: 30. 1979; Grierson in *Grierson & Long, Fl. Bhutan* 1(2): 327. 1984; Sharma *et al.* *Fl. India* 1: 395. 1993. *Berberis wallichiana auct non DC.*, *Prodr.* 1: 107. 1824; Hook.,f. in *Fl. Brit. India* 1: 110. 1872; Hara in *Fl. E. Him.* 1: 93. 1966.

Shrubs evergreen upto 3 m tall. Stem grooved, slightly yellowish. **Leaves** lanceolate - elliptic, lamina 2.5 - 6.5 x 0.7 - 2.6 cm, strongly spinose-dentate, acute; pedicels to 2.9 cm, erect, deep pink. **Flower** 3 - 8 in fascicles. **Sepals** pink, in 2 whorls, outer ones ovate, inner ones elliptic; **Petals** 0.3 - 0.69 x 0.3 - 0.50 cm, obovate, yellow; **ovules** 3 - 8. **Berries** ovoid to oblong.

Flower : April - June *Fruit:* September - December
Exsiccatus : Durpin dara - Rachela 2750 m, *SR Lepcha & AP Das* 0250, dated 16.09. 2005
Status : Less common

Local Distribution : Chitray, Tinsimana, Rachel Middle, Jorpokhari. 2300 – 3050 m
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : Endemic to E. Himalaya

Berberis insignis Hook.f. et Thoms., Fl. India 1: 226. 1855; Hook.,f. Fl. Brit. India 1: 111. 1872; Hara & Ohashi in Fl. E. Him. 1: 93 1966; Grierson in Grierson & Long., Fl. Bhutan 1(2): 324. 1984; Sharma *et al.* Fl. India 1: 400.1993
Local name: *Tungbunzen* (Lep.) *Chutro* (Nep).

Shrubs erect evergreen upto 1.5 m tall, thickly branched. Spines few; to 7cm. **Leaves** sub-petiolate, **lamina** 5 - 17 x 2 - 4.7cm, spinous toothed, acuminate, base attenuate, shining on both surfaces, veins prominent below, glaucous; pedicels 1.2cm, thick, curved. **Flowers** 5 - many in axillary fascicles. **Calyx** in 2 whorls, outer ovate, 0.2 x 0.19cm, inner ones elliptic. 0.6-0.35cm. **Corolla** 0.5 - 0.3cm, obovate, bifid, yellowish. **Berries** ovoid-ellipsoid, black.

Flower : April – June *Fruit:* August – December
Exsiccatus : Ramitey 2400m, *SR Lepcha & AP Das* 31111, dated 03.10.2004.
Status : Common.
Local Distribution : Singhaney - Panglakha, 2000 – 2600 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL - BHUTAN).
Note : 1. Endemic to E. Himalaya
2. Cultivated for ornamental

Berberis umbellata Wallich (cat, 40,n 1475. 1829, *nom, nud*) ex. G. Don gen syst 1: 116. 1831; Hook. f. & Thoms in Fl. India 224. 1855; in Fl. Brit. India 1: 110. 1872. Hara in FL. E. Him. 93. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 31. 1979; Sharma *et al.* Fl. India 1: 389.1993

Shrubs small spiny stems with young shoots depressed. Spines sometime obsent, 3-fid rarely 1. **Leaves** oblanceolate to obovate, membranous, to mucronate usually de-current to shortly cuneate at base, sparingly serrulate, along margin densely papillose. **Inflorescence** 3 - 6 flowered rarely 10 flowered, subumbellate ; bracts ovate acute. **Sepals** 6, in usually 2 series outer sepals ovate acute inner sepals obovate; **petals** yellow, 6, in 2 series obovate cunneate entire stamens 6, free; ovary simple ovules stipitate, stigma flat subsessile. **Berries** oblong ellipsoid, bright red; **seeds** dark brown,

Flower : March-June *Fruit:* August – September
Exsiccatus : Rachel 2950 m, *SR Lepcha & AP. Das* 31056, Dated 02.10.2004.
Status : Fairly common
Local Distribution : Panglakha, Singhaney, Zuluk below, 2900 – 4200 m.
General Distribution : HIMALAYAS; INDIA (Gharwal - Sikkim), BHUTAN, NEPAL.
Note : Endemic to the Himalaya.

Mahonia Nuttall

Mahonia nepaulensis Prain in Journ. Asia. Soc. Beng. 64: 316. 1895; G. Taylor, Meconopsis 39, t. 7. 1934; Hara in Fl. E. Him. 104 1966; 3: 43. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 2: 37. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 406 . 1984; Sharma *et al.* Fl. India 1: 411-412. 1993. *Mahonia acanthifolia* G. Don., Gen. Syst. 1: 118. 1831; Guha Bakshi in Sharma *et al.*, Fl. India 1: 407. 1993.

Shrubs erect or small trees upto 4 m tall. **Leaves** oblong-lanceolate; stipules filiform; leaflets 8 - 11 pairs, lowermost pair smaller, semicircular; lateral leaflets 4 - 5.6 cm long, oblong-ovate, margin spinulose; **Inflorescence** racemose upto 20 cm long, in fascicles of 3 - 4; bracts 2 - 3 cm long. **Calyx** in 3 series; outer upto 0.2 cm long, broadly ovate, acute; median calyx to 0.4 mm long, ovate, obtuse; inner ones to 0.6 cm long, oblong-elliptic, 2-lobed at apex. **Stamen** conical apiculate at apex. **Ovules** 2 - 4; **Berries** to 1cm long, ovoid, blue-black.

Flower : October - December *Fruit:* January - May
Exsiccatus : Phusrey 2150 m, **SR Lepcha & AP. Das 31180**, Dated 03.10.2004.
Status : Less Common.
Local Distribution : Dohrok, 1800 - 2700 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL - BHUTAN.
Note: 1. Endemic to Eastern Himalaya.
 2. A potent medicinal plant.

LARDIZABALACEAE Decne.

Holboellia Wallich

Key to the varieties:

1. Leaves digitately 3 - 9 foliolate; leaflet ovate, oblong, or ovate-lanceolate ... *var. latifolia*
- + Leaves digitately 7 - 9 foliate; leaflet lanceolate *var. angustifolia*

Holboellia latifolia Wall., Tent. Fl. Nepal 24. t. 16. 1824; Hook. f & Thoms., in Hook.f., Fl. Brit. India 1: 108. 1872; Hara *et al*, Fl. E. Him. 2: 34. 1971; Grierson & Long, 1(2): 330. 1984; Sharma & Hajra, Fl. India 1: 423. 1993.

Var. latifolia

Local Name: Gofla (Nep.).

Shrubs evergreen, climbing upto 5.5m tall. Stem usually twinning at apical portion. Leaves digitately 3 - 9 foliolate; Leaflets lamina 3.5 - 13 × 1.5 - 5cm, 3(9), ovate, oblong, or ovate-lanceolate, leathery, base widely cuneate, margin entire, apex acute, main veins not impressed. **Inflorescence** raceme, 3 - 7 flowered, in axillary fascicles; peduncles shorter than petioles filiform, purplish. **Flower** green or purplish green, sweet scented. **Calyx** 6 in 2 series, the outer 3 valvate, the inner 3 imbricate, oblong elliptic, green or purplish. **Corolla** 6, orbicular, brownish red; anthers apiculate. **Staminodes** minutes; carpel free, stigma sessile. **Fruits** monocarpelary, pear shaped red. **Seeds** orbicular, obovoid, blackish.

Flower : April - May *Fruit:* June - September
Exsiccatus : Jorepokhri 2700 m, **SR. Lepcha & AP. Das 31081**, 07.10.2004
Status : Abundant upto 3100m.
Local Distribution : Singaney, Padamchen, Premlakha, 2100-3100m.
General Distribution : HIMALAYAS; INDIA (KUMAON-NEFA), Manipur, Meghalaya, N Assam; W. CHINA.

Note : Fruits edible & the roots are used in treatment of rheumatism.

var. angustifolia (Wallich) Hk.f. *et* Thoms. in Fl. Bhutan India 1: 108. 1879; Hara *et al*. Enum. Fl. Pl. Nepal 2: 32. 1979; Grierson & Long, Fl. Bhutan 1(2): 330. 1984; Fasc. Fl. Ind. 19: 34. 1988. *H. angustifolia* Wallich, Tent. Fl. Nep. 25, t.17. 1824.

Local Name: Gofla (Nep.).

Similar to var. *latifolia* but leaves digitate with 7 - 9 leaflets, lamina 22 -13 x 0.4 - 6.5 cm, lanceolate, narrow, entire to crenate, base cuneate. **Flowers** 3 - 5 in axillary fascicles, rarely raceme, pendulous. **Tepals** 5, ovate-elliptic to lanceolate, greenish white or greenish-purple, glabrous, sparsely hairy; **stamens** free.

Flower : April - May *Fruit*: Aug. - Nov.
Exsiccatus : Rachela below near Jorpokhari 2980 m, **SR Lepcha & AP. Das** 03011, dated 11. 09. 2004.
Status : Abundant
Local Distribution : Rachela Park, Jaributti, Jorpokhari, 2000-3000m.
General Distribution : HIMALAYAS (Kumoan-Arunachal Pradesh), Meghalaya, Manipur),
 Note : Endemic to Eastern Himalaya.

MENISPERMACEAE A.L. Jussieu

Stephania Loureiro

Key to the species :

1. Leaf ovate, peltate; fruits globose *S. glandulifera*
 †. Leaf elongate-deltoid; fruits obovate *S. elegans*

Stephania elegans Hook.f. et Thoms., Fl. Ind. 1: 195. 1855; in Fl. Brit. India 1: 103. 1872; Hara in Fl. E. Him. 96. 1966; 2: 36. 1971; Kitamura in Enum. Fl. Pl. Nepal 2: 28. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 337. 1984; Sharma *et al.*, Fl. India 1: 333. 1993.

Twinnings, slender, shrubby, with tuberous root-stock. Stem terete, ridged, glabrous. **Petioles** to 4.5 cm long; **lamina** 3.5 - 11 x 2 - 5.5 m, elongate-deltoid, entire, acute, rounded-truncate at base, light green, glabrous, 5-7 nerved. **Cymes** axillary, umbellate. Peduncles upto 5cm long. **Flowers** purple-green, smelly. **Male flowers**: sepals to 0.5 cm, obovate, acuminate; petals shorter than sepals, broadly ovate, purple. **Female flowers**: sepals 0.50 x 0.4cm, obovate; petals minute, obovate. **Drupe**s obovoid, fleshy, reddish on ripening.

Flower : May - September *Fruit*: October - November.
Exsiccatus : 2300m, **SR Lepcha & AP. Das** 01600, dated 25.07.2004.
Status : Common.
Local Distribution. : Phusrey, Dorok, Hattichery, 1400 - 2100m.
General Distribution. : HIAMALAYA;INDIA (Gharwal to Assam), Khasia, Naga hills.
 Note : Endemic to Himalaya.

Stephania glandulifera Miers, Contr. Bot. 3:220. 1871; Hara in Fl. E. Him. 1:95. 1966; 2: 36. 1971; Kitamura in Hara, Enum. Fl. Pl. Nepal 2: 28. 1879; Whitemore in Enum. Fl. Pl. Nepal 2: 28. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 37. 1984; Sharma *et al* in Fl. India 1:334. 1993. *Stephania rotunda auct. non* Lour.: Hook.f. & Thoms., Fl. India 197. 1855; in Fl. British India 1: 103. 1872 p.p., non. Lour.

Local Name: Kunthey Paam (Lep) Tamarkay (Nep.).

Twinner perennial with tuberous rootstock. **Petioles** long, upto 10.5 cm; **lamina** 3.5 - 10 x 3.5 - 9cm, peltate, ovate, subacute to acute, rounded at base, margin entire to crenate, glabrous on both

surfaces. **Inflorescence** umbellate cymes, axillary on leafless branches. Peduncles upto 7.5cm long. **Calyx** in male flowers obovate, glandular or papillose near apex; **Corolla** absent; terminal column to 0.4cm across; female flowers similar to male ones. **Fruits** globose.

- Flower* : February – May *Fruit*: August – November.
Exsiccatus : Below phusrey, 2300m, *SR Lepcha & AP. Das 301*, dated 13.10.2004.
Status : Less Common.
Local Distribution. : Phusrey, Dorok, Hattichery , Premlakha 500 – 2100m.
General Distribution. : E.HIMALAYA; INDIA, (NEPAL to BHUTAN) and Assam.
Note: 1. Endemic to the Eastern Himalaya
 2. The Root-bulb is used as a drinking pot for poultry to prevent from diseases.

PAPAVERACEAE A.L. Jussieu

Key to the Genera:

1. Leaves elliptic, oblong, lanceolate; placenta attached to style *Meconopsis*
 + Leaves broadly ovate; placenta attached to stigma *Carthartia*

Carthartia Hooker

Carthartia villosa Hook.f., in Bot. Mag. t. 4596 .185 –Phot.-Alb. Fl. E. Himal. F. 174 & 175. 1968; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 119. 1872; Long in Grierson & Long, Fl. Bhutan 1(2): 409. 1984. *Meconopsis villosa* (Hook.f.) G.Taylor in Taylor & Cox, Account Mecopnop. 28, 1934; Hara in Fl. E. Him. 105. 1966.

Herbs perennial, with persistent withered leaf bases upto 1.5m tall. **Stem** erect, usually unbranched, brownish villous throughout. Petiole upto 22cm; stem leaves smaller, upper ones sessile. **Leaves** lamina 5 - 13 x 6 - 16cm, broadly ovate, palmately lobed; basal leaves few, broadly or suborbicular, palmately 3 – 5 lobed. **Inflorescence** in solitary, terminal and axillary, 1 -5 per stem. Born on slender stem. **Corolla** 4, suborbicular, yellow. Ovary cylindric, glabrous bearing sessile, stigma 4 -7 radiating lobes **Capsules** cylindric.

- Flower & Fruit* : May - July
Exsiccatus : Panglaka, *SR Lepcha & AP. Das 32967*, 27.07.2005.
Status : Less Common.
Local Distribution : Thegu, Changu lake. 2800 – 4000m.
General Distribution : EASTERN HIMALAYAS. INDIA
Note : Endemic to Eastern Himalaya.

Meconopsis Viguier

Key to the species:

1. Leaves lanceolate, ovate or oblong, Corolla yellow *M. paniculata*
 + Leaves elliptic, Corolla red, purple or blue *M. napaulensis*

Meconopsis napaulensis DC. Syst. Nat. 2: 21. 1821, excl. *B. takera* in note. B. C. Eding. 6: 216, t. 1-2, 33, f. 1-5 1917; Hiroshima in Fl. E. Him. 94. 1966; Fl. E.Him.(3): 43.1972 Hara *et al.*, Enum. Fl. Pl. Nepal 2: 31. 1979; Long in Grierson & Long, Fl. Bhutan 1(1): 406.1984.

Shrubs monocarpic, large, upto 2.5m tall. Stem, stiffy brownish villous throughout. **Leaves** lamina 25 - 40 x 6 - 22cm, rosette leaves, elliptic, deeply pinnatifid, rarely pinnatisect on base, lobes ovate oblong, acute or obtuse, coarsely crenate or serrate; **basal leaves** often more strongly pinnatisect, segments oblong with large rounded teeth. **Inflorescence** in solitary cymes in short branches, flowers many, pendulous. **Corolla** red, purple or blue. **Capsules** oblong - ellipsoid,

Flower & Fruit : July - September.

Exsiccatus : Panglakha, **SR Lepcha & AP. Das 30980**, dated 27.07.2005.

Status : Less Common.

Local Distribution : Thegu, Changu lake, Rachela, Panglakha 2700 – 3600 m.

General Distribution : E. HIMALAYA; INDIA(NEPAL – BHUTAN) , S. TIBET, W. CHINA.

Note : 1. Endemic to Himalaya

2. Root stock highly poisonous (Grierson & Long, 1984).

Meconopsis paniculata (D. Don) Prain in Journ. Asiatic. Soc. Bengal 64 f: 316. 1895; Hara & Ohashi in Fl. E. Him. 1: 104. 1966; Hara *et al* Fl.E. Him. (3):43.1972; Hara *et al*. Enum. Fl. Pl. Nepal 2: 37. 1979; Grierson & Long Fl. Bhutan 1(1):406.1984. Sharma *et al*. Fl. India ; (2): 21. 1993. *Papaver paniculatum* C. Don, Prodr. 197. 1825 p.p. *Meconopsis napaulensis* sensu Hook. f., *et* Thoms., Fl. Brit. India 1: 118. 1872 (ut *nipalensis*) non DC.

Shrubs gregarious upto 2 m tall. Stem hairy. **Leaves** lamina pinnately lobed, lanceolate; **basal leaves** in rosette, upto 40 cm, upper ones clasping on stem, margins variously cut into lobes, lobes lanceolate with long spiny tip, densely shining hairy both sides. **Inflorescence** in solitary, in short branches, flowers yellow, upper one stalked, lower ones on branched stalks; **Calyx** 2, falling before opening of buds. **Corolla** 4, upto 5 cm, rounded, yellow; stamens 4; ovary superior. **Capsule** ellipsoid-oblong, splitting by pores or valves, densely bristly-haired.

Flower & Fruit : June - November

Exsiccatus : Kupup 3900 m, **SR Lepcha & AP. Das 31076**, dated 07.10.2004.

Status : Less Common.

Local Distribution : Changu lake, Sherathang, Rachela, kupup, 3350 – 4260 m.

General Distribution : E. HIMALAYA (Gharwar – NEFA).

Note : 1. Endemic to Himalaya

2. An ornamental plant.

FUMARIACEAE DC.

Key to the Genera:

1. Climber; flowers actinomorphic *Dicentra*
 + Herbs erect or diffuse; flowers zygomorphic *Corydalis*

Dicentra Bernhardi (*nom. cons.*)

Key to species:

1. Flowers 7 – 10; capsule ovoid – ellipsoid *D. scandens*
 + Flowers 2 – 6; capsule cylindrical *D. lichiangensis*

Dicentra scandens (D. Don) Walpers, Repert. 1: 118. 1842; Hook.f., Fl. Brit. India 1: 121. 1872, p.p.; Hara *et al*. Enum. Fl. Pl. Nepal 2:35.1975; Long in Grierson & Long, Fl. Bhutan 1(2):382 - 383.1984; Ellis & Balakrishnan in in Sharma *et al*, Fl. India 2: 79. 1993. *Dielytra scandens* D.

Don, Prodr. Fl. Nep. 198. 1825. *Dactylicapnos thalictrifolia* Wallich, Tent. Fl. Nep. 51. t.89. 1826. *Dicentra thalictrifolia* (Wall.) Hook.f. & Thomson, Fl. Ind. 272. 1855.

Climbers perennial, upto 3 - 4m tall. Stems grooved. **Leaves** lamina 3.4 – 5.5 cm long, ternately, compound; petioles short *ca* 2.5 cm long; **leaflets** ovate-elliptic or ovate-spathulate, obtuse, apiculate, base cuneate. **Inflorescence** in cymes with flowers *ca* 1.5cm long, yellow, rarely purple, 7 – 10 flowered; bracts lanceolate; pedicels filiform. **Calyx** triangular, ovate, acuminate, caducous. **Corolla** yellow, acute. Ovary oblong, with slender style and quadrangular flattened stigma. **Capsules** 11 - 18 mm long, many-seeded, ovoid - ellipsoid.

Flower : June – September *Fruit*: September – October
Excisscatus : Rachela 2950 m, **SR Lepcha & AP. Das 20224**, dated 29.10. 2004.
Status : Sparse or Less commn.
Local Distribution : Kyongnosla, Changu, 2500 – 3050 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, INDIA, MYANMAR, CHINA.

Note : An important folk medicine.

Dicentra lichiangensis Fedde, in Fedde Repert. xvii.199.(1921); Long in Grierson & Long Fl. Bhutan 1(2): 383. 1984.

Climber, slender, upto 3m. **Leaves** biternate; **lamina** of leaflets 2 - 3 x 0.7 – 2 cm, narrowly ovate or elliptic, obtuse and acuminate, base cuneate, 7 - 10 nerves. **Inflorescence** in corymbose cymes, flower 2 - 6, peduncle 3 - 5 cm. bracts linear – lanceolate, 3 – 9 x 0.8 mm, mostly ciliate dentate. **Calyx** similar to bracts but oftenly shorter upto 5mm, yellow in outer side, upto 13 mm. with auricle at base. Nectariferous glands upto 4mm, oftenly slender, curving upwards. **Capsules** cylindrical.

Flower & Fruit : April – August
Excisccatus : Panglakhha 3050 m, **SR Lepcha & AP. Das 31015**, dated 07.10.2004.
Status : Sparse or less common
Local Distribution : Rachela, Padamchen 2500 m and above.
General Distribution : BHUTAN.

Note : 1. New distribution record for Sikkim
 2. Endemic to Eastern Himalaya

Corydalis Ventenat (*nom. cons*)

Key to the Species:

1. Stem less than 50 cm tall; petals spurs slender 2
- + Stem more than 50 cm tall; petals spurs broad *C. flaccida*
2. Stem leaves simple, opposite 3
- + Stem leaves branched, alternate 4
4. Flower small; corolla spur tip deflexed *C. leptocarpa*
- + Flower large; corolla spur not deflexed *C. changuensis*
3. Herb upto 15 cm; stem leaves solitary 5
- + Herb taller than 15cm; stem leaves 2 -4 6
5. Stem with short axillary shoot; racemes 5 - 20 flowered *C. polygalina*
- + Stem without axillary shoot; racemes 10 - 15 flowered *C. sikkimensis*
6. Bracts obovate; capsule cylindrical 7
- + Bracts linear or lanceolate; capsule obovate or oblong 9
7. Herbs upto 40cm tall 8
- + Herbs upto 15cm tall *C. fillicina*

- | | |
|---|------------------------|
| 8. Inflorescence with very few flowered | <i>C. longipes</i> |
| + Inflorescence with many flowered | <i>C. ophiocarpa.</i> |
| 9. Bracts lanceolate, capsule obovate | <i>C. Chaerophylla</i> |
| + Bracts linear ; capsule oblong | <i>C. juncea</i> |

Corydalis flaccida Hook.f. & Thoms., Fl. India 260.1885; in Fl. Brit. India 1: 122.1872; Hara *et al.* Enum. Fl. Pl. Nepal 2: 33.1979; Long in Grierson & Long Fl. Bhutan 1(2): 389.1984; Sharma *et al.* Fl. India 2: 56. 1993.

Herbs erect upto 1m tall. **Leaves** basal very few and broad, 3 - 4pinnatisect, segments ovate, bluntly toothed, obtuse or apiculate. Stem leaves numerous, often sessile.

Inflorescence in racemes 25 - 7.5cm, oblong 9 - 22 flowered. **Bracts** lower pinnatifid, upper linear toothed. Pedicels oftenly equaling bracts. **Calyx** broadly ovate, cordate acute, dentate. **Corolla** purplish, outer pair broadly crested, slightly upwardly curved spur. **Capsules** linear.

<i>Flower</i>	: June	<i>Fruit:</i> July
<i>Exsiccatu</i>	: Bhimbase 4200 m, SR Lepcha & AP. Das 1988, dated 20. 10. 2005	
<i>Status</i>	: Frequent	
<i>Local Distribution</i>	: Changu, Serathang. 3100 - 4600 m.	
<i>General Distribution</i>	: HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR.	

Corydalis leptocarpa Hook. f. & Thoms., Fl. India 1: 260. 1855; Hook.f., in Fl. Brit. India 1: 122. 1872; Fl. E. Him. 2: 40. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 34. 1979; Long in Grierson & Long, Fl. Bhutan 1(2): 389. 1984. Ellis & Balakrishnan in Sharma *et al.*, Fl. India 2: 65. 1993.

Corydalis leptocarpa Hook. f. & Thoms., Fl. India 1: 260. 1855; Hara, Fl. E. Him 2: 40. 1971; Hara *et al.* Enum.Fl. Pl. Nepal 2: 34. 1979.

Herbs annual diffused upto 20 cm tall. Stem glabrous. Petiole 2 - 5.5cm long. **Leaves** bipinnate; **lamina** of leaflets 1.5 - 2.5 x 0.5 - 2.5cm, ovate-elliptic, crenately lobed, glabrous, pale beneath, nerves not so prominent. **Inflorescence** in racemes 2 - 4 cm, 5 - 8 flowered. Bracts obovate. **Flowers** 2 - 4 cm long. Corolla spurred (spurs tip deflexed), upper pair crested, purple or pinkish red. **Capsules** linear.

<i>Flower</i>	: March	<i>Fruit:</i> June.
<i>Exsiccatu</i>	: Singhaney 2590 m, SR Lepcha & AP. Das 0199, dated 20.10. 2005.	
<i>Status</i>	: Sparse or Less common	
<i>Local Distribution</i>	: Dohrok, Hangey, Tungya. 1400 - 2500m.	
<i>General Distribution</i>	: INDIA ,NEPAL, BHUTAN, MYANMAR, CHINA.	

Corydalis chaerophylla DC., Prodr. 1: 128. 1824; Hook.f., Fl. Brit. India 1: 126. 1872; Long in Grierson & Long, Fl. Bhutan 1(2): 393. 1984; Ellis & Balakrishnan in Sharma *et al.*, Fl. India 2: 44. 1993.

Herbs perennial, erect, upto 1.3m tall. Stems grooved, glabrous to crispate pubescent below. **Lamina** 9 - 15 x 7-14 cm, broadly ovate, long-petiole, bipinnatisect; pinnae sessile, decurrent; segments oblong, obtuse; cauline leaves confined to upper part of stem, petiolules sheathing at base. **Inflorescence** in terminal racemes, up to 20cm, few flowered, rarely dichotomously branched panicles. **Flowers** golden yellow; pedicels upto 3mm long; bracts 3 - 4mm long, ovate-orbicular, serrulate. Outer pair of corolla apiculate, crested; **upper petal** upto 13 mm long; spur straight, nectariferous; lower corolla without a prominent basal pouch. **Ovary** glabrous; style rather flattened and grooved. **Capsules** 2-5 seeded, obovoid or ellipsoid.

Flower & Fruit : May-November
Exsiccatus : Lam-pokhri 4350 m, *SR Lepcha & AP. Das 30936*, dated 26.07.2005.
Status : Common
Local Distribution : Changu, Kyongnosla, Nathang 3500 – 4500 m.
General Distribution : HIMALYAS; INDIA(Kumaon – Sikkim), and Naga Hills, BHUTAN
Note : Endemic to Himalaya.

Corydalis juncea Wall., Tent. Fl. Nap.54, t, 42, f.dextra.1826: Hook.f. & Thoms in Fl. Brit. India 1: 123. 1972: Hara in Fl.E.Him.2: 40.1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 34.1979; Long in Grierson & Long Fl. Bhutan 1(2):393.1984.

Herbs slender upto 35 cm tall. **Basal leaves** often solitary, biternate, on long petiole upto 10cm ; leaflets variable, simple , elliptic, more often deeply palmatisect, with linear to obovate segments. **Stem leaf** usually solitary, linear, entire. **Inflorescence** in raceme of 5 - 20 flowered. **Bracts** linear, entire. **Pedicels** equaling or exceeding 5 –20 flowered. **Upper petal** 8 – 12mm, including short kneel broadly crested. **Lower lip** usually deflexed, crested. **Capsules** oblong.

Flower & Fruit : June – September.
Exsiccatus : Bhimbase 4350 m, *SR Lepcha & AP. Das 31430*, dated 27.07.2005.
Status : Common.
Local Distribution : Changu lake, Bombay hill (KAS), 3600 – 4600 m.
General Distribution : HIMALAYAS; INDIA, NEPAL to BHUTAN.
Note : Endemic to E. Himalaya

Corydalis filicina Prain in J. Asiat. Soc. Bengal ii, 65(2): 30. 1896; Long in Grierson & Long. Fl. Bhutan 1(1): 396. 1984; Ellis & Balakrishnan in Sharma *et al.* Fl. India 2: 55.1993.

Herbs perennial, upto 15cm tall. **Petiole** upto 3cm. **Lamina** 1.5 – 2.5 x 1.5 – 2cm ,ovate, finely biternatisect; terminal leaflets larger than lateral, pinnate, segments obovate mucronate, upto 2.5mm broad. **Inflorescence** in dense racemes with 10 - 20 flowered. **Bracts** lower upto 6mm, pinnatisect, upper bracts linear upto 4mm, entire. **Pedicel** slender. **Flowers** larger, yellow, upper calyx curved to 17mm, not crested; spur straight.

Flower : July – September.
Exsiccatus : Yakla 3700 m, *SR Lepcha & AP. Das 0198*, dated 19. 10. 2005.
Status : Common
Local Distribution : Nangpo cho, Jalepla. 3200 – 4500 m.
General Distribution : INDIA NEPAL, BHUTAN.
Note : Endemic to Eastern Himalaya.

Corydalis polygalina Hook.f. & Thoms. in Fl. Brit. India 1: 123 .1872; Long in Grierson & Long Fl. Bhutan 1(1): 393. 1984; Ellis & Balakrishnan in Sharma *et al* Fl. India 2:69.1993

Herbs slender tuberous, upto 35 cm tall. **Stem** with short axillary shoots. **Leaves** basal with pinnatisect or ternatisect into linear – lanceolate segments short upto 2.5cm, stem leaves upto 5, similar but shortly petiolate or sessile ; lower bract usually pinnatisect; upper bracts entire, upto 14 mm, pedicel much exceeding bracts. **Racemes** 5 - 20 flowered. **Corolla** c 14mm including broad spur half its length, keel with broad crest narrowly decurrent along spur.

Flower : June – September.
Exsiccatus : Dokala 4050 m, *SR Lepcha & AP. Das 10680*, dated 03. 17. 2004.
Status : Common
Local Distribution : Changu, Jalepla, Nathula. 3600 – 4600 m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, TIBET.

Corydalis opiocarpa Hook.f. & Thoms. in Hook. f., Fl. Brit. India 1: 122. 1872; Long in Grierson & Long., Fl. Bhutan 1(1): 397. 1984; Ellis & Balakrishnan in Sharma *et al* Fl. India 2: 68. 1993

Herbs erect upto 1m tall. **Stem** with short axillary shoots. **Leaves** basal, lamina 8 – 17 x 5 – 13 cm, numerous when young, ovate triangular, bipinnatisect on flattened petiole upto 13 cm, ultimate segments obovate, obtuse or mucronate. Stem leaves numerous, smaller. **Inflorescence** in racemes with many flowered; **Bracts** lanceolate, pointed, entire. **Calyx** suborbicular. **Upper petal** upto 14mm, included spur, lip winged but not crested. Lower lip equalling upper. **Capsules** linear, strongly undulate.

Flower & Fruit : June
Exsiccatu : Neora phatak 2700 m, **SR Lepcha & AP. Das** 27785, dated 30.09. 2004.
Status : Common
Local Distribution : Changu, Singhaney, Kupup 3000 – 3300m.
General Distribution : HIMALAYA; INDIA, BHUTAN, CHINA.

Corydalis longipes DC., Prodr.1: 128. 1824; Hara in Fl. E. Himal.103.1966; Hara *et al.*, Enum Fl. Pl. Nepal 2: 34. 1979; Long in Grierson & Long Fl. Bhutan 1(2): 396.1984.

Herbs with diffused stem, upto 35cm tall. **Lamina** 0.5 – 2.5 x 2 – 3.5 cm, slender, numerous, oftenly borne on stems, ovate in outline, ultimate segments obovate or oblanceolate. **Inflorescence** in lax racemes, very few flowered. Lower bracts deeply toothed upper entire. **Calyx** suborbicular, dentate. **Corolla** yellow, 11-14 mm including upwardly curved slender spur 5 – 7.5 mm long, broad at base: **upper lip** with low, entire crest not decurrent on spur: **lower lip** equalling upper; nectariferous gland one third to one half the length of spur. **Capsule** linear with single row of seeds.

Flower & Fruit. : June – September.
Exsiccatu : Bhimbase 4350 m, **SR Lepcha & AP. Das** 31489, dated 27.07.2005.
Status : Common.
Local Distribution : Serabthang, Baba Mandir and above 3800 – 4300 m.
General Distribution : HIMALAYAS; INDIA,(Sikkim to BHUTAN), MYANMAR.

Corydalis sikkimensis (Prain) Fedde, Fedde Repert. Spec. Nov. 17: 201. 1921; Long in Grierson & Long. Fl. Bhutan 1(2): 398. 1984; Ellis & Balakrishnan in Sharma *et al.*2: 71. 1993. *C. duthiei* Maxim var. *sikkimensis* Prain in Journ. Asiat. Soc. Bengal, 65(2): 33. 1896.

Herbs, erect or diffused with decumbent stem, 12 – 22 cm tall. **Leaves** radical 7.5 – 15 cm long, pinnatisect with 4 -5 pairs of lateral and one terminal pinne; cauline leaves 2 -4, rarely 1, often in subopposite pairs, similar but smaller than radical leaves. **Racemes** 10 – 15 flowered, subcorymbose. **Flowers** 15 – 20 mm long, yellow, spur straight to subfalcate. **Capsules** to 13 mm long, narrowly, obovate – oblong; seeds shiny, smooth.

Flower & Fruit : July – September.
Exsiccatu : Sherathng 4000 m, **Sinha & Shukla**, 20552, dated 17. 10. 2005.
Status : Common.
Local Distribution : Changu, Jalepla. Upto 4500 m.
General Distribution : E. HIMALAYA; INDIA, (Sikkim to BHUTAN).
Note : Endemic to Eastern Himalaya

Corydalis changuensis D.G. Long in Notes Roy. Bot. Gard. Edinburgh, 42(1): 102. 1984; Long in Grierson & Long. Fl. Bhutan 1(2): 397. 1984.

Herbs upto 25 cm tall, much branched. **Leaves** many, born on stems; petiole slender to 4 cm long; broadly ovate, lamina 1 – 2.3 x 1.2 – 2.8 cm, deeply or equally biternatisect. **Racemes** lax, few flowered. **Flower** larger, upper petal 13 – 16 mm, less strongly curved upwards; spur longer and broader, 5 – 9 x 2 – 3 mm, with crest extending almost tip of spur; lower lip with short spur, to 1.2 mm; nectariferous gland much longer to 6 mm long.

Flower & Fruit : July – September.
Exsiccatus : Sherathing 4000 m, *Sinha & Shukla*, BHSI 20539, dated 17.10. 2005.
Status : Common.
Local Distribution : Changu, Baba mandir, 4000 – 4300 m.
General Distribution : E. HIMALAYA; INDIA (Sikkim).
Note : Endemic to Sikkim.

DAPHNIPHYLLACEAE Muell.

Daphniphyllum Blume

Daphniphyllum himalense (Benth.) Muell. in DC., Prodr. 16(1): 113. 1869, p.p.; Hook.f., Fl. Brit. India 5: 354. 1887, p.p.; Hara in Fl. E. Him. 1: 184. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 200. 1982; Long in Grierson & Long, Fl. Bhutan 1(3): 814. 1987. *Goughia himalensis* Benth. in Hook. Journ. Bot. Kew. Misc. 6: 9. 1854.

Local Name: Lal Chandan (Nep.).

Tree evergreen upto 12 m tall. **Leaves** ; petioles 1.4 - 2.5; lamina 4.2 x 1.8 - 2.8 cm, oblanceolate, entire, acute, base attenuate, coriaceous, glaucous below. **Flowers** in axillary racemes of 3 - 8 cm, unisexual; **perianth** absent; **male flowers** with 5 stamens; filament free; anthers 0.25 x 0.1 cm, narrow, dorsally compressed, apiculate; **female flowers** with 2-chambered superior ovary; ovules 2 in each chamber; styles thick, recurved. **Drupe** 0.5 - 1 x 0.3 - 0.5 cm, ellipsoid with almost round tip, one seeded.

Flower : May – July *Fruit:* September – December
Exsiccatus : Rachela below *SR Lepcha & AP. Das* 27716, Dated 20.15.2006.
Status : Rare.
Local Distribution : Durpin dara , Panglakha. 2195 – 2280 m.
General Distribution : INDIA (Darjeeling, Sikkim, Meghalaya), NEPAL, BHUTAN, S. TIBET, MYANMAR.

MORACEAE Link

Key to the Genera:

1. Leaves vein 3- 15; Style bifid or rarely simple *Ficus*
 + Leaves veins 3- 5; Style strictly simple *Morus*

Ficus Linnaeus

Key to the species:

1. Trees or shrubs upto 10 m tall 2
 + Trees upto 20m tall *F. benjamina*

2. Leaves broadly ovate; lateral nerves 3 - 6 pairs *F. auriculata*
 + Leaves lanceolate or elliptic-lanceolate; lateral nerves 5 - 6 pairs *F. nerifolia*

Ficus auriculata Lour., Fl. Cochinch. 666. 1790; Gard. Bull. Singap. 18: 33. 1960; Hara in Fl. E. Him. 1: 53. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 209. 1982; Grierson & Long, Fl. Bhutan 1(1): 92. 1983. *F. roxburghii* Wall. [Cat. No. 4508. 1831, *nom. nud.*] *ex* Miq. in Ann. Mus. Lugd.-Bat. 3: 296. 1867; King in Fl. Brit. India 5: 534. 1885.

Local Name: Kundong kung (Lep.) Nebhara (Nep.).

Tree 8- 10 m tall. **Leaves;** petioles 5.5 – 10 cm long; **stipules** triangular; **lamina** broadly ovate or rounded, 13 - 24 x 8 - 23 cm, acute or mucronate, base deeply cordate strongly 5- 7 nerves, margins toothed or rarely entire, upper surface glabrous, Lower sparsely pubescent, lateral nerves 3 - 6 pairs, raised beneath, ; **peduncles** 3cm long, borne on short leafless branches. **Male flowers** with 1-3 stamens **Female flowers** ovary oblique; receptacles turbinate; style simple. **Achene** in **Figs** viscid.

Flower & Fruit : April – September

Exsiccatus : Haticherey – Mulkharkha 1850m, **SR Lepcha & AP Das 2100**, dated 20.03.2004.

Status : Common.

Local Distribution : Mulkharkha, 900 – 1700 m.

General Distribution : HIMALAYAS; INDIA, BHUTAN, MYANMAR, CHINA.

Notes : Domesticated for the fodder.

Ficus benjamina L., Mant. Pl. 129. 1767; Fl. Brit. India 5: 508. 1888; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 209. 1979; Lebbis in Enum. Fl. Pl. Nepal 3: 209. 1982; Grierson & Long, Fl. Bhutan 1(1): 95. 1983

Local Name: Lungzyi kung (Lep.) Kabra (Nep.).

Trees upto 20m tall. **Branches** usually drooping. **Petioles** 1.3 - 2.8 cm long; **lamina** ovate-elliptic, 4.5 - 13 x 5 – 6.5 cm, abruptly acuminate, base cuneate or rounded, glabrous, veins many and parallel. **Figs** globose, orange-red when mature, sessile, axillary; **bracts** usually 3, upto 0.2cm.

Flower & Fruit : October– April

Exsiccatus : Haticherey - Phusey 1600 m, **SR Lepcha & AP. Das 2200**, dated 20.07.2004.

Status : Common.

Local Distribution : Rachel middle, NNP, 1600 – 2300 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, CHINA, PHILIPINES, NEW GUINEA.

Note : 1. Dried juvenile buds are used in local pickle.

2. Plant strictly endemic to Eastern Himalaya

Ficus nerifolia J.E. Smith in Rees, Cyclop. 14. no. 21. 1810; Hara in Fl. E. Him. 1: 54. 1966; Lebbis in Enum. Fl. Pl. Nepal. 3: 210. 1982; Grierson & Long, Fl. Bhutan 1(1): 95. 1983. *F. gemella* Wall. *ex* Miq. in Hooker's Lond. Journ. Bot. 7: 454. 1848. *F. nemoralis* Wall. *ex* Miq. var. *genella* (Wall. *ex* Miq.) King in ARBGC 1(2): 162. 1888; 5: 534. 1888.

Local Name: Syit kung (Lep.) Dudhilo (Nep.).

Shrub or small tree, to 10 m tall. **Branchlets** reddish. **Stipules** upto 1- 1.5 cm, lanceolate; petioles 1.5 – 2.2 cm long, light red; **lamina** lanceolate or elliptic-lanceolate, 8 – 13 x 2 – 4.5 cm, entire, sharply acuminate, base cuneate, glabrous both surfaces, lateral nerves 5 – 6 pairs, reticulation conspicuous and dark coloured beneath. **Figs** ellipsoidal-globose, usually sessile, rarely peduncled.

Flower & Fruit : June– February.

Exsiccatus : Phusrey below 2100 m, **SR Lepcha & AP. Das 2300**, dated 23.07.2004.

Status : Common.

Local Distribution : Phusrey below 1400 – 2250 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, CHINA.

Note : Leaves are good fodder; figs edibles.

Morus Linnaeus

Morus australis Poir. in Lamk., Ency. 4: 380. 1797; Makai in JAA 8: 236. 1927; Lebbes in Enum. Fl. Pl. Nepal. 3: 209.1982; Grierson & Long, Fl. Bhutan 1(1): 101. 1983. *M. indica auct.non L.*: Hook.f., Fl. Brit. India 5: 492. 1888.

Local Name: Sano Kimbu (Nep.).

Shrubs or **small trees**, deciduous upto 9m tall. **Leaves** alternate; petioles 1 – 2.5 cm; Stipules upto 1.5 cm, lateral; **lamina** 3 – 6.5 x 3 – 6 cm, ovate, caudate-acuminate, base cordate or rounded, coarsely serrate, rarely trilobed, pubescent beneath, upper surface minutely strigose. **Male spikes** to 3cm, axillary, perianth segments to 0.4cm; **stamens** 0.3cm. **Female spikes** shorter, perianth segments 4, short to 0.1cm, ovate., overlapping, becoming succulent in fruit; **style** bifid. **Fruiting spikes** purplish-black.

Flower & Fruit : March – May

Exsiccatus : Subaney dara 1750 m, **SR Lepcha & AP. Das 2800**, dated 23.08.2004.

Status : Sparse

Local Distribution : Subaney Dara 1500 – 1750 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Note : Inflorescence edible.

URTICACEAE A. Jussieu

Key to the Genera

- | | |
|---|--------------------|
| 1. Perennial herbs or shrubs or trees | 2 |
| + Annual herbs | 6 |
| 2. Stinging hairs present | 3 |
| + Stinging hairs absent | Pilea |
| 3. Leaves entire, crenate or serrate | 4 |
| + Leaves palmately 3-7 lobed | Girardinia |
| 4. Achene ellipsoid | Boehmeria |
| + Achene obliquely ovate or ovate..... | 5 |
| 5. Female flowers with equal perianth segments | Urtica |
| + Female flowers with unequal perianth segments | Dendrocnide |
| 6. Stinging hair present | Laportea |
| + Stinging hair absent | 7 |

7. Leaves apparently alternate *Elatostema*
 + Leaves opposite 8
 8. Stipule connate, axillary *Lecanthus*
 + Stipules free, lateral *Chamabainia*

Boehmeria Jacquin

Key to the species

1. Leaves lanceolate 2
 + Leaves ovate - elliptic or suborbicular *B. macrophylla*
 2. Flowers mostly aggregated in globose clusters *B. glomerulifera*
 + Flowers mostly in spikes *B. hamiltoniana*

Boehmeria hamiltoniana Weddell in Ann. Sci. nat. ser. 4, 1: 199. 1854; Monogr. Urt. 371. 1856; Hook.f. in Fl. Brit. India 5: 579. 1885; Symb. Sin. 7: 151. 1929; Hara & Ohashi in Fl. E. Him. 1: 56. 1966; Grierson & Long, Fl. Bhutan 1(1): 127. 1983.

Local Name: Kamley, Chiplay (Nep.).

Shrubs, robust upto 3 m tall. **Branches** slender and glabrous. **Leaves:** petioles 1 - 3cm long; lanceolate, lamina 5 - 12 x 3 - 6cm, margin crenulate or serrulate, acuminate, base cuneate or narrowly rounded, membranous, glabrous, basally 3-nerved, veins sparsely pubescent beneath. **Flowers** in spikes 10 - 12cm long, slender. **Achenes** ellipsoid, glabrous, with the crown of persistent style

Flower : September - November *Fruit:* November - February.
Exsiccatus : Phusrey 2100m, **SR Lepcha & AP. Das** 30267, dated 07.10.2004.
Status : Frequent.
Local Distribution : Dohrok, Phusrey, upto 2400 m,
General Distribution : Tropical HIMALAYAS; INDIA, Khasia and Mishmi hills, (NEPAL-BHUTAN).

Note: 1. Endemic to Himalaya
 2. Foliage are potential fodder for cattle.

Boehmeria glomerulifera Miquel in Zoll., Syst. Verz. Ind. Archip. 101, 104 1854; Hara *et al.*, Fl. Enum. Fl. Pl. Nepal 3: 200.1982; Grierson & Long, Fl. Bhutan 1(1): 124. 1983. *B. malabarica* Weddel in Arch. Mus. Hist. Nat. Paris 8: 355. 1855-56; Hook.f., Fl. Brit. India 5: 575. 1885.

Local Name: Kamle (Nep.).

Shrubs upto 3 m tall. **Branches** oftenly pubescent. **Leaves** alternate; petioles 2.5 - 6.2cm long; stipules upto 5.5cm, lanceolate; **lamina** 9 - 22 x 4 - 10 cm, ovate, acuminate, base rounded, margins crenulate or sometimes serrulate, glabrous and rugose on upper surface, minutely hairy lower. **Flowers** mostly aggregated in globose clusters, 0.5 - 0.9 cm in diam., pubescent, **female flowers** usually born on upper sides of old branches, males towards base.

Flower : March - July
Exsiccatus : Dohrok 2300m, **SR Lepcha & AP. Das** 30262, dated 07.10.2004.
Status : Frequent.
Local Distribution. : Dorok, Phusrey, Premlakha upto 2300 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, SRI LANKA.

Boehmeria macrophylla D. Don, Prodr. Fl. Nepal 60. 1825; Tuyama in Hara, Fl. E. Him. 56. 1996; Hara *et al.*, in Enum. Fl. Pl. Nepal 3: 200. 1982; Grierson & Long, Fl. Bhutan 1(1): 126. 1983.

Local Name: Kamley (Nep.).

Subshrubs monoecious or dioecious upto 3.5 m tall. **Leaves:** petioles to 10cm long, slender; stipules to 1cm, lanceolate; **lamina** ovate - elliptic or suborbicular, 5 - 22 x 3 - 12 cm, acuminate, rarely cuspidate, base rounded, rarely subcuneate or cordate, serrate or dentate teeth uniform, veins inconspicuous, arching upwards, subglabrous, pubescent. **Male spikes** to 13 cm long, branch at base. **Female spikes** usually simple, solitary, to 25 cm, rarely pendulous. **Achenes** ellipsoid, bearing hook style.

Flower & Fruit : April - August

Exsiccatus : Subaney 1800 m, *SR Lepcha & AP. Das 1350*, dated 15.09.2007.

Status : Frequent.

Local Distribution : Subaney, Premlakha, Above Talkharkha upto 2000 m.

General Distribution : SUBTROPICAL HIMALAYA; INDIA (Kumaon - Mishmi hills), Khasia Burma, Laos, TONKIN, & W. CHINA.

Note : Foliage used as fodder for cattle.

Chamabiana Wight

Chamabiana cuspidata Wight, Icon. t. 1981. 1853; Monogr. Urtic. 387, t.12: 1856; Hook.f. in Fl. Brit. India 5: 580. 1885; Hara & Ohashi in Fl. E. Him. 57. 1966; 3: 19. 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 202. 1982; Grierson & Long, Fl. Bhutan 1(1): 128. 1983. *C. squamigera* Weddell in DC., Prodr. 16 (1): 218. 1869.

Local Name: Kurkuray Jhar (Nep.).

Herbs, creeping, slender, diffused. **Stem** pubescent. **Leaves** opposite; stipules 0.4 - 0.7 cm, 4 at base, broadly ovate, petioles upto 0.22cm; **lamina** 1.4 - 1.3 x 0.6 - 1.4 cm, ovate, serrate, acute, base rounded or cuneate, basally 3-nerved, pubescent. **Flowers** in axillary sessile 4-merous, male above, female below; **male flowers** shortly pedicellate, **perianth** deeply divided, lobes many and mucronate; **female flowers** with hirsute tubular perianth, minutely 4-toothed; stigma ovate, fimbriate, persistent. **Achenes** compressed and enclosed.

Flower & Fruit : March - November

Exsiccatus : Ramitey Dara (2900m) *SR Lepcha & AP. Das 31196*, dated 03.10.2004.

Status : Common

Local Distribution : Rachel below, Singhaney - Panglakha 1900 - 2450 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, SRI LANKA, MYANMAR, EAST TO CHINA, JAVA.

Elatostema J.R. & J.G.A. Forster

Key to the species

1. Herbs small upto 22 cm tall 2
- + Herbs or under-shrubs more than 22 cm tall 3
2. Leaves ovate - lanceolate; margin deeply serrate from middle 4
- + Leaves obovate, margin with few teeth at apex *E. obtusum*
4. Herbs creeping, slender, leaf oblong-elliptic, flower ciliate *E. hookerianum*

- + Herbs erect, leaves elliptic, flower hairy *E. sessile*.
 3. Leaves ovate – lanceolate; Rudimentary leaves present *E. monandrum*
 + Leaves elliptic-oblong; Rudimentary leaves absent *E. Sikkimensis*

Elatostema hookerianum Weddel, Monogr. Urtic. 309. 1856; Hook.f. in Fl. Brit. India 5: 567. 1885; Hara & Ohashi in Fl. E. Him. 58. 1966; 3: 20. 1975; Grierson & Long, Fl. Bhutan 1(2): 122. 1983.

Local Name: Sunol chim (Lep.)

Herbs, perennial, dioecious upto 40 cm tall. **Stem** glabrous, creeping. **Leaves** usually sessile, **lamina** 3.5 -8.5 x 1 - 3cm, obscurely oblong-elliptic, acuminate, base obliquely cordate-auriculate, margin serrate on upper half, basally 3 - 5 veined; stipules 0.40 - 0.85cm, linear. **Flowers** dioecious; bracts free in male heads, mucronate, that of female heads fused into a receptacle, ciliate. **Achenes** ellipsoid, irregularly ribbed.

Flower : April - June *Fruit:* July - September
Exsiccatus : Rachela 2950 m, **SR Lepcha & AP. Das 31088**, dated 02.10.2004.
Status : Abundant.
Local Distribution : Reshete, Chitray, Rachela Park, 1800 – 2600 m.
General Distribution : E. HIMALAYA; INDIA, (Darjeeling-Arunachal Pradesh), Meghalaya, Naga Hills, S. TIBET.

Note : Endemic to Eastern Himalaya

Elatostema monandrum (Buchanon-Hamilton ex D. Don) H. Hara, Fl. E. Himal. 3: 21. 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 203. 1982; Grierson & Long, Fl. Bhutan 1(1): 122. 1983. *Procris monandra* Buch.-Ham. ex D. Don, Prodr. 61. 1825. *Elastotema surculosum* Wight, Icon. t. 2091, f. 4. 1853; Hook.f. in Fl. Brit. India 5: 572. 1888; Hara in Fl. E. Him. 59. 1966, p.p. *E. surculosum* var. *elegans* Hook.,f. in Fl. Brit. India 5: 573. 1885.

Herbs very small, erect 5 - 15 cm. **Stems** either glabrous or puberulous. **Leaves** sessile, alternate, a small rudimentary leaf placed oppositely; **lamina** ovate - lanceolate, 2 - 4 x 0.3 - 1.2 cm, lower leaves smaller, sub-entire, margin deeply serrate from middle or often below middle, acute or acuminate, base obliquely cuneate-rounded ; rudimentary leaves to 0.8 cm long, oblong, entire. **Flowers** heads of male flowers usually sessile, rarely pedunculate, subtended by free broad bracts. **Female receptacles** sessile and enclosed by connate bracts. **Achenes** fusiform.

Flower : June - August *Fruit:* August - October
Exsiccatus : Premlakha 2200 m, **SR Lepcha & AP. Das 1328**, dated 10.10.2007.
Status : Fairly Common.
Local Distribution : Jorpokharai, Rachela, Premlakha 700 – 3050 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, SRI LANKA, MYANMAR, W. CHINA.

Elastostema obtusum Weddel in Ann. Sci. Nat. ser. 4, 1: 190. 1854; Hook.f., in Fl. Brit. India 5: 573. 1885; Hara *et al.*, Fl. E. Him 58. 1966; Grierson & Long, Fl. Bhutan 1(1): 121. 1983:

Local Name: Gagleto (Nep.).

Herbs, slender upto 22 cm tall. **Stems** with reddish minute glands. **Leaves** alternate, sessile; **stipules** solitary, to 0.5 cm long, often linear-lanceolate; **lamina** obovate, 0.4 - 1.5 x 0.30 - 0.8 cm, obovate, margin with few teeth at apex, obtuse, slightly oblique, basally 2-nerved, veins pubescent. **Peduncles** to 2.5 cm; **bracts** 4, upto 0.5 cm long, ovate-oblong. **Male-heads** 3 - 4 flowered. **Flowers** 0.3 cm across; **perianth** segments 3, obovate, slightly horned. **Fruit** not seen.

Flower : May - July

Exsiccatu : Dohrok 2300 m, **SR Lepcha & AP. Das 1330**, dated 10.10.2007.
Status : Frequent.
Local Distribution : Phusrey, Premlakha, Dohrok, 1800 – 2800 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, W. CHINA

Elatostema sessile Forster, Char. Gen. 106. 1776; Monogr. Urtic. 294, t. 9. 1856; Hook.f. in Fl. Brit. India 5: 563. 1885; Rep. Beih. 83. (1): 30. 1935; Hara & Ohashi in Fl. E. Him. 59. 1966; Grierson & Long, Fl. Bhutan 1(1): 118. 1983.

Local Name: *Sunol* (Lep.) *Gaglet* (Nep.).

Herbs or undershrubs upto 60 cm tall. **Stem** hollow. **Leaves** sessile, alternate; stipules 1.5 - 1.8cm long; **lamina** oblong 3.5 – 14.5 x 0.9 - 3.8 cm, elliptic, margin deeply serrate, acuminate, base obliquely cuneate, dark green, scarcely appressed pilose. **Flowers** axillary, sessile or rarely short peduncled, 0.3 - 1.3 cm across. **Male flowers** spurred at apex, perianth segments 0.2 - 0.20cm long, oblong. **Female flowers** accompanied with linear bracteoles, hairy. **Achenes** ellipsoidal.

Flower : May - August *Fruit*: August - November
Exsiccatu : Phusrey 2200m, **SR Lepcha & AP. Das 30254**, dated 06.10.2007.
Status : Common.
Local Distribution : Middle Rachel Chowk. 1750 – 2600 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, MALAYASIA

Elatostema sikkimense C.B. Clarke in Jour. Lin. Soc. Bot. 15: 125. 1877; Hook.f., in Fl. Brit. India 5: 571. 1885; Grierson & Long, Fl. Bhutan 1(1): 121. 1983

Herbs, sub-erect, much branched, 45 cm tall. **Stem** creeping, succulent. **Leaves** asymmetric; **petioles** to 0.8 cm long; stipules lanceolate; **lamina** 5 - 13 x 3.5 - 4cm, elliptic-oblong, acuminate, base cuneate, margin sharply serrate toward the apex, shallowly serrate on the other, glabrous. **Flowers** monoecious. Male and female **heads** to 1.4cm diam., shortly pedunculate. **Involucral** bracts with horny spur. **Perianth** lobes rounded and gibbous. **Achenes** fusiform, usually ribbed.

Flower : June - August *Fruit*: July - November
Exsiccatu : Talkharka 2280 m, **SR Lepcha & AP. Das 30251**, dated 06.10.2004.
Status : Abundant.
Local Distribution : Talkharka, Subaney, Premlakha 1600 – 2300 m.
General Distribution : E. HIMALAYA; INDIA (Darjeeling-Sikkim).
Note: 1. Endemic to Eastern Himalaya
2. Grows on wet rocks and slopes.

Dendrocnide Miquel

Dendrocnide sinuata (Blume) Chew in Gard. Bull.(Sing.121; 206.1965; Hara in Fl. E. Him. 3: 19. 1975; Grierson & Long, Fl. Bhutan 1(1): 111. 1983. *Urtica sinuata* Blume, Bijdr. Fl. Ned. Ind. 505. 1826

Shrubs upto 3 m tall, stinging hairs spreading on the inflorescence. **Leaves**: stipules ovate, to 2.3 cm long; petiole upto 16 cm long; **lamina** ovate or elliptic, 15 x 33 – 6 – 22 cm, acute, acuminate, base rounded or cordate, with stinging hairs on lower surface. **Flowers** in panicle to

20 cm long. **Female flowers** usually larger than males. **Male flowers** to 3.5 cm. **Female flowers** with ovary beaked at apex. **Achenes** obliquely ovate, white.

Flower & Fruit : July – October

Exsiccatus : Mulkharka below 1400 m, **SR Lepcha & AP. Das** 1346, dated 10.10.2007.

Status : Very Common in lower region

Local Distribution : Mulkharka 1400 – 1400 m.

General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, SRI LANKA, THAILAND MALAYSIA.

Girardinia Gaudichaud

Girardinia diversifolia (Link) Fries in Kew Bull. 36: 145. 1981; Grierson & Long, Fl. Bhutan 1(1): 111. 1983. *Urtica diversifolia* Link, Enum. 2: 385.1822, non Blume 1825. *Girardinia heterophylla* Decaisne in jacquemont Voy. Inde. 4, Bot. 151. t. 153. 1844; Hook. f., in Fl. Brit. India 5: 550. 1885. *U. palmata* Forssk., Fl. Aeg.- Arab. 159. 1775, non *Girardinia*. *U. heterophylla* Vahl, Symb. Bot. 1:76.1790 nom. illeg. *Girardinia heterophylla* Decne in jacquemont Voy. Inde. 4, Bot. 151. t. 153. 1844; Hook. f. Fl. Brit. India 5: 550. 1888.

Vern. name : *Kuju Sorong* (Lep.), *Bhangray Sisnu* (Nep.).

Herbs, perennial upto 2m tall with prominent stinging hairs. **Leaves** alternate; petioles upto 12 cm long; stipules 2 – 3 cm, ovate connate; **lamina** 7 – 18.5 x 8 - 19.5cm, broadly ovate, deeply palmately lobed, sometimes lower leaves unlobed, acuminate, base rounded, coarsely serrate, strongly 3-nerved at base. **Inflorescence** axillary in male panicles, flowers 0.13cm diam, perianth segments 4, free. **Female panicles** prickly, condensed to spike-like; flowers equal to male flowers, perianth united, 3-toothed; style subulate. **Achenes** compressed and black.

Flower & Fruit : June – September

Exsiccatus : Pangolakha below 2700 m, **SR Lepcha & AP. Das** 27750, dated 30.9.2004.

Status : Common.

Local Distribution : Rachel Middle, Jaributti, 1400 – 2500 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, SRI LANKA, MYANMAR, CHINA, MALAYSIA.

Note : Young shoots are eaten as vegetables and the fiber derived from the matured plants are being used in making traditional dresses including bow strings and rope by the Lepchas.

Laportea Gaudichaud (*nom. cons.*)

Laportea terminalis Wight, Icon. t. 1972. 1853; Monogr. Urtic. 125, t. 2c. 1856; Hook.f. in Fl. Brit. India 5: 549. 1885; Hara & Ohashi in Fl. E. Him. 60. 1966; Hara et al, Enum. Fl. Pl. Nepal 3: 204. 1982; Grierson & Long, Fl. Bhutan 1(1): 110. 1983. *L. bulbifera* auct non Wedd., Chew in Gard. Bull. Singapur 25: 121, f 2. 1969, p.p.

Local Name: *Surong bee* (Lep), *Patle Sisnu* (Nep.).

Herbs, perennial, upto 125 cm tall. with white prominent stinging hairs throughout. **Stipules** bifid, 07 – 1.3 cm long, lanceolate. **Leaves** alternate; petioles 1 – 7 cm long slender; **lamina** 4.5 – 14.5 x 2.5 – 13 cm, ovate, margin sharply serrate, acute to acuminate, base rounded, pinnately veined with 3 nerves at base, nerves raised beneath, scaberulous and deep green above, pale green

beneath. Flowers with male flowers 0.3cm across, perianth segments 4 - 5, equal, hairy; stamens 4 - 5. Female flowers on winged stalks, perianth segments 4, unequal; style slender upto 0.2cm. Achenes flattened with elongated fruiting pedicels.

Flower : May - August Fruit: September - February
 Exsiccatus : Phusrey 2100m, SR Lepcha & AP. Das 31183, dated 03.10.2004.
 Status : Less Common.
 Local Distribution : Phusrey, Hangey, 1600 - 2800 m.
 General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, SRI LANKA, TIBET, MYANMAR, CHINA, MALAYSIA.

Lecanthus Weddell

Lecanthus peduncularis (Royle) Weddell in DC., Prodr. 16(1): 164. 1869; Tayuma in Hara Fl. E.Him. 60. 1966; Hara et al, Enum. Fl. Pl. Nepal 3: 204.1982; Grierson & Long, Fl. Bhutan 1(1): 116. 1983. *Procris peduncularis* Royle, III. Bot. Himal t. 83. 1836. *Lecanthus wightii* Wedd. in Ann. Sci. Nat. "Ser. 4", 1: 187. 1854; Hook., f., in Fl. Brit. India 5:559. 1885.

Herbs small, succulent, dioecious upto 50cm tall. Leaves apparently alternate; stipules to 0.7cm; petioles ca 5 cm; opposite; lamina asymmetric, 1.2 - 3.5 x 0.6 - 1.3 cm, ovate, margin sharply serrate, acuminate, base cuneate or oblique-round, pilose hairy above, 3 - nerved from base, veins pilose hairy beneath. Peduncles simple. Receptacles upto fleshy. Flowers reddish-green: male flowers 4 - 5 merous; female flowers: perianth segmented into 3 unequal lobes; stigmas sessile. Achenes small ovoid, compressed.

Flower & Fruit : July - October
 Exsiccatus : Dohrok below 2200 m, SR Lepcha & AP. Das 20230, dated 28.10.2004.
 Status : Very Common.
 Local Distribution : Phusrey, Premlakha, Talkharka 1800 - 2600 m.
 General Distribution : AFRICA; HIMALAYAS; INDIA, MYANMAR, W. & C CHINA, TAIWAN, JAVA.

Pilea Lindley (nom. cons.)

Key to the species

1. Herbs more than 1 m tall 2
- + Herbs less than 1m tall 3
2. Flowers spike-like, much branched; Achene ovate. *P. anisophylla*
- + Flowers solitary; Achene broadly ovoid, *P. scripta*
3. Leaves broadly ovate, elliptic ovate 4
- + Leaves linear oblong *P. ternifolia*
4. Herbs > 50 cm tall 5
- Herbs < 50 cm tall *P. bracteosa*
- . Leaves margin serrate *P. symmeria*
- Leaves entire with minute acumen *P. umbrosa*

Pilea anisophylla Weddell, Monogr. Urtic. 193. 1856; Tuyama in Hara Fl. E. Him. 60. 1966; Hara *et al*, in Enum. Fl. Pl. Nepal 3: 205. 1982.

Herbs perennial upto 160 cm tall. **Stems** ascending, succulent. **Leaves:** petioles unequal, upto 3 cm; **lamina** unequal shaped, lanceolate, ovate- or oblong-lanceolate 4 – 13 x 1.7 -5 cm, pale green in both upper surface and lower, 3-veined, base deeply cordate, rarely rounded, margin entire or rarely 1-3-serrate, apex caudate-acuminate, **Flowers male** spikelike, few branched. **Female flowers** cymose - racemose, pubescent. Male perianth lobes 4, ovate, connate; **stamens** 4; **Female perianth** lobes unequal, abaxial lobe. **Achenes** ovate,

Flower : June – September *Fruit:* September - December
Exsiccatus : Talkharka- Dohrok upto 2290 m, **SR Lepcha & AP. Das 1340**, dated 10.10.2007.
Status : Common
Local Distribution : Dorok, Phusrey, Talkharka 1900 – 2400 m
General Distribution : SUB-TROPICAL HIMALAYA (NEPAL – BHUTAN) Naga hills, CHINA & FORMOSA

Pilea bracteosa Weddell, Monogr. Urtic. 245. 1856; Hook.f. in Fl. Brit. India 5: 555. 1885; Hara in Fl. E. Him 3: 24. 1975; Hara *et al*, in Enum. Fl. Pl. Nepal 3: 205. 1982; Grierson & Long, Fl. Bhutan 1(1): 114. 1983

Herbs glabrous to 55 cm tall. **Leaves** opposite; stipules to 1 cm long, ovate-oblong; petioles 2.3 cm long; **lamina** broadly ovate, 4 – 13 x 2 - 4.5 cm, sharply serrate, acuminate, base rounded, glabrous or rarely sparsely pubescent on upper surface, strongly 3-veined. **Panicles** upto 7.5 cm long, spreading. **Male flowers** 3-merous. **Perianth** segments in female flowers 3, unequal; stigmas brush-like.

Flower & Fruit : May – August
Exsiccatus : Neora border 2290 m, SR Lepcha & AP. Das 1341, dated 10.10.2007.
Status : Common.
Local Distribution : Sikkim-Neora Boundary, Rachel below. 1600 – 2500 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, W. CHINA.

Pilea scripta (Buchanan-Hamilton ex D. Don) Weddell, Ann. Sci. Nat., Bot., sér. 4. 1: 187. 1854; Grierson & Long, Fl. Bhutan 1(1): 113: 1983. *Urtica scripta* Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 59. 1825.

Herbs perennial stout dioecious or monoecious. **Stems** branched, to 1.8 m tall. Stipules lanceolate, veinless; **petioles** sub-equal, to 5 cm; **lamina** elliptic- or oblong-lanceolate, rarely narrowly elliptic, 4 - 13 x 2 – 6 cm, 3-veined, lateral veins many, **Flowers** solitary, in upper stem, a cymose panicle, often longer than petioles. **Male flowers** pedicellate or sessile; perianth lobes 4, connate 1/2 of length; **stamens** 4; **Female flowers** subsessile; perianth lobes connate at base; **staminodes** 3, scale-like, oblong. **Achenes** purplish spotted, broadly ovoid,

Flower : **June – August** *Fruit:* **September - October**
Exsiccatae : Dorok 2322 m, **SR Lepcha & AP. Das 30284**, dated 06.10.2004; Phusrey 2280 m, **SR Lepcha & AP. Das 30226**, dated 06.10.2004.
Status : Common
Local Distribution : Dohrok, Phusrey 2000 – 3200 m.
General Distribution : TEMPERATE HIMALAYA; INDIA, (NEPAL TO Mishmi hills) Khasia, BURMA, and W.CHINA.

Pilea symmeria Weddel, Monogr. Urtic. 246. 1856; Hook.f. in Fl. Brit. India 5: 554. 1885; Tayuma in Hara Fl. E. Him. 62. 1966; 3: 25. 1975; Hara *et al*, Enum. Fl. Pl. Nepal 3: 206. 1982; Grierson & Long, Fl. Bhutan 1(1): 113. 1983. *P. wightii* sensu Fl. Brit. India 5: 554. 1888, *non* Wedd.

Local Name: Phusray Gakleto (*Nep.*).

Herbs small upto 35 cm. **Stipules** upto 0.40 cm, lanceolate, membranous; petioles to 3.7 cm; **lamina** ovate 1.5 - 3 x 1-2 cm, margin serrate, acute, base rounded, dark green, usually glabrous, rarely sparsely pilose on upper surface, strongly 3-veined, reticulation conspicuous in lower surface. **Panicles** to 3.3 cm long, axillary. **Male flowers** trimerous. **Female flowers** with 3 unequal perianth segments. **Achenes** compressed,

Flower & Fruit : May - August

Exsiccatus : Phusray 2260 m, *SR Lepcha & AP. Das* 1342, dated 10.10. 2007.

Status : Common.

Local Distribution : Sikkim-Neora Boundary, , Rachila Chowk. 2300 - 2900 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, W. & C. CHINA.

Pilea ternifolia Weddel, Monogr. Urtic. 202.1856; Hook.f. in Fl. Brit. India 5: 552. 1885; Tayuma in Hara Fl. E. Him. 62. 1966; 3: 26. 1975; Hara *et al*, Enum. Fl. Pl. Nepal 3: 206. 1982; Grierson & Long, Fl. Bhutan 1(1): 116. 1983

Herbs epiphytic upto 35 cm tall. **Stem** unbranched. **Leaves** opposite or ternately whorled, subsessile or rarely shortly petiolate to 0.6 cm long; **lamina** linear-oblong, 3. 5 - 6 x 0.4 - 1.5 cm, acuminate, base obliquely cordate, margin coarsely serrate, glaucous in lower surface, nerves numerous. **Cymes** to 2.5 cm, axillary, densely flowered; peduncles to 0.8 cm long. **Flowers** dioecious, whitish; perianth to 0.2 cm diam. **Achenes** minute, oblong, smooth.

Flower & Fruit : July - December

Exsiccatus : Rachela below 2510 m, *SR Lepcha & AP. Das* 1344, dated 10.10.2007.

Status : Common.

Local Distribution : Sikkim-Neora Boundary, , Rachela Chowk. 1900 - 2500 m.

General Distribution : TEMPERATE HIMALAYA; INDIA, NEPAL - BHUTAN.

Note : Endemic to Eastern Himalaya (Sikkim).

Pilea umbrosa Weddel in Ann. Sci. Nat. ser. 4, 1: 187. 1854; Monogr. Urtic. 243. 1856; I 5: 556. 1888; Symb. Sin. 7: 121 et 130. 1929; Hara in Fl. E. Him. 62. 1966; Grierson & Long, Fl. Bhutan 1(1): 113. 1983.

Herbs upto 45 cm tall, pubescent. **Leaves** opposite; stipules membranous, often persistent; petioles to 4.3 cm long; **lamina** broadly elliptic-ovate, 6.5-13 x 2-5.5 cm, margin coarsely serrate, caudate-acuminate with entire and minute acumen to 0.4. base sub-cuneate or rounded, 3-nerved at base, dark greenish. **Male panicles** much branched. **Female panicles** shorter than male ones. **Achenes** with a few intra-marginal ridge.

Flower : May - August **Fruit**: August - December

Exsiccatus : Middle Rachela 2680 m, *SR Lepcha & AP. Das* 1345, dated 10.10. 2007.

Status : Common.

Local Distribution : Sikkim-Neora Boundary, Rachela Chowk 1900 - 2500 m.

General Distribution : TEMPERATE HIMALAYAS (Kashmir - Sikkim), Khasia, and W. CHINA.

Urtica Linnaeus

Urtica mairei H. Lev., in Fedde, 12: 183. 1913; Fedde Repert. 12: 183. 1913; Hara in Fl. E. Him. 3: 28. 1975; Hara *et al.*, in Enum. Fl. Pl. Nepal 3: 204. 1982. *U. parviflora* Roxb., Fl. Indica ed. 2, 3: 581. 1832; Hook.f. in Fl. Brit. India 5: 548. 1885; Journ. Linn. Soc. 26: 472. 1899; Grierson & Long, Fl. Bhutan 1(1): 108. 1983.

Local Name: Sorong bee (Lep.) Sisnu (Nep.).

Shrubs or undershrubs upto 3 m tall. **Stem** pubescent. **Leaves** opposite; **stipules** ovate-lanceolate, acuminate; petioles to 6 cm, slender, stinging hairy; **lamina** 5 - 13 x 2.5 - 8 cm, ovate-lanceolate or lanceolate, rarely ovate, margin doubly crenate or serrate, acuminate, base rounded or cordate, veins covered with stiff stinging hairs. **Flowers** in lax panicles. **Male flowers** with 4-lobed perianth and 4 stamens. Perianth in **female flowers** 4-lobed with dissimilar segments; ovary ovoid; stigmas sessile and brush-like. **Achenes** compressed with 2 broadly ovate.

Flower : March - July *Fruit:* August - January
Exsiccatus : Phusrey Dara, 2300m, *SR Lepcha & AP. Das 20117*, dated 08.10.2004.
Status : Common.
Local Distribution : Phusrey, Subaney, Karponang 1600 - 2200 m.
General Distribution : TEMPERATE HIMALAYAS; INDIA, NEPAL, BHUTAN.

Order : Juglandales

JUGLANDACEAE A. Richard ex Kunth

Engelhardtia Leschen ex Blume

Engelhardtia spicata Leschen. ex Blume, Bijdr. 528. 1826; Hook.f., in Fl. Brit. India 5: 595. 1885; Hara in Fl. E. Him. 47. 1966; 2: 17. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 212. 1982; Grierson & Long, Fl. Bhutan 1(1): 58. 1983. *Engelhardtia roxburgiana* Lindl. ex Wall., Pl. Asiat. Rar. 2: 85, t. 199, t. 7(fr. only) 1831, p.p.

Local Name: Suvyok kung (Lep.) Mauwa (Nep.)

Trees monoecious rarely dioecious upto 23 m tall. **Leaves** even pinnate, upto 35 cm long; leaflets often oblong lamina, 6 - 16 x 2.5 - 8 cm, obtuse or subacute, base rounded, oblique, unequal, petiolules glabrous or pubescent beneath. **Male catkins** to 11 cm long, each flower composed of 6 - 10 almost sessile; anthers on short side branch. **Female catkins** to 13 cm; bracts to 4.5 mm. **Fruiting catkins** nut ovoid, midlobe of bract largest, oblanceolate.

Flower & Fruit : April - June
Exsiccatus : Lower phusrey 1800 m, *SR Lepcha & AP. Das 32907*, dated 27.10.2004.
Status : Less common
Local Distribution : Mulkharka, 1400 - 2250 m.
General Distribution : HIMALAYA; INDIA (Assam, Naga Hills, Manipur) NEPAL - BHUTAN), TAR, INDO-CHINA, W. CHINA.
Note : Wood useful; bark used in a fish intoxicant, good firewood.

Order: Fagales

FAGACEAE Dumort

Key to the Genera:

- 1. Rudimentary ovary with pistillode 2
- + Rudimentary ovary without pistillode 3
- 2. Evergreen trees; leaf margin entire or serrate; female flower with spreading style .. *Lithocarpus*
- + Deciduous trees; leaf margin serrate; female flower with cylindric style *Castanopsis*
- 3. Male flower with 6 – 18 stamens; female flower with 6 – 9 styles *Quercus*
- + Male flower with 6- 12 stamens; female flowers with 3 style *Castanea*

Castanopsis Spach

Key to the Species:

- 1. Petiole ovate-lanceolate, margin serrate only towards apex..... *C. tribuloides*.
- + Petiole oblong-elliptic; margins sharply serrate with subulate teeth... *C. indica*

Castanopsis tribuloides (Smith) A. DC. in Journ. Bot. 1: 182. 1836; Hook.f.in Fl.Brit.India 5: 622. 1888; Hara *et al.* Fl. E. Him. 1: 49. 1966; Chater in Hara Enum. Fl. Pl. Nepal. 3: 214. 1982; Grierson & Long. Fl. Bhutan 1 (1): 82. 1983. *Quercus tribuloides* Smith in Rees, Cyclop. 29: no. 13. 1819.

Local Name: Musre Katus (Nep.).

Trees evergreen; bark dark gray. **Petioles** to 2.2cm long; **lamina** ovate-lanceolate, 5.6 -12 x 2.5 - 5 cm, serrate towards apex, acuminate, base acute, usually coriaceous, lateral nerves 7 - 14 pairs. **Inflorescence** with male spikes paniculate or fascicled, sparsely flowered, more slender, pubescent. **Female spikes** solitary, pale. **Cupules** to 2.6 cm across including basally branched bands of spines. **Nuts** ovoid, glabrous, and mucronate.

- Flower* : April. - September. *Fruit:* October. - December.
- Exsiccatus* : Bara-Ramitey 2650 m, , *SR Lepcha & AP. Das 31130*, dated 03.10.2004.
- Status* : Common.
- Local Distribution* : Rachel Middle, Panglakha, 1800 – 2400 m.
- General Distribution* : HIMALAYA; INDIA, (Kumaon – Sikkim) Assam , BURMA, INDO-CHINA, W.CHINA.

Castanopsis indica (Roxb.) A. DC. in Journ. Bot. 1: 182. 1863; Hook.f., in Fl. Brit. India 5: 620. 1888; Hara in Fl. E. Him. 1: 49. 1966; Grierson & Long Fl. Bhutan 1(1): 80. 1983. *Castanea indica* Roxb. [Hort. Beng. 68. 1814, *nom. nud.*] Fl. Ind. ed. 2, 3 : 643. 1832.

Local Name: Aulay Katus (Nep.).

Tree evergreen upto 20 m tall. Bark gray, warty. Juvenile shoots rusty-tomentose. **Leaves** ; petioles to 1cm long; oblong-elliptic, **lamina** 8 - 20 x 3.5 – 8.5 cm, margins sharply serrate with subulate teeth, acute to acuminate, base cuneate or often rounded, glabrous in upper surface,

rusty-tomentose below; mid-rib strongly depressed in upper surface lateral veins 12-19. **Spikes** to 17 cm long, in lax panicles, sub-erect and tomentose. **Male spikes** many; female spikes 1- 2. **Male flowers** clustered; stamens 12; pistillode villous. **Female flowers** solitary, densely pubescent; styles 3, cylindric. **Cupules** globose. **Nuts** ovoid.

Flower : February - April *Fruit*: October. - December.
Exsiccatus : Rachela below 2700 m , **SR Lepcha & AP. Das 31130**, dated 03.10.2004.
Status : Common.
Local Distribution : Rachela Middle, 600 -1800 m.
General Distribution : HIMALAYA; INDIA, (NEPAL – NEPAL) Assam, BURMA, Bengal, INDO-CHINA. THAI, CHINA.
Note : 1. Nuts edible.
 2. Potential local timber

Quercus Linnaeus

Key to the species:

1. Lamina with 9 - 12 pairs of lateral nerves; nuts oblong *Q. lineata*
 + Lamina with 18 - 25 pairs of lateral nerves; nuts ellipsoid *Q. lamellosa*

Quercus lineata Blume var. *oxydon* (Miq.) Wenzig in Jahrb. Bot. Gart. Berlin 4: 232. 1886; Hook.f., Fl. Brit. India 5: 506. 1888; Hara in Fl. E. Him. 1: 51. 1966. *Quercus oxydon* Miq. in Ann. Mus. Bot. Lugd.- Bat. 1: 114. 1863; Chater in Hara Enum. Fl. Pl. Nepal 3: 216. 1982; Grierson & Long. Fl. Bhutan 1(1): 76. 1983.

Local Name: Phalant (Nep.), Buuk (Lepcha)

Trees deciduous upto 25 m tall. **Petioles** to 2.8cm; **lamina** oblong, 6.2 - 13.5 x 3.2 – 5 cm, spinous serrate above middle, acuminate, base cuneate, silky hairy, lateral nerves 9 - 12 pairs. **Inflorescence** in spikes. **Flowers** monoecious borne in single spikes. **Male spikes** upto 7.5 cm long, drooping; **flowers** to 0.35 cm across, globose; **bracts** 0.45 - 0.8 cm long, lanceolate; perianth 5 - 6 lobed; stamens 5 - 7. **Female spikes** erect, 2 - 5 flowered; styles 3. **Cupules** to 1 cm in diam, hemispheric, with 5 - 7 overlapping lamellae covering half of the nut. **Nuts** ellipsoid slightly conical tip.

Flower : May - July *Fruit*: October - January
Exsiccatus : Dohrok 2280m, **SR Lepcha & AP. Das 30257**, dated 06.10.2004.
Status : Frequent.
Local Distribution : Rachela below, Singhaney bans, 2000 – 25000m.
General Distribution : HIMALAYAS; INDIA , NEPAL, BHUTAN, MYANMAR, CHINA, MALAYSIA.

Quercus lamellosa Smith in Rees Cyclop. 29: no. 23. 1819; Hook.f. in Fl. Brit. India 5: 606. 1888; Hara et al in Fl. E. Him. 1: 51. 1966; Chater in Hara Enum. Fl. Pl. Nepal 3: 216. 1982; Grierson & Long in Fl. Bhutan 1(1): 76. 1983.

Local Name: Bajranth (Nep.).

Tree evergreen, gregarious upto 20 m tall. **Petioles** long upto 4 cm; **lamina** oblong-lanceolate, 9 - 19 x 2.5 - 4.5 cm, conspicuously toothed and veined, dark green in upper surface, blue-green in lower surface, nerves 18-25 pairs, straight, elevated below; young Leaves silvery or buff-hairy in surface lower surface. **Male flowers** in drooping, long and flexuous catkins. **Female flowers**

solitary or crowded in short, erect spikes; styles 3, recurved. **Cupules** with concentric lamellate rings, woody, enclosing half of the nut. **Nuts** oblong, solitary or paired.

- Flower & Fruit* : April - June
Exsiccatus : Premlakha – Panglakha 2650 m, **SR Lepcha & AP. Das 1031**, dated 20.09. 2005.
Status : Very Common.
Local Distribution : Rachela, Hangay. 1900 - 2800 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, N. MYANMAR, S. W. CHINA.
Note : Used for timber and as firewood.

Lithocarpus Blume

Lithocarpus pachyphylla (Kurz) Rehder in JAA 1: 129. 1919; Chater in Hara Enum.Fl. Pl. Nepal 3: 215. 1982; Grierson & Long in Fl.Bhutan 1(1): 80. 1983; *Quercus pachyphylla* Kurz in JASB 2: 197, t. 14, f. 1-4. 1875; Hook.f., Fl.Brit.India 5: 608. 1888; Hara *et al* Fl.E.Him 1: 51. 1966.

Local Name:*Sunguray Katus* (Nep.).

Trees evergreen upto 20 m tall. Branches glabrous. **Lamina** elliptic-oblongate, 7-19 x 2.7 – 6 cm, entire, caudate-acuminate, base acute, coriaceous, glabrous, nerves impressed in upper surface, prominent in lower surface. **Male flowers** clusters (catkin) stout, erect; subtending bracts to 0.4 cm, ovate, subulate; **stamens** 12, pistillode present. Female flowers below, usually few, with spreading styles. **Cupules** nearly 3 cm in diam.; bracts fused together at base, enclosing half of the nuts. **Nuts** ovoid, turbinate

- Flower & Fruit* : May – January
Exsiccatus : Rachela 2750 m, **SR Lepcha & AP. Das 31227**, dated 07.08. 2008.
Status : Common
Local Distribution : Singhaney, Panglakha,. 2200 - 3100 m.
General Distribution : E. HIMALAYAS; INDIA, BHUTAN, NEPAL, N. MYANMAR
Note : Potential for both timber and wood

Castanea Miller

Castanea sativa Miller, Gard. Dict. ed. 8, 1. 1768; Grierson & Long., Fl. Bhutan 1(1): 79. 1983..

Local Name:*Katus* (Nep.).

Trees deciduous. **Leaves** simple, alternate; petioles 1.5 – 2 cm long; **lamina** 5 - 13 x 2.5 – 5 cm, ovate-elliptic, coarsely serrate, acute-acuminate, base cuneate, glabrous both sides. Inflorescence unbranched, spicate, erect. **Male flowers** 6 - 16, staminate and without pistillode. **Female flowers** with 6 - 9 filiform styles. **Cupule** subglobose, spiny, spines to 1cm long.

- Flower & Fruit* : May – December
Exsiccatus : Rachela below 2200 – 2600 m, **SR Lepcha & AP. Das 1030**, dated 07.08. 2008.
Status : Frequent
Local Distribution : Panglkha, Ramitey, Dorok above. 2200 - 3100 m.
General Distribution : ENDEMIC TO SOUTH AMERICA
Note : Seeds edible

BETULACEAE S.F. Gray

Key to the genera:

1. Tree upto 10 m tall; stamens 2..... *Corylus*
+ Tree more than 15 m tall; stamens 3 – 20 2.
2. leaf ovate, serrate; male catkins axillary p..... *Betula*
+ Leaf elliptic; entire or serrulate; male catkins in terminal panicles *Alnus*

Alnus Miller

Alnus nepalensis D. Don, Prodr. Fl. Nep. 58. 1825; Hook.f. in Fl. Brit. India 5: 600. 1888; Hara in Fl. E. Him 1: 48. 1966; 2: 17. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 213. 1982; Grierson & Long, Fl. Bhutan 1(1): 72. 1983

Local Name: *Sungru kung* (Lep.) *Utis* (Nep.).

Tree deciduous upto 24 m tall. **Leaves** alternate; petioles 1-1.8 cm; stipules oblong, auriculate; leaves; **lamina** 2.5 - 13 x 2 - 8 cm, broadly elliptic, entire, acute, base cuneate, usually coriaceous, brownish glandular below, veins pubescent. **Flowers** unisexual, monoecious; **male catkins** longer, drooping, paniculate; **female spikes** much shorter, ellipsoid, erect, clustered; scales long, woody cone like on maturity. **Achenes** triangular.

- Flower* : October – December *Fruit:* February – May.
Exsiccatus : Phusrey below, 1600 - 1800 m, *SR Lepcha & AP. Das 0249*, dated 15.09.2005
Status : Common in degraded landscape
Local Distribution : Rigu, Premlakha below, Bhusuk, 1500 – 2300 m.
General Distribution : HIMALAYAS; INDIA (GARHWAL - BHUTAN), MYANMAR, TIBET, W. CHINA.

- Note* : 1. Endemic to Himalaya
2. A good source for timber and firewood; very fast growing tree.

Betula Linnaeus

Key to the species:

1. Bark reddish-brown; Nuts with narrowed winged *B. alnoides*
+ Bark whitish-pink, Nuts with broadened winged *B. utilis*

Betula alnoides D. Don, Prodr. Fl. Nepal 58. 1825; Hook.f., in Fl. Brit. India 5: 599. 1888; Hara & Ohashi in Fl. E. Him 1: 48. 1966; 2: 18. 1971; Hara *et al.* Enum Fl. Pl. Nepal 3: 213. 1982; Grierson & Long, Fl. Bhutan 1(1): 71. 1983. *B. cylindrostachya* Wallich, Pl. As. Rar. 2: 7. 1831.

Local Name: *Saur* (Nep.).

Tree moderate size, deciduous upto 15 m tall. **Bark** with reddish brown, vertical strips. **Leaves** ; stipules lanceolate; ovate – ovate lanceolate, **lamina** 5 - 10 x 3.5 - 9 cm, irregularly serrate or doubly serrate, acuminate, base rounded or cordate, subglabrous upper surface, lower surface pubescent in young and gland dotted when old, lateral nerves 10 – 15 pairs. **Male catkins** sub solitary, erect, to 0.6 cm broad, fascicled, slender, pendulous. **Female catkins** in panicle, 2.5 – 5.5 x 0.3 - 1cm; scales to 0.4 cm, lanceolate. **Nuts** with narrowed winged.

Flower : January – April *Fruit:* March – June
Exsiccatus : Middle Rachela 2280 - 2549 m, **SR. Lepcha & AP. Das 31129**, dated 03.10.2004
Status : Common.
Local Distribution : Rachela, Subaney, 1700 – 2250 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MEGHALAYA, TIBET, CHINA.
Note 1. Endemic to Himalaya
 2. Locally used for timber

Betula utilis D. Don, Prodr. Fl. Nepal 58. 1825; Hook.f., in Fl. Brit. India 5: 599. 1888; Hara in Fl. E. Him. 1: 48. 1966; 2: 18. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 3: 214. 1982; Grierson & Long. Fl. Bhutan 1(1): 71. 1983. *B. bhojpatra* Lindl. in Wallich, Pl. As. Rar. 2: 7. 1831.
Local Name: *Bhujpat* (Nep.).

Trees to upto 17 m tall.. Barks papery, slightly whitish pink. **Leaves** ; stipules short to 1.1cm long, , ovate, usually deciduous; petioles to 1.3 cm long, **lamina** 2.5 - 8 x 2.5 - 8 cm, ovate, serrate, acute, base more or less truncate, veins pubescent in upper surface and glandular in lower, lateral nerves 8 – 12 pairs. **Inflorescence** in axillary solitary catkins. **Male catkins** 5.5. - 10 x 0.7 - 0.9 cm, borne towards shoot tips; scales 0.2 cm, orbicular; perianth 4-lobed; stamens 2. **Female spikes** terminal on side shoots, 2.5 - 6 x 1.5 - 1.3 cm; scales 3 lobes linear; perianth absent; style 2, filiform. **Nuts** with broadened winged.

Flower : April – June *Fruit:* July – October
Exsiccatus : Bara-Ramitey 2900-3040m, **SR Lepcha & AP. Das 31127**, dated 13. 10. 2005.
Status : Less Common.
Local Distribution : Jorpokhari, Trijunction, Rachela below 2400 – 3050 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, W. CHINA.
Note : 1. Endemic to Himalaya:
 2. Used for timber, paper making and for a medicine; Foliage is good fodder.

Corylus Linnaeus

Corylus ferox Wallich, Pl. As. Rar. 1: 77, to 87. 1830; Hook.f., Fl. Brit. India 5: 625. 1888; Pfl.-reich IV-61, Ht. 19: 44, f. 13.1904; Pl. Wilson. 2: 448.1916; Hara & Ohashi in Fl. E. Him. 1: 49. 1966; Grierson & Long. Fl. Bhutan 1(1): 72. 1983.
Local Name: *Lekh Katus* (Nep.).

Trees moderate sized, to 12 m tall. **Leaves**; petioles to 2 cm long, appressed pubescent; **lamina** 6.5 - 12 x 3.5 - 4.6 cm, ovate or elliptic, acuminate, base rounded, margin serrate, lowers surface pubescent and glandular-hairy, upper surface sparsely pubescent, lateral veins 11-15 pairs, usually parallel, prominent. **Male catkins** to 6.5 cm long, pendulous, scales ovate, pubescent; stamens 10, crimson; anthers apically pilose. **Female catkins** inconspicuous, usually 6 – 8; perianth adnate to ovary; ovary inferior; styles 2, linear, exerted, reddish. **Fruits** in clusters. Nuts aoid, compressed, and covered with spiny involucre.

Flower & Fruit : October – December
Exsiccatus : Below Rachela trijunction 2990 m, **SR Lepcha & AP. Das 0257**, dated 17.09.2005.

- Status* : Rare.
Local Distribution : Jorpokhari, Tinsimana. 2400 – 3050 m.
General Distribution : HIMALAYAS; INDIA(Sikkim) NEPAL, BHUTAN, MEGHALAYA,
TIBET, N. MYANMAR, W. CHINA.
Note : 1. Endemic to Himalayas
2. Nuts edible.

Subclass: **Caryophyllidae** Order: **Caryophyllales**

PHYTOLACCACEAE R. Brown

Phytolacca Linnaeus

Phytolacca acinosa Roxb., Fl. Indica ed. 2, 2: 458. 1832; Hook.f., Fl. Brit. India 5: 21. 1885 p.p.; Hara in Fl. E. Him. 78. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 171. 1982; Grierson & Long, Fl. Bhutan 1(2): 191. 1984.

Local Name: *Jaringo* (Nep.).

Herbs succulent, perennial. **Stem** cymosely branched. **Petioles** 0.8 – 1.5cm. **Leaves** simple, alternate; **lamina** 4.5 -15 x 1.6 - 5.5cm, elliptic-lanceolate, entire, acute or acuminate, base attenuate; membranous, glabrous, pinnately veined, lateral nerves 9-13 pairs. **Inflorescence**, terminal racemes erect, many-flowered; bracts short, membranous, linear; bracteoles linear. ; pedicel coarse, short hairy. **Flowers** actinomorphic, bisexual, greenish-white, upto 0.5cm across; tepals 5, free but shortly connate at base, elliptic, obtuse, spreading; stamens 8-10; carpels 10, free, dark purple. **Fruits** globose to slightly depressed, bluish-black when ripe.

- Flower & Fruit* : May – July
Exsiccatus : Padamchen 2200 m, **SR Lepcha & AP. Das** 2600, dated 23.07.2004.
Status : Less common
Local Distribution : Padamchen, Premlakha 1300 – 2380 m.
General Distribution : HIMALAYAS; INDIA (Kashmir – BHUTAN), Assam, and W. China.
Note : 1. Endemic to Himalaya.
2. Leaves eaten as vegetable.

Chenopodium Linnaeus

Chenopodium ambrosioides L., Sp. Pl. 219. 1753; Boiss., Fl. Or. 4: 904. 1879; Hook.f., in Fl. Brit. India 5: 4. 1886, Hara in Fl. E. Him. 76. 1966; Mullin in Hara, Enum. Fl. Nepal 3: 170. 1982; *Ambrina ambrosioides* Spach. in Hist. Nat. Veg. 4: 297. 1836; *Chenopodium integrifolium* Vorosch., Bot. Zhurn. 27: 42. 1942; *Chenopodium suffruticosum* Willd., Enum. Pl. Hort. Berol.: 290. 1809.

Herbs annual, aromatic strongly aromatic, **Stem** to 80 (-120) cm, ± erect, branches. **Leaves**; petiole to 1.5 cm long; lamina to 13 cm, lanceolate to elliptic, irregularly coarsely serrate, sometimes shallowly sinuate to almost entire, attenuate at base, acute to obtuse at apex; bracts

entire, linear - lanceolate - narrowly obovate, uppermost very small. **Inflorescence** paniculate, flowers sessile in small, dense. Terminal flowers bisexual, **perianth** deeply 5-lobed, lobes; **stamens** usually 5; perianth connate, 5-toothed; glabrous to sparsely pubescent.; **stigmas** usually to 4, slender. **pericarp** free. **Seeds** horizontal, rarely oblique, brown.

Flower & Fruit : May - January.

Exsiccatus : Mulkharka - Phusrey 2120 m, *SR Lepcha & AP. Das 0296*, dated 13.09.2005.

Status : Common.

Local Distribution : Mulkharka, Chitray. 2100 - 3000 m.

General Distribution : PAKISTAN, INDIA, W. CHINA.

Note : Probably endemic to tropical America. Earlier cultivated as medicinal plant and introduced in tropical and subtropical areas of the world, where it is commonly naturalized.

AMARANTHACEAE A. Jussieu

Key to the Genera:

1. Plants sub-erect, undershrubs; bracts concave *Cyathula*
+ Plants erect herbs; bracts ovate *Achyranthes*

Achyranthes Linnaeus.

Key to the species:

1. Plants > 1 m tall; bracts ovate; perianth segments ovate-oblong *A. bidentata*
+ Plants < 1 m tall; bracts subulate; perianth segments ovate-lanceolate *A. aspera*

Achyranthus aspera L., Sp. Plant. 204. 1753; Hara *et al* Fl. E. Him 1:76.1996; Hook.f. in Fl. Brit. India 4: 4. 1885; Long in Grierson & Long Fl. Bhutan 1(2):227. 1984.

Local Name: *Ankhlay Jhar* (Nep.).

Herbs, perennial, erect, or spreading 20 - 110 cm tall. **Leaves** opposite, ovate- elliptic; petiole to 13 mm; **lamina** 3 - 12 x 1.8 - 7 cm, acute, base cuneate, pubescent. **Flowers** in long slender spike to 30 cm; **bracts** subulate, occasionally spinous, to 2.5 mm, concave. **Perianth** segments rigid, ovate, - lanceolate, to 4.5 mm; **stamens** 5; anthers 2 celled, filament connate at base; **ovary** oblong, style filiform; **stigma** capitate. **Fruits** 1 seeded.

Flower & Fruit : June - August

Exsiccatus : Mulkharka - Phusrey, 1500 m, *SR Lepcha & AP. Das 31256*, dated 13.07.2008.

Status : Abundant

Local Distribution : Premlakha, Mulkharka 1200 - 1500 m.

General Distribution : INDIA (Kashmir - Sikkim), BHUTAN.

Note : Endemic to Himalaya.

Achyranthus bidentata Blume, Bijdr. 545. 1825; Hook.f. in Fl. Brit. India 4: 730. 1885; Hara *et al.*, Fl. E. Him. 1: 76 & 635, f. 57. 1966; 2: 25. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 168. 1982; Long in Grierson & Long, Fl. Bhutan 1(2): 227. 1984.

Local Name: *Ankhlay Jhar* (Nep.).

Herbs, perennial, erect upto 90 cm tall. **Leaves** petiolate (petioles upto 2.5 cm); **lamina** 3.6 -12 x 3 - 5 cm, elliptic-lanceolate, repand entire, pubescent. **Flowers** upto 11.5 cm long, nodding;

rachis slender; **bracts** upto 0.6 cm long, ovate; bracteoles longer than bracts, spinous and auricled basally. **Perianth** segments 5, unequal, upto 0.3 cm long, ovate-oblong, greenish; **staminodes** quadrangular, dentate, green. **Capsules** to 0.23 cm long, oblong, enclosed by perianth.

- Flower* : August - November *Fruit* : November - February
Exsiccatus : Dohrok, 2100 m, **SR Lepcha & AP. Das** 30278, dated 06.10.2004;
 Rachela, **SR Lepcha & AP. Das** 31033, dated 02.10.2004
Status : Abundant
Local Distribution : Padamchen, Kyongnosla, 1200 – 2280 m.
General Distribution : TROPICAL AFRICA, HIMALAYAS, (Kashmir - Sikkim), SRI
 LANKA, CHINA, MALAYSIA AND EW GUINEA.

Cyathula Blume

Cyathula capitata Moquin in DC., Prodr. 13 (2): 329. 1849; Hook.f. in Fl. Brit. India 4: 722. 1885; Hara & Ohashi in Fl. E. Him.1: 77. 1966; Hara *et al.*, Enum. Fl. Pl. Nepa l (3): 169. 1982; Long in Grierson & Long, Fl. Bhutan 1(2): 225. 1984.

Undershrubs, suberect, perennial upto 1.9 m tall. **Leaves**; petiole 2 - 3 cm long, opposite; lamina 5 - 13 x 3 - 4.5 cm, elliptic-lanceolate, caudate-acuminate, base acute, entire, membranous. **Flowers** 3.5 – 4.5 cm across, clustered in globose heads. Bracts concave. **Perianth** segments 0.4 - 0.6 cm long, linear-lanceolate, 1-nerved and with terminal hooked awns. **Stamens** 5, united. **Staminodes** imbricate and alternating with stamens; style simple; stigma capitellate; **ovule** solitary. **Capsule** covered by persistent perianth and styles.

- Flower* : June – August *Fruit*: September - December
Exsiccatus : Phede 3200 m, **SR Lepcha & AP. Das** 32874, dated 27.10.2004,
Status : Frequent.
Local Distribution : Zeluk, Dohrok above above upto 3700 m.
General Distribution : HIMALAYAS; INDIA (Sikkim, Bhutan), BHUTAN, INDO - CHINA.

CARYOPHYLLACEAE A. Jussieu

Key to the Genera:

1. Sepals united at base 2
 + Sepals free to base 3
2. Style 2 *Gypsophylla*
 + Style 3-5 *Silene*
3. Stamens less than equal to 5 4
 + Stamens more than equal to 5 5
4. Leaves lanceolate *Brachystemma*
 + Leaves ovate or suborbicular *Drymaria*
5. Slender, prostrate or decumbent herbs 6
 + Diffuse or mat forming herbs 7
6. Styles 2-3, capsule 2-6 valved *Arenaria*
 + Style 5, capsule 10 valved *Cerastium*
7. Capsule longer than sepals *Sagina*

+ Capsule short *Stellaria*

Arenaria Linnaeus

Arenaria melandriodes Edgew. ex Edgew. & Hook.f. in Fl. Brit. India 1: 241. 1874; Hara *et al.* Enum. Fl. Pl. Nepal 2: 52. 1979. Grierson in Grierson & Long, Fl. Bhutan 1(2): 212. 1984; Sharma *et al.* Fl. India: (2): 82, 504. 1993. *Arenaria cerastiiformis* Williams in Journ. Linn. Soc. Bot. 38: 402. 1909.

Herbs perennial, slender, rhizomatous. Stems ca 10cm. **Leaves** lamina 4.5 – 10 x 3 – 6.5 mm, oftenly elliptic acute, base usually rounded or sometime thicken above, glandular pubescent beneath margins. **Flowers** solitary, ± sessile or nodding on pedicels. **Sepals** ovate to lanceolate or obovate, rounded at apex. **Petals** pink, oblanceolate - obovate, rounded at apex, narrowed and almost clawed at base. **Style** 2.

Flower : July
Exsiccatus : Kupup 4200 m, *SR Lepcha & AP Das* 30917, 24.07.2005.
Status : Rare
Local Distribution : Nathang, Dokala, Tamjay. 3800 – 4200 m,
General Distribution : EASTERN HIMALAYAS; INDIA, NEPAL, BHUTAN, S.TIBET.
Note : Endemic to Eastern Himalaya.

Brachystemma D. Don

Brachystemma calycinum D. Don, Prodr. Fl. Nepal 216. 1825; Hook.f., Fl. Brit. India 1: 235. 1874; Hara in Fl.E.Him.1: 79. 1966; Hara *et al.* Enum Fl. Pl. Nepal. 2: 53. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 209. 1984; Sharma *et al.*, Fl.India: (2): 209. 1993.

Herbs subscaudent. Stem usually overcrowded branched, upto 2.5 m long, quadrangular, glabrous. **Leaves**; petioles short upto 1.9 cm long; lamina 2.5 - 6.5 x 2 – 4 cm, ovate-lanceolate, crenulate, acute, 3-nerved. **Inflorescence** in axillary and terminal cymes. **Cymes** 7 -12.5cm long. Peduncles slender; **bracts** 0.4-0.6cm, linear. **Flowers** small 1 - 1.8cm across. **Sepals** 5, oblong – lanceolate. **Petals** 5, shorter than sepals, narrow, whitish. **Stamen** 10; **styles** 2. **Ovaries** one-chambered, ovules 2. **Capsules** globose; seeds reniform.

Flower : April – July *Fruit*: August – December
Exsiccatus : Rachela 3000 m, *S.R. Lepcha & AP. Das* 27721, Dated 30.09.2004.
Status : Less Common.
Local Distribution : Panglakha below. Deorali dara. 1100 – 1750 m
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, W. CHINA.

Drymaria Willdenow

Drymaria villosa Chamisso & Schlacht. in Linnaea 5: 232. 1830; Mizushima in Hara Fl. E. Him. 80. 1966; Grierson in Grierson & Long, Fl. Bhutan 1(2): 216. 1984; Majumdar in Sharma *et al* Fl. India 2: 533. 1993.

Herbs, annual, prostrate or ascending, 25 - 40 cm tall. **Leaves** lamina 5 – 15 mm across, orbicular to reniform, cordate to truncate at base, villous with long whitish hairs; stipules usually entire. **Inflorescence** in paniculate cymes; **bracts** 0.5-1.5 mm long. **Sepals** 5, ovate-elliptic, 2 - 3.5 x 1 -

2 mm. Corolla 5, 2-3.6 mm long, 2-fid up to middle or more; lobes acute to deeply emarginated, with caducous filiform auricles at base. Stamens 5. Ovary ovoid to globose. **Capsules** ovoid or ellipsoid, 2-3.5 mm long, 3-valved.

Flowers & Fruits : January – December
Exsiccatus : Zuluk boarder 3700 m, **SR. Lepcha & AP. Das 20232**, 28.10.2004.,
Status : Abundant
Local Distribution : Karponang, Changu, Kyongnosla. 1700 – 2400 m
General Distribution : SUBTROPICAL ASIA; W. & S. CHINA, OCEANIA, HAWAII.
Note : Having vital folk medicinal value

Cerastium Linnaeus

Cerastium glomeratum Thuillier, Fl. Env. Paris ed. 2: 226. 286. 1799; Sci. Rep. Thoku Univ. Ser. 4, Biol. 29: Grierson in Grierson & Long, Fl. Bhutan 1(2): 205. 1984; Mizushima in Fl. E. Him. 1: 79. 1966; Sharma *et al* Fl. India 2: 523. 1993. *C. vulgatum* L., Fl. Suec. Ed. 2: 158. 1755, *nom ambing.*; F.; 38, f. 24. 1936. Hara in Fl. E. Him.(1): 628.1966; Sharma *et al.*, Fl. India (3): 503, 519. 1993. *C. vulgatum* var. *glomeratum* (Thuill) Edge. *et* Hook. f., in Fl. Brit. India 1: 228. 1874. ut '*glomerata*'.

Herbs, slender and suberect upto 40 cm. **Leaves** lamina 0.8 - 1.5 x 0.5 - 0.9 cm, oblanceolate or ovate, acute or obtuse, base narrowed or rounded, pubescent, sometimes glandular. Inflorescence in terminal cymes. **Calyx** 5, free, 07 - 05 x 0.4 - 0.12 cm, lanceolate, either glandular or eglandular, pubescent, margins scarious. **Corolla** 5; stamens 10; ovary unicelled; **styles** 5, filiform. **Capsule** small 0.7 - 1.4 cm, cylindrical, usually 10-valved and straw - coloured.

Flower & Fruit: May - September
Exsiccatus : Rachela 3050 m, **SR Lepcha & AP. Das 31065**, 02.10.2004.
Status : Abundant.
Local Distribution : Kyongnosla, Phede, 2200 – 3050 m.
General Distribution : PAN-TEMPERATE.

Gypsophylla Linnaeus

Gypsophylla cerastioides D. Don, Prodr. Fl. Nepal. 213. 1825. Grierson in Grierson & Long, Fl. Bhutan 1 (2): 200. 1984; Hara in Fl. E. Him. 2: 200. 1971; Sharma *et al* Fl. India. 3. 560. 1993.

Herbs perennial, upto 40cm tall. tomentose. Stems densely aespitose, ascending. **Leaf lamina** 0.3 - 1.5 x 0.4 -1.4cm, obovate-spatulate, both surfaces pubescent, margin ciliate; basal leaves long petiolate; cauline leaves sessile. **Inflorescence** in terminal cymes, 5 - 20-flowered; bracts leaflike, margin ciliate. **Flowers** 4 -13mm in diam.; pedicel short 2 - 6mm. **Calyx** green, broadly campanulate, lobes ovate or lanceolate, margin ciliate, apex obtuse. **Corolla** lilac or white, pale purple-red 3-veined, obovate-cuneate, base narrowed, apex retuse. **Stamens** shorter than petals. Ovary ovoid. **Capsules** ovoid, usually indehiscent. Seeds black, compressed globose minutely tuberculate.

Flower : May *Fruit*: August
Exsiccatus : Lampokri 4200m, **SR Lepcha & AP. Das 31411**, dated 27.07.2005.

Status : Common
Local Distribution : Thamjay, Nathula, 2800 – 4000 m
General Distribution : INDIA, BANGLADESH, BHUTAN, NEPAL, N PAKISTAN.

Sagina Linnaeus

Sagina saginoides (L.) Karsten, Dentsch. Fl. 539. 1882; Journ. Japan. Bot. 35(7): 194. 1960; Grierson in Grierson & Long, Fl. Bhutan 1(2): 214. 1984; Sharma *et al.* Fl. India (2): 557. 1993. *Spergula saginoides* L., Sp. Pl. 1: 441. 1753. *Sagina procumbens non L.*: Edgew. & Hook.f., Fl. Brit. India 1: 243. 1874.

Herbs perennial very small 1 – 3.5cm tall. **Leaves** small, linear, acuminate, sometimes awned at apex.; pedicels glabrous. **Calyx** 0.12 - 0.3 cm, keeled ovate; **Corolla** equal or slightly larger than calyx, white. **Capsules** slightly longer than calyx, 5-valved; **seeds** dorsally grooved, tubercled and pale brown.

Flower & Fruit : May - July
Exsiccatus : Zeluk, 3650 m, **SR Lepcha & AP. Das 20233**, dated 28.10.2004.
Status : Less Common.
Local Distribution : Kaphyokla, Zeluk, 2100 – 3050 m.
General Distribution : PAN-TEMPERATE.

Silene Linnaeus

Silene gonosperma (Rupr.) Bocquet in Candollea 22: 4. 1967; in Phan. Monogr. 1: 32. 1969; Subsp. *Himalayensis* (Rupr.) Bocquet in Candollea 22: 8. 1967; in Phan. Monogr. 1: 33. 1969. *Lychinis apetala* auct, non L. Edgew. & Hook. f. in Fl. Brit. India 1: 222. 1874; Mizushima in Fl. E. Him. 81. 1966; Grierson in Grierson & Long. Fl. Bhutan 1(2): 203. 1984. Sharma *et al.* Fl. India (3): 567. 1993. *Lychinis himalayensis* (Rohrb.) Edgew. in Fl. Brit. India 1: 223. 1879.

Herbs perennial upto 30 cm tall. **Leaves** lamina 1.5 - 4.5 x 0.5 - 0.4 cm, oblanceolate, acuminate, base attenuate, pubescent. **Inflorescence** in terminal cymes, flowers solitary or a rarely 2 - 3, nodding at first. **Calyx** slightly inflated, campanulate, glandular-pubescent, green with broad dark purple ribs, rarely complete dark purple, teeth oftenly acute, with scarius margins. **Corolla** scarcely exerted. **Calyx**, reddish purple, receptacle scarcely elongated. **Capsules** broadly ovoid.

Flower : February – September
Exsiccatus : Lam-Pokhri, 4300m, **SR Lepcha & AP. Das 30820**, dated 29.09.2005.
Status : Less common
Local distribution : Rongchu, Kupup, 2500 – 4400 m.
General distribution : EASTERN HIMALAYA; INDIA, NEPAL, BHUTAN
Note : Endemic to Eastern Himalaya.

Silene indica Roxb. ex Otth in DC., Prodr. 1: 368. 1824. Hort. Beng. 34; Fl. India ii. 446; Bocquet in Candollea, 22: 12. 1967; in Phan. Monogr. 1: 65. 1969; Grierson in Grierson & Long, Fl. Bhutan 1(2): 202. 1984

Herbs perennial. **Stem** glandular – pubescent. **Lamina** ovate – lanceolate, 3 – 7 x 2 – 3 cm, acute or acuminate, base rounded, glabrous or sparsely pubescent. **Flowers** in cymes, nodding

and becoming erect. **Calyx** green, herbaceous, glandular – pubescent on the nerves, tip oblique, subobtusate, green or brackish. **Corolla** limb exerted to 5mm from calyx, green or purplish. **Receptacle** scarcely elongated. **Capsules** ovoid.

Flower : June – August
Exsiccatus : Gnathang 3800 m, **SR Lepcha & AP. Das 30862**, dated 29.07.2005.
Status : Common
Local distribution : Changu, Dongchula, Tiger hill, 2400 – 4100 m.
General distribution : HIMALAYAS; INDIA, KASHMIR TO ASSAM, S. TIBET.
Note : Endemic to the Himalayas.

Stellaria Linnaeus

Key to the species:

1. Herbs pubescent; calyx lanceolate.....2
 + Herbs glabrous; calyx ovate-lanceolate..... *S. subumbellata*
2. Stems with whitish pilose hairs; Leaves lamina 1.5 - 3 x 0.4 - 0.3cm.....*S. patens*
 + Stem without pilose hairs; Leaves lamina 0.3 – 28 x 0.3 - 1.8cm.....*S. vestita*

Stellaria patens D. Don, Prodr. Fl. Nepal 215. 1825; Mizushima in Hara Fl. E. Him. 84. 1966; Hara & Ohashi in Fl. E. Him. 3: 35. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 2: 58. 1979; Grierson in Grierson & Long Fl. Bhutan 1(2): 207. 1984 ; Sharma *et al.* Fl. India: (2): 581. 1993. *Stellaria fenzliana* Klotzsch, B. Reise Pr. Waldem. 141, t. 29 A. 1862. *Stellaria longissima* Wall. ex Edgew. & Hook. f. in Fl. Brit. India 1: 231. 1874.

Herbs weak, grayish, pubescent. **Stems** with whitish pilose hairs; **lamina** ovate- lanceolate, 1.5 - 3 x 0.4 - 0.3 cm, acute or acuminate, base rounded, sessile **Inflorescence** in loose terminal cymes, flowers few. **Sepals** lanceolate ca 5mm; **Corolla** somewhat shorter than sepals. **Receptacle** not elongated. **Ovary** 1-celled; style 3 – 5. **Capsules** short, opening by 6 valves. **Seeds** numerous.

Flower : June.
Exsiccatus : Nathang 3680 m, , **SR Lepcha & AP. Das 32952**, Dated 27.10.2004.
Status : Rare
Local Distribution : Kupup, Tamjay, 1300 – 4000 m.
General Distribution : HIMALAYA; INDIA, (Punjab – Sikkim), BHUTAN.
Note : Endemic to Eastern Himalaya.

Stellaria subumbellata Edgeworth, Fl. Brit. India. 1:233. 1874. Sharma *et al.* Fl. India: (2): 589.1993; Grierson & Long, Fl. Bhutan 1(2): 208. 1984.

Herbs annual, glabrous. **Stems** tufted, ascending, upto 22 cm tall, slender. **Lamina** 4.5 - 13 x 1.2 – 4 mm, sessile, linear to linear-lanceolate, both surfaces glabrous, midvein conspicuous, base rounded, apex obtuse. **Inflorescence** in cymose umbel. **Flowers** 2 – 4, bracts ovate, membranous. Pedicel 1.2 - 2.5 cm, slender. **Calyx** 5, green, ovate-lanceolate, 3-veined, margin broadly membranous, apex acute. **Corolla** absent. Stamens 5; filaments slender. Styles 3, short. **Capsule** ovoid, as long as persistent sepals, 6-valved. **Seeds** pale brown or dark brown, compressed orbicular.

Flower : June – July *Fruit:* July – August.
Exsiccatus : Serabthang 4300 m, , **SR Lepcha & AP Das 24118**, Dated 04.10.2006
Status : Not common

Local distribution : Kupup, Kyongnosla. Kaphyokla 3000 – 4300 m.
General distribution : HIMALAYA; INDIA, (Kashmir – Sikkim), NEPAL.
 Note : Endemic to Himalaya

Stellaria vestita Kurz in J. B. 11: 194. 1873; Mizushima in Fl. E. Him.85. 1966; H. Ohashi in Fl. E. Him. 3: 35. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 2: 58. 1979; Grierson & Long Fl. Bhutan 1(2): 206. 1984. Sharma *et al.* Fl. India. 3; 590: 1993. *Stellaria saxatilis* Buch-Ham. ex D.Don., Prodr. Fl. Nepal 215. 1825; Edgew. & Hook. f. in Fl. Brit. India 1: 232. 1874; Hara *et al.* Enum. Fl. Pl. Nepal 2: 58. 1979. *Stellaria hamiltoniana* Majundar in J. India B.S. 44: 142. 1965.

Herbs usually grayish, pubescent. **Stem** normally prostrate upto 45cm tall. **Leaves** oftenly ovate, lamina 0.3 – 28 x 0.3 - 1.8cm, acute - acuminate, base rounded, sessile. **Inflorescences** in loose cymes. **Flowers** few. **Sepal** lanceolate ca 5.5mm. **Corolla** usually 3 - 4mm, bifid almost to base longer than calyx. **Capsule** ovoid, \pm as long as sepals. **Seeds** numerous ca 10-11.

Flower : February – September
Exsiccatus : Lam-Pokhri 4250 m, *SR Lepcha & AP Das 30948*, dated 24.07.05
Status : Not common
Local Distribution : Lam-pokhri, Bhimbase, Donkyala, 1600-2500m.
General Distribution : INDIA, BHUTAN, NEPAL, TAIWAN, MALAYSIA, CHINA.

Order: Polygonales

POLYGONACEAE A.L. Jussieu

Key to the Genera:

- | | |
|--|-------------------|
| 1. Erect herbs or sub-shrub | 2 |
| + Creeping, climbing, or prostrate herbs | 3 |
| 2. Style capitate or rounded | 4 |
| + Style fimbriate | 6 |
| 3. Flower peduncled | 5 |
| + Flower sessile | <i>Koenigia</i> |
| 4. Leaves large, perianth segments – 6 | <i>Rheum</i> |
| + Leaves small, perianth segments – 5 | <i>Aconogonum</i> |
| 5. Ocreae cylindric | <i>Persicaria</i> |
| + Ocreae lacerate or split obliquely | <i>Bistorta</i> |
| 6. Perianth segments-6, styles -3 | <i>Rumex</i> |
| + Perianth segments – 4, styles – 2 | <i>Oxyria</i> |

Aconogonum (Meisner) Reichenbach

Key to the Species:

1. Plant erect; perianth white *A. polystachyum*.
- + Plant creeping or strangling; perianth not white 2
2. Plant creeping; stem dichotomously branched *A. campanulatum*
- + Plant strangling; stem not dichotomously branched 3
3. Stem glabrous; mid-rib surface dotted above *A. molle* var *frondosum*
- + Stem pubescent; mid-rib dense silky hairy beneath *A. molle* var. *rude*

Aconogonum campanulatum (Hook.f.) Hara & Oashi in Fl. E. Him. 67. 1966; Hara *et al* in Enum. Fl. Pl. Nepal 3: 172. 1982; Grierson & Long, Fl. Bhutan 1(1): 154. 1983. *Polygonum campanulatum* Hook.f., Fl. Brit. India 5: 51. 1885. *Reynoutria campanulata* (Hook.f.) Moldenke in Bull. Torrey Bot. Cl. 68: 675. 1941. *Aconogonum campanulatum* var. *fulvidum* (Hook.f.) Hara & Ohashi in Fl. E. Him. 67. 1966.

Herbs, perennials, creeping upto 1.3 m tall. **Stems** dichotomously branched, tomentose, and stoloniferous. **Leaves** elliptic-ovate or even lanceolate; stipules tubular, enclosing almost all internodal length in young shoots, **lamina** 4.5 - 13 x 1.5 - 4.5 cm simple, alternate, margin entire, finely ciliate, acuminate, base acute to rounded, obscurely oblique, hairs beneath, reticulate, nerves densely pubescent beneath. **Flowers** in axillary cymes and terminal, divaricate. **Panicles** spreading, pubescent. **Bracts**, nearly ovate, acute; pedicels short, jointed under the perianth. **Flowers** bisexual, pendent; **perianth** minute, campanulate, white, glabrous; stamens 8; styles free. **Achenes** 3-winged.

Flower : July - October *Fruit*: September – December
Exsiccatus : Panglakha barrack below, **SR Lepcha & AP. Das** 29397 dated 30.09.2004.
Status : Very Common.
Local Distribution : Rachel Peak, Panglakha 2200 – 3100m.
General Distribution : HIMALAYAS; INDIA, (Kumaon - Sikkim), Naga Hills, S. TIBET and W. CHINA.

Note: Endemic to Himalayas

Aconogonum molle (D. Don) Hara & Ohashi in Fl. E. Him. 68. 1966; 2: 21. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 172. 1982; Grierson & Long, Fl. Bhutan 1(1): 156. 1983. var. *molle*. *Polygonum molle* D. Don, Prodr. Fl. Nep. 72. 1825; Hook.f. in Fl. Brit. India 5: 50. 1885; *Ampelgynonum molle* (D. Don) Roberty *et* Vautier in Boissiera 10: 31. 1964.

Local Name: Kundyom dung (Lep.), Thotney (Nep.).

Shrubs, straggling. **Branches** pubescent, terete. **Stipules** upto 5cm, oblique tubular and pubescent; petiole shorter; **lamina** 0.3 – 0.9cm, densely adpressed hairy, 3.5 - 11 x 1.8 - 4.5 cm, elliptic-lanceolate, entire-ciliate, acute to acuminate, rounded to cuneate, hairy, densely haired along mid-nerve, lateral nerves 12 - 17 pairs. **Flowers** axillary and terminal, hirsute with white and flexuous hairs. **Bracts** upto 0.3, rounded, sparsely hairy. **Pedicels** upto 0.2 cm. **Flowers** 0.4 x 0.3 cm across; **tepals** 5, spreading, united at base, elliptic - oblong; **stamens** 8; cylindric, slightly swollen in the middle, brownish red; style trifid, short; brownish red. **Fruits** trigonous and covered.

Flower & Fruit : June - September
Exsiccatus : Jalepla 4100 m, **SR Lepcha & AP. Das** 31021, dated 02.10.2004.

Status : Abundant.
Local Distribution : Kupup, Jalepla 3050 – 4200 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, CHINA, INDO-CHINA, MALAYSIA.

Note : Young shoots are eaten in the form of curry.

var. *frondosum* (Meisn.) Hara in Fl. E. Him. 68. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 172. 1982; Grierson & Long, Fl. Bhutan 1(1): 156. 1983. *Polygonum paniculatum* Bl., Bijdr. 533 (Dec. 1825-Mar. 1826); Hook.f. in Fl. Brit. India 5: 49. 1885. *P. frondosum* Meisn. in DC., Prodr. 14: 137. 1856; Hook.f. in Fl. Brit. India 5: 50. 1885.

Stem glabrous; **petiole** upto 2 cm; Leaves lamina (upto 7.5 - 17 x 1.8 - 7 cm); **mid-rib** surface dotted above.

Flower : July - October. *Fruit*: August - November.
Specimen Cited : Memenchu 4000m, *SR Lepcha & AP. Das 31014*, dated 07.10.2004.
Status : Common.
Local Distribution : Machuki. 1000 – 2600m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, JAVA.
Note : Stem used as pickle and curry.

var. *rude* (Meisn.) Hara & Ohashi in Fl. E. Him. 68. 1966; 2: 22. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 172. 1982; Grierson & Long, Fl. Bhutan 1(1): 156. 1983. *Polygonum rude* Meisn. in DC., Prodr. 14: 137. 1856; Hook.f. in Fl. Brit. India 5: 49. 1885.

Local Name: Kundyom (Lep.), *Thotne* (Nep.).

Stem pubescent with hairs; **Lamina** 4.5 - 11 x 1.2 - 3.5 cm; **petiole** upto 1.5 cm long with dense adpressed hairs; **mid-rib** dense silky hairy beneath

Flower & Fruit : July. - November.
Exsiccatus : Kupup(12500ft) *SR Lepcha & AP. Das 32955*, dated 28.07.2005.
Status : Common.
Local Distribution : Kyongnosla 2100 – 2800 m.
General Distribution : HIMALAYAS; INDIA, (Garhwal-BHUTAN).
Note : 1. Endemic to Himalayas
2. Young stem edible and locally consumed as pickle

Aconogonum polystachyum (Wall. ex Meisn.) K. Haraldson in Symb. Bot. Upsal., 22(2): 69. 1978; Grierson & Long, Fl. Bhutan 1(1): 156. 1983.

Shrubs upto 2.2m tall. **Stem** glabrous or pubescent. **Leaves**; sub-sessile or petiolate upto 1.2cm long; ovate elliptic, **lamina** 8.5 – 18.5 x 2.5 – 9 cm, acuminate, base rounded in cuneate, usually glabrous or pubescent on both above and lower, rarely densely covered; **Ocrea** 2.5 – 50mm, usually membranes pubescent. **Inflorescence** racemes in panicle, flower in branching; Perianth usually creamy, segment ovovate. **Achenes** trigonous, brown.

Flower & Fruit : July- September
Exsiccatus : Kupup 4150 m, *SR Lepcha & AP. Das 31019*, dated 08.10.2004.
Status : Common
Local Distribution : Kyongnosla, Memenchu, 3300 – 5000 m)
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN.
Note : Endemic to Himalaya.

Bistorta (Linnaeus) Adanson

Key to the species:

- 1. Herbs strictly erect 2
- + Herbs prostrate, trailing, slender 3
- 2. Stamens shortly exerted; ocreae non membranous *B. vivipara*.
- + Stamens not exerted; ocreae membranous *B. amplexicaulis*
- 3. Achene brown 4
- + Achene black *B. emodi*
- 4. Perianth pink 5
- + Perianth white *B. suffulta*
- 5. Leaves base lanceolate or linear lanceolate *B. macrophylla*.
- + Leaves base cuneate *B. vacciniifolia*

Bistorta vivipara (L.) S.F. Gray. Nat. Arr. Br. Pl. 2:268. 1821; Ohashi & Hara in Fl. E. Him. 2: 22. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 173. 1982. Grierson & Long, Fl. Bhutan 1(1): 168. 1983. *Polygonum vivaparum* L., Sp.Pl. 360. 1753.

Herbs erect with thick and fibrous rhizomes. **Stems** simple, 8-30cm. **Lamina** 2-10 x 1-2.5 cm, lower leaves usually ovate, acute, base rounded or cordate, usually with pubescent beneath; **Ocreae** brown, acute, entire; upper leaves linear. **Flowers** in raceme usually bulbiferous in lower part, avoid; flowers white or sometime deep pink. **Stamens** shortly exerted. **Achene** brown.

Flower : June *Fruit*: September
Exsiccatus : Kupup 4200 m, **SR Lepcha & AP. Das** 31407, dated 27.07.2005.
Status : Common
Local Distribution : Kyongnosla, Nathang, Memenchu, 3300 – 5000 m)
General Distribution : EUROPE, SIBERIA, W. & C. ASIA; HIMALAYA; INDIA, NEPAL, BHUTAN, TIBET, CHINA,

Bistorta amplexicaulis (D. Don) Greene. Leafl. 1: 21.1904; Hara & Ohashi in Fl. E. Him. 69. 1966;3: 29.1975; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 173.1982; Grierson & Long, Fl. Bhutan 1(1): 167. 1983. *Polygonum amplexicaulis* D. Don, Prodr. Fl. Nepal 70. 1825. *Polygonum petiolatum* D. Don, Prodr. Fl. Nepal 70.1825. *Polygonum amplexicaulis* var. *speciosa* (Meisn.)Hook. f. in Fl. Brit. India 5: 33. 1885.

Herbs erect with usually rhizomatous upto 70cm tall. **Unbranched**, rarely branched. **Leave**; **petioles** of lower leaves usually upto 18cm, upper ones sessile, **lamina** 5 x 12 (-25) x 3 – 7 (-12) cm, ovate, base cordate acuminate; amplexicaul, glabrous; ocreae 1.8 - 4.2 cm, brown, membranous, entire. **Flowers** in raceme to 6cm, mostly borne on slender peduncles 2 – 9 cm. **Flowers** usually numerous. **Perianth** pink or purple; pedicels normally 5 - 8mm. **Stamens** not exerted. **Achenes** brown, 3 - 7 mm.

Flower & Fruit : June - September
Exsiccatae : Kupup 3950 m, **SR Lepcha & AP. Das** 20920, dated 24.09.2005; on way to Panglakha from Premlakha 2800m, **SR Lepcha & AP. Das** 135, dated 18.09.2004; Singaney 2700 m, **SR Lepcha & AP. Das** 196, dated 25.09. 2004.
Status : Sparse.

Local Distribution : Kupup, Tinsimana, Panglakha 2800 – 3050 m.
General Distribution : AFGANISTAN, HIMALAYAS; INDIA, NEPAL, BHUTAN, W. & C. CHINA.

Bistorta emodi (Meisn.) Hara & Ohashi in Fl. E. Him. 69. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 173. 1982; Grierson & Long, Fl. Bhutan 1(1): 167. 1983. *Polygonum meissneri* Wall. Cat. 1693. 1829, *nom. nud.*; *Polygonum emodi* Meisn. in Wall., Pl. Asiat. Rar. 3: 51. t. 287. 1832; Hook. f., Fl. Brit. India 5: 33. 1885; Steward in Contr. Gray Herb. 88: 29. 1930.

Herbs, perennial, prostrate, glabrous, branched. **Stem** with few branches, prostrate, 13 - 18 cm long. **Leaves** lamina 3 – 6.0 x 1.5 - 4.0 cm, lanceolate or linear, grass-like, acute, sessile. **Ochrea** 1.8 - 3 cm long, tubular, ovate, long acuminate, membranous. **Flowers** in erect, terminal, simple or branched, upto 4.5 cm, lax flowered raceme long slender peduncles. Flowers 1.8 - 3mm across. **Ochreolae** tubular, glabrous, ovate, acute. **Perianth** 4 - 5-parted, upto 5 mm long, oblanceolate, obtuse, deep red. **Stamens** 8, filaments long, filiform, equal. **Ovary** trigonous with three styles, free till middle, stigmas capitate. **Fruit** trigonous, black, shining.

Flower & Fruit : July – September
Exsiccatae : Nathang 3890 m, *SR Lepcha & AP. Das 30953*, dated 24.09.2005;
Lungthung, 3850, *SR Lepcha & AP. Das 32827*, dated 25.10.2004.
Status : Rare.
Local Distribution : Rachel Peak. 2800 – 3100 m.
General Distribution : HIMALAYAS; INDIA, (Simla to Sikkim) and W. CHINA

Bistorta suffulta (Maxim.) Green ssp. *pergracilis* (Hemsl.) Sojak in Preslia 46(2): 152. 1974. Grierson & Long, Fl. Bhutan 1(1): 167. 1983; *Polygonium pergracile* Hemsl. In Journ. Linn. Soc. 26: 344. 1891.

Herbs slender upto 40 cm tall. Branched. **Lamina** 5.5 x9 (-22) x 2.5 – 5 (13) cm, ovate, acuminate, base attenuate, subsessile, margins inrolled when young, veins prominent, fine and parallel, glabrous or weakly pubescent above. **Inflorescence** racemes slender, upto 5cm long, branched, flower 4-5; **perianth** ca 3 mm, white; stamens not exerted. **Achenes** brown.

Flower : May. – June
Exsiccatus : Panglakha 2890 m, *SR Lepcha & AP. Das 29390*, Dated 30.09.2004.
Status : Common
Local Distribution : Kyongnosla, 3300 – 5000 m)
General Distribution : HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : Endemic to Himalaya.

Bistorta macrophylla (D. Don) Sojak, Preslia 46: 152. 1974; Hara *et al.* in FL.E.Himal. 2: 72.1971; Sojak; Hara *et al.* in Enum. Fl. Pl. Nepal. 3: 173.1982; Grierson & Long, Fl. Bhutan 1(1): 168. 1983. *Polygonum macrophyllum* f. *tomentosum* Kitam., F. & Fl. Nep. Him. 117. 1955. *B. sphaerostachya* (Meisn.) Greene, Leaflet. 1: 21. 1904.

Herbs erect. **Stem** upto 30cm long bearing usually 2 - 4 leaves. **Lamina** 3.5 – 10 x 2.5 – 3.5 cm, ovate – lanceolate, acute or sometime linear, margin often strongly inrolled, marginal veins prominent, base lanceolate or linear lanceolate, pubescent beneath. **Upper leaves** lanceolate or linear, sessile, **ochreae** 1- 4cm, brown, acute entire. **Flowers** in racemes upto 70cm long, erect. **Perianth** pink. **Achenes** brown.

Flower : September
Exsiccatus : Padamchen boundary 2800m, *SR Lepcha & AP. Das 32901*, dated
- 27.10.2004.

Status : Common
Local Distribution : Padamchen,, Zuluk, Kyongnosla upto 5000 m.
General Distribution : HIMALAYA; INDIA, NEPAL, BHUTAN, CHINA
Note : Endemic to Himalaya.

Bistorta vacciniifolia (Meisn.) Green, Leafl. 1: 21. 1904; Grierson & Long, Fl. Bhutan 1(1): 167.1983; Hara & Ohashi in Fl. E. Him. 69.1966. *Polygonum vacinifolium* Meisner, Wall. ex Meisner in Wallich, Pl. Asiat. Rar. 3:54.1832; Hook.f. in Fl. Brit. Ind. 5: 33. 1885, Steward, L.c.27. 1930

Shrubs trailing, sometime stoloniferous. **Stem** slightly sub-erect, upto 17 cm. **Leaves** sessile, **lamina** ovate –elliptic, 1.5 – 2.5 x 0.8 – 1.8 cm, acute, base cuneate, **ocreae** c 1.3 cm., vein lacerated. **Flowers** in terminal racemes, rarely branched, to 7 cm, flower few – many. **Perianth** to 7mm, usually pink; **stamens** and style exerted,. **Achenes** brown to 1.8 cm.

Flower : September – November
Exsiccatus : Padamchen boundary, 2800m *SR Lepcha & AP. Das 32901*, dated 27.10.2004.

Status : Common
Local Disstrubution : Padamchen, Zuluk, Kupup 2800 - 4000 m
General Distribution : HIMALAYA; INDIA (Kashmir – BHUTAN) Manipur, and W. TIBET.

Note : Endemic to Himalaya.

Koenigia Linnaeus

Koenigia nepalensis D. Don, Prodr. Fl. Nep. 74.1825; Hara in Fl. E. Him 70. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3:174. 1982; Grierson & Long. Fl. Bhutan 1(1):157. 1983. *Polygonum filicaule* Wall. ex Meisn. in Wall., Pl. Asia. Rar. 3: 59. 1832; Hook.f. in Fl. Brit. India 5: 25. 1885.

Herbs annual small upto 35 cm. **Stem** prostrate, creeping. **Leaves**: petioles upto 0.62 cm long, upper leaves sessile; **lamina** 0.57 - 2.5 x 0.35 – 1.5 cm, ovate, acute, base rounded, sparsely hairy both sides; **Ocreae** to 0.5 cm, cup-shaped, pilose; **Flowers** in small flat-topped corymbs; **perianth** to 0.18 cm, segments 5, basally connate, white or pinkish; **stamens** 0.07 cm; styles 3, short and obliquely capitate. **Achenes** trigonous.

Flower & Fruit : June – August.
Exsiccatus : Rachela below, 2850 m, *SR Lepcha & AP. Das 20296*, dated 16.07. 2005

Status : Abundant.
Local Distribution : Panglaxha, Rachela Trijunction, 2700 – 3100 m.
General Distribution : HIMALAYAS; INDIA (Kashmir to Sikkim), TIBET, W. CHINA and Formosa

Oxyria Hill

Oxyria digyna (L.) Hill, Hort. Kew. 158. 1768; Grierson & Long, Fl. Bhutan 1(1): 175. 1983. *Rumex digynus* L., Sp. Pl. 1: 337. 1753; Hara *et al* in Enum. Fl. Pl. Nepal 3: 175. 1982

Herbs perennial. **Stems** solitary or several erect, upto 30 cm tall. **Leaves** ; petiole 3-12 cm; lamina 1.5 - 3 x 2 - 4 cm, nearly all basal, reniform or orbicular-reniform, abaxially sparsely hirtellous along veins, adaxially glabrous, base broadly cordate, margin sub-entire, apex obtuse;

cauline ones usually rudimentary; ocrea shortly tubular, membranous, apex oblique. Flowers terminal, paniculate; bracts membranous, each 2 - 5-flowered. Pedicels slender, articulate below middle. Flowers bisexual. Perianth greenish or pinkish; outer tepals smaller, deflexed; inner ones accrescent in fruit, obovate, appressed. Filaments dilated at base. Achenes ovoid, broadly winged.

Flower & Fruit : September – October
Exsiccatus : Kupup 3900 m, **SR Lepcha & AP. Das 02400**, dated 25.09. 2003.
Status : Not common
Local Distribution : Kupup, Gnathang, Lampokhri 1300 - 4900m
General Distribution : EUROPE, NORTH AMERICA, TAJIKISTAN, KAZAKHSTAN, RUSSIA, PAKISTAN, SW ASIA, INDIA, NEPAL, BHUTAN, JAPAN, KOREA, MONGOLIA

Persicaria Linnaeus

Key to the species:

1. Petiole winged or articulated at base 2
- + Petiole not winged 3
2. Herbs erect; stems usually with recurved spines; leaf hispidulous on both surfaces *P. pubescens*
- + Herbs climbing; stem without recurved spines; leaf pubescent and setoses on both surfaces *P. thunbergii*
3. Leaves runcinate *P. runcinata*
- + Leaf minutely dissected; ovate or deltoid-ovate 4
4. Flowers in corymbose heads; stamens 8; Perianth pinkish-white *P. chinensis*
- + Inflorescence oftenly axillary or terminal; stamens 3; Perianth light pink *P. nepalensis*

Persicaria chinensis (L.) H. Gross in Engl. Bot. Jaharb. 49: 269. 277 & 315. 1913; Grierson & Long, Fl. Bhutan 1(1): 163. 1983. *Polygonum chinense* L., Sp. Pl. ed. 1, 1: 363. 1753; Fl. Brit. India 5: 44. 1886; Hara *et al* in Fl. E. Him.3: 175. 1982

var. *ovalifolia* (Meisn.) Hara & Ohashi in Fl. E. Him. 71. 1966; 2: 22. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 175. 1982. *Polygonum chinense* var. *ovalifolia* Meisn. *sensu* Fl. Brit. India 5: 45. 1885.

Local Name: Ratnawlo (Nep.).

Shrubs, erect. Stem grooved. **Stipules** obliquely truncate tube and enclosed to entire internode, white; **petiole** upto 1cm, winged in few ones, 2-unequally auricled at base; **lamina** 4.5 -13 x 2.5 - 4.5cm, amplexicauled, shape much variable, oblong-lanceolate to oblong-ovate, margins minutely dissected, light red, thinly hairy, acute or acuminate, base variable from rounded, truncate to subcordate, glabrous and dark green above, densely brown hairy along mid-vein beneath, lateral veins 6 - 12 or more. **Flowers** in corymbose heads. **Peduncles** divaricate. Panicles glandular hairy. Bracts scarious, glabrous. **Involucral** leaves 0. **Perianth** pinkish-white, 5-cleft, lobes subequal; **stamens** 8; filaments glandular; styles 3, united below. **Fruits** trigonous.

Flower : June - October *Fruit:* August - December
Exsiccatus : Panglakha, **SR Lepcha & AP. Das 31182**, dated 05.10.2004.
Status : Common.
Local Distribution : Rachel, Panglakha, Talkharkha 1600 – 2200 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, CHINA, JAPAN,

MALAYSIA.

Note : A common fodder for cattle.

Persicaria nepalensis (Meisn.) H. Gross in Engl., Bot. Jahrb. 49: 277. 1913; Hara & Ohashi in Fl. E. Him. 72. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 177. 1982; Grierson & Long, Fl. Bhutan 1(1): 164. 1983. *Polygonum nepalense* Meisn., Monog. Polyg. 84, t. 7. fig. 2: 1826. *Polygonum punctatum* Ham. ex D. Don, Prod. Fl. Nep. 72. 1825.

Herbs, annual erect or procumbent. Leaves; stipulate, stipules to 0.6cm long, tubular, obliquely truncate; petioles upto 0.4cm, broadly winged, auricled, basally haired at nodal region; lamina 1.2 - 2.5 x 0.5 - 1.4cm, ovate or deltoid-ovate, slightly repund, little curved downwards, acute, base narrowed to winged petiole, dark green above, paler, glabrous to sparsely glandular hairy beneath, nerves impressed above, prominent below, mid-rib thick. **Inflorescence** oftenly axillary or terminal, with involucre green, sessile, ovate-cordate. Leaves peduncles small or nil, glandular hairy at the tip. Bracts ovate, glabrous. **Perianth** 5-lobed, accrescent, light pink; stamens 3; stigma capitate. **Achenes** biconvex.

Flower : May - November

Exsiccatae : Panglaxha 2760 m, *SR Lepcha & AP. Das* 29350, dated 30.9.2004.
NNP border, *SR Lepcha & AP. Das* 29353, dated 01.10.2004.

Status : Abundant.

Local Distribution : Kyongnosla, Rongchu, Changu below (1500-3100 m).

General Distribution : AFGANISTAN, HIMALAYAS; INDIA, NEPAL, BHUTAN, SRI LANKA, CHINA, KOREA, JAPAN, MALAYSIA.

Persicaria pubescens (Blume) Hara in Journ. Jap. Bot. 17: 335. 1941; Hara *et al* in Fl. E. Him. 73. 1966; in Hara *et al.*, Enum. Fl. Pl. Nepal 3: 177. 1982. Grierson & Long, Fl. Bhutan 1(1): 163. 1983. *Polygonum pubescens* Blume, Bijdr. 1825-26; Steward in Contr. Gray Herb. 88: 62. 1930. *Polygonum pubescens* Blume, Bijdr. 1825-26; Steward in Contr. Gray Herb. 88: 62. 1930; Pl. Jap. 2: 474. 1877; Hara & Ohashi in Fl. E. Him. 74. 1966; *P. hydropiper* ssp. *microcarpa* (Danser) Sojak in Preslia 46: 153. 1974.

Herbs annual or perennial upto 1.2 m tall. Stems erect, often reddish, hispidulous. **Leaves**: petiole to 5 mm ; **lamina** 3.5 - 9 x 1-4cm ovate-lanceolate or broadly lanceolate, both surfaces hispidulous, base cuneate, margin ciliate, apex acuminate or acute; ocrea tubular, hispid, apex truncate, ciliate. **Inflorescence** terminal or axillary, spicate, pendulous, lax, to 16 cm, interrupted below; funnel-shaped, margin ciliate, each 3- or 4-flowered; pedicels longer than bracts. **Perianth** green, red above, 5-parted, densely purplish glandular punctate; **tepals** elliptic; stamens 8, included; styles 3, connate to below middle. **Achenes** black, ovoid.

Flower : May - August

Exsiccatu : Singhaney 2200 m, *SR Lepcha & AP. Das* 20290, dated 28.10.2004.

Status : Sparse

Local Distribution : Subaney dara - Singhaney bans upto 2500 m.

General Distribution : EUROPE, N. AFRICA, HIMALAYAS; INDIA, NEPAL, BHUTAN, JAPAN, N. AMERICA.

Persicaria thunbergii (Seib. & Zucc.) H. Gross in Beih. Bot. Centralbl. 37(2): 114. 1919; Hara *et al* in Fl. E.Him. 1: 633. 1966; Hara *et al* Enum. Fl. Pl. Nepal 3:178. 1982; Grierson & Long. Fl. Bhutan 1(1):172.1983. *Polygonum thunbergii* Seib. & Zucc., Fl. Jap. Fam. Nat. 2: 84. 1784.

Herbs climbing upto 1.5 m tall.. Stem usually with small recurved spines. **Leaves:** petiole usually short to 4 mm long; lamina 3 -6.5 x 3 - 7.5 cm, acuminate , basal lobes spreading, acute, pubescent and setoses on both surfaces ; **ochreae** strigose, to 15 mm long with much longer 8 mm long cilia. **Spikes** up to 15 cm long, filiform, which are rather drooping, extremely slender and much interrupted. **Flowers** in terminal ; **perianth** ± gland-dotted. **Stamens** 8. Nuts trigonous, pale brown.

Flower : August – September. *Fruit:* September – October.
Exsiccatus : Memenchu, **SR Lepcha & AP. Das 31013**, dated 02.10.2004.
Local Distribution : Bab-mandir, Chhangu, Zuluk
General Distribution : PAKISTAN, INDIA, NEPAL, BHUTAN, BANGLADESH, CHINA, INDONESIA, JAPAN, KOREA.

Persicaria runcinata (D. Don) H. Gross in Engl., Bot. Jahrb. 49: 277. 1913; Hara in Fl. E.Him. 74. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3:178. 1982; Grierson & Long Fl. Bhutan 1(1): 164. 1983. *Polygonum runcinatum* D. Don, Prodr. Fl. Nep. 73. 1825; Hook.f. in Fl. Brit.India 5: 43. 1885.

Local Name: Ratnawlo (Nep.).

Herbs annual, prostrate, or ascending, upto 40 cm tall. **Stem** flaccid, grooved, creeping. **Leaves:** stipules cylindric, truncate, white-membranous; petiole 3 cm long, articulate at base, hairy; **lamina** 3 - 4.5 x 1 - 3.5 cm, runcinate, terminal lobe rhombic-ovate, lateral lobes linear oblong, in 1-3 pairs, amplexicled, pubescent beneath, veins pubescent below. **Flowers** head 2 cm across, globose; peduncle 1.5 - 3cm long, slender; **involucral leaf** absent; bracts enclosing pedicel, nerved in mid vein, hairy outside. **Perianth** light pink or white, 5 - cleft ; **stamens** 8, slightly exceeding perianth; anthers black; filament white; styles 3, united basally. **Achenes** rounded.

Flower & Fruit : April – December
Exsiccatus : Singhaney 2360 m, **SR Lepcha & AP. Das 20294**, dated 28.10.2004.
Status : Common
Local Distribution : distributed widely in altitude from 1200 – 3000 m
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, THAILAND, W. & C. CHINA, FORMOSA, MALAYSIA.

Note : A common fodder.

Rheum Linnaeus

Key to the species:

1. Herbs less than 2 m tall 2
- + Herbs morethan 2 m tall *Rheum australe*
2. Leaves basal in rosette; ocrea red *R. nobile*
- + Leaves arranged in stem axis; ocrea brown *R. acuminatum*

Rheum nobile Hook.f., & Thoms., Ill. Himal. Pl. t. 19. 1855; Hara in Fl. E. Him. 75. 1966; Grierson & Long. Fl. Bhutan 1(1): 172. 1983.

Herb usually large, upto 2 m tall. Roots rhizomatous. Stem erect, usually striped. **Basal leaves** in a rosette; stem leaves dense; petiole stout, shorter than blade, to 20 cm, glabrous; leaf lamina large, orbicular, ovate, leathery, glabrous or pilose above, glabrous below, basal veins 5 - 7, conspicuously raised abaxially, base rounded or subcordate, margin entire, apex obtuse; upper leaves smaller, orbicular, to 13 cm; ocrea red, broadly lanceolate. **Panicle** 5- 8-branched, to 8 cm long; bracts light yellow ; pedicel to 3 mm, slender, **Flowers** 5 - 9-fascicled. **Tepals** 6 or fewer,

connected at base, elliptic, inner 3 larger, yellow; **stamens** 8 ; anthers oblong-elliptic; **filaments** base inflated, to 4 mm; **ovary** ovoid; style short; stigma inflated. **Fruit** not seen.

Flower : June – July *Fruit*: September
Exsiccatus : Kupup (Tiger hill) 4650 m, **SR Lepcha & AP. Das 31500**, dated 27.07.2005.

Status : Not common

Local Distribution : Top hill of Baba mandir, upto 5000 m.

General Distribution : E. HIMALAYA (NEPAL – BHUTAN).

Note : 1. Endemic to Eastern Himalaya

2. This species is drastically becoming rare in the area and used in making natural dye.

Rheum australe D. Don, Prodr. Fl. Nepal. 75. 1825; Hara in Enum. Fl. Pl. Nepal 3: 179. 1982; Grierson & Long. Fl. Bhutan 1(1): 172. 1983.

Herb upto 3 m tall. Branched above. **Petiole** upto 32cm long; leaves basal upto 40 x 25cm long broad, acute, base cordate, pubescent beneath; upper leaves usually smaller; ocreae 5 – 12 cm long, brown. **Flowers** in axillary or terminal panicles. **Perianth** segments oblong – ovate, ca 2.2 mm, round or acute at apex, red; pedicels jointed near base. **Fruits** orbicular, 6-7.5 cm long and broad not at apex, winged.

Flower & Fruit : June – September

Exsiccatus : Sherathang 4200 m, **SR Lepcha & AP. Das 20295**, dated 13.11.2004.

Status : Common

Local Distribution : Manju lake, Serathang, 3400 – 4100 m).

General Distribution : PAKISTAN, INDIA, , NEPAL, BHUTAN, MYANMAR

Note : a potent medicinal plant.

Rheum acuminatum Hook.f. & Thoms., Hara *et al* in Fl. E. Him. 75.1966; Hara in Enum. Fl. Pl. Nepal 3: 179.1982; Grierson & Long. Fl. Bhutan 1(1): 172. 1983.

Herbs perennial upto 1 m tall. Branched usually above. **Leaves**; petiole upto 28 cm long; basal leaves acuminate, base cordate, pubescent beneath; upper leaves usually smaller; Ocreae 5 – 11 cm long, brown. **Flowers** in axillary or terminal panicles. **Perianth** segments oblong – ovate, ca 3mm, dark red; pedicels to 5 mm, jointed near base. **Fruits** orbicular, 6.8 - 7.5 cm long and broad notched base and at apex; achene winged.

Flower & Fruit : June – September

Exsiccatus : Manju lake 4290 m, **SR Lepcha & AP. Das 30935**, dated 24.05.2005.

Status : Common

Local Distribution : Manju lake, Serathng, 3400 – 4100 m.

General Distribution : E. HIMALAYA (Sikkim)

Note : Endemic to Eastern Himalaya

Rumex Linnaeus

Rumex nepalensis Spreng., Syst. Veg. 2: 159. 1825; Hook.,f. in Fl. Brit. India 5: 60. 1885; Hara & Ohashi in Fl. E. Him. 75. 1966; Hara *et al*, Enum. Fl. Pl. Nepal 3: 179. 1982; Grierson & Long Fl. Bhutan 1(1): 173. 1983.

Ver. Name: Halhalay (Nep.).

Herbs, perennial, rosette upto 1m tall. **Stem** vertically ridged. **Stipules** white, persistent, sparsely hairy to glabrous; **petiole** upto 6 cm, hairy; **lamina** oblong-ovate, 3.5 – 13 x 1.5 - 5cm,

and of radicals 11 - 15 x 4.5 - 7.5cm, oblong-ovate, subacute, cordate, thinly pubescent to glabrous beneath, dark green above, brown when dry. **Flowers** in axillary or terminal racemes. Flowers minute, polygamous, whorls much crowded upwards, reddish to yellowish-green. **Perianth** segments 6, outer 3 smaller, oblanceolate, entire; inner 3 larger, ovate, persistent and enlarged, distinctly veined and fringed with hooked bristles of 0.4 cm length; **stamens** 6; style 3; stigma fimbriate. **Achenes** light red.

- Flower & Fruit* : June - October
Exsiccatus : Bhimbase 4350 m, **SR Lepcha & AP. Das** 31432, dated 27.7.2005.
Status : Common
Local Distribution : Kupup. Kyongnosla, Rachel Middle. 1900 - 3200 m.
General Distribution : S. W. EUROPE; W. ASIA, AFGANISTAN ; HIMALAYAS;
INDIA, MYANMAR, TONKIN, CHINA, JAPAN, JAVA.
Not : Young leaves eaten as vegetable; also used as medicine against eczema and dye obtained from this species is traditionally being used for numerous purposes.

Subclass: Dilleniidae

Order: Theales

THEACEAE D. Don

Eurya Thunberg

Key to the species

1. Plants with straight branches; corolla whitish yellow..... *E. cerasifolia*
+ Plants with profuse branched; petals white *E. acuminata*

Eurya acuminata DC., Mem. Ternstr. 26. 1822; Prodr. 1: 525. 1824; C.B. Clarke in Fl. Brit. India 1: 285. 1872; Hara & Ohashi in Fl. E. Him. 208 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 64. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 363. 1984; Sharma *et al.*, Fl. India 3: 178. 1993.

Local Name: *Sanu Jhinguni* (Nep).

Shrubs to small trees with profuse branches, young twigs pubescent. **Leaves**; petioles to 0.6 cm, pubescent; **lamina** 3.5 - 12 x 1 - 3 cm, elliptic-lanceolate, serrulate, short acuminate, cuneate, glabrous, glossy, mid-nerve elevated and pubescent beneath. Pedicels to 0.30 cm. 3 - 5. **Flowers** in axillary fascicles; bracteolate, dioecious. **Sepals** 5, to 0.4 cm, broadly elliptic, glabrous, persistent. **Petals** 0.5 - 0.6 x 0.30 cm, ovate, white; **stamens** 15, shorter than petals; **ovary** subglobose, glabrous; **styles** 3, united at base. **Fruits** subglobose.

- Flower* : September - November *Fruiting*: November - January
Exsiccatus : Dohrok, 2300m, **S.R.Lepcha & A.P. Das** 1320, dated 06.10.2004.
Status : Common
Local Distribution : Subaney, Phusrey, Beusa 1400 - 2100m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, TIBET, MYANMAR,
THAILAND, CHINA.
Note : Used as fodder & fuel wood.

Eurya cerasifolia (D. Don) Kobuski in Anna. Miss. Bot. Gard. 25: 326. 1938; Hara & Ohashi in Fl. E. Him. 209 1966; Hara *et al.* Enum.Fl.Pl.Nepal 2: 84. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 364. 1984; Sharma *et al.*, Fl. India 3: 183. 1993. *Diospyrus cerasifolia* D. Don, Prodr. Fl. Nepal 144. 1825. *E. symplocina* Blume, Mus. Bot. Lugd.- Bat. 2: 133. 1856; C.B. Clarke in Fl. Brit. India 1: 285. 1872.

Local Name: Tukzel Kung (Lep), Thulo Jhinguni (Nep.).

Shrub or small tree, branches striate. **Lamina** elliptic-lanceolate, 5 - 11.5 x 1.5 - 3.5 cm, margins entire or serrate above middle, acuminate, base cuneate to rounded, glossy, mid-vein raised beneath, depressed above, veins prominent both sides. **Inflorescence** fascicles crowded with few - many flowered, bracteolate. **Flowers** minute. **Calyx** to 0.5 x 0.4cm, obtuse, silky. **Corolla** 5, to 0.5 x 0.4 cm, oblong-elliptic, whitish yellow; stamens upto 15; ovary glabrous; styles branched. **Fruits** subglobose or broadly ellipsoid, blue- black.

Flower : October - January *Fruiting:* April - October.
Exsiccatus : Dohrok 2250m, , **S.R.Lepcha & AP. Das 30221**, dated 06.10.2004..
Status : Frequent.
Local Distribution : Dorok, Subhaney 1200 - 2100 m.
General Distribution : HIMALAYAS; INDIA, BHUTAN, NEPAL, MYANMAR, THAILAND, INDO-CHINA, MALAYSIA.

Order: Malvales

ELAEOCARPACEAE DC.

Key to the Genera:

1. Flowers solitary or in fascicles; capsule spiny or bristly *Sloanea*
 + Flowers racemed; drupe glabrous *Elaeocarpus*

Elaeocarpus Burmann ex Linnaeus

Elaeocarpus lanceifolius Roxb., Fl. Indica, ed. 2, 1: 598. 1832; Masters in Fl. Brit. India 1: 402. 1872; Indian Trs. 102. 1906; Hara in Fl. E. Him. 1: 201. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 72. 1979; Miller in Grierson & Long, Fl. Bhutan 2(1): 170. 1991.

Local Name: Syapkyu (Lep.) Bhadrasay (Nep.).

Tree 10 - 20 m tall. **Petioles** 0.8 - 2.5 cm long; **lamina** 09 - 16 x 3.5 - 5 cm, elliptic, acute or acuminate, base attenuate, scarcely pubescent beneath or glabrous, minutely blistered on drying, lateral veins axils glandular along midrib beneath. **Racemes** upto 6.5 cm, flower 9 - 10. **Pedicels** 0.07 cm. **Calyx** lanceolate, tomentose or glabrous. **Corolla** obtriangular, whitish, segmented to middle into many segments, hairy; **stamens** numerous, **Ovary** 3-locular. **Fruits** ovoid to ellipsoid; stone 3-grooved, one seeded.

Flower : August - October
Exsiccatus : Neora border 2100 m, **SRLecha & AP, Das 1006**, dated 17.10.2004
Status : Common
Local Distribution : Rigu, Dhorok 1300 - 2200 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR,

S.CHINA.

Note : Fruits edible.

Sloanea Linnaeus

Sloanea dasycarpa (Benth.) Hemsl. in Hook., Ic. Pl. 27: t. 2628. 1901; Hara *et al.* Enum. Fl. Pl. Nepal 2: 73. 1979; Miller in Grierson & Long, Fl. Bhutan 2(1): 167. 1991. *Echinocarpus dasycarpus* Benth. in Jour. Proc. Linn. Soc. 5 suppl. 2: 73. 1861; Masters in Hook.f., Fl. Brit. India 1: 400. 1872.

Trees large, evergreen, upto 28m tall. **Petioles** 1 – 2.8cm long, glabrous; **lamina** 3.5 - 18 x 2.5 – 4.2 cm., oblanceolate or obovate, margin serrulate, acute to acuminate, base cuneate, glabrous except vein axils with tufts of hairs beneath along midnerve, lateral nerves 5 - 6 on either sides; pedicels short 1.5 – 2 cm long, extending upto 5.4 cm in fruit. **Inflorescence** solitary axillary. **Sepals** 4 or 5, unequal, ovate-lanceolate, tomentose. **Petals** 4 or 5, apex lacinate; stamens many; anthers acute; ovary ovoid, villous. **Capsules** globose, 4-valved and covered with deciduous bristles; bristles plumose; **seeds** arillate.

Flower : August – October

Exsiccatus : Phusrey NNP border 2120m, *SR Lepcha & AP. Das* 3790 dated 17.10.2004

Status : Rare

Local Distribution : Phusrey, PWS. 1300 – 2200 m.

General Distribution : E. HIMALAYA; INDIA, (E.NEPAL- BHUTAN), S. BURMA and W. CHINA.

Note : 1. Endemic to Eastern Himalaya.
2. Fruits edible.

MALVACEAE A.L. Jussieu

Urena Linnaeus

Urena lobata L., Sp. Pl. ed. 1, 2:692. 1753; Masters in Fl. Brit. India 1: 329. 1872; Hara in Fl. E. Him. 206. 1966; Hara *et al.*, Enum Fl. Pl. Nepal 2: 69. 1979; ssp. *lobata* Fasc. Fl. India 19: 228. 1988; Miller & Long in Grierson & Long, Fl. Bhutan 2(1): 194. 1991.

Local Name: *Kuray Paat* (Nep.).

Shrubs, annual or perennial small upto 2 m tall. **Leaves** variable; petioles short to 8 cm long; **lamina** 2 - 10.5 x 0.3 – 12.5 cm, ovate to orbicular, unlobed, irregularly incised towards base, lobes usually upto 5, often more, apex and base obtuse to acute or rounded, entire or serrate, stallate usually hairy on both sides, glabrescent, basally 3 - 9 nerved; stipules to 0.5 cm long, filiform; epicalyx segments to 0.68 cm, linear-lanceolate. Pedicels upto short 0.5cm. Flowers solitary or few in clusters, axillary. **Calyx** lobes 0.50 - 0.75 cm, ovate to deltoid. **Corolla** obovoid, pinkish; **staminal** column upto 1.5 cm. **Mericarps** with sharp bristles.

Flower & Fruit : July - January.

Exsiccatus : Dohrok, *SR Lepcha & AP. Das* 30297, dated 07.10.2004.

Status : Common

Local Distribution : Phusrey, Karponang, Rongchu; upto 1900 m.

General Distribution : PANTROPIC.

Note : A noted fibre yielding plant.

Order: Nepenthales

DROSERACEAE Salisbury

Drosera Linnaeus

Drosera peltata Smith ex Willd., Sp. Pl. 1: 1546. 1797; C. B. Clarke in Hook.f., Fl. Brit. India 2: 424. 1878; Long in Grierson & Long, Fl. Bhutan 1(2): 379. 1984; Hara in F.E. Him. 1: 110. 1996

Herbs annual or perennial, upto 22 cm tall. **Stem** erect or climbing, branched distally, with tuber of glabrous or with black, papillose glands. **Leaves**; petiole 2.5 – 8.5 mm.; basal leaves densely whorled, rarely absent exstipulate, yellowish green, **lamina** 1.5 – 3.5 × 5.5 – 7mm; peltate, orbicular to suborbicular, cauline leaves alternate, exstipulate, yellowish green; leaf blade peltate or lunate to semi-orbicular, margin glandular hairy. **Inflorescence** terminal; 3 - 22-flowered; **bracts** cuneate to oblanceolate or subulate; calyx 5 - 7, yellowish green, lanceolate to ovate, glabrous to glandular hairy, apex 5 - 7-fid. **Corolla** usually white, rarely pink or red, oblong-cuneate. Stamens 5, **Ovary** subglobose ; placentas 3; styles 3, 2-5-parted. **Stigma** 2- or 3-fid. **Capsules** subglobose, 3 - 5-valved. **Seeds** ellipsoid-ovoid to globose.

- Flower* : July- August, *Fruit* : August-September.
Exsiccatus : Kupup lake 4030 m, , *SR Lepcha & AP. Das 1004*, dated 13.10. 2004.
Status : Less common
Local Distribution : Kyongnosla, Changu. 2000 – 4000 m
General Distribution : INDIA, CHINA, SE ASIA; AUSTRALIA

Order: Violales

FLACOURTIACEAE DC.

Gynocardia R. Brown.

Gynocardia odorata R. Brown, in Roxb., Pl. Corom. 4:95, t. 299. 1820; Hook.f.& Thoms. in Fl. Brit. India 1: 195. 1872; Hara *et al.* Enum. Fl. Pl. Nepal 2: 49. 1979; Grierson & Long, Fl. Bhutan 2 (1): 219. 1991. Sharma *et al* Fl. India 2: 407. 1993. *Chaulmoogra odorata* (R.Br.) Roxb., Fl. Ind. ed. 2, 3: 835. 1832.

Local Name: *Gantay, Bandre, Ramphal* (Nep.).

Trees, upto 20m tall. **Leaves** simple; petiole 1-1.6cm; **lamina** 13 - 18 x 4.5 – 6.5 cm, oblong, apiculate, base nearly rounded, margin uneven, coriaceous, pale beneath, veins decurrent on mid-rib. Pedicels to 2.5cm. **Inflorescence** in fascicles, unisexual; male flowers in few flowered racemes, arising from leaf axils. **Calyx**, with obtuse lobes. **Corolla**, oblong, yellowish green; stamens many; anthers basifixed. **Female flowers** similar to male flowers; ovary superior; styles

5, short; stigma cordate; staminodes 6 - 15, hairy. Fruits globose berry, clustered, rough textured, brown; seeds 2 cm, obovoid.

- Flower & Fruit* : April – June
Exsiccatus : Below Pushrey barrack 1800 m, *SR Lepcha & AP. Das* 750, dated 21.10. 2008.
Status : Frequent
Local Distribution : Rachel middle, boarder to NNP. 1600 - 2300m.
General Distribution : HIAMALYAS; INDIA, NEPAL, BHUTAN, , MYANMAR.
Note : Fruit pulp is used for fish poisoning by Sherpas.

STACHYURACEAE J.G. Agardh

Stachyurus Siebold *et* Zuccarini

Stachyurus himalaicus Bentham, J. Linn. Soc. 5: 55. 1861; Dyer in Fl. Brit. India 1: 288. 1872; Hara & Ohashi, Fl. E. Him. 1: 214. 1966; 2: 83, 1971; Hara *et al*, Enum. Fl. Pl. Nepal 2: 65. 1979; Fasc. Fl. India 20. 135. 1990; Grierson in Grierson & Long. Fl. Bhutan 2(1): 228-229. 1991; Sharma *et al*, Fl. India 3: 204. 1993.

Local Name: *Churay Lahara* (Nep).

Herbs, deciduous. Branches straggling. **Leaves** simple with linear stipules; **petioles** upto 1.5cm; **lamina** 2.5 – 7.5 x 2 – 4.5 cm, ovate-elliptic, finely serrate, acuminate, rounded, both surfaces glabrous. **Flowers** raceme in spike, axillary, unbranched, 2.5 – 4cm long, pendulous; bracts to 0.5cm, ovate, brown. **Flowers** bisexual, greenish-yellow to pinkish appear before leaves. **Calyx** to 0.5 cm, obovate. **Corolla** longer than sepals, obovate; stamens 0.28 - 0.40cm, ovary superior (in female flower); pistillodes 0.32cm (in male flower). **Fruits** subglobose.

- Flower* : January - April. *Fruit* May - August
Exsiccatus : On way to Rachel 2800 m, *SR Lepcha & AP. Das* 31229, dated 13.09. 2008.
Status : Less Common.
Local Distribution : Middle Rachel, Panglakha below, upto 2850 M,
General Distribution : HIMALAYAS (NEPAL-BHUTAN), Manipur, Naga Hills, S.E. TIBET, MYANMAR, CHINA.

VIOLACEAE Batsch.

Voila Linnaeus

Key to species

1. Herbs perennial *V. diffusa*
+ Herbs perennial 2
2. Flower yellow *V. biflora*
+ Flowers white or purplish 3
3. Leaf lamina slightly –deeply cordate, apex acute -obtuse 4
+ Leaf lamina kidney shaped; apex blunt *V. canescens*

4. Sepal lanceolate, 3 veined *V. hookeri*
 + Sepals ovate *V. hamiltoniana*

Viola biflora L., Sp. Pl. 936. 1753; Hook.f. & Thoms. in Fl. Brit. India 1: 182.1872,p,p; Hara & Ohashi in Fl. E. Him. 212. 1966; Hara *et al*, Enum. Fl. Pl. Nepal 2: 47.1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 224. 1991; Sharma *et al*. 2: 375-379. 1993.

Herbs perennial upto 20 cm tall. **Leaves** basal leaves 2 to several; stipules ovate or ovate-lanceolate margin entire or denticulate, apex acute; petiole short; reniform, broadly ovate, or suborbicular to orbicular, **lamina** 1 - 4 x 1 - 3.5 cm, abaxially glabrous, upper surface puberulous, base cordate or sub-truncate, margin dentate or shallowly crenate, apex obtuse. **Flowers** yellow. **Sepals** linear-lanceolate apex acute, basal auricles very short. **Petals** oblong-obovate, purple veined; spur shortly cylindrical; ovary glabrous; styles clavate, deeply 2-lobed in upper half. **Capsules** oblong-ovoid.

- Flower* : April - August. *Fruit:* July – October.
Exsiccatus : Kupup Lake 4250 m, **SR Lepcha & AP. Das 30904**, dated 24.07.2005.
Status : Common.
Local Distribution : Kupup 2500 – 4300 m.
General Distribution : EUROPE, RUSSIA, INDIA, NEPAL, BHUTAN, CHINA, MYANMAR, JAPAN, KOREA, MALAYSIA, MONGOLIA.

Viola canescens Wall. in Roxb., Fl. Indica. 2: 450. 1824; Hara *et al*, Enum. Fl. Pl. Nepal 2: 47. 1979. Grierson in Grierson & Long, Fl. Bhutan 2(1): 223. 1991. *V. serpens* Wall. var. *canescens* Thoms. in Fl. Brit. India 1: 184. 1872 p.p.

Herbs perennial stem less, pubescent. **Leaves**; petioles to 6 cm long, hairy; stipules lanceolate, fringed and brown, leaf **lamina** 1.2 - 4 x 1- 3 cm, ovate-cordate to kidney-shaped, sinuate, apex blunt, base cordate, blade thick and gray hairy. **Flowers** 1 cm across, pale violet, spurred; **sepals** 5, free, greenish, hairy externally; **petals** 5, exceeding the sepals in length, free; **stamens** united basally; **ovary** superior.

- Flower* : March – May
Exsiccatus : Dohrok 2155 m, **SR Lepcha & AP. Das 1347**, dated 10.10.2007.
Status : Common.
Local Distribution : Dhamdhamay Dara, PHE Source, Chitray, Reshete. 2100 – 2600 m.
General Distribution : TEMPERATE HIMALAYAS; NILGIRIES; INDIA, NEPAL, BHUTAN, SRJ LANKA, JAVA, CHINA.

Viola diffusa Gingins in DC., Prodr. 1: 298. 1824; Hook.f. & Thoms in Fl. Brit. India 1: 183. 1872; W. Becker in Beih. Bot. Centrabl. Abt. 2, 40: 114. 1920; Hara & Ohashi in Fl. E. Him. 212. 1966; Hara *et al*, Enum. Fl. Pl. Nepal 2: 47. 1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 224. 1991.

Herbs annual spreading by stolons. **Leaves** simple; stipules upto 1cm, lanceolate, pale, ciliate; petioles upto 2cm, pubescent; **lamina** 1.5 – 4 x 1.5 - 2.9 cm, ovate, crenate, ciliate, obtuse, base rounded to cordate, blade decurrent with petiole, slightly pubescent both sides, hairs straight. **Bracts** linear-lanceolate, ciliate. **Peduncles** to 7 cm long, slender, glabrous. **Sepals** 0.4 cm, lanceolate, acute, base slightly ciliate. **Petals** twice longer than sepals, recurved, pale blue, base greenish yellow, glabrous; **styles** slender at base, spur globose. **Capsule** oblong-ovoid, glabrous.

- Flower* : February – April *Fruit:* June – August
Exsiccatus : Below Rachel 2600 m, **SR Lepcha & AP. Das 1348**, dated 10.10.

2007.

- Status* : Common.
Local Distribution : Middle Rachel (NNP Border), 1400 – 2530 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, JAPAN, MALAYSIA.
Note : A medicinal plant.

Viola hookeri Thoms. ex Hook.f. & Thoms in Fl. Brit. India . 1: 183.1872 p.p.; Hara & Ohashi in Fl. E. Him. 213. 1966; Hara *et al*, Enum. Fl. Pl. Nepal 2: 49. 1979; Grierson in Grierson & Long, Fl. Bhutan 2 (1): 225. 1991; Sharma *et al*, Fl. India 2: 374-375. 1993. *Viola sikkimensis* W. Becker, Beih. Bot. Central.bl. 34(2): 260. 1916.

Herbs perennial. **Stipules** brown, lanceolate, 2 - 2.3cm; petiole glabrous; **lamina** broadly ovate or suborbicular, 2 - 2.5 x 2 - 4 cm, both surfaces glabrous or sparsely puberulous, base deeply cordate, margin densely and shallowly crenate, apex obtuse. **Flowers** white or purplish; pedicels exceeding leaves, glabrous, 2-bracteolate above middle; bracteoles sub opposite, **Sepals** narrowly lanceolate, glabrous, 3-veined. **Petals** oblong - obovate, lateral ones glabrous, anterior one purple veined; **ovary** conical, glabrous; **styles** clavate; stigmas flat at apex. **Capsules** ovoid - orbicular.

- Flower* : April.- May. *Fruit*: May – June.
Exsiccatus : Bara –Ramitey 2400m, **SR Lepcha & AP. Das 31107**, dated 03.10.2004
Status : Common.
Local distribution : Bara-Ramitey, Above Dorok, Singhaney 1500 - 2500 m.
General distribution : INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Viola hamiltoniana D. Don, Prodr. Fl. Nep. 206. 1825; Hara *et al*, Enum. Fl. Pl. Nepal 2: 47. 1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 228. 1991; *V. distans* Wall. in Trans. Med. Phys. S. Calc. 7: 227. 1835; Hook.f. & Thoms. in Fl. Brit. India 1: 183. 1872. *V. distana* var. *acaulis* Hook.f. et Thoms. in Fl. Brit. Ind. 1: 184. 1872. *V. arcuata* Bl., Bijdr. 58. 1825 (June-Dec.).

Herbs perennial with slender stolon. **Stipules** upto 1 cm, lanceolate, fimbriate, brownish; petioles to 8 cm long, glabrous or sparsely pubescent; **lamina** 1.3 - 6 x 1 - 5 cm, ovate, crenate-serrate, acute to rounded, deep cordate or deltoid, sparsely pubescent above, glabrous beneath. **Bracts** upto 0.75 cm. Peduncles short 10 cm long. **Sepals** ovate, acute. **Petals** to 1 cm, lower most smaller, white, glabrous or thinly pubescent within; spur rounded; **styles** straight, slightly tapering upward. **Capsules** many seeded.

- Flower* : March - June *Fruit*.: April - August
Exsiccatus : Padamchen below 2450 m, **SR Lepcha & AP. Das 1350**, dated 11.10. 2007.
Status : Common.
Local Distribution : Mulkharka, Rachel Durpinay 2100 – 2600 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, MALAYSIA, PHILIPPINES.

CUCURBITACEAE A. Jussieu

Key to the Genera:

1. Leaves simple, tendrils 2-5 fid 2
+ Leaves pedately 3-5 foliolate, tendrils simple *Gymnostemma*

2. Flowers bracteate, fruits indehiscent *Trichosanthes*
 + Flowers ebracteate, fruits dehiscent 3
3. Calyx tube narrowly cylindrical; seed ellipsoidal; ovary oblong *Edgaria*
 + Calyx tube elongated; seeds oblong; ovary ellipsoidal *Biswara*.

Biswara Cogniaux

Biswara tonglensis Cogn. in Completes- rend. Soc. Bot. Belg. 21: 16. 1882; Grierson in Grierson & Long, Fl. Bhutan 2(1): 267. 1991. Yamazaki in Hara Fl. E. Him 1: 321. 1966.

Climbers large. **Leaves** simple, deeply lobed; petiole 8 cm long; ovate or suborbicular, lamina 13 – 25 x 13 – 10 cm, 3 – 7 lobed, lobes triangular, lanceolate or sub-linear, acuminate, base deeply cordate. **Male peduncle** often paired with 1 flowered; ebracteate. **Calyx** tube cilliose, teeth lanceolate. **Corolla** lobe 5.5 x 3 cm. **female peduncle** to 11 cm long. **Fruits** oblong.

Flower : July *Fruit*: September
Exsiccatus : Dorok 2350 m, *SR Lepcha & AP. Das 30283*, dated 07.10.2004.
Status : Less common
Local Distribution : Premlakha, Hangey, Panikharka 1700 – 3000 m.
General Distribution : E. HIMALAYAS; INDIA, BHUTAN
Note : Endemic to Eastern Himalaya.

Edgaria C.B. Clarke

Edgaria darjeelingensis C.B. Clarke in Journ. Linn. Soc. Bot. 15: 114. 1876; in Fl. Brit. India 2: 632. 1879; Mizushine in Fl. E. Him. 322. 1966; Hara *et. al.* Enum. Fl. Pl. Nepal 2: 178. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 268. 1984.

Climbers annual. **Leaves** simple; lamina ovate 8 - 10 x 3.5 – 6 cm, un-lobed or very shallowly 5 lobed, acuminate, usually base cordate, margin undulate, denticulate, often pubescent on both surface. **Male peduncle** often with solitary flowers. **Female flowers** solitary, peduncle short. **Calyx** tube very short upto 2cm. **Corolla** lobes ovate upto 2 cm. **Anthers** upto 4 mm. **Fruits** usually ellipsoid, hirsute. **Seeds** small 0.8 x 1.5 mm.

Flower : June – September
Exsiccatus : Hangey 1700 m, *SR Lepcha & AP. Das 1001*, dated 18. 08.2004.,
Status : Not common
Local Distribution : Phusrey, Durpin dara. 1500 – 3200 m.
General Distribution : HIMALAYA; INDIA (Garhwal – Sikkim).BHUTAN
Note : Endemic to Himalayas.

Gynostemma Blume.

Gynostemma pentaphylla (Thunb. ex Murray) Makino in Bot. Mag. Tokyo 16: 179. ?????; Mizushima in Hara Fl. E. Him. 1: 523. 1966; C.Y.WU in Acta . Phytotax. Sin., 21(4):362. 1983; Grierson in Grierson & Long, Fl. Bhutan 1(2): 270. 1984. *Vitis pentaphylla* Thunb. ex Murray in Linnaeus, Syst. Veg. ed. 14: 244. 1784.

Climber woody. **Leaves**; petiole up to 6 cm, petiolules up to 4 mm; pedately 3 - 5 foliolate tendrils simple; leaflets ovate or elliptic lamina 3 - 9 x 2 - 6 cm, acuminate, base attenuate, margin serrate, glabrous. **Flower** minute; male flower up to 50cm, **females flower** short. **Calyx** lobes triangular, to 0.7mm. **Corolla** lobes subulate. **Fruits**; seeds trigonous, compressed, wrinkled.

Flower : August – October *Fruit*: November
Exsiccatus : Phusrey 2130 m, *SR Lepcha & AP. Das 3000*, dated 12.08.2008.
Status : Less common
Local Distribution : upto 3000 m.
General Distribution : INDIA (Simla to Assam), BHUTAN, MYANMAR, CHINA, MALAYSIA.

Trichosanthes Linnaeus

Trichosanthes wallichiana (Seringe) Wight in Ann. & Mag. Nat. Hist 8: 270. 1842; Mizushima in Fl. E. Him. 325. 1966; Hara *et. al.* Enum. Fl. Pl. Nepal 2: 181. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(2): 266. 1984. *Involueraria wallichiana* Seringe in Mem. S. Phys. Hist. Nat. Geneve 3. t. 5. 1825. *Trichosanthes multeloba auct. non.* Miq; C.B. Clarke in Fl. Brit. India 2: 607. 1879.

Climbers annual. **Lamina** sub-orbicular, 8 - 15 x 12 - 18 cm, usually 3 - 8 lobed, lobes, oblong or lanceolate, acuminate, base rounded, margin usually denticulate or sometime dentate, pubescent above; glands clustered between veins on lower surface, tend-rib usually 2-3 fid. **Male peduncles** pubescent usually 6 - 11 flowered; bract ovate, base sheathing tooth above. **Calyx** tube upto 6 cm, upto 12 cm wide at apex. **Petals** obovate, upto 5 cm, female peduncles upto 4.5 cm. **Ovaries** oblong. **Fruits** oblong ovoid, reddish.

Flower : July – August
Exsiccatus : Dohrok 2300 m, *SR Lepcha & AP. Das 30219*, dated 06.10. 2004.
Status : Less common
Local Distribution : Premlakha, Rigu, Bhusuk 1600 - 2700 m.
General Distribution : INDIA (Simla to Assam), BHUTAN, MYANMAR, CHINA, MALAYSIA.

BEGONIACEAE C.A. Agardh

Begonia Linnaeus

Key to the species:

1. Plant with rhizomatous rootstocks 2
- + Plant with tuberous rootstock 4
2. Leaf-lamina ovate or suborbicular ; margin coarsely toothed 3
- + Leaf-lamina ovate; margins deeply lobed *B. flaviflora*
3. Flowers red ; bract ovate *B. sikkimensis*
- + Flowers white or pink.; bract obovate *B. palmata*
4. Plants epiphytic *B. gemmipara*
- + Plants not epiphytic 5

5. Leaf-margin finely serrate, dentate or toothed 6
 + Leaf-margin obscurely crenulate- serrulate *B. ovatifolia*
6. Leaves only 1 rarely more *B. picta*
 + Leaves more than 1 never 1 7
7. Leaf-margin finely serrate; lower veins sparsely pubescent *B. josephi*
 + Leaf-margins dentate or denticulate ; lower veins reddish villous *B. satrapis*

Begonia flaviflora (Clarke) Hara in Journ. Jap. Bot. 45: 91. 1970; Hara & Ohashi in Fl. E. Him. 2: 84. Pl.3b.1971; Grierson in Grierson & Long, Fl. Bhutan 2(1): 245. 1991. *Begonia laciniata* Roxb. var. *flava* Clarke in Fl. Brit. India 2: 645. 1879.

Herbs, upto 55 cm tall with densely tomentose stem. **Rootstock** creeping, rhizomatous. **Lamina** 6 - 20 x 5 - 13 cm, ovate, acuminate, base obscurely cordate, margin deeply lobed, lobes to 4 cm, serrate. Stipules lanceolate; **peduncles** to 13 cm long, tomentose; **bracts** oblong, yellowish. **Flowers** yellow; perianth segments to 1.5 cm, ovate; **stamens** clustered forming a compact mass; **styles** 2, branched. **Capsules** winged.

Flower & Fruit : July - September
Exsiccatus : Dohrok 2300m, **SR.Lepcha & AP. Das 0235**, dated 15.07.2005.
Status : Less common
Local Distribution : Dohrok, Phusrey, Lingtam – Subaney 1700 – 2300 m.
General Distribution : E. HIMALAYA; INDIA, BHUTAN, NEPAL.
Note : Endemic to E. Himalaya.

Begonia gemmipara Hook. f., Ill. Him. Pl. t. 14. 1855; C.B. Clarke in Fl. Brit. India 2: 641. 1879; Fl. E. Him.2: 84. 1971; Hara *et al* Enum.Fl. Pl. Nepal 2: 181. 1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 242. 1991. *Putzevsia gemmipara* Klotzsch in Abh. Akad. Berl. 135. 1855.

Epiphytic herbs, erect, , upto 15cm tall. Rhizome tuberous. Stem erect. **Petioles** 3.5 – 4.5 cm long; **lamina** ovate 4 – 8.5 x 3 – 5.2 cm, acuminate, base asymmetric, truncate or cordate, margin coarsely serrate, glabrous; pedicels bracteate. **Flowers** pendulous, white or pink. **Perianth** segments 0.5 - 0.6cm, suborbicular. **Stamens** grouped in globose mass; styles 3. **Capsules** inflated.0.72 -1.4 cm, wings sub-equal.

Flower : August – October *Fruit*: October – December.
Exsiccatus : Panglakha 2790 m, **SR.Lepcha & AP. Das 31092**, dated 08.10.2004.
Status : Common.
Local Distribution : Rachila. Panglakha 1900 – 2900 m.
General Distribution : E. HIMALAYA;INDIA, NEPAL.
Note : Endemic to E. Himalaya. (Sikkim)

Begonia josephii A. DC. in Ann. Sci. Nat. Ser. 4(11): 126. 1859; Prodr. 15(1): 313. 1864; C.b. Clarke in Fl. Brit. India 2: 639. 1879; Hara & Ohashi in Fl. E. Him. 1: 214. 1966; 2: 84. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 181. 1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 240. 1991.

Herbs with tuberous rootstock. **Petioles** upto 19 cm long; leaves all basal; **lamina** 3.5 - 13 x 2.5 - 7.5 cm, oblong-ovate, acuminate, base rounded, peltate, finely serrate, sometimes 3 - 5 lobed, glabrous above, pubescent on veins beneath; bracts to 0.3 cm, ovate. **Male flowers**: whitish or pink, outer perianth segments suborbicular, inner smaller, elliptic; **stamens** 0.30 cm long. **Female flowers**: perianth equal or slightly smaller; **styles** branched. **Capsules** ellipsoid, glabrous winged.

Flower & Fruit : July - September
Exsiccatus : Dohrok 2100 m, **SR.Lepcha & AP. Das** 0236, dated 16.07.2005.
Status : Less common
Local Distribution : Rigu above, 1800 - 2450 m.
General Distribution : E. HIMALAYA; INDIA, BHUTAN, NEPAL.
Note : Endemic to Eastern Himalaya

Begonia ovatifolia A. DC. in Ann. Sci. Nat. Ser. 4, 11: 132. 1859; Prodr. 15(1): 328. 1864; C. B. Clarke in Fl. Brit. India 2: 642. 1879; Hara in Fl. E. Him. 3: 86. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 2: 182. 1979; Grierson in Grierson in Grierson & Long, Fl. Bhutan 2(1): 241. 1991.

Herbs succulent with tuberous rootstock. Stemless or rarely with stem. **Leaves** alternate, simple; petioles to 4 cm; **lamina** 2.5 - 5.5 x 3 - 1cm, broadly ovate, acute to ± rounded apically, base rounded or cordate, margin obscurely crenulate-serrulate, thinly hairy above, hairy along veins beneath; **peduncles** bearing upto 10 flowers; **perianth** segments to 0.3 x 0.43 cm, pink or white; stamens 0.2 cm, united on column. **Capsules** winged, wing acute; **styles** usually persistent in the fruit.

Flower & Fruit : August - September
Exsiccatus : Dohrok 2250 m, **SR.Lepcha & AP. Das** 0237, dated 16.07.2005.
Status : Less common
Local Distribution : Dohrok, Durpiney near NNP border, 1800 - 2450m.
General Distribution : SUB-TROPICAL E. HIMALAYA; INDIA, BHUTAN, NEPAL
Note : Endemic to Eastern Himalaya.

Begonia palmata D. Don, Prodr. Fl. Nep. 233. 1825; Hara & Ohashi in Fl. E. Him. 1: 215. 1966; 2: 84. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2:182. 1979; Grierson & Long., Fl. Bhutan 2(1): 245. 1991. *B. laciniata* Roxb., Fl. Ind. ed. 2(3): 649. 1832; C.B. Clarke in Fl. Brit. India 2: 645. 1879.

Herbs pubescent, upto 25 cm tall. Rootstock rhizomatous, creeping, rigid. Stems short, shaggy-pubescent. **Petioles** 22 cm long; stipules to 13 cm long, triangular; **lamina** 4 - 8 x 5 - 19 cm, ovate or suborbicular, acutely toothed or lobed, densely pubescent. **Flowers** whitish or pink; bracts 0.50 x 0.70 cm, obovate; perianth segments, pubescent outside; **stamens** numerous in globose; **styles** 2, branches convolute. **Capsules** winged.

Flower & Fruit : May - September
Exsiccatus : Dohrok 2100 m, **SR.Lepcha & AP. Das** 0238, dated 17.07.2005
Status : Common
Local Distribution : Dohrok, Phusrey, Bhusuk, 1800 - 2450m.
General Distribution : E. HIMALAYA; INDIA, BHUTAN, NEPAL, MYANMAR, CHINA.
Note : Endemic to Eastern Himalayas

Begonia picta Smith, Exot. Bot. 2: t. 101. 1805; C.B. Clarke in Fl. Brit. India 2: 638. 1879; Hara & Ohashi in Fl. E. Him. 1: 215. 1966; 2: 84. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 182. 1979; Grierson in Grierson & Long., Fl. Bhutan 2(1): 242. 1981.

Herbs with tuberous rootstock, upto 22 cm tall. **Petioles** to 13 cm long; leaves mostly solitary, basal, with another cauline leaf, **lamina** 3 – 13 x 3 – 9 cm, ovate, base obliquely cordate, margin finely serrate, coarse pubescent both sides; **perianth** 2-seriate, outer ones elliptic, white or pink, inner ones stamens many in globose mass of 0.55cm diam.; styles 3, united at base. **Capsules** to 4 mm, ellipsoid, with triangular winged.

Flower & Fruit : August - September
Exsiccatus : Talkharkha 1700 m, *SR.Lepcha & AP. Das 0239*, dated 17.07.2004.
Status : Common
Local Distribution : Talkharkha, Durpiney NNP border 1600 - 2200m.
General Distribution : HIMALAYAS; INDIA, BHUTAN, NEPAL.
Note : Endemic to Himalaya.

Begonia satrapis C.B. Clarke in Fl. Brit. India 2: 638. 1879; Grierson in Grierson & Long. Fl. Bhutan 2(2): 242. 1971.

Herbs with tuberous rootstock, stem, or stemless upto 30 cm tall. Occasionally trailing or rooting at base. **Petioles** to 13 cm long; stipule to reniform; ovate to reniform **lamina** 8 – 11 x 5 – 11 cm, subacute or acuminate, base rounded above or cordate, margin dentate or denticulate, teeth ending in fine hairs, pubescent above reddish villous at vein beneath; peduncle elongated, longer than leaves, reddish pubescent; bract oblong – lanceolate, persistent shaggily hairy. **Flowers** white or pink, outer perianth segment elliptic ciliate and pubescent outside. **Capsules** ± equally winged.

Flower & Fruit : August - September
Exsiccatus : FIDE (W.W. Smith, Nathang 4040 m)
Status : Rare
Local Distribution : PWS, 600 – 1525 m.
General Distribution : INDIA (Sikkim)
Note : Endemic to Sikkim

Begonia sikkimensis A. DC. in Ann. Sci. Nat. Ser. 4, 11: 134.1859; Prodr. 15(1): 349. 1864; C. B. Clarke in Fl. Brit. India 2: 646. 1879; Hara & Ohashi *et al.* Fl. E. Him. 1: 215. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 182. 1979; Grierson in Grierson & Long Fl. Bhutan 2(1): 241. 1991.

Herbs with terrestrial, rhizomatous rootstock upto 45cm tall. **Petioles** 5 - 16cm; stipules 1-2cm, suborbicular or rarely linear-lanceolate; symmetrical, suborbicular, irregularly lacinated with acuminate segments; **lamina** 15 - 31 cm across, margins coarsely toothed, nearly glabrous. **Peduncles** 10-16cm; **bracts** to 2cm, broadly ovate, reddish and deciduous. **Perianth** 1-1.5cm, elliptic, red; **stamens** numerous in a globose mass of 0.55cm diam.; **styles** 2, basally connate, with tortuous branches. **Capsules** inverted, 0.9 - 1 x 0.38 - 0.4cm, inverted wings obovate and finely striate.

Flower & Fruit : August – November
Exsiccatus : Dohrok 2300m, *SR Lepcha & AP. Das 30269*, dated 06.10.2004.
Status : Less Common.

Local Distribution : Dohrok, Bhusuk 1200-2300m.

General Distribution : E. HIMALAYA; INDIA (Darjeeling - Sikkim), BHUTAN, NEPAL.

Note : 1. Endemic to E. Himalaya

2. An ornamental plant.

Order: Salicales

SALICACEAE Mirbel

Key to the Genera:

1. Tree or shrubs > 7 m tall; flowers few or numerous in catkins; capsule 2 valved *Salix*
+ Trees deciduous < 10 m tall; flower solitary in axils of bract; capsule < 2 valved ... *Populus*

Populus Linnaeus

Key to the species

1. Leaves apex acuminate; margin finely crenate-serrate; base cordate *P. ciliata*
+ Leaves apex acute; margin sharply serrulate; base weakly cordate *P. glauca*

Populus ciliata Wall. ex Royle, Ill. Bot. Him. 346, t. 98 (84a), f. 1. 1839; Prodr. 16(2): 329. 1868; Hook.f. in Fl. Brit. India 5: 638. 1885; Hara in Fl. E. Him. 44. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 217. 1982; Grierson & Long, Fl. Bhutan 1(1): 60. 1983. *P. rotundifolia* Griff., Itin. Notes 172. 1848. *P. balsamifera* (non L.) Wesmael in Bull. Soc. Bot. Belg. 26: 379. 1886.

Local Name: Numbun kung (Lep.), Duda Malata (Nep.).

Trees deciduous upto 20m tall. Branches slightly angled. Leaves alternate; petioles 6 - 10cm long; lamina ovate, 7 - 18 x 5 - 13 cm, base cordate, rarely rounded, finely crenate-serrate, ciliate, acuminate, base cordate, rarely rounded, 3-nerved at base, sparsely pubescence. Male catkins to 10.5 cm long, with 1.3 cm bracts, obovate, fimbriate. Female catkins upto 30 cm, with flat to obscurely concave disc; ovary to 0.6cm, ovoid; styles broaden and with 2-lobed. Capsules to 1.2 cm, glabrous.

Flower & fruit : April - October

Exsiccatus : Rachela in NNP Border 2540 m, SR Lepcha & AP. Das 02833, dated 14.10.2005.

Status : Less Common.

Local Distribution : Rachela NNP border, 2200 - 2600 m.

General Distribution : TEMPERATE HIMALAYAS; INDIA, NEPAL, BHUTAN.

Note : Endemic to Himalaya.

Populus glauca Haines in Journ. Lin. Soc. Bot. 37: 408. 1906; Hara *et al.*, Enum. Fl. Pl. Nepal. 3: 217. 1982; Grierson & Long, Fl. Bhutan 1(1): 60. 1983.

Local Name: Re- Numbing Kung (Lep.), Lekh ko Malata, Duda Malata (Nep.).

Trees with stem sparingly branched. Leaves simple, alternate; petioles to 8 cm, often slender, pinkish-red, whitish hairy prominent on young leaves; lamina broadly ovate, 5 - 13 x 4.5 - 10 cm, margin sharply serrulate, acute, base weakly cordate, white adpressed-hairy in both sides,

distinctly 3-nerved at base, lateral nerves 5 - 6 pairs and light pink-brown. **Catkins** usually drooping, to 15 cm long; rachis with whitish hairs. **Flowers** bisexual. **Capsules** subglobose.

Flower & fruit : July - October
Exsiccatus : Above Ramitey dara – Rachela 2500 m, **SR Lepcha & AP. Das 2931**, dated 28.07.2005.
Status : Less Common.
Local Distribution : Rachela Middle, NNP border, 2000 – 2900 m
General Distribution : E. HIMALAYA; INDIA, (NEPAL-W. BHUTAN).
Note : Endemic to E. Himalaya.

Salix Linnaeus

Key to the Species:

1. Tree or shrub erect; Leaf elliptic lanceolate, margins entire or obscurely serulate in upper half *S. daltoniana*
+ Shrub decumbent; Leaves obtuse or sub-acute, margins serrulate near apex, or rarely entire *S. calyculata*

Salix calyculata Hook.f. ex Anders. in Fl. Brit. India 5: 6.1885; Hara *et al*, Enum.. Fl. Pl. Nepal 3: 217. 1982; Grierson & Long, Fl. Bhutan 1(1): 69. 1983

Shrub decumbent, branchlet upto 50cm. **Lamina** obovate, 1.5 x 5 x 1 – 2 cm ; usually obtuse or sub-acute , base cuneate , margins serrulate near apex, or rarely entire , sometime blackish when dry , long silky villous beneath at first, later glabrous ; petiole 5 – mm; stipule minute. **Catkins** terminal on leavy shoots, 2 – 5 cm. **Male catkins** 1.5 – 2 cm ; bracts oblong , ca 4 x 1mm reddish brown , glabrous to ciliate ;stamen 2, filament free , glabrous . **Female catkins** 2- 2.5 cm ;bracts obovate ,c3 x 2 mm , glabrous. **Capsules** narrowly ovoid, to 4 mm, style divided, bifid.

Flower & Fruit : June – July
Exsiccatus : Rachela 3020 m, **SR Lepcha & AP. Das 27760**, dated 30.09.2004.
Status : Less common
Local Distribution : Rachela, Onway to Panglakha 3800 – 4570 m.
General Distribution : EASTERN HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : Endemic to E. Himalaya

Salix daltoniana Hook.f. ex Anders. in Journ. Linn. Soc.4: 49. 1860; Hook.f. in Fl. Brit. India.5:632. 1885; Hara *et al*, Enum. Fl. Pl. Nepal. 3: 217. 1982; Grierson & Long, Fl. Bhutan 1(1): 66. 1983

Local Name: *Behera kapasi*(Nep.)

Tree or **shrubs** upto 6m tall. Stems glabrous. **Petioles** short, 2.5 – 13 mm.; **lamina** elliptic lanceolate, 2.5 – 6 x 1.5 cm , acute, base rounded or cuneate , margins entire or obscurely serulate in upper half, blackish above when dry, pubescent on veins, white or brownish sericeous beneath;. **Catkin** appeared in young leave. **Male catkins**; bracts obovate c 2mm rounded or notched at apex, pale villous with long straight hairs especially on the inner surface ; stamen 2 , filaments free , pubescent . **Female catkins** 5 – 6 x 0.5cm, bracts similar to male but somewhat broader and darker, **Capsules** narrowly ovoid, 3.5 – 4.5 cm usually white, sessile, **styles** divided to half length, branch bifid.

Flower : June – September

Exsiccatus : Rachela 2990 m, *SR Lepcha & AP. Das 02401*, dated 16.10.2004.
Status : Common
Local Distribution : Rachela, Panglakha, upto 3100 m,
General Distribution : HIMALYAS; AFGHANISTAN, INDIA, NEPAL, BHUTAN.

Order: **Capparales**

CRUCIFERAE A. Jussieu (*nom. cons.*)

BRASSICACEAE Burnett (*nom. alt.*)

Key to the Genera:

1. Petals white, pink or purple	2
+ Petals yellow	3
2. Petals spathulate	<i>Nasturtium</i>
+ Petals not spathulate	<i>Cardamine</i>
3. Inner sepals pouched at base	<i>Rorripa</i>
+ Inner sepals not pouched at base	<i>Barbarea</i>

Barbarea Brown

Barbarea intermedia Boreau, Fl. Centre France. 2: 48. 1840; Grierson in Grierson & Long, Fl. Bhutan 1(2): 434. 1984.

Herbs biennial or perennial upto 75 cm tall. Stems erect, glabrous. **Leaves** cauline leaves petiolate; petiole to 4.5 cm long, glabrous or ciliate; leaf lamina to 13 cm, pinnatifid, 1-4 (-7) lobes on each side of midvein, lateral lobes oblong or ovate, 2 -8 × 1 - 7 mm, entire or repand; terminal lobe ovate, considerably larger than lateral ones; Cauline leaves pinnatifid or pinnatisect, with 1-4 lateral lobes, entire, sessile, auriculate; auricles ovate or narrowly oblong. **Racemes** ebracteate, elongated. **Sepals** yellow, oblong, 2 × 1.5 mm, saccate. **Corolla** obovate; petals yellow, oblanceolate, rounded, to 1.5 mm, attenuate to base; **filaments** yellow, **anthers** oblong, ca. 1.3 mm. **Fruits** linear, slightly compressed, torulose.

Flower : May - July
Exsiccatae : Kupup - Bhimbase 4200 m, *SR Lepcha & AP. Das 31450*, dated 27.07.2005; Zuluk 3700 m, *SR Lepcha & AP. Das 30891*, dated 30.07.2005.
Status : Common
Local Distribution : Rachela, Kyongnosla 2800 - 4200 m.
General Distribution : INDIA, BHUTAN, NEPAL, PAKISTAN, NATIVE TO SW ASIA AND C EUROPE

Cardamine Linnaeus

Key to the species:

- | | | |
|--|----|-----------------------|
| 1. Plant more than 30 cm tall ; Leaf ovate, ovate-lanceolate | 2. | |
| + Pant upto 30cm tall; Leaf ovate- orbicular | | <i>C. hirsuta</i> |
| 2. Petals purplish, leaves serrate - crenate | | <i>C. macrophylla</i> |
| + Petals white, Leaves entire, rarely sinuate | | <i>C. griffithii</i> |

Cardamine griffithii Hook.f. & Thomas. in Journ. Linn. Soc. 5: 146. 1861; Hook.,f. & T. Anderson in Fl. Brit. India 1: 139. 1872; Grierson in Grierson & Long . Fl. Bhutan 1(2): 431. 1984

Herbs annual. **Stem** erect upto 65 cm, glabrous, angular, grooved. **Leaves**; leaflets 3 – 5 pairs, ovate, 2.5 – 9 x 3 – 6, obtuse, rounded base, margin entire or irregularly sinuate; lower most auricular against stem; leaflets terminal sub orbicular to 1.5 cm long. **Flowers** in racemose with few –flowered. **Sepals** oblong – elliptic, obtuse. **Petals** white or purplish, obovate. Pods upto 1.2 cm.

<i>Flower</i>	: May – July.
<i>Exsiccatu</i>	: Padamchen 2100 m, <i>SR Lepcha & AP. Das</i> 22739, dated 11.10.2007.
<i>Status</i>	: Not common,
<i>Local Distribution</i>	: Kyongnosla, Padamchen 2100 - 3500 m.
<i>General Distribution</i>	: TEMPETRATE EURASIA; INDIA, BHUTAN.

Cardamine hirsuta L., Sp. Pl. ed. 1(2): 655. 1753; Hook.f. & T. Anderson in Fl. Brit. India 1: 138. 1872; Grierson in Grierson & Long Fl. Bhutan 1(2): 431. 1984. Sharma *et al.* (2): 112-113. 1993; Sharma *et al.* Fl. India 2: 112. 1993

Herbs annual. **Stem** erect upto 30 cm, pubescent. **Basal leaves** many; **lamina** 0.5 – 1.5 x 0.5 - 0.8 cm, in rosette, 3cm; basal leaves many leaflets variable in shape but usually ovate-orbicular; terminal leaflet larger and 3 -lobed, **Flowers** upto 0.8 cm long, white, clustered in ebracteate racemes. **Sepal** 0.4 – 3cm, elliptic. **petals** absent or **corolla** longer than calyx 0.5 - 0.40 cm, white, narrow; stamens cylindrical 4- 6, whitish green. **Seeds** cylindric-round, few to upto 12-13 per pod, usually pale brown.

<i>Flower</i>	: March – May	<i>Fruit</i> : April – October
<i>Exsiccatu</i>	: Rachela 2195 – 2280 m, <i>SR Lepcha & AP. Das</i> 32849, dated 25.10.2004.	
<i>Status</i>	: Less Common.	
<i>Local Distribution</i>	: Rachela Middle, Jorpokhari. 2100 – 3000 m.	
<i>General Distribution</i>	: TEMPETRATE EURASIA; INDIA, NEPAL, BHUTAN	

Cardamine macrophylla Willd., Sp. Pl. 3 (1): 484. 1800; Hook.,f. & T. Anderson in Fl. Brit. India 1: 139. 1872; Hara & Ohashi in Fl. E. Him. 1: 108. 1966; 2: 43. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 40. 1979; Grierson in Grierson & Long Fl. Bhutan 1(2): 430. 1984; Sharma *et al.* Fl. India 2: 115 – 116. 1993

Herbs usually glabrous, leafy erect upto 45 -130 cm tall. **Leaves** pinnate, lamina 1.5 - 4 x 0.8 - 1.5 cm; leaflets 3 - 5 pairs, elliptic, ovate-lanceolate, serrate-crenate, obtuse or acuminate, margin serrate, base cuneate, glabrous, lateral nerves not so prominent. **Pedicels** 0.8 - 1.5 cm long. **Flower** few to many, 1 - 1.8 cm across. **Sepals** 3.5 - 5.5 x 0.18 - 0.30 cm, oblong-elliptic with papery margins, coarse and sparsely hirsute. **Petals** obovate or oblanceolate, purplish; style thick. **Stigma** rounded or bilobed.

- Flower* : May - July.
Exsiccatae : Kyongnosla 2280 m, *SR Lepcha & AP. Das* 32847, dated 10.5.2005.
 Gnathang 3800m, , *SR Lepcha & AP. Das* 30803, dated 24.07.2005.
 Lampokhri 4300m, *SR Lepcha & AP. Das* 30923, dated 24.07.2005.
Status : Less Common.
Local Distribution : Zuluk, Donkyala, Trijunction, 2200-4300 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, CHINA, KOREA
Note : Shoots edible.

Nasturtium Brown

Nasturtium officinale Brown, Hook. Kew ed. 2(4): 110. 1812; Hook.f. & T. Anderson in Fl. Brit. India 1: 133. 1872; Hara in Fl. E. Him. 1: 110. 1966; Grierson in Grierson & Long Fl. Bhutan 1(2): 436. 1984; Sharma *et al*, Fl. India 2: 125.1993. *Rorippa nasturtium-aquaticum* (L.) Hayek, Sched. Fl. Stir. Exs. 22. 1905.

Local Name: Sinrayo (Nep.).

Herbs, perennial, found in marshy place. **Stem** erect-spreading, 5 - 10 cm, rooting from lower nodes. **Leaves** lamina 0.5 - 1.3 x 0.3 - 2.2 cm, imperipinnate, 1 - 5 cm; lateral leaflets, elliptic; terminal leaflet slightly broader and longer than lateral ones, ovate-cordate, sinuate or entire, obtuse-acute. **Flowers** in short and ebracteate racemes, white. **Calyx** 4, in two pairs, free, 0.27 x 0.4 cm, oblong. **Corolla** 4, free and alternating with sepals, 0.4 x 0.15 cm, obovate, tapering below. **Pods** cylindrical, curved upwardly. **Seeds** in two rows.

- Flower* : April - June *Fruit*: May - October
Exsiccata : Panglakha 2900 m, *SR Lepcha & AP. Das* 32099, Dated 28.07.2005.
Status : Less Common.
Local Distribution : Rachel 1400 - 2200 m.
General Distribution : EURASIA, N. AFRICA; NATURALISED IN INDIA.
Note : Eaten as vegetables.

Rorippa Scopoli

Rorippa dubia (Persoon) H. Hara, J. Jap. Bot. 30: 196. 1955.; Grierson in Grierson & Long Fl. Bhutan 1(2): 437. 1984. *Sisymbrium dubium* Persoon, Syn. Pl. 2: 199. 1807.

Herbs annual or perennial, slender to 50 cm tall. **Stem** glabrous or sparsely pubescent. **Leaf** deeply pinnatifid; Lower and middle cauline leaves auriculate ; petiole to 4 cm, leaf blade pinnatifid or undivided, obovate, oblong, or lanceolate, margin entire or irregularly crenate or serrate, apex obtuse or subacute; apex oblong, elliptic, or oblong-lanceolate, Uppermost leaves usually sessile, auriculate; leaf blade lanceolate or oblong, margin entire or serrulate, apex acute or acuminate. **Racemes** ebracteate. **Fruiting pedicels** slender, to 12 mm. **Sepals** pinkish,

ascending, oblong-linear,. **Corolla** yellow ; **Petals** mostly absent, rarely present and linear or narrowly oblanceolate; **filaments** to 2.5 mm; anthers oblong. **Ovules** many.; stigma rounded. Fruit linear, Seeds reddish brown.

Flower : April – June
Exsiccatus : Nathang – Panglakha 3000 – 3800 m, **SR Lepcha & AP. Das** 32930, 31.07. 2005.
Status : Less common
Local Distribution : Padamchen, Kyongnosla, Gangtok, 2800 - 4200m.
General Distribution : INDIA, BHUTAN, BANGLADESH, INDONESIA, JAPAN, LAOS, MALAYSIA, MYANMAR, NEPAL, PHILIPPINES, THAILAND, VIETNAM; naturalized in temperate areas.

MORINACEAE J.G.agardh

Key to the Genus:

1. Leaves in pairs or whorls of 3; lamina linear lanceolate; staminodes inserted in upper half of corolla tube **Morina**
+ Leaves in rosette or on sterile shoot or whorls of 4; lamina linear oblong-oblanceolate – lanceolate; staminodes inserted near base of corolla tube **Cryptothladia**

Morina Linnaeus

Morina nepalensis D. Don, Prodr. Fl. Nepal 161. 1825; C.B. Clarke in Fl. Brit. India 3: 217. 1882; Hara in Fl. E. Him. 3: 108. 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 210 1974; Clement in Grierson & Long, Fl. Bhutan 2(3): 1373. 2001. *Morina nana* Wall. [Cat. 14, n. 424. 1829, *nom. nud.*] ex DC., Prodr. 4: 645. 1830. *Morina betonicoides* Benth. in Hook., Ic. Pl. 12: 63, t. 1171. 1873.

Herbs rhizomatous, leave base remains. **Leaves** in pairs or in whorls of 3, linear oblanceolate to lanceolate, lamina 5 – 25 x – 3 cm, margin toothed, teeth spinous in groups of 3, rarely with small spinose teeth, glabrous. **Petiole** sheath to 5 cm. **Flowering** to 90 cm; bracts ovate. **Involucel** tubular, spines 10, villous. **Calyx** tubular – campanulate, glabrous outside, hairy inside ; lips emarginated. **Corolla** tubular, white or pink. **Fruits** oblong.

Flower : August – September
Exsiccatus : Bhimbase 4340 m, **SR Lepcha & AP. Das** 30849, Dated 27, 07.2005.
Status : Common
Local distribution : Memenchu lake, Rachel, Sherapthang, 3000 – 4500 m.
General distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET.

Cryptothladia (Bunge) Cannon

Cryptothladia polyphylla (DC.) Cannon in Bull. Brit.Mus. (Nat. Hist.). Bot,12 (1): 20. 1984; Clement in Grierson & Long, Fl. Bhutan 2(3): 1373. 2001. *Morina polyphylla* Wall. ex DC., Prodr. 4: 644. 1830; Hara in Fl. E. Him. 3: 108. 1975.

Herbs rhizomatous, with fibrous leaf remains. **Leaves** in rosette on sterile shoots; **lamina** linear oblong, 7 - 38 x 2 – 5.5 cm, margin toothed, teeth tooth bear 2 - 3 spiny teeth, petiole sheath to

2.5 cm . Flowers in several verticals forming spike; flowering stem to 50 cm long; bracts ovate - acuminate. exceeding flowers, margin spiny; Involucrel ± tubular, widening to apex. hairy; spiny teeth . Calyx to 11 mm, pilose; lip 2 lobed equal or shorter than tube, lobes ovate oblong, mucronate. Corolla white or pink, lips apparently scarcely opening not exceeding calyx. Fruits ± oblong.

- Flower : May - August
 Exsiccatus : Lampokhri - Bhimbase 4320 m, SR Lepcha & AP. Das 30858, dated 27.10.2007.
 Status : Very Common.
 Local Distribution : Nathang, Lampokhri. 3600 - 4200 m.
 General Distribution : HIMALAYAS; INDIA (Gharwal to BHUTAN).
 Note : Endemic to Himalaya

Order: Ericales

ERICACEAE A.L. Jussieu

Key to the Genera:

- | | |
|---|---------------------|
| 1. Shrubs dwarf (alpine); leaves imbricate | <i>Cassiope</i> |
| + Shrubs dwarf to large or tree; leave not imbricate | 2 |
| 2. Lamina entire | 3 |
| + Lamina serrate or serrulate | 4 |
| 3. Leaf surface glabrous | <i>Lyonia</i> |
| + Leaf surface with hairs or peltate scales..... | <i>Rhododendron</i> |
| 4. Leaves evenly placed along the branches; corolla urcinate | <i>Gaultheria</i> |
| + Leaves crowded towards the branch ends; corolla campanulate | <i>Enkianthus</i> |

Cassiope D. Don

Key to the species:

- | | |
|---|------------------------|
| 1. Lamina ovate-triangular; pedicel densely crisped-tomentose | <i>C. fastigiata</i> |
| + Lamina lanceolate; pedicel densely pubescent | <i>C. selaginoides</i> |

Cassiope fastigiata (Wall.) D. Don in Edinburge New Philos. Journ.17: 157. 1834; Clarke in Hook.f., Fl. Brit. India 3: 459. 1882; Hara in Fl. E. Him. 234. 1966; Hara et al., Enum. Fl. Pl. Nepal. 3: 55. 1982; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 392. 1991. *Andromeda fastigiata* Wall. in As. Res.13: 394. 1820. *Andromeda cupressiformis* Wall. ex D. Don in Mem. Wern. Nat. Hist. 5.3: 411. 1821.

Herbs upto 20 cm tall. Stems decumbent but much branched, fastigiated. Leaves densely imbricate; lamina ovate - triangular, 4 - 6 × 1.5 - 2 mm, leathery, abaxially deeply furrowed reaching near apex and diverging near base, furrow-rim densely pubescent, adaxially concave, subglabrous, base divergent, 2 - lobed, margin silvery, membranous, densely ciliolate, apex apiculate; pedicel 1 3 - 7 mm, densely crisped-tomentose. Calyx purple; lobes oblong-ovate,

margin broadly membranous. **Corolla** white, broadly campanulate, 6 – 9 mm; lobes spreading, 2 – 3.5 mm; **stamens** ca. 2.5 mm; filaments glabrous. **Capsules** small 2 – 3 mm in diam.

Flower : May-July *Fruit.* : June-September
Exsiccatus : Kupup Lake, **SR Lepcha & AP Das** 32822, dated 25.10.2004.
Status : Common
Local Distribution : Memenchu, Baba mandir, Rongchu, Changu. 4265 - 4470m.
General Distribution : HIMALAYA; INDIA, (Kashmir to BHUTAN).
Note : Endemic to Himalaya

Cassiope selaginoides Hook.f. & Thoms. in Hook., J.B. Kew mist. 7: 126, t. 4.1855; C.B. Clarke in Fl. Brit. India 3: 460. 1882; Hara *et al.* in El. E. Him. 2: 94. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 3: 55. 1982; Long & Rae in Grierson & Long., Fl. Bhutan 2(1): 392. 1991.

Herbs slender, decumbent upto 25 cm. **Lamina** lanceolate 2 – 4 × 1 – 1.5 mm, bristle tipped, leathery, base divergent, 2-lobed, margin silvery, membranous, densely ciliolate; pedicel densely pubescent 6 – 22 mm. **Flowers** solitary axillary, nodding. **Calyx** 5, free, purple; lobes oblong-ovate, margin broadly membranous. **Corolla** 5, white, broadly campanulate, 6 – 9 mm; lobes spreading, 2 – 3.5 mm; **stamens** ca. 2.5 mm; filaments glabrous; **Fruits** capsule.

Flower : May- August *Fruit:* September
Exsiccatus : Kupup Lake 4200 m, **SR Lepcha & AP. Das** 32822, dated 25.10.2004.
Status : Common
Local Distribution : Memenchu, Baba mandir, 3400 – 4400 m.
General Distribution : E. HIMALAYA;INDIA, (Sikkim - BHUTAN) and W. CHINA.
Note : Endemic to Eastern Himalaya

Enkianthus Loureiro

Enkianthus deflexus (Griff.) Schneider, Ill. Handb. Laubh. 2: 521. 1911; Hara *et al.* Fl. E. Him. 1: 234. 1966; EFPN 3: 55. 1982; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 394: 1991.
Rhodora deflexa Griff., Itin. Not. 148 & 187. 1848. *E. himalaicus* Hk. f. & Thoms. in Hk. Journ. Bot. Kew. Gard. Misc. 7:125, t. 3. 1855; C.B. Clarke in Fl. B. India 3: 461. 1882

Local name: Khorsanay (Nep.)

Shrubs or small trees, upto 6 m tall. **Leaves** in terminal clusters; petioles to 1.5 cm ; **lamina** 2.5 - 8 × 0.7 – 20 cm, ovate-elliptic, finely toothed, acute, base acute, hairy beneath. **Inflorescence** with 6-12 flowered umbels. Pedicels to 3cm, long, slender, greenish white. **Flowers** pendulous, light pink-orange ; **sepals** 5, united at base, to 0.5 cm , triangular, greenish; **petals** 5, united, bell-shaped, glabrous, lower greenish white, terminal light pinkish with red vertical lines (veins) beneath on petal tubes; **stamens** 10, epipetalous; anthers 2-spurred, ash white, dorsifixed; **ovary** 5-celled superior; style to 0.5cm, hairy. **Capsules** with persistent calyx, 5-partite, light brown when ripe.

Flower : April – June *Fruit:* June - November
Exsiccatus : Rachela 2450 m, **SR Lepcha & AP. Das** 3001, dated 12.08.2006.
Status : Common
Local Distribution : Kyongnosla, Rachela, Panglakha upto 2900 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL - BHUTAN, MYANMAR.

Gaultheria Linnaeus

Key to the species:

1. Calyx lobes ovate- oblong nerer triangular 2
+ Calyx lobes triangular-ovate 3
2. Leaves margin inconspicuously crenulate, Capsule globose... *G. nummularioides*
+ Leaves margin denticulate-setulose Capsule glabrous..... *G. trichophylla*
3. Leaves veins (seconadary) = or < 4 pairs 4
+ Leaves veins (secondary) = or > 4 pairs *G. griffithiana*
4. Leaves base cuneate to broadly cuneate; pedicel pubescent... *G. fragrantissima*
+ Leaves base obtuse-rounded or attenuate; pedicel glabrous... *G. hookeri*

Gaultheria fragrantissima Wall. in Asiatic. Res. 13: 397, fig. 1820; C. B. Clarke in Fl. Brit. India 3: 457. 1882; Hara & Ohashi in Fl. E. Him. 1: 234. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 55. 1982; Long & Rae in Grierson & Long, Fl. Bhutan 2(1):388. 1991.

Local Name: Lek Bilounay, Basak (Nep.).

Shrubss upto 4m tall. **Leaves** scattered; petiole to 7 mm; elliptic, oblong-elliptic, ovate, obovate, or narrowly obovate-lanceolate, **lamina** 4.5 – 15 × 2.5 – 5.5cm, leathery, abaxially scattered punctate, secondary veins 4 – 7 pairs, secondary and fine veins distinctly raised abaxially, base cuneate to broadly cuneate, sometimes obtuse-rounded, margin obtusely serrulate; apex acute. **Flowers** in axillary, racemose, many flowered, pubescent; bracts ovate, to 3 mm, abaxially glabrous or puberulous, margin ciliolate; pedicel pubescent; broadly ovate. **Calyx** glabrous; lobes triangular. **Corolla** white, tubular-urceolate, abaxially glabrous; filaments dilated, puberulous; anthers ca. 1.45 mm; **ovary** pubescent. Calyx at Fruitblue-purple, fleshy. **Capsules** globose.

<i>Flower</i>	: Jan -May.	<i>Fruit:</i> June-August.
<i>Exsiccatus</i>	: Singaney dara 2600 m, , SR Lepcha & AP Das 01018 , dated 16.09.2007.	
<i>Status</i>	: Common	
<i>Local Distribution</i>	: Kyongnosla, Changu, Memenchu, Kupup; 4265 – 4570 m	
<i>General Distribution</i>	: INDIA, NEPAL, BHUTAN, CHINA, MYANMAR, VIETNAM.	

Gaultheria griffithiana Wight in Calcutta. Journ. Nat. Hist. 8: 176. 1847; C.B. Clarke in Fl. Brit. India 3: 458. 1882; Hara & Ohashi in Fl. E. Him.1: 234. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 55. 1982; Long & Rae in Grierson & Long. Fl. Bhutan 2(1): 388. 1991.

Shrubs, rarely tree upto 5m tall. **Leaves**; petiole to 11 mm, glabrous; scattered, oblong, elliptic, or lanceolate-oblong, **lamina** 6 – 17 × 2 – 6 cm, thickly leathery, abaxially densely punctate, adaxially glabrous, veins 3 or 4 pairs, base broadly cuneate to subcordate, margin closely serrulate, apex caudate-acuminate. **Inflorescences** axillary, racemose, clustered, 2 – 6 cm, many flowered, pubescent or lanuginose; bracts ovate to orbicular-ovate, 2 – 7 mm, abaxially glabrous or densely sericeous; **bracteoles** 2, ovate, 1.5 – 3 mm, abaxially glabrous, ciliolate. **Calyx** lobes triangular-ovate, apex obtuse to acute. **Corolla** white, light pink, or pale green, 5 – 7 mm, campanulate, abaxially glabrous; lobes recurved; filaments rhombic, papillate; **anthers** 1 – 1.5 mm; **ovary** sericeous. Calyx at Fruitdark purple, fleshy. **Capsules** globose,

<i>Flower</i>	: April – June	<i>Fruit:</i> May – October
<i>Exsiccatae</i>	: Panglakh 2890m, SR Lepcha & AP. Das 31167 , dated 03.10.2004; Rachela 3000 m, SR Lepcha & AP. Das 29335 , dated 30.09.2004.	

Status : Abundant.
Local Distribution : Rachel, Kyongnosla. 4265 – 4570 m.
General Distribution : INDIA, BHUTAN, NEPAL, MYANMAR.

Gaultheria hookeri C.B. Clarke in Hook.f., Fl. Brit. India 3: 458. 1882; Hara *et al.* Enum. Fl. Pl. Nepal 3: 35. 1982; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 390. 1991. *G. hookeri* var. *angustifolia* Clarke in Fl. Brit. India 3: 458. 1882.

Shrubs prostrate or erect upto 100 cm tall. **Leaves** scattered; petiole to 5.2 mm, hirsute; elliptic to lanceolate, **lamina** 3.5 – 9.5 × 1.5 – 4.5 cm, leathery, abaxially punctate, ± hirsute, adaxially glabrous, secondary veins (3 or) 4 (-7) pairs, secondary and fine veins raised abaxially, slightly impressed adaxially, base obtuse-rounded or attenuate, margin serrate-mucronate, apex abruptly acute. **Inflorescences** terminal and axillary, racemose, pubescent; bracts orbicular-ovate or ovate, to 8 mm, abaxially glabrous, adaxially puberulous; pedicel to 4.5 mm, glabrous; **bracteoles** 2, similar to bracts but smaller. **Calyx** glabrous, lobes triangular-ovate, margin ciliate. **Corolla** pink or white, 3.5 – 4.6 mm; filaments dilated towards base, puberulous; **ovary** puberulous. **Calyx** at Fruit blue-black. **Capsules** sericeous-puberulous.

Flower : July - October. *Fruit*: March – December.
Exsiccatus : Panglakha ridge 2990 m, , **SR Lepcha & AP Das** 27736, dated 30.09.2004.

Status : Less common/sparse
Local Distribution : Kupup, Nathang, Zuluk. 3800 – 4200 m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA.

Gaultheria nummularioides D. Don, Prodr. Fl. Nepal 150. 1825; Clarke in Hook.f., Fl. Brit. India 3:457. 1882; Hara & Ohashi in Fl. E. Him. 1: 235. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 55. 1982; Long & Rae in Grierson & Long. Fl. Bhutan 2(1): 39. 1991.

Shrubs, prostrate, with much branched. **Petiole** ca. 1 mm; **lamina** broadly ovate or suborbicular, sometimes ovate or elliptic, 5 – 15 × 3 – 13 mm, papery or leathery, abaxially densely or sparsely setiferous, usually pale, sometimes red punctate, adaxially glabrous, secondary veins 2 or 3 pairs, base obtuse, truncate, rounded, or subcordate, rarely cuneate, margin denticulate-setulose, apex acute, distinctly mucronate. **Flowers** solitary, axillary, bracts ovate-triangular, ca. 1.5 mm; bracteoles 2 – 4, persistent, stramineous, larger than bracts. **Calyx** glabrous; lobes ovate, ca. 3 mm, apex shortly acuminate. **Corolla** white, pink, or crimson, campanulate, ca. 5 mm, abaxially glabrous; triangular. Filaments spindle-shaped, villous, papillate; **Ovary** glabrous. **Calyx** at Fruit blue-purple or black; **Capsules** globose.

Flower : July - October *Fruit*: March - December.
Exsiccatus : Rachel 2950 m, **SR Lepcha & AP Das** 27770, dated 30.09.2004.

Status : common
Local Distribution : PWS, KAS, 4265 – 4570 m.
General Distribution : INDIA, NEPAL, BHUTAN, BANGLADESH, MYANMAR, CHINA, INDO-NESEA.

Gaultheria trichophylla Royle, Ill. Bot. Himal. Mts. 260. 1835; Clarke in Hook.f., Fl. Brit. India 3: 457. 1882; Hook.f., in Bot. Mag. 125: t 7635. 1899; Hara in Fl. E. Him. 235. 1966; Hara *et al.* Enum. Fl. Pl. Nepal. 3: 55. 1982; Long & Rae in Grierson & Long., Fl. Bhutan 2(1): 391. 1991.

Shrubs dwarf, prostrate. **Petiole** very short, to 0.6 mm; **lamina** elliptic or elliptic-oblong, 3.5 – 13 × 2.5 – 5.5 mm, leathery dense, glabrous, rarely abaxially scattered hispidulous on midvein,

veins inconspicuous, both ends obtuse to acute, margin inconspicuously crenulate, long ciliate when mature. **Flowers** solitary, axillary; pedicel to 2.5mm or flower subsessile; bracts absent; bracteoles 2, apical, broadly ovate, glabrous. **Calyx** glabrous; lobes ovate-oblong, 1.5 – 3 mm, ciliolate. **Corolla** white, campanulate, ca. upto 5.8 mm, deeply 5-lobed, glabrous; lobes erect, oblong; filaments spindle-shaped; ovary glabrous. Calyx at Fruitblue, fleshy. **Capsules** glabrous.

Var. *trichophylla*

Lamina elliptic or elliptic-oblong, long ciliate along margin.

Flower : May *Fruit:* July
Exsiccata : Kyongnosla 3700 m, **SR Lepcha & AP. Das 037**, Dated 10.10.2006.
Status : Common
Local Distribution : Panglakha, Rachel, Baba Mandir. 3000 – 4500 m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, MYANMAR.

Lyonia Nuttall

Key to the species

- 1. Leaf apex obtuse; calyx lobes oblong or narrowly lanceolate to linear *L. villosa*
- + Leaf apex acuminate; calyx lobes strictly oblong *L. ovalifolia*

Lyonia ovalifolia (Wall.) Drude in Engler., Pfl. Nat. Pflanzenfam 4(1): 44. 1889; Hara & Ohashi in Fl. E. Him.1: 236. 1966; Hara *et al.* Enum.Fl. Pl. Nepal 3: 55. 1982; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 395. 1991. *Andromeda ovalifolia* Wall. in Asiat. Res. 13: 391, t. 11. 1820. *Pieris ovalifolia* (Wallich) D. Don in Edinb. New Philos. Journ. 17: 159. 1834; Clarke in Hook.f., Fl. Brit. India 3: 460. 1882.

Local Name: Angeri (Nep.).

Shrubss or trees, upto 4 m tall. **Petiole** 3.5 – 8.3mm; **lamina** 2.5 – 18 × 4.5 – 12 cm, glabrous or pubescent; ovate, narrowly to broadly elliptic, lanceolate, or suborbicular, papery to thinly leathery, both surfaces ± with white or brown hairs, rarely abaxially densely white villous on midvein or subglabrous, veins prominently raised to slightly depressed or nearly obscure, base obtuse, cuneate, or sometimes cordate, apex acuminate. **Inflorescence** pubescent; pedicel 2.5 – 8.5mm, densely pubescent. **Calyx** lobes oblong, densely or sparsely pubescent. **Corolla** tubular, 6.2 – 10.5mm, abaxially pubescent; filaments 4.5 – 7.4mm, pilose, with 2 spurs at apex; **ovary** glabrous or rarely pubescent. **Capsules** globose or ovoid, glabrous to pubescent.

Flower : May - June *Fruit:* July - September.
Exsiccatus : Panglakha ridge 2890 m, , **SR Lepcha & AP. Das 27719**, Dated 30.07.2004.
Status : Most common
Local Distribution : 15th Mile, Karponang, Kyongnosla, Padamchem, Premlakha.
General Distribution : EASTERN HIMALAYA; INDIA, BHUTAN, NEPAL, MYANMAR, MALAYSIA,

Note : Leaves poisonous to cattle. The tribals of Sikkim used it as an insect repellent.

Lyonia villosa (Wall. ex Clarke) Handel-Mazzetti, Symb. Sin. 7: 789. 1936; Hara *et al.* in Fl. E. Him.(1): 236. 1996; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 389. 1991; *Xolisma villosa* (Hook.f.) Rehder; J. Arn. Arb. 5: 53. 1924.

Shrubss or small trees upto 3 m tall. **Petiole** pubescent; **lamina** 2 – 5.5 × 1.5 – 4.5 cm, obovate or oblong-obovate, papery to subleathery, abaxially villous or pubescent on veins or sometimes

subglabrous, adaxially pubescent on veins, or glabrous, veins raised abaxially, midvein impressed adaxially, base broadly cuneate to rounded or subcordate, apex obtuse, mucronate. **Inflorescence** pubescent, rarely glabrous; bracts leaflike; **pedicels** 2.5 – 4.5 mm, pubescent to glabrous. **Calyx** lobes oblong or narrowly lanceolate to linear, 3 – 4 mm, glandular hairs. **Corolla** tubular, abaxially pubescent; filaments ca. 5.2 mm, pilose; **ovary** glabrous to pubescent. **Capsules** ovoid, glabrous or rarely pubescent.

Flower : May-August. *Fruit*:: September – October.
*Exsiccatu*s : Ramitey dara 2600 m, , **SR Lepcha & AP. Das 31160**, dated 03.10. 2004.
Status : Common
Local Distribution : Rachela, Panglakha, Rongchu, 4265 – 4570 m.
General Distribution : HIMALAYA; INDIA, (Gharwar to Sikkim) and W. CHINA.
 Note : Endemic to Himalaya.

Rhododendron Linnaeus

Key to the Species:

- | | |
|---|------------------------|
| 1. Leaf glabrous beneath; scale visible | 3 |
| + Leaf woolly tomentose beneath | 9 |
| 3. Leaves 2.5 – 18 x 1.5 – 8 cm | 4 |
| + Leaves upto 3 x 2 cm | 8 |
| 4. Leaves with conspicuously stiffly bristly..... | <i>R. cilliatum</i> |
| + Leaves not bristly | 5 |
| 5. Leaf base without cilia or slender bristles | 6 |
| + Leaf base with cilia or slender bristles | <i>R. dalhousiae</i> |
| 6 Leaf white or pale green beneath | 18 |
| + Leaf green or brown beneath | 7 |
| 7. Leaves scales over lapping ; dense scaly above | <i>R. baileyi</i> |
| + Leaves scales scarcely overlapping; sparsely scaly above | <i>R. cinnabarinum</i> |
| 8. Leaves densely scaly beneath with overlapping lacerate scales | <i>R. anthopogon</i> |
| + Leaves sparsely scaly , scales not overlapping | <i>R. lepidotum</i> |
| 9. Leaves oblong elliptic , obtuse | 10 |
| + Leaves ovate elliptic; acuminate | <i>R. edgeworthii</i> |
| 10. Petiole covered by thickly borwn or whitist tomentose | <i>R. lanatum</i> |
| + Petiole glabrous | 11 |
| 11. Leaves velvety tomentose; petiole gklabrous | 12 |
| + leaves rough, not velvety | 13 |
| 12. Leaf strongly reflxed at margins , when dry | <i>R. aeriginosum</i> |
| + Laef not reflxed at margins , when dry | <i>R. campanulatum</i> |
| 13. Leaves elliptic-oblanceolate; indementum silvery | 14 |
| + Leaf ovate eillptic to broadly elliptic or suborbicular | 15 |
| 14. Corolla bright red, pink or rarely white, stamens 20 | <i>R. arborium</i> |
| + Corolla crimson or blood red; stamens 10 | <i>R. barbatum</i> |

- | | |
|---|-------------------------|
| 15. Petiole glaucous green; corolla deep crimson | <i>R. thomsonii</i> |
| + Petiole wrinkled; corolla not deep crimson | 16 |
| 16. Leaves glabrous beneath | <i>R. griffithianum</i> |
| + Leaf tomentose beneath | 17 |
| 17. Lateral veins prominent beneath | <i>R. grande</i> |
| + Lateral veins prominent or weakly beneath | <i>R. falconeri.</i> |
| 18. Flower rosy-pink, rarely white with pinkish marks | <i>R. glaucophyllum</i> |
| + Flower pale green – greenish yellow | <i>R. triflorum</i> |

Rhododendron aeruginosum Hook.f., Rh.Sikkim Him.t. 22. 1849; U.C. Pradhan in Him. Plant Journ. 3(8):111; 1985; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 375. 1991; *R. campanulatum* subsp. *Aeruginosum* (Hook.f.) Chamberlain in Notes R.B.G. Edinb. 37(2): 329. 1979; U.C. Pradhan in Him. Plant Journ. 3(8): 113. 1985.

Local Name: Nilo-pate chimal (Nep.).

Shrubs upto 1.5 tall. **Leaves;** petioles 4-5mm.long lamina 5 – 7.5 x 3 – 4.5 cm, elliptic, leathery, cordate at base and mucronate at apex, margins recurved; leaf surface matt, bright green, glaucous, ventral surface densely covered by deep rusty-brown tomentum, midrib and lateral veins covered by tomentum; pedicels to 2 mm, long, deep rose-pink, spotted purple-crimson on dorsal inside and crimson blotched at base. **Corolla** broadly campanulate, 2.5 – 2.8 x 3 – 3.5 cm 5-lobed, lobes shortly sub-divided, **Stamens** 10, unequal, never exceeds corolla; **filaments** brownish-black; **ovary** 5-celled, glaucous, dark brownish-black.

Flower : May - June
Exsiccatus : Kupup 4100 m, **SR Lepcha & AP. Das** 32923, dated 28.07.2005.
Status : Less common
Local Distribution : Kyongnosla, 4500-5000m
General Distribution : EASTERN HIMALAYA; (Sikkim – BHUTAN) AND S. TIBET.
Note : Endemic to Eastern Himalaya.

Rhododendron anthopogon D. Don in Mem. Wven Nat. His. Soc.3: 402. 1821; C.B. Clarke in Hook.f., Fl. Brit. Ind. 3: 472. 1882, p.p.; Hara *et al.* Fl. E. Him. 236. 1966; 2: 95. 1971; U.C.Pradhan in Himal.Plant Journ.3 (8): 111. 1985; Long & Rae in Grierson & Long.Fl. Bhutan (2): 385. 1991

Shrubs up to 40 cm tall. Shoots slightly bristly and scaly; **Petiole** long 7 mm, scaly above; lamina 2 – 4 x 1- 2.5 cm, oval or oblate-elliptic, obtusely mucronate at the apex, base rounded, sparsely scaly above and densely rusty scaly on the underside; petiole long 7 mm, scaly above. **Inflorescence** compact terminal head of 4 - 6 flowers. **Flowers** narrowly tabular with 5 rounded spreading lobes across, pinkish-white to deep pink. **Calyx** deeply lobed, elliptic margins finely ciliate. **Corolla** narrowly tabular glabrous, externally scaly and rainy inside. **Stamens** 5 - 8 include in the corolla-tube, glabrous; **Ovary** 4-5 celled, scaly. **Capsules** enclosed by persistent calyx-lobes.

Flower : May – June *Fruit:* September – October.
Exsiccatus : Nathang 4100 m, **SR Lepcha & AP. Das** 32823, Dated 25.10.2004.
Status : Rare
Local Distribution : Kyongnogla, Tiger hill, Chang hills. Nathang (3000m -5500m)
General Distribution : E. HIMALAY; INDIA, (NEPAL – BHUTAN) and S. TIBET.

Note : 1. Endemic to Eastern Himalaya

2. The dried leaves are used as incense in Buddhists monasteries in Sikkim, Tibet and at Bhutan.

Rhododendron arboreum Smith, Exot. Bot. 1: 9, 1.6. 1805; Hook. f., Rhod. Sikkim Him. 4. 1849; C.B. Clarke in Hook.f., Fl. Brit. India 3: 465. 1882; Hara *et al.* Fl. E. Him. 237. 1966; 2: 95. 1971; U.C. Pradhan, Himal. Plant Journ. 3(8): 111. 1985; Long & Rae in Grierson & Long. Fl. Bhutan 2(1): 372. 1991

Local Name: Lali Gurans (Nep.)

Trees, 10 - 15m tall. **Lamina** 10 - 25 x 3 - 6 cm, oblong-lanceolate to lanceolate, narrowed to the apex, base wedge-shaped; dark green, glossy and glaucous above and bearing silvery-white to fawn or cinnamon indumentum. **Inflorescence** compact trusses of 15 - 20 flowers, to 15 cm across; rachis tomentose. Pedicels about 8 mm. long downy and sparsely glandular. **Flowers** fleshy, usually blood-red to scarlet, tubular-companulate. **Calyx** to 0.3 cm long, lobes-5, tiny, triangular, slightly glandular and downy and fringed with hairs. **Corolla** tabular, companulate, to 4.5 cm long, lobes bearing dark nectary pouches at the base. **Stamens** 10, sub-equal, filaments white, glaucous. **Pistil** long, ovary conic, white-tomentose. **Capsules** oblong-cylindric, straight, or rarely curved.

Flower & Fruit : March - May

Exsiccatus : Panglaxha 3000 m, , **SR Lepcha & AP. Das 31080**, Dated 02.10.2004.

Status : Common

Local Distribution : Rachela, Kyongnosla, Lungthung, Karponang, Changu, Kupup.

General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, S.E. TIBET

Note : The wood is used for making handle of Banphok or Khukri's (traditional knife of Sikkim) The wine prepared by the fermentation of the flower by Sherpa tribe is the remedies for antidote and altitude sickness.

Rhododendron baileyi Balfour F. in Notes R.B. G. Edinb. 11.23. 1919; Staple in Bot. Mag. t. 8942. (1922); Alph. Check. Rh. Sp. (1981); U.C. Pradhan in Himal. Plant Journ. 3(8); 112. 1985; Grierson & Long. Fl. Bhutan 2(1): 382. 1991

Vern. Name : Sano chimal (Nep.)

Shrubs up to 1.5 m tall. **Leaves**; petioles to 8 mm; lamina 2.2 - 5 x 0.9 - 2.5 cm, elliptic to obovate, very densely brownish, scaly beneath, with overly lapping scales, upper surface densely scaly. **Flower** in 3 - 9 in distinct terminal racemes; pedicels to 2.5 cm. **Corolla** deep wine red or purple **Stamens** 10, stamen smaller than pistil; stigma swollen, 5-lobed; **ovary** 5-celled. **Capsules** cylindric.

Flower : May - July

Exsiccatus : Nathang boundary 4050m, **SR Lepcha & AP. Das 32939**, dated 27.10.2004.

Status : Common

Local Distribution : Serabthang, Changu; 3000 - 4000 m

General Distribution : E. HIMALAYA; INDIA, (BHUTAN- Arunachal Pradesh).

Note : Endemic to Eastern Himalaya.

Rhododendron barbatum Wall. ex G. Don. Gen. Hist. 3: 844. 1834; Hook.f., Rh. Sikkim Him..t. 3. 1849; C.B. Clarke in Hook.f., Fl. Brit. India 3: 468. 1882; Hara *et al.* Fl. E. Him. 237. 1966; 2: 96. 1971; U.C. Pradhan in Himal. Plant Journ. 3(8): 112. 1985; Long & Rae in Grierson & Long. Fl. Bhutan 2(1): 376. 1991

Local Name: Lal-Chimal (Nep.)

Trees upto 10 m tall. etiole bearing glandular bristles; **lamina** 10 – 20 x 3 – 7 cm , elliptic-lanceolate, acute, base rounded, margins reflexed and rough; upper surface shiny, midrib grooved primary nerves deeply impressed; wooly to hairless below, yellowish-green, glabrous on both surfaces. **Inflorescence** a compact globose head to 15cm across, bud scales and bracts very sticky; rachis glaucous. **Flowers** 10 - 20 per truss, blood red to scarlet-red, closely packed and born on pedicels to 0.15cm long, glaucous. **Calyx** large glaucous, ending in 5 ovate lobes at the base. **Corolla** tabular-companulate, bright scarlet, or scarlet-crimson with blakish nectarines at the base. **Stamens** 10, filaments glaucous, white and carrying purplish-black anthers. **Ovary** oblong, greenish-white, glandular hairs. **Capsules** long oblong-cylindric, brown.

Flower : March - April
Exsiccatus : Jorepokhri, **SR Lepcha & AP. Das 31165**, dated 03.10.2004.
Status : Not common
Local Distribution : Rachel, Panglakha. 2800 – 3050 m.
General Distribution : HIMALAYA; INDIA, (Kumaon – BHUTAN).
Note : 1. Endemic to Eastern Himalaya.
2. This species is oftenly found in mixed Abies forest along rivulets, in association with *R. hodgsonii* and other *Rhododendron* species

Rhododendron campanulatum D.Don in Mem. Wern. Soc. 3: 410. 1821; C.B. Clarke in Fl. Brit. India 3: 466.1882; Long & Rae in Grierson & Long . Fl. Bhutan 2(1): 375. 1991.

Shrubs large, upto 4 m tall . Branchlets glabrous. **Leaves** coriacious, elliptic, rarely elliptic oblong, **lamina** 5.5 – 13 x 2.5- 5 cm, acute or subacute, base rounded or narrowly cordate, margin not reflexed., glabrous, without metallic bloom above, short fawn or pale brown indumentum of capitellate hairs closely apressed in upper and lower. **Racemes** 8 – 15 flowered; pedicels to 3 cm, glabrous. **Calyx** c 1.3 mm, glabrous. **Corolla** open –campanulate 5 lobed, white or pink with reddish spots and large blotch within, **stamen** 10; filament with few hairs. **Ovary** glabrous. **Capsules** curved.

Flower : May - June *Fruit* : August
Exsiccatus : Changu 3200 m, **SR Lepcha & AP. Das 3000** m, dated 13.07.2005.
Status : Less common
Local Distribution : Changu, upper Rachel
General Distribution : E. HIMALAYA; INDIA, BHUTAN, TIBET, MYANMAR, CHINA.

Rhododendron lanatum Hook.f., Rh. Sikkim Him.t. 16. 1851; C.B. Clarke in Hook.f., Fl. Brit. India 3: 467 1882; Hara *et al*, Fl. E. Him.239. 1966; U.C. Pradhan in Himal. Plant Journ. 3(8): 120. 1985; Long & Rae in Grierson & Long.Fl. Bhutan 2(1): 374. 1991

Local Name: Bhutle Gurans (Nep.)

Trees upto 3 m tall. **Petioles** 15 – 20 mm.long, thickly tomentose; **lamina** 8 – 12 x 3.5 – 5 cm, obovate to obovate-elliptic, cuneate at the base, shiny dark yellowish green above and densely wooly-tomentose beneath, covering the veins. **Inflorescence** 5 - 7 flowered and borne on pedicels 20 - 23mm.long, covered by thick grayish tomentum. **Calyx** reduced to 5 irrigrular lobes or carrying three lobes usually lanceolate and unequal in size. **Corolla** broadly companulate, pale sulphur-yellow flushed and spotted with red and crimson, 4 x 6 cm across. **Stamens** 10, filaments unequal to 2.3 cm long, brownish black; **anthers** dilated; stigma, style glaucous; ovary broad, cylindrical, gently curved. **Fruit** not observed.

Flower : May – June *Fruit*: September – October
Exsiccata : Kupup 4200 m, *SR Lepcha & AP. Das 32962*, dated 28.07.2005.
Status : Not common
Local Distribution : Nathula, Kyongnosla. Changu 3800 – 4300 m.
General Distribution : E.HIMALAYA; NEPAL – BHUTAN).
Note : In Tibet the woolly fawn of underside of the leaves is used in oil lamp.

Rhododendron cilliatum Hook.f., *Rhod. Sik. Himal. T. 24. 1851*; Long & Rae in Grierson & Long., *Fl. Bhutan 2(1): 380, 1991*.

Shrubs upto 2 m tall. Branchlets with bristly and scaly. **Lamina** elliptic, 4 – 8 x 2 – 3 cm, acute or rounded mucronate, base rounded, upper surface dark green, bristly at base of margins, lower surface pale green, scaly and thinly bristly. **Racemes** corymbose 2 – 5 flowered; pedicels to 13 mm, bristly. **Calyx** unequally divided to base into ovate elliptic, base scaly, ciliate margins. **Corolla** campanulate, white flushed pink. **Stamen** 10; filament pubescent towards base. **Ovary** 5 celled, without scales. **Capsules** ovoid- oblong.

Flower : April – May *Fruit*: June – July
Exsiccatas : Changu 3200 m, *SR Lepcha & AP. Das 1015*, dated 20. 09. 2005.
Status : Less common
Local Distribution : Changu, upper Rechilla. 2900 – 3300 m
General Distribution : E. HIMALAYA; INDIA, (E. NEPAL – BHUTAN) and S. TIBET.
Note : Endemic to Eastern Himalayas.

Rhododendron cinnabarinum Hook.f, *Rh. Sikkim Him.t. 8. 1849*; C.B. Clarke in Hook.f., *Fl. Brit. India 3:474.1882*; Hara *et al* *Fl. E.Him. 238. 1966*; 2: 96. 1971; U.C. Pradhan in *Himal Plants Journ. 3(8): 114. 1985*; Long & Rae in Grierson & Long.*Fl. Bhutan 2(1): 382. 1991*

Local Name: Sano chimal (Nep.)

Shrubs upto 2 m tall. Bark reddish. **Leaves**; petioles to 2 cm long, glaucous or slightly scaly. lamina 5 – 10 x 2 – 4.5 cm elliptic to oblanceolate, tapering both ends, grayish- green and finely reticulated above and reddish scaly and glaucous below. **Inflorescence** in terminal cluster of 3 - 7 pendant red waxy flowers. pedicels to 0.7 cm long and scaly. **Calyx** rounded, acute unequally 5-lobed, the uppermost largest. **Stamens** 10, filaments pilose at the base. Stigma swollen, 5-lobed, hairy at the base; **ovary** 5-celled, scaly. **Capsules** long scaly.

Flower. : April- May.
Exsiccatas : Nathang boundary, *SR Lepcha & AP. Das 32939*, dated 27.10.2004.
Status : Common
Local Distribution : Kupup – Nathang. 1900 – 4000 m
General Distribution : E. HIMALAYA; INDIA, (NEPAL – BHUTAN) , S. TIBET.
Note : Endemic to Eastern Himalaya.

Rhododendron dalhousiae Hook.f., *Rhod. Sik. Him. t. 1 & 2. 1849*; C.B. Clarke in Hook.f., *Fl. Brit. India 3: 469. 1882*; Hara in *Fl. E. Him. 1: 23. 1966*; Hara in *Enum. Fl. Pl. Nepal 3: 57. 1982*; U.C. Pradhan in *Sik. Him. Rhod. 40, t. 8. 1990*; Long & Rae in Grierson & Long.,*Fl. Bhutan 2(1): 379. 1991*.

Local Name: Kurlingo, Laharay Chimal (Nep.).

Shrubs upto 3 m tall. Often grows on rock crevices or even epiphytic. Juvenile shoots bristly- scaly. **Leaves** compactly alternate; petioles to 1.5 cm, bristly; **lamina** 8 - 13 x 2.5 – 5 cm, obovate-oblong to oblanceolate, entire, obtuse-acute, rounded or mucronate, base cuneate and

ciliate, dark red sessile glandular scales scattered beneath; pedicels upto 1.4 cm long, pubescent. **Flowers** 2 - 4 in terminal clusters, fragrant. **Sepals** upto 15 x 1 cm, deeply 5-lobed, lobes oblong obtuse, scatterly pubescent, nerves impressed within. **Petals** to 10 cm long, wide campanulate, lobes 5, tips rounded, creamy white to light yellow; **stamens** 10; filament downy and pubescent in lower half part; anthers brown; ovary 5-chambered. **Capsules** 5-ribbed.

Flower : March – May *Fruit*: June – October
Exsiccatus : Middle Rachela 2300 - 2400 m, *SR Lepcha & AP. Das 1013*, dated 10.09. 2005.

Status : Frequent

Local Distribution : Mul-Pokhari, Pangolakha-NP Border, Rachela Middle. 2200 – 2500 m.

General Distribution : EASTERN HIMALAYA; INDIA, (NEPAL – NEFA).

Note : 1. Endemic to Eastern Himalayas

2. Sometime grown in the garden for its aesthetic value.

Rhododendron edgeworthii Hook.f. in Rh. Sik. Him. 22. t. 21. 1851; Bot. Mag. t. 4936. 1856; C. B. Clarke in Hook.f., Fl. Brit. India 3: 469. 1882; Hara in Fl. E. Him. 96. 1971; U.C. Pradhan in Him. Pl. Journ. 3 (8): 116. 1985; Long & Rae in Grierson & Long., Fl. Bhutan (2):1. 378. 1991.

Local Name: *Edgeworth ko Chimal, Lahare Chimal* (Nep.).

Shrubs epiphyte, to 4m tall. **Branchlets** straggling densely pale brown tomentose. **Petioles** to 1.5 cm long; **lamina** 3 - 10 x 1.5 - 4.5 cm, ovate or ovate-elliptic, margin recurved below, acute to shortly acuminate, base rounded, dark shiny green, strongly rugose and glabrous above, lower surface with soft, thick reddish-brown tomentum.; pedicels to 2cm, stout, densely tomentose. **Flowers** terminal, usually 2 or solitary or upto 3 in numbers, highly aromatic. **Calyx** to 1.5 cm, cup-shaped, deeply 5-lobed, pink to green, pubescent and scaly, lobes obovate and spreading. **Corolla** 7.5 cm long, tubular at base and opening into a wide funnel at the mouth, white, often tinged pink or pink, lobes 5 to middle and rounded, scaly outside, margins crisped; **stamens** 10, slightly curved; filaments white, pilose in lower part; **anthers** purple-brown; pistil pale pink, ovary ovoid, tomentose; style pilose at lower part; stigma 5-6 lobed. **Capsules** cylindrical.

Flower : April – May *Fruit*: May – September
Exsiccatus : Middle Rachela 2300 - 2400 m, *SR Lepcha & AP. Das 1014*, dated 19.09. 2005.

Status : Less Frequent

Local Distribution : Pangolakha-NNP border, Rachela middle. 2200 – 2500 m.

General Distribution : E. HIMALAYA: INDIA, BHUTAN, TIBET, MYANMAR, CHINA.

Rhododendron falconeri Hook.f., Rh. Sikkim Himal.t.10. 1849; Bot. Mag .t. 4924. 1856; C.B. Clarke in Hook.f., Fl. Brit. India 3: 465 1882; Hara *et al* Fl. E. Him.239. 1966; 2: 96. 1971; U.C. Pradhan in Himal. Plant Journ. 3(8): 117. 1985; Long & Rae in Grierson & Long.Fl. Bhutan 2(1): 270. 1991

Local Name: *Korlinga* (Nep.)

Trees upto 15m tall. Leaf buds large, conical, tomentose; **Petiole** long grooved above, covered with grayish-white hairs; **lamina** 15 – 30 x 7 – 15 cm, oblong-ovate to elliptic, dark green and rugose above, dense rusty tomentum beneath; veins and veinlets deeply impressed, slightly raised below. **Inflorescence** round terminal heads to 25 cm across, bearing 20 - 25 flowers. **Corolla** obliquely campanulate, creamy-white to pale yellow with purple blotch at the base; bud scales sticky. **Calyx** small, tomentose. **Stamens** 12 - 16, hairy on the basal half. **Stamens**, exserted. **Stigma** greenish-yellow; ovary conoid, 12 mm long. **Capsules** 16 - 18 chambered, hispid.

Flower : Aprl.- May.
Exsiccatu : Jorepokhri, 2650 m, *SR Lepcha & AP. Das 31136*, dated 03.10.2004.
 Singaney Bans 2530 m, *SR Lepcha & AP. Das 250*, dated 15.05.2007.
Status : Common
Local Distribution : PWS. 3300 – 3600 m.
General Distribution : EASTERN HIMALAYA;INDIA, (NEPAL – NEFA).
 Note : Endemic to Eastern Himalaya

Rhododendron glaucophyllum Rehder, Sp. Rh. 804. 1930; NRBGE 36(1): 113. 1978; Rh. Hb. 24 & 151. 1980; Hara in Enum. Fl. Pl. Nepal 3: 58. 1982; Hara in Fl. Him. 232. 1984; U.C. Pradhan in Him. Pl. Journ. 3(8): 118. 1985; Long & Rae in Grierson & Long. Fl. Bhutan 2(1): 384. 1991. *Rhododendron glaucum* Hook.f., Rhod. Sik. Him. t. 17. 1849; C.B. Clarke in Hook.f., Fl. Brit. India 3:471. 1882.
Local Name: *Takma Chimal* (Nep.)

Shrubs usually dwarf upto 1.5m tall. Juvenile shoots often glandular-scaly, glaucous. **Leaves** fragrant; petioles to 0.5 cm long, glandular-scaly; **lamina** 3.5 – 6.5 x 1.5 - 2.5 cm, lanceolate to elliptic-lanceolate, margin recurved, acute, base rounded, dull green above, white and glaucous with brown and yellow scales beneath. **Racemes** subumbellate and in terminal truss of few to 5. peicels 2 cm long, light green, scaly; floral bracts 1.2 x 1cm, ovate. **Flowers** upto 3 cm across, rosy-pink or rarely white with pinkish marks. **Calyx** to 0.80 x - 0.50 cm, deeply 5-lobed, persistent and scaly externally **Corolla** to 3cm, tubular-campanulate or campanulate, with 5 orbicular spreading lobes, marked with distinct light green nerve); **stamens** 10, exerted; filaments hairy; **anthers** dark brown; pistil 1.5cm, pale green turns into reddish pink; **ovary** 5-chambered, scaly towards the apex; stigma 5-lobed. **Capsules** elliptic-globular, scaly, and covered with a little shorter persistant calyx.

Flower : April – May *Fruit* : August - October
Exsiccatu : Panglakha 3050 m, *SR Lepcha & AP Das 1017*, dated 27.10.2004.
Status : Less Common
Local Distribution : Rachela Trijunction, Jorpokhari. 1600 – 3100 m.
General Distribution : E. HIMALAYA; INDIA, (Sikkim, Darjeeling), BHUTAN.
Note : 1. Endemic to Eastern Himalaya
 : 2. Cultivated for ornamental value.

Rhododendron grande Wight. In Calc. Journ. Nat. Hist. 8:176 (1847); Ic. 4:t. 1202 (1850); Hook.f., Sikkim Him. t. 9 (1849); Bot. Mat.t. 5054 (1858); C.B. Clarke in Fl. Brit. India 3:464 1882; Sp. Rh. 310 (1930); Hara *et al.* Fl. E. Him. 239 (1966)-96 (1971); U.C. Pradhan Him. Plant journ. 3(8):118 (1985); Grierson & Long.Fl. Bhutan 2(1): 370. 1991
Vern.name ; Patle korlinga

Tree upto 15m tall. Juvenile leaves silky, imbricated. **Leaves** lamina 15 - 35 x 7.5 – 12.5 cm oblong-lanceolate or oblong-elliptic, shining, deep green above and silvery-white indumentum below, veins impressed. **Inflorescence** with 20 -30 flowers; rachis to 5 cm long. **Flowers** pale rose in bud and white to creamy-white in flowers usually glandular,tufted. **Corolla** 5 – 7 x 5 – 6 cm ventricose-companulate, and nectarines purple blotched, the limb 5-lobed. **Calyx** 8-lobed. **Stamens** 16, unequal; filaments white, anthers purplish-brown. **Stigma** purplish-brown, ovary 10 - 16 celled, densely glandular or tomentose. **Capsule** broad, curved, tomentose.

Flower. : March – April
Exsiccatu : Pokhri chowk 2650 m, *SR Lepcha & AP. Das 31124*, dated 03.10.2004.

Status : Less common
Local Distribution : Kupup, Serabthang. to 4000 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL to NEFA), S. TIBET
Note : Endemic to Eastern Himalaya

Rhododendron griffithianum Wight, Ic. Plant. 4: t. 1203. 1850; Hook, f., Rh. Sikkim Him. t. 11. 1851 (as *R. aucklandii*); C.B. Clarke in Hook.f., Fl. Brit. India 3: 468. 1882; Hara *et al* Fl. E.Him. 239. 1966; 2: 97. 1971; U.C. Pradhan in Himal. Plant Journ. 3(8): 118. 1985; Long & Rae in Grierson & Long.Fl. Bhutan 2(1): 368. 1991.

Local Name:Seto chimal (Nep.)

Trees small upto 5m tall. Juvenile leaves reddish-pink bark. **Petiole** to 3.5 cm long recurved, light green; **lamina** 5 – 20 x 5 – 7 cm, drooping, oblong-elliptic, leathery, margin and midrib yellowish-green; dark green on dorsal sides, ventral surface light green with clear venation. **Inflorescence** 4 - 5 flowered. **Flowers** very large 10 – 11 cm across, white flushed pink behind and borne on glaucous; pedicels 3.5 cm long, saucer-shaped, green flushed red. **Stamens** 12 - 13, filaments to 4.5 cm long, white, anther pale, brown. **Capsules** 5-chambered.

Flower : April – May
Exsiccatus : Jorepokhri (Rachela) 2700 m, , **SR Lepcha & AP. Das 31177**, dated 03.10.2004.

Status : Not common
Local Distribution : Kyongnosla, Changu. 2000 – 3200 m
General Distribution : E. HIMALAYA; INDIA, (NEPAL to NEFA), S. TIBET
Note : Endemic to Eastern Himalaya

Rhododendron lanatum Hook.f., Rh. Sikkim Him.t. 16. 1851; C.B. Clarke in Hook.f., Fl. Brit. India 3: 467 1882; Hara *et al* Fl. E. Him.239. 1966; U.C. Pradhan in Himal. Plant Journ. 3(8): 120 1985; Long & Rae in Grierson & Long.Fl. Bhutan 2(1): 374. 1991

Local Name:Bhutle Gurans (Nep.)

Trees upto 3 m tall. **Petioles** 15 - 20mm.long, thickly tomentose; **lamina** 8 – 12 x 3.5 – 5 cm, obovate to obovate-elliptic, cuneate at the base, shiny dark yellowish green above and densely wooly-tomentose beneath, covering the veins. **Inflorescence** 5 - 7 flowered and borne on pedicels 20 - 23mm.long, covered by thick grayish tomentum. **Calyx** reduced to 5 irregular lobes or carrying three lobes usually lanceolate and unequal in size. **Corolla** broadly campanulate, pale sulphur-yellow flushed and spotted with red and crimson, 4 x 6 cm across. **Stamens** 10, filaments unequal to 2.3 cm long, brownish black; **anthers** dilated; stigma, style glaucous; ovary broad, cylindrical, gently curved. Fruit not observed.

Flower : May-June *Fruit*: September – October
Exsiccatus : Kupup 4200 m, **SR Lepcha & AP. Das 32962**, dated 28.07.2005.

Status : Not common
Local Distribution : Nathula, Kyongnosla. Changu 3800- 4300 m.
General Distribution : E. HIMALAYA; INDIA, (Sikkim – BHUTAN) and S. TIBET .
Note : 1. Endemic to Eastern Himalaya

2. The wooly fawn of underside of the leaves is used in oil lamp in Tibet.

Rhododendron lepidotum Wall. ex G. Don, Gen. Hist. 3: 845. 1834; Hara *et al*, Fl. E. Him. Wall, ex G. Don, Hist. 3: 845. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 3: 471.1882; Hara, Fl. Himal. 240. 1966; 2: 97. 1971; U.C. Pradhani in Himal. Plant Journ. 3(8): 1230.1985; Long & Rae in Grierson & Long Fl. Bhutan 2(1): 384. 1991

Vern. Name: Baley sunpatey, Balu sunpatey (Nep.)

Shrubs, aromatic rounded or mat, branlets scaly. **Leaves** scaly; petioles absent or 1.5 mm, obovate; **lamina** oblanceolate or elliptic 0.4 – 1.3 x 0.4 – 0.7 cm, acute or rounded, base cuneate, conspicuously scaly on both surface. **Flowers** 1 -2 terminal, pendant; pedicels slender, to 3 cm, scaly. **Calyx** 5 lobed, lobes rounded to 0.5 cm, scaly. **Corolla** campanulate to 2 cm, red pink purple white or yellow often spotted. **Stamens** 10, filaments pubescent towards at the base. **Ovary** 5-celled, scaly,; **style** very short, deflex. **Capsules** shortly cylindric.

Flower : May - July.
Exsiccatu : Kupup 4150 m, **SR Lepcha & AP Das** 1012, dated 13. 10. 2005.
Status : Common
Local Distribution : KAS, Changu below. 2500 – 4200 m.
General Distribution : HIMALAYA; INDIA, (Kashmir – BHUTAN) and S. TIBET.
Note : Endemic to Himalaya

Rhododendron thomsonii Hook.f., Rh. Sikkim Him.t. 12. 1851; Bot. Mag. t. 4997. 1857; C.B. Clarke in Hook.f., Fl. Brit. India 3: 468 .1882; Hara *et al* Fl. E. Him. 240. 1966; 2: 98. 1971; U.C. Pradhan in Himal. Plant Journ. 4: 9-10. 1986; Long & Rae in Grierson & Long. Fl. Bhutan 2(1): 377. 1991

Local Name: Dr. Thomson ko Gurans (Nep.)

Shrubs upto 4.5 m tall. Juvenile leaves glaucescent, waxy blue. **Petiole** 10 – 12 mm long green; **Lamina** 4 - 10 x 3 – 6.5 cm, orbicular to elliptic, apex rounded, mucronate, base cordate or rounded; upper surface pale to dark- green in mature, **Inflorescence** of 6 - 10 campanulate flowers of blood-red or deep, crimson, scarlet or blakish-red, **Corolla** to 6 cm, .5-lobed, lobes emarginated, upper lobes spotted; base with honey pouches of purple-red colour. **Calyx** 1.5 – 2 cm long, cup-shaped, unequally 5-lobed, truncate; **Stamens** 10, filaments glaucous, style red, curved upwards; **stigma** globose or rounded. pale greenish; ovary to 0.8 cm long, glaucous, 6 - 10 celled. **Capsules** broadly oblong, purple.

Flower : May – June
Exsiccatu : Padamchen boundary 2600 m, **SR Lepcha & AP. Das** 01008, dated 27.10.2004.
Status : Common.
Local Distribution : Kyongnosla, Rachel, 3300 – 4500 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL– BHUTAN) and S. TIBET.
Note : Endemic to Eastern Himalaya

Rhododendron triflorum Hook.f., Rh. Sik. Him. t. 19. 1851; C.B. Clarke in Hook.f., Fl. Brit. India 3: 474. 1882; Hara in Fl. E. Him. 1: 240. 1966; 2: 99. 1971; Hara in Enum. Fl. Pl. Nepal 3: 59. 1982; Hara in Fl. Him. 231. 1984; U.C. Pradhan in Him. Pl. Journ. 4: 9-10. 1986; Long & Rae in Grierson & Long. Fl. Bhutan 2(1): 380. 1991.

Local Name: Pahente Chimal (Nep.).

Shrubs upto 3 m tall. Shoots glaucous and black glandular. **Leaves**; petioles to 0.7 cm long, scaly; **lamina** 3.5 – 7 x 1 – 2.5 cm, lanceolate to oblong-lanceolate, entire, acute, base rounded, glabrous and shiny green above, whitish or pale green and densely minute scaly and glandular beneath, mid-nerve elevated and prominent on under surface, lateral nerves upto 14 pairs, distictly marked above and faintly impressed beneath. **Racemes** terminal, 2-3 flowered; pedicels to 1cm long, scaly. **Flowers** fragrant, pale yellow to greenish yellow, with green spots. **Calyx** minute, obscurely 5-lobed, lobes very short. **Corolla** zygomorphic, to 5 cm across, funnel-

shaped, pale yellow, with 5 spreading ovate-obtuse lobes, tube to 0.9 cm, densely scaly outside; **stamens** 8 - 10, exerted; filaments hairy towards base; pistil exceeding stamens; **ovary** oblong-cylindrical, scaly; stigma truncate. **Capsule** cylindric.

Flower : April - June *Fruit* : August - September
Exsiccatus : Jore-pokhri, below Rechela 3000 m, *SR Lepcha & AP. Das 1012.*
 dated 19.09.2005
Status : Less Common
Local Distribution : Jorpokhari below. 2400 - 3100 m.
General Distribution : E. HIMALAYA; INDIA, (E. NEPAL- BHUTAN) and S. TIBET .
Note : Endemic to Eastern Himalaya

VACCINIACEAE S.F. Gray

Key to the Genera

1. Plant mostly grows on the tree trunks; Leaf sessile; base rounded; Flowers pendulous, axillary; petals lined with transverse deep red waves-like rings, red..... *Agapetes*
- + Plant mostly grows on rock crevices; leaf (petiolated) petiolule upto 1.5 cm long, base attenuate; Flowers not pendulous, terminal; petals pinkish white..... *Vaccinium*

Agapetes Linnaeus

Key to the species

1. Plants upto 1 m tall 2
- + Plants more than 1 m tall *A. saligna*
2. Petals tube lined with transverse deep red waves -like ring *A. serpens*
- + Petals tube yellow *A. hookeriana*

Agapetes hookeri (Clarke) Sleumer in Bot. Jahrb. 70: 106. 1939; Long & Rae in Grierson & Long, Fl. Bhutan 2 (1): 402. 1991. *Pentapterigium hookeri* C.B. Clarke in Fl. Brit. India 3: 450. 1882. *A. incurvata* (Griff.) Sleumer var. *hookeri* (Clarke) Airy shaw in Kew Bull. 1958: 486. 1959; Hara *et al.* Enum. Fl. Pl. Nepal 3: 54. 1982.

Local Name: *Gujru Ganta* (Nep.)

Shrubs epiphytic upto 60 cm tall with swollen stem base. **Leaves** sessile, alternate, lamina 4 - 8 x 1 - 3 cm, ovate-lanceolate, crenate-serrate, acuminate, base slightly sub-cordate, coriaceous, nerves prominent, pubescent below, impressed veins above rugose. Pedicels to 3 cm, thick and hairy at the apex. **Flowers** in axillary fascicles, often 2 - 4, pendulous. **Sepals** lobes upto 0.5 cm, ovate, green. **Petals** tubular, long upto 2 cm, yellow, ribs hairy; **anthers** 0.7 cm, spurred; **ovary** pinkish green.

Flower & fruit : June - September
Exsiccatus : Panglaxha 2100 - 2500 m, *SR Lepcha & AP. Das 1347*, dated 10.10. 2007.
Status : Rare
Local Distribution : Rechila Middle, Phusrey 1900 - 2500 m.
General Distributions : E. HIMALAYA INDIA,(E. NEPAL-BHUTAN).
Note : Endemic to Eastern Himalaya

Agapetes saligna (Hook.f.) Bentham et Hook.f., Gen. Pl. 2: 571. 1876; C.B. Clarke in Fl. Brit. India 3: 444. 1882; Hara in Fl. E. Him. 233. 1966; Hara et al, Enum. Fl. Pl. Nepal 3: 54. 1982; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 403. 1991. *Vaccinium salignum* Hook.f., Ill. Him. Pl. t. 15A. 1955.

Local Name: Angaray/ Amilay (Nep.)

Shrubs erect, upto 2 m tall. Stem usually brownish-gray. **Petioles** upto 1 cm long; **lamina** lanceolate, 4 - 11 x 1 - 4 cm, entire, acuminate, base cuneate, yellowish green below, dark green above, glabrous. **Flower** in racemes to 6 - 9, to 3 cm long. Peduncles to 4cm, glabrous. Pedicels widened at apex becoming cup-like. **Sepals** 0.3 - 0.5cm, 5-toothed, lanceolate, teeth hairy, greenish inside, red-brown outside (in old ones), young ones greenish red. **Petals** tubular, 5-lobed, 0.4 - 1cm, pinkish green (old ones), yellowish green (young ones); **stamens** 10, short, free, yellowish; **anthers** elongated; **ovary** greenish; style 1, simple. **Berries** subglobose, 5-lobed; seeds ellipsoid.

Flower : May *Fruit:* May - October.

Exsiccatus : Rachela (NVNP border), 2650 m, *SR Lepcha & AP. Das* 1348, dated 10.10.2007.

Status : Common.

Local Distribution : Rachela Middle, Singhaney 2100 - 2600 m.

General Distributions : North-east INDIA, MYANMAR.

Note : 1. Endemic to Himalaya.

2. Fruits edible.

Agapetes serpens (Wight) Sleumer in Engl., Bot. Jahrb. 70: 105. 1939; Hara & Ohashi in Fl. E. Him. 233. 1966; Hara et al, Enum. Fl. Pl. Nepal 3: 54. 1982; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 401. 1991. *Agapetes serpens* Wight in Calc. Journ. Nat. Hist. 8: 171. 1847. *Pentapterigium serpens* (Wight) Klotzsch in Linnaea 24: 47. 1851; C.B. Clarke in Fl. Brit. India 3: 449. 1882.

Local Name: Bhandaray (Nep.)

Shrubs, pendent, hanging on tree trunks up to 80 cm tall. **Lamina** ovate-lanceolate, 0.5 - 1.6 x 0.3 - 0.5 cm, margin recurved, entire to remotely serrate, sub-acute, sessile, base rounded, thick, leathery.; pedicels to 1.5 cm long, glandular hairy. **Flowers** axillary, solitary, pendulous **Sepals** tube 5-angled with distinct 5 reddish nerves and dissected into 5 on terminal apex, lobes lanceolate, glandular hairy. **Petals** tubular, lined with transverse deep red waves-like rings, red, nerves hairy, lobes 5, recurved; **stamens** 10, free; filaments shorter; **anthers** 0.4 - 0.6 cm, elongated; **ovary** 5-celled, inferior; style simple. **Berries** globose.

Flower : December - May *Fruit:* April - June

Exsiccatus : Panglakha 2800m, *SR Lepcha & AP. Das* 182, dated 13.10.2003.

Status : Common.

Local Distribution : Panglakha, Rachela Middle, Thartharay. 1900 - 2500 m.

General Distributions : E. HIMALAYA INDIA, (NEPAL-Arunachal Pradesh).

Note : 1. Endemic to Eastern Himalaya

2. Fruits edible.

Vaccinium Linnaeus

Key to the species

Leaves alternate; leaf margins entire; petals pinkish white *V. retusum*

Leaf whorls; leaf margins crenate - serrate; petals greenish yellow *V. vacciniaceum*

Vaccinium retusum (Griffith) C.B. Clarke in Fl. Brit. India 3: 451. 1882; Hara & Ohashi in Fl. E. Him. 241. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 59. 1982; Rae in Grierson & Long, Fl. Bhutan 2(1): 397. 1991. *Thibaudia retusa* Griffith, Not. 4: 300. 1854.

Local Name: Ratay (Nep.).

Shrubs, grows on rocks upto 2 m tall. Branches densely hirsute. **Leaves** alternate; petioles short (upto 0.22 cm), **lamina** 1.5 - 2.5 x 0.5 - 1.5 cm, obovate, margins recurved down, entire, shallowly retuse, base attenuate, glabrous, lower surface faint white. **Inflorescence** in terminal racemes, usually 9 - 20 flowered, pubescent; bracts compact and conspicuous, 0.3 - 0.7 cm, elliptic, pinkish white, caduceous; bracteoles to 0.5cm, scaly. **Flowers** pinkish white. **Sepals** teeth very short, obtusely triangular. **Petals** ovoid with tubular base and constricted at apex, pinkish white, glabrous, lobes pinkish; stamens 10, free; anther tubular, dorsally spurred; filament with long hairs. **Fruits** sub-globose.

Flower : April - June *Fruit:* June - September
Exsiccatae : Sano-Ramitey 2200 m, *SR Lepcha & AP. Das 31166*, dated 03.10.2004; On way to Rachela (Neora Valley National Park border) 2500m, , *SR Lepcha & AP. Das 31190*, dated 03.10.2004.
Status : Frequent.
Local Distribution : Mulkharka Pokhari, 1900 - 2500 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Vaccinium vacciniaceum (Roxb.) Sleumer in Bot. Jahrb. 71: 479. 1941; Hara in Fl. E. Him. 242. 1966; 2: 99. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 60. 1982; Rae in Grierson & Long, Fl. Bhutan 2(1): 399. 1991. *Ceratostema vacciniacea* Roxb., Fl. Ind. ed. 2(2): 412. 1832. *V. serratum* (G. Don) Wight, Icon. 4: t. 1184. 1848; C.B. Clarke in Fl. Brit. India 3: 452. 1882.

Vern. name: Rukh Tamarkay (Nep.).

Shrubs epiphytic to 2 m tall. **Leaves** sessile, whorled; **lamina** 4 - 13 x 1.5 - 3.5 cm, lanceolate, crenate-serrate, acute, base slightly rounded, glabrous. **Flower** in racemes with many flowered, both terminal and axillary, to 10 cm long. Pedicels to 1.5 cm, widening above towards the apex, erect; **bracts** to 0.5 cm, lanceolate-triangular, caduceous; **bracteoles** to 0.25cm, linear, persistent. **Sepals** shortly 5-toothed, teeth upto 0.3cm, triangular. **Petals** upto 1 x 0.5cm, urn-shaped, upward shortly recurved 5-lobed, greenish yellow; **stamens** 10, free; anthers with 2 tubular tips ; ovary inferior, style simple. **Berries** globose, under persistent sepals.

Flower : March - May *Fruit:* April - July
Exsiccatas : Phusrey 2100 m, *SR Lepcha & AP. Das 1349*, dated 10.10.2007.
Status : Frequent.
Local Distribution : Lower Tinsimana, Mulkharka, Phusrey 2900 - 2900 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR.

MONOTROPACEAE Nuttall

Monotropa Linnaeus

Monotropa uniflora L., Sp. Pl. ed. 1(1): 387. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 3: 476. 1882; Hara in Fl. E. Him. 1: 232. 1966; 2: 93. 1971; Hara in Enum. Fl. Pl. Nepal 3: 60. 1982; Rae in Grierson & Long, Fl. Bhutan 2(1): 356. 1991.

Herbs saprophytic glabrous upto 13 cm tall. **Stem** erect, fleshy, scaly, upto 2cm long, ovate-lanceolate, rounded, papery, pinkish-white. **Inflorescence** solitary, terminal, nodding. **Calyx** 0.35 - 0.48cm, ovate - oblanceolate, glabrous, white. **Corolla** 3, free, almost obovate, entire, hairy within, reddish-white or white, pubescent inside; **stamens** 10, free; anthers with terminal slit on each cell, whitish; filament pubescent below; ovary ovoid, 5-chambered; **style** flattened and stout. **Capsule** globose.

Flower & Fruit : July – October.
Exsiccatus : Towards NNP Border, 2245 m, *SR Lepcha & AP. Das* 1900, dated 20. 03.2004.
Status : Rare.
Local Distribution : NNP Border, In between 2195 – 2280 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, CHINA, JAPAN, N & C AMERICA.

Order: Ebenales

SYMPLOCACEAE Desf.

Symplocos Linnaeus

Key to the species

- | | |
|--|-----------------------|
| 1. Petals yellowish | <i>S. glomerata</i> |
| + Petals whitish | 2 |
| 2. Leaf margin entire | <i>S. dryophila</i> |
| + Leaf margin serrate, obscurely serrate | 3 |
| 3. Calyx lobes lanceolate | <i>S. theaeifolia</i> |
| + Calyx lobes rounded or ovate | 4 |
| 4. Flowers 4-8 | <i>S. ramosissima</i> |
| + Flowers more than 8 (numerous) | <i>S. lucida</i> |

Symplocos dryophila C.B. Clarke in Fl. Brit. India 3: 578. 1882; Pfl. Reich IV-242, Ht. 6: 42. 190; Hara in Fl. E. Him. 250. 1966; Long in Grierson & Long, Fl. Bhutan 2(2): 583. 1999.

Local Name: Kharanay (Nep.)

Tree with gray branchlets. **Leaves;** petioles to 2 cm long; **lamina** 5 – 13 x 3 – 4 cm, oblanceolate or oblong-elliptic, entire, acuminate, base acute, coriaceous, glabrous, mid-rib prominent beneath, lateral nerves 8 - 12 pairs. **Racemes** to 14 cm long, axillary, lax, fulvous hirsute; bracts orbicular, villous; bracteoles similar to bracts in shape. **Pedicels** upto 0.30 cm long. **Calyx** tube to 0.20 cm, lobes ovate, hairy at the top. **Petals** to 50 cm, ovate-lanceolate, white; **stamens** many. **Fruit** globose, reddish-brown.

Flower : May - July *Fruit:* August - September .

Exsiccatus : Ramitey - Phusrey 2300, **SR Lepcha & AP. Das 1300**, dated 03.10.2004.
Status : Less frequent
Local Distribution : Mulkharka, Rachel below, 1900 – 2650 m.
General Distribution : E. HIMALAYA INDIA, (NEPAL - Sikkim).
Note : Endemic to Eastern Himalaya

Symplocos glomerata King ex C.B. Clarke in Fl. Brit. India 3: 577. 1882; Trs. N. Beng. 86. 1929; Hara & Ohashi in Fl. E. Him. 250. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 78. 1982; Fasc. Fl. India 20: 152. 1990; Long in Grierson & Long Fl. of Bhutan 2(2): 582. 1999.

Local Name: Kholme (Nep.).

Tree, small, glabrous. **Leaves**; petiole to 0.9cm; **lamina** lanceolate, 5.5 – 10.5 x 2 – 2.9cm, acute to acuminate, cuneate, serrate, glabrous both sides, usually coriaceous, lateral nerves 8 – 9 pairs on either sides. **Inflorescence** in axillary fascicles; bracts and bracteoles small, ovate, wooly; pedicels short, hairy. **Calyx** small, glabrous within. **Corolla** ca 0.4cm long, yellowish; stamens 25.

Flower & Fruit : April - May.
Exsiccatus : Panglakha 2400m, **SR Lepcha & AP. Das 29381**, dated 30.09.2004.
Dohrok, **SR Lepcha & AP. Das 30241**, dated 06.10.2004.
Status : Common.
Local Distribution : Dhorok, Panglakha 1750 – 2800 m.
General Distribution : E. HIMALAYA; INDIA, Khasia Hills, BHUTAN
Note : Endemic to Eastern Himalaya.

Symplocos lucida (Thunberg) Siebold *et* Zuccarini, Fl. Japan 1:55, t. 24. 1835; Fl. Jow. 1:297. 1981; Fl. Meg. 2: 577. 1987; Long in Grierson & Long, Fl. of Bhutan 2(2): 581. 1999. *Laurus lucida* Thunberg, Fl. Japan 174. 1784. *S. thezafolia* D. Don, Prodr. 145. 1825; C.B. Clarke in Fl. Brit. India 3: 575. 1882.

Local Name: Kharanay (Nep.).

Trees, medium glabrous. **Stem** usually greenish. **Leaves**; **petioles** 0.5 – 1.5cm; **lamina** oblong-lanceolate, 5 - 10.5 x 1.8 - 3.5cm, obscurely serrate, acuminate, usually light green beneath, glabrous, glossy, coriaceous, nerves prominent on both sides. **Racemes** axillary with dense flowered; **bracts** 0.5 - 0.6cm. **Calyx** 0.13 - 0.4cm, lobes rounded, ciliate, persistent. **Corolla** larger than calyx, ovate, whitish; stamens many, disc long, whitish hairy. **Fruits** ellipsoid, black when fully ripe.

Flower : March - April. *Fruit*: May - August.
Exsiccatus : Bara-Ramitey 2400 m, , **SR Lepcha & AP. Das 31171**, dated 03.10.2004.
Status : Common.
Local Distribution : Mulkharka, Rachel Chowk, 1900 – 2650 m.
General Distribution : E. HIMALAYA
Note: 1. Endemic to Eastern Himalaya
2. Oil extracted from seeds can be good remedies against spider- bites (stings) (Das & Rai, 2003)

Symplocos ramosissima Wallich ex G. Don, Gen. Hist. 4:3. 1837; Prodr. 8:257.1844; C.B. Clarke in Fl. Brit. India 3: 577. 1882; Hara in Fl. E. Him. 1: 250. 1966; Hara *et al.* Enum. Fl. Pl. Nepal

3: 79. 1982 Fasc. Fl. Ind. 20:167. 1990. *Lodhra ramosissima* (G. Don.) Miers in Journ. Soc. 17. 299. 1880.

Local Name: *Kharanay* (Nep.).

Trees small with glabrous stem. **Leaves:** petioles to 1.4 cm. long, glabrous; **lamina** 4 – 13 x 2 – 3.5 cm, oblong-lanceolate, finely serrate, acuminate, papery, surfaces glossy and glabrous, nerves more distinct beneath. Pedicels to 0.20 cm, yellowish, pubescent. **Racemes** axillary, small, usually 4-8 flowered. **Calyx** small, yellowish pubescent externally, lobes ovate; **Petals** to 0.4 cm, white; stamens 20; anthers slightly exerted. **Fruits** ellipsoid.

Flower : March – June *Fruit:* July – November
Exsiccatus : Ramitey 2300 m, *SR Lepcha & AP. Das 1301*, dated 03.10. 2004.

Status : Common
Local Distribution : Mulkharka, Rachel below, 1900 – 2650 m.
General Distribution : TEMPERATE HIMALAYAS and Khasia Hills.
Note : Endemic to Himalaya

Symplocos theaeifolia D. Don, Prodr. Fl. Nep. 145. 1825; C.B. Clarke in Fl. Brit. India 3: 575. 1882; Hara in Fl. E. Him. 251. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 79. 1982; Facs. Fl. Ind. 20: 170. 1990. *S. phyllocalyx* C.B. Clarke in Fl. Brit. India 3: 575. 1882; Hara in Fl. E. Him. 250. 1966.

Local Name: *Khorsanay* (Nep.).

Trees upto 18 m tall. Branchlets glabrous or patently villous. **Leaves:** petioles to 1.5 cm long; **lamina** 5 – 13 x 3 – 4 cm, oblong-lanceolate, obscurely serrulate, acuminate, base cuneate, coriaceous, nerves many. **Panicles** to 4 cm, axillary, dense; bracts to 0.4 cm long; bractlets to 0.20 cm, pubescent. **Flowers** sub-sessile, scented. **Calyx** lobes to 0.4 cm long, lanceolate, ciliate. **Petals** to 0.60 cm, lanceolate or ovate, whitish; **stamens** to 30 cm, with hairy disc; **styles** densely pubescent. **Fruits** ellipsoid.

Flower : December – April *Fruiting:* May – August
Exsiccatus : Mulkharka 2380, *SR Lepcha & AP. Das 1302*, dated 03.10. 2004

Status : Common
Local Distribution : Mulkharka, Rachel below, 1600 – 2650 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, THAILAND, MALAYSIA

Order: Primulales

MYRSINACEAE R. Brown

Key to the Genera:

1. Flowers in branched raceme; fruit with few (1-2) seeded *Myrsine*
+ Flowers in axillary fascicle; fruit with many seeded *Maesa*

Maesa Forsskål

Key to the Species:

- | | |
|--|-------------------|
| 1. Branches glabrous; berry globose | 2 |
| + Branchelets puberulous; berry sub-globose | <i>M. montana</i> |
| 2. Lamina 8 – 23 x 2 -5.5 cm; coriaceous, rugose | <i>M. rugosa</i> |
| + Lamina 7 – 13 x 2.3 - 5 cm; herbaceous, not rugose | <i>M. chisia</i> |

Maesa chisia Buch.-Ham. ex D.Don, Prod. Fl. Nep. 148. 1824; C.B. Clarke in Hook.f., Fl. Brit. India 3: 509.1882; Hara in Fl. E. Him. 243. 1966; Long & Rae in Grierson & Long, 2(2): 507. 1999.

Local Name: Tukzyel kung (Lep.) Bilouney (Nep.)

Shrub or small tree to 3 – 6m tall. Branches glabrous. **Petioles** to 1.7cm; **lamina** membranous, lanceolate or elliptic 7 – 13 x 2.3 - 5 cm, acuminate, base cuneate, margin sub entire, sinuate or distantly serrate, glabrous, lateral veins reticulate, conspicuous, translucent. **Inflorescence** in simple or branched racemes, to 5.5.cm; pedicels to 2.8 cm. Sepals ovate to 1mm. **Corolla** white, to 1.8 mm. **Fruits** to 4 mm across, globose

Flower & Fruit : February – May

Exsiccata : Singhaney dara 2230 m, *SR Lepcha & AP. Das 31270*, dated 13.07.2008

Status : Common.

Local Distribution : Rachel Middle, Singhaney dara. 1300 – 2250 m.

General Distribution : E. HIMALAYA; INDIA, (NEPAL – BHUTAN) Khasia, Manipur, and N. BURMA.

Note : Endemic to Eastern Himalaya.

Maesa montana A. DC. in DC., Prodr. 8: 79. 1844; Philip. Journ. Sci. 73: 28. 1940; Hara in Fl. E. Him. 243. 1966; Long & Rae in Grierson & Long, Fl. Bhutan 2(2): 507. 1999. *M. indica auct. non* (Roxb.) A. DC.: C.B. Clarke in Hook.f., Fl. Brit. India 3: 509. 1882 p.p. *M. elongata* Mezz. in Pfreich. Ht. 9: 31. 1902.

Shrub to 4.5 m tall. Branchelets puberulous. Bark dark brown. **Lamina** elliptic or sometime variable, 4.5 - 12 x 2.4 - 5 cm, obscurely dentate at distant, acute to caudate-acuminate, base cuneate, rounded, sometimes obtuse, midrib puberulous in lower surface, glabrous. **Racemes** 3.5 – 5 cm long, simple or branched, puberulous. **Flowers** to 0.3 cm diam., white. **Fruits** 0.45-0.55 cm across, sub-globose, creamy white, many seeded.

Flower & Fruit : February - November

Exsiccatus : Singhaney dara 2200 m, *SR Lepcha & AP. Das 31272*, dated 13.07.2008.

Status : Frequent.

Local Distribution : Premlakha, Singhaney dara, Subhaney. 1200 – 2250 m.

General Distribution : TROPICAL HIMALAYAS; INDIA, NEPAL, BHUTAN, W.CHINA.

Maesa rugosa Clarke in Hook.f., Fl. Brit. India 3: 508. 1882; Hara & Ohashi in Hara, Fl. E. Him. 16. 1966; Long & Rae in Grierson & Long, Fl. Bhutan 2(2): 506. 1996. *Maesa rugosa* var. *iffithii* Clarke in Hook.f., Fl. Brit. India 3: 509. 1882.

Local Name: Thulo Bilounay (Nep.)

Tree or shrubs, stout upto 4 -5 m tall. **Petioles** short 1 – 1.9cm, glabrous; **lamina** narrowly ovate – lanceolate, 8 – 23 x 2 -5.5cm, distantly obscure-denticulate, caudate, base cuneate, rugose, both sides glabrous, slightly coarse beneath, nerves prominent and raised beneath, slightly impressed above, lateral nerves 12-15 on either halves. **Racemes** many flowered, upto 4cm long, paniced, glabrous. **Flowers** small, tetramerous. **Calyx** 4-lobed, sepals ovate. **Corolla**, campanulate, lobes round, whitish-yellow; **stamens** 5, inserted on the corolla tube; style short. **Berry** globose, almost completely enclosed.

Flower : January - April. *Fruit*: June - October
Exsiccatus : Bhutan border (near Rachel) 2950 m, **SR Lepcha & AP. Das** 27727, dated 30.10.2004.
Status : Less Common.
Local Distribution : Mulkharka, Pangolkha - NNP Border, 1600 – 2150 m.
General Distribution : E. HIMALAYA; INDIA (Sikkim – BHUTAN) TIBET, W. CHINA.

Myrsine Linnaeus

Myrsine semiserrata Wall. in Roxb., Fl. Indica 2: 293. 1824; Hook.f., Fl. Brit. India 3: 511. 1882; Hara & Ohashi in Hara, Fl. E. Him. 243. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 76. 1982; Long & Rae in Grierson & Long, Fl. Bhutan 2(2): 508-509. 2001. *M. semiserrata* var. *subspinosa* (D. Don) Clarke in Hook.f., Fl. Brit. India 3: 512. 1882.

Local Name: Phalame (Nep.).

Shrubs, bushy, sparingly branched. **Leaves** shortly petiolate; **lamina** 3.5 – 10.5 x 1.5 - 3.5cm; lanceolate, dentato-serrate, acute or short-acuminate, cuneate, coriaceous, glabrous, light red when young, lateral nerves 10-15 pairs, thick beneath, impressed above; pedicel to 0.4cm. **Flowers** numerous in axillary fascicles, 4-merous, whitish-green; **Calyx** persistent; **styles** branched. **Berries** blue to reddish-purple.

Flower : December. - March. *Fruit*: January - June.
Exsiccatus : Zuluk –PWS boarder 3800 m, **SR Lepcha & AP. Das** 20243, dated 28.10.2004.
Status : Common.
Local Distribution : Rachel Middle, Zuluk. 2000 – 2400 m.
General Distribution : INDIA, NEPAL, BHUTAN, TIBET, N. MYANMAR, W.C. CHINA.

PRIMULACEAE Ventenat

Key to the Genera:

1. Leaves all radical; flower umbellate *Lysimachia*
 + Leaves cauline; flowers axillary or raceme s 2
2. Rhizomatous herbs; Corolla rotate with cylindric or saucer ahaped *Primula*
 + Rhizomatous or stoloniferous herbs; corolla campanulate or saucer shaped *Androsace*

Androsace Linnaeus

Key to the species:

1. Plants forming cushion or mat *A. globifera*
 + Plants forming clumps 3

3. Plant rhizomatous..... 4
 + Plant non rhizomatous *A. hookeriana*
 4. Leaf densely hirsute on both surfaces; flower 4 – 10 (25); calyx pubescent ... *A. geraniifolia*
 + Leaf sparsely hirsute; flower 3 – 8; calyx ciliated *A. croftii*

Androsace croftii Watt. in Journ. Linn. Soc. 20. 17. 1884; Aitken in Grierson & Long, Fl. Bhutan 2(2): 558. 1999.

Herbs perennial, rhizomatous, decumbent, smaller. **Leaves** 2 – 4 cm, not much hirsute as *A. geraniifolia*; petiole upto 3.5 cm long; suborbicular. 4-5 lobed. Peduncle to 6.5 cm long, covered with densely silvery pubescent. **Umbels** 3 – 8 flowered; peduncle 1 – several per rosette. Pedicels to 13 mm, bracts linear. **Calyx** to 6 mm sparsely ciliate; teeth acute. **Corolla** pink or white, eye greenish; limb to 6 mm in diam. lobes obcordate.

Flower : April *Fruit:* August
Exsiccatus : Gnathang 4000 m, **SR Lepcha & AP. Das 2803**, dated 15.10. 2003.
Status : Less Common
Local Distribution : Gnathang, Tukula, 3600 – 4000 m
General Distribution : E. HIMALAYA; INDIA (Sikkim).
Note : Endemic to Eastern Himalaya.

Androsace geraniifolia Watt. in Journ. Linn. Soc. 20: 17. 1882; Hook.f. in Fl. Brit. India 3: 407. 1882; Hara in Fl. E. Him. 2:100. 1971; Aitken in Grierson & Long., Fl. Bhutan 2(2): 556. 1991. *A. rhizomatosa* Hand.- Mazz. In Journ. Bot. Lond. 76: 281. 1938.

Herbs perennial, rhizomatous, decumbent occasionally stoloniferous. **Petiole** to 13 cm, white, pubescent; **lamina** suborbicular, 0.3 - 0.5 x 4 – 6 cm, 5 -6 lobed, each of 3 -5 apical teeth, both surface covered with white hirsute. Peduncle 1 – many., densely pubescent. **Umbels** 4-10(25) flowered. Occasionally with a small leafy rosette later developed into new plant; bracts linear or lanceolate; pedicels 20 mm. **Calyx** campanulate, pubescent; teeth acute, equals to the tube. **Corolla** pink or white with yellow eye; limb upto 10 mm, lobes oblong or obovate, entire. **Capsule** globose.

Flower : April *Fruit:* August
Exsiccatus : Kupup 4200 m, **SR Lepcha & AP. Das 2802**, dated 15.10. 2003.
Status : Less Common
Local Distribution : Kupup, Changu, 2300 – 4200; Tinsimana, Rachel, 2200 – 2600 m.
General Distribution : HIMALAYA; INDIA, NEPAL, BHUTAN and W, CHINA
Note : 1. An ornamental plant

Androsace globifera Duby, in DC. Prodr. 8. 48. 1844; Hook.f. in Fl. Brit. India 3: 500. 1882; Aitken in Grierson & Long. Fl. Bhutan 2(2): 561. 1999.

Herbs with cushion forming. Rosette globose, 7 – 13 mm in diam. **Lamina** elliptic, 2.5 – 5 x 1 – 2 mm apex acute, margins entire, usually with white straight hairs on both surfaces, more prominent on apex and beneath. **Flower** 1 – 2 rosette, peduncles very short; pedicels to 1.5 cm, pubescent. **Calyx** to 3 mm, sparsely pubescent, teeth acute. **Corolla** lilac or white with yellow eye; lobes obovate. **Capsules** oblong.

Flower : June *Fruit:* August
Exsiccata : Nathula 4400 m, **SR Lepcha & AP. Das 2805**, dated 15. 10. 2003.
Status : Less Common
Local Distribution : Nathula, Changu, Jalepla, 3700 – 4550 m

General Distribution : E.HIMALAYA; INDIA, BHUTAN, NEPAL, CHINA

Note : 1. Endemic to Eastern Himalaya.

2. An ornamental plant

Androsace hookeriana Klatt. In *Linnaea*, 32: 293. 1863; Hook.f. in *Fl. Brit. India* 3: 490. 1882; Aitken in *Grierson & Long. Fl. Bhutan* 2(2): 558. 1999.

Herbs stoloniferous usually forming a clumps. **Lamina** obovate, ovate or elliptic, - spatulate **lamina** 3 – 13 x 2.5 - 7 mm. acute, obtuse or emarginated, base rounded or attenuate to petiolate (Petiole upto 2 cm, long), margin entire, sparsely pubescent on both surfaces. **Peduncle** sparsely pubescent. **Umbels** 2 – 10 flowered; bract linear; pedicels to 4 mm. **Calyx** pubescent, slightly more on margins; teeth acute - rounded. **Corolla** pink with green, orange or dark red eye, lobes obovate, entire. **Capsules** ovoid.

Flower : June

Fruit: August

Exsiccata : Jalepla 4200 m, **SR Lepcha & AP. Das** 2804, dated 15. 10. 2003.

Status : Less Common

Local Distribution : Chakung Chu, Jalepla, 3300 – 4600 m

General Distribution : E.HIMALAYA; INDIA (sikkim), NEPAL, CHINA.

Note : Endemic to Eastern Himalaya.

Lysimachia Linnaeus

Key to the species:

1. Herbs plants..... *L. laxa*
+ Herbs prostrate 3
3. Branches not ferruginous-villous; Flowers in terminal clusters *L. congestiflora*
+ Branches ferruginous villous; Flowers axillary, solitary *L. debilis*

Lysimachia congestiflora Hemsl. in *Jour. Linn. Soc.* 26:50. 1889; Hara in *Fl. E. Him.* 245. 1966; 2: 101. 1971; Gould in *Hara et al Enum. Fl. Pl. Nepal* 3: 64. 1982; Aitken in *Grierson & Long, Fl. Bhutan* 2(2): 568. 1999. *L. japonica* Thunb. *sensu* *Fl. Brit. India* 3:505. 1882, p.p. *L. japonica* var. *cephalantha* Franchet in *Journ. de. Bot.* 9: 461. 1895.

Herbs perennial prostrate upto 32 cm tall. Stem terete, puberulous, rooting from lower nodes. **Lamina** opposite; 5 x 1 – 4 cm, ovate, entire-gland dotted, acute, base cordate. Peduncles to 0.8 cm. **Flowers** solitary or 2-nate, congested in terminal clusters. **Sepals** lanceolate, villous; corolla subrotate, yellowish, lobes to 1 cm long, oblong, acute and gland dotted; filaments basally united; ovary villous; styles glabrous. **Capsules** small to 0.6 cm.

Flower : May - July *Fruir*: August - September.

Exsiccata : Rachela 2780 m, **SR lepcha & AP. Das** 2600, dated 13. 10. 2003

Status : Less Common.

Local Distribution : Rachela. Padamchen 1800 – 2450 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, CHINA, TAIWAN, MYANMAR, THAILAND.

Lysimachia debilis Wall. in *Roxb., Fl. Indica. ed. Carey* 2: 25. 1824; Hara in *Fl. E. Him.* 1: 245. 1966; 2: 101. 1971; Hara *et al. Enum. Fl. Pl. Nepal* 3: 64. 1982. *L. japonica auct. non* Thunb., Hook. f., *Fl. Brir.India* 3: 505. 1882, p.p.

Similar to *L. congestiflora* but **branches** ferruginous-villous; peduncles axillary, slightly elongating in fruit, with solitary flower. **Corolla** campanulate, lobes smaller, reflexed in fruit.

Flower : May - July *Fruit*: July- Decmber
Exsiccate : Panglakha 2460 m, **SR Lepcha & AP. Das 2700**, dated 13.10.2003.
Status : Frequent.
Local Distribution : Rechilla Middle, Mulkharka. 1600 – 2500 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, THAILAND.

Lysimachia laxa Baudo, Ann. Soc. Nat. (Bot.) II, 20: 347. 1843; Aitken in Grierson & Long, Fl. Bhutan 2(2): 567. 1999; *L. ramosa* Wall. ex Duby in DC., Prodr. 8: 65. 1844; Hook.f. in Fl. Brit. India 3: 503. 1882; Hara *et al*, Enum. Fl. Pl. Nepal 3: 65. 1982.

Herbs annual with sub erect- stem , to 50 cm tall, branched. **Leaves** simple, alternate; petiole to 1.5 cm, glabrous; lamina 2.5 - 12 x 1.5 – 3 cm, lanceolate, entire, acute to acuminate, base attenuate, sparsely hairy and faintly gland-dotted above, glabrous beneath. Pedicels axillary, slender, to 5 cm, glabrous. Flowers solitary. **Sepals** 5, to 0.5 cm long, ovate-acuminate, basally united. **Corolla** rotate, longer than sepals, yellow, segments elliptic-oblong; stamens 4, broad below, inserted on petal lobes; anthers 2-celled; filament short, basifixed; ovary swollen, sub-globose; style 1, filiform. **Capsules** globose, splitting irregularly.

Flower : May - August *Fruit*: September – December
Exsiccata : Panglakha – Singhaney 2155 m, **SR Lepcha & AP. Das 2801**, dated 15.10.2003.
Status : Rare.
Local Distribution : PHE Source, Ruka Hill, Lava, Jaributti. 1900 – 2600 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, SRI LANKA, MYANMAR, S.W. CHINA, THAILAND.

Primula Linnaeus

Key to the species:

1. Flowers weakly zygomorphic *P. munroe*
- + Flowers strongly zygomorphic 2
2. Leaves suborbicular or broadly ovate; petiole non-decurrent.. 3
- + Leaves ovate or oblong; petiole decurrent 7
3. Lamina deeply lobbed 4
- + Lamina shallowly lobed 5
4. Petioles sheathing at base *P. vaginata*
- + Petioles not sheathing at base *P. geranifolia*
5. Leaf palmately veined; corolla pink. *P. listera*
- + Leaf pinnately veined; corolla white or rarely pale mauve ... *P. filipes*
7. Leaf pubescent with multicellular hairs 8
- + Leaves glabrous or rarely farinose- papilose 14
9. Leaf margins entire *P. walshii*
- + Leaf toothed 10

10. Inflorescence with 1-4 flowered	<i>P. primulina</i>
+ Inflorescence with (3) 6 – 30 flowered	11
12. Flowers upto 5	<i>P. assaminca</i>
+ Flowers more than 5	13
13. Flowers upto 4; corolla purple	<i>P. sapphirina</i>
+ Flowers upto 2; corolla pale blue violet	<i>P. klattii</i>
14. Leaf ovate oblong; Corolla creamy or pale yellow	<i>P. reticulata</i>
+ Leaf oblong –elliptic; Corolla white, mauve bluish purple, or yellow ...	18
18. Corolla white.	<i>P. soldanelloides</i>
+ Corolla mauve or bluish purple, or yellow	19.
19. Leaf entire ; corolla pink	<i>P. concinna</i>
+ Leaf serrate, or toothed	20
20. Corolla lilac-purplish with yellow (white eye)	<i>P. muscoides</i>
+ Corolla white or yellow	21
21. Corolla white; tube pubescent outside	<i>P. tenuiloba</i>
+ Corolla tube glabrous outside	22
22. Corolla lobes deeply bifid	<i>P. drummodiana</i>
+ Corolla lobes 3 or more toothed	23.
23. Corolla pink to magenta with greenish yellow eye	<i>P. bracteosa</i>
+ Corolla white or creamy, claret red and pink	24.
24. Bud scale present at Flower	<i>P. elongata</i>
+ Bud scale absent at Flower	25
25. Corolla deep claret red; lobes entire	<i>P. kingii</i>
+ Corolla yellow, white- purplish, purplish blue	26
26. Corolla white or creamy white or pink	27
+ Corolla yellow, white or purplish	29
27. Flowers white or creamy	28
+ Flowers pink	<i>P. tibetica</i>
28. Inflorescence with > 10 flowered	<i>P. sikkimensis</i>
+ Inflorescence < 10 flowered	<i>P. capitata</i>
29. Flowers upto 30 per umbel; farinose	<i>P. calderiana</i>
+ Flowers upto 12 per umbel; Efarinose	<i>P. glabra</i>

Primula assaminca Fletcher in Trans & Proct. Bot. Soc. Edinb. 33. 107. 1941; Grierson & Long, Fl. Bhutan 2(2): 545. 1999.

Herbs, perennial, evergreen with persistent withered leaf remains at base. **Lamina** oblanceolate, 1.5 - 4.3 x 0.8 – 1.5 cm. obtuse; base attenuate into short winged petiole, white farinose beneath, minutely glandular-puberulus above; peduncle to 4cm (-8cm in fruit). **Umbels** single or 1- 5 flowered ; bracts lanceolate to 10 mm long, glandular - puberulous; pedicels to 6 mm. **Calyx** 8 – 12 mm, glandular puberulous, divided to 2/3 into lanceolate teeth. **Corolla** mauve with white-eye, tube to 11 mm, limbs rotate.

Flower & Fruit : May – June

Exsiccatus : **FIDE**, SMITH, W.W. (1913). The Alpine and Sub-alpine vegetation of

South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.

- Status* : Rare
Local Distribution : Chakung chhu (Sub-alpine East Sikkim) 3550-4600m
General Distribution : E. HIMALAYA, Sikkim (BHUTAN – Assam).
Note : Endemic to Eastern Himalaya.

Primula bracteosa Craib in Notes Bot. Gard. Edin. 6. 250. 1917; Grierson & Long, Fl. Bhutan 2' (2): 528. 1999. *P. boothii* Craib in Notes Bot. Gard. Edin. 6: 249. 1917.

Herbs evergreen, sparsely farinose or efarinose; with winter buds and persistent bud scales absent. **Lamina** rugose, spatulate or broadly obovate, 2.5 - 7 x 2 - 3 cm, obtuse, base tapering into short broadly winged petiole, obtuse, margin denticulate, glabrous and efarinose or sparsely farinose on both surfaces in Flower, where as ovate, to 6 x 5 cm, truncate or cordate at base with reddish narrowly winged petiole to 9 cm after Flower; peduncle at Flower 1- 5 cm, occasionally sparsely farinose at apex. **Umbels** single 3 -17 flowered. **Calyx** campanulate, keeled at base, to 13 mm puberulous, farinose or not, cut to middle into entire, ovate- yellow eye surrounded by white, lobes obovate, margin sinuous or trilobed. **Capsules** globose.

- Flower & Fruit* : April – July
Exsiccatus : FIDE, SMITH, W.W. (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.

- Status* : Frequent
Local Distribution : Changu, Yakla, Kupup, Sherabthang, Chola upto 4300 m.
General Distribution : E. HIMALAYA (Sikkim – NEFA) and S. TIBET.
Note : Endemic to Eastern Himalaya

Primula capitata Hook., Bot. Mag. 76: t. 4550. 1850; Hook.f.in Fl. Brit. India 3: 486.1882; Hara et al in Fl. E. Him. 246.1966; S. Gould in Enum. Fl. Pl. Nepal 3: 70. 1980; Grierson & Long, Fl. Bhutan 2(2): 550. 1999;

Herb upto 50 cm tall. **Leaves** forming a rosette; petiole winged by decurrent leaf blade; **Lamina** oblong-oblong-oblanceolate to oblong-spatulate, 1.5 -13 x 0.4 -3.5 cm, white or yellow farinose in upper surface, glandular beneath, base attenuate, margin denticulate, apex acute to rounded. **Umbel** in capitata, numerous flowered; bracts ovate to broadly lanceolate, often with tuft or crown at apex. Flowers nodding. **Calyx** tinged with purple, campanulate, lobes broadly ovate to elliptic, apex obtuse to acute. **Corolla** purple. limb lobes obovate, deeply 2-lobed, tube to 8 mm; stamens usually above the base of corolla tube. **Capsules** subglobose,

- Flower & Fruit* : May – August)
Exsiccatus : Kupup, 3950 m, *SR Lepcha & AP. Das 03140*, dated 10. 17. 2005
Status : Common
Local Distribution : Kupup, Bhimbace, upto 4350 m.
General Distribution : E. HIMALAYA (Sikkim, BHUTAN) and S. TIBET.
Note : Endemic to E. Himalaya.

Primula capitata ssp. *crispata* Hook.f., Not. B. G. Edinb. 16: 18 .1928.

Leaves often white farinose on upper surface. **Inflorescence** appeared from undeveloped flowers at apex.

- Flower & Fruit* : June – August
Exsiccatus : On way to Bhimlakh 4350m, *SR. Lepcha & AP. Das 0268*, dated 07.10.2006.

Status : Common
Local Distribution : Bhimlakra 2700 - 4500 m.
General Distribution : E. HIMALAYA (Sikkim, BHUTAN) and TIBET and N. BURMA.

Primula capitata ssp. *lacteocapitata* (I.B. Balfour & W.W. Smith) W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh. 16: 18. 1928. Hara in Fl. E. Him. 246.1966. *Primula lacteocapitata* I. B. Balfour & W. W. Smith in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 178. 1916.

Leaves sharply pointed; petiole red at base; farina on lower surface creamy

Flower & fruit : August – September
Exsiccatae : Kupup 4250m, *SR. Lepcha & AP. Das 31428*, dated 27.07.2005.
Gnathang 4100 m, *SR Lepcha & AP. Das 34131*, dated 27.07. 2005.

Status : Common
Local Distribution : Kupup, Gnathang 2700 – 3900 m.
General Distribution : E. HIMALAYA; INDIA Sikkim, BHUTAN, CHINA.
Note : Endemic to Eastern Himalaya.

Primula calderina I.B. Balf. & Cooper in Notes Bot. Gard. Edinb. 9: 7.1915; Hara in Fl. E. Him. 246.1966; Hara *et al*, Enum. Fl. Pl. Nepal 3: 70. 1982. *P. dianae* Balfour f. & Cooper in Notes Bot. Gard. Edinb. 9: 163. 1916.

Herbs deciduous with prominent winter resting buds, scales persistent at flower, ovate, yellow farinose. **Lamina** oblanceolate or spatulate, 4 – 35 x 1.5 – 6.8 cm, obtuse to acute, base tapering to winged petiole, margin crenate-denticulate weakly farinose beneath. Peduncle to 30 cm at Flower, farinose near apex. Umbels 5 - 25 flowered ; pedicels to 3 cm, farinose; bracts lanceolate 13 mm, farinose. **Calyx** campanulate, to 11 mm, cut to middle into lanceolate and blunt teeth farinose. **Corolla** purple white, with yellow eye, limb to 3 cm diam., lobes obcordate, emarginated. **Capsules** globose, included within calyx.

Flower & Fruit : May – August
Exsiccatu : Jalepla 4200 m, *SR Lepcha & AP. Das 2827*, dated 12. 10. 2005.
Status : Not common
Local Distribution : Jelepla, 3000 – 4880 m.
General Distribution : E.HIMALAYA; INDIA, NEPAL, BHUTAN, CHINA

Primula concinna Watt in Journ. Linn. Soc. 20: 5. 1882; Grierson & Long, Fl. Bhutan 2(2): 544. 1999.

Herbs or lower shrubs, dwarf cushion-forming or turf-forming upto 2.5 cm tall. **Lamina** oblanceolate or obovate, 1.5 - 2 x 0.5 cm including petiole, acute or subacute, base attenuate, margin entire or obscurely crenate, glabrous above, yellowish farinose beneath; peduncle concealed among leaves, to 12 mm long. **Umbels** 1-5 fragrant flowered; bracts linear; pedicels slender, to 9 mm. **Calyx** campanulate, to 5 mm, ± farinose, divided to middle into oblong subacute teeth. **Corolla** purplish or white with yellow eye, tube to 6 mm, limb rotate, with obovate emarginated lobes. **Capsules** oblong, as long as calyx.

Flower & Fruit : June – July
Exsiccatu : **FIDE**, SMITH, W.W. (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.
Status : Less frequent
Local Distribution : Changu, Nathula 4265 – 4880 m.

General Distribution : E. HIMALAYA (NEPAL, BHUTAN) and S. TIBET.

Note : Endemic to Eastern Himalaya.

Primula drummondiana Craib, in Journ. Roy. Hort. Soc., Lond. 39: 190. 1913; Grierson & Long; Fl. Bhutan 2 (2). 532. 1999. *P. cunninghamii* King & Craib. in Notes Bot. Gard. Edin. 6: 258. 1917.

Herbs evergreen; usually without winter resting buds. **Lamina** oblanceolate or spatulate, 2 – 13 x 1 – 4.5 cm, obtuse, base tapering to winged petiole, sharply and unequally spreading – denticulate, puberulous above, later glabrous, sparsely farinose at first, efarinose at maturity. **Flowers** numerous, borne amongst basal rosette leaves; pedicels slender, 0.5 – 6 cm, puberulous, farinose, divided 1/2 – 2/3 into lanceolate teeth. **Corolla** pink or purplish with a brown spot at base of lobes, eye yellow, tube 2 x length of calyx, limb to 15 mm in diam., lobes obcordate, bifid. **Capsules** not seen.

Flower & Fruit : September – February.

Exsiccatus : FIDE, SMITH, W.W. (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.

Status : Frequent

Local Distribution : Changu, Gnatong, Karponang, Lingtoo, Sherabthang 2200 – 4000 m.

General Distribution : E.HIMALAYA; INDIA (Sikkim).

Note : Probably endemic to Alpine East Sikkim and endemic to Eastern Himalaya.

Primula elongata E.H.L. Krause in Sturm, Fl. Deutschland, ed 2, 9: 267.1901; Grierson & Long, Fl. Bhutan 2(2): 536. 1999.

Herbs deciduous with persistent winter resting buds and scales oblong, farinose. **Lamina** oblanceolate, 5 – 13 x 2.5 – 5 cm, obtuse or subacute, base tapering to winged petiole, covered at first beneath by weal farina; peduncle long upto 15- 30 (- 45) cm, farinose above. **Flowers** usually with a single or occasionally double of 5- 10; pedicels upto 12 mm ; bracts subulate, 2 .5 – 4. 5mm. Calyx tubular, to 8 mm , cut to middle into lanceolate teeth. **Corolla** zygomorphic, sulphur- yellow, limb to 2 cm diameter, lobes obcordate, crenulate – toothed at apex. **Capsules** cylindric.

Flower & Fruit : April – July

Exsiccatus : FIDE, SMITH, W.W. (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.

Status : Frequent

Local Distribution : Changu , Yakla, Kupup , Gnathong, Sherabthang, upto 4350 m.

General Distribution : E. HIMALAYA; INDIA, BHUTAN.

Primula filipes Watt, in Journ. Linn. Soc. 20. 5. 1882; Hook.f. in Fl. Brit. India 3: 485. 1882; Grierson & Long, Fl. Bhutan 2(2): 527. 1999.

Herbs rhizomatous; **Petiole** 1.5 – 5.5 cm long, pubescent; **lamina** broadly ovate, 1.5 – 6 x 1.5 – 5 cm, base rounded, truncate or cordate, margin undulate or shallowly lobed, denticulate, pinnately veined to base, reddish pubescent beneath; peduncle 1- 6 cm. **Umbel** single and 4 - 10 flowered; pedicels to 22 mm. **Calyx**, limb to 13 mm. **Corolla** white to pale mauve with yellow eye, tube 2 - 3 x length of calyx, limb to 13 mm in diam.

Flower & Fruit : November - February

Exsiccatus : FIDE, SMITH, W.W. (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.

Status : Less frequent
Local Distribution : Subalpine- east Sikkim 1980 – 2740 m.
General Distribution : E.HIMALAYA; INDIA, BHUTAN, CHINA

Primula gerantifolia Hook.f., in Fl. Brit. India 3. 484. 1882; Grierson & Long, Fl. Bhutan 2(2): 529. 1999.

Herbs slightly larger than *p. vaginata*. **Petiole** upto 15 mm long, ± shaggily pubescent, without sheathing at base; **lamina** sub-orbicular, to 2.5 – 10 cm in diam., base deeply ordate, sharply toothed and lobed up to 1/3 width, hairy, especially beneath; peduncle to 45 cm, pubescent. **Umbel** (rarely 2superposed umbels) with 2 - 7 flowers; pedicels to 17 mm. **Calyx** reddish, campanulate, ribbed, 4 – 10 mm, divided to middle into lanceolate teeth. **Corolla** deep pink or red, tube to 10 mm, limb to 15 mm in diam., lobes emarginated. **Capsules** as long as calyx.

Flower & Fruit : May – August
Exsiccatu : Kupup 4280 m, *SR Lepcha & AP. Das* 2821, dated 12. 08. 2006.
Status : Not Common
Local Distribution : Karponang, Kupup, 2740 – 3660 m.
General Distribution : INDIA, BHUTAN, MYANMAR, NEPAL, CHINA

Primula glabra Klatt in Linnaeae 37: 500.1871-73. *P. genestieriana* Handel- Mazzetti in Anz. Akad.wiss. wein, math, -nat, 59: 250. 1922.

Herbs rosette, glabrous forming a small clumps. **Leaves** spathulate, 1 – 4 x 0.5 – 1.5cm, subacute or obtuse, base tapering to winged petiole, margin sharply denticulate, usually glandular punctuate beneath. Peduncle slender, to 12 cm. **Umbel** upto 12 flowers; bracts ovate to lanceolate pedicels to 5 mm. **Calyx** campanulate, lobes rounded. **Corolla** blue or purplish rarely white, yellow eye; limb to 5 mm diameter with obovate deeply emarginated lobes. **Capsule** short, as long as calyx.

Flower & Fruit : April – August
Exsiccatu : Kupup 4250 m, *SR Lepcha & AP. Das* 2806, dated 17.10. 2003.
Status : Not common
Local Distribution : Kupup, 3650 – 4510 m.
General Distribution : E.HIMALAYA; INDIA, BHUTAN, NEPAL, CHINA, MYANMAR.

Primula kingii Watt., Journ. Lin. Soc. 9:20. 1882; Hook.f. in Fl. Brit. India 3:491. 1882; Grierson & Long, Fl. Bhutan 2 (2): 538. 1999. *P. gageana* I.B. Balf & W.W. Smith in Notes Bot. gard. Edinb. 9:18.1915;

Herbs perennial efarinose with resting-buds; scales oblong, to 2.5 cm. **Lamina** fleshy, elliptic-oblanccolate, 3.5 – 13 x 1.5 – 2.5 cm including petiole, acute, base attenuate, margin horny, remotely denticulate, gland-pitted beneath. Peduncle to 8 cmlong. **Umbels** 3 - 7 (-12) flowered, pendent; bracts linear; pedicels to 13 mm puberulous. **Calyx** narrowly campanulate, to 9 mm, divided to middle into triangular teeth. **Corolla** dark claret to almost black, campanulate, to 18 mm long, lower tubular part as long as calyx, limb to 17 mm, diameter lobes oblong or elliptic, entire or emarginated. **Capsules** ovoid, to 1.7 x length of calyx.

Flower & Fruit : September - October
Exsiccata : Rachela below- Jorepokri, 3000, *SR Lepcha & AP. Das* 02823, dated 12.08.2006.
Status : Extremely Rare
Local Distribution : Kupup, Nathula, Gnathang, Sherabthang, 35000 – 4265 m.
General Distribution : INDIA, BHUTAN,

Notes : 1. Endemic to Eastern Himalaya (Sikkim, Darjeeling)
2. Flowers much attractive, ornamental.

Primula klatti Balakrishnan in Journ. Bombay Nat. Hist. Soc. 67:63. 1970. Grierson & Long, Fl. Bhutan 2(2): 553. 1999.

Herbs efarinose. **Leaves**; petiole upto 22cm long; elliptic or oblong, **lamina** 5 - 20 x 4.5 - 7.5 mm, acute, base cuneate, margin crenate to incised-dentate, white pubescent on both surfaces; peduncle upto 13 cm, glabrous. **Flower** solitary (rarely 2) + horizontal; bract ovate, minute. **Calyx** reddish, campanulate, to 7 mm, teeth oblong, apiculate, farinose within. **Corolla** blue-violet, broadly funnel-shaped, to 2.5 cm long, limb saucer-shaped, to 3 cm diameter, farinose within; lobes oblong, coarsely crenate at apex.

Flower & Fruit : July- August
Exsiccatus : FIDE, SMITH, W.W. (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.
Status : Rare
Local Distribution : Alpine -East Sikkim 3960 - 4720 m.
General Distribution : E. HIMALAYA; INDIA, BHUTAN.
Note ; Endemic to E. Himalaya.

Primula listeri King ex Hook.f.; in Fl. Brit. India 3: 485. 1882; Grierson & Long, Fl. Bhutan 2(2): 527. 1999.

Herbs rhizomatous clump - forming ; efarinose. **Petiole** 2 - 13 cm, pubescent; **lamina** suborbicular 1 - 6 x 1.5 - 5.5 cm, obtuse cordate, lobes up to 1/3 width, palmately 5-veined at base. pubescent especially above; peduncle to 13 cm, pubescent. **Umbels** 2 - 4 flowered ; pedicels to 14 mm long; bracts linear-lanceolate 2 - 8mm. **Calyx** widely campanulate, to 8 mm, pubescent, mouth to 11 mm broad when pressed, teeth short, acute. **Corolla** pink, tube as long as calyx, limb to 13 mm diameter, lobes obcordate, emarginated. **Capsules** subglobose included within calyx.

Flower & Fruit : April- June
Exsiccatus : Karponang 3000m, SR Lepcha & AP. Das 30955, dated 24.07.2005.
Status : Not common
Local Distribution : Jorepokhri, Karponang, 2440 - 3800 m)
General Distribution : E. HIMALAYAS; INDIA, BHUTAN.
Note : Endemic to E. Himalaya.

Primula minutissima Jacq. ex Duby in A. de Candolle, Prodr. 8: 42. 1844. Hook.f. in Fl. Brit. India 3: 494 . 1882. *Primula heydei* Wat; S.Gould in Enum. Fl. Pl. Nepal 3: 73.1982.

Herbs small perennial. **Leaves** rosettes; petiole sometime as long as leaf blade; leaf blade narrowly oblong to lanceolate or oblanceolate, **lamina** 4 -12 x 2 -3.5 mm, upper surface yellow farinose, sparsely glandular beneath, base attenuate, margin denticulate, apex acute to acuminate. **Umbel** to 7 ; bracts 2 or 3, lanceolate, apex acute. **Flowers** sessile. **Calyx** tubular to tubular-campanulate, to 5 mm, farinose ; lobes lanceolate, apex acute. **Corolla** dark reddish purple, lobes obovate, deeply emarginate. **stamens** above base of corolla tube. **Capsule** cylindrical.

Flower : June
Exsiccatus : PWS 3500 - 4500 m, SR. Lepcha & AP. Das 19285, dated 18. 12. 2004.

Status : Less frequent
Local Distribution : PWS. 3500 - 4500 m
General Distribution : PAKISTAN, INDIA; NEPAL, CHINA.

Primula munroi Lindl. Bot. Reg. t. 5. 1847; Grierson & Long, Fl. Bhutan 2(2): 542. 1999. *P. involucrata* Sweet, Cat. 562; ex Duby. in DC. Prodr. 8. 35; otto, ex Hook, Bot. Mag.t. 2842.

Herbs perennial glabrous. **Petiole** winged, to 6 cm; **lamina** ovate or oblong, 1 - 4 x 0.5 - 1.5 cm, obtuse, base abruptly narrowed, entire or denticulate, farinose; peduncle to 30 cm long. **Umbel** single 2 - 6 nodding flowers, flower fragrant; bracts oblong-lanceolate, prolonged below insertion into a broad 1-3-toothed auricle to 7 mm; pedicels slender, 1 - 3 cm. **Calyx** tubular - campanulate, to 7.5 mm, divided in upper third into lanceolate teeth. **Corolla** white with yellow eye rarely pink tinged or purplish, \pm zygomorphic, tube 12 mm, limb to 2 cm diam., lobes obcordate, deeply emarginated. **Capsules** oblong.

Flower & Fruit : May & September
Exsiccatus : Kupup 4250 m, **SR Lepcha & AP. Das** 2809, dated 13.10 2007.
Status : Less frequent
Local Distribution : Kupup, Nathula, Lhonak, 3650 - 4570 m
General Distribution : E.HIMALAYA; INDIA, BHUTAN.
Note : Endemic to E. Himalaya.

Primula muscoides Hook.f. ex Watt. in Journ. Linn. Soc. 20: 15.1882; et Fl. Brit. India 3: 434. 1882; Grierson & Long, Fl. Bhutan 2 (2): 546. 1999.

Herbs dwarf with cushion-forming and elongated slender wiry stems upto 8 cm. **Lamina** slightly leathery, narrowly ob-triangular, to 13 x 7 mm, apex rounded or almost truncate with 3 - 5 blunt teeth, margins entire, base \pm sessile, glabrous, efarinose. **Flowers** solitary, peduncle absent at Flower time, to 3 cm at fruiting; pedicels less than 1 mm, farinose. **Calyx** campanulate, to 4 mm, divided to middle into triangular teeth, farinose on both surfaces. **Corolla** lilac-purplish with yellow or white eye, tube usually pubescent in throat, lobes ascending, narrowly oblong, shortly bifid. **Capsules** globose.

Flower & Fruit : June - August
Exsiccatus : **FIDE, SMITH, W.W.** (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.
Status : Less frequent
Local Distribution : Sherabthang, 4000 - 4600 m.
General Distribution : INDIA, BHUTAN, NEPAL, CHINA

Primula primulina (Spreng.) Hara, ; Journ. Jap. Bot. 37: 99. 1962; in Fl. E. Him. 248. 1966; Grierson & Long Fl. Bhutan 2(2): 545. 1999. *Androsace primulina* Spreng., Syst. Veg. 4(2): 57. 1827; S. Gould in Enum. Fl. Pl. Nepal.3: 70. 1982; Hara in Fl. E. Him.244. 1966.

Herbs perennial. Leaves; **petiole** narrowly winged; **lamina** spatulate to oblanceolate, 8 - 25 x 4 - 6 mm, upper surface minutely glandular, mid vein pubescent, lower surface scabrous, glandular pubescent, base attenuate, margin deeply pinnatifid - dentate, apex rounded. Scapes to 8 cm, glandular. **Umbels** 2 -4; bracts ovate to linear-lanceolate. **Flowers** usually sessile. **Calyx** campanulate, to 5 mm, glandular outside, lobes triangular to oblong, white farinose inside, apex acute to obtuse. **Corolla** purple or blue-purple, rarely white; tube, pubescent outside, limb to 13 mm wide; lobes obovate, deeply emarginated. **Stamens** near base of corolla tube. **Capsules** cylindrical.

Flower : September

Exsiccatus : On way to Panglakha from Gnathang 3200 m, **SR Lepcha & AP. Das** 30831, dated 29.07.2005.
Status : Frequent
Local Distribution : Panglakha, Rachel 4000 - 4500 m
General Distribution : INDIA, BHUTAN, NEPAL, CHINA.

Primula reticulata Wall. in Roxb. Fl. Indica ed Cary 2: 21. 1824; Grierson & Long, Fl. Bhutan 2(2): 541. 1999.

Herbs perennial. **Petiole** 2 – 12 cm, long; **lamina** membranous, ovate, oblong, 2 - 10 x 1 – 3.5 cm, obtuse, base shallowly cordate, margin \pm doubly crenate-denticulate, veins \pm prominent and minutely papillate beneath,; peduncle to 28 cm. **Umbel** of 2 - 8 flowered, sparsely farinose above; pedicels to 4 cm; bracts leafy, lanceolate, to 15 x 5 mm. **Calyx**, upto 8 mm sparsely farinose. **Corolla** creamy or pale yellow, to 22 mm long, thinly farinose within.

Flower & Fruit : May - August

Exsiccatus : **FIDE, SMITH, W.W.** (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.

Status : Less frequent

Local Distribution : Changu, Kupup, Nathula 3500 – 4265 m.

General Distribution : INDIA, BHUTAN, NEPAL, CHINA

Primula sapphirina Hook.f. & Thoms. ex Watt., in Journ. Linn. Soc. 20: 10. 1882; ex Hook. f., in Fl. Brit. India 3: 492. 1882.

Herbs perennial, dwarf, e-farinose. **Lamina** oblanceolate, 4 – 11 x 2 – 6 mm, obtuse, base attenuate, margin pinnatifid-dentate, with scattered white hairs on midrib beneath or also glabrous; peduncle slender, to 5 cm, minutely glandular. **Flowers** 1-2(-4) sessile, semi – pendent; bract lanceolate. **Calyx** blackish – purple, to 3.5 mm, divided to middle into acute teeth. **Corolla** bluish – purple or lilac, funnel – shape, to 7.5 mm long, limb to 5 mm in diam., lobes c 1.5 mm long. **Capsules** subglobose, usually included within calyx.

Flower & Fruit : June - August

Exsiccatus : Gnathang – Panglakha 3100 m, **SR Lepcha & AP. Das** 32932, dated 31.07. 2005.

Status : Less frequent

Local Distribution : Changu, Kupup, Nathang, Nathula. 3800 – 4680 m)

General Distribution : INDIA, NEPAL, BHUTAN, TAR – REGION.

Note ; Endemic to E. Himalaya.

Primula sikkimensis Hook.f., B. Mag. 77: t. 4597. 1851; in Fl. Brit. India 3: 491.1882; var *sikkimensis*: Grierson & Long, Fl. Bhutan 2(2): 540. 1999. *Primula sikkimensis* var. *pubibunda* (W.W. Sm.) W. W. Sm. & Fletcher, Trans. Bot. Soc. Edinb. 33: 454. 1943.

Herbs perennial. **Leaves** in rosette; **lamina** oblanceolate, 5 – 36 x 1 – 6 cm (including petiole), tip obtuse, base attenuate, (rarely abruptly at base), margin crenate-serrate to finely dentate, upper surface reticulate veins. Efarinose. **Umbels** usually 1, rarely 2 – flowered, fragrant; bracts linear lanceolate, to 13 mm, distinct midrib. **Calyx** campanulate; farinose divided to middle into lanceolate teeth. **Corolla** yellow, occasionally cream-white, tube slightly longer than calyx; limb lobes obovate to obovate-oblong to 2 cm. **Capsules** oblong,

Flower & Fruit : May - August

Exsiccatus : Kupup lake 3900 m, **SR Lepcha & AP. Das** 313, dated 13.08. 2005.
Lampokhri 4380 m, **SR Lepcha & AP. Das** 30944, dated 24.07. 2005.

Status : Common
Local Distribution : Kupup, Lampokhri, Bhimbase 2600 - 4400 m
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, MYANMAR.

Primula soldanellodes Wall. in Jour. Linn. Soc. 20: 10. 1882; *et ex* Hook.f., Fl. Brit. India 3: 49.1882; Grierson & Long. Fl. Bhutan 2(2): 552. 1999.

Herbs perennial, dwarf, e-farinoso. **Petiole** upto 13 mm long; **lamina** elliptic, 6 - 15 x 1.5 - 6 mm, subacute, base attenuate, margin deeply pinnatifid-dentate, glabrous; peduncles to 4.5 cm, ebracteate. **Flower** solitary and pendant. **Calyx** dark purple, to 4 mm, campanulate, divided to middle into acute teeth. **Corolla** white, broadly funnel-shaped, to 13 mm long, limb to 14 mm diameter, lobes oblong, entire, or emarginated.

Flower & Fruit : June - August

Exsiccatus : FIDE, SMITH, W.W. (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.

Status : Less frequent

Local Distribution : Changu, Lam pokhri, 4100 - 4730 m.

General Distribution : INDIA, NEPAL, BHUTAN, TIBET

Note ; Endemic to E. Himalaya.

Primula tenuiloba Pax in Bot. Jahrb. 10: 204. 1888; Grierson & Long, Fl. Bhutan 2 (2): 546. 1999. *P. indobella* I.b. Balf & W.W. Smith. in Notes Bot. Gard. Edin. 9: 24. 1915.

Herbs, dwarf, tuft, efarinoso. **Lamina** spatulate, 4 - 25 x 3 - 8 mm, obtuse, based tapered to winged petiole, sharply denticulate or serrulate, glabrous on both surfaces; peduncle slender, upto 13 mm. **Calyx** to 6.8 mm. **Corolla** deep blue with white eye, sometimes all white, tube up to 12 mm, white villous outside, limb to 2 cm diam., lobes ascending, deeply obcordate, divided into 2 linear teeth longer than broad. **Capsules** not seen.

Flower & Fruit : June - August

Exsiccatus : FIDE, SMITH, W.W. (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.

Status : Frequent

Local Distribution : Lhonak, Sherabthang, Zemu valley, 4100 - 4500 m.

General Distribution : INDIA, NEPAL, BHUTAN, CHINA.

Primula tibetica Watt in Journ. Linn. Soc. 20: 6. 1882; *et ex* Hook.f., Fl. Brit. India 3: 488.1882. Grierson & Long. Fl. Bhutan 2(2): 542. 1999

Herbs perennial, dwarf, glabrous. **Lamina** ovate - elliptic, 1 - 3 x 0.5 - 2.5 cm. obtuse of subacute base cuneate; margins entire, efarinoso; petiole winged to 3 cm. Peduncle to 23 cm long. usually hidden among leaves. **Flowers** 1 - 12; bracts oblong, to 5 mm acute base sacuate or shortly auricled. Pedicels often longer than peduncles 5 cm. **Calyx** narrowly campanulate to 4 mm, usually with 5 prominent dark purple ribs, divided to 1/3 into oblong obtuse teeth, tube saccate at base. **Corolla** pink with yellow eye, limb to 11 mm diam., with obcordate deeply emarginated lobes. **Capsules** cylindric.

Flower & Fruit : May - September

Exsiccatus : Bhimbase 4350 m, *SR Lepcha & AP. Das 02824*, dated 12.07.2006.

Status : Not common

Local Distribution : Bhimbase, Jalepla, 3600-4570m.

General Distribution : INDIA, NEPAL, BHUTAN, CHINA

Note ; Endemic to E. Himalaya.

Primula vaginata Watt in Journ. Linn. Soc. 20: 4. 1882; Hook.f. in Fl. Brit. India 3: 484. 1882. Grierson & Long. Fl. Bhutan 2(2): 526. 1999.

Herbs with creeping rhizome; efarinose. **Petioles** to 8 cm, sparsely pubescent, with sheathing, channeled base up to 6 mm broad; **lamina** orbicular, 1 - 4 cm in diam, base cordate, sharply toothed and lobed to 1/3 width, veins palmately radiating from base, pubescent especially beneath; peduncle to 12 cm, pubescent. **Umbels** with compact 2 - 8 flowered ; pedicels to 13 mm; bracts linear. **Calyx** obconic, to 6 mm, longitudinally veined, teeth to 3 mm. **Corolla** mauve, tube 4 - 7 mm, limb to 13 mm diameter, lobes toothed. **Capsules** subglobose, + as long as calyx.

Flower & Fruit : April - June
Exsiccatus : Kyonglhasa 2970 m, *SR Lepcha & AP. Das* 2820, dated 12. 18. 2006.
Status : Less frequent
Local Distribution : Karponang, Kyonglhasa , Laghep; 2740 - 4050 m.
General Distribution : INDIA, BHUTAN, CHINA, MYANMAR.

Primula walshii. Craib in Journ. Roy. Hort. Soc., Lond. 39: 190. 1913; Grierson & Long. Fl. Bhutan 2(2): 546. 1999

Herbs rosette, dwarf. **Petioles** upto 4 mm long, winged; **lamina** oblanceolate, 7 - 13 x 3 - 6 mm, acute, base cuneate, entire or obscurely serrate at apex, glandular puberulous on each side, efarinose; peduncle at Flower time upto 6 mm, mostly hidden among leaves and in fruit up to 3 cm. **Umbels** 1-4 flowered ; bracts upto 2 mm long ; ovate or lanceolate, broadly clasping at base forming a cup shaped involucre; pedicels to 4 mm. **Calyx** tubular, to 6 mm, glandular pubescent divided to half into lanceolate teeth. **Corolla** pink or pale mauve with yellow or white eye, tube without hairs in throat, limb rotate; lobes broadly obovate, deeply emarginated. **Capsules** oblong.

Flower & Fruit : May - July
Exsiccatus : **FIDE**, SMITH, W.W. (1913). The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.
Status : Less frequent
Local Distribution : Changu, 3960 - 4570 m
General Distribution : INDIA, NEPAL, BHUTAN, SE TIBET
Note ; Endemic to E. Himalaya.

Subclass: Rosidae

Order: Rosales

HYDRANGEACEAE Dumort

Key to the Genera:

1. Shrub upto 2 m tall, petals elliptic; styles 3-5 *Dichroa*
- + Shrub upto 4 m tall, petals lanceolate, spreading; styles 2 *Hydrangea*

Dichroa Louriero

Dichroa febrifuga Lour., Fl. Cochinch. 1: 301. 1970; C.B. Clarke in Hook.f., Fl. Brit. India 2: 406. 1879; Hara & Ohashi in Fl. E. Him. 114. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 157. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(3): 522. 1987. *Adamia cyanea* Wallich, Tent. Fl. Nepal 46. T. 36. 1826.

Local Name: Gaybu kanung (Lep.), Basak (Nep.)

Shrubs perennial upto 2m tall. **Lamina** elliptic to oblanceolate, 10 - 14 x 4-5 cm, usually acuminate, base cuneate or rarely attenuate, margin serrate, sparsely pubescent on both surfaces. **Calyx** including acute lobes upto 4mm. **Petals** elliptic, pale blue, becoming reflexed. **Stamens** short upto 5mm purplish. **Styles** 3-5, thickened at apex. **Berries** sub-globosa, blue.

Flower : May - September. *Fruit:* July - December

Exsiccatus : Phusrey 2150 m, **SR Lepcha & AP. Das** 30300, dated 15.10.2007

Status : Common

Local Distribution : Premlakha, Rigu, Subaney dara, Mulkharka, 900 - 2400 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, MALAYSIA, TAIWAN.

Note : Shoot and Bark of the roots are used in preparing febrifuge.

Hydrangea Linnaeus

Key to the Species:

1. Shrubs, erect upto 4 m tall 2
- + Climber, epiphytic *H. anomala*
2. Leaves lamina 4.5 -10 x 4 - 6.5 cm; obovate *H. microphylla*
- + leaves lamina 10 - 25 x 5 -13 cm; ovate-lanceolate *H. aspera*

Hydrangea aspera D. Don, ssp. *robusta* (Hook.f. & Thoms.) Mc Clintock in JAA 37: 373. 1956; Hook.f., Fl. Brit. India (3): 520. 1879; Grierson in Grierson & Long, Fl. Bhutan 1(3): 520. 1987. *H. robusta* Hook.f., & Thoms. in Journ. Linn. Soc 2: 76. 1885; Hook. f. in Fl. Brit. India 2: 404. 1878; Hara & Ohashi in Fl. E. Him. 1: 115. 1966.

Local Name: Bhogatay (Nep.).

Shrubs, erect, upto 4m tall. Twigs are usually densely pubescent. **Petiole** to 8 cm long, pubescent; **lamina** 10 - 25 x 5 -13cm, broadly ovate-lanceolate, margin finely double-serrate, teeth acuminate, alternately large and small, pilose, acute, base rounded to even cordate. Bracts lanceolate, deciduous. Fertile flowers light orange yellow; **Calyx** long, lobes acute; **Petals** free, lanceolate, spreading; **stamens** 8; styles 2 upto 0.2.5cm, broadened above, apex nearly kidney-shaped. **Capsule** truncate above; seeds ellipsoid. Sterile flowers with ovate-elliptic calyx lobes, white.

Flower : July - September. *Fruit:* October - January

Exsiccatus : Dohrok 2300 m, **SR Lepcha & AP. Das** 30249, dated 06.10.2004.
Padamchen 2000 m, **SR Lepcha & AP. Das** 31035, dated 07.10.2004.

Status : Common.

Local Distribution : Rachela chowk, Zuluk.Hangey 2000 - 3500 m.

General Distribution : HIMALAYAS; INDIA, BHUTAN, E. TIBET, MYANMAR, TONKIN, W. & C. CHINA, FORMOSA.

Hydrangea macrophylla (Thunb.) Seringe in DC., Prodr. 4:15. 1830; Journ. Japan Bot. 30: 277. 1955; Hara *et al.* Enum. Fl. Pl. Nepal 2: 157. 1979; Grierson in Grierson & Long. Fl. Bhutan 1(3): 521. 1987; *Viburnum macrophyllum* Thunb., Fl. Jap. 125. 1784.

Shrubs, glabrous, with several branches. **Leaves** opposite; lamina 4.5 -10 x 4 - 6.5 cm, obovate, shallowly serrate, teeth obtuse, abrupt acuminate, base cuneate, glabrous above, vein axils hairy in lowers surface. nerves usually 7 - 9 pairs. **Flowers** in cymosely branched corymbs, bisexual, fertile flowers. **Calyx** to 0.4cm, lobes broadly ovate or elliptic, white or sometime bluish lobed. **Petals** to 0.32 cm, lanceolate, purple or whitish, recurved; **stamens** equal to corollas ; sterile flowers many.

Flower : June - August *Fruit*: August - October
Exsiccatus : Dorok 2300 m, *SR Lepcha & AP. das 30249*, dated 06.10.2004.
Status : Common
Local Distribution : Rachela below, KAS 2000 - 3000 m.
General Distribution : Native of JAPAN.
Note : 1. A new distribution record for Sikkim.
2. A common garden shrub.

Hydrangea anomala D. Don, Prodr. Fl. Nep. 211. 1825; Hook.f., Fl. Brit. India 2: 405. 1879; Hara in Fl. E. Him. 114. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 157. 1979; Grierson in Grierson & Long. Fl. Bhutan 1(3): 520. 1987. *H. altissima* Wallich, Tent. Fl. Nep. 2 t. 50. 1826; Hook.f., Fl. Brit. India 2: 404. 1878.

Climber, epiphytic, seen mostly on trees with branches of rooting. Stem pubescent, hairy, white. **Leaves** opposite; petioles to 0.7 cm; **lamina** 3.5 - 13 x 1 - 3 cm, ovate, serrate, teeth acute and pubescent above, acuminate, base cuneate or rounded, nerve axils brownish hairs below. **Flowers** in terminal corymbs to 17 cm across, branched. **Bracts** to 1cm cm, elliptic, glabrous. **petals** upto 0.30 cm and usually cohering in a conical cap; **stamens** 10, to 0.40 cm; **styles** 2, broaden at top. **Capsule** subglobose, ribbed; seeds elliptic.

Flower : March - June *Fruit*: June - October
Exsiccatus : Singhaney 2300 m, *SR Lepcha & AP. Das 32906*, dated 27.10 2004.
Status : Common.
Local Distribution : Mulkharka, Jorpokhari 2200 - 3050 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, W. & C. CHINA.

GROSSULARIACEAE DC.

Ribes Linnaeus

Key to the Species:

1. Bracts glabrous; berries globose *R. glaciale*
+ Bracts sparsely ciliate; berries ellipsoid *R. lacinatum*

Ribes glaciale Wall. in Roxb., Fl. Indica 513. 1824 p.p.; C.B. Clarke in Hook.f., Fl. Brit. India 2: 410. 1879 p.p.; Grierson in Grierson & Long. Fl. Bhutan 1(3): 525. 1987. *R. takare* D. Don, Prodr. 208. 1825; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 159. 1979. *R. acuminatum* Wall. ex G. Don, Gen. Hist. 3: 187. 1834; Hara in Fl.E.Him.1: 115. 1966.

Shrubs upto 5 m tall. Stem shining and glabrous. **Petioles** upto 2.5 cm, coarsely short-hairy; **lamina** 2.5 - 4.8 x 1.5 - 4.5 cm, cordate-ovate, shallowly 3-5 lobed, lobes sharply inciso-serrate,

middle lobe elongate, acute or acuminate, base sub-cordate to cordate, a few scattered white hairs above; glabrous beneath, nerves pubescent beneath. **Flowers** in racemes upto 2.5cm, elongated, erect to slightly pendent, many flowered, shortly white pubescent. **Bracts** exceeding pedicels, linear lanceolate, glabrous, brownish. Pedicels glabrous, greenish or upper half faded red. **Calyx** minutely pubescent. **Corolla** 5, reddish brown, glabrous; **stamens** 5, short; styles bifid. **Berries** globose, reddish.

Flower : August – July
Exsiccatus : Singhaney dara 2240m, *SR Lepcha & AP. Das 0146*, dated 16.09.2004.
Status : Frequent.
Local Distribution : Middle Rachela 2100- 2750m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Ribes lacinatedum Hook.f. & Thoms. in Journ. Linn. Soc. Bot. 2: 87. 1857; Hara in Enum. Fl. Pl. Nepal 2: 158. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(3): 525. 1987.

Shrubs slender dioecious upto 4m tall. **Leaves** 3 lobed; petioles to 3 cm; **lamina** 2.5 – 3 x 2 – 5 cm, mid lob longer slightly longer than lateral lobes, gradually acuminate, base rounded cordate, trunket of cordate, margin coarsely-sharply serrate; sparsely glandular, pubescent in upper surface, glandular sub-sessile, below. **Flowers** in racemes up to .5cm, elongated; bracts lanceolate, sparsely ciliate. **Flower** crimson or purple. **Calyx** lobes ovate – lanceolate. **Berries** ellipsoid, glabrous, red.

Flower : April- June
Exsiccatus : Tungya 2255 m, *SRLepcha & AP. Das 075*, dated 16.09. 2004
Status : Frequent
Local Distribution : Middle Rachela 2100 – 3950 m
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

CRASSULACEAE DC.

Key to the Genera:

1. Plant rhizomatous; flowers terminal; bisexual or unisexual *Rhodiola*
 + Plant non- rhizomatous; flowers in loosely corymbose; bisexual *Sedum*

Rhodiola Linnaeus

Key to the Species:

1. Leaf linear - elliptic; flowers in dense compact corymbs, petals yellowish - white - greenish yellow; stamens longer than or \pm as long as petals 2
 + Leaf oblanceolate or obovate; flowers in subumbelately loose corymbs; petals dark reddish purple; stamen shorter than petals *R. himalayensis*
 2. Flowers usually 5 to dense; leaf margin with 2 – pairs of teeth *R. wallichiana*
 + Flowers 6 – 15; leaf margin entire..... *R. fastigiata*

Rhodiola fastigiata (Hook.f. & Thoms.) Fu, in Acta Phytotax. Sin., Addit. 122. 1965; Grierson in Grierson & Long, Fl. Bhutan 1(3): 478. 1987.

Herbs with sub-erect rhizome. Stems to 17 cm long, glabrous. **Leaves** linear – elliptic, lamina 6 – 13 x 1 – 1.5 cm, subobtuse, base attenuate, margin entire. **Flowers** 6 – 15 forming compact

corymbose cymes. **Calyx** tube to 0.7 mm, lobes ovate – triangular, upto 2.5 - 3.5 x 1.8 mm. **Petals** yellowish white, narrowly linear obovate; **stamens** longer than petals; **carpels** to 8 mm; style c 2 mm, curve outwards.

Flower & fruit : June – August
Exsiccatus : Donkyala 3900 m, **SR Lepcha & AP. Das 1000**, dated 18.09.2004.
Status : Common.
Local Distribution : Dongkyala, Bhimbace below, 3800 – 4400 m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA.

Rhodiola himalayensis (D. Don.) S.H. Fu, Acta Phytotax. Sin., Addit. 1: 121. 1965; Grierson in Grierson & Long, Fl. Bhutan 1(3): 477. 1987. *Sedum himalense* D. Don, Prodr. Fl. Nepal. 212. 1825

Herbs rhizomatous. **Rhizome** elongated, suberect, to 3.2 cm thick. **Leaves** oblanceolate or obovate, lamina 5 – 22 x 2 – 4.5 mm, acute, base attenuate, sub-entire or denticulate, papillose near margin. **Flowers** in dense in male than female, cymes, subumbelately in loose corymb. Flower 5 merous, unisexual. **Calyx** tube to 3.2 mm lobes triangular, acuminate; **petals** dark reddish purple, oblong-ovate, 2 – 3.5 x 1.7 mm; **stamens** shorter than petals; **carpels** to 5.8 mm, **styles** to 0.5 mm long.

Flower : May – June *Fruit*: June: August
Exsiccatus : Kupup 4100 m, **SR Lepcha & AP. Das 0270**, dated 25.09.2005
Status : Common
Local Distribution : Bhimbace, Donkyala, Bhimbace, 3500 – 4200 m.
General Distribution : INDIA, NEPAL, BHUTAN, S.CHINA
Note : Endemic to Eastern Himalaya

Rhodiola wallichiana (Hooker) S.H. Fu, Acta Phytotax. Sin., Addit. 1: 125. 1965; Grierson in Grierson & Long, Fl. Bhutan 1(3): 478. 1987. *Sedum wallichianum* Hooker, Icon. Pl. 7: t. 604. 1844.

Herbs rhizomatous. **Rhizome** to 3.5 cm. Stem to 32 cm, glabrous. **Leaves** deciduous, linear, lamina 8 – 28 x 1 – 3.5 mm, acuminate, base attenuate, small teeth 2 -3 pairs towards apex. **Flowers** in dense compact corymbs, bisexual, usually 5. **Calyx** tube to 1.2 mm, lobes triangular, acuminate. **Petals** greenish yellow; **stamens** ± as long as petals; **carpels** to 13 mm, **styles** to 3.5 mm, spreading.

Flower : August – September *Fruit*: October
Exsiccata : Changu 4000 m, **SR Lepcha & AP. Das 0271**, dated 15.09.2005
Status : Common
Local Distribution : Kyongnosla, Gnathang, Donkya upto 3990 m,
General Distribution : INDIA, BHUTAN, NEPAL, MYANMAR, CHINA.

Sedum Linnaeus

Sedum triactina A. Berger in Engler & Prantl, Nat. Pflanzenfam., ed. 2. 18a: 460. 1930. Grierson in Grierson & Long, Fl. Bhutan 1(3): 482. 1987. *Triactina verticillata* J.D. Hooker & Thoms., J. Linn. Soc. 2: 103. 1858

Herbs perennial slender, weak. Flowering stems to 40 cm. **Leaves** often 3-verticillate or opposite, with pseudopetiolate, persistent around middle of stem; leaf spatulate-oblong, lamina

0.5 - 3.8 × 0.3- 0.8 base narrowly cuneate, apex emarginate to obtuse. **Inflorescence** corymbiform, lax; bracts obovate-orbicular to suborbicular. **Flowers** 5-merous. **Sepals** narrowly triangular-oblong, 1.5 × 0.6 mm, apex obtuse. **Petals** yellow, narrowly oblong, -6 × 3.5 mm, apex obtuse. **Stamens** 10, slightly shorter than petals; **Nectar** scales 3, linear or linear-spatulate, apex emarginate or obtuse. **Carpels** 3, divergent, base connate. **Styles** ca. 2 mm. **Follicles** divergent, 1- or 2-seeded. **Seeds** oblong-ovoid.

Flower : June – August *Fruit*: September
Exsiccatus : Bombay hill (Kyongnosla) 3700m, **SR Lepcha & AP. Das** 0272, dated 15. 09. 2005
Status : Common
Local Distribution : Me-Menchu lake, Baba mandir, Kupup, 2000 – 3800 m,
General Distribution : INDIA, BHUTAN, NEPAL, W. CHINA

SAXIFRAGACEAE A.J.C. Grierson

Key to the Genera

1. Perennial rhizomatous herbs 2
 + Perennial non-rhizomatous herbs *Saxifraga*
 2. Leaves alternate, bi- or triternate *Astilbe*
 + Leaves rosetted *Berginia*

Astilbe Buchanon-Hamilton

Astilbe rivularis Buchanon-Hamilton in D. Don, Prodr. Fl. Nep. 211. 1825; C.B. Clarke in Fl. Brit. India 2: 389. 1878; Hara & Ohashi in Fl. E. Him. 1: 111. 1966; Hara *et al*, Enum. Fl. Pl. Nepal 2: 149. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(3): 488. 1987.

Local Name: Buro Okhati (Nep.).

Herbs, perennial, rhizomatous upto 2.5m tall. Stem short. Stipules sheathing. **Leaves** large, bi- or tri-ternate; stipules sheathing; **petioles** long, slender, brown hairy with long (upto 1.8 cm) hairs at leaflet axils, base sheathing; **lamina** of leaflets 5 - 8 x 2.5 - 5 cm, ovate or elliptic, biserrate, acuminate, base rounded or sub-cordate, nerves prominent and appressed brown hirsute beneath. **Panicles** terminal, upto 126 cm, branched. Peduncles pubescent; **bracts** brown; pedicels 0.4 - 0.19cm. **Calyx** deeply 5-lobed, lobes 0.18 - 0.3 cm, oblong, obtuse, green. **Corolla** absent; stamens 5; carpels 2, connate below, divaricating when ripe. **Capsules** ovoid – ellipsoid; seeds numerous.

Var. *rivularis*

Leaflets rhombic-elliptic or obovate (terminal ones), or ovate (lateral ones). **Petals** absent.

Flower : June - September *Fruit*: July – October.
Exsiccatus : Singhaney dara 2700 m, **SR Lepcha & AP. Das** 3710, dated 03.10. 2005.
Status : Less Common.
Local Distribution : Singhaney, upto 3000m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, INDONESIA, LAOS, N. MYANMAR, THAILAND, VIETNAM

Note : Root decoction is used for the treatment of post-natal women.

Berginia W.H. Harvey ex Bentham & Hook.f.

Key to the species

1. Petals obovate 2
+ Petals orbicular *B. pacumbis*
2. Leaves sub-orbicular or broadly obovate; flower 1 *B. purpurascens*
+ Leaves elliptic or ovate-elliptic; flowers upto 18 *B. ciliata*

Berginia ciliata (Haworth) Sternberg in Gartenfl. 307.1886; Clos, in Bull. Soc. Bot. Fr. 41: 397. 1894; Hara *et al* in Fl. E. Him. 2: 46.1971; Grierson in Grierson & Long, Fl. Bhutan 1(3): 492. 1987. *Berginia ciliata* f. *ligulata* (Haworth) Sternberg; Kew Bull. 20: 134. 1966.

Local Name: Pakhanbed (Nep.)

Herbs perennial. Rhizomes thick. **Lamina** 5 – 17 x 5 – 13 cm, sub-orbicular or broadly obovate; rounded at base and apex, margin fine reticulate, densely ciliate. **Flowers** 1- 18. **Calyx** cup-shaped, sepals 5, 4– 13 mm, green, lobed acute, denticulate at apex. **Petals** 5, obovate, 10 – 16 x 5 14 mm, white tinged pink. **Stamens** 10, 5 – 11 mm

- Flowering* : June – July. *Fruiting:* October.
Exsiccatus : Karponang 2200m, *SR Lepcha & AP. Das* 3702, dated 13.10.2005.
Status : Common
Local Distribution : Karponang, KAS 2300 – 2400 m
General Distribution : PAKISTAN, AFGHANISTAN, INDIA, NEPAL, BHUTAN.
Note : The roots are used in traditional medicine.

Berginia pacumbis (Buchanan-Hamilton ex D. Don) C.Y. Wu & J.T. Pan in J.T. Pan, Acta Phytotax. Sin. 26: 126. 1988. *Saxifraga pacumbis* Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 209. 1825.

Herbs perennial, ca. 25 cm tall. Rhizomes thick. **Leaves** all basal; petiole 3.5 -9cm or longer, sheathless, sheathing base rigidly ciliate at margin; leaf blade orbicular or broadly ovate to broadly obovate, **lamina** 5.5 – 13 x 4.5 -13 cm, leathery, both surfaces glabrous, base rounded, margin entire or obscurely crenate, rigidly ciliate, apex obtuse. **Inflorescence** cymose, pedicels sparsely sub-sessile, glandular. **Hypanthium** sparsely glandular hairy. **Sepals** spreading, broadly ovate, 2.5 – 4 mm, leathery, glabrous, veins many. **Petals** white or pink, orbicular, ca. 6.5 x 5.5 mm, veins many, apex obtuse. **Stamens** short, 4 mm. **Ovary** ovoid.

- Flower* : June – July. *Fruit:* October.
Exsiccatus : Changu – Sherathang 3900 m, *SR Lepcha & AP. Das* 168, dated 17.10. 2005.
Status : Threatened
Local Distribution : Sherathang. Kupup 2300 – 2400 m
General Distribution : AFGHANISTAN, PAKISTAN, INDIA, NEPAL, BHUTAN.

Berginia purpurascens (Hook.f. & Thomson) Engler in B. Zeith 26: 841. 1868; Hara & Ohashi in Fl. E. Him. 111: 1966; Hara *et. al.* Enum, Fl. Pl. Nepal 2: 150. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(3): 492. 1987. *Saxifraga purpurascens* Hook.f. & Thomson in J. Linn. Soc. Bot. 2: 61. 1857; C.B. Clarke in Fl. Brit. India 2: 398. 1879.

Herbs perennial with thick rhizome 15 -30cm tall. **Stems** reddish brown, glandular pubescent. **Leaves** elliptic or ovate-elliptic, 8 - 23 x 6-14cm, base cuneate or rounded, margin usually entire but sometime shallowly sinuate, glabrous or ciliate near base; basal sheathing. **Flowers** usually

1-, nodding. **Calyx** dull crimson, lobes oblong, rounded. **Petals** obovate, tapering to a basal, bright pink; stamens as long as style. **Capsule** ellipsoid, base surrounded by persistent calyx.

Flower : May – July *Fruit*: October
Exsiccatus : Kyonglasha – Changu 3700 m, **SR Lepcha & AP. Das** 3340, dated 20.10. 2006.
Status : Threatened
Local Distribution : Kyongnosla, 2700 – 4800 m.
General Distribution : E. HIMALAYA; INDIA (Khasia, Manipur) (NEPAL – NEFA), THAI, TONKIN, and W. CHINA.

Note : Traditionally used as a medicine. It is a source of the drug Bergenin

Saxifraga Linnaeus

Key to the species:

1. Herbs more than 25 cm tall 2
- + Herbs less than 25 cm tall 3

2. Leaf ovate ; base rounded *S. hookeri*,
- + Leaf elliptic oblong; base cordate *S. moorcroftiana*²

3. Herbs less than 15cm tall *S. montana*
- + Herbs more than 15 cm tall 4

4. Flower solitary one rarely 2 – 3; petals yellow spotted with orange ... *S. parnassiifolia*
- + Flower 6 – 11; petals yellow not spotted with orange. *S. latiflora*,

Saxifraga hookeri Engler & Irmischer in Engl. Jahrb. 48: 582 1912; Grierson in Grierson & Long, Fl. Bhutan 1(3): 507 – 508. 1987.

Herbs perennial to 40 cm tall. **Leaf lamina** ovate, 6 – 13 × 6 - 13cm, sub-acute acute, base rounded; lower one petiolate, upper one sessile, glandular to pubescent. **Flowers** 3 – 10, loosely racemose or corymbose, pedicel glandular to pubescent. **Calyx** ovate, usually glandular to pubescent. **Petals** obovate to 7.5 x 3 mm, yellow.

Flower : August – September *Fruit*: October
Exsiccatus : Donkyala 3890 m, **SR Lepcha & AP. Das** 2835, dated 23.10.2004.
Status : Common
Local Distribution : Bhimbase, Kupup, 2600 – 4500 m.
General Distribution : NE INDIA (Sikkim), BHUTAN, NEPAL, CHINA,
Note : Endemic to Eastern Himalaya

Saxifraga latiflora Hook.f. & Thomson in, J. Linn. Soc. Bot. 2: 71. 1857; Hara *et al* in Fl. E. Him. 117. 1966. C.B. Clarke in Hook.f., Fl. Brit. India 2: 392.1879; Grierson in Grierson & Long, Fl. Bhutan 1(3): 506.1987

Herbs perennial. **Stem** simple, erect to 20 mm, glandular to pubescent towards apex. **Lamina** elliptic – oblanceolate, 4 – 7 x 1.5 – 2.3 cm, acute lower one narrowed at base into a broad petiolate upper one sessile, glabrous or sparsely ciliate. **Flower** solitary one rarely 2 – 3; pedicels glandular to pubescent. **Calyx** 8 – 12 mm, lobes broadly ovate to 10 mm, slightly obtuse,

glandular to ciliate. **Petals** oblong to obovate to 7 – 13 x 5 – 7 mm, yellow spotted with orange within.

Flower : July – August *Fruit*: August - October
Exsiccatus : Tamjay 3750 m, *SR Lepcha & AP. Das* 2840, dated 15.11.2004.
Status : Less common
Local Distribution : Tamjay, Kupup, 4000 – 4400 m.
General Distribution : E.HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : Endemic to Eastern Himalaya

Saxifraga montana H. Smith, Acta H. Gotob. 1: 9, f. 2 e-l, t. 6. 1924; Grierson in Grierson & Long, Fl. Bhutan 1(3): 511. 1987. *Saxifraga montanella* H. Smith, Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 238. 1960.

Herbs perennial, caespitose perennial. **Stem** to 13 cm, brownish and lanate,. **Leaves**: petiole to 13 mm, glabrous; **lamina** of basal leaves elliptic – oblanceolate, 4.5 – 16 x 1.5 – 5 mm, subacute, base attenuate. **Flowers** solitary or few. **Calyx** 4 – 8 mm lobes oblong- ovate 4 – 13 x 1.6 – 2.2 mm brown pubescent and ciliate. **Petals** elliptic or obovate, 4 – 8 x 3.5 mm, yellow.

Flower : July – August *Fruit*: August – October
Exsiccatus : Nathang – Bhimbase 4220 m, *SR Lepcha & AP. Das* 2836, dated 10.10.2004.
Status : Less common
Local Distribution : Nathang, Bhim, base 4000 - 4400 m.
General Distribution : E.HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : Endemic to Eastern Himalaya

Saxifraga moorcroftiana (Seringe) Wallich ex Sternberg, Revis. Saxifrag. Suppl. 2: 28. 1831; Hara *et al.*, Fl. E. Him. 117. 1966; Grierson in Grierson & Long, Fl. Bhutan 1(3): 487. 1987. *Saxifraga diversifolia* Wallich ex Seringe var. *moorcroftiana* Seringe in de Candolle, Prodr. 4: 44. 1830; *S. reflexa* T.C. Ku (1989), not Hooker (1832), nor Saint-Lager (1880).

Herbs perennial, upto 50 cm tall. **Stem** glandular villous. **Basal leaves** deciduous at anthesis; petiole ca. 2.5 cm, abaxially sparsely brown glandular villous; **lamina** elliptic to oblong, 2 x 2.2 cm, abaxially brown glandular pilose, apex acute; cauline leaves sessile; proximal ones oblong **lamina** 1.2 x 0.6 – 2.5cm, abaxially glandular pilose, base cordate, apex rounded or acute; most distal leaf ovate to ovate-elliptic, surfaces glabrous, base cordate, margin sparsely glandular ciliate. **Flowers** in corymbose, upto 7.5 cm, 2 - 12-flowered; bracts elliptic, glandular ciliate at margin. **Sepals** ovate-elliptic, abaxially dark purple hairy or glabrous, margin dark purple, veins 5 – 7. **Petals** yellow, obovate, 5 - 7-veined. **Ovary** ovoid.

Flower : July. *Fruit*: August – October
Exsiccatus : Kupup 4180m, *SR Lepcha & AP. Das* 057, dated 16.07.2005.
Status : Sparce
Local Distribution : Nathang, Bhimbase, Kupup 3500 – 4400 m.
General Distribution : HIMALAYA (Kashmir- BHUTAN), S. TIBET, and W. CHINA.
Note : Endemic to Himalaya.

Saxifraga parnassifolia D. Don, Trans. Linn. Soc. London, Bot. 13: 405. 1822; Hara *et al.* Fl. E. Him. 117.1966; Grierson in Grierson & Long, Fl. Bhutan 1(3): 507. 1987;

Herbs perennial upto 24 cm tall. **Stem** branched, villous. **Basal leaves** with petiole 1 - 2.5 cm, crisped glandular villous; cordate-ovate, 1 – 4.5 x 1.2 – 3.5 cm, crisped villous on both surfaces at margin or glabrous, base cordate, apex acute; cauline leaves 6 or 7, sessile, ovate to cordate,

0.7 – 3.2 × 0.4 - 3.2 cm, base cordate, semi-amplexicaul, apex obtuse or acute; proximal leaves glandular villous on both surfaces; distal leaves shortly glandular hairy on both surfaces, margin shortly glandular hairy. **Flower** 6 - 11; pedicels shortly glandular hairy. **Sepals** erect to spreading, ovate to broad, brown glandular hairy, veins 5 - 7. **Petals** yellow, obovate to broadly ovate, 5 - 7-veined, apex obtuse. **Ovary** ovoid

Flower : July – September. *Fruit*: October
*Exsiccatu*s : Bhimbase 4350 m, *SR Lepcha & AP. Das 041*, dated 16.10.2004.
Status : Less common
Local Distribution : Bhimbase, Jalepla, 2700 – 4400 m.
General Distribution : HIMALAYA (Gharwal – BHUTAN)
Note : Endemic to Himalaya.

PARNASSIACEAE S.F.Gray.

Parnassia Linnaeus

Key to the species:

1. Herbs less than 30 cm tall 2
 + Herbs more than 30 cm tall *P. nubicola*
2. Flowers white or creamy white 3
 + Flowers greenish *P. tenella*
3. Petals lanceolate; margins ciliate at base *P. chinensis*
 + Petals obovate; margins ciliate all around, except at base of claw ... *P. cooperi*

Parnassia chinensis Franch., in Bull. S. Bot. Fr. 44: 252. 1897; Hara in Fl. E. Him. 3:48. 1974; Grierson in Grierson & Long, Fl. Bhutan 1(3): 516. 1987.

Herbs annual, erect to 15 cm tall. **Radical leaves** 2 – 13 mm long, broadly ovate, cordate at base; cauline leaves smaller, usually with a few long brown hairs on margin in base. **Flowers** white or creamy – white. **Calyx** lobes 2.5 – 3.5 mm long, ovate, with brown hairs at base. **Petals** 3 – 10 mm long., obovate, ciliate or dentate at base; **staminodes** to 3.5 mm long., 3 lobed at apex.

Flower : June *Fruit*: September
*Exsiccatu*s : Serabthang 3900 m, *SR Lepcha & AP. Das 1900*, dated 15.10.2003;
 Kupup 4200m, *Sinha & Shukla 20449* dated 18.08.2006
Status : Common
Local Distribution : Nathang, Kupup, Rachel, 2700 – 3900 m
General Distribution : HIMALAYA; INDIA (NEPAL – BHUTAN), S. TIBET, N. BURMA,
 AND W.CHINA.

Parnassia cooperi Evans in Not. Roy. Bot. Gard. Edinb. 13: 172. 1921; Grierson in Grierson & Long, Fl. Bhutan 1(3): 517. 1987.

Herbs annual, erect to 22 cm tall. **Lamina** 1.5 – 4.5 cm long and broad, acute or subacute, deeply cordate at base. **Flowers** white or creamy white. **Calyx** to 8.5 mm long oblong ovate, ciliate with long brown hairs at base. **Petals** ± 13 mm long lanceolate, acuminate tapering

abruptly in lower third in to a narrow claw, margin ciliate all around except in claw; **staminodes** 3-lobed, midlobed minute; **style** to 2 mm bearing 3 branches.

Flower : June *Fruit*: September
Exsiccatus : Kupup 4250 m, *SR Lepcha & AP. Das* 2400, dated 20.08.2004.
Status : Not common
Local Distribution : Kupup, Gnathang 3900 m
General Distribution : HIMALAYA; (Sikkim – BHUTAN).
Note : Endemic to Himalaya.

Parnassia nubicola Wall. (cat.34.n.1246.1829. *nom.nud.*) ex Royle, Ill. Bot. Him. 227, t.50. 7.3. 1835; C. B. Clarke in Hook.f., Fl. Brit. India 2: 402.1879; Hara in Fl. E.Him.115.1966; Hara *et al.*, Enum Fl. Pl. Nepal 2: 156. 1979; Grierson in Grierson & Long, Fl. Bhutan 1(3): 516. 1987

Herbs upto 40 cm tall. Single leaf appears near base. Basal leaves 3 - 8; **petioles** 2.5 – 13 cm; **lamina** abaxially greenish, adaxially deep green or brown-green, elliptic or ovate-oblong, rarely oblong, 2.5 – 6.5 × 2 .5 - 3.5 cm, papery, base subcuneate, sometimes truncate, apex acute or shortly acuminate; Cauline leaves similar to basal ones but smaller, often with a few rusty brown appendages at base. **Flower**: hypanthium campanulate. **Sepals** densely brown punctate, ovate-oblong or ovate-lanceolate, ca. 6.5 × 3.5 mm, margin entire, apex obtuse. **Petals** white, purple-brown punctate, broadly ovate, 1 - 1.3cm × 7 - 13mm, margin entire or erose proximally, apex rounded. **Anthers** ellipsoid, **staminodes** flat, lamina 3-lobed lobes lanceolate or ovate-lanceolate. **Ovary** semi-inferior, ovoid; stigma 3-lobed. **Capsules** ovoid, 3- or 4-lobed. Seeds brown, oblong.

Flower : August - September. *Fruit*: September – October
Exsiccatus : Kupup - Gnathang, 4000 m, *SR Lepcha & AP. Das* 31468, dated 27.07.2008
Status : Common
Local Distribution : Kupup, Gnathang, Changu, Padamchen 2700 – 3900 m
General Distribution : AFGHANISTAN, PAKISTAN, HIMALAYAS; INDIA, NEPAL, BHUTAN.

Parnasia tenella Hook.f. & Thoms. in Joun. Linn. Soc. Bot. 2: 80. 1857; C.B. Clarke in Hook.f., Fl. Brit. India 2: 403. 1879; Grierson in Grierson & Long, Fl. Bhutan 1(3): 517. 1987.

Herbs annual, erect to 12 cm tall. **Leaves**; radical leaves upto 3 cm long; suborbicular, rounded or emarginated; deeply cordate at base; cauline leaves inserted in upper half of stem. **Flowers** greenish. **Calyx** to 3 mm long, oblong; petals to 5 mm long, obovate, dark green, minutely ciliate. **Staminodes** to 1.5 long, undivided, flattened, and suborbicular at apex; **styles** 3.

Flower : July *Fruit*: September
Exsiccata : Sherathang, *SR Lepcha & AP. Das* 2500, dated 19.07.2007.
Status : Common
Local distribution : Changu, Memenchu upto 3900 m
General distribution : HIMALAYAS; INDIA, (NEPAL – BHUTAN).
Note : Endemic to Himalaya.

ROSACEAE A.L. Jussieu

Key to the Genera:

- | | |
|--|--------------------|
| 1. Leaves simple | 2 |
| + Leaves compound | 3 |
| 2. Stipules present | 4 |
| + Stipules absent | Spiraea |
| 3. Stipules adnate to petiole | 5 |
| + Stipules free | 8 |
| 4. Leaves 3 lobed | 6 |
| + Leaves unlobed | 7 |
| 5. Prostrate or scrambling herb or shrubs | 10 |
| + Erect or rosette herb | Potentilla |
| 6. Herbs often with prickles or bristles, 1-seeded | Rubus |
| + Herbs without prickles or bristles, 2-10 seeded | Neillia |
| 7. Hypanthium tubular or obconical | 9 |
| + Hypanthium turbinate | Cotoneaster |
| 8. Deciduous tree | Sorbus |
| + Erect or spreading shrubs or creeping herbs | Rubus |
| 9. Ovary 1- celled | Prunus |
| + Ovary 2-5 celled | Sorbus |
| 10. Stem without prickles | 11 |
| + Stem bearing prickles | Rosa |
| 11. Plants stoloniferous | Fragaria |
| + Plants mat forming, without stolon | Sibbaldia |

Cotoneaster Rupp

Cotoneaster microphyllus Lindl., Bot. Reg. 13:t. 1114. 1827; Hook.f. in Fl. Brit. India 2: 387. 1879; Hara & Ohashi in Fl. E. Him.1: 119. 1966; 2: 5. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 135. 1979; Grierson & Long, Fl. Bhutan 1(3): 589. 1987. *C. congestus* Baker in Saunders, Refug. Bot. 1: t. 51. 1869; Hara & Ohashi in Fl. E. Him. 119. 1966

Local Name: Broosh Jhar (Nep.).

Shrubs annual, ramose. **Stem** racemosely branched, woody. **Leaves** simple; **petioles** to 0.35cm; **lamina** 0.50 - 1.5 x 0.25 - 0.50cm, elliptic-obovate, obtuse to subacute, base cuneate, glabrous above, appressed hairy beneath, dark green. **Flowers** solitary; calyx to 0.7cm, 5-lobed, pubescent; petals 5, suborbicular, 0.3cm, white, tinged pink; carpels adnate to calyx tube. **Fruits** 0.60 - 0.80 cm, subglobose to globose, scarlet.

Flower & Fruit : April – July

Exsiccata: : Rachela 2970 m, **SR Lepcha & AP. Das** 31281, Dated 13.09.2008

Status : Common

Local Distribution : Panglakha, Rachela, KAS, 2280 – 3100 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, S.W. CHINA

Fragaria (Tournefort) Linnaeus

Key to the species:

1. Leaflets obovate or elliptic; margins 7-14 toothed; petals white *F. nubicola*
+ Leaflets, oblong or ovate; margins 4 - 6 toothed; petals blotched reddish *F. daltoniana*

Fragaria daltoniana Gay in Ann. Sci. Nat. Ser. 4, 8:204. 1857, *e typo*; Hook.f., in Fl.Brit.India 2:345. 1878; Hara & Ohashi in Fl. E. Him. 121. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 137. 1979; Long in Grierson & Long, Fl. Bhutan 1(3): 578. 1987. *F. sikkimensis* Kurz., Jour. Asiat. Soc. Beng. 44 (3): 206. 1876.

Herbs annual, upto 7 cm tall. **Stems** usually slender, subglabrous. **Leaves** 3 lobes; **petioles** appressed pilose; **leaflets** shortly petiolulate, abaxially greenish, adaxially dark green, oblong or ovate, 1 - 2.8 × 0.5 - 2 cm, abaxially appressed pilose, adaxially subglabrous, base cuneate or oblique, margin incised serrate, 4 - 6 toothed, apex rounded or acute. **Flower** solitary, axillary; pedicel upto 4.5 cm. **Sepals** ovate, apex caudate; epicalyx segments oblong, nearly equaling calyx, apex 2 - or 3-lobed. **Petals** blotched reddish, usually suborbicular. **Stamens** and carpels many. **Fruits** red in mature, conic, ovoid, **Achenes** glabrous.

- Flower & Fruit* : June - July
Exsiccatus : Singhaney dara 2420 m, *SR Lepcha & AP. Das 31094*, dated 02.10.2004.
Status : Less Common
Local Distribution : Singhaney dara 2400 - 3500 m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, MYANMAR.

Fragaria nubicola Lindl. [in Wall., Cat. N. 1288. 1829, *nom. nud.*] ex Lacaïta in Journ. Linn. Soc. Bot. 43: 467. 1916. Hara & Ohashi in Fl. E. Him. 121: 1966; Long in Grierson & Long, Fl. Bhutan 1 (3): 578. 1987. *Fragaria vesca* var. *nubicola* Hook. f. in Fl. Brit. India 2: 344. 1879. *Fragaria vesca auct. non L.* : C.R. Rao in India for. 93: 47. 1967.

Herbs perennial prostrate with short rootstock. **Leaves** palmately 3 foliate; **Petioles** oppressed or erect spreading pale pubescent, rarely 2 additional minor leaflets; **leaflets** obovate or elliptic, lamina 2 - 4.5 x 2 - 2.5 cm, obtuse, base cuneate, sessile, margin sharply serrate with usually 7 - 14 teeth on each side, with silky whitish pubescent at lower surface. Flowers scape 1 - 3 flowered. **Calyx** cup lobes, triangular entire; epicalyxes segments elliptic lanceolate, acuminate, befid at apex. **Petals** obovate, white. **Achenes** borne on succulent red, globose.

- Flower & Fruit* : April - June
Exsiccatae : Kupup 4200 m, *SR Lepcha & AP. Das 31492*, dated 27.07.2005;
Thamey dara 2570 m, *SR Lepcha & AP. Das 31048*, dated 07.10.2004.
Status : Less Common
Local Distribution : Kupup, Hangey, Rachel 1600 - 4000 m.
General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR.

Neillia D. Don

Key to the species:

1. Leaf margins serrate; stipules serrate; stamens upto 8 - 10 *N. thirsiflora*
+ Leaf margins entire; stipules entire; stamens 22 - 25 *N. rubiflora*

Neillia thirsiflora D. Don, Prodr. Fl. Nepal 229. 1825; Hook. f. in Fl. Brit. India 2: 1. 1879; Hara & Ohashi in Fl. E. Him. 122. 1966; Grierson in Grierson & Long, Fl. Bhutan 1(3): 537. 1987.

Local Name: Jikre (Nep.)

Shrubs, erect, 1 - 3.5cm tall. **Leaves** simple, ovate; stipules ovate, to 8.3 mm, serrate; lamina 3 - 12 x 1.5 - 4.5cm, shallowly 3 lobed, base deeply cordate, margin irregularly serrate; stipules ovate, serrate. **Flower** in large compact leafy panicle or narrowly raceme, flowering shoots scaly at base and without dormant buds. **Calyx** cup broadly campanulate, with densely velutinous, often reddish. **Corolla** pink or white. **Stamens** upto 8-10, fruiting calyx cups with stalked capitate glands at base. Fruiting calyx cup bearing glands. **Seeds** 8 - 12.

Flower & Fruit : July - August

Exsiccatus : Phusrey 2120 m, **SR Lepcha & AP. Das** 20 286, dated 28.10.2004

Status : Less Common

Local Distribution : Hangey, Dohrok, 1300 - 2500 m.

General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, INDONESIA.

Neillia rubiflora D. Don, Prodr. Fl. Nepal. 122. 1825; Grierson in Grierson & Long, Fl. Bhutan 1(3): 537. 1987; Hara & Ohashi in FL. E. Him. 122. 1966.

Local Name: Jikre (Nep.)

Shrub erect upto 3 cm tall. **Leaves** simple, ovate; petiole to 2.5 cm; stipules to 1cm, entire; lamina 3 - 9 x 2 - 4.5cm, more deeply 3 lobed, base oftenly deeply cordate, margin irregularly serrate **Flower** in panicle or narrowly raceme, flowering shoots scaly at base and without dormant buds. **Calyx** cup broadly campanulate, usually with densely velutinous, often reddish. **Corolla** pink or white, **Stamens** 22 - 25. **Fruiting calyx** cups with stalked capitate glands at base.

Flower & Fruit : May - July

Exsiccatus : Rachela below 2790 m, **SR Lepcha & AP. Das** 31020, dated 07.10. 2004.

Status : Less Common

Local Distribution : Rachela, Panglakha, KAS, Changli, 2000 - 3100 m.

General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, CHINA

Potentilla Linnaeus

Key to the species:

1. Leaflets more than 4 pairs 2
- + Leaflets upto 2 pairs or (5 foliate) *P. fruticosa*
2. Corolla yellow 3
- + Corolla white to deep crimson at base *P. coraindifolia*
3. Leaflets upto 8 pairs; achenes ovoid 4
- + Leaflets more than 9; achenes obovoid *P. peduncularis*
4. Leaf margins sharply serrate *P. fulgens*
- + Leaf margins more bluntly dentate *P. polyphylla*.

Potentilla coraindifolia D. Don, Prodr. Fl. Nep. 232. 1825; Grierson & Long Fl. Bhutan 1(3): 573. 1987. *Potentilla meifolia* Wall. ex Lehm., Pugill. 3: 29 (1831).

Herbs with thick with persistent leaves remain. **Leaves** pinnate upto 11cm long; lateral leaflets 4 – 9 pairs, deeply pinnatisect, segments linear, sparsely pubescent. **Flower** upto 5, corymbs on peduncles upto 13cm. **Calyx** lobes upto 4mm long. **Corolla** obovate, emarginated, white to deep crimson at base. **Achenes** oblong – ellipsoids.

Flower & Fruit : July - August

Exsiccatae : Bhimbase 4400 m, *SR Lepcha & AP. Das 30940*, dated 27.07.2005;
Baba Mandir 3700m, *SR Lepcha & AP. Das 0151*, dated 22.07.2003.

Status : Less Common

Local Distribution : Kupup, Bhimbase, Nathang 2300 – 4500 m.

General Distribution : E. HIMALYA; INDIA, NEPAL, BHUTAN, CHINA

Potentilla fruticosa L., Sp. Pl. 495. 1753; Hook. f. in Fl. Brit. India 2: 347. 1879; Hara *et al.* Enum. Fl. Pl. Nepal 2: 139. 1987. *Dasiphora fruticosa* (L.) Rydb. In Mem. Dept. Bot. Columbia Univ. 2: 188. 1898. *Potentilla arbuscula* D. Don var. *rigida* (Wall. ex. Lahm.) Wolf, Mongr. Pot. 57. 1908; Murata in Fl. E. Him. 122: 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 139. 1979; Grierson & Long, Fl. Bhutan 1 (3): 565. 1987. *Potentilla nepalensis* D. Don., Prodr. Fl. Nepal 229. 1825. *non.* Hook. 1824.

Local Name: Chariya phal (Nep.)

Shrubs perennial upto 2 m tall. **Leaves** pinnately 5 – foliate or 2 pairs; **leaflets** elliptic 4 - 13 x 4 - 5.5mm, acute or obtuse, apiculate, base rounded, margin entire, sparsely or densely silky pubescent on both surfaces; stipules ovate - lanceolate, brown scarious. **Flowers** solitary, terminal on lateral shoots. **Calyx** cup often reddish, lobes ovate, epicalyxes segment elliptic. **Corolla** obovate, rounded, yellow. **Achenes** conical or ovoid, white pilose.

Flower & Fruit : May – August

Exsiccatae : Kupup 4180 m, *SR Lepcha & AP. Das 31425*, dated 27.07.2005;
Lam-pokhri below 4390 m, *SR Lepcha & AP. Das 30997*, dated 27.07.2005.

Status : Less Common

Local Distribution : Lampokhri, Kupup, Donkyala 3000 – 4200 m.

General Distribution : INDIA, NEPAL, BHUTAN, CHINA.

Potentilla fulgens Wall. ex Hook. in B. Meg. 53: t. 2700. 1826. Lehm., Rev. Pot. 54. 1856; Hook. f. in Fl. Brit. India 2: 349. 1879; Murata in Fl. E. Him. 125. 1966; 2: 53. 1971; Hara *et. Al.* Enum. Fl. Pl. Nepal 2: 140. 1987. *Potentilla siemersiana* Lehm., [Ind. Sem. H.B. Hamburg 8: 182], *nom. nud.*]. *Potentilla fulgens* var. *intermedia* Hook.f. in Fl. Brit. India 2: 350. 1878; Grierson & Long, Fl. Bhutan 1 (3): 571. 1987.

Herbs perennial, erect spreading upto 50cm tall, usually with whitish hairy. **Leaves** interrupted pinnate, 5 – 22 cm; larger **leaflets** 4 - 8 pairs, **lamina** usually narrowly obovate to elliptic, 1 - 3.5 x 1 - 3cm, obtuse, base cuneate or rounded, margins sharply serrate, pubescent sparsely and in veins usually impressed above, thick silvery white sericeous beneath; **stipules** of basal leaves ovate lanceolate, brown; stipules of cauline leaves similar leaflets. **Flowers** in corymbose cymes. **Calyx** lobes ovate, sericeous. **Corolla** obovate, rounded yellow. **Achenes** ovoid, glabrous.

- Flower & Fruit* : June - August
Exsiccatae : Neora pathak 2750 m, *SR Lepcha & AP. Das* 20271 dated 28.10.2004
 Bhimbase 4400 m, *SR Lepcha & AP. Das* 31462, dated 27.07.2005.
Status : Less Common
Local Distribution : Bhimbase, Neora pathak 1600 – 4800 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, W.CHINA.

Potentilla peduncularis D. Don, Prodr. Fl. Nepal 230. 1825: Hook. f. in Fl. Brit. India 2: 351. 1879; Murata in Fl. E. Him. 124. 1966; Hara *et al.*, Enum, Fl. Pl. Nepal 2: 140 1979; Grierson & Long, Fl. Bhutan 1(3): 571. 1987. *Potentilla velutina* Wall., Cat. 28, n. 1016. 1829, *nom. nud.*
Potentilla pedumularis var. *obscura* Hook. f. in Fl. Brit. India 2: 352. 1879.

Herbs perennial, rosette with their woody rootstock 50 cm tall . **Leaves** mostly regularly pinnate, oblong or oblanceolate, 7 - 18cm; lateral leaflets 9 - 21 pairs; **lamina** oblong elliptic, 1 - 2.5 x 1.5 – 2cm, ± obtuse, base rounded or cuneate, margins serrate, sparsely pubescent above, oftely with white sericeous beneath ; stipules ovate-lanceolate, brown. **Flowers** usually 2 - 6; + coymbose, borne on almost leafless peduncle. **Calyx** lobes ovate. **Petals** obovate, rounded, yellow. **Achenes** obovoid, glabrous.

- Flower & Fruit* : June – July
Exsiccatae : Lampokhri 4390 m, *SR Lepcha & AP. Das* 30945, dated 24.07.2005;
 Kupup tiger hill 4400m, *SR Lepcha & AP. Das* 31414, dated 27.07.2005.
Status : Less Common
Local Distribution : Kupup, Lampokhri, Donkyala 3000 – 4600 m.
General Distribution : E.HIMALAYA, INDIA, NEPAL, BHUTAN, S.E. TIBET, W.CHINA.

Potentilla polyphylla Wail. [Cat. 28, n. 1026. 1829, *nom. nud.*] ex Lehm., Pugil. 3: 13. 1831; Hara *et. al.* Enum. Fl. Pl. Nepal 2: 141. 1979; Grierson & Long, Fl. Bhutan 1(3): 572. 1987;
Potentilla monniana Wight. Ic. Pl. India Dr. 1.t. 233. 1839; Hook. f. in Fl. Brit. India 2: 349, 1879; Murata in Fl. E. Him. 124. 1966. *Potentilla polyphylla* B. barbata Lehm., 1: c. 53. 1856.
Potentilla sordida Klotzsch in B. Reise Pr. Waldem. t. 9. 1862.

Herbs perennial spreading upto 55 cm. **Stem** with pilose hairy slightly silky when young. **Leaves** leaflets similar; stipules of basal leaves usually ovate-lanceolate; larger leaflets usually in 4 - 8 pairs; **lamina** broadly obovate to elliptic, 0.5 - 3.5 x 1 - 2.5cm, obtuse, base cuneate or rounded, margins more bluntly toothed, green and sparsely pubescent leaflets similar; **Flowers** in corymbose cymes. **Calyx** lobes ovate sericeous. **Corolla** ovate, rounded, yellow. **Achenes** ovoid glabrous.

- Flower & Fruit* : June - August
Exsiccatae : Bhimbase 4380 m, *SR Lepcha & AP. Das*, 30946, dated 24.07.2005.;
 Kupup 4100 m, *SR Lepcha & AP. Das*, 30996, dated 24.07.2005.
Status : Less Common
Local Distribution : Donkyala, Bhimbase, Lampokhri 2700 – 4600 m.
General Distribution : INDIA, NEPAL, BHUTAN, SRI LANKA

Prunus Linnaeus

Key to the species:

1. Flowers in corymbs or fascicles; Drupes ellipsoid or oblong,..... *P. cerasoides*.
 + Flowers in racemes usually on new shoot; Drupe ovoid..... *P. napaulensis*

Prunus cerasoides D. Don, Prodr. 239. 1825; Brittonia 4: 89. 1941; Journ. Jap. Bot. 51: 9. 1976; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 141. 1979; Grierson & Long, Fl. Bhutan 1(3): 540. 1987. *Cerasus puddum* Seringe in DC., Prodr. 2: 537. Nov. 1825; Hara & Ohashi in Fl. E. Him. 125. 1996. *Prunus puddum* (Wall.) Roxb. *ex* Brandis, For. Fl. Ind. 194. 1874; Hook.f. in Fl. Brit. India 2:314. 1879.

Local Name: Painyun (Nep.).

Tree robust, deciduous upto 22 m tall. Bark dark-brown, often peel off in strips. **Leaves** simple; stipules linear-lanceolate; petioles to 1.8 cm, usually with 1-3 glands at tip; lamina 4 - 16 x 3.3 - 6.3 cm, ovate-oblong elliptic, or ovate-lanceolate, margin serrate, shortly acuminate, base truncate or rounded, lateral nerves 7 - 12 on either half. **Flowers** in corymb or fascicles 1-3 flowered, pink, slightly fading to white. **Calyx**-tube to 1.5 cm long, campanulate, lobes ovate, acute. **Petals** to 1.3 cm long, obovate; **stamens** many; ovary glabrous; style exerted. **Drupes** ellipsoid or oblong, yellow or rarely red.

Flower & Fruit : October – January

Exsiccatus : Panglakha below 2600 m, *SR Lepcha & AP. Das* 2025, 15.08.2004.

Status : Frequent.

Local Distribution : 1600 – 2400 m.

General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Note : The twigs and branches are used for making many household tools.

Prunus napaulensis (Seringe) Steud., Nom. Bot. ed 2, 2: 403. 1841; Hook.f., in Fl. Brit. India 2: 316. 1879; Hara in Fl. E. Him. 126. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 142. 1979; Grierson & Long, Fl. Bhutan 1(3): 540. 1987. *Cerasus napaulensis* Ser., in DC., Prodr. 2: 540. 1825.

Local Name: Arupatey (Nep.).

Trees upto 23 m tall. **Leaves** simple, alternate; petioles to 1.5 cm; lamina narrowly elliptic-lanceolate, 3 – 7.8 x 1 – 3.7 cm, finely serrate, acute to short acuminate, base rounded or subcordate, upper surface glabrous; lower glaucous, lateral vein axils with or without hair-tufts. **Flowers** in racemes usually on new shoot, elongate, leafy at base, 6 - 11 cm long; rachis pubescent beneath. **Flowers** to 1.2 cm across, white. **Calyx** green, gray-pubescent, 5-lobed, teeth to 0.13 cm long, obtuse-sub-acute. **Petals** 5, to 0.38 cm, obovate; **stamens** many; anthers brown; filament whitish; carpel 1. **Drupes** ovoid, seeds not seen.

Flower : April – May *Fruit:* May – August

Exsiccatus : Neora pathak 2750 m, *SR Lepcha & AP. Das* 22795, dated 17.10. 2004.

Status : Common

Local Distribution : Rachela Chowk, Neora pathak 2200 – 2800 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, CHINA, MYANMAR.

Rosa Linnaeus

Rosa sericea Lindl., Monogr. Rosa 105, t. 12. 1820; Hook. f. in Fl. Brit. India 2: 367. 1879; Hara & Ohashi in Fl. E. Him. 127. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 143. 1947; Grierson & Long, Fl. Bhutan 1(3): 586. 1987. *R. tetrsepala* Royle III. Bot. Him. 23. 1833. *nom. nud.*

Shrubs erect upto 5m, stems naked or sometime with paired or scattered broad prickles. **Leaves**

2 – 8 cm; leaflets 6 - 12 (17); lamina oblong or usually narrowly ovate 1- 2.5 x 1.5 - 2cm, acute or rounded base cuneate, margins usually serrate near apex, or sometime entire, usually pubescent above, densely sericeous beneath. Flowers solitary on short lateral shoots. 5-merous. Calyx tube turbinate, lobes lanceolate, + obovate long and broad. Style free. Fruits obovoid or sub-globose orange-red.

- Flower & Fruit* : April – June
Exsiccatae : Kupup 3970 m, **SR Lepcha & AP. Das 31436**, dated 27.07.2005;
 Rachela 2990 m, **SR Lepcha & AP. Das 31053**, dated 08.10.2004;
 Changu 4000 m, **SR Lepcha & AP. Das 146**, dated 23.07.2006.
Status : Less Common
Local Distribution : Rachela, Kupup, Changu 2000 – 4600 m.
General Distribution : INDIA, NEPAL, BHUTAN, TIBET, CHINA, MYANMAR.
Note : Flowers used medicinally; fruit edible.

Rubus Linnaeus

Key to the Species:

- | | |
|--|-------------------------|
| 1. Stems creeping; leaves 3- 5 foliate | 2 |
| + Stems erect; leaves 3 – 11 foliate | 3 |
| 2. Petals white | <i>R. calycinus</i> |
| + Petals pink | <i>R. pectinaroides</i> |
| 3. Leaves simple, rarely lobed. | 4 |
| + Leaves compound | 5 |
| 4. Panicles with long spreading branches; Bracts with linear teeth. | <i>R. paniculatus</i> |
| + Panicles narrow; bracts with linear teeth | 6 |
| 6. Stems and petioles glandulars- bristly | <i>R. treutleri</i> |
| + Stems and petioles eglandular | 7. |
| 7. Leaf-lobes acute | <i>R. reticulatus</i> |
| + Leaf-lobes rounded or subacute | <i>R. rugosus</i> |
| 5. Leaflets with 8- 12 lateral veins | 8 |
| + Leaflets with 25 – 50 pairs of lateral veins | 9 |
| 8. Calyx lobes to 13 mm long; petals greenish white | <i>R. lineatus</i> |
| + Calyx lobes to 6 mm; petals red | <i>R. thomsonii</i> |
| 9. Leaves pinnately 3 foliate | 10 |
| + Leaves pinnate, leaflets 5 – 11 | 13 |
| 10. Leaflets elliptic or obovate, rounded | <i>R. ellipticus</i> |
| + Leaflets ovate, acute or acuminate | 12 |
| 12. Stipules linear entire. | <i>R. sikktimensis</i> |
| + Stipules ovate, lanceolate | <i>R. wardii</i> |
| 13. Leaves 3 foliate; margins coarsely serrate; petals red | <i>R. hypargyrus</i> |
| + Leaves 5, 7 or 9 foliate ; margins sharply serrate; petals pink | <i>R. niveus</i> |

Rubus calycinus Wall. ex. D. Don. Prodr. Fl. Nepal 235: 1825; Hook. f., in Brit. India 2: 237. 1879; Hara & Ohashi in Fl. E. Him. 128. 1966; Hara *et al.* Enum. Fl. PL. Nepal 2: 144. 1979; Long in Grierson & Long. Fl. Bhutan 1(3): 549. 1987. *Rubus lanatus* Wall., Cat. 22, n. 737. 1829, *nom. nud.*

Herbs, perennial, creeping woody stems, usually with hirsute and with scattered slender prickles. **Leaves** simple, cordate-orbicular to reniform, apex rounded, base oftenly deeply cordate, unlobed or shallowly lobed, margins denticulate, hirsute on veins, of slender prickles on veins beneath; petiole usually prickly and hirsute. **Stipules**, broadly ovate serrulate. **Flowers** 2 -3 erect. **Flowering** braches sub-erect, bearing 1 - 4 leaves. **Pedicels** prickly. **Calyx** lobes green, ovate, obtuse. **Corolla** white, obovate. **Fruits** red, globose.

Flower : April - May
Exsiccatus : Panglakha 2900 m, *SR Lepcha & AP. Das 30894*, dated 30.07.2004.
Status : Less Common
Local Distribution : Nathang, Panglakha 2100 - 3500 m
General Distribution : HIMALAYAS; INDIA, (NEPAL-Arunachal Pradesh), Meghalaya, Manipur, N. MYANMAR, W. CHINA.

Note : Fruits edible.

Rubus ellipticus Smith in Rees, Cyclop. 30: no.16. 1819; Hook.f. in Fl. Brit. India 2: 336. 1878; Hara & Ohashi in Fl. E. Him. 129. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 144. 1979; Long in Grierson & Long, Fl. Bhutan 1(3): 557. 1987.

Local Name: *Ainselu* (Nep.).

Shrubs, bushy, branches stout, pubescent with flexuous stiff brown hairs to 0.5 cm; prickles deflexed, scattered. **Leaves**; stipules to 0.5 cm, linear; petioles upto 6 cm, densely pubescent; leaflets 3, pinnate, **lamina** 2.5 - 10 x 3 - 9 cm, terminal one larger, elliptic-obovate to suborbicular, serrate, obtuse or subacute, base rounded, dark green and glabrate above, pale and thinly pubescent beneath along distantly prickled mid-nerve, veins thick and prominent beneath. **Panicles** both terminal and axillary, many flowered. **Calyx** cup bristly, segments 5, ovate, acute, entire, persistent, softly pale pubescent. **Petals** larger than sepals, obovate, white. **Drupe** succulent and sweet, orange-yellow.

Flower : December Fruit: March - May
Exsiccatus : Subhaney 1900 m, *SR Lepcha & AP. Das 03004*, dated 14.08.2006
Status : Abundant
Local Distribution : Subaney, Rigu, Lingtam upto 2000 m,
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, SRI LANKA, MYANMAR, INDO-CHINA.

Note : Fruits sweet and edible.

Rubus hyperigyus Edgew., Tr. Linn. Soc. 20: 45. 1846; Long in Grierson & Long, Fl. Bhutan 1 (3): 559. 1987. *R. pedunculatus* var. *hypargyus* (Edgew.) Kitam., F. & Fl. Nep. Him. 158. 1955.

Shrubs, scrambling upto 3m, with leafy shoots, scattered prickles, pubescent. **Leaves** 3 foliate, ; leaflets ovate, terminal to 2 - 9 x 2.5 - 5 cm, acuminate, base rounded or cuneate, margins often doubly serrated, pubescent above, white tomentose - almost glabrous beneath, terminal petiolules to 18 mm. **Flowers** solitary or 2 - 5 in short axillary racemes; pedicles to 2 cm. **Calyx** cup usually with few prickles, lobes lanceolate to 13 mm, subulate apex. **Corolla** pinks or white, obovate to 7mm. **Fruits** red or orange, drupelets 30 - 60, pubescent.

Flower & Fruit : June - August
Exsiccatus : Panglakha m, *SR Lepcha & AP. Das 31082*, dated 13.09.2008.

Status : Less Common
Local Distribution : Rachela, Jorepokri, 2600 – 3600 m.
General Distribution : E. HIMALAYA; INDIA,
Note : Endemic to Eastern Himalaya.

Rubus lineatus Reinw. in Blume, Bijdr. 1108. 1826; Hook. f. in Brit. India 2: 333. 1879; Hara & Ohashi in Fl. E. Him. 130. 1966; Hara *et al.*, Enum. Fl. PL. Nepal 2: 145. 1979; Long in Grierson & Long, Fl. Bhutan 1 (3): 555. 1987.

Shrubs scrambling upto 3.5m, usually eglandular; **Stem** with few prickles or unarmed; branch lets sericeous whitish. **Leaves** pedately 5-foliolate, but sometime 3 to 7 foliolate; petiole unarmed or prickly rarely with few prickles at base leaflets terminal elliptic - oblanceolate, lamina 7 - 12 x 2 - 4.5cm acuminate, base oftenly cuneate, margins serrated sharply, white sericeous beneath, lateral veins 23 - 48 pairs, midrib rarely with few prickles at base; **Stipules** ovate, entire. **Flowers** few in short axillary clusters or cymes. **Calyx** lobes triangular, acuminate, entire. **Corolla** greenish white. **Fruits** red.

Flower : July – August *Fruit*: September – October
Exsiccatus : Singhaney 2500 m, **SR Lepcha & AP. Das 30214** Dated. 23.10.2010
Status : Less Common
Local Distribution : 2100 – 4300 m
General Distribution : AFGHANISTAN, E. HIMALAYA; INDIA, (NEPAL-BHUTAN),
Assam, MYANMAR, CHINA, MALAYSIA.
Note : Dried root used to cure food poisoning. Stem used for fencing.

Rubus niveus Thunb., Diss. Rubo. 7 & 9, f. 3. 1813; Hook.f. in Fl. Brit. India 2: 335. 1872; Hara & Ohashi in Fl. E. Him. 130. 1966; 2: 58. 1971; Hara *et al.*, Enum. Fl. PL. Nepal 2: 146. 1979; Long in Grierson & Long, Fl. Bhutan 1(3): 560. 1987. *Rubus lasiocarpus* Smith in Rees Cyclop. 30: Rubus n. 6. 1819. *Rubus pinnatus* D. Don., Prodr. Fl. Nep. 234. 1825. *Rubus rosaeiflorus* Roxb, Fl. Indica ed. 2, 2: 519. 1832. *Rubus nikeus* var. *pauciflorus* (Wall ex Lindl.) Focke, in Bibl. B. 17. (Ht. 72): 183. 1911.

Shrubs reddish shorts with white and scattered recurved prickles, oftenly eglandular. **Leaves** pinnate, petiole oftenly prickly, usually 5, 7 and 9 foliolate, **lamina** of leaflets usually ovate rarely lanceolate or elliptic, 2.5- 5.5 x 0.5 - 4cm, sub-acute or acute, base narrowly rounded, margins sharply serrate, sub glabrous, white tomentose and veins beneath; stipules linear lanceolate. **Flowers** upto 25 in terminal, rarely in axillary corymbs. **Calyx** white tomentose, not prickly, lobes ovate, shortly acuminate. **Corolla** pink, fruit red, becoming bleakish when ripe.

Flower : April – May.
Exsiccatae : Thamey dara 2400m, **SR Lepcha & AP. Das 30222**, dated 06.10.2004;
Padamchen 2600 m, **SR Lepcha & AP. Das 30999**, dated 27.07.2005;
Nathang 3840 m, **SR Lepcha & AP. Das 30897**, dated 30.07.2005.
Status : Less Common
Local Distribution : Dorok, Thamey dara, Nathang 2000 – 3900 m
General Distribution : AFGHANISTAN HIMALAYAS; (Kashmir-Sikkim), S. INDIA,
MYANMAR, INDO-CHINA, MALAYSIA.

Rubus paniculatus Smith in Rees, Cyclop. 30: Rubus n. 40. 1819; Hook f. in Fl. Brit. India 2: 329. 1879; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 146. 1979; Hara *et al* in Fl. E. Him 1:131. 1966; Long in Grierson & Long Fl. Bhutan 1 (3): 552. 1987.

Shrubs climbing, stems with scattered small recurved prickled; branch-lets tomentose creamy white. **Lamina** ovate, shallowly 2 - 4 lobed on each side, 9 - 15 x 4 - 10cm usually acuminate, base deeply cordate on lower leaves, truncate on uppermost leaves, margin serrate, lateral veins 6-8 pairs, pubescent above, white tomentose beneath; petiole prickly or not; stipules oblong-lanceolate. **Flowers** in broad tomentose. **Bracts** lanceolate, laciniate with lanceolate teeth. **Calyx** lobes triangular, entire, sericeous. **Corolla** white, oblong.

var. paniculatus

Leaves abaxially persistently tomentose, margin coarsely serrate.

- Flower* : June – November
Exsiccatae : Neora Pathak 2740m, *SR Lepcha & AP. Das 31217*, dated 13.09.2008;
Deorali dara 2290m, *SR Lepcha & AP. Das 30231*, dated 06.10.2004;
Chitray 2680 m, *SR Lepcha & AP. Das 31012*, dated 02.10.2004.
Status : Less Common
Local Distribution : Singhaney, chitray, Hangey, Rachela 2100 – 3200 m
General Distribution : HIMALAYAS; INDIA (Rajori-Sikkim), Meghalaya.
Note : Endemic to Himalaya

Rubus pectinaroides H. Hara, J. Jap. Bot. 47: 111. 1972; Long in Grierson & Long, Fl. Bhutan 1(3): 549. 1987.

Herbs, creeping. **Stem**, slender flexus bristles, pubescence. **Leaves** alternate simple, cordate orbicular to reniform, apex rounded, base cordate, shallowly lobed, margin denticulated,; **stipules** ovate oblong, lamina 4.5 x 8 x 2.5 x 6mm, apex serrate. **Flower** nodding. **Calyx** lobes purple, entire, rarely 3 – 5 toothed. **Corolla** deep pink.

- Flower & Fruit* : July - September
Exsiccatus : Nathang 3780 m, *SR Lepcha & AP Das 30894*, dated 30.07.2005.
Status : Less Common
Local Distribution : Rachila, Jorepokri , 2500 - 3800m.
General Distribution : E. HIMALAYA; INDIA, BHUTAN.
Note : Endemic to Eastern Himalaya.

Rubus reticulatus Wall. ex Hook.f. in Fl. Brit. India. 2: 331. 1879; Long in Grierson & Long Fl. Bhutan 1 (3); 554. 1987; Hara & Ohashi in F.E.Him. 1:131.1966

Shrubs scandent upto 1.2 cm tall. **Leaves** simple; petiole 3.5 – 8 cm, gray, soft hairs, stipules pectinately lobed; **lamina** ovate to suborbicular, 10 – 15 x 9 – 15 cm, palmately 5-veined, lateral veins 5 – 7 pairs, abaxially densely hairs along veins, cordate, margin distinctly 5-lobed, lobes apically acute or ± obtuse, unevenly densely serrate. **Flower** terminal, axillary ; **bracts** elliptic, margin entire, tomentose, soft hairy. **Calyx**, broadly ovate, margin entire, apex acuminate. **Corolla** white or yellowish white, obovate to suborbicular. **Stamens** many, glabrous; filaments linear. **Fruits** red, globose.

- Flower* : July – August *Fruit:* September – October
Exsiccatae : Panglakha 2300m, *SR Lepcha & AP. Das 23716*, dated. 27.11.2003;
Tungya 2190 m, *SR Lepcha & AP. Das 30234*, dated 06.10.2004.
Status : Less Common
Local Distribution : Rachela, Panglakha, Tungya 2200 – 3800 m
General Distribution : HIMALAYA; INDIA, (Kumaon - Sikkim)
Note : Endemic to Eastern Himalaya

Rubus rugosus Smith in Rees, Cyclop. 30: Rubus n. 34. 1819; Hara & Ohashi in Fl. E. Him. 3: 53. 1975; Hara *et al.*, Enum. Fl. PL. Nepal 2: 146. 1979; Long in Grierson & Long, Fl. Bhutan 1(3): 554. 1987. *Rubus rugosa* Buch.-Ham. ex D. Don., Prodr. Fl. Nep. 234. 1825. *Rubus hamiltonianus* Seringe in DC., Prodr. 2: 566. 1825, p.p. *Rubus molucanus auct. non L.*: Hook. f. in Fl. Brit. India 2: 330. 1879, p.p.

Shrubs, large scrambling, stems with brownish pubescent, with recurved prickles, eglandular. **Leaves** alternate smaller; **lamina** 7 - 11 X 5-11cm, lobes rounded or sub-acute, margins crenate-serrate; **Stipules** smaller, early caduceous **Flower** clusters dense; pedicels short. **Calyx** lobes upto 10mm, entire or minutely toothed at apex.

Flower : June – November

Exsiccata: : Bara Ramitey 2500m, **SR Lepcha & AP. Das 31012**, dated 02.10.2004; Rachela below 2750 m, **SR Lepcha & AP. Das 31079**, dated 08.10.2004.

Status : Less Common

Local Distribution : Rachela, Panglakha, Subaney, Bara Ramitey 1400 – 2900 m.

General Distribution : C. & E. HIMALAYAS, Assam, Meghalaya, W. Ghats, Nilgiris, MYANMAR, MALAYSIA.

Rubus sikkimensis Hook.f. in Fl. Brit. India. 2: 336. 1878; Long in Grierson & Long .Fl. Bhutan 1(3): 558. 1987.

Shrubs upto 2 m tall. **Stem** densely covered with slender straight prickles and gland tipped bristle. **Leaves** alternate, 3 foliate, leaflets white, pubescent, white tomentose at lower surface, glandular upper surface. **Flower** solitary or paired. **Calyx** cup glandular – prickly, lobes ovate, usually pubescent, caudate acuminate. **Corolla** red, pink.

Flower : July

Exsiccatus : Chitray 2690 m, **SR Lepcha & AP. Das 31139**, dated 03.10.2004.

Status : Less Common

Local Distribution : Rachela, Jorepokri, Chitray 3000 – 3650 m.

General Distribution : E. HIMALAYA; INDIA(Sikkim), BHUTAN.

Note : Endemic to Eastern Himalaya

Rubus treutleri Hook.f. in Fl. Brit. India 2: 331. 1879; Hara & Ohashi in Fl. E. Him. 3: 53. 1975; Long in Grierson & Long, Fl. Bhutan 1 (3): 554. 1987.

Local Name: Thalumboo

Shrubs, scrambling or climbing. Stem, branchlets, with bristles and prickles. **Leaves**; petiole to 6cm, covered with soft hairs. sub orbicular, lamina 5 – 13 x 4 – 12 cm, base cordate, lobed broadly avute, serrate, pubescent above; **Flowers** in racemes, **Calyx** lobe ovate, to 14 mm, 3 -5 toothed at apex, tomentose with bristle and prickles. **Corolla** to 11 mm, pink. **Fruits** many drupelets.

Flower & Fruit : June – August

Exsiccatus : Panglakha 2850 m, **SR Lepcha & AP. Das 03017**, Dated. 18.09.2005

Status : Less Common

Local Distribution : Rachela, Jorepokri, 2500 – 3700 m.

General Distribution : E. HIMALAYA; INDIA (Sikkim), NEPAL, BHUTAN. W. CHINA

Note : Endemic to Eastern Himalaya

Rubus thomsonii Focke, Abh. Nat. Ver. Bremen 4: 198. 1874; Hook.f., in Fl. Brit. India 2: 332. 1878; Hara *et al.*, Fl. E. Him. 132. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 147. 1979; Long in Grierson & Long Fl. Bhutan (3): 556. 1987.

Shrubs small, scrambling. **Stem** with slender prickles 0.2 - 0.3 cm. **Stipules** segments linear; petioles 1.2 - 3 cm; petiolules very short; leaflets 3; **lamina** 3.5 - 9 x 1.6 - 3 cm, ovate, terminal one much bigger, serrate-doubly serrate, acute to acuminate, base narrow cuneate, sparsely pubescent above, glabrous and glassy beneath. **Calyx** lobes lanceolate, entire, eglandular. **Corolla** red. Fruit drupelets, pubescent.

Flower : August *Fruiting*: October
Exsiccatus : Panglakha 2300m, *SR Lepcha & AP. Das* 25900 dated 09.07.2010
Status : Less Common
Local Distribution : Rachel, Jorepokri, Panglakha 2200 - 3050 m.
General Distribution : E. HIMALAYA; INDIA (Sikkim), NEPAL, BHUTAN.
Note : Endemic to Eastern Himalaya

Rubus wardii Merr. in Brittonia 4: 84. 1941; Hara in Journ. Jap. Bot.47: 142. 1972; Hara & Ohashi in Fl. E. Him. India 3: 53. 1972; Long in Grierson & Long, Fl. Bhutan 1(3): 559. 1987.

Shrubs, trailing or scrambling. **Stem**, with scattered prickles. **Leaves**; pinnate 3 foliate, leaflets terminal rhombic obovate, to 11 x 4 - 8 cm, apex caudate acuminate, base rounded; margin lobed, glandular or pubescent on both surface; stipule ovate, lanceolate, hairy. Flowers solitary, axillary; pedicels to 7cm. **Calyx** to 2 cm in diam. prickly, lobe ovate caudate or lanceolate, pubescent or glandular. **Corolla** white, orbicular to 13 mm. Fruits globose, red, numerous drupelets.

Flower & Fruit : May - July
Exsiccatus : Neora Pathak 2720m, *SR Lepcha & AP. Das* 2900, dated 13.10.2007
Status : Less Common
Local Distribution : Rachel, Jorepokri, Singhaney 2400 - 3100 m.
General Distribution : E. HIMALAYA (Darjeeling-Sikkim), S.E. TIBET, N. MYANMAR, W. CHINA.

Sibbaldia Linnaeus

Key to the species:

1. Leaflets oblong - obovate; flower in 5-merous, 3-10+ sub-umbellate *S. cuneata*
+ Leaflets obovate - cuneate; flower solitary or in pairs *S. perpusilla*

Sibbaldia cuneata Hornem. ex Kuntze in Linnaea 20: 59. 1847; Hara & Ohashi in Fl. E. Him. 132. 1966; Hara *et al.* Enum, Fl. Pl. Nepal 2: 147. 1979. *Sibbaldia parviflora* Edgew. in Trans. Linn. Soc. 20: 44. 1846; Grierson & Long, Fl. Bhutan 1(3): 575. 1987. *Potentilla sibbaldi* Hook.f. in Fl. Brit. India 2: 345. 1879.

Herbs perennial upto 12cm tall. Branches usually covered by leaf remains. **Leaves** 3-foliate; **leaflets** usually oblong-obovate, 1 - 2.5 x 0.5 - 2 cm, apex truncately 3 fid, base cuneate or rounded, sparsely pilose beneath; **stipules** linear-lanceolate. **Flowers** normally in 5-merous, 3-10+ sub-umbellate, peduncles, usually lengthening in fruit. **Calyx** lobes ovate, epi-calyx segment linear-lanceolate. **Petals** yellow, narrowly obovate. **Stamens** usually 5, rarely 10. **Achenes** ovoid, glabrous.

- Flower & Fruit* : May – October
Exsiccatae : Kupup 4120 m, *SR Lepcha & AP. Das* 31444, dated 27.07.2005;
 Dokala 3950 m, *SR Lepcha & AP. Das* 32956, 15.08.2005.
Status : Less Common
Local Distribution : Dokala, Kupup, 3300 – 4500 m.
General Distribution : C. ASIA; RUSSIA, AFGHANISTAN, PAKISTAN, INDIA, NEPAL,
 BHUTAN, CHINA

Sibbaldia perpusilloides (W.W. Sm.) Hand.-Mazz., Symb. Sin. 7: 520. 1933; Grierson & Long, Fl. Bhutan 1(3): 576. 1987. *Potentilla perpusilloides* W.W. Sm., Rec. Bot. Surv. Ind. 4: 188. 1911.

Herbs robust slender with many persistent dead leaves. Stem to 6cm. **Leaves** 3-foliolate; petiole to 5mm; **leaflets** obovate – cuneate to 8mm, fid at apex, densely silky pubescent; lamina 1 - 2.5 x 0.5 - 2cm, apex truncately 3 fid, late. **Flower** solitary or in pairs or sessile, unisexual, 4 merous. limb to 5mm in diam. **Calyx** pale yellow, **Stamens** 4. **Achenes** 3 – 4

- Flower & Fruit* : May – October
Exsiccatas : Dokala 3970 m, *SR Lepcha & AP. Das* 30908, dated 24.07.2005.
Status : Less Common
Local Distribution : Kupup, Bhimbase, Dokala 4000 - 4800m.
General Distribution : E. HIMALAYA; INDIA Sikkim, E. NEPAL, BHUTAN and W. CHINA .

Sorbus Linnaeus

Key to the species:

1. Leaflets oblong 2
 + Leaflets oblong-elliptic, elliptic-obovate 3
 2. Stipules ovate or suborbicular *S. arachnoidea*
 + Stipules ovate or lanceolate *S. foliolosa*
 3. TreeS more-than 5 m tall 4
 + Shrub or small tree less than 5 m tall *S. microphylla*
 4. Leaf lateral veins 6-11 pairs; margins crenate-serrate *S. cuspidata*
 + Leaf lateral veins 10 -15 pairs; margins serrulate *S. griffithii*

Surbus arachnoidea Kochner, Feddes Repert. 10: 514 9 .1912. Long in Grierson & Long. Fl. Bhutan 1(3): 597. 1987.

Tree up to 10 m tall. **Leaves** pinnate 13-18cm; rachis winged, glabrous; leaflets 7 – 9 pairs, pale green beneath, oblong, apex acute, mucronate, base obliquely cuneate, margin serrate in above, sessile, brownish pubescent, on veins lower surface; stipules leafy persistent, ovate or suborbicular, entire or serrate, glabrous. **Flowers** in large corymbs, to 8cm in diam., numerous flowers; pedicel brown tomentose. **Calyx** lobe triangular, to 3-mm. **Corolla** white or pink, ovate, to 3 mm. **Stamens** pinkish. **Styles** 5 free, **Fruits** globose, pink.

- Flower* : May – July
Exsiccatas : Kupup – Bhimbase 4230 m, *SR Lepcha & AP. Das* 30979, dated 27.07.2005.
Status : Common

Local Distribution : Kupup, Bhimbase, Lampokhri, 3000 – 4300 m.
General Distribution : EASTERN HIMALAYA; INDIA, BHUTAN
Note : Endemic to Eastern Himalaya.

Sorbus cuspidata (Spach) Hedlund in Kong. Svenska vet-Akad. Handl. 35. 89. 1901; Hara & Ohashi in Fl. E. Him. 133:1966; 2: 60. 1971; Hara *et. al.*, Enum, Fl. Pl. Nepal 2: 147. 1979; Long in Grierson & Long, Fl. Bhutan 1(3): 595. 1979. *Crataegus cuspidata* Spach. Hist. Nat. Veg. 2: 106. 1834. *Pyrus crenata* auct. non D. Don. Lindl. in B. Reg. 20: t. 1655. 1835. *Sorbus crenata* C. Koch. Dendr. 1: 196. 1869.

Trees deciduous upto 12 m tall. **Leaflets** elliptic, occasionally obovate, never doubly, crenate-serrate, **lateral veins** 6-11 pairs. Flower cymes corymbose. Corolla woolly within; fragrant; pedicel white tomentose. **Calyx** tube funnel shaped, tomentose, lobes lanceolate. **Fruits** orange or yellow, globose.

Flower & Fruit : April – May
Exsiccatu : Changu – Kupup 3550 m, *SR Lepcha & AP. Das* 2786, dated 13.08.2005

Status : Less Common

Local Distribution : Changu, Kyongnosla 2500 - 3200 m.

General Distribution : HIMALAYAS, INDIA (Gharwal – Sikkim) NEPAL, BHUTAN.

Note : Endemic to Eastern Himalaya

Sorbus foliolosa (Wall.) Spach. Hist. Nat. Veg. 2: 96. 1834; Hara & Ohashi in Fl. E. Him. 133: 1966; 2: 61. 1971; Hara *et. al.*, Enum, Fl. Pl. Nepal 2: 148. 1979; Long in Grierson & Long, Fl. Bhutan 2(3): 138. 1979. *Pyrus foliolosa* Wall., Pl. As. Rar. 2: 81, t. 189. 1831, p.p. Hook. f. in Fl. Brit. India 2: 376. 1879. p. p. *S. himalaica* Gabelian in B. Zhurn. s.s.s. R. 56: 658. t. 1-2. 1971.

Trees 5 - 10cm tall. **Leaves** brown on branch-let usually stout; stipules upper leaves ovate or lanceolate; petioles and rachises narrowly winged; **leaflets** oblong, proportionately longer and narrower, 23 - 42 x 5 - 12mm, mucronate or shortly acuminate; stipules of upper leaves ovate or lanceolate, bifid or sharply serrate into cuspidate teeth; petioles and rachises narrowly winged. **Corolla** white or creamy, rarely pinkish. **Fruit** upto 7 mm, white or flushed with pink.

Flower & Fruit : May – June
Exsiccatae : Changu 3960 m, *SR Lepcha & AP. Das* 152, dated 10.09.2003; Padamchen – Pangalakra 2800 m, *SR Lepcha & AP. Das* 20237, dated 28.10.2004; RamiteyDara 2700 m, *SR Lepcha & AP. Das* 31182, dated 05.10.2004.

Status : Less Common

Local Distribution : Changu, Padamchen, Ramitey Dara 2500 – 4000 m.

General Distribution : E. HIMALAYAS; INDIA((Sikkim), NEPAL, BHUTAN

Note : Endemic to Eastern Himalaya

Sorbus griffithii Rehder in Sargent, Pl. Wilson. 2: 277. 1915; Long in Grierson & Long. Fl. Bhutan 1(3): 595. 1987. *Pyrus griffithii* (Decaisne) Hook. f. in Fl. Brit. India 2: 377. 1879.

Trees to 15 m tall. **Leaflets** obovate elliptic, oblong elliptic, 12 - 20 x 6 - 10mm, base cuneate, margins regularly serrulate ; white tomentose beneath, prominent on veins, glabrous above, lateral veins 10 -15 pairs; petiole densely white tomentose. **Flowers** in corymbs, woolly, **Calyx** tubes white tomentose, woolly outside. **Corolla** white, obovate. Style 2. **Fruits** globose, upto 2 seeded.

Flower : April. – May.
Exsiccatus : Zeluk 3200 m, **SR Lepcha & AP. Das 31982**, dated 10.10.2004.
Status : Not common
Local Distribution : Zeluk, Nathang, Changu, 3500 – 2700 m.
General Distribution : EAST HIMALAYA; INDIA, BHUTAN. \

Note : Endemic to Eastern Himalaya

Sorbus microphylla Wenzing in Linnaea 38: 76. 1873; Hara & Ohashi in Fl. E. Him. 133: 1966; 2: 61. 1971; 3: 53. 1975; Hara *et al.* Enum, Fl. Brit. India 2: 148. 1979; Long in Grierson & Long, Fl. Bhutan 1(3): 597. 1987. *Pyrus microphylla* Wall. [Cat. 20, n. 676. 1828, *nom. nud.*] ex Hook. f., in Fl. Brit. India 2: 376. 1879.

Shrub or small tree to 3 – 4 m tall. **Leaves** brown on short lateral shoots, pinnate, rachis winged and usually glandular; **leaflets** usually 9-12 pairs, oblong elliptic, 12 - 20 x 6 - 10mm, acute or mucronate, base obliquely rounded, sessile, margins sharply serrate almost to base; pubescent or glabrous on white to pale brown on surfaces; stipules subulate, lanceolate or bifid. **Flowers** in corymbs upto 8 cm across, 15 - 50 flowered; pedicels brownish pubescent. **Calyx** lobes broadly triangular. **Petals** rose pink or white tinged pink. **Stamens** pinkish. Style 5. **Fruits** globose, white, or pink.

Flower : April. – May.
Exsiccatae : Changu 3890 m, **SR Lepcha & AP. Das 021**, dated 10.09.2003; Dokala 3960 m, **SR Lepcha & AP. Das 30976**, dated 27.07.2005.
Status : Common
Local Distribution : Changu, Dokala, 3000 – 4500 m.
General Distribution : E.HIMALAYAS; INDIA (Sikkim), and W. CHINA

Spiraea Linnaeus

Key to the species:

1. Leaves base cuneate, margin coarsely double serrate *S. micrantha*
 + Leaves base attenuate or sub-sessile, margin entire or rarely teeth near apex .. *S. canescens*

Spiraea canescens D. Don, Prodr. Fl. Nep. 227. 1825; Hook.f.in Fl. Brit. India 2: 325. 1879; Grierson in Grierson & Long, Fl. Bhutan 1(3): 535. 1987. *Spiraea cuneifolia* Wall. ex Cambess., in Jacquem., Voy. 4 (Bot.): 47, t. 57. 1835.

Shrubs upto 5 m, branched, twigs ribbed Leaves elliptic – oblanceolate, 0.6 – 5 x 0.3 – 0.6cm obtuse or sub acute, base attenuate, sub-sessile, margin entire or rarely teeth near apex, glabrous in upper surface, pubescent beneath. **Flowers** in corymbs to 3 cm. Calyx to 6mm, pubescent lobes c 1.5mm. **Corolla** obovate, 2 - 2.5 x 4 mm, white or pink. Follicles pubescent, immersed in calyx cup.

Flower & Fruit : May – June
Exsiccatus : Kyongnosla 3600m, **SR Lepcha & AP. Das 112**, dated 17.08.2005.
Status : Less Common
Local Distribution : Changu, Kyongnosla, Zeluk, 2600 – 3600 m.
General Distribution : INDIA, NEPAL, BHUTAN., TIBET.
Note : Endemic to Eastern Himalaya

Spiraea micrantha Hooker f. in Fl. Brit. India 2: 325. 1879; Hara & Ohashi in Fl. E. Him. 134: 1966; Hara *et al.*, Enum. Fl. PL. Nepal 2: 149. 1979; Grierson in Grierson & Long, Fl. Bhutan 1 (3): 534. 1987. *S. japonica* var *himalaica* Kitamura in Act. Phytotax, Geobot. 15: 160. 1954.

Shrubs rhizomatous, stems, simple, sparsely fine pubescent. Leaves ovate-lanceolate lamina 3-13 x 1.5 – 6 cm, gradually acuminate, base usually cuneate, margin usually coarsely double serrated. **Flowers** in terminal corymbs **Diocious**; flowers in terminal corymbs; panicle usually 6-18 cm broad. **Corolla** white or pink; follicles pubescent, immersed or from **calyx** cup few seeded.

Flower & Fruit : May – June
Exsiccatus : Changu 4100 m, **SR Lepcha & AP. Das** 240, dated 17.98.2005.
Status : Less Common
Local Distribution : Kyongnosla , Changu, 2200 – 3800 m.
General Distribution : E. HIMALAYA (NEPAL – BHUTAN) INDIA (Khasia and Manipur).
Note : Endemic to Eastern Himalaya

Order: Fabales

MIMOSACEAE R. Brown

Key to the Genera:

1. Straggling undershrubs, very sensitive; fruits jointed *Mimosa*
+ Erect trees; not sensitive; fruits not jointed *Albizia*

Albizia Duraz

Albizia lebbek (L.) Benth. in Hooker, Lond. Jour. Bot. 3: 87. 1844; Baker in Hook.f., Fl. Brit. India 2: 298. 1879; Hara in Fl. E. Him. 136. 1966; 2: 61. 1971; Ohashi in Hara *et al*, Enum. Fl. Pl. Nepal 2: 104. 1979; Clement in Grierson & Long, Fl. Bhutan 1(3): 644. 1987. *Mimosa lebbek* L., Sp. Pl. 516. 1753.

Local Name: Sundyong kung (Lep.), *Siris* (Nep.).

Trees 20- 30m tall, deciduous. **Leaves** ; Leaf rachis glandular at the base and apex, glands few, oval; pinnae 2 - 4 pairs, leaflets upto 16 pairs; leaves lamina 3 – 4. 8 x 1.5 – 3.7 cm, oblong to ovate, asymmetric, glabrous to thinly pubescent beneath, pale-green. **Flowers** in solitary axillary with many flowered, or many in lines forming terminal raceme. **Calyx** 0.22 - 0.4 cm, pubescent. **Corolla** 0.5 - 0.75cm, segmented to middle; **stamens** greenish-white. Pods 12 - 25 x 3.5 – 4.8 cm; seeds upto 15, suborbicular.

Flower & Fruit : April – December.
Exsiccatus : Mulkharka 1400 -1600 m, **SR Lepcha & AP. Das** 01400, dated 20.13.2004.
Status : Frequent
Local Distribution : Mulkharka, Phusrey below, 600 - 1400 m.
General Distribution : TROP. HIMALAYAS; INDIA, SRI LANKA, S.E. ASIA, CHINA.
Notes : Used for fuel-wood, timber and planted for shades.

Mimosa Linnaeus

Mimosa pudica L., Sp. Pl. 1, 518 1753; Ohashi in Hara Fl. E. Him. 1: 159. 1966. Clement in Grierson & Long, Fl. Bhutan 1(3): 639. 1987.

Local Name: Nyom-uuk muuk (Lep.), *Bhuwari Jhar* (Nep.).

Herbs or undreshrubs straggling and sensitive due to turgor pressure. **Branches** covered with bristles. Stem prickly. **Stipules** linear-lanceolate, margin bristly; **leaves** sensitive deflated on touching, pinnae 4, digitate, to 7.5 cm long; **leaflets** 11-19 pairs, to 1.5 cm long, narrowly oblong acute, adpressed bristly beneath; peduncles covered with spreading bristle. **Flower** heads axillary, to 1.5 cm across. **Flowers** pink or white; **stamens** 4, exerted. **Pods** to 3 cm long, prickly along the sutures, joints usually 3-5.

Flower & Fruit : July – October

Exsiccatus : Mulkharka – Haticherey 1500 m, *SR Lepcha & AP. Das 01500*, dated 20.03.2004.

Status : Common

Local Distribution : Mulkharka, 600 – 1300 m.

General Distribution : Native of Tropical AMERICA, but now Pnatropic .

FABACEAE Lindley (*nom. alt.*)

PAPILIONACEAE Giseke (*nom. alt.*)

Key to the Genera:

1. Leaves 3- foliate 2
+ Leaves bipinnate or odd pinnate *Astragalus*
2. Annual or perennial herbs 4
+ Shrub or trees with stem and branchlet armed..... *Erythrina*
4. Pod 1 or few seeded *Trifolium*
+ Pod 8 - 20 seeded *Parochetus*

Astragalus Linnaeus

Astragalus donianus DC., Prodr.2: 283. 1825; Baker in Hook.f., Fl. Brit. India 2: 119. 1876; Charter in Enum. Fl. Pl. Nepal 2: 106. 1979; Grierson & Long in Fl. Bhutan 1(3): 719. 1987. *A. pycnorhizus* Wall. ex Benth. in Royle, Ill. Bot. Him. 199. 1835; Hara in Fl. E. Him. 160. 1966.

Herbs prostrate or ascending, glabrous upto 20 cm tall. **Leaves** to 4cm; leaflets 8 - 15, obovate oblong, 2.2 - 3.5 x 2 - 3mm , emarginated, base rounded, pubescent beneath, stipules oavt. **Flowers** 1 -2 on peduuncles. **Calyx** divided into middle into ovate – acuminate teeth. **Corolla** brownish purple, suborbicular. **Ovary** pubescent. **Pods** oblong, inflated, subsessile, acuminate at apex into fine sting 12- 15 seeded.

Flower : June

Fruit: August

Exsiccatus : Changu 3800 m, *SR Lepcha & AP. Das 2779*, dated 15.09.2006.

Status : Rare

Local Distribution : Changu, above Panglakha 2130 – 4400 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL, Sikkim).
Note : Endemic to Eastern Himalaya

Erythrina Linnaeus

Erythrina arborescens Roxb., Fl. India ed. 3:256. 1832; Baker in Hook.f., Fl. Brit. India 2: 190. 1876; Hara in Fl. E. Him. 1: 156. 1966; 3: 63. 1975; Hara & Ohashi in Enum.Fl. Pl. Nepal 2: 120. 1979; Grierson & Long, Fl. Bhutan (3): 684. 1987.

Local name: Jasey Kung (Lep.), Phaledo (Nep.).

Trees deciduous to 23 m tall, spiny in stem and branches. **Leaves** pinnately 3-foliolate; petioles, often spiny; leaflets **lamina** 7 - 18 x 5 - 19 cm, broadly ovate, acute to shortly acuminate, base slightly cordate or rounded, pubescent in lower surface. **Stipules** usually, lanceolate. **Flowers** in axillary racemes to 35 cm long. Peduncles to 30 cm. **Calyx** to 1.3 cm, campanulate, slightly truncate, hairy; ovate-elliptic, orange-scarlet; wings oblong; keel upto 2.3 cm, white. **Pods** oblong-ellipsoid, slightly narrowed towards end; seeds few to 5, blackish.

Flower : September *Fruit*: October - January
Exsiccatus : Mulkharka 1350 m, **SR Lepcha & AP. Das** 2781, dated 20.10.2004
Status : Frequent.
Local Distribution : Premlakha, Padamchen, 1200 – 2460 m.
General Distribution HIMALAYAS; INDIA, (Kumaon-BHUTAN), MYANMAR, CHINA.
Note : Planted near fields for fencing.

Parochetus Hamilton

Parochetus communis Buch.-Ham. ex D. Don, Prodr. Fl. Nep. 240. 1825; Baker in Fl. Bri. India 2: 86. 1876; Hara in Fl. E. Him. 1: 160.1966; Kitamura in Enum. Fl. Pl. Nepal 2: 127. 1979; Grierson & Long Fl. Bhutan 1(3): 728. 987.

Herbs perennial runner. Stem slender rooting from nodes. **Leaves** palmately trifoliolate; stipules to 0.5 cm, lanceolate; petioles to 8 cm, glabrous; leaflet **lamina** 0.7 – 2 x 0.7 – 2.5 cm, broadly obovate, emarginate or crenate, entire, base cuneate, glabrous above, pubescent beneath, lateral nerves 3-5 pairs. **Bracts** linear, basally connate. **Flowers** solitary, axillary, 1.3 cm long. **Calyx** campanulate, to 0.8 cm, 5-toothed, teeth unequal, bluish-purple, whitish beneath, broadly obovate, longer than wings; **stamens** (9)+1. **Pods** linear, greenish, glabrous; seeds rounded.

Flower : March. - September. *Fruit*: July- November.
Exsiccatae : Singhaney 2450 m, SR Lepcha & AP Das 27769, dated 30.09.2004;
Dohrok above 2350 m, **SR Lepcha & AP Das** 20284, dated 13.09.2005.
Status : Abundant
Local Distribution : Singhaney, Dohrok, 1600 - 2400m.
General Distribution : SUBTROPICAL TO ALPINE HIMALAYAN RANGES; INDIA (Sikkim), NILGIRI, SRI LANKA, MYANMAR, JAVA, ETC.

Trifolium Linnaeus

T. repens L., Sp. Pl. 718. 1753; Baker in Fl. Brit. India 2: 86.1879; Grierson & Long Fl. Bhutan 1(3): 731. 1987

Herbs annual or perennial to 80cm tall. **Stem** appressed, pubescent, prostrate. **Leaves** pinnately or digitally 3 foliate; petioles to 181cm long; **leaflets** elliptic or obovate, lamina 2 – 4 x 1 – 2 cm., obtuse or acute, base cuneate, margin denticulate, glabrous above. **Flowers** heads sessile, among upper leaves. **Calyx** tube to 4mm, teeth triangular or lanceolate, lowest one longest. **Corolla** to 2cm, narrow purplish pink. **Pod** to 4mm, 1 seeded.

Flower : May – August
Exsiccatu : Rachela 2700 m, *SR Lepcha & AP Das*, 2780, dated 15.10.2006
Status : Not common
Local Distribution : upto 2700 m.
General Distribution : Native to N AFRICA, SW ASIA, and EUROPE, CHINA.

CAESALPINIACEAE R. Brown

Bauhinia L.

Bauhinia vahlii Wight et Arnt., Prodr. 297. 1834; Baker in Fl. Brit. India 2:279. 1878; Hara in Fl. E.Him. 1:141. 1966; 3:57. 1957. 1975; Hara & Ohashi Enum. Fl. Pl. Nepal 2: 108. 1979; Grierson & Long Fl. Bhutan 1(3):634. 1987.

Local Name: Bharla (Nep.).

Liana, brown pubescent young shoot; tendrils circinate, in opposite pairs. **Petioles** to 2.5 cm long; **lamina** 10 - 17 x 16 - 24 cm, suborbicular, entire, lobed at apex, lobes rounded or obtuse, base cordate, pubescent, basally 10-13 nerved. **Flowers** in corymbose terminal, many-flowered. **Bracteoles** acuminate. **Peduncles** long to 13 cm, terate. **Calyx** 2 lobed, slender, pubescent. **Corolla** obovate, whitish, with distinct midvein, pubescent outside; fertile stamens 2 or 3; **anthers** red; ovary shortly stalked; style coiled. **Pods** to 28 cm long, oblong, brownish; seeds upto 12, oblong. brown.

Flower : April - July *Fruit*: November - January
Exsiccatu : Mulkharka below 1250 m, *SR Lepcha & AP. Das* 2782, dated 20.10.2004.
Status : Common.
Local Distribution : Mulkharka, Lingtam above 700 – 2100 m.
General Distribution : HIMALAYA; INDIA (Assam, Bihar, W. Peninsula), (Kumaon-BHUTAN)

Order: Proteales

ELAEAGNACEAE A. Jussieu

Key to the Genera:

1. Plant monoecious bearing silvery, yellow, brown scales; fruit drupelike *Elaeagnus*
+ Plant dioecious without scales; Fruit globose or elliptic berry *Hippophae*

Elaeagnus Linnaeus

Elaeagnus conferta Roxb., Fl. Ind. ed. Carey. 1:460. 1820; Hara in Fl.E.Him.1: 216. 1966; Clement in Grierson & Long, Fl. Bhutan 2(1): 214. 1991. *E. arborea* Roxb., Fl. Ind. ed. Carey 1: 461. 1820; *E. latifolia sensu* Fl. Brit. India 5: 202. 1890, p.p. non L.

Local Name: Mallero (Nep.).

Shrubs straggling. Branches often thorny. **Leaves** simple, alternate.; petiole to 1.2 cm long; elliptic-lanceolate, lamina 7 - 13 x 2 - 4 cm, entire to slightly repund, shortly acuminate, base narrow and rounded, glabrous, light brown above, silvery white in lowers surface with scattered scales, uncostate, nerves prominent, impressed in upper surface; pedicels upto 0.7 cm long. **Inflorescence** in axillary clusters of 2 - 5. **Tepals** tube constricted above the ovary, lobes ovate and spreading; **stamens** 4, inserted within tepal throat; **filaments** short; style inserted, hairy. **Drupes** ellipsoid.

Flower & Fruit : February - April.

Exsiccatus : Phusrey 2190 - 2280 m, *SR Lepcha & AP. Das 1005*, dated 15.09. 2006

Status : Rare.

Local Distribution : Hangey, Rigu, Premlakha 1800 - 2600 m.

General Distribution : SUBTROPICAL AND TEMPERATE HIMALAYAS; INDIA, CHINA, NEPAL, MYANMAR, MALAYSIA.

Note : Use in making pickles.

Hippophae Linnaeus

Hippophae rhamnoides L., Sp. Pl. 1023. 1753; Clement in Grierson & Long, Fl. Bhutan 2(1): 216. 1991.

Shrubs, deciduous, upto 3 m tall. **Leaves** linear oblong, slightly narrower lamina, 2.5 - 5.5 x 0.2 - 0.6 cm, margin revolute, lower surface whitish including midrib. **Flowers** grouped at base of lateral shoot. **Male flowers** to 4 mm, anther to 3 mm. **Female flowers** to 2.2 mm. **Fruits** elliptic, 7 x 5 mm.

Flower & Fruit : February - April.

Exsiccatus : Nathula 4500 m, **FIDE, SMITH, W.W. (1913)**. The Alpine and Sub-alpine vegetation of South-Eastern Sikkim. Rec.Bot. Surv. India 4(7): 323-431.

Status : Rare.

Local Distribution : Nathula 1800 - 2600m.

General Distribution : INDIA (Sikkim, Kashmir).

Order: Myrtales

SONNERATIACEAE Engler et E.F. Gilg

Duabanga Buchanon-Hamilton

Duabanga grandiflora (Roxburgh ex DC.) Walpers, Repert. 2: 114. 1843; JAA 48: 96. 1967; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 287. 1991. *Lagerstoemia grandiflora* Roxb. ex DC., Mem. Soc. Hist. Nat. Geneve 32:84. 1826. *Duabanga sonneratioides* Buch.-Ham. in Trans. Lin. Soc. 17: 177-178. 1835; C.B. Clarke in Fl. Brit. India 2: 579. 1879.

Local Name: Lampatey (Nep.).

Trees robust, upto 28 m tall. Branches drooping. **Leaves:** petioles to 0.53 cm; **lamina** ovate-oblong, 13 - 33 x 5.5 - 13 cm, acuminate, base cordate, dark green above, pale beneath, veins conspicuous beneath and parallel. **Inflorescence** terminal corymbs and drooping, with 4 - 22 flowered; pedicels to 2.5 cm, stout. **Flowers** actinomorphic, bisexual, with pungent odour. **Calyx**-cup 2 - 3 cm across; funnel-shaped, tubular base adnate to ovary-base, lobes triangular, greenish. **Corollas** free, obovate, stamens numerous, inserted on calyx tubes; anthers versatile; ovary superior; style to 8cm; stigma capitate; ovules many and axile. **Capsules** subglobose, 6 - 8 valved; seeds many.

Flower & Fruit : December - April

Exsiccatus : Haticherey - Lower Phusrey 1700m, **SR Lepcha & AP. Das** 1507, dated 10.10.2007.

Status : Frequent

Local Distribution : Southern boundary of PWS, upto 1700 m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, CHINA, MYANMAR, MALAYSIA.

Note : Used as a timber wood.

ONAGRACEAE A.L. Jussieu

Key to the Genera :

1. Petals 2, sepals 2, stamens 2 *Circaea*
+ Petals 4, sepals 4, stamens 8 *Epilobium*

Circaea Linnaeus

Key to the species/ variety:

1. Plants minutely pubescent; leaf elliptic ; apex acute *C. alpina* ssp. *angustifolia*
+. Plants thickly pubescent; leaf ovate ; apex acuminate *C. alpina* ssp. *micrantha*

Circaea alpina ssp. *angustifolia* (Hand. -Mazz.) Boufford, Ann. Missouri Bot. Gard. 69: 910. 1983; Boufford in Grierson & Long, Fl. Bhutan 2(1): 314. 1981. *Circaea imaicola* (Ascherson & Magnus) Hand. -Mazz. var. *angustifolia* Hand. -Mazz., Symb. Sin. 7: 603. 1933.

Herbs 10 - 40cm tall. Stem thickly pubescent. **Leaves lamina** 1.5 - 5.5 × 0.8 - 3.5cm, elliptic, broadly trullate, or ovate, rarely broadly ovate, base narrowly to broadly cuneate, margin shallowly denticulate, apex acute. Inflorescence simple or with lateral racemes at base, glabrous or pubescent, ; pedicels glabrous or, rarely, sparsely pubescent with short glandular hairs. **Flowers** opening during or after elongation of raceme and ± widely spaced, with a setaceous bracteole at base; ovary with hairs; **hypanthium** to 0.4 mm. **Calyx** broadly to broadly ovate or oblong-ovate, apex rounded to obtuse. **Corolla** white or pink, narrowly to broadly obovate, corolla lobes rounded, truncate, or minutely crenulate. **Fruits** with purple hairs.

Flower : July. - September. *Fruit*: August - November
Exsiccatus : Panglakha 2780m, **SR Lepcha & AP. Das** 27726, 30.07.2004.
Status : Less Common.
Local Distribution : Padamchen, Nathang, Bombay hill (KAS), 2300 - 3600 m.
General Distribution : AFGHANISTAN, HIMALAYA; INDIA Khasia, CHINA, and FORMUSA.

Circaea alpina ssp. *micrantha* (A.K. Skvortsov) Boufford, Ann. Missouri Bot. Gard. 69: 959. 1983; Boufford in Grierson & Long, Fl. Bhutan 2(1): 314. 1981. *Circaea micrantha* A.K. Skvortsov, Byull. Glavn. Bot. Sada (Moscow) 103: 36. 1977.

Herbs upto 30 cm tall. Stem glabrous or minutely pubescent. **Lamina** narrowly ovate to broadly triangular, 2 - 5.5 × 0.4 - 5 cm, base cordate, less often truncate, margin sharply dentate to serrate, apex shortly acuminate. **Inflorescence** a simple raceme or with 1 or 2, rarely more, densely to sparsely pubescent with glandular hairs; flowering pedicel 1 erect, glabrous or glandular pubescent. **Flower** buds glabrous; ovary glabrous or rarely with minute uncinata hairs at anthesis; **hypanthium** reduced to absent to 0.6 mm. **Sepals** ovate to broadly ovate to oblong ovate, apex rounded. **Petals** white or pink, obtriangular to obovate, lobes truncate to rounded

Flower : June- November
Exsiccatus : Changu 4000 m, **SR Lepcha & AP. Das** 32921, dated 29.10.2004.
Status : Less common
Local distribution : Changu, KAS, Padamchen. 2000 - 4000 m.
General distribution : INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Epilobium Linnaeus

Key to the species:

- | | |
|--|-----------------------|
| 1. Herbs less than 40 cm tall | 2 |
| + Herbs more than 50 cm tall | 3 |
| 2. Herbs erect | 4 |
| + Herbs slender | <i>E. clarkeanum</i> |
| 4. Stems with scales; stigma clavate rarely capitate | <i>E. cylindricum</i> |
| + Stems without scales; stigma capitate | <i>E. royleanum</i> |
| 3. Plant annual | 5 |
| + Plants perennial | <i>E. roseum</i> |
| 5. Leaf lamina ovate to elliptic oblong | 6 |

- + Leaf lanceolate- ovate lanceolate *E. tibeticum*
- 6. leaf glabrous to strigilose at margins and veins *E. sikkimensis*
- + Leaf with stiffly hairy at margins and veins *E. wallichianum*

Epilobium clarkeanum Hausskn., Monog. Epil. 220, t. 9, f. 53. 1884; Boufford in Grierson & Long, Fl. Bhutna 2(1): 321. 1991. *E. alpinum non L.*, C.B. Clarke in Hook.f., Fl. Brit. India 2: 586. 1879.

Herbs sender upto 18 cm tall. Stem with leafy with scales at base, less branched, appressed stiffly hairy. Leaves sessile or shortly petioled to 0.20cm long; **lamina** 1 - 1.5 x 0.3 - 1cm, ovate to elliptic, obscurely serrulate, obtuse to subacute, cuneate or subrounded, both surfaces almost glabrous, veins appressed stiffly hairy; pedicel to 0.3cm. **Hypanthium** tubular and hairy ring within. **Sepals** to 0.25 x 0.2 - 0.13 cm, keeled. **Petals** to 0.7 x 0.4 cm, light red or white, apical notched; **ovary** stiffly hairy; stigma subcapitate. **Capsules**; seeds obovoid, reticulate, papillose.

- Flower* : August *Fruit*: October
- Exsiccatus* : Rachela below 2870m, **SR Lepcha & AP. Das** 2790, dated 18.09. 2005.
- Status* : Rare
- Local Distribution* : Rachela Middle 2200 - 2900 m.
- General Distribution* : HIMALAYAS; INDIA (Sikkim - BHUTAN)
- Note* : Endemic to Himalaya

Epilobium cylindricum D. Don, Prodr. Fl. Nep. 222. 1825; Hara in Fl. E. Him. 224. 1966; Kitamura in Enum. Fl. Pl. Nepal 2: 174. 1979; Boufford in Grierson & Long, Fl. Bhutan 2(1): 317. 1991. *E. roseum* var. *cylindricum* (D. Don) C.B. Clarke in Hook.f., Fl. Brit. India 2: 585. 1879.

Herbs erect to 30 cm, much branched. Stem glabrescent or thinly appressed stiffly hairy. **Leaves** shortly petiolate; **lamina** 1- 2 x 0.3 - 0.8 cm, narrowly lanceolate, serrulate, acute, attenuate, subglabrous except nerves. **Flowers** axillary. **Sepals** to 0.5 x 0.17 cm, with appressed stiff hairs. **Petals** to 0.6 x 0.1 - 0.38 cm, rose; **ovary** appressed hairy; **stigma** clavate or capitate. **Capsules** fruiting pedicel elongated; seeds obovoid, papillose.

- Flower* : June *Fruit*: October
- Exsiccatus* : Rachela below 2400 m, **SR Lepcha & AP. Das** 2791, dated 18.09. 2005.
- Status* : Not common
- Local Distribution* : Rachela Middle 2000 - 2800 m.
- General distribution* : HIMALAYAS; AFGANISTAN, INDIA, NEPAL, BHUTAN, TIBET, W. CHINA.

Epilobium roseum Schreber, Spicil. Fl. Lips. 147. 1771. C.B. Clarke in Hook.f., Fl. Brit. India 2: 584. 1879.

Herbs erect, perennial. Stems to 50 cm tall, simple, or branched, strigillose, with glandular hairs throughout upper stem. **Leaves** sessile or petioles to 10 mm; **lamina** of cauline leaves elliptic to oblong or lanceolate to narrowly ovate, 2.5 - 5.5 x 0.5 - 2 cm, subglabrous, base cuneate to

rounded or subcordate, margin denticulate with 9 - 40 teeth per side, apex acute. **Inflorescence** and flowers erect. **Sepals** to 5 mm. **Petals** pink to rose-purple; stigma clavate to subcapitate, entire. **Capsules** to 5 cm, glandular pubescent, Seeds dark brown.

Flower & Fruit : June – August
Exsiccatus : Kupup –Gnathang 4200 m, *SR Lepcha & AP. Das* 32925. dated 13.10.2004.
Status : Less Common.
Local Distribution : Changu, KAS, Padamchen. 2000 – 3900 m.
General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, SW ASIA, RUSSIA, KAZAKHSTAN, EUROPE

Epilobium royleanum Hausskn. in Oesterr. Bot. Zeitschr. 29: 55. 1879; Boufford in Grierson & Long, Fl. Bhutna 2 (1): 318. 1991. *E. roseum* var *indicum* Clarke in Fl. Brit. India 2: 584. 1879. *E. roseum* var *dalhousieanum* Clarke in Fl. Brit. India 2 :584. 1879.

Herbs erect or ascending upto 25 cm tall. Stem with scales, simple or branched above, appressed stiffly hairy, rarely subglabrous. **Leaves**; petiole to 0.40 cm, lamina slightly clasping, 1 - 3 x 0.2 -0.70 cm, narrowly ovate to lanceolate, serrulate with 13 - 16 teeth on each side, acute, attenuate to cuneate, appressed hairy along margin beneath, lateral nerves not distinct. **Flower** erect, hypanthium elongated, hairy within. **Sepals** 4, basally connate. **Petals** 4, rose-purple; **ovary** stiffly appressed pubescent; **stigma** subcapitate. **Capsules** hairy; seeds obovoid, papillose.

Flower : August *Fruit* : November
Exsiccatus : Neora pathak 2750m, *SR Lepcha & AP. Das* 2792, 18.09.2005.
Status : Common
Local Distribution : Neora Pathak, Rachel Middle 1800 - 2800 m.
General Distribution : TEMPERATE HIMALAYAS.
Note : Endemic to Himalaya.

Epilobium sikkimense Hausskn., Oesterr. Bot. Z. 29: 52. 1879. Raven in BBMB 2(12): 372. 1962; Hara *et al.*, Fl.E.Him. 2:175.1979; Grierson & Long Fl. Bhutan 2(1): 320. 1991. *Epilobium alsinifolium* auct. Non vill.; C.B. Clarke in Hook.f., Fl. Brit. India 2: 586.1879,p.p.

Herbs annual, erect. Stems upto 60 cm tall, sometimes branched. **Leaves** sessile and slightly clasping above, lower ones rarely with very short petioles 1.5 – 3 mm; cauline blade ovate to elliptic or oblong, narrower below, **lamina** 1.8 - 8.5 × 1 - 3.5cm, glabrous except for sparsely strigillose margin and midvein, base broadly cuneate or rounded, margin serrulate with 10 - 35 teeth per side, apex subobtusate to acute. **Inflorescence** and flowers nodding to suberect. **Corolla** pink to rose-purple, 7-1

Flower : July - August. *Fruit*: August - September
Exsiccatus : Bhimbace 4350 m, *SR Lepcha & AP. Das* 31140, dated 30.10.2004.
Status : Less Common.
Local Distribution : Bhimbace, Kupup, Lampokhri. 4000 – 4600 m.
General Distribution : HIMALAYA; INDIA (Gharwal – BHUTAN) S. TIBET, N. BURMA, and W. CHINA.

Epilobium tibetacum Hausskn. in Oesterr. B. Z. 29: 54. 1879; Boufford in Grierson & Long, Fl. Bhutan 2(1): 319. 1991.

Herbs annual, erect much-branched upto 60 cm tall. **Leaves** lanceolate to narrowly oblanceolate, acute at apex, serrulate along margins. **Inflorescence** a spike. **Flowers** pink to rose purple, rarely white. **Capsule** to 6.5 mm long, cylindric. Seeds \pm 1.3 mm obovoid, reticulate, tuft of hairs dull white, prone to detach.

Flower : June *Fruit* : September
Exsiccatus : Kupup lake 4230 m, **SR Lepcha & AP. Das** 32924, dated 29.10. 2004.
Status : Less Common.
Local Distribution : Bhimbase, Kupup. 4100 – 4400 m.
General Distribution : E. HIMALAYA; INDIA (NEPAL to BHUTAN)
 Note : Endemic to E. Himalaya.

Epilobium wallichianum Hausskn. in Oesterr. B. Z. 29: 54. 1879; Hara in Fl. E. Him. 1: 224. 1966; Boufford in Grierson & Long, Fl. Bhutan 2(1): 320. 1991. *Epilobium tetragonum* auct. Non L.: C.B. Clarke in Fl. Brit. India 2: 586. 1879, p.p.

Herbs annual, sub-erect leafy to 65 cm tall. **Leaves** oblong elliptic, obtuse or acute at apex, subcordate to broadly cuneate at base, sparsely stiffly hairy on veins and margins. **Inflorescence** nodding. **Flowers** 4 – 13 mm long, pink to rose- purple. **Capsules** to 8mm long, cylindrical stiffly hairy and glandular ; **seed** obovoid, papilose.

Flower : June *Fruit* : October
Exsiccata : Kupup lake 4250 m, **SR Lepcha & AP. Das** 32923, dated 29.10. 2004.
Status : Less Common.
Local Distribution : Bhimbase, Kupup, Gnathang 4000 – 4400 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL – BHUTAN) S. TIBET, Khasia, Naga Hills, and W. CHINA.
 Note : Endemic to E. Himalaya.

MELASTOMATACEAE A.L. Jussieu

Key to the Genera :

- | | |
|---|---------------------|
| 1. Herbs or shrubs with 4-angled stem | 2 |
| + Shrubs with terete stem | 3 |
| 2. Leaf with white crystalliferous cells at base of hairs | <i>Osbeckia</i> |
| + Leaf without crystalliferous cells at base of hairs | <i>Sarcopyramis</i> |
| 3. Petals 5, stamen 10, ovary 5-celled | <i>Melastoma</i> |
| + Petals 4, stamens 8. ovary 4-celled | <i>Oxyspora</i> |

Melastoma Linnaeus

Key to the species:

- | | |
|--|-------------------------|
| 1. Shrubs upto 4 m tall; fruits subglobose | <i>M. normale</i> |
| + Shrubs upto 6 m tall; fruits truncate | <i>M. malabathricum</i> |

Melastoma malabathricum L., Sp. Pl. ed. 1(1): 390. 1753 -*ut malabathrica* C.B. Clarke in Hook.f., Fl. Brit. India 2: 523. 1879; Hara & Ohashi in Fl. E. Him. 221. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 170. 1979; Clement in Grierson & Long, Fl. Bhutan 2(1): 296. 199.

Local Name: Chulasi (Nep.).

Shrub, upto 4m tall. Juvenile plant with densely appressed hairy. **Stem** and petiole strigose and with subulate-echinate scales. **Leaf** opposite, lanceolate-elliptic **lamina** 6 - 13 x 2.2 - 4.5 cm, acuminate, base rounded or cuneate, 5-veined, row of white cells at the hair-base above, shortly hairy below. **Flowers** clustered at branch ends. **Calyx** usually fimbriate, tube scaly hairy, lobes 0.55 - 0.6cm, oblong. **Corolla** 2 - 4cm, obovate, mauve-purple. **Fruit** sub-globose, apically truncate.

Flower : February - July. *Fruit:* September - January.
Exsiccatu : On way to Premlakha & Panglakha, 1300m, **SR Lepcha & AP. Das** 30824, dated 30.09.2004.
Status : Common.
Local Distribution : Premlakha, Hangay, Mulkharka 600 - 1200 m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, SRILANKA, MYANMAR, MALAYSIA, AUSTRALIA.

Melastoma normale D. Don, Prodr. 220. 1825; C.B. Clarke in Hook.f., Fl. Brit. India 2: 524. 1879. Man. Ind. Timb. 367. 1902; Clement in Grierson & Long Fl. Bhutan 2(1): 296. 1991. *Melastoma nepalensis* Lodd, Bot. Cab. T. 707. 1824, Fl. Jow. 1: 202. 1981.

Shrubs 4.5 - 6 m tall. **Stems** hairy and with subulate bristles at nodes. **Petioles** 0.4 - 2.5 cm long, bristly hairy and with scales; **lamina** ovate-lanceolate, oblong-lanceolate or elliptic-lanceolate 5 - 15 x 3.8 - 6 cm, acute to shortly acuminate, base rounded, truncate, pubescent above and hairs under surface, densely villous or silky, basal nerves 3 - 7. **Flowers** 5.5 - 7 cm diam., 4 - 10 in terminal fascicles, rose-purple; **bracts** upto 1.5cm long, ovate or linear-lanceolate, caducous, hairy; **pedicels** upto 1.5cm long, bearing with serrulate scales. **Calyx** 1 - 1.5 cm long, silky, lobes slightly hairy. **Fruits** truncate, rather warty and transversely dehiscent.

Flower & Fruit : June - December.
Exsiccatu : Padamchen boundary 1800 m, **SR Lepcha & AP. Das** 332, dated 23.10.2003.
Status : Fairly Common.
Local Distribution : Aritar, Rigu, 1400 - 2200 m.
General Distribution : INDIA, NEPAL, BHUTAN, THAILAND, CHINA, JAPAN, MALAYSIA, N. AUSTRALIA.

Osbeckia Linnaeus

Key to the species:

1. Leaf veins (lateral) 5 - 7; stamens to 8 *O. stellata*
+ Leaf veins (lateral) 3; stamens to 10 *O. nepalensis*

Osbeckia nepalensis Hook., Exot. Fl. 1:t.31. 1822; C.B. Clarke in Hook.f., Fl. Brit. India 2: 521.1879; Clement in Grierson & Long, Fl. Bhutan 2 (1): 293. 1991. *O. speciosa* D. Don, Prodr. Fl. Nep. 222. 1825.

Shrubs perennial upto 2 m tall. **Stem** branched adpressed hairy. **Leaves** narrowly ovate - oblong to elliptic, lamina 3 - 13 x 3.5 - 5 cm, acute, base rounded, margin entire thinly ciliate, adpressed hairy, long strait hairs on veins; nerves 3, prominent. **Flowers** terminal paniculate, few - numerous flowered. **Calyx** to 20 mm, tube adpressed ciliate appendages; lobes 5 oblong ovate, ciliate. **Corolla** 5 broadly obovate, pink, white or moave, oftenly ciliate at apex; **Stamens** 10. **Capsule** hairy at apex.

Flower : July – October *Fruit*: November
Exsiccatus : Subaney Dara 1900 m, **SR Lepcha & AP. Das 01445**, dated 13.10.2007.
Status : Common.
Local Distribution : Subaney dara, upto 2000 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, THAILAND.

Osbeckia stellata Ker-Gawl. in Edgw., Bot. Reg. 8: t. 674. 1822; Hara *et al.* FL E. Him. 222. 1966; Clement in Grierson & Long, Fl. Bhutan 2(1): 293-294:1991. *O. crinita* Naud. in Ann. Sci. Nat. Bot. Ser. III, 14: 72. 1850; C.B. Clarke in Hook.f., Fl. Brit. India 2: 517. 1879 p.p.

Shrub perennial upto 160 cm tall. **Stem** predominantly branched and hairy. **Leaves** ; petioles short to 1.5cm; ovate to oblong-lanceolate, **lamina** 4.3 - 12 x 2 – 4.3 cm, acuminate, base subcordate to rounded, adpressed hairy both sides, nerves usually 5 – 7; **bracts** ovate, often suborbicular, densely hairy on the margin; pedicels upto 0.50 cm long. **Flowers** 2 – 3.5 cm across, 4-merous, or very rarely 5-merous. **Calyx**-tube with dense tufts of stellate hairs, lobes subulate. **Petals** upto 2 cm long, obovate; **stamens** 8; anthers with incurved beaks, **ovary** slightly bristly.

Flower : July – October *Fruit*: November - January.
Exsiccatus : On the way Premlakha to Panglakha, **SR Lepcha & AP. Das 27707**, dated 30.09.2004.
Status : Common.
Local Distribution : Premlakha, Hangey 500 – 1500 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Oxyspora DC.

Oxyspora paniculata (D. Don) DC., Prodr. 3: 123. 1828; Hara in Fl. E. Him. 2: 89. 1971; C.B. Clarke in Hook.f., Fl. Brit. India 2: 525. 1879; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 171. 1979; Clement in Grierson & Long, Fl. Bhutan 2(1): 297. 1984. *Arthrostemma paniculata* D. Don in Mem. Worn. Not. Hist. s. 4: 299. 1822. *Oxyspora vegans auct. non* Wall., Hook in B. Meg. 76. E. 4553. 1850.

Shrub large upto 3m tall. **Lamina** ovate to ovate-elliptic, 10 - 25 x 5 - 12cm, usually acuminate, base rounded, rarely sub-cordate, margin obscurely dentate, upper surface minutely, tuberculate, glabrous, lower surface stellate-hairy, mainly veins, **petiole** usually with tuft of hairs at top. **Inflorescence** drooping, rachis usually terete. **Calyx** ± tubular, stellate hairy; teeth triangular. **Petals** ovate-oblong, pink. **Stamens** upto 15mm long anthers with small lump on connective near base; short anther with spur on connective; **Style** curved at apex. **Capsules** ± ellipsoid.

Flower : July -October *Fruit*: January - May
Exsiccatus : Phusrey Simaney, **SR Lepcha & AP Das 31001**, 02. 10.2004.
Status : Common
Local distribution : Hatichery, Rigu 500-2000 m
General distribution : INDIA (Sikkim), BHUTAN, NEPAL CAMBODIA, LAOS, MYANMAR, VIETNAM.

Sarcopyramis Wallich

Sarcopyramis nepalensis Wall., Tent. Fl. Nepal 32. t. 23. 1824; C.B. Clarke in Hook.f., Fl. Brit. India 2: 541. 1879; Hara & Ohashi in Fl. E. Him. 222: 1966; Hara *et. al.* Enum. Fl. Pl. Nepal 2: 171. 1979; Clement in Grierson & Long Fl. Bhutan 2(1): 299. 1984. *Sarcopyramis lanceolata* Wall. [Cat. 213. n. 6290, 1832, *nom. nud.*] ex Bennett, pl. Jav. Rar. 214. 1844. *Sarcopyramis grandiflora* Griff. Notul. 4: 678. 1854.

Herbs, erect, upto 35 cm tall, branched. Stems quadrangular, glabrous. **Petioles** 1 - 2.4 cm, narrowly winged; blade broadly ovate to ovate lanceolate, **lamina** 4.5 – 9.5 × 2 -4.5 cm, blade, membranous, abaxially puberulous or glabrescent, adaxially sparsely strigose and with or without white spots, secondary veins 1 or 2 on each side of midvein, base truncate to cuneate, slightly decurrent, margin serrulate, apex acuminate. **Inflorescences** terminal, cymes, 1 – 3 -flowered, with 2 bracts at base; bracts subsessile, foliaceous, ovate; pedicels quadrangular. **Calyx** obpyramidal, apex of calyx lobes truncate and with a membranous disk, disk margin fimbriate. **Petals** pink, obovate, ca. 5.5mm, oblique, apex truncate. **Stamens** equal; connective decurrent. Ovary with a membranous crown. **Capsules** cup-shaped, quadrangular, membranous.

<i>Flower</i>	: August – October	<i>Fruit</i> : September – January.
<i>Exsiccatus</i>	: Jorepokhri, SR Lepcha & AP. Das 29387, dated 30.09.2004.	
<i>Status</i>	: Fair	
<i>Local Distribution</i>	: Rachela below, Padamchen, Singhaney 1000-3000m.	
<i>General Distribution</i>	: NE-INDIA (Sikkim - Assam), BHUTAN, NEPAL, MALAYA, INDONESIA MYANMAR, PHILIPINES , THAILAND. CHINA	

Order: Cornales

NYSSACEAE Dumort.

Nyssa Linnaeus

Nyssa javanica (Blume) Wang. in Pfreich. 41: 15.1909; Wasscher in FM 4: 29. 1948; Clement in Grierson & Long, Fl. Bhutan 2(1): 333. 1991. *Agathisanthes javanica* Bl., Bijdr. 645. 1825. *Nyssa sessiliflora* Hook. f. & Thoms., Gen. Pl. 1: 952. 1967; C.B. Clarke in Hook.f., Fl. British India 2: 747. 1879.

Local Name: *Lho Sumbrang kung* (Lep), *Lekh Chilaunay* (Nep.).

Tree robust upto 25 m tall. **Leaves** alternate, simple; petioles 1 - 2.7 cm long; **lamina** 4 - 13 x 4 - 8 cm, oblong-elliptic, margin entire or denticulate, acute to shortly acuminate, base cuneate or rounded, sparsely hairy, pinnately veined. **Flower heads** 1-1.5 cm diam., sub-globose, capitate. Peduncles upto 2.5cm long. Male and female flowers alike in shape, axillary. **Calyx** about 0.2.5 cm, appressed hairy, 4 -5 lobed; **Corolla** usually 5, 0.2 x 0.13 cm, almost oblong; stamens 10; style simple, often bifid; ovary unilocular; ovule solitary and pendulous. **Fruit** obovoid.

<i>Flower & Fruit</i>	: May - August.
<i>Exsiccatus</i>	: Lower Phusrey 1950 m, SR Lepcha & AP. Das 0302, dated 7.10.2004.
<i>Status</i>	: Less Frequent.
<i>Local Distribution</i>	: Mulkharka, Phusrey. 1400 - 2000 m.
<i>General Distribution</i>	: E. HIMALAYA; INDIA, NEPAL, BHUTAN, MALAYSIA, JAVA, SUMATRA, BORNEO.

CORNACEAE Dum.

Key to the Genera:

1. Shrub upto 5 m tall; drupe ovoid 2
+ Tree upto 15 m tall; drupe subglobose *Swida*
2. Leaf apposite; lamina elliptic oblong; Umbels not originated on the midvein .. *Aucuba*
+ Leaf alternate; lamina lanceolate; umbels originated at midvein *Helwingia*

Aucuba Thunberg

Aucuba himalaica Hook. f. et Thoms. ex Hook. f., Ju. Himal. Pl. T.12. 1955; C.B. Clarke in Fl. Brit. India 2: 747. 1879, Pfl.-reich IV-299, Hook. 41: 41. 1910; Hara in Fl. E. Him. 1: 232 & 644. 1966; Clement in Grierson & Long. Fl. Bhutan 2(1): 331. 1991.

Local Name: Kali Kaath (Nep.).

Shrub upto 4m tall, dichotomous branched **Leaves** opposite; petioles 1-2.3 cm long; lamina 10 – 20 x 2 - 6 cm, elliptic - oblong or oblong, long acuminate, base cuneate, margin serrate - denticulate, coriaceous, glabrous above, tomentose in lower surface in juvenile. **Male panicles** to 15 cm. **Male flowers** upto 0.6 cm. **Calyx** 4 – toothed, to 0.33 cm, ovate; stamens 4, subsessile. **Female panicles** to 5.2 cm. **Female flowers** upto 0.57 cm long. **Petals** to 0.40 cm, ovate; ovary unilocular; style short. **Fruit** ovoid, 1-seeded

Flower & Fruit : April – July

Exsiccata : Tungya 2150 m, *SR Lepcha & AP. Das 0302*, dated 08.09.2004.

Status : Common

Local Distribution : Rachel Middle, Tungya 2100-2650m.

General Distribution : EASTERN HIMALAYA; INDIA (Sikkim - Manipur).

Note : Endemic to NE India.

Helwingia Willdenow

Helwingia himalaica Hook.f. & Thoms., Fl. Brit. India 2: 726. 1879; Hara in Fl. E. Him. 1: 232, 645 & 662, t.49. 1966; 2: 92. 1971; 3: 88 & 393-413, t. 5a, b. 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 191. 1979; Clement in Grierson & Long. Fl. Bhutan 2(1): 331. 1991.

Shrubs upto 2 m tall. **Stem** woody, branched, glabrous. **Leaves** alternate; petioles 0.5-2.6 cm long, glabrous; **lamina** 4.5-13 x 1.1-3.6 cm, lanceolate, bristly-serrate, acuminate, base cuneate, glabrous, mid-rib strong, lateral nerves arched, mostly 6 to 8 on either half. **Umbels** sessile, borne on middle of midvein on lamina. **Pedicels** 0.15-0.2 cm, slender, glabrous. **Flower** unisexual, minute, greenish; males many; **sepals** truncate; **petals** and **stamens** 3-5; ovary 3-4 celled; styles basally connate. **Fruits** ovoid, red, fleshy.

Flower : April - May *Fruit*: June - September.

Exsiccatus : Rachel below near NNP border 2700 m, *SR Lepcha & AP Das 400*, dated 13. 10. 2004.

Status : Very Common in semi-open places

- Local Distribution* : Mulkharka, Rachela below, 2250-2800 m.
General Distribution : HIMALAYAS; INDIA (Sikkim), (NEPAL-BHUTAN),
 MEGHALAYA, MYANMAR, W. CHINA.
Note : It is an important ornamental plant.

Swida Opiz

Swida macrophylla (Wall.) Sojak in Nov. B.H.B. Univ. Carol. Prag. 1960: 10. 1960; Hara *et al*, Enum. Fl. Pl. Nepal 2: 193. 1997; Clement in Grierson & Long, Fl. Bhutan 2(1): 330. 1991.
Cornus macrophylla Wall. in Roxb., Fl. Indica 1: 433. 1820; Prodr. Fl. Nepal 141.1825; C.B. Clarke in Fl. Brit. India 2: 744. 1879.

Local Name: Patmero/Bangi Kath (Nep.).

Tree to 15 m tall. **Leaves** opposite; petiole 1 – 3.3cm; **lamina** 10 - 19 x 5.5 -11 cm, ovate to ovate-elliptic, acuminate, base truncate to rounded, whitish puberulent beneath, with hairs on both sides. **Inflorescence** erect, youngest branches in opposites. **Flowers** bisexual. **Calyx** teeth small, distinct, obscurely 4 toothed, teeth to 0.07 cm. **Petals** 4, upto 0.45 cm, usually oblong, spreading; **stamens** 4, equal to petals; anthers cordate with recurved tips; ovary 2-elled; style simple with capitate stigma. **Drupe**s subglobose, 2 seeded.

- Flower & Fruit* : May – July
Exsiccatus : Sokpa pokhri 1950m, *SR Lepcha & AP. Das 0301*, dated 17.09.2005
Status : Common
Local Distribution : Middle Rachela Chowk, Sokpa-pokhri 1800 – 2500 m.
General Distribution : AFGANISTAN, HIMALAYAS; INDIA (Kashmir-BHUTAN);
 MEGHALAYA, MYANMAR, EAST TO CHINA, JAPAN.

Order: Santalales

SANTALACEAE R. Brown

Dufrenoya Chatin

Dufrenoya platyphylla (Sprengel) Stauffer in Viert., Nat. Ges. Zurich. 114: 70. 1969; Tebbs in Enum. Fl. Pl. Nepal 3: 192. 1982; Grierson & Long, Fl. Bhutan 1(1): 143. 1983. *Viscum platyphyllum* Sprengel, Syst. Veg. 4 (Curr. Post.): 47. 1827. *Dendrotrophe heterantha* (Wallich ex DC.) Henry *et* Roy in Bull. Bot. Surv. India 10: 276. 1969.

Local Name: Ainjeru (Nep.).

Shrub usually parasitic on tree upto 3 m tall. **Lamina** shape variable; usually obovate to orbicular, 3.5 – 7.5 x 2 – 4.5 cm, entire, obtuse, base abruptly attenuate, coriaceous, glabrous, nerves 7 - 9 from base, distinct beneath. **Inflorescence** with male flowers sessile in pedunculate scaly clusters; **perianth** with 5 - 6 triangular lobes. **Female flowers** in clusters of 3 - 10, scaly only at base and apex; perianth tube 5 - 6 lobed; ovary obovoid, inferior; fruiting pedicels upto 1cm. **Fruits** a small drupe, obovoid.

- Flower & Fruit* : April – July
Exsiccatae : Padamchen- Talkharkha 2240 m, *SR Lepcha & AP Das 31028*, dated

02.10.2004, Phusrey dara 2000m, , *SR Lepcha AP Das 302*, dated
26.09.2003. Katusey dara 1950 m, *SR Lepcha & AP Das 310*, dated
26.09.2003.

Status : Less Frequent.

Local Distribution : Subaney, Singhane Phusrey, Padamchen 1600-2250m.

General Distribution : HIMALAYAS; INDIA, (Kumaon-BHUTAN), Assam, MYANMAR.

Note : 1. Endemic to Himalaya.
2. A noted medicinal plant.

LORANTHACEAE A.L. Jussieu

Scurrula Linnaeus

Key to the Genera :

1. Shrubs parasitic upto 2 m tall; leaves alternate but often opposite near apex ... *Scurrula*
+ Herbs parasitic upto 1.5 m tall; leaves not prominent *Viscum*

Scurrula elata (Edgew.) Danser in Bull. Jard. Bot. Buitenz. Ser. 3(10): 350. 1929; Hara & Ohashi in Fl.E.Him 1: 64. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 191. 1982; Greirson & Long, Fl. Bhutan 1(1): 147. 1983. *Loranthus elatus* Edgew. in Trans. Linn. Soc. 20: 58. 1846:

Local Name: Aijeru (Nep.).

Shrubs parasitic upto 2.5 m tall. Juvenile buds and shoots stellate tomentose, brownish. **Leaves** alternate but often opposite near apex; **petioles** 1 - 2 cm; **lamina** broadly ovate, 3 - 11 x 1.2 - 5 cm, entire, acute, base rounded to cuneate, brownish stellate tomentose on both surfaces, glabrous both surface when mature; lateral nerves 4 - 6 pairs, mid-vein axil with short hairs. **Inflorescence** in axillary racemes; peduncle to 1.7 cm, brown ; bracts to 0.22 cm, ovate. **Flowers** bisexual, upto 2.8 m long, 6 - 10 in each cluster. **Sepals** to 0.23 cm, tube slightly truncate. **Petals** to 3.3 cm long, tubular, curved, reddish in basal part, apically green; anthers reddish; filament slender, black; stigmas swollen and globose. **Fruits** obovoid, narrowing at base.

Flower & Fruit : April - December

Exsiccatae : Dokala 3800 m, *SR Lepcha & AP. Das 31162*, dated 03.10.2004.
Dorhok 2300 m., *SR Lepcha & AP. Das 30292*, dated 07.08.2004.

Status : Common

Local Distribution : Rachela, Mulkharka. 2000 - 3900 m.

General Distribution : INDIA, NEPAL, BHUTAN, TIBET, CHINA.

Viscum L.

Viscum nepalense Spreng., Syst. Cur.-Post. 47. 1827; Ramamoorthy in FHD 311. 1976; Grierson & Long, Fl. Bhutan 1(1): 150. 1983; Fl. Meghalaya 2: 762. 1987. *V. atriculatum auct non*. N. Burm., 1768; Fl. Brit. India 5: 226. 1886

Local Name: Dah-sumthet (Lep.), Harchur (Nep.).

Herbs parasitic, leafless and cymosely branched upto 1.2m, pendent phylloclade. Stem oftenly jointed terete only towards base. Branches oftenly flattened, striate. **Leaves** absent or not prominent; nodes constricted; internodes variable in length and breadth, 2 - 3.5 x 0.3 - 0.8 cm, flattened, decussately oriented, tapering towards base. **Flowers** unisexual, clustered at nodes, minute and greenish; anthers white. **Fruits** globose, yellowish-green.

Flower & Fruit : July - September

- Exsiccatus* : Chandaney RF, - Padamchen 1900 m, SR Lepcha & AP Das 03014, dated 13. 10. 2004.
Status : Rare.
Local Distribution : Chandaney RF, - Padamchen, 1420 - 2180m.
General Distribution : HIMALAYAS, INDIA, MYANMAR, CHINA, FORMOSA.
Note : Use in traditional medicinal for the treatment of fracture.

Order: Celastrales

CELASTRACEAE R. Brown

Key to the Genera:

1. Leaf alternate; ovary free or partly immersed in the Disc 2
 + Leaf opposite ; ovary immersed in the disc *Euonymus*
2. Erect shrub or tree; spinescent; flowers in axillary cymes; calyx deeply lobed; fruits 3 celled; 1 - 6 seeded *Maytenus*
 + Climbers or epiphytic shrub; non spinescent; flowers in axillary, terminal cymes or panicles; calyx cup shaped; fruits 2 -3 celled; 3 - 6 seeded *Celastrus*

Celastrus Linnaeus

Key to the species:

1. Plant climbing; leaf base rounded – cuneate *C. hookeri* .
 + Plant lianas or scandant; leaf base attenuate *C. paniculatus*

Celastrus hookeri Prain, in Journ. Asiat. Soc. Beng. 73: 197.1904.; Hra in Fl. E. Him. 1: 189; 1966; Long in Grierson & Long. Fl. Bhutan 2(1): 122. 1991.

Herbs climbing, deciduous, brachlet thily lenticellate., **Leaves** broadly elliptic to suborbicular 9 - 13 x 6 – 10 cm, abruptly mucronate, base rounded – cuneate, margins crenate – serrate. **Flowers** few, in axillary and terminal cymes at the tip of new shoot. **Petals** shallowly toothed, filament glabrous. **Fruits** few, coriaceous; **seeds** ovoid – ellipsoid.

- Flower* : April - June. *Fruit:* July
Exsiccatus : Singhaney dara 2100 m, **SR Lepcha & AP. Das 0295**, dated 14.09.2005
Status : Commn
Local Distribution : Dohrok, Subhaney. 2100 – 3050 m.
General Distribution : E. HIMALAYA; INDIA (Sikkim, Khasia, Manipur,) NEPAL, BHUTAN, CHINA, BURMA.

Celastrus paniculatus Willd., Sp. Pl. 1: 1125. 1797; Lawson in Fl. Brit. India 1: 617. 1875; Hara in Fl. E. Him. 1: 189. 1966; Hara *et al*, Enum. Fl. Pl. Nepal 2: 88. 1979; Long in Grierson & Long. Fl. Bhutan 2(1): 122. 123. 1991. subsp. *paniculatus*: FWB 1:419. 1997. *Celastrus dependens* Wall. (Cat. no. 4302. 1831, *nom.nud.*) in Roxb., Fl. Ind. ed. Carey, 2:389. 1824.

Local Name: Bhainsay Lahara (Nep.).

Shrubs, scandants. Branchlets terete, pubescent. Stem grooved, lenticellate. **Leaves** simple, alternate; petioles to 1 cm; **lamina** 3 – 11 x 1.8 – 4.5 cm, obovate to orbicular, crenate-serrulate, abruptly acuminate, base attenuate, glabrous, whitish green beneath. **Flowers** in paniced, cymes, terminal, pendulous; peduncles pubescent. Flowers whitish-green. **Sepals** 5, ovate, fimbriate, greenish. **Petals** 5-lobed, margin irregular, clawed, obovate; stamens 5; anthers yellow; filament greenish-white; stigma 3-lobed. **Capsule** globose; seeds arillate, ellipsoid.

Flower : April - June. *Fruit:* July - September
Exsiccatus : Rachela 2160 - 2700, **SR Lepcha & AP. Das** 0293, dated 13.09.2005.
Status : Common
Local Distribution : Mulkharka, Rachela below 1400 – 2700m.
General Distribution : HIMALAYAS; INDIA, SRI LANKA, MYANMAR, INDO-CHINA, MALAYSIA, CHINA, FORMOSA, AUSTRALIA.

Euonymus Linnaeus

Key to the species:

1. Erect shrubs or small trees *E. frigidus*
 + Climbers or epiphytes 2
2. Corolla crimson; capsule turbinate *E. viburnoides*
 +. Corolla white; capsule globular or subglobose 3
3. Cymes 3 – 15 flowered; ovary smooth; capsule 2 -4 shallowly lobed *E. vagans*
 + Cymes 7 – 30 flowered; ovary warted; capsule unlobed *E. echinatus* ..

Euonymus echinatus Wall. in Roxb., Fl. Indica, ed. Carey, 2: 410. 1824; Lawson in Fl. Brit. India 1: 611. 1872; Hara *et al.*, Fl. E. Him. 1: 189. 1966; Hara in Enum. Fl. Pl. Nepal 2: 89. 1979; Long in Grierson & Long, Fl. Bhutan 2(1): 118. 1991.

Shrubs, climbers epiphytic on tree and rock-crevices with tufted adventitious roots. **Leaves** opposite; petioles to .5 cm; **lamina** 1.5 - 6 x 1.5 - 4 cm, ovate-lanceolate, serrate, acute, base rounded, glabrous, lateral nerves arching, prominent above. **Cymes** to 4.5 cm, usually terminal or axillary, 3 – 15 flowered; peduncles divided. **Flowers** 4-merous, dark red; sepal lobes to 0.13 cm. **Petals** 4, to 0.40 cm long, rounded, white, greenish or yellowish ; stamens inserted on fleshy disc; anthers 4. **Capsules** globular, echinate, armed of several minute spines.

Flower : April – June *Fruit:* August – September
Exsiccatus : Rachela middle **SR Lepcha & AP. Das** 03787, dated 08.10.2004.
Status : Common
Local Distribution : Rachela middle, Phede. 2700 – 3200 m.
General Distribution : E. HIMALAYA; INDIA (Sikkim, Darjeeling)
Note : Endemic to Eastern Himalaya.

Euonymus frigidus Wall. in Roxb., Fl. Indica, 2: 409. 1824; Hara in Fl. E. Him. 189. 1966; Lawson in Fl. Brit. India 1: 611. 1872; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 89. 1979; Long in Grierson & Long, *et al.*, Fl. Bhutan 2(1): 119. 1991; Singh *et al.*, Fl. India 5: 99. 2000

Tree small or ever green shrubs upto 4m. Buds terminal enlarged in winter and autumn. **Leaves** lamina 3.5 – 12 x 1.5 - 3cm, coriaceous, oblong elliptic to oblanceolate, acuminate, base cuneate, and margins serrulate, lateral veins smooth. petiole 4 - 10mm. **Flower** in cymes 2.5 – 4 cm axillary, **flowers** mostly 6 - 7, 4-merous, 4 – 5 mm diameter. **Calyx** lobed 0.7 mm. **Corolla**

brownish-crimson, broadly ovate or suborbicular 3-4 mm, unlobed; **anthers** sessile. **Capsules** subglobose, fleshy, 1 - 2cm before dehiscence, 4 lobed after dehiscence, red, 4-lobed, 2 - 3 cm in diam. seeds 4.

Flower : May - June. *Fruit* : August- December
Exsiccatus : Rachela 2970 m, **SR Lepcha & AP. Das 31062**, dated 08.10.2004.
Status : Common.
Local Distribution : Kyongnosla, 15 mile, Rachela . 3000 - 3010
General Distribution : E. HIMALAYA, INDIA (Darjeeling, Sikkim, Assam, Manipur)
MYANMAR, CHINA.

Note : An ornamental plant.

Euonymus vagans Wall. in Roxb., Fl. Ind. ed. Carey, 2: 412. 1824; Lawson in Fl. Brit. India 1: 611. 1872; Hara in Fl. E. Him. 1: 190. 1966; 2: 71. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 90. 1979; Long in Grierson & Long., Fl. Bhutan 2(1): 118. 1991.

Similar to *E. echinatus* but differing in variable shapes and sizes of the leaves. **Cymes** with 7 - 30-flowered. **Flowers** smaller, upto 0.9 cm across. **Capsules** subglobose, lobes 2 - 4, shallowly rounded .

Flower : May - June. *Fruit* : August- December
Exsiccatus : Rachela lower 2800, **SR Lepcha & AP Das 0290**, dated 17.09.2005
Status : Common.
Local Distribution : Hangey, Sokpa pokhri, 1800 - 2500 m
General Distribution : E. HIMALAYA, INDIA (Sikkim, Assam, Manipur) TIBET, CHINA.
Note : An ornamental plant.

Euonymus viburnoides Prain, JASB 73:194. 1904; Hara in Fl. E. Him. 1:190. 1960; Grierson & Long., Fl. Bhutan 2(1):118. 1991. *E. frigidus sensu* Fl. Brit. India 1:611. 1875, p.p. *non* Wallich.
Local Name: Haray Lahara (Nep.).

Shrubs epiphytic evergreen, lenticellate. Branchlets 4-angled. **Leaves**; petioles to 2 cm long; lamina 3 - 10 x 2.5 - 5.5 cm, ovate-lanceolate, acuminate, base cuneate or rounded, margins irregularly serrulate, nerves 7 pairs. **Cymes** to 10 cm, many flowered, axillary, divaricately branched. **Flowers** to 0.7cm across, 4-merous. **Calyx** lobes upto 0.20 cm, concave. **Petals** 0.22 - 0.5 cm, orbicular, crimson. **Capsules** turbinate, quadrangular.

Flower : May - June *Fruit*: July - September
Exsiccatus : Rachela below, 2300 m, **SR Lepcha & AP. Das 0291**, dated 17.09. 2005.
Status : Less common
Local Distribution : Kyongnosla, 15 mile, Rachela, Panglakha upto 3200 m.
General Distribution : E. HIMALAYA, INDIA (Sikkim, Darjeeling) CHINA.
Note : Endemic to Eastern Himalayas

Maytenus Molina

Maytenus rufa (Wall.) Hara, Journ. Jap. Bot. 40: 327. 1965; Hara in Fl. E. Him. 1: 190. 1966; 2: 72. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 90. 1979; Long in Grierson & Long, Fl. Bhutan 2(1): 124. 1991. *Celastrus rufa* Wallich in Roxb., Fl. Ind. 2:397. 1824. *Gymnosporia rufa* (Wall.) Lawson in Fl. Brit. India 1: 620. 1875.

Shrubs upto 5 m tall. **Branches** slender, spinose. Spines upto 1.5 cm long, naked. **Leaves** lamina 3 - 11 x 15 - 4.5 cm, broadly lanceolate to elliptic lanceolate, serrate, acuminate, coriaceous, glabrous. **Cymes** 2 - 4.5 cm diam., axillary, pendulous. **Flowers** numerous, small; calyx teeth minute, triangular. **Petals** 0.13 - 0.4cm, suborbicular, creamy - white. **Capsules** turbinate.

Flower : April - June *Fruit:* July - September
Exsiccatus : Tungya, 2100 m, **SR Lepcha & AP. Das** 0294, dated 20.09.2005
Status : Less common
Local Distribution : Tungya, 1400 - 2400m.
General Distribution : HIMALAYAS; INDIA (Kumaon- Skim), NEPAL, BHUTAN,
Note : Endemic to Himalaya.

AQUIFOLIACEAE Bartling

Ilex L.

Key to the species:

- | | |
|--|-----------------------|
| 1. Corolla 4-lobed; stamens 4 | 2 |
| + Corolla 5 - 7 lobed; stamens 5 - 8 | <i>Ilex fragilis</i> |
| 2. Leaves elliptic to obovate; corolla white | <i>I. crenata</i> |
| + Leaves lanceolate to narrowly oblong; corolla reddish pink | <i>I. sikkimensis</i> |

Ilex crenata Thunberg, Fl. Japan 78. 1784 var. *thomsonii* (Hook. f.) Loesener, Monogr. Aquifol. 1: 202, t. 4, f. 2C. 1901; Hara in Fl. E. Him. 1: 187. 1966; 2: 70. 1971; Andrews in Grierson & Long, Fl. Bhutan 2(1): 108. 1991; Hajra in Fl India 5: 52. 2000. *I. thomsonii* Hook.f., Fl. Brit. India 1: 602. 1875.

Trees with puberulous shoots. **Leaves**; petioles to 0.30 cm; elliptic to obovate, lamina 1.5 - 3 x 0.6 - 1.5 cm, crenate towards apex, acute, attenuate, glabrous, lower surface with dark glands, lateral nerves oftenly indistinct. **Flowers** 1 - 3 in axillary cymes, 4-merous. **Calyx** 4-lobed, glabrous, lobes sub-orbicular to broadly ovate. **Corolla** 4-lobed, white, sub-orbicular or broadly ovate; stamens 4, nearly as long as petals. **Fruit** to 0.8 cm across, glabrous, black, Fruit pedicels usually with hairs.

Flower : May - July. *Fruit:* August - November
Exsiccatus : NNP border, 2700 m, **SR Lepcha & AP. Das** 31297, dated 13.07.2008.
Status : Less Common.
Local Distribution : Rigu, Padamchen 2100 - 2800 m.
General Distribution : E. HIMALAYA; INDIA (Darjeeling-BHUTAN), MEGHALAYA.
Note : Endemic to Eastern Himalaya.

Ilex fragilis Hook. f. in Fl. Brit. India 1: 602 . 1875; Hara in Fl. E. Him. 1: 187 . 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 87. 1979; Andrews in Grierson & Long, Fl. Bhutan 2 (1): 106. 1991; Hajra in Fl India 5: 56. 2000

Local Name: Phalamkath (Nep.).

Trees branched, glabrous. **Leaves** alternate, uppermost paired ; petiole to 1.5 cm ; **lamina** 4 – 7.5 x 1.2 - 3.8 cm , ovate to elliptic-ovate, serrate, acuminate, rounded, glabrous, lower surface pale green - yellowish, mid-vein deep and broad, lateral veins 6 - 9 pairs, rugose. **Flowers** or fascicles usually un-branched or axillary, monoecious; pedicels short to 0.30 cm, glabrous. **Calyx** glabrous, 5 - 7 lobed, rounded to oblong, ciliated. **Corolla** white, 5 - 7 lobed, occasionally more, larger than sepals, to 0.17 cm, spreading, ciliated; **stamens** 5 - 8, originate from corolla. **Drupe** red, glabrous.

Flower : May - June *Fruit:* September - February
Exsiccatus : Rachela below, 2800 m, *SR Lepcha & AP. Das* 31295, dated 13.07.2008
Status : Very Common.
Local Distribution : Rachela Middle, Neora Pathak, 2200 – 2600 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL-BHUTAN), ASSAM, MYANMAR, W.CHINA.

Ilex sikkimensis Kurz, Jour. Asiat. Soc. Beng. 44(2): 202. 1875; Hara in Fl. E. Him. 1:188. 1966
I. hookeri King in Jour. Asiat. Soc. Beng. 55(2): 266, t. 14. 1887; Monogr. Aquifol. 287. 1901; Andrews in Grierson & Long, Fl. Bhutan 2 (1): 109. 1991.

Local Name: Lise (Nep.).

Trees upto 9 m tall. **Leaves** ; **petioles** to 2 cm, pinkish red; **lamina** 4 – 12 x 1 - 3.5 cm, lanceolate to narrowly oblong, serrate, acute to acuminate, attenuate, coriaceous, greenish above, both sides glabrous, mid-rib channeled in lower surface, prominently depressed above. **Flowers** ; **male flowers** in axillary clusters; **females flowers** usually solitary, axillary. **Calyx** 4 – lobed, to 0.2 cm. **Corolla** 4-lobed , reddish pink; **Stamens** 4. **Drupe** to 0.8cm across, **Fruit** pedicel slightly elongated.

Flower : April – May *Fruit:* August – November
Exsiccatus : Rachela below at Jorpokhari, 2700 m, *SR Lepcha & AP. Das* 31298, dated 13.07.2008
Status : Common.
Local Distribution : Tinsimsna, Jorpokhari, 2500 – 3050 m.
General Distribution : E. HIMALAYA (NEPAL – BHUTAN).
Note : Endemic to Eastern Himalaya.

Order: Euphorbiales

BUXACEAE Dumort

Sarcococca Lindley

Sarcococca hookeriana Baillon, Monogr. Bux. 53. 1859; Hara in Fl. E. Him. 1: 185. 1966; Grierson & Long in Fl. Bhutan 2(1): 131. 1991. *S. pruniformis* var. *hookeriana* (Baillon) Hook.f., Fl. Brit. India 5: 267. 1887.

Local Name: *Hue shing* (Bhutia), *Chile Kaath* (Nep.).

Shrub 1.5 - 2m tall. Stem terete, branched. **Leaves** alternate; petiole 0.3 – 1.2; **lamina** 3.5 - 8 x 2.2 – 3 cm, narrowly elliptic-lanceolate, entire, acute or acuminate, cuneate, both surfaces glabrous, mid-rib faint and impressed above, nervules obscure. **Inflorescence** axillary racemes few to many flowered, short. **Bracts** ovate. **Flowers** fragrant. Tepals short upto 0.3 cm, imbricate, pinkish, or pale-yellow; **stamens** long, exerted, whitish; ovary globular.

Flower : April – August.

Exsiccatus : NNP boundary 2195 m, *SR Lepcha & AP. Das* 0263, dated 15.09. 2005.

Status : Rare

Local Distribution : PWS, 2100 -2300m.

General Distribution : E. HIMALAYA; INDIA (Sikkim, West Bengal, Assam, Arunachal Pradesh), NEPAL, BHUTAN, S. TIBET

Note : 1. Endemic to Eastern Himalaya.
2. Wood used to make walking sticks.

EUPHORBIACEAE A. Jussieu

Key to the Genera:

1. Herbs annual or perennial 2
- + Shrubs or trees *Euphorbia*
2. Plants dioecious 3
- + Plants monoecious *Glochidion*
3. Leaf palmately (5 – 13) veined and often peltate at base; Petals 8 – 10 *Ostodes*
- + Leaf pinnately veined and 3 veined at base; Petals absent *Macaranga*

Euphorbia Linnaeus

Key to the species:

- 1 Plant with creeping rhizomatous 2
- + Plant without rhizomatous 3
- 3 Stem foetid; styles united in lower third, recurved *E. sikkimensis*
- + Stem non foetid; style united in lower half, not recurved *E. longifolia*

- 3 Plant less than 1 m tall; young shoot crispate-pubescent *E. Himalayansis*
 + Plant more than 1 m tall; young shoot non crispate pubescent ... *E. luteo-viridis*

Euphorbia himalayansis (Klotzsch) Boissier in DC. Prodr. 15 (2): 113. 1862; Hook. f., Fl. Brit. India 5: 258. 1887; Hurusawa & Tanaka in Fl. E. Him. 182. 1966; Kitamura in Hara, Fl. Pl. Nepal 3: 195. 1982; Long in Grierson & Long., Fl. Bhutan 1(3): 765. 1987. *Tithymalus himalayansis* Klotzsch. Kurusawa & Ya. Tanaka in Fl. E. Him. 182. 1966.

Herb perennial, dark green bearing a woody roots stock to 70 cm tall. Juvenile shoots crisped-pubescent. **Leaves**; stems leaves oblong or oblong lanceolate lamina 2.5-4x0.5-0.8cm, obtuse or subobtuse, base rounded, glabrous, sessile,; exstipulate; uppermost leaves 6 - 10 in whorl. **Rays** to 4.5 cm densely crispate-pubescent; bracts enclosing cyathium, ovate acute. **Cyathia** campanulate with 5 brown semicircular glands; **ovary** smooth; **styles** connate simple recurved bearing small capitate stigma. **Capsules** globose-trigonous. .

Flower : June- *Fruit:* August
Exsiccatus : Sherathang 4300 m, **SR Lepcha & AP Das**, 103. dated 07.10. 2006
Status : Sparse.
Local Distribution : Sherathang 3000 - 4200m
General Distribution : E. HIMALAYA; INDIA, (NEPAL to BHUTAN).
 Note : Endemic to Eastern Himalaya

Euphorbia longifolia Baillon ex Boissier, in DC. Prodr.15(2): 78. 1862; D.Don; Prodr. Fl.Nepal 62. 1825; Hook. f. in Fl. Brit India 5:261.1887; Kitamura in Hara Enum.Pl.Nepal 1:195.1982; Long in Grierson & Long. Fl. Bhutan 1(3): 765. 1987

Herbs perennial with creeping rhizome up to 120 cm tall. **Stems** simple, juvenile stems rays glabrous or sparsely pilose. **Leaves**: stems leaves linear lanceolate, 4.5 - 13 x 1.5 - 2 cm, acute base cuneate, glabrous, subsessile or shortly petiolated to 3.5 mm. Rays up to 4.3 cm glabrous; bracts yellow ovate to 2.5cm. **Cyathia** campanulate to 4.5mm; **ovary** prominently bearing small blunt tip rounded up-growth (warted) ; **styles** to 3.3mm, united in lower half, bilobed. **Capsules** warted.

Flower : May - June *Fruit:* August
Exsiccatus : .Changu 4000 m, **SR Lepcha & AP. Das 0102**, dated 16.09.2004
Status : Sparse.
Local Distribution : Kupup, Changu, 1880 - 4000 m
General Distribution : E. HIMALAYA
 Note : Endemic to Eastern Himalaya

Euphorbia luteo-viridis D.G. Long, in notes Roy. Bot. Gard. Edinberg 44 (1): 163. 1986; Long in Grierson & Long. Fl. Bhutan 1(3): 764. 1987

Herbs perennial with thick roots stock woody. **Leaves**: cauline leaves tuft slightly shorter lamina 14 - 35 (55) cm; leaves and inflorescence yellow-green rarely reddish-tinged; broad lamina 2 - 3.5 x 1 - 2.8cm, obtuse, sessile. **Rays** of umbels 4 - 5, crispate-pubescent, to 3.5cm; **bracts** to 1.8cm broad, suborbicular or broadly ovate; **styles** to 3 mm. **Capsules** not observed.

Flower : May *Fruit:* August

Exsiccatus : Changu 4000 m, **SR Lepcha & AP. Das** 2765, dated 07.10.2006
Status : Sparse.
Local Distribution : Gnathang, Changu 3400 – 4300 m
General Distribution : E. HIMALAYA; INDIA, (NEPAL – BHUTAN).
Note : Endemic to Eastern Himalaya.

Euphorbia sikkimensis Boissier in DC. Prodr. 15: 2.113. 1862; Hook. f. in Fl. Brit. India . 5.(2): 1887; Hara *et al.* in Fl. Enum. Fl. Nepal 3: 196.1982; Long in Grierson & Long, Fl. Bhutan 1(3): 764. 1987. *Tithymala sikkimensis* (Boissier) Hurusawa & Tanaka in Fl. E. Him. 184(1966).
Herbs perennial with creeping rhizome. **Stem** glabrous and foetid upto 85 cm long. **Leaves**; stems leaves alternate, linear or lanceolate **lamina** 3.5 - 13 x 0.6 - 2cm acute, base cuneate, glabrous, subsessile or on petiole to 4.5mm exstipulate, uppermost leaves up to 18 in a whorl. **Rays** glabrous bearing 3 - 4 flowers ovate, acute orange or red; bract enclosing cyathium, devoid of any pigmentation. **Cyathia** campanulate with 4 - 5 semicircular glands at margin ovary smooth; **styles** united in lower third, recurved above. **Capsules** globose-trigonous.

Flower : May - June *Fruit*: September- October.
Exsiccatus : Kyongnosla 3400 m, **SR Lepcha & AP. Das** 2767, dated 18.10. 2005.
Status : Sparse.
Local Distribution : Phusrey, Kyongnosla 3000 – 3800 m
General Distribution : E. HIMALAYA
Note : Endemic to Eastern Himalaya.

Glochidion Forster

Glochidion acuminatum Mueller Argoviensis, in Linnaea 32: 68. 1863; Hook.f. in Fl. Brit. India 5: 323. 1887; Kitamura in Hara Enum. Fl. Pl. Nepal 3: 196. 1982; Long in Grierson & Long, Fl. Bhutan 1(3): 779. 1987.

Local Name: Lalikaath (Nep.).

Tree evergreen medium size 6 – 10 m tall, with pubescent drooping branchlets. **Leaves** alternate; lamina 4 – 13 x 2 – 4 cm, lanceolate, entire, acuminate pinnately veined, greenish above, pale and hoary pubescent beneath. **Flowers** in axillary dense fascicles. **Sepals** 6; unequal, obovate greenish. **Petals** 0; **male flowers** with 3 anthers; styles connate, columnar, column 4-5 lobed, lobes erect, short. **Fruits** globose, with persistent style.

Flower : April – June *Fruit*: August – December
Exsiccatus : Phusrey 2200 m, **SR Lepcha & AP Das**, 2770, dated 13.07.2003
Status : Frequent
Local Distribution : Phusrey, 160 – 2000 m
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, S.W. CHINA.
Note : Used as fodder for cattle. Table plates and cups are made by pinning up the leaves and used in festive occasions especially during puja offerings

Macaranga Petit-Thouars

Macaranga postulata King ex Hook. f., in Fl. Brit. India 5: 445. 1887; Hurusawa & Tanaka in Fl. E. Him. 1: 179. 1966; Kitamura in Hara E. Fl. Pl. Nepal 3: 197. 1987; Grierson & Long., Fl. Bhutan 1(3):805. 1987. *M. gmelinifolia* Hook. f., in Fl. Brit. India 5: 445. 1887.

Local Name: Malata (Nep.).

Tree upto 15 m tall, with rusty pubescent branches. **Leaves** alternate; stipules to 1 cm; petioles to 13 cm long; **lamina** 7 - 17 x 6 - 13 cm, broadly ovate, obscurely sinuate-dentate, acute to shortly acuminate, base shallowly cordate or truncete, veins palmately 5 - 7 at base, glabrous above, densely gland-dotted beneath., ovate. **Male panicles** to 5 cm; flowers 0.3 cm across; stamens 20. **Female panicles** to 10 cm; flowers shortly pedicellate. **Calyx** to 0.25 cm, 4-lobed; ovary bilobed, glandular; styles 2, recurved. **Capsules** brownish tomentose, with persistent styles.

Flower : October - November *Fruit:* December - February
Exsiccatus : Hangey 1900 m, *SR Lepcha & AP. Das* 2771, dated 13.07.2003
Status : Common
Local Distribution : Phusrey, Subaney 1500 - 2000 m
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN.
Note : Endemic to Eastern Himalaya.

Ostodes Blume

Ostodes paniculata Blume, Bijdr. 620. 1826; Hook.f. in Fl. Brit. India 5: 400. 1887; Man. Ind. Timb. 616, 1902; Fl. Asm. 4: 197. 1940; Fl. Meg. 2: 197. 1987; Long in Grierson & Long., Fl. Bhutan 1(3): 795. 1987.

Local Name: Palak kung (Lep.), *Bepari* (Nep.).

Trees upto 20 m tall, spreading. Bark brownish. **Petioles** long upto 20 cm; often crowded at branchlet ends, **lamina** 6 - 18 x 3 - 8 cm, ovate or ovate-elliptic, margin serrate distantly, acuminate, base rounded or rarely oblique, glabrous, dark green above, paler beneath, 3- nerved. **Panicles** hairy. **Flowers** to 1 cm diam., pinkish-white. **Sepals** 3. **Petals** 4 -5, shortly clawed; **stamens** many (more than 20); filaments free, basally hairy. **Capsules** subglobose.

Flower : March *Fruit:* August
Exsiccatus : Beusa 1900 m, *SR Lepcha & AP. Das* 1019, 15. 09. 2005.
Status : Less frequent
Local Distribution : Phusrey, 1600 - 2050 m
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, W. MALAYSIA, CHINA.

Order: Rhamnales

RHAMNACEAE A.L. Jussieu

Rhamnus Linnaeus

Key to the species:

1. Leaves elliptic-obovate; flowers fascicled; Corolla absent..... *R. purpureus*
+ Leaves oblong-elliptic; flowers paniced; Corolla 5..... *R. napalensis*

Rhamnus napalensis (Wall.) Laws. in Hook.f., Fl. Brit. India 1: 640. 1872, '*nipalensis*'. Grubvo in Fl. Syst. Pl. Vasc. 8: 299. 1949; Hara *et al.* Enum.Fl. Pl. Nepal 2: 91. 1979; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 143. 1991; Hajra & Singh *et al.*, in Fl. India 5: 188. 2000. *Ceanothus napalensis* Wall. in Roxb., Fl. Indica 2: 375 & 575. 1824; Cat. 150, n. 4263. 1831.

Local Name: Archal (Nep.).

Shrubs climbing up to 6 m tall. **Leaves** alternate or sub-opposite; **petiole** up to 1.8cm long; stipules small, caduceus; oblong - elliptic, lamina 5 - 15 x 3.7 - 7 cm, apiculate, base rounded, margins serrulate, lower surface glabrous except hair-tufts at vein axils; stipules minute and caduceus. **Inflorescence** simple or compound racemes, branched, terminal and axillary; peduncles slightly pubescent. **Flowers** many, greenish. **Calyx**-lobes 5, triangular. **Corolla** 5, spatulate; ovary rounded; styles trilobed. **Fruits** in drupes sub-globose, 2 - 3 seeded.

Flower & Fruit : July - October

Exsiccatus : Phusrey 2100 m, **SR Lepcha & AP. Das** 1353, dated 10.10.2004.

Status : Less common.

Local Distribution : Dorok, Ramitey dara (NNP border) 1520 - 2280 m.

General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, CHINA, MYANMAR, INDO-CHINA.

Note : Used in traditional medicines for the treatment of bone fracture.

Rhamnus purpureus Edgew. in Trans. Lin. Soc. 20: 44. 1846; Laws. in Fl. Brit. India 1: 639. 1872; Hara in Fl. E. Him. 198. 1966; 2: 77. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 91. 1971. Fasc. Fl. India 20: 57. 1990; Long & Rae in Grierson & Long, Fl. Bhutan 2(1): 144. 1991.

Shrubs or small trees, erect, unarmed. **Leaves** membranous, elliptic-obovate, serrate, base cuneate. **Flowers** 0.52 - 0.55cm across, 3 - 6 in axillary fascicles. **Calyx** lobes 0.33 - 0.6cm long. **Corolla** absent. **Fruits** in drupes 0.60 - 1cm diam, 3 or 4 lobed.

Flower & Fruit : July - October

Exsiccatus : Phusrey 2370m, **SR Lepcha & AP. Das** 1354, dated 10.10.2004.

Status : Sparse

Local Distribution : Dohrok, Singhaney upto 2650 m.

General Distribution : HIMALAYA; INDIA, NEPAL, BHUTAN, CHINA, MYANMAR, INDO-CHINA.

LEEACEAE (DC.) Dumort

Leea Linnaeus

Leea indica (N. L. Burman) Merr., Philipp. J. Sci. 14: 245. 1919. Long & Rae in Grierson & Long. Fl. Bhutan 2 (1): 164. 1991; Hajra *et al.* Fl. India 5: 337.2000. *Staphylea indica* N. L. Burman, Fl. Indica, 75. 1768;

Local Name: *Gelini* (Nep.)

Shrubs or small trees. **Stipules** broadly obovate, apex rounded, glabrous; **petioles** to 21 cm long, central petiole longer than laterals, to 4.5 cm, glabrous; **lamina** 23 - 4.5 × 1.8 - 3.8 cm, 2- or 3-pinnate, glabrous leaf axis glabrous; leaflets elliptic - elongate elliptic, or elliptic-lanceolate, base rounded, margin irregular - regular teeth, teeth sharp, apex acuminate; lateral veins 6 - 11 pairs, abaxial veinlets conspicuous. **Inflorescences** opposite to leaves, compound dichasial or umbelliform; peduncle 1 - 3 cm, with brown hairs. **Involucre** elliptic-lanceolate, apex acuminate, glabrous; **bracts** oval elliptic-lanceolate, apex shortly acute and acuminate; pedicel 1 - 2.5 mm, pubescent; buds, apex suborbicular. **Calyx** triangular, glabrous. **Corolla** elliptic, glabrous, white or greenish white. **Staminodial tube** to 1.3 mm. **Stamens** 5; filaments to 0.7 mm; anthers elliptic. **Ovary** globose; stigma expanded slightly. **Berries** 4 - 6-seeded.

Flower : April - July *Fruit:* August - December
Excisscatus : Dohrok 2300 m, *SR Lepcha, & AP. Das* 30263, dated 16.10.2004.
Status : Not common
Local Distribution : Phusrey, Mulkharka, 200 - 1200 m.
General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, SRI LANKA, THAILAND, CAMBODIA, INDONESIA, VIETNAM, LAOS, MALAYSIA, NEW GUINEA, PHILIPPINES, AUSTRALIA, PACIFIC ISLANDS

VITACEAE Juss.

Key to the Genera

1. Style with small discoid stigma, tendril branch swollen into a cup *Tetrastigma*
+ Style rarely with discoid stigma, tendril branch with swollen pads *Parthenocissus*

Parthenocissus Planchon

Parthenocissus semicordata (Roxb.) Planch. in DC., Monogr. Phan. 5: 451. 1887; Hara in Fl. E. Him. 200. 1966; 2: 79. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 94. 1979; Long & Rae in Grierson & Long. Fl. Bhutan 2(1): 152. 1991.

Vitis semicordata Roxb., Fl. Indica. ed. Carey, 2: 841. 1824.

V. himalayana (Royle) Brandis var. *semicordata* (Roxb.) Lawson in Fl. Brit. India 1: 656. 1875.

Local Name: *Charcharey Lahara* (Nep.).

Climber shrubby branched, slender, glabrous. Stem quadrangular. **Leaves** ternately 3-foliolate; petioles 1.5 - 5 cm; leaflets asymmetric, **lamina** 4 - 6 × 3 - 4 cm, ovate-elliptic, distantly serrate, caudate, cuneate or semi-cordate, glabrous, pubescent along nerves. **Tendrils** upwardly branched, terminating into a disc-like pads. **Flowers** in terminal or leaf-opposed paniculate umbels. **Calyx**

salver-shaped. **Corolla** 5, to 0.7 cm; style truncate; stigma simple or bilobed. **Berries** globose; seeds, black.

Flower & Fruit : July- October

Exsiccatus : Phusrey upto 2000 m, **SR Lepcha & AP. Das 1351**, dated 11.10.2007.

Status : Common.

Local Distribution : Dohrok, Phusrey, Ramitey upto 2500 m.

General Distribution : E. HIMALAYA ; INDIA Khasia hills.

Note : 1. Endemic to Eastern Himalaya

2. Leaves become red before being shed. A good fodder.

Tetrastigma (Miquel) Planchon.

1. Stem reddish; leaves 3 foliate; petals pale green *T. serrulatum*

+ Stem rarely reddish; leaves 3 – 5 foliate; petals pinkish white *T. objectum*.

Tetrastigma serrulatum (Roxb.) Planchon in DC., Monogr. Phan. 5: 432. 1887; Hara in Fl. E. Him. 1: 201. 1966; 2: 80. 1971; 3: 82. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 2: 95. 1979; Long & Ray in Grierson & Long, Fl. Bhutna 2(1): 155. 1991;

Cissus serrulata Roxb., Fl. Ind. ed. Carey, 1: 432. 1820.

Vitis capreolata D. Don, Prodr. Fl. Nep. 188. 1825; Lawson in Fl. Brit. India 1: 659. 1875.

Local Name: Charchary lahara (Nep.).

Climbers or shrub. Stem reddish with bifid tendril. **Leaves** 5 – foliate; petiole 24.5 cm; triangular stipules, **lamina** 2.5 – 3.5 cm acuminate, cuneate base, margin crenate with short shape teeth between crenations. **Flowers** pale green, pubescent, umbellately branch cymes, 2.5 – 5 cm diam.; Peduncle red. **Calyx** small. **Petals** 2 mm, short style. **Berries** globose, red, black or purple in ripe. 2 seeded.

Flower : May - October. *Fruit*: April - May

Excissatus : Sano-Ramitey 2200m, **SR Lepcha & AP. Das 20250**, dated 8.10.2004.

Status : Common.

Local Distribution : Singhaney, Dohrok, Phusrey to 2400 m.

General Distribution : TEMPERATE HIMALAYAS; INDIA, (Kumaon-Darjeeling), CHINA.

Note : 1. Endemic to Himalaya

2. A common fodder plant.

Tetrastigma obtectum (Wallich ex Lawson) Planch. ex Franch. in Bull. S. Bot. Fr. 33: 458. 1886; Monogr. Phan. 5:434. 1887; Hara in Fl. E. Him. 3:81. 1975; Long & Ray in Grierson & Long Fl. Bhutan 2(1): 157. 1991.

Vitis obtecta Wallich ex Lawson in Fl. British India 1: 657. 1875.

Tetrastigma Myanmarnicum Momiyama, in Fl. E. Him. 2: 79. 1971, p.p. excl. basionym.

Climber slightly shrubby; pendent branches. Stem terete, woody. Tendril terete, branched. **Leaves**; petioles 1 – 1.5 cm long, pubescent. **Leaves** pedately 3 or 5 foliate; leaflets size variable 3 – 13 x 2 – 4 cm, obovate, acute, base cuneate, margin serrate, membranous, pubescent along veins beneath. Peduncle to 18 cm long. Cymes 24 cm across, compound-umbellate, pubescent.

Pedicels upto 40 cm. **Calyx** minute. **Petals** upto 0.5 cm, pinkish white; stigma lobes 4, flat. **Berries** globose, with 2 seeds.

Flower : May - October. *Fruit*: April - May
Excisscatus : Singhaney 2100m, **SR Lepcha & AP. Das** 03056 dated 19.07.2005..
Status : Common.
Local Distribution : Rachel Chowk, Singhaney, Phusrey to 2400 m.
General Distribution : TEMPERATE HIMALAYAS; INDIA (Kumaon-Darjeeling), CHINA.
Note : 1. Endemic to Himalaya
2. A common fodder plant.

Order: Linales

LINACEAE Gray

Anisadenia Wallich ex Meisner

Anisadenia saxatilis Wall. ex Meisn., Pl. Vas. Gen. Comment. 2: 96.1938; Hook.f., Fl. Brit. India 1: 412. 1872; Hara in Enum. Fl. Pl. Nepal 2: 73. 1979; Fasc. Fl. India 13: 3. 1983; Grierson & Long in Fl. Bhutan 1(3): 752. 1987. Sharma *et al.*, Fl. India 3: 573. 1993. *A. khasyana* Griff., Notul. 4: 534. 1854; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 73. 1989.

Herbs small perennial, epiphytic, 10 – 40cm tall. Stem usually unbranched, subglabrous. **Lamina** 2.5 - 7 x 0.6 – 2cm, arrangement variable, mainly alternate (lower ones), upper somewhat whorled towards top; elliptic-lanceolate, acute, base cuneate, pubescent beneath; **bracts** lanceolate, caducous. **Inflorescence** in terminal spike. **Calyx** 0.22 - 0.5cm, strongly nerved and glandular bristly. **Corolla** 0.60 - 0.85cm, obovate, pinkish. **Fruits** oblong.

Flower : June – September *Fruit*: August – November
Excisccatus : Dohrok 2300 m, **SR Lepcha & AP. Das** 30216, dated 06.10.2004.
Status : Rare.
Local Distribution : Padamchen, Kyongnosla 1800 – 3000 m.
General Distribution : HIMALAYAS; INDIA, (Kashmir -BHUTAN), Arunachal Pradesh, NAGALAND.
Note : Endemic to Eastern Himalaya

Order: Sapindales

STAPHYLEACEAE (DC.) Lindley

Turpinia Ventenat

Turpinia nepalensis Wallich ex Wight et Arnott, Prodr. 156. 1834; Ic. Pl. India Or. 3:t. 972. 1845; Hara in Fl.E.Him.1:191.1966; 2:72. 1971; Hara *et al.*Enum.Fl.Pl.Nepal 2: 99. 1979; Nam. Chang. Flr. Pl. 577. 1987; Long in Grierson & Long. Fl.Bhutan 2 (1): 129. 1991; Mat. Fl.

Arunachal Pradesh 1(2):332. 1996. *T. martabanica* Wallich, Cat. 150, n. 4278.1831, *nom. nud.* *T. pomifera* auct. non DC. : Hiern. in Fl. Brit. India 1: 698. 1875 p.p.

*Local Name:*Thali (Nep.).

Trees small upto 18m tall. **Leaves** opposite unevenly 1-pinnate, rachis swollen at nodes; petiolules short to 1.2cm long; stipules interpetiolar to 0.9 cm; **leaflets** lanceolate or elliptic, **lamina** 6.5 -13 x 3 - 5cm, acute, base cuneate, margin serrate, sparsely hairy above, nerves prominent beneath, lateral veins 6 - 9 on either sides. **Inflorescence** in axillary and terminal panicles, bisexual. **Sepals** and **petals** 3, sub-equal, scarcely ciliate; ovary superior and 3-celled; style 3; ovules 4 per cell. **Fruits** sub-globose, apically 3-ridged.

Flower & Fruit : September– October

Exsiccatus : Phusrey 2190 m, **SR Lepcha & AP. Das 1511**, dated 10.10.2008.

Status : Rare

Local Distribution : Phusrey, Dohrok, Hangey 1600 – 2380 m.

General Distribution : E.HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, INDO-CHINA, CHINA, THAILAND

Note : Used as firewood.

ACERACEAE A. Jussieu

Acer Linnaeus

Key to the species

- | | |
|---|-------------------------|
| 1. Leaf unlobed or rarely 2 lateral lobes | <i>Acer hookeri</i> |
| + Leaf 3- 5 – 7 lobed | 2 |
| 2. Leaf trilobed | <i>A. thomsonii</i> |
| + Leaf 5 – 7 lobed | 3 |
| 3. Lamina entire | <i>A. coppadocium</i> |
| + Lamina serrate..... | 4 |
| 4. Samara erect, angle of divergent 90° or less | 5 |
| + Samara slanting , the angle of divergent more than 90°..... | 6 |
| 5. Lamina inciso- serrate, apex caudate | <i>A. caudatum</i> |
| + Lamina remotely serrate, apex acuminate..... | <i>A. sterculiaceum</i> |
| 6. Leaf lobes deltoid, margin deeply serrate | <i>A. pectinatum.</i> |
| + Leaf lobes ovate, sub-entire or serrulate | <i>A. campbellii</i> |

Acer campbellii Hooker f. et Thomson ex Hiern in Fl. Brit. India 1: 696. 1875; Trs. N. Beng. 42. 1929; Hara & Ohashi in Fl.E.Him.1:191. 1966; Hara *et al.* Enum. Fl.Pl.Nepal 2: 98. 1979 ; Grierson & Long. Fl. Bhutan 2(1): 64. 1991. Pant in Singh *et al.*, Fl. India 5: 397:2000.

Trees 20 - 30m tall. **Leaves** palmately 5 - 7-lobed, lamina 10 - 12 × 12 - 15 cm, broader than long, both surfaces light green, shining, margin serrulate, base truncate-cordate, 5 - 7-nerved,

glabrous or at the axils and along the nerves beneath sparsely pilose; lobes ovate-caudate or lanceolate-caudate. **Flower** in dense corymbose, terminal, appearing with leaves 5 - 15 cm long, pentamerous, greenish-white. **Stamens** 8, somewhat included, reddish, filament short. **Disc** extra staminal. **Ovary** glabrescent. **Samaras** 1.7 - 3.0 cm long, slanting, the angle of divergent more than 90°, glabrous.

Flower : April *Fruit* : August
Exsiccatae : Rachela 2800 m, *SR Lepcha & AP. Das* 31058, Dated 03.10.2004
 Bara- Ramitey 2500 m, *SR Lepcha & AP. Das* 31137, Dated
 03.10.2004.

Status : Common
Local Distribution : Memenchu, 3560 m.
General Distribution : N INDIA (Sikkim), NEPAL, BHUTAN, MYANMAR, CHINA,
 VIETNAM.

Note : Used as a fodder in Sikkim.

Acer cappadocicum Gleditsch, Schriften Ges. Naturf. Freunde Berlin 6: 116. 1785;
 Hara in Fl.E.Him. 2: 93. 1971; Grierson & Long in Fl. Bhutan 2(1): 67. 1991; Pant in
 Singh *et al* Fl. India 5: 397. 2000

Trees to 20 m tall. **Leaves** deciduous; **petiole** 7 - 12 cm, slender, glabrous; lamina 4 - 12 (-20) x 5 - 20 cm, abaxially pale green, adaxially dark green, usually longer than broad, adaxially glabrous, base rounded, 3 - 7-lobed, occasionally with leaves small, entire; middle lobe triangular-ovate, apex acuminate; lateral lobes obtuse or triangular-ovate. **Flowers** in corymbose inflorescence; yellowish green; pedicel 2 - 2.5 cm. **Sepals** 5; **petals** 5; **disc** glabrous.

Flower : April *Fruit*: August
Exsiccatus : Rachela, 2800 m, *SR Lepcha & AP. Das* 31119, dated 03.10.2004.
Status : Less Common
Local Distribution : Rachela, Panglaxha, PWS, 1500-3000
General Distribution : INDIA (Kashmir, Sikkim, Assam), NEPAL, CHINA, BHUTAN,
 PAKISTAN, SW ASIA, EUROPE (ITALY)].

Acer caudatum Wallich, Pl. Asiat. Rar. 2: 4. 1830 & 2: 28.t. 132. 1831; Hiern in Hook.f., Fl. Brit. India 1: 695. 1875; Hara in Fl. E. Him.(1):19. 1991. Grierson & Long, Fl. Bhutan 2(1): 67. 1991; Pant in Singh *et al.*, Fl. India 5: 399. 2000;

Trees or shrubs, upto 15 m tall. **Leaves** Petioles 5 - 10 cm long, pubescent, lamina 7.5-15 x 8-18 cm, under surface pubescent, 5-lobed, basal lobes small or often obscure; adult barbate in the axils of nerves below, base cordate, margin inciso-serrate, 5 - 7 nerved, apex long, linear, cuspidate-serrulate. **Flowers** in erect, terminal, racemes; villose, pentamerous, yellowish. **Stamens** 8, exserted. **Disc** large, extra staminal. **Ovaries** pubescent; styles elongated; stigmas short. **Samaras** ca 3 cm long, angle of divergent less than 90°.

Flower : March *Fruit*: October
Exsiccatus : Kyongnosla, *SR Lepcha & AP. Das* 31479, dated 27.07.2005.
Status : Less Common
Local Distribution : PWS, 1675 - 2130
General Distribution : INDIA (Sikkim), BHUTAN, CHINA, MYANMAR

Acer hookeri Miquel in Arch. Neerl. Sci. Nat. 2: 471. 1852; Hiern in Fl. Brit. India 1:694 1875; Trs. N. Beng. 41. 1929; Hara in Fl. E. Him 1:191. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 98. 1979; Grierson & Long., Fl. Bhutan 2 (1):64. 1991.

Local Name: Lal Kapasi (Nep.)

Trees upto 15 m tall. Branches green with whitish stripes later becomes reddish. **Leaves:** petioles to 4 cm long, reddish, sparsely hairy in lower basal part; **lamina** 5 - 13 x 3 - 7 cm, ovate, sharply serrate to bi-serrate, caudate-sub-cordate, acuminate, glabrous and green both sides or sparsely hairy on veins of old leaves beneath, basally 5-nerved. **Flowers** appears with leaves, racemes simple, to 12 cm, pendulous. **Flowers** actinomorphic, monoecious, greenish white and appear along with new leaves. **Sepals** 0.5 x 0.4 cm, almost oblong. **Petals** nearly equal to sepals but slightly broader, 0.33 x 0.17 cm, obovate; stamens 8, scarcely exerted. **Samara** sub horizontal, nuts rounded, winged divergent, to 1.5 x 0.4 cm.

Flower : April *Fruit:* August
Exsiccatus : Rachela trijunction 3000 m, **SR Lepcha & AP. Das** 31257, dated 13. 07. 2008.
Status : Less Common
Local Distribution : Rachela trijunction, 2200- 3000 m.
General Distribution : INDIA (Sikkim)
Note: 1. Endangered species of India (Nair & Shastry ,1987- 1988)
2. An ornamental plant.

Acer pectinatum Wallich, Pl. As. Rar. 2: 4. 1831; Hara *et al.* Enum. Fl. Pl. Nepal 2: 298. 1979; Hara *et al.* Fl. E. Him. 2: 73.1971; Grierson & Long, Fl. Bhutan 2 (1): 67. 1991. *A. caudatum* f. *pectinatum* (Wallich) Hiern in Fl. Brit. India 1: 695. 1875. *A. caudatum* auct. non Wallich: Hiern. in Fl. Brit. India 1: 695. 1875 p.p.

Local Name: Lekh Kapasi (Nep.).

Trees deciduous, upto 22 m tall. **Leaves** lamina 5 - 8 x 5.5 - 7.5 cm.; **petioles** purplish red, 2.5 x 6 cm, 3 - 5 lobed, leaf blade abaxially pale green, adaxially dark green, suborbicular, 3 - 5 lobed, abaxially pubescent, adaxially glabrous, primary veins 5, lateral veins 8 or 9 pairs, base cordate or deeply cordate, 3 - 5 lobed; middle lobe ovate, apex caudate-acuminate, lateral lobes triangular, margin serrate, apex caudate-acuminate or obtuse. **Pedicels** slender, glabrous. **Flowers** staminate. **Sepals** 5, purplish green, ca. 3.5mm. **Petals** 5. **Stamens** 8. **Fruits** yellowish ca. 5 x 4.5 mm; wings falcate, spreading obtusely.

Flower : April - June *Fruit* July - November
Exsiccatae : Rachela 2800 m, **SR Lepcha & AP Das** 31117, dated 27.10.2004.
Kyongnosla, 3500 m, **SR Lepcha & AP. Das** 32006, dated 27.10.2004.
Status : Rare
Local Distribution : Rachela, Kyongnosla, 2200 - 3500
General Distribution : NE INDIA, NEPAL, BHUTAN, NE MYANMAR, CHINA,

Acer sterculiaeectum Wallich, Pl. As. Rar. 2: 3. t. 105. 1830; Hara in Fl. E. Him. (1):192.199; Grierson & Long. Fl. Bhutan 2.1:68.1991; Pant in Singh *et al.*, Fl. India 5: 408. 2000 ; *A. villosum* sensu Wallich *J.c.* 2: 4. 1831 (non Presl.); Hiern in Hook.f. Fl. Brit. India 1: 695. 1875.

Trees upto 15 m tall. **Leaves** ; Petioles densely villose, upto 13 cm long, canaliculated; lamina 12 - 20 x 13 - 22 cm, subcoriaceous, 3 - 5 lobed, basal lobes smaller, often obscure, both surfaces

dull green, upper glabrate; margin remotely serrate, base deeply cordate, 5 – 7 nerved, apex acuminate. **Flowers** racemose pubescent, appearing with or before leaves, lax, lateral collate, pendulous, pentamerous, greenish-yellow, bracts wooly. **Stamens** 5 - 8 (7 - 10), perigynous, exserted. **Ovaries** greenish-brown, prominent green disc present. **Samaras** 4-5 cm long, puberulent, brownish, angle of divergent 90°.

Flower : February *Fruit:* September
Exsiccatus : Ramitey 2000 m, **SR Lepcha & AP Das** 31109, Dated 03.10.2004.
Status : Less common
Local Distribution : Ramitey, PWS, 1675 – 2130
General Distribution : HIMALAYAS, INDIA (Sikkim), BHUTAN
Note : Endemic to Himalaya.

Acer thomsonii Miquel in Arch. Ne'erl. Sci. Nat. 2: 470. 1867; Hara in Fl. E. Him. 1: 193. 1966; 2: 73. 1971; Kitamura in Enum. Fl. Pl. Nepal 2: 98. 1979; Fasc. Fl. India 9: 18. 1982; Grierson & Long., Fl. Bhutan 2(1): 66. 1991. *A. villosum* Wallich var. *thomsonii* (Miquel) Hiern in Fl. Brit. India 1: 695. 1875.

Local Name: Melo Kapasi (Nep.).

Trees upto 30 m tall. **Leaves;** petioles to 15 cm long; lamina 7 - 22 x 6.5 - 15 cm, sub-coriaceous, trilobed, sub-orbicular, triangular, acuminate, base rounded or cordate, entire or obscurely serrate, glabrous in older. **Inflorescence** spicate racemose, to 23 cm long. **Sepals** upto 0.4 cm, oblong, white pubescent. **Petals** almost equal to sepals or slightly longer, yellowish. **Anther** exserted. **Samara** reddish brown, wings to 7cm.

Flower : October – December *Fruit:* January – August
Exsiccatus : Memenchu, 3800 m, **SR Lepcha & AP Das** 20299, dated 28. 10. 2004.
Status : Rare
Local Distribution : PWS, 1400 – 2400 m
General Distribution : HIMALAYAS; INDIA (Simla - Arunachal Pradesh), MANIPUR, MYANMAR.

ANACARDIACEAE Lindley

Key to the Genera:

- | | |
|--|-------------------|
| 1. Leaves simple..... | 2 |
| + Leaves compound..... | 3 |
| 2. Leaves opposite, petals 4, stamens 8..... | <i>Dobinea</i> |
| + Leaves alternate, petals 5, stamens 5..... | <i>Semicarpus</i> |
| 3. Flowers unisexual ; stamens 5 | <i>Rhus</i> |
| + Flowers bisexual; stamens 10 | <i>Spondias</i> |

Dobinea D. Don

Dobinea vulgaris D. Don, Prodr. Fl. Nep. 249. 1825; Hook.f. in Fl. Brit. India 1: 696. 1875; Hara in Fl. E. Him. 1: 186. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 100. 1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 62. 1991; Hajra *et al.*, Fl. India 5: 41. 2000.

Local Name: Sanglay (Nep.).

Shubs upto 5.5 m tall branched. **Leaves** opposite; petioles 2-3cm long; **lamina** 7 – 13 x 3 – 5.5 cm, elliptic-lanceolate, acuminate, dentate - serrate, thinly hairy beneath. **Inflorescence** in panicles upto 53 cm long, mostly terminal, pyramidal. **Flowers** unisexual, whitish, male to 0.18 cm; bracts upto 1.6 cm long, usually linear **stamens** 8, alternately short and long; female to 0.15 cm. **Petals** absent; **stamens** 8. **Fruits** orbicular – ob-cordate, 0.4 cm across, compressed, whitish.

Flower : August - October *Fruit:* October - November
Exsiccatus : On way to Panglakh from Premlakha, 1800 m, **SR Lepcha & AP Das**
31258, dated 13. 07. 2008
Status : Common
Local Distribution : Rigu, Between Padamchen – Lingtam, 1120-2200 m
General Distribution : HIMALAYAS; INDIA (Sikkim- Assam).NEPAL-BHUTAN,

Rhus Linnaeus.

Key to the species:

1. Leaf surface sparsely pubescent above, densely brown tomentose below ; panicles both pyramidal and terminal.; flowers greenish- white *Rhus semialata*
- + Leaf surface glabrous in both sides, glossy adaxially; panicles axillary; Flowers yellowish green *Rhus succedanea*

Rhus semialata Murray in Comm. Soc. Goetting 5: 27. t. 3. 1784; Hook.f. in Fl. Brit. India 2: 10. 1876; Grierson in Grierson & Long, Fl. Bhutan 2(1): 55. 1991. *R. javanica* L., Sp. Pl. 265. 1753; Kanai in Hara Fl. E.Him. 1: 186. 1966. *R. javanica* var. *roxburghii* (DC.) Rehder and Wilson in Sargent, Pl. Wilson. 2: 179. 1914

Local Name: Bhakimlo (Nep.).

Shrub to small tree, upto 12.5 m tall. **Branched**, lax. **Leaves** alternate, odd-pinnate; leaflets 3 - 6 pairs, **lamina** 3 - 13 x 2.4 – 7.2 cm, oblong-ovate or elliptic, margin crenate-dentate, acute, base rounded rarely truncate, upper surface sparsely pubescent, lower densely brown tomentose , rachis usually winged upwards. **Panicles** both pyramidal and terminal. Flowers yellow or greenish-white. **Calyx** very small with rounded lobes. **Petals** about oblong, deflexed; ovary to 0.17 cm, oblong, reduced to pistillode in male flowers. **Drupe** subglobose, to 0.6 cm across, reddish, hairy.

Flower & Fruit : August - January
Exsiccatus : Rachela below – NNP border 2230 m, **SR Lepcha & AP. Das** 31259,
Dated 13.07. 2008
Status : Common
Local Distribution : Rachela Chowk, Panglakh below, 1400 – 2250 m.
General Distribution : HIMALAYAS; INDIA, MYANMAR, THAILAND, CHINA,
FORMOSA, KOREA, JAPAN.

Note : Fruits edible.

Rhus succedanea L., Mant. Pl. 2: 221. 1771; Hook.f. Fl. Brit. India 2: 12. 1876; Hara in Fl. E. Him. 1:186. 1966; 3: 76. 1975; Grierson in Grierson & Long, Fl. Bhutan 2(1): 65. 1991; var. *acuminata* (DC.) Hook. f. in Fl. Brit. India 2: 12. 1876. *R. acuminata* DC., Prodr. 68. 1815.
Local Name: Rani Bhalayo (Nep.).

Shrub to small trees upto 10 m tall. **Leaves** imparipinnate; petioles to 0.8 cm long; leaflets 2 - 6 pairs, ovate or oblong, **lamina** 4.8 - 11.5 x 1 - 4.8 cm, entire, caudate-acuminate, cuneate, rounded or rarely oblique, both upper and lower surface glabrous, glossy adaxially, silvery white abaxially, mid-rib deeply impressed above, lateral veins 13 - 24 pairs. **Panicles** axillary, to 10 cm, slender. **Flowers** unisexual, yellowish green. **Sepals** short, 0.3 cm, glabrous. **Petals** larger than sepals, glabrous; stamens 5, reduced to staminodes in female flowers; **ovary** to 0.16 cm, ovoid, reduced to pistillode in male flowers. **Drupes** drooping, subglobose, to 0.6 cm, yellowish.

Flower : April – June *Fruit* : June – August.

Exsiccatus : Subaney Dara, 1800 m, *SR Lepcha & AP. Das* 31261, dated 13. 07. 2008

Status : Less Common.

Local Distribution : Subaney Dara, Rachel Chowk, 1200 – 2300 m.

General Distribution : HIMALAYA; INDIA, MYANMAR, THAILAND, INDO-CHINA, JAPAN.

Note : Sap causes irritating and itching blisters on skin (Rai & Das 2000).

Spondias L.

Spondias pinnata (L. f.) Kurz, Prelim. Rep. For. & Veg. Pegu Append. A. 44, App. B. 42. 1875; Hara *et al.* Enum. Fl. Pl. Nepal 2:102. 1979; Grierson in Grierson & Long, Fl. Bhutan 2 (1): 60. 1991. *Mangifera pinnata* L. f., Suppl. Pl. 156. 1781. *Spondias mangifera* Willd., Sp. Pl. 2: 751. 1799; Hook.f. in Fl. Brit. India 2:42. 1876.

Local Name: Amaroo (Nep.).

Trees to upto 38 m tall. **Branches** spreading, in old trees. **Leaves** alternate, odd-pinnate, to 35 cm; leaflets 2 - 6 pairs, oblong-elliptic, **lamina** 5.9 – 16 x 4 – 7 cm, acuminate, base rounded or cuneate, entire with a distinct intra-marginal vein, glabrous. **Panicles** axillary or terminal. **Flowers** ± sessile, bisexual, borne on inflorescence branches. **Calyx** 5-lobed, lobes to 0.07 cm. **Petals** 5, 0.22 - 0.5 x 0.2 - 0.20 cm, ovate - oblong, valvate ; stamens 10 ; ovary sub-globose; styles 4-5, free. **Drupe** ellipsoid, 4-5 celled, orange-yellow.

Flower & Fruit : March - June

Exsiccatus : Subaney – Panglakhha 2700 m, *SR Lepcha & AP. Das* 31262, dated 15. 07. 2008.

Status : Less Frequent.

Local Distribution : Rachel Chowk, 1200 – 2300 m.

General Distribution : TROPICAL HIMALAYAS; INDIA, SRI LANKA, MALAYSIA.

Note : Fruits eaten. Shoot also yields a gum called “Chop” (Rai & Das, 2009).

Semecarpus L. f.

Semecarpus anacardium L. f., Suppl. Pl. 182. 1781; Hook. f. Fl. Brit. India 2: 30. 1876; Hara in Fl. E. Him 1:187. 1966; 3:77. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 2:102. 1979; Grierson in Grierson & Long. Fl. Bhutan 2(1):61. 1991.

Local Name: Kalo Bhalayo (Nep.).

Trees deciduous to 15 m tall. Juvenile shoot pale tomentose. **Leaves;** petioles to 5 cm long; simple, **lamina** 16 - 37 x 13 - 20 cm, oblong-obovate, cuneate, entire, subglabrous above, pubescent beneath, coriaceous. **Flowers** in panicles slightly shorter or equalling leaves. **Flowers** to 1cm across, subsessile, dioecious. **Calyx** obconic. **Petals** to 0.6 cm long, oblong, greenish white. **Drupe** up 3 cm long, oblong or ovoid.

Flower & Fruit : May - February

Exsiccatus : Subaney - Singhaney 1600m, *SR Lepcha & AP. Das* 208, dated 16.09. 2001.

Status : Less Frequent.

Local Distribution : Gangtok below, Rigu, 1200 - 1700 m.

General Distributions : HIMALAYAS; INDIA, (Sirmore-Sikkim), MYANMAR, MALAYSIA, N. AUSTRALIA.

Note : The species is of ethno-medicinal importance.

RUTACEAE A.L. Jussieu

Key to the Genera:

1. Leaves compound 2
- + Leaves simple *Skimmia*
2. Shrubs or tree with trifoliate or pinate leaves 3
- + Herbs with bi- or triternate leaves *Boenninghausenia*
3. Leaves opposite, pinnate; trees evergreen; stamen 4 - 5 *Tetradium*
- + Leaves alternate; trifoliate; shrubs often armed; stamens 4 - 8 *Zanthoxylum*

Boenninghausenia Reichenboch.

Boenninghausenia albiflora (Hook.) Reichenb. ex Meisn., Consp. 197. 1828; Hook. f. in Fl. Brit India 1: 486. 1875; Kanai in Fl. E. Him. 3: 75. 1972 Hara *et al.*, Enum. Fl. Pl. Nepal 2: 81. 1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 7. 1991; Hajra *et al.*, Fl. India 4: 263. 1997

Herbs or under-shrubs upto 1.5m tall. Branches usually slender, glabrous. **Stem** glabrous to pubescent. **Leaves** lamina bipinnate, 4.5 - 15 x 3.5; leaflets blades elliptic-obovate to broadly obovate suborbicular, entire, emarginate to rounded, cuneate, glabrous, pale green, nerves distinct. **Inflorescences** in terminal cymes, globose to ovoid to ellipsoid to oblong in bud. **Flowers** upto 65mm long. **Calyx** 1- 2mm persistent. **Corolla** elliptic to obovate to oblong 3.5 - 9 x 3.5mm, white or pink striped-stamen slightly longer than corolla. **Gynophore** elongating in fruit.

Flower : May. *Fruit*: November.
Exsiccatus : Talkharka 2200m, **SR Lepcha & AP. Das 27745**, dated 30.09.2004
Status : Not common.
Local distribution : Talkharka, Singhaney 1350-3050m.
General distribution : PAKISTAN, INDIA, NEPAL, BHUTAN, MYANMAR, THAILAND, INDONESIA, PHILIPPINES, JAPAN, LAOS, VIETNAM.
Note : Used in the treatment of lice and other related problems.

Skimmia Thunbery

Key to the species:

1. Shrubs or trees, upto 9m tall; leaf surface glabrous and glossy beneath; fruits ellipsoid, reddish *S. arborescens*
- + Shrubs upto 2m tall; leaf surface pale beneath; fruit sub-globose, black *S. laureola*

Skimmia arborescens Anders. ex Gamble in Journ. Lin. Soc. Bot. 43: 491. 1916; Kanai in Fl. E. Him. 170. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 82. 1979; Grierson Grierson & Long, Fl. Bhutan 2(1): 19. 1991; Hajra *et al.*, Fl. India 4: 393. 1997. *Limonia laureola sensu* Hook.f., in Fl. Brit. India 1:499.1875, p.p. non (DC.) Walpers.

Local Name: Limbuniphul, Choulaney (Nep.).

Shrubs or small evergreen trees upto 9 m tall. **Leaves** closely alternate, falsely whorled at branch ends; petioles 0.5 - 1.5cm; lamina 5.5 - 13 x 2.2 - 4.8 cm, elliptic - oblanceolate, entire, caudate-acuminate, cuneate, glabrous, glossy beneath, lateral veins 5 - 7 on each side. **Inflorescence** in short racemes to 3. 8 cm long, terminal. **Sepals** 0.2 - 0.13 cm. **Petals** 0.26 - 4 x 0.13 - 0.5 cm, creamy; stamens 0.2 - 0.8cm; anthers brown; filaments greenish-white; ovary 0.20cm long. **Fruits** ellipsoid, reddish.

Flower : April - May *Fruit*: November - March.
Exsiccatus : Mulkharka 2120 m, **SR lepcha & AP. Das 31114**, dated 13.10.2004
Status : Common.
Local Distribution : Mulkharka, Hangey, 2100 - 2800 m.
General Distribution : INDIA, NEPAL, BHUTAN, W. CHINA, THAILAND.

Skimmia laureola (DC.) Walpers, Repert. 5: 405. 1842-1847; Grierson in Grierson & Long, Fl. Bhutan 2(1): 19. 1991; Hajra *et al.*, Fl. India 4: 394, 397. 1997. *S. melanocarpa* Rehder & Wilson in sory, pl. Wilson. 2: 138. 1914. *Skimmia wallichii* Hook.f. & Thoms. ex Gamble in Journ. Linn. Soc. Bot. 43: 492. 1916,

Local Name: Jainberiphul (Nep.)

Shrubs small evergreen glabrous semi-prostrate, not exceeding 2m tall. **Leaves** simple or crowded on branches. alternate; petioles short 1.5cm; elliptic; oblanceolate - entire, acute or caudate, cuneate, glabrous, dark green above pale beneath, lamina 3 - 11 x 3 - 5cm, acute, base cuneate lateral nerves 6 - 8 pairs. **Flowers** in short terminal racemes, fragrant. **Sepals** -5 lobed. **Petals** 5 lobes upto 1.2mm long, greenish yellow, oblanceolate; **stamens** 5 equal or slightly or shorter to petals 2.5mm. **Ovary** ovoid. **Fruits** sub-globose to 8 mm in diam., black.

Flower : April. *Fruit*: May.
Exsiccatus : Ramitey dara - Rachel 2890 m, **SR Lepcha & AP. Das 31191**, dated 05. 10.2004.
Status : Less common

Local distribution : Rachela, Premlakha 2895-3200m
General distribution : E. HIMALAYA (NEPAL-BHUTAN, Assam), MYANMAR, W. CHINA.

Tetradium Loureiro

Tetradium fraxinifolium (Hook.) Hartely in Gard. Bull. Singapore 34(1): 102. 1981; Grierson in Grierson & Long, Fl. Bhutan 2(1): 9. 1991; Hajra *et al*, Fl. India 4: 370. 1997. *Philagonia fraxinifolia* Hook. in Ic. Pl. t. 710. 1875. *Evodia fraxinifolia* Hook.f. in Fl. Brit. India 1: 490. 1875.

Local Name: Khanakpa (Nep).

Tree upto 13m tall. **Leaves** ovate elliptic, acuminate, **lamina** 8 – 25 x 3.5 - 9cm base ± asymmetrically rounded, margin crenates, glabrous or sparsely pubescent on both surfaces, marginal oil glands layer then those scattered about lamina, **leaflets** 3 - 7pairs, ovate. **Inflorescence** 8 - 22cm, branches pubescent, flower 4 merous. **Calyx** 4, 1 - 2mm. **Corolla** greenish 3 - 6mm. **Stamens** slightly longer than corolla. **Ovary** glabrous or appressed pubescent: ovate 2-3per. **Fruit** 4 carpellate, connate, at base forming a 4 lobed follicle; 2 seeded per cell, subtrigonus.

Flower : May – November *Fruit*: July – November.
Exsiccatus : Dohrok 2200m, **SR Lepcha & AP. Das 30271**, Dated 06.10.2004.
Status : Common
Local Distribution : Dohrok, Phusrey, Rachela upto 3000 m
General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, THAILAND, VIETNAM
Note : Fruit used to make pickles and taken in acute dysentery.

Zanthoxylum Linnaeus

Key to the Species:

1. Perianth uni-seriate, petiole and leaf rachis usually wing 2
+ Perianth bi-seriate; petiole and rachis not winged *Z. oxyphyllum*
2. Leaf margins serrate; flowers in sub-umbellate panicles, rarely axillary ... *Z. acanthopodium*
+ Leaf margins crenate or entire; flowers axillary in short pedunculate ... *Z. armatum*

Zanthoxylum oxyphyllum Edgew. in Trans. Linn. Soc. 20: 42. 1846; Hook.f. in Fl. Brit. India 1: 494. 1875; Hara *et al*, Enum. Fl. Pl. Nepal 2: 83. 1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 15. 1991. *Zanthoxylum violaceum* Wall., cat 33,m1213.1829, nom. nud,p.p. *Fagara oxyphylla* (Edgew) Engl,pltfam.34: 118.1896 ; Hajra *et al*. Fl. India 4: 378-385. 1997

Local Name: Bhainsy timur (Nep).

Shrubs or small trees, twigs scrambling, prickles hooked. **Leaves** odd-pinnate; lamina 4 – 8 x 2 - 3cm, acute odd-pinnate leaflets 1 – 9 pairs ovate-lanceolate to oblong, acute or acuminate, base rounded or cuneate, margin glandular crenate and leaflets usually bearing spines beneath. **Inflorescence** in sub-umbellate panicles. Male flowers **calyx** 4 – lobed. **Corolla** 4, ovate-elliptic. Perianth biseriate. **Stamens** 4, pistillodes 1 or 2 female flowers; calyx and petals as in male flowers. **Staminodes** absent. **Carpel** 4, ovoid style cohering. **Follicles** upto 4, sub-globose, purplish red.

Flower : May – June *Fruit*: September – October

- Exsiccatus* : Ramitey dara 2300m, *SR Lepcha & AP. Das 31163*, dated 03.10.2004.
 Rachela 3010 m, *SR Lepcha & AP. Das 27716*, dated 30.09.2004.
- Status* : Sparse
- Local Distribution* : Ramitey dara, Subaney – Singhaney 1980 – 2900 m
- General Distribution* : HIMALAYAS; INDIA, (Garhwal-BHUTAN), Meghalaya, MYANMAR.

Zanthoxylum acanthopodium DC., Prodr. 1: 727. 1824; Hook.f. in Fl. Brit. India 1: 493. 1875; Trs. N. Bengal 29. 1929; Hara & Ohashi in Fl. E. Him. 171. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 83. 1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 13. 1991; Hajra *et al.*, Fl. India 4: 385. 1997

Local Name: Boke Timbur (Nep).

Shrub with prominent prickles, tomentose, ferruginous in young branchlets. **Leaves** usually imperipennate, upto 22cm; **leaflets** 3 - 9, lamina 3.8 - 6.5 x 1.4 - 3.5cm, lanceolate or ovate-lanceolate, serrate, shortly acuminate or acute, rounded, glabrous above, pubescent, veins distinct beneath, wings between leaflets upto 0.55 cm broad. **Inflorescence** axillary, small crowded, shortly pedunculate. **Perianth** uniseriate. **Calyx** leaves linear, ciliate; **stamens** brownish. **Fruits** sub-globose, red; seeds globular; follicle blackish.

- Flower* : October - February *Fruit:* December - June
- Exsiccatus* : Subaney Dara, *SR Lepcha & AP. Das 31029*, dated 02.10.2004.
- Status* : Less Common.
- Local Distribution* : Subhaney, Dohrok 2000 – 2600 m.
- General Distribution* : HIMALAYAS ; (Kumaon-BHUTAN), INDIA (Meghalaya) MYANMAR, THAILAND, INDO-CHINA, W. CHINA.

Note : Fruits chewed to cure indigestion and flatulence

Zanthoxylum armatum Candolle, Prodr. 1: 727. 1824; Hajra *et al.*, Fl. India 4: 379. 1997; Hara & Kanai, Fl. E. Him. 3: 76. 1975.

Shrubs, climbers, or trees upto 5 m tall. Branch-lets and leaflet with prickles. **Leaves** 3 – 9 foliolate; rachis glabrous or rust-colored pubescent, wings to 4.5 -6 mm on each side; **leaflet** subsessile, opposite, lanceolate, ovate, or elliptic, 2.5 - 13 x 1.5 – 3.8cm, base attenuate to broadly cuneate, margin crenate or entire and often revolute when dry, apex acute to acuminate. **Inflorescences** terminal on short lateral branchlets, rarely axillary, upto 30 flowers. **Perianth** in 2 irregular series or 1 series, with 6 - 8 ± undifferentiated tepals. **Male flowers:** stamens 4 - 6; anthers yellow prior to anthesis; connective apex with oil gland; carpels lacking. **Female flowers:** carpels 2 or 3, abaxially often with a conspicuous oil gland; styles recurved; staminodes ligulate. **Fruit** follicles usually purplish red, with some oil glands. Seed blackish brown.

- Flower* : April – May *Fruit:* August – October
- Exsiccatus* : Singhaney dara – Rachela 2800 m, *SR Lepcha & AP. Das 31027*, dated 07.10. 2004.
- Status* : Less Common.
- Local Distribution* : Singhaney, Rachela 2000 – 3100 m.
- General Distribution* : PAKISTAN, INDIA, NEPAL, BHUTAN, BANGLADESH, THAILAND, INDONESIA, JAPAN, KOREA, LAOS, MYANMAR, PHILIPPINES, VIETNAM.

Order: Geraniales

OXALIDACEAE R. Brown

Oxalis Linnaeus

Key to the species:

1. Leaflets ob-cordate – broadly cordate 2
+ Leaflets ob-triangular *O. latifolia*
2. Inflorescence with 1 flowered; corolla white; capsule ovoid *O. acetosella*
+ Inflorescence with 2 - 3 flowered; corolla yellow; capsule sub-cylindrical *O. corniculata*

Oxalis acetosella L., Sp. Pl. 43. 1753; Rec. Surv.Bot. India 6(8): 325-341. 1919; Journ. Fac. Sci. Univ. Tokyo Bot. 6: 81. 1952; Hajra *et al.*, Fl. India 4: 242. 1997; Hara in Fl. E. Him. 167. 1966. *O. leucolepis* Diels in Notes Bot. Gard, Edin. 5:223. 1912.

Herbs with rigid and creeping root-stock. **Leaves** petioled to 14cm long, pubescent; **lamina** of leaflets broadly obcordate, 1.5 – 3.5 x 1.2 – 4 cm, ternate, appressed pubescent beneath along margins; peduncles to 17 cm, slender, axillary. **Flowers** to 1.7 cm diam, 1-flowered, white. **Calyx** oblong, rounded. **Corollas** equal to calyx, spatulate-oblong, white; stamens 10, unequal and alternately placed; ovary to 0.4cm, glabrous. **Capsules** 0.42 x 0.38 - 0.8 cm, ovoid, ribbed.

Flower & Fruit : May– August
Exsiccatus : Below Dorok 1920m, *SR Lepcha & AP. Das 31277*, dated 13.09. 2008.
Status : Rare.
Local Distribution : NNP border, 1420 - 2180m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, JAPAN, TAIWAN.

Oxalis corniculata L., Sp. Pl. 435. 1753; Hara in Fl. E. Him. 1:168. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 77. 1979; Long in Grierson & Long, Fl. Bhutan 1(3):742. 1987

Local Name: Chari-amilo (Nep.).

Herbs perennial, spreading upto 15 cm. **Leaves** palmate-trifoliolate, radicals leave, clustered; petiole to 4.5 cm, densely brownish hairy; palmate-trifoliolate, radicals, clustered; stipules adnate; **leaflets lamina** 0.5 – 1 x 0.6 - 1cm, entire-ciliate, broadly obcordate, emarginate, lobes rounded, base cuneate, both sides densely hairy, veins indistinct; peduncles axillary, usually 2-5 flowered, hairy. Pedicels upto 1.5cm long. **Flowers** 0.6 – 1.5cm across. **Calyx** linear-elliptic, persistent. **Corolla** yellow, larger than calyx, notched in the middle. **Capsules** subcylindric, pubescent, fruiting pedicel deflexed; seeds many.

Flower & Fruit : February – October
Exsiccatus : Phusrey above, 2430, *SR Lepcha & AP. Das 31278*, dated 13.09.2008.
Status : Common.
Local Distribution : Phusrey – Rachel middle. 2100 - 2800m.
General Distribution : COSMOPOLITAN
Note : Leaves are having potential medicinal values.

Oxalis latifolia Humboldt, Bonpland & Kunth., Nov. Gen. Sp. 5:184, t. 467. 1821; Hara in Fl. E. Him.168. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 77. 1979; Long in Grierson & Long, Fl. Bhutan 1(3): 743. 1987.

Herbs with bulbil scales many nerved. **Leaflets**, ob-triangular 2.5 – 5.5 x 3 – 3.5 cm, shallowly emarginated, eglandular and glabrous. **Inflorescence** umbels not compound. **Flowers** campanulate. Calyx with 2 hastate apical glands. **Corolla** red-pink.

Flower & Fruit : May – August
Exsiccatus : Dhorok below 1960m, *SR Lepcha & AP. Das* 31279, dated 13.09.2008.
Status : Frequent
Local Distribution : Phusrey 1060 – 2000 m.
General Distribution : Native of C. & S. AMERICA, Naturalized in ASIA & EUROPE.

GERANIACEAE A.L. Jussieu

Geranium Linnaeus

Key to the species

1. Inflorescence solitary cymes 1 or (2)-flowered 2
- + Inflorescence cymes in umbel-like aggregates 2 or (3)-flowered *G. polyanthes*
2. Herbs with 3-9 lobes, petals purplish, staminal filament dark red *G. donianum*
- + Herbs with 3-5 lobes, petals pale pink, staminal filament whitish *G. nepalensis*

Geranium donianum Sweet, Geran.4:sub t. 338. 1827; Hara in Fl.E.Him.3: 72.1975; Hara *et al.*, Enum.Fl. Pl. Nepal 2: 76. 1979; Campbell & Long in Grierson & Long, Fl. Bhutan 1(3): 748. 1987; Hajra *et al.*, Fl. India (4): 68, 71, 1997. *G. multiflorum* D. Don, Prodr. Fl. Nepal. 207. 1825. *G. collinum auct.non.bieb*:Edgew.& Hook.f.in Fl. Brit. India 1: 429. 1872.

Herbs perennial, erect upto 40cm tall. **Stem** much branches. **Leaves** opposite, stipules lanceolate; petiole to 0.7 mm; **lamina** 1.6 - 3.38 cm across, appressed nonglandular trichomes; segments 5, rhombic to obtriangular, 3 - 9 lobed in distal half. **Inflorescence** solitary, 2-flowered; bracteoles linear-lanceolate. **Calyx** 5.5 – 1.2mm, antrorse to patent nonglandular trichomes, inside almost glabrous. **Corolla** deep purplish, 1.8 - 2.5 cm, not reflexed, margin basally ciliate, apex emarginate. **Staminal** filaments dark red distally but paler at base, lanceolate, anthers reddish, 1.5 - 2.3 mm. **Nectaries** 5, hemispheric; stigma dark red. **Fruit** erect when immature; mericarps smooth, narrowed apex; Seeds small upto 2.4 mm.

Flower : July-August *Fruit:* August - September
Excissatus : Kupup 3940 m, *S.R.Lepcha & A.P. Das* 31408, Dated 27.07.2005.
Status : Abundant.
Local Distribution : Serabthang, Bhimbase, Dokala, 3500 - 4500 m
General Distribution : HIMALAYAS - INDIA (Sikkim), BHUTAN, NEPAL, CHINA,
Note : Endemic to Himalaya.

Geranium nepalense Sweet, Geran. 1:t.12. 1820; Edgew. & Hook.f. in Fl. Brit. India 1: 430. 1872; Hara in Fl. E. Him.1: 167. 1966; 3: 74: 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 76. 1975; Campbell & Long in Grierson & Long, Fl. Bhutan 1(3): 749. 1987. Hajra *et al.*, Fl. India (4): 76. 1997

Herbs, perennials slender. **Stem** upto 72 cm tall, trailing, or ascending. **Leave** opposite; stipules lanceolate to subulate; **petiole** to 50 cm, pubescent, lamina deeply 3 - 5 lobed, lobes ovate-rhombic, toothed, hairy; pedicels pubescent, eglandular. **Inflorescence**, solitary cymes (1 or)2-flowered; peduncle upto 7.5cm; bracteoles linear-lanceolate. **Calyx** 3.2 - 5.5 mm, non glandular trichomes, whitish yellow. **Corolla** white, pale pink, or rarely deep pink, 4.3 - 5.8 mm, both surfaces with a few trichomes, apex rounded or slightly notched. **Staminal** filaments whitish, lanceolate, anthers 2 celled violet. **Nectaries** 5, hemispheric, glabrous. **Stigma** reddish. **Fruit** erect when immature; mericarps 1 transversal vein at apex, capsule to 13 mm including beak.

Flower : April – September *Fruit:* May – October
Exsiccatae : Dohrok 2200 m, **SR Lepcha & AP. Das** 30282, Dated 06.10.2004.
Panglakha 2990 m, , **SR Lepcha & AP. Das** 20274, Dated 28.10.2004.
Status : Abundant.
Local Distribution : Rachela, Padamchen, Kupup 2800 – 4000 m.
General Distribution : PAKISTAN, AFGHANISTAN, NE & S INDIA, NEPAL, BHUTAN, SRI LANKA, MYANMAR, THAILAND, INDONESIA, LAOS, N. VIETNAM.

Note : The whole plant is used for Chinese medicine.

Geranium polyanthes Edgew. & Hook.f. in Fl. Brit. India 1: 431.1874; Hara in Fl. E. Him. 167. 1966; 3: 75. 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 76.1979; Campbell & Long in Grierson & Long, Fl. Bhutan 1(3): 745.1987; Hajra *et al.* Fl. India (4): 78. 1997

Herbs perennials erect or decumbent upto 65 cm tall. **Leaves** alternate or opposite at inflorescence; stipules ovate; petiole subglabrous; **lamina** 2.3 – 4.9 cm, palmately cleft, pilose with ± appressed trichomes; segments 5 - 7, obtriangular, 3 - 9-lobed oblong or obovate lobes. **Inflorescence** cymes in dense umbel-like aggregates, usually 2(or 3)-flowered; peduncle absent; pedicel to 2.7cm, with trichomes; bracteoles lanceolate. **Calyx** to 7.5 mm. **Corolla** pinkish outside glabrous, inside basally with trichomes, margin basally ciliate, apex rounded or retuse. **Staminal** filaments pink or white, lanceolate; anthers yellow, to 1.3 mm. **Nectaries** 5, hemispheric, glabrous. **Stigma** pinkish. **Fruit** mericarps reticulate, without a basal callus.

Flower : July - August *Fruit:* August – October
Exsiccatae : Lampokhri 4350 m, **SR Lepcha & AP. Das** 30931, dated 27.07.2005.
Bhimbase 4290 m, **SR Lepcha & AP. Das** 30981, dated 27.07.2005.
Dokala 3850 m, **SR Lepcha & AP. Das** 30994, dated 28.07.2005.
Status : Abundant.
Local Distribution : Jalepla, Gnathang, Tamzay 2900 – 4000 m.
General Distribution : HIMALAYAS; (Kumaon to Sikkim).
Note : Endemic to Himalaya.

BALSAMINACEAE A. Richard

Impatiens Linnaeus

Key to the species:

- | | | |
|---|----|------------------------|
| 1. Herbs more than 1 m tall | 2. | |
| + Herbs less than 1 m tall | 3 | |
| 2. Capsules sub-cylindric – cylindric | 4 | |
| + Capsules clavate | | <i>I. drepanophora</i> |
| 4. Herbs \geq 1 m tall; flowers few (2 -7 flowered) | | <i>I. cymbifera</i> |
| + Herbs \leq 1 m tall; flowers numerous | | <i>I. pradhanii</i> |
| 3. Capsules ellipsoid, fusiform, elongated | 5 | |
| + Capsules cylindric, linear | 6 | |
| 5. Capsule ellipsoid | | <i>I. bracteata</i> |
| + Capsule fusiform or elongated | 8 | |
| 6. Flowers purplish pink with dark red stripe | | <i>I. pulchra</i> |
| + Flowers orange red or golden yellow with purple nerves at throat... | | <i>I. porrecta</i> |
| + Flowers pale to midium yellow | | <i>I. jurpia</i> |
| 8. Flowers \geq 4 | | <i>I. decipiens</i> |
| + Flowers \leq 4 | | <i>I. spirifer</i> |
| 10. Lateral veins 7 - 9 pairs, flowers pale purple to yellowish white ,.... | 11 | |
| + Lateral veins 4 - 7 pairs, flowers strictly yellow | | <i>I. Longipes</i> |
| 11. Lamina 3.5 – 8 x 3.5 – 7 cm; flowers radiate | | <i>I. radiata</i> |
| + Lamina 2.5 – 6 x 1 – 6 cm; Flowers never radiate | | <i>I. racemosa</i> |

Impatiens bracteata Colebrook ex. Roxburgh in Roxburgh, Fl. India, ed. Carey & Wallich, 2: 459. 1824; Balakrishnan, Fl. Jowai 1: 111.1981; Grey-Wilson in Grierson & Long., Fl. Bhutan 2 (1): 103. 1991

I. fimbriata Hook., Exot. Fl. 2:t.146. 105; Hook. f., Fl. Brit. India 1: 461.1874.

Herbs annual upto 5 - 45m tall. **Stem** glabrous, few branched. **Leaves** opposite rarely sub-opposite alternate, elliptic lanceolate, **lamina** 3 – 13 x 1 – 3.4. Inflorescence a dense many-flowered raceme; flowers pink with a yellow throat: bracts closely overlapping, markedly fimbriate to 2.5 cm. Lower sepal slightly boat shaped, constricted into a curved filiform spur to 2.5 cm. Dorsal petals slightly hooded, ovate or flattened, lateral united petals to 1.5 cm; upper lateral petals suborbicular ; lower obovate. **Capsules** fusiform.

Flower	: June	Fruit:	September
Exsiccatu	: Rachela below 2750 m, <i>SR Lepcha & AP. Das</i>		27725, dated 30.09.

2004.

Status : Less common
Local Distribution : Dorok- Phusrey, Rachela, Gangtok below, 1200 - 1500 m
General Distribution : E.HIMALAYA; INDIA, Meghalaya, Manipur. (NEPAL – BHUTAN)
Khasia, CHINA.

Note : A new distribution record for Sikkim.

Impatiens cymbifera Hook.f., Fl. Brit. India 1: 475. 1875; Grey-Wilson in Grierson & Long., Fl. Bhutan 2 (1): 102. 1991

Herbs annual upto 1.5 m tall. **Leaves** elliptic – ovate elliptic or lanceolate elliptic **lamina** 7.5 – 20 × 2.5 – 7 cm. **Inflorescence** 2 -7 flowered in raceme, sometime reduced to 1 flower on lateral shoot; flower purple, lilac to reddish purple; peduncle to 7.5 cm. **Sepal** lower one like boat shaped, to 1.3 cm, abruptly constricted into a curved filiform spur 0.7 – 1.1cm. **Dorsal petals** slightly hooded, ovate- cordate, to 1.2 cm, crested above; **lateral united** petals 2.3 cm, upper lateral petal suborbicular, lower lateral narrow lanceolate – oblong, obtuse. **Capsule** cylindrical

Flower & Fruit : July - November
Exsiccatu : On way to Panglakha 2700 m, **SR Lepcha & AP. Das** 20216, dated 08.10. 2004.

Status : Common
Local Distribution : Panglakha, Rachela 1900 – 3000 m.
General Distribution : E. HIMALAYAS; INDIA (Sikkim, Assam, Nagaland, Manipur, Meghalaya) NEPAL, MYANMAR INDO- CHINA.

Impatiens decipiens Hook.f. in Rec. Bot. Surv. India 4: 17. 1905; Grey-Wilson in Grierson & Long, Fl. Bhutan 2(1): 95. 1991,

Herbs perennial upto 55 cm tall. **Leaves** ovate to ovate- elliptic, **lamina** 2.3 – 13 x 4.5 – 6.2 cm, lateral veins pubescent in upper surface. **Flowers** in fascicles of 2 – 4, occasionally solitary, pink to purple. **Lower** sepal funnel shaped to 1.3 cm gradually tapering into a spur; spur to 3.3 cm, usually S- shaped filiform, sparsely pubescent. **Dorsal petal** slightly hooded; lateral united sepals shaped to 23 mm, upper lateral petals of each pair broadly oval, slightly emarginated, 0.6 – 1 x 0.5 – 0.7 cm.; lower lateral petals asymmetrically oval. 1 – 1.4 x 0.8 – 1.2 cm. **Capsules** cylindrical.

Flower : September *Fruit* : December
Exsiccatu : Panglakha 3100 m, **SR Lepcha & AP. Das** 30255, dated 06.10.2004.

Status : Less common
Local Distribution : Mulkharka, Subaney, Talkharka, 1200 – 1600 m.
General Distribution : INDIA (Darjeeling – Sikkim), NEPAL, BHUTAN, TIBET, CHINA,
Note : Endemic to Eastern Himalaya

Impatiens drepanophora Hook.f. in Rec. Bot. Surv. India 4: 17 & 22. 1905; Grey-Wilson in Grierson & Long, Fl. Bhutan 2 (1): 97. 1991; Vivekananthan in Hajra *et al*, Fl. India 4: 1997.

Herbs annual robust, upto 100 cm tall. **Leaves** lamina 4.5 - 13 x 2.5 - 5 cm, alternate; leaf blade ovate - lanceolate, with 2 stipitate basal glands. lateral veins 7 - 8 pairs, base cuneate, apex acuminate. **Flowers** axillary or subterminal, racemose, 6 – 9 flowered; Pedicels short slender, bracteate at base; **bracts** usually caducous, green, ovate-lanceolate, glandular. Flowers yellow. Lateral **calyx** 2, falcate. Lower calyx constricted into an involute-incurved spur. Dorsal **corolla**

spurred, orange; lateral united corolla clawed; basal lobes red spotted, narrowly oblong; distal lobes oblong. **Capsules** clavate.

Flower : August *Fruit* : September
Exsiccatus : Rachela 2870 m, *SR Lepcha & AP. Das* 30228, dated 06.10.2004.
Status : Common
Local Distribution : Panglakha, Bhusuk, Rachela 2000 - 2900 m.
General Distribution : E. HIMALAYA; INDIA (Darjeeling - Sikkim,) NEPAL. BHUTAN, MYANMAR,
Note : Endemic to Eastern Himalaya.

Impatient jurpia Buch.- Ham. ex Hook.f. & Thoms. in Journ. Linn. Soc. 4: 140. 1860; Hook.f. Fl. Brit. India 1: 471.1874; et in Rec. Bot. Surv. India 4: 14. 1905; Hara Fl. E. Him. 196. 1966 & 2: 75: 1971; Grey-Wilson in Grierson & Long. Fl. Bhutan 2 (1): 90. 1991; Hajra *et al.*, Fl. India 4: 161. 1997.

Herbs perennial - annual upto 60 cm tall. **Leaf** glabrous, oval \pm ovate, **lamina** 7 - 23 x 2 - 13 cm. **Flowers** 3 - 10 in racemes, pale - mid yellow, **Spurs** often reddish ; peduncle to 13 cm **Calyx** lower obliquely sulcate - abruptly constricted into a curve. **Corolla** dorsal cuculate, with a keel like crest, upto 6 mm in upper part, ; lateral united corolla to 35 mm. upper lateral corolla oval, emarginated; lower lateral corolla asymmetrically obovate. **Capsules** cylindrical.

Flower : June - August
Exsiccatus : Pangolakha, 2800 m, *SR Lepcha & AP. Das*, 30933, dated 24.07.2005
Status : Common
Local Distribution : Phusrey, Bhusuk, 1200 - 1800 cm
General Distribution : E. HIMALAYA; INDIA (Sikkim, Darjeeling), BHUTAN
Note : Endemic to E. Himalaya.

Impatiens longipes Hook.f & Thoms. in J. Linn. Soc. 4: 151. 1960; Hook.f., in Fl. Brit. India 1: 473. 1875 et Rec. Bot. Surv. India 1: 473. 1875 et Rec. Bot. Surv. India 4: 21. 1905; Grey-Wilson in Grierson & Long. Fl. Bhutan 2(1): 98: 1991.

Herbs annual upto 90cm tall. **Leaves** lamina 4 - 8 x 3 - 4 cm, alternate; **Petioles** with 2 basal glands; leaf blade ovate-lanceolate, lateral veins 4-7 pairs, base cuneate, attenuate into petiole, margin crenate-serrate, apex long acuminate. **Flowers** axillary or subterminal, racemose, 3 - 6 (-7)-flowered; peduncles spreading, bracts often caducous, yellow. **Calyx** small, 2, rarely 4, ovate-oblong, apex acuminate. **Lower calyx** infundibular, narrowed into a hooked. **Corolla** orbicular, apex mucronulate on dorsal side; united and without clawed at lateral; **Capsules** linear, seeds oblong-ovoid, rugose.

Flower : August *Fruit*: September
Exsiccatae : Rachela 3050 m *SR Lepcha & AP. Das* 31044, dated 02.10.2004;
Pangolakha 2850, *SR Lepcha & AP. Das*, 29372, dated 30.09.2004.
Status : commom
Local Distribution : Rachela, Panglakha, Durpiney near NNP border ca. upto 4100 m.
General Distribution : E. HIMALAYA; INDIA (Darjeeling - Sikkim).
Note : Endemic to Sikkim & Darjeeling himalaya

Impatiens porrecta Hook.f. & Thoms. in J. Linn. Soc. 4: 138. 1860; Hook.f. in Rec. Bot. Surv. India 4: 33. 1905 ; Grey-Wilson in Grierson & Long. Fl. Bhutan 2 (1): 83. 1991.

Herbs upto 45 cm tall, tufted, diffuse. **Stems** slender, creeping at base, glandular hairy. **Leaves** lamina 3.5 - 7 × 2 - 4 cm, oblong obovate to elliptic oblong, obtuse, acute or acuminate, crenate serrate at margins, base cuneate, petioles 2.5 mm long, peduncles 1 - 2 flowered. **Flowers** orange red or golden yellow with purple nerves at throat; **bracts** setaceous, glands tipped, spur long, abruptly hooked. **Capsules** ellipsoid.

Flower : September *Fruit* : November
Exsiccatus : Dohrok 2300 m, **SR Lepcha & AP. Das** 30251, dated 06.10.2004.
Status : Common
Local Distribution : Lingtam, Rigu, Karponang, Dohrok upto 3000 m.
General Distribution : E. HIMALAYA; INDIA (Sikkim, Darjeeling)
Note : Endemic to Eastern Himalaya

Impatiens pradhanii Hara in Journ. Jap. Bot. 40: 99. 1965; Vivekananthan in Hajra *et al*, Fl. India 4: 125. 1997; Grey-Wilson in Grierson & Long, Fl. Bhutan 1(1): 103. 1991. *Impatiens bicornuta* Wallich in Roxb., Fl. Indica, ed. Carey & Wallich ii. 460. 1824.

Herbs annual, upto 1 m tall. **Leaves** alternate; petiole with globose glands at base; elliptic or elliptic-lanceolate, **lamina** 5.5 - 12 (-16) × 5 - 8cm both surfaces glabrous or sparsely pilose, setose at base, lateral veins 10 - 12 pairs, base cuneate, margin coarsely crenate, apex caudate-acuminate. **Inflorescences** crowded in leaf axils, racemose, many flowered; Pedicels fascicled or verticillate ; **bracts** ovate, with conspicuous aristate glands at apex. **Flowers** pale blue-purple, **Lateral calyx** 2, ovate, with aristate glands at apex. **Lower calyx** purple spotted, broadly sigmoid-curved constricted into a hooked or incurved spur; **Dorsal corolla** suborbicular ; lateral united petals not clawed, basal lobes ovate to suborbicular; distal lobes narrowly caudate, apex long tailed ; auricle inflexed, **Anthers** obtuse. **Capsule** subcylindric, shiny.

Flower : June *Fruit*: August
Exsiccatus : Mulkharkha - Ramitey dara 1800 m, **SR Lepcha & AP. Das**, 27798, dated 30.09.2004
Status : Less common
Local Distribution : Rigu, Subaney, Ramitey dara 2400 - 2800 m.
General Distribution : E. HIMALAYA; INDIA (Darjeeling - Sikkim).
Note : Endemic to Sikkim.

Impatiens pulchra Hook.f. & Thoms. in Journ. Linn. Soc. 4: 139. 1860; Hook.f., Fl. Brit. India 1: 459. 1874; Grey-Wilson in Grierson & Long., Fl. Bhutan. 2(1): 90. 1991; Vivekananthan in Hajra *et al*, Fl. India 4: 199. 1997;

Herbs upto 30 cm tall, erect, glabrous, **Stems** nodes sparsely branched. **Petiole** upto 13 mm, glabrous. **Leaf-lamina** 3 - 10 × 1.5 - 3 cm, oblong or lanceolate, elliptic - lanceolate, shortly attenuate into petiole at base, acuminate, crenate to crenate dentate along margin, dark green above, pale beneath, lateral nerves 8 -12 pairs. **Flowers** purplish pink with dark red streak, peduncles upto 2 flowered. **Bracts** lanceolate. **Lateral calyx** 2, acute to acuminate. Lip funnel shaped. Spur constricted, filiform, basal lobes elliptic oblong, distal lobes narrowly elliptic to semiovate, obtuse. **Capsules** ellipsoid.

Flower : June *Fruit:* October
Exsiccatus : Phusrey, 2306 m, **SR Lepcha & AP. Das** 20216, dated 08.10.2004.
Status : Common
Local Distribution : Phusrey, Premlakha, Beusa 1200 – 1800 m
General Distribution : E. HIMALAYAS; INDIA (Sikkim, Darjeeling, Assam, Arunachal Pradesh, Nagaland and Meghalaya), NEPAL, BHUTAN, MYANMAR.
 Note : Endemic to Eastern Himalaya

Impatiens racemosa DC., Prodr. 1: 688. 1824; Hook.f., Fl. Brit. India 1: 479. 1875; Grey-Wilson in Grierson & Long, Fl. Bhutan 2 (1): 97. 1991 ; Vivekananthan, Rathakrishnan, Swaminathan & Ghara in Hajra *et al.*, Fl. India 4: 1997.

Herbs annual upto 70cm tall. **Leaves** elliptic-lanceolate or elliptic-ovate, **lamina** 2.5 - 5- 8 x 1 – 6 cm, glabrous on both surfaces, setose between teeth, lateral veins 7 - 9 pairs, base cuneate, attenuate into petiole, margin crenate, apex acuminate. **Inflorescences** axillary or subterminal, racemose, 3 -10 flowered; peduncles subtending leaves. Pedicels slender, bracteate at base, lanceolate. **Flowers** yellow or pale yellow. Lateral calyx 2, red when dry .with 1 gland at one side of upper margin. **Lower calyx** boat shaped, narrowed into an incurved, spur very short or absent. **Dorsal corolla** hooded, orbicular, lateral united corolla not clawed, 2-lobed; basal lobes ovate to orbicular ; distal lobes broadly dolabriform. **Auricles** rounded. **Anthers** obtuse. **Capsules** linear clavate, seeds many; brown, oblong.

Flower : June *Fruit:* August
Exsiccatus : Premlakha 2200 m, **SR Lepcha & AP. Das**, 27741, dated 30.09.2004
Status : Common
Local Distribution : Dorok, Premlakha, Durpiney, Bhusuk 1200 - 3000 m.
General Distribution : HIMALAYA; INDIA (Kashmir to Darjeeling, Sikkim), NEPAL. BHUTAN, CHINA.

Note : Endemic to Himalaya.

Impatiens radiata Hook.f., in Fl. Brit. India 1: 476. 1875 & in Rec. Bot. Surv. India 4: 15. 1905; Biswas, Pl. Darj. Sikkim 1: 210. 1966; Grey-Wilson in Grierson & Long Fl. Bhutan 2(1):96.1991 ; Vivekananthan, Rathakrishnan, Swaminathan & Ghara in Hajra *et al.*, Fl. India 4: 201. 1997.

Herbs annual upto 80 cm tall. **Leaves** lamina 3.5 – 6- 12 x 3.5 - 7cm, petiole bearing 2 globose basal glands; oblong-ovate or lanceolate, setose between teeth, lateral veins 7 - 9 pairs, margin crenate, apex acuminate. **Inflorescences** with many flowered, verticillate, radiate, many flowered per cycle. Pedicels slender, bracteate at base; bracts persistent, **Flowers** pale purple to yellowish white, small. **Lateral calyx** ovate-lanceolate, **Lower calyx** boat shaped , erect spur. **Dorsal corolla** hooded, suborbicular; lateral united corolla 2-lobed; basal lobes broadly ovate to suborbicular ; distal lobes oblong, apically 2-lobed. **Anthers** obtuse. **Capsule** linear; seeds obovoid, small,

Flower : August *Fruit:* September
Exsiccatae : Rachela 3030 m, **SR Lepcha & AP. Das** 31077, dated 02.10.2004; Jorpokhri, 2600 m , **SR Lepcha & AP. Das** 31095, dated 02.10.2004.
Status : Common
Local Distribution : Lingtam – Subaney dara, Premlakha below, Rachela 2100 - 3200 m.
General Distribution : E.HIMALAYA; INDIA, (NEPAL –NEFA) Khasia, CHINA.
 Note : Endemic to Eastern Himalaya

Impatient spirifer Hook.f. & Thoms. in Journ. Linn. Soc., Bot.4: 135. 1860; Hook.f, Fl. Brit. India 1: 471. 1875 & in Rec. Bot. Surv. India 4: 17. 1905; Biswas, Pl. Darjeeling Sikkim Him.1: 208.1966; Grey-Wilson in Grierson & Long. Fl. Bhutan 1(2): 94. 1991.

Herbs erect upto 30 cm tall. **Stem** sparingly branched. **Leaves** alternate, upper sessile, subverticillate, lower petiolate, alternate, ovate to ovate lanceolate or ovate elliptic base attenuate, apex acuminate, shallowly crenate along margin, lateral nerves 4 – 8 pairs, stipule setose. **Flowers** one or two, peduncle, yellow, pedicels slender. Lateral calyx ovate, cordate, with 3.5 mm long appendages, slightly pubescent. **Lip** pale rose; spurs abruptly constricted, spirally coiled at apex. Purple spotted. **Wings** bilobed, 2.2 – 2.8 cm long, violet purple; basal lobe slightly smaller than distal ones, ovate to narrowly lanceolate, 1.2 – 1.5 x 0.6 - 0.8cm. **Capsules** elongate; seed globose, puberulous.

Flower : September *Fruit*: December
Exsiccatus : Pangolakha 2880 m, **SR Lepcha & AP. Das** 30255, dated 06.10.2004.
Status : Less common
Local Distribution : Talkharka, Lingtam, Panglakha, Kyongnosla, upto 3000 m,
General Distribution : E. HIMALAYA; INDIA, (E. NEPAL – BHUTAN) S. TIBET.
Note : Endemic to Eastern Himalaya

Order: Apiales

ARALIACEAE A. Jussieu

Key to the Genera:

- | | |
|--|----------------------|
| 1. Plant unarmed | 2 |
| + Plant armed | <i>Brassaiopsis</i> |
| 2. Scandent shrubs or tree | 3 |
| + Rhizomatous herb with unbranched stem | <i>Panax</i> |
| 3. Pedicel articulated at base of ovary | 4 |
| + Pedicel not articulated at base of ovary | 5 |
| 4. Leaflets margin entire | <i>Pentapanax</i> |
| + Leaflets margin serrate | <i>Aralia</i> |
| 5. Leaf simple | <i>Merriliopanax</i> |
| + Leaf compound | 6 |
| 6. Leaves mostly 3-foliolate | <i>Gamblea</i> |
| + Leaves digitate | <i>Schefflera</i> |

Aralia Linnaeus

Aralia cachemirica Decaisne in Jacq., Voy. Ind. 72, t. 81. 1844; C.B. Clarke in Fl. Brit. India 2: 722. 1879; Hara in Fl. E. Him. 1: 225. 1966; Grierson in Grierson & Long, Fl. Bhutan 2(1): 336. 1991. *Panax decompositum* Wallich ex DC., Prodr. 4:255. 1830; non *Araliade composita* Reinw. ex de Vries 18.6-57.

Shrubs to 2 – 3.5 m tall. **Stem** unarmed. **Leaves** pinnate, 30 - 65cm; leaflets lamina 4.5 – 14. 5 x 3.3 - 6.5 cm, ovate, acuminate, base cordate or rounded, margin serrate, glabrous or shortly pubescent, hairy. **Panicles** 32 - 44 cm, branched. **Bracts** 4 - 5 mm, subulate. **Umbels** 1.4 - 2.5 cm across. branches of panicles and pedicels pubescent, usually articulated at base of flower. **Flowers** creamy. **Calyx** minutely 5-toothed. **Petals** 5, imbricate. **Styles** 5, almost free. **Fruits** 0.5 -0.6 cm in diam. Sub-globose, 5-celled, dark purple; 5 seeded.

Flower & Fruit : July – August
Exsiccatus : Nathang – Panglakha, 3000 – 4000 m, **SR Lepcha & AP. Das** 39884, dated 30.07.2005
Status : Less common
Local Distribution : Neora-Sikkim Border, Mulkharka. 2400 – 2700 m.
General Distribution : AFGANISTAN AND TEMPERATE HIMALAYAS; INDIA (Kashmir-Darjeeling), BHUTAN.

Brassaiopsis Decaisne et Planchon

Key to the species:

1. Leaves palmately 7 – 12 lobed; lobes segmented towards base, oblong *B. mitis*
+ Leaves deeply palmately to 11 lobed; lobes segments linear-lanceolate *B. hispida*

Brassaiopsis hispida Seemann, in Journ. Bot 2: 292. 1864; Grierson in Grierson & Long, Fl. Bhutan 2(1): 343. 1991.

Local Name: Phutta (Nep.).

Tree 4 – 5 m tall. **Stem** with prickle. **Leaves** deeply palmately upto 11 lobed; petiole to 40 cm, with prickles; suborbicular, lamina 25 x 60 cm, lobes divided 2 -3 at base, oblong, acute, margin prickly serrate, base cordate upper surface glabrous, lobes further segmented at base, oblong, acuminate. **Inflorescence** racemose to 45 cm. main axis with prickle in umbels. Peduncles upto 9 cm, in diam. **Flowers** in panicles upto 40 cm long; umbels to to 6 cm in diam.. **Calyx** teeth minute, rusty tomentose. **Petals** 5, stamen valvets **Fruits**, globose.

Flower : February - April
Exsiccatus : Phusrey, 2150 m, **SR Lepcha & AP. Das** 30262, dated 06.10.2004
Status : Frequent.
Local Distribution : Singhaney, Prem lakha below, 1000 – 2000 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL-BHUTAN.
Note : Endemic to Himalaya.

Brassaiopsis mitis C.B. Clarke in Fl. Brit. India 2:736. 1879; Hara in Fl. E. Him. 1: 226. 1966; 3: 86. 1975; Hara et al. Enum. Fl. Pl. Nepal 2: 191. 1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 343. 1991.

Local Name: Chuletro, Phootta (Nep.).

Trees, 3 – 6 m tall with spiny and few branches. **Leaves** palmately 7 – 12 lobed; petioles to 40 cm long, bristly pubescent, often prickly; suborbicular, **lamina** 15 – 50 cm across, incised into many lobes, lobes further segmented towards base, linear-lanceolate, acuminate, stellately pubescent undersurface. **Flowers** in panicles upto 52 cm long; umbels to 10 cm im diam., numerous. **Calyx** teeth minute, rusty tomentose. **Corolla** to 0.6cm, creamy white, glabrous. **Fruits**, globose.

Flower : May – July *Fruit*: August – October
Exsiccatus : Panglakha ridge, 2300 m, **SR Lepcha & AP. Das** 31289, dated 13. 07. 2008.
Status : Frequent.
Local Distribution : Panglakha ridge, Phusrey – Rigu, 1360 – 2380 m.
General Distribution. : E. HIMALAYA; INDIA (NEPAL-BHUTAN).
Note : 1. Endemic to Himalaya.
2. Fodder plant

Gamblea Clarke

Gamblea ciliata C.B. Clarke in Fl. Brit. India 2: 740. 1879; Hara *et al* Enum.Fl. Pl. Nepal 2: 191. 1979; Grierson in Grierson & Long, Fl. Bhutan 2(1): 340. 1991.

Local Name: Kursimla (Nep.).

Trees medium sized to 12m tall, unarmed. **Leaves** ; petioles to 20 cm long, initially brownish tomentose; palmate, usually 3-foliolate, rarely 5-foliolate; leaflets **lamina** 5 - 25 x 5 – 15 cm, ovate or elliptic, entire, ciliate, acuminate, base cordate, sometimes cuneate, thinly hairy along veins on both sides. **Flowers** in panicles upto 22cm long; umbels to 10 cm across, usually 10-18 flowered. **Calyx** with minute teeth. **Corolla** to 0.40 cm, ovate, greenish slightly recurved. **Fruits**, subglobose-globose; seeds 3 - 5.

Flower : June – July *Fruit*: August – October
Exsiccatus : Below Premlakha 2600 m, **SR Lepcha & AP. Das** 20291, dated 28.10. 2004
Status : Less Frequent.
Local Distributions : Rigu- Lingtam, 2200 – 2650 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL-BHUTAN, MYANMAR, S. TIBET.

Merrilliopanax Linnaeus

Merrilliopanax alpinus (C.B. Clarke) C.B. Shang, Bull. Mus. Natl. Hist. Nat., B, Adansonia. 5: 293. 1983; Grierson & Long. Fl. Bhutan 2 (1):348. 1991. *Brassaiopsis alpina* C.B. Clarke in Fl. Brit. India 2: 736. 1879; Mizushima in Fl. E. Him. 226. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 191. 1979.

Local Name: Botey phutta (Nep.)

Trees upto 8 m tall. **Stem** unarmed, pale brownish, tomentose. **Leaves** : petiole to 22 cm long, ; broadly ovate or suborbicular, **lamina** 13 – 23 x 12 – 26 cm, 3 lobed, acuminate, base cordate, margin serrulate, upper and lower surface both pubescent, more pale brown in lower surface,

Panicle branched to 26 cm, pale brown. **Umbels** to 2.3 cm in diam. 7 – 15 flowered; pedicels to 6 mm. Petals greenish, ovoid to 2.5 mm. Stamens to 2.3 mm. **Inflorescence** a terminal panicles of umbels. **Flowers** small. **Calyx** teeth 5, minute. **Petals** 5. Ovary 2 celled; ovules 1 per cell; style 2 united at base. **Fruits** ellipsoid, to 4 x 4 mm.

- Flower* : May – September
Exsiccatus : Singhaney bans 2200 m, **SR Lepcha & AP. Das** 194, dated 13.08.2006.
Status : Frequent.
Local Distribution : South Rigu, Mulkharka towards WB, 1700 – 2800 m.
General Distribution. : E. HIMALAYA ; INDIA, NEPAL, BHUTAN.
Note : 1. Endemic to Himalaya.
 2. The species is used as medicinal and an ornamental in China.

Panax Linnaeus

Panax pseudo-ginseng Wallich, Trans. Med. Phys. Soc. Calcut. 4: 117. 1829; Grierson in Grierson & Long. Fl. Bhutan 2(1): 340. 1991. *Aralia pseudo-ginseng* (Wallich) Clarke in Fl. Brit. India 2: 721. 1879. subsp. *himalaicus* Hara, Journ Jap. Bot. 45: 208, f. 2b. 11 c-e & 12 a. 1970; Hara in Fl. E. Him 2: 90. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 192. 1979.

Local Name: Jarra Okhati, Paanch Pattay (Nep.).

Herbs perennial rhizomatous 55 cm tall. Rhizomes with nodular rings. **Stem** erect, unbranched. **Leaves** whorled at stem tip; petioles upto 6, to 6 - 13 cm long, red in maturity; leaflets 5, **lamina** to 11 -13 x 2.5 - 5 cm, ovate or lanceolate, acuminate, base cuneate or obliquely rounded, margin coarsely dentate-serrate, deeply incised, midvein and lateral veins red, hirsute on upper surface. Peduncles 13 cm long. **Flowers** in terminal umbellate. Pedicel slightly raised above the main axis, **Calyx** small, 5-toothed. **Corolla** 5, larger than calyx elliptic, acute and whitish; stamens 5; anthers ovoid; styles 2, connate at base; ovary 2-celled. **Fruits** numerous, subglobose, red on ripening; seeds 2-3.

Key to the varieties

1. Rhizome nodules closely arrange; leaf margin dentate- serrate *var. angustifolia*
 + Rhizome nodules widely arranged; leaf insiso-serrate *var. bipinnafidus*

var. angustifolius (Burkil) Li in Sargentia 2: 118. 1942; Hara in Fl.E.Him. 1: 227. 1966; 2: 90. 1971; Hara *et al.* Enum.Fl. Pl. Nepal 2: 192. 1979; Grierson in Grierson & Long, Fl. Bhutan 2 (1): 341. 1991. f. *angustifolius*.

Herbs 15 - 25 cm tall, rhizomatous. **Rhizomes** nodules closely arrange rarely distantly, each nodule representing one year's growth. Petioles 2 - 6cm long; **leaflets lamina** 4 - 13 x 1.3 – 3 .4 cm, elliptic lanceolate or elliptic obovate, margin unlobed but dentato-serrate; acuminate, densely pilose throughout. Pedicels upto 0.70 cm long. **Seeds** not compressed.

- Flower & Fruit* : May – September.
Exsiccatus : Rachela below, 2600 m, **SR Lepcha & AP. Das** 0170, dated 23.06. 2008
Status : Very rare.
Local Distribution : Rachela , NNP border, 1800 – 2600 m.

General Distribution : E. HIMALAYA; INDIA, (NEPAL-BHUTAN), MEGHALAYA, THAILAND, W. CHINA.

Note : The rhizomatous nodules are believed to contain a 10 % of active principles of the drugs for vitality. The local people collect them for various folk medicines.(Das & Rai 2001)

var. bipinnatifidus (Seeman) Li in *Sargentia* 2: 118. 1942; Hara in *Fl. E. Him.* 1: 227. 1966; 2: 90. 1971; Hara *et al.* *Enum. Fl. Pl. Nepal* 2: 192. 1979; Grierson in Grierson & Long, *Fl. Bhutan* 2 (1): 341. 1991.

Herbs usually with weak and slender stem. **Nodules** of rhizome often with longer gaps of ca 3.5 cm in between. **Leaflets** 2.5 - 7 cm, pinnatisect; **pinnae** alternately larger and smaller, incise-serrate again, larger lobes upto 0.65 cm broad.

Flower & Fruit : May - September

Exsiccatus : Kyongnosla, 3500 m, *SR Lepcha & AP. Das* 0170, dated 25.10. 2004.

Status : Very rare

Local Distribution : PWS only.

General Distribution : E. ASTERN HIMALAYA (SIKKIM, DARJEELING, ARUNACHAL PRADESH, BHUTAN, CENTRAL TO EASTERN NEPAL, NORTH BURMA AND SOUTHWESTERN CHINA), ASSAM.

Pentapanax Seemann

Pentapanax fragrans (D. Don) T.D. Ha in *Fl. Ser. Vietnam* Autoref. Diss.?? 1872; cf. Ha in *Novosti Sist. Vyssh. Rast.* 11: 227. 1974; Grierson in Grierson & Long, *Fl. Bhutan* 2(1): 338. 1991. *P. leschenaultii* (DC.) Seeman in *Journ. Bot.* 2: 296, cum fig. 1864; Hara in *Fl. E. Him.* 1: 227. 1966; 3: 87. 1975; Hara *et al.* *Enum. Fl. Pl. Nepal* 2: 192. 1979. *Hedera fragrans* D. Don, *Prodr. Fl. Nep.* 187. 1825. *Panax leschenaultii* DC., *Prodr.* 4: 254. 1830.

Local Name: Chinday (Nep.).

Shrubs to small trees, upto 10m tall. occasionally grows as an epiphyte. **Leaves** 12-30cm, pinnately 3 to 5, foliolate; **leaflets** 5 - 15 x 2 - 8 cm, ovate-elliptic, serrate, acuminate, base rounded or often cordate, glabrous above, pubescent along veins beneath. **Umbels** to 3cm across, globose; rachis upto 13 cm long, pubescent. **Bracts** lanceolate. **Flowers** bisexual, to 0.6cm in diam., pedicellate, greenish **Calyx** lobes minute, glabrous. **Corolla** ca 0.4cm long, deciduous; styles united. **Fruit**, oblong, ribbed.

Flower : April - July. *Fruit*: August - December

Exsiccatus : Ramitey dara , 1800 - 2700 m, *SR Lepcha & AP. Das* 31141, dated 03. 10. 2004.

Status : Frequent.

Local Distribution : Rigu, Gangtok below, 1900 - 2500 m.

General Distribution : HIMALAYAS; INDIA, (Kumaon - BHUTAN), Meghalaya, MYANMAR, CHINA.

Note : Fruits and leaves are eaten as vegetable.

Schefflera Forster

Key to the species:

1. Trees to 12 m tall; nerves much impressed above *S. impressa*
+ Shrubby climber, rarely epiphytic; nerves not prominent above *S. venulosa*

Schefflera impressa (Clarke) Harms. in Engl., Pfl.-fam. 3(8): 38. 1894; Hara in Fl. E. Him. 1: 228. 1966; 3: 87. 1935; Hara *et al.* Enum. Fl. Pl. Nepal 2: 193. 1979; Grierson in Grierson & Long, Fl. Bhutan 2 (1): 345. 1991. *Heptapleurum impressum* Clarke, Fl. Brit. India 2: 728. 1879.
Local Name: Bhalu Chinday, Bhalu Phootta (Nep.).

Trees small unarmed to 12 m tall. Leaves digitate; petioles upto 35 cm long; leaflets 5 - 8; lamina 8 - 23 x 4 - 9 cm, elliptic-oblongate, entire, acuminate, base cuneate, glabrous above, stellate wooly beneath, nerves well impressed above. Panicles to 50 cm, branched, tomentose. Umbels upto 4 cm; petals to 0.5 cm, greenish white; styles upto 1.8 cm, connate. Fruits subglobose.

- Flower* : July - September *Fruit:* September - December
Exsiccatus : Subaney dara - Singhaney bans 1700 - 2300 m, **SR Lepcha & AP. Das**
31501, dated 15.07.2008
Status : Less common
Local Distribution : Rigu, Premlakha below, 1800 - 2500 m.
General Distribution : HIMALAYAS; INDIA, (Kumaon - BHUTAN), S. W. CHINA.
Note : Endemic to Himalaya.

Schefflera venulosa (Wight *et* Arnott) Harms in Engl., Pfl.-fam. III, 8: 39. 1894; Sargentia 2: 34. 1942; Hara in Fl. E. Him. 1: 228. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 2: 193. 1979; *Heptapleurum venulosum* (Wight *et* Arnott) Seemen in Journ. Bot. 3: 80. 1865; *S. elliptica* Harms *sensu* Hand.-Mzt., Symb. Sin. 7: 691. 1933.
Local Name: Kursimla Lahara (Nep.); Kuntiong-rik (Lep.).

Shrubs climbing bearing thick adventitious roots, often epiphytic. Leaves digitately 5 - 7 foliate; petioles 8- 15cm long; petiolules 2 - 4cm; leaflets lamina 7 - 17 x 4 - 8 cm, elliptic-oblong, acuminate, glabrous. Panicles to 20 cm long, stellate pubescent. Umbels many flowered, upto 2cm long. Bracts ovate, caducous. Calyx truncate; petals 0.22 - 0.5 cm long, obovate-oblong, whitish. Fruits to 0.6 cm across, ellipsoid, prominently 5-ribbed, orange-crimson.

- Flower* : September - December *Fruit.* December - March
Exsiccatus : Singhaney bans 2000 m, **SR Lepcha & AP. Das** 31500, dated 15.07. 2008.
Status : Frequent.
Local Distribution : Singhaney- Subhaney, Premlakha 700 - 2300 m.
General Distribution : HIMALAYAS; INDIA (Punjab - Sikkim), BHUTAN, Meghalaya, MYANMAR, S. AND W. CHINA, MALAYSIA.

APIACEAE A. Jussieu

Key to the Genera

- | | |
|--|-------------------------|
| 1. Non-aromatic herbs | 2 |
| + Aromatic herbs | <i>Pleurospermopsis</i> |
| 2. Rhizomatous herb | 3 |
| + Non-rhizomatous herb | 4 |
| 3. Stylopodium rounded or domed | 5 |
| + Stylopodium conical | <i>Oenanthe</i> |
| 4. Umbels compound | 6 |
| + Umbels simple | <i>Hydrocotyle</i> |
| 5. Petals obovate, fruit oblong | <i>Sinocarrum</i> |
| + Petals ovate-lanceolate, fruit ovate-subglobose | <i>Acronema</i> |
| 6. Fruit ovoid-oblong or sub-globose | 7 |
| + Fruit rectangular-ellipsoid or suborbicular | 8 |
| 7. Calyx teeth present | 9 |
| + Calyx teeth absent | <i>Sanicula</i> |
| 8. Outermost petals often longer than inner ones | <i>Heracleum</i> |
| + Outermost petals \pm equal to inner ones | <i>Cortiella</i> |
| 9. Petioles usually winged | 12 |
| + Petioles not winged | 10 |
| 10. Fruits winged | 11 |
| + Fruits unwinged | 12 |
| 11. Stylopodium present | 13 |
| + Stylopodium usually absent | <i>Selinum</i> |
| 12. Stylopodium conical | <i>Physospermopsis</i> |
| + Stylopodium domed | <i>Pimpinella</i> |
| 13. Stylopodium conical-rounded | <i>Pleurospermum</i> |
| + stylopodium domed | <i>Cortia</i> |
| 14. Flowers usually white | <i>Vicatia</i> |
| + Flowers yellow, sometimes tinged green or purple | <i>Bupleurum</i> |

Acronema Edgeworth

- | | |
|---|--------------------|
| 1. Plant non-rhizomatous; Bracts 1 fallings early | 2 |
| + Plant rhizomatous; Bracts absent | <i>A. nervosum</i> |

2. Corolla creamy-white; umbellules 3 - 6 rayed *A. hookeri*
 + Corolla purplish; umbellules 2 - 4 rayed *A. tenerum*

Acronema hookeri (Clarke) Wolff, in Eng. Pflanzenreich, Umellif. Apioide.- Ammin.323.1923. Watson in Grierson & Long, Fl. Bhutan 2(2): 481. 1999. *Pimpinella hookeri* C.B. Clarke, in Hook.f. Fl. Brit. India 2: 686.1869.

Herbs perennial robust, branched upto 120 cm tall. **Leaves**; lower pinnate or ternate, or 2-ternate; leaflets ovate, to 2.5 x 1.5 cm, serrate to deeply lobed, glabrous, main vein minutely papilose; ultimate segments elliptic - ovate, obtuse - mucronate at the apex; fewer upper leaves, sheathing at base. **Flowers** umbels around in upper half of stem, in a lax group, 3 - 6 rays; rays to 16 mm, slender, bracts and bracteoles 0 - 1, linear; umbellules 3 - 5 flowered. **Corolla** creamy-white rarely purplish at base, lanceolate. **Stylopodium** flat - domed shaped. **Fruits** ovoid to sub globose.

- Flower & Fruit* : July - August
Exsiccatae : Dohrok, 2200 m, *SR Lepcha & AP. Das* 31075, dated 06. 10. 2004;
 Kyongnosla 3500m, *SR Lepcha & AP. Das* 066, dated 13.09. 2004.
Status : Fair
Local Distribution : Kyongnosla, Padamchen, 800 - 3200 m.
General Distribution : INDIA, CHINA, BHUTAN, INDONESIA, JAPAN,
 NEPAL, MALAYSIA, MYANMAR, PAKISTAN, PHILIPPINES, SRI
 LANKA, VIETNAM; E AFRICA.

Note : The species has reputed medicinal value.

Acronema nervosum Wolff in Fedde, Report. 27: 315. 1930; Watson in Grierson & Long, Fl. Bhutan 2(2): 482. 1999.

Herbs small perennial, rhizomatous upto 40 cm tall. **Stem** slender, rhizomatous unbranched. **Leaves** with 1 - 2 in both basal and cauline, ternate or pinnate, 13 x 4 cm including the petiole; leaflets of basal leaves, **lamina** 0.4 - 2.8 x 0.3 - 1.5 cm, ovate - elliptic; ternately lobed, margin usually serrately toothed in upper half; sheathing base of upper leaves narrowed to 2 mm broad. **Umbels** solitary and terminal, 3 - 5 rayed, elongating in fruits; **bracts** absent. umbellules to 3.5 mm., 3 - 7 flowered; pedicels to 4 mm, glabrous; **bracteoles** 2 - 3, linear. **Petals** white - purplish, elliptic ovate, apex acuminate elongated, rarely papilose. **Stylopodium** dark purple - creamy, flattened; styles erect. **Fruits** ovoid - globose.

- Flower & Fruit* : July - August
Exsiccatas : Zuluk, 4000 m, *SR Lepcha & AP Das* 32845, dated 26.10 2004.
Status : Fair
Local Distribution : Memenchu, Kupup, Changu, 2800 - 4000 m.
General Distribution : HIMALAYALA; INDIA(Kumaon - BHUTAN).
Note : Endemic to Eastern Himalaya.

Acronema tenerum (DC.) Edgewarth in Trans. Linn. Soc. 20: 51. 1851.; Cannon in Enum. Fl. Pl. Nepal 2: 184. 1979. *Pimpinella tenerum* Benth. ex Hook.f. in Fl. Brit. India 2: 686. 1869. Var *dissecta* C.B. Clarke; Watson in Grierson & Long, Fl. Bhutan 2(2): 482. 1999.

Herbs perennial. **Stem** slender or erect. **Leaves** pinnate with 3 - 7 leaflets; petiole sheathing base, narrow, to 1.3 mm broad; **lamina** 5 - 2 cm including petiole. upper leaves usually ternate;

leaflets ovate, entire to deeply ternately lobed, 4 – 13 x 5 – 11 mm acute, base truncate, margin serrate, papilose on margins and veins in upper surface; ultimate lobes ovate elliptic. **Umbels** 2 – 4 rayed, laxly braced, rays 5 – 13 mm; **bracts** 1, lanceolate- linear., fallings early. umbellules to 10 with to 4 flowered; pedicels to 6 mm, glabrous; **bracteoles** 3 – 5, ovate. **Corolla** purplish , narrowly lanceolate. acuminate to filiform. **Stylopodium** greenish cream, flat –domed shaped. styles spreading . **Fruits** narrowly ovoid.

Flower & Fruit : July – August
Exsiccatus : Nathang, 4000 m, **SR Lepcha & AP. Das** 31294, Dated, 08.10. 2008
Status : Fair
Local Distribution : Kyongnosla, Padamchen, 3200 – 4000 m.
General Distribution : HIMALAYAL; INDIA(Kumaon – BHUTAN), BURMA, CHINA,

Bupleurum L.

Key to the Species :

1. Plants more than 40cm tall, stem sparingly branched 2
- + Plants less than 40cm tall, stem solitary *B. longicaule*

2. Flower bracteole elliptic – ovate; umbellules 1- 4 flowered *B. dalhousianum*
- + Flower bracteole elliptic – sub-orbicular; umbellules 10 -15 flowered .. *B. candolii*

Bupleurum candolii Wallich (cat,17,n.552.) 1829, *nom. nud.*) ex DC. Prodr. 4: 131. 1830; C.B. Clarke in Fl. Brit. India 2: 674; Kanai in Hara Fl.E.Him.228.1966; Hara *et. al* Enum. Fl. Pl. Nepal 2:184.1979; Watson in Grierson & Long Fl. of Bhutan 2(2): 467. 1999.

Herbs perennial upto 1 m tall. **Stem** erect, much - branched. **Leaves**; lower leaves linear-lanceolate or long - elliptic, **lamina** 12 – 15 × 0.5 – 0.8 cm, 11 – 15-nerved, abaxially glaucous, apex rounded-obtuse, apiculate. **Upper** leaves long-obovate, base cuneate. **Umbels** to 4 cm across; bracts 3 – 5, ovate, unequal; rays 4 – 8, to 3 cm, unequal, slender; bracteoles 5, broadly elliptic or suborbicular, apex rounded, apiculate, greatly exceeding flowers; **umbellules** 10 – 15-flowered; pedicels short 0.5 – 1.5 mm. **Corolla** pale yellow or dark purple. **Stylopodium** low-conic, discoid, dark yellow or dark purple. **Fruit** oblong, brown.

Flower : July - August *Fruit*: September - October
Exsiccatus : Rachela – Panglakha, 2700 m , **SR Lepcha & AP. Das** 0193, dated 26.07.2006
Status : Less Common
Local Distribution : Kyongnosla, Karponang, Padamchen 1800 – 3200 m.
General Distribution : PAKISTAN, HIMALAYA; INDIA (Kashmir, Sikkim), NEPAL, BHUTAN, MYANMAR,.

Bupleurum dalhousianum (Clarke) Koso-Poljansky in Act. Hord. Etrop. 30: 165. 1915; Watson in Grierson & Long., Fl. Bhutan 2(2): 466. 1999.

Herbs perennial upto 40cm tall. Sparingly branched. **Leaves** membranous with reticulate veining in parallel; basal and lower leaves linear to ob-lanceolate, lamina 2.5 x 0.17 -0.6 cm, usually obtuse acute , long attenuate at base; middle leaves linear- lanceolate, acute , base rounded, semi-plexicaul, **lamina** 2.5 – 5.5 x 0.4 – 1cm; upper leaves broadly lanceolate , lamina 1.5 – 3.5 x

0.5 – 1.2 cm rounded to cordate at base, amplicaula. Flower in umbellules upto 10, rays rarely unequal, bract 2-3 unequal, bracteole 4- 5, elliptic ovate, 3 – 5.5 x 2 – 3.5 mm, obtuse acuminate. Petals dull blue to dark purple. Stylopodium dark purple red. Fruit ovoid.

- Flower* : June *Fruit* : July
Exsiccata : Rachel, 3100 m, *SR Lepcha & AP. Das 31427*, dated 11.10.2004.
Premlakha – Panglakha, 2900 m, *SR Lepcha & AP. Das 0192*, dated 30.09.2004
Status : Fairly common
Local Distribution : Nathang, Kupup, Lampokhri, Changu, Kyongnosla 3050 – 4600 m.
General Distribution : INDIA, BHUTAN, MYANMAR, NEPAL, VIETNAM
Note : A reputed medicinal plant elsewhere.

Bupleurum longicaule Wallich (cat.17,n.557.1829.nom. nud.) Ex DC. Prodr. 4: 131.1830; C. B. Clarke in Fl. Brit. India 2: 667.1879; Hara *et. al* Enum. Fl. Pl. Nepal 2:185.1979; Watson in Grierson & Long Fl. Bhutan 2(2): 468. 1999. *Blupleurum rupestre* Edgew. in. Tr. Linn. S. 20: 52. 1846.

Herbs perennial upto 20 cm tall. Stems solitary, purplish-red, decumbent. Lower leaves lanceolate; basal leaves few sessile, base broad, clasping; linear; lamina 3 – 8 x 0.2 – 0.4 cm, 5 – 7 nerved, tapering into petiole.; upper leaves sessile; blade lanceolate or ovate, 1.5 – 5 x 0.3 – 0.8 cm, base rounded, clasping, apex acuminate, sometimes caudate. Flower few in umbels; bracts 1 – 3, ovate, 5 – 18 x 4 – 8 mm, unequal; ray unequal; bracteoles, broadly ovate or obovate, tinged purple, slightly exceeding flowers, apex apiculate; umbellules, 16 – 24-flowered; pedicels short 1– 2 mm. Corolla dark purple. Stylopodium low-conic, dark purple. Fruit oblong-ovoid, brown.

- Flower & Fruit* : June – September
Exsiccata : Bhimbase, 4350 m, *SR Lepcha & AP. Das 0191*, dated 27.07.2006.
Status : Less common
Local Distribution : Changu, Memenchu, On way to Bhimbase, 3300 – 4600 m.
General Distribution : SIBERIA, PAKISTAN, HIMALAYA, BHUTAN, NE INDIA, NEPAL, MYANMAR.

Note : A reputed medicinal plant

Cortia DC.

Cortia depressa (D. Don) C. Norman in J.B.75: 96.1937; Kanai in Fl.E.Him.3: 87.1975; Hara *et al* Enum. Fl. Pl. Nepal 2: 185.1979; Watson in Grierson & Long., Fl. Bhutan 2(2): 494. 1999. *Athamanta depressa* D. Don, Prodr. Fl. Nepal 184. 1825. *Cortia lindleyi* DC.Prodr.4: 187.1830. *Cortia nepalensis* C.Norman in J.B. 67: 245. 1929.

Herbs of 10 – 20 cm tall. Leaves; petioles pubescent; lamina 1 – 12 x 0.55 – 2.5cm, 1.5 – 2.5 - pinnatisect, pinnae 5 – 7 pairs; ultimate segments linear, 2.5 – 4.5 x 1 – 1.5 mm, margins entire, narrowly revolute. Bracts few, 2-pinnate, segments linear; rays numerous, 3.5 – 8 cm, unequal. pubescent; bracteoles 10 – 15, 2-pinnatisect, narrow-linear, longer than flowers; umbellules 25 – 30-flowered. Styles short 0.2 – 1.8 mm, little elongated in fruit. Fruit ovoid - oblong, 3.5 – 5 x 2.5 – 4 mm.

- Flower* : July-August *Fruit*: September – October

Exsiccata : Panglakha, 3000 m, **SR Lepcha & AP. Das**, 30842, dated 29.07.2005
Status : Less common
Local Distribution : Sherabthang, Lampokri, Changu 3000 – 4400 m.
General Distribution : HIMALAYA; INDIA Kumaon – BHUTAN, TIBET.
Note : Endemic to Eastern Himalaya.

Cortiella C. Norman.

Key to the species

1. Leaf lamina 3.5 – 11 x 1 – 3 cm; petals always white *C. hookeri*
 + Leaf lamina 6.5 – 13 x 3 – 5 cm; petals white, rarely tinge purple *C. cortiodes*

Cortiella hookeri (C.B. Clarke) C.Norman in Journ. Bot., Lond. 1937; Watson in Grierson & Long Fl. Bhutan 2 (2): 488. 1999. *Cortia hookeri* C.B. Clarke in Fl. Brit. India 2: 709. 1829; Cannon in Enum. Fl. Pl. Nepal 2: 186. 1979.

Herbs perennial upto 35 cm tall. **Leaf lamina** 3.5 – 11 x 1 – 3 cm, ultimate leaves segments 1.5 – 3.5 x 0.85mm. Peduncles crassicaul, upto 4.5mm. Inflorescence of umbel with 7 – many rays; rays 1- 5cm; umbellules usually upto 2cm across, pedicels upto 4.5mm. **Calyx** teeth linear-subulate, 0.4 - 1.3mm. **Corolla** white rarely purplish. **Fruits** purple tipped wings on dorsal ribs of mericarp often convuluted crowded, dark, vittae lines appear at the maturity.

Flower : June *Fruit.* : September
Exsiccatu : Nathang, 3950 m, **SR Lepcha & AP. Das** 052, dated 13.05.2003
Status : Less common
Local Distribution : Dongkyala, Nathang, Sherathang (3950 - 5000m)
General Distribution : HIMALAYA; INDIA, NEPAL - BHUTAN.
Note : 1. Endemic to Eastern Himalaya.
 2. Matured seeds are eaten as spices.

Cortiella cortiodes (C. Norman) M.F. Watson in Edinburgh J. Bot., 53(1): 130. 1996 ; Watson in Grierson & Long Fl. Bhutan 2(2): 489. 1999. *Selinium cortiodes* C. Norman in Journ. Bot., Lond. 75: 95. 1937.

Herbs upto 27cm tall. **Leaves lamina** 6.5 -13 x 3 x 5 cm, ultimate leaf segment 2 – 12 x 0.65mm. **Umbel** with sessile on the crown of plat, rays many; lateral umbels rarely crassicaul upto 10 cm long, less rays , upto 3.5 cm, shorter than leaves, spreading; umbellule 2 cm across, bracteole usually tipped purple- black. **Calyx** teeth short upto 1,2mm long. **Petals** white, rarely tinge purple 1- 1. 3 x 0.4 – 0.55mm. **Fruits** 3 dorsal ribs prominent, some with reduced wings in the lower half.

Flower : June-July *Fruit.* : September – October
Exsiccatu : Donkyala, 3980 m, **SR Lepcha & AP. Das** 600, dated 13.05.2003
Status : Less common
Local Distribution : Jalepla, Dongkyala (4000 – 5300 m)
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN.
Note : Endemic to Eastern Himalaya.

Heracleum Linnaeus.

Key to the species:

- 1 Leaf gregarious; Umbel rays upto 6, calyx teeth subulate; fruits orbicular *H. nepalense*
+ Leaf not gregarious; Umbel rays more than 6, calyx teeth linear; fruits obovate *H. wallichii*

Heracleum nepalense D. Don, prodr. Fl. Nepal 185. 1825; C.B. Clarke in Fl. Brit. India 2: 714. 1879; Kanai in Fl. E. Him 229. 1966; Hara *et al*, Enum Fl. Pl. Nepal 2: 186. 1979. *Heracleum nepalense* var. *bivittata* C.B. Clarke in Fl. Brit. India 2: 714. 1879; Watson in Grierson & Long, Fl. Bhutan 2(2): 501. 1999.

Local Name: Samben (lep.) Chimping (Nep.)

Shrubs stout erect, upto 2 m tall. Stem solitary, pubescent. **Leaves**; basal leaves with long-petiolate; broad-ovate, lamina 20 - 45 × 20 - 35 cm, trifoliolate or 1 - 2-pinnate, pinnae 3 - 7 pairs; leaflets broadly ovate, lamina 9 - 20 × 5 - 12 cm, both surfaces finely pubescent, especially along veins, margins serrate. **Cauline leaves** similar to the basal, reduced upward, smaller, 3-lobed sessile on expanded sheaths. **Umbels** (11-) 15 - 30 cm wide; bracts 1 - 5, linear or absent; rays numerous unequal, extending in fruit; bracteoles linear, unequal, persistent; umbellate 8 - 30-flowered. **Calyx** teeth subulate. **Corolla** white, occasionally pinkish, radiant, 2-lobed. Young ovary densely hairy. Fruits obovoid.

Flower & Fruit. : June - September.

Exsiccatus : Rachela, 2800m, *SR Lepcha & AP. Das* 31070, dated 02.10.2004

Status : Common

Local Distribution : Karponang, Kyongnosla, Changu, Padamchen, Rachela, 2000 - 4000 m

General Distribution : INDIA (North East), NEPAL - BHUTAN, MYANMAR,

Note : 1. Endemic to Himalaya.

2. Dried seeds are used for flatulent.

Heracleum wallichii DC., prodr 4: 195. 1830; C.B. Clarke in Fl. Brit. India 2: 712. 1879; Kanai in Fl. E. Him. 229. 1966; Hara *et al* Enum. Fl. Pl. Nepal 2: 186. 1979; Watson in Grierson & Long Fl. of Bhutan 2(2): 501. 1999. *Heracleum diversifolia* Wall., cat 18, n. 574. 1829. *nom. nud.* *Heracleum sublineare* C.B. Clarke in Fl. Brit. India 2: 713. 1879.

Local Name: Samben (lep.) Chimping (Nep.)

Herbs, slender, perennial. **Stem** upto 60 cm tall, white-hirsute below nodes. **Leaves** ; upper leaves 3-partite or unipinnate; leaflets lamina 2 - 5.5 × 1.2 - 3 cm, lanceolate, serrate, acute-acuminate, base narrowly oblique, pilose above, glabrous beneath except nerves. **Umbel rays** 6 - 8, glabrous. **Bract** 1, small, linear, deciduous. **Bracteoles** linear and more prominent. **Pedicels** 0.5 - 1.5 cm. **Calyx** teeth linear; **petals** to 0.60 cm long, 2 - lobed, white, or pinkish. **Fruits** obovate, glabrous, brownish, broad lateral wings, ridged.

Flower : July- August **Fruit**: September- October.

Exsiccata : Memenchu, 3800 m, *SR Lepcha & AP. Das* 052, dated 13.05.2003

Status : Less common

Local Distribution : Kyongnosla, Baba Mandir, Changu, Padamchen (3000 - 4100 m)

General Distribution : E. HIMALAYA, (NEPAL - BHUTAN).

Note : 1. Endemic to Eastern Himalaya

2. Matured seeds eaten as spice.

Hydrocotyle L.

Key to the species

1. Lamina reniform; calyx white or purplish *H. himalaica*
+ Lamina cordate; calyx light green *H. nepalensis*

Hydrocotyle himalaica P.K.Mukharjee in Indian For 95: 470.t.1.1969; Hara *et. al* Enum. Fl. Pl. Nepal 2:186.1979.; Watson in Grierson & Long Fl. of Bhutan 2(2): 443. 1999. *Hydrocotyle Javanica* var. *podantha* C. B. Clark in Fl. Brit. India 2: 668. 1879. excl. Basionym.; *Hydrocotyle Javanica auct.non.* Molkenb; Hara in Fl. E.Him.230.1966

Herb decumbent upto 50 cm tall. **Leaf** blades orbicular or reniform, **lamina** (0.8-)1.5 - 3.5 (-6) × (1.2 -) 3 - 6(-8) cm, shallowly 5-7-lobed, lobes deltoid or rounded, both surfaces sparsely hirsute or covered with purplish verruciform hairs, obtusely crenate, apex obtuse-rounded, principal nerves 9. **Flowers** umbels with many-flowered, densely capitate in flower; peduncle 3-8 cm, usually as long as or longer than petioles; pedicels 1-2 mm in flower, 4-7 mm in fruit. **Calyx** white with yellow or purplish red glands. **Styles** spreading. **Fruit** brown to purplish red, cordate - globose.

- Flower* : June - July
Exsiccatus : Rachel, 2900 m, **SR Lepcha & AP. Das** 31002, dated 02.10.2004
Status : Less common
Local Distribution : Karponang, Gangtok, Penlangla, Rigu, Hathicherey upto 2200 m.
General Distribution : E. HIMALAYA; INDIA Meghalaya,(NEPAL-BHUTAN),

Hydrocotyle nepalensis Hooker, Exot. Fl. 1: t. 30. 1823; Hara *et. al* Fl. E. Him. 1: 229 & 643. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 186. 1979; Watson in Grierson & Long Fl. of Bhutan 2(2) ; 444: 1999. *H. polycephala* Wight & Arnt., Prodr. Fl. Ind. 1: 366. 1834. *H. javanica* auct. non Thunb.: Clarke in Fl. Brit. India 2: 667. 1879, p.p.

Herbs decumbent, comparatively larger stem. **Leaves**; petioles 1 - 6.5 cm long, thick, fleshy, light red when young; **lamina** 2 - 4.5 x 1.6 -7.2 cm ; palmately 6 - 7 lobed, usually serrate, broadly cordate, greenish and hairy above, light green beneath, veins greenish white to light red. **Peduncles** 1.7 - 2.7 cm long, aggregated. **Corolla** light-green; **stamens** upto 0.6 cm long.

- Flower* : May - July *Fruit* : July- December
Exsiccatae : Dohrok , 2300m, **SR lepcha & AP. Das** 30244, dated 06.10.2004;
Lungthung, 3900 m, **SR Lepcha & AP. Das** 32885, dated 27.10.2004
Status : Less Common.
Local Distribution : Gangtok, Hathicheray, Lingtam, (1900-2300m).
General Distribution : AFRICA, HIMALAYAS, BHUTAN, INDIA (Kashmir - Meghalaya), TIBET, KOREA, AUSTRALIA, HAWAII, MALYSIA. MYANMAR.
Note : The species has reputed medicinal value. Decoction of leaf is given in throat-pain and Also in pneumonia.

Oenanthe Linnaeus.

Key to the species

1. Plants diffused creeping; primary pinnae 5 - 7 pairs; fruit subglobose *O. thomsonii*
+ Plants weakly erect; segments upto 3 pairs; fruit ellipsoid *O. hookeri*

Oenanthe thomsonii C.B. Clarke in Fl. Brit. India 2: 697.1879; Kanai in Fl. E. Him.230.1966; Hara *et. al* Enum. Fl. Pl. Nepal 2: 189. 1979; Watson in Grierson & Long Fl. Bhutan 2(2): 486.1999.

Herbs with weak diffused, creeping upto 85cm tall. **Stems** slender, creeping, branched. **Leaves lamina** 3 – 13 (– 30)cm long pinnately divaricately divided ; primary pinnae 5 – 7 pairs; ultimate segments short linear; **lamina** 2 – 3 × 1 – 2 mm. **Flowers** in umbels 3 – 8 across, frequently leaf-opposed; peduncles elongate, 2.5 – 10 cm, rays 4 – 12, 1.5 – 3.5 cm, unequal; **bracts** absent; bracteoles 5 – 7, linear, 1.5 – 4 mm; **umbellules** 15 – 20-flowered; pedicels short, unequal. **Styles** ca. 1 mm, reflexed. **Fruit** subglobose.

Flower : April - August *Fruit* : September - October
Exsiccatae : Rachela, 2900 m, *SR Lepcha & AP. Das* 31091, dated 02.10.2004.
Premlakha –Panglakha, *SR Lepcha & AP. Das*, 27749, dated
30.09.2004
Status : Fairly common
Local Distribution : Gangtok, ~~Fadong~~, Bulbulay 1000–2500 m.
General Distribution : E. HIMALAYA (NEPAL-BHUTAN), Meghalaya, MYANMAR,
CHINA.

Oenanthe hookeri C.B. Clarke in Hook.f. Fl. Brit. India 2: 647. 1879; Watson in Grierson & Long Fl. Bhutan 2(2): 486. 1999.

Herbs annual. **Stem** fleshy, weakly erect to 1 m cm long. **Leaves** simple, **lamina** 3 – 18 cm, pinnate; rachis like grass, flattened; segments upto 3 pairs, linear, 2 – 23 x 1mm, glabrous. **Flowers** in umbels few to 4 rayed; rays to 3 cm; bracteoles 2.5 mm; **umbellules** to 1 cm long. **Calyx** teeth c 2 mm. **Petals** white, rarely tinged pink, obovate spatulate, to 24 mm, style short. **Fruit** ellipsoid..

Flower : July - September
Exsiccata : Rachela, 2950 m, *SR Lepcha & AP. Das* 31091, dated 02.10.2004.
Status : Fairly common
Local Distribution : Premlakha, Rachela (2000 – 3000 m).
General Distribution : INDIA (Khasia), BHUTAN

Physospermopsis (H. Wolff) C. Norman

Physospermopsis kingdon-wardii (H. Wolff) C. Norman, J. Bot. 76: 231. 1938; Watson in Grierson & Long. Fl. Bhutan 2(2): 489. 1999. *Trachydium kingdomwardii* H. Wolf, in Fedde, Report. 27: 124. 1929.

Herbs upto 65 cm tall. **Stem** short and aculous, rarely tinge red. **Leaves** pinnate; **lamina** 2.5 – 8 x 1 – 2.6 cm including petiole, **pinnate** in 3 – 4 pairs, broadly ovate, 3 – 8 x 4 – 7 mm, ternately lobed, shallower toward apex.; segment ovate oblong, dissected. **Umbels** 5 – rayed ; rays 2. 7 cm **umbellules** to 13 mm across, bracteole lanceolate – elliptic in outline. **Petals** white – purple. **stylopodium** broad and flat; style creamy. **Fruits** rectangular in outline, truncate.

Flower & Fruit : July – September

Exsiccatus : Kupup – Bhimbase, 4100 m, **SR Lepcha & AP. Das** 31422, dated 27.07.2005.
Status : Rare
Local Distribution : Kupup, Bhimbase 3500 – 4500 m
General Distribution : INDIA, CHINA, BHUTAN, E NEPAL.

Pimpinella Linnaeus.

Key to the species :

1. Plants over 1 m tall; leaflets finely serrate; petals cream to purple cream, rarely white
 *P. diversifolia*
 + Plants less than 1 m ; leaflets bi-serrate ; petals white *P. tongloensis*

Pimpinella diversifolia DC., Prodr. 4: 122. 1830; C.B. Clarke in Fl. Brit. India 2: 688. 1879; Hara in Fl. E. Him. 1: 230. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2:188. 1979; Watson in Grierson & Long. Fl. Bhutan 2(2): 476. 1999.

Herbs perennial erect - slender with single stock root upto 1.2 m tall. **Stem** slender. **Leaves** trifoliate or variable in shape and size, lower leaves pinnate with 2 pairs of lateral leaflets; leaflets **lamina** 2 - 5.5 x 1.5 – 4cm, ovate, apex acute to acuminate, base cordate to truncate, lower cauline often simple, ovate, upper ones usually pinnate; petioles long, scarcely hairy to glabrous; cauline leaves shallowly 3 - 5 lobed; leaflets variable, rounded or ovate, sometimes lobed or deeply dissected, finely serrate, often lacinate. **Peduncles** 6 - 16 rayed. Bract linear. **Flower** small, shortly pedicelled; **Petals** cream to purple cream and sometime emarginated white. **Fruits** ridged and blackish.

Flower : July - September *Fruit:* September. - November
Exsiccatus : Rachela trijunction, 2900m, **SR Lepacha & AP. Das** 099, dated 13.10.2003.
Status : Common.
Local Distribution. : Karponang, Rachela trijunction, 2000 – 3500 m.
General Distribution : INDIA (West Bengal, Sikkim, Meghalaya) AFGANISTAN, CHINA, MYANMAR, JAPAN.

Pimpinella tongloensis P.K. Mukherjee in Bull. Bot. Surv. India 12 (1-4): 78. 1970 publ. 1972 ; Watson in Grierson & Long Fl. Bhutan 2(2): 476. 1999.

Herbs erect up to 70 cm tall. **Stem** often glabrous or rarely pubescent, ribbed. **Leaves** oftenly trifoliate; petiole 1- 7cm, glabrous or with thin hairs; leaflets **lamina** 1.7 – 6.8 x 0.4 – 4.6 cm, triangular-ovate, apex acute, margin serrate (bi-serrate), base truncate - cordate, sometime obliquely cordate, usually glabrous but sometime strigose on the main veins above. **Umbels** to 12 - rayed; rays 8 – 19 mm, unequal; **bracts** lanceolate to 5mm, falling early; umbellules with 13 – 19 flowered; pedicels to 1.8 mm, unequal, bracteoles 1 - 3, linear-lanceolate, **Petals** ovate-acute, white. **Anthers** white to suffused purple. **Fruits** ovoid attenuate to the tip, smooth.

Flower : August-September
Exsiccatus : Rachela below, 2900 m, **SR Lepcha & AP. Das** 29388, dated 16. 08. 2004.
Status : Not common
Local Distribution : Panglakha, Padamchen above, 2500 – 2800 m

General Distribution : E.HIMALAYA; INDIA (Sikkim), CHINA,
 Note : 1 Endangered species of India (Nair & Shastry, 1977-78).
 2. A new distribution record for Sikkim.

Pleurospermopsis C. Norman

Pleurospermopsis sikkimensis (C.B. Clarke) C. Norman in J.B.67: 200, t.2. 1938; Hara *et al* Enum. Fl. Pl. Nepal 2: 188. 1979; Watson in Grierson & Long., Fl. Bhutan 2(2): 460. 1999.
Pleurospermum sikkimensis C.B. Clarke in Fl. Brit. India 2: 702. 1879

Herbs or small shrub upto 60cm tall. Stem base ca. 1 cm thick. **Leaves**; petioles slender, 2.5 – 15 cm, sheath often purple spotted; **lamina** oblong in outline, 5 – 20 × 2 – 5 cm; pinnae 3 – 7 pairs, 9 – 18 × 7 – 20 mm, base rounded or truncate, apex acute, green adaxially, often tinged purple abaxially. **Flowers** in umbels 4 – 15 (–25) cm across; **bracts** green; rays stout, to 3 mm thick; umbellules 2 – 4 cm across; bracteoles numerous, 1 – 16 × 4 – 8 mm, 3-lobed, lobes toothed, acute; pedicels 1–3 mm. **Calyx** teeth purple-black, ca. 0.5 mm. **Fruits** green, apex blackened.

Flower & Fruit : January– September: October
Exsiccatae : Kupup, 4000 m , *SR Lepcha & AP. Das* 31070, dated 02.10.2004;
 Panglakha, 3000 m, *SR Lepcha & AP. Das* 30422, Dated 13. 10.2006
Status : Rare
Local Distribution : Changu, Donkyala, Jalepla, Nathang, 3000 – 4250 m.
General Distribution : HIMALAYA; INDIA, (NEPAL – BHUTAN) CHINA.

Pleurospermum Hoffman

Key to the species:

1. Plants non-aromatic; leaf pinnae 7 – 9 pairs; calyx teeth present *P. hookeri*
 + Plants aromatic; leaf pinnae 4 – 6 pairs; calyx teeth absent *P. pilosum*

Pleurospermum hookeri C.B. Clarke in Fl. Brit. India 2: 705. 1879; Hara *et. al* Enum. Fl. Pl. Nepal 2: 188.1979; Watson in Grierson & Long Fl. of Bhutan 2(2): 456. 1999.

Herbs perennial upto 50 cm tall. Stem slender, ribbed. **Leaves** mostly basal; basal and lower petioles 3 – 8 cm, sheaths narrowly oblong; triangular - ovate, 5 – 13 cm, 3 – 4-ternate-pinnate; pinnae 7 – 9 pairs, ovate-lanceolate, **lamina** 3 – 5 × 1.5 – 2.5 cm; ultimate segments linear, ca. 2 mm. **Flowers** in umbels 5 – 7 cm across; peduncles 6 – 12 cm; bracts 5 – 7, obovate - lanceolate or linear - lanceolate, 1.5 – 2.5 cm, margin membranous, broad, white or tinged brown, apex long-caudate or occasionally pinnatifid; rays sub equal, ribbed; bracteoles obovate – lanceolate, similar to bracts, pedicels numerous, flattened. **Calyx** teeth unequal, narrowly triangular. **Corolla** rounded, 1–1.2 mm, white. Anthers dark purple. **Fruit** ovoid.

Flower & fruit : August – October.
Exsiccata : Zuluk – Serabthang, 3900 m, *SR Lepcha & AP. Das* 003, dated 13.06.2006
Status : Less Common
Local Distribution : Baba Mandir, Kupup, Bhimbase, Donkyala, 3600 – 5000 m.
General Distribution : HIMALAYA; INDIA,(Kashmir – BHUTAN), CHINA.

Note : Endemic to Himalaya.

Pleurospermum pilosum C. B. Clarke ex H. Wolf in Fedde. Repert. 27: 117. 1929. Watson in Grierson & Long. Fl. Bhutan 2(2): 1999.

Herbs aromatic upto 35 cm tall. **Stem** purplish with leaf remains clothing at base. **Leaves**; petiolate (petiole winged at base to 4.5 mm, red); usually 2-3 pinnately divided, **lamina** 8 – 25 x 3.5 – 10 cm (including petiole), 4 -6 pairs of leaflets divisions; ultimate segment ovate, pinnatisect, with whitish pubescent at veins beneath. **Umbel** 6 – 17 rays; bracts 1 -3, lanceolate. **Umbellules** 20 -30 flowered; **bracteoles** purplish green, ovate, acuminate. **Calyx** teeth absent. **Petals** white within, purple red or greenish on the reverser. Fruit oblong tinged purple.

Flower & Fruit : July – October.

Exsiccata : Baba-mandir – Kupup, 3900 m, *SR Lepcha & AP. Das*, dated 13.06.2006

Status : Less Common

Local Distribution : Baba Mandir, Kupup, Bhimbase, Donkyala, 3800 – 4500 m.

General Distribution : HIMALAYA; INDIA, BHUTAN.

Note : Endemic to Himalaya.

Sanicula L.

Sanicula elata Buch-Hamilton ex. D. Don. Prodr. Fl. Nep. 183. 1825; Kanai in Hara Fl. E. Him. 231.1966; Hara in Fl. E. Him. 644.1966; Hara *et al* Enum. Fl. Pl. Nepal 12: 189.1979; Watson in Grierson & Long. Fl. Bhutan 2(2): 446. 1999. *Sanicula hermaphrodia* Buch.-Ham. ex. D. Don. Prodr. fl. 183. 1825; *Sanicula curopace* var. *elata* (Buch.-Ham. ex. D. Don.) H. Wolff in Engl., Pl. Fleich Iv-228 (Ht.31): 63.1913

Herbs 20 – 80cm tall. **Leaf**; basal leaves several; leaves blade broadly ovate-cordate or sub-pentagonal, **lamina** 3 – 7 × 4 – 10 cm, palmately 3 (– 5)-parted, irregularly serrate, teeth mucronate; shallowly 2–3-parted, base cuneate, apex acuminate; lateral segments oblique-ovate, often 2-parted. Cauline leaves short-petiolate; blade 3(– 5)-parted, upper leaves greatly reduced. **Flowers** in cymose branched, terminal branch often very short, lateral branches elongate; **bracts** 2, lanceolate; rays ca. 5 mm, unequal; **bracteoles** 7 – 10, linear; umbellules 4 – 8 flowered. **Petals** white, pale yellow or pale blue. **Fertile flowers** 3(or 4) per umbellule; calyx teeth shorter than bristles, persistent; styles 2-times longer than calyx teeth, recurved. **Fruit** ovoid-globose.

Flower : April – August

Exsiccatus : Dohrok 2200 m, *SR Lepcha & AP. Das* 30202, dated 06.10. 2004

Status : Fair

Local Distribution : Kyongnosla, Padamchen, 900 – 3200 m.

General Distribution : INDIA, CHINA, BHUTAN, INDONESIA, JAPAN, NEPAL, MALAYSIA, MYANMAR, PAKISTAN, PHILIPPINES, SRI LANKA, VIETNAM; E AFRICA.

Note : The species has reputed medicinal value.

Selinum L. (*nom. cons.*)

Key to the species

1. Leaf ultimate segments ovate to oblong Fruit oblong-ovoid ... *S. candollei*

+ Leaf ultimate segments linear, Fruits elliptic- circular *S. wallichianum*

Selinum candollei DC., Prodr. 4: 165. 1830; C. B. Clark in Fl. Brit. India 2: 700.1879; Kanai in Fl. E. Him. 231. 1966; Hara *et al* Enum. Fl. Pl. Nepal 2: 189.1979. ; Watson in Grierson & Long Fl. of Bhutan 2(2): 491. 1999. *Angelica candollei* Wall., cat. n, 582. 1829. *nom. nud peucedum wallichianum* DC., Prodr. 4: 181. 1830. *Selinum wallichianum* (DC.) Raizada & Saxena in India forester 92: 323.1966. *Selinum tenuifolium* var. *filicifolium* (Edgew.) C.B. Clarke in Fl. Brit. India 2: 700. 1879.

Herbs or small shrubs upto 1.5 m tall. **Stem** erect, ribbed, branched above. **Leaves**; basal petioles 20 – 30 cm, wholly sheathing; sheaths inflated, 5 – 10 cm broad, purplish; leaf blade broadly ovate, **lamina** 20 – 25 × 15 – 20 cm, 3-pinnate; pinnae 4 – 5 pairs; ultimate segments linear, 2 – 5 × ca. 1 mm. **Umbels** 6 – 10 cm across (to 20 cm in fruit); bracts 4 – 8, linear, caducous; rays subequal, elongating in fruit; bracteoles 5 – 12, lanceolate, unequal, longer than umbellules, ascendant, entire or apex 2 – 3-lobed, margins white membranous; umbellules 20 – 25-flowered. **Calyx** teeth linear-lanceolate, 0.5–1 mm, longer than stylopodium. **Petals** white or pinkish, purplish-red when in bud. **Fruits** oblong-ovoid.

Flower : July-August *Fruit*: September
Exsiccatus : Rachela, 3000 m, *SR Lepcha & AP. Das* 31075, dated 02.10.2004.
Status : Less common
Local Distribution : Kyongnosla, Tamjay, Bombay hill (Changu) 3200 – 4000 m
General Distribution : HIMALAYAS; INDIA, (Kashmir – BHUTAN).
Note : Endemic to Eastern Himalaya.

Selinum wallichianum (DC.) Raizada & Saxena in India Forester, 92: 323. 1966; Watson in Grierson & Long. Fl. Bhutan 2(2): 490. 1999. *Selinum tenuifolium* Wallich. Cat. N. 579; ex DC: Prod. 4. 181. 1830.

Herbs perennial foetid, upto 1.2 m tall. **Stem** surrounded by the leaves remains at base. **Leaves** 3 pinnate; petiole to 23 cm long, narrowly sheathing at base; ultimate segments ovate to oblong, deeply pinnatifid, lobes acute, pubescent on veins beneath, acute; basal leaves pubescent, finely pubescent at rachis and veins in lower surface, narrow sheathing base. **Umbel** to 8.5 cm across, 15 - 25 rayed, white, papilose - puberulent; **bracteole** linear - lanceolate; occasionally forke, occasionally pinnatifid. **Calyx** teeth to 1.2 mm. **Petals** 1.5 mm, white, unequal; style to 0.7 mm. **Fruits** elliptic- circular, ribbed.

Flower : July - September
Exsiccatus : Rachela, 2950 m, *SR Lepcha & AP Das* 31075, dated 02.10.2004.
Status : Less common
Local Distribution : Kyongnosla, Tamjay, Bombay hill (Changu) 2000 – 4000 m
General Distribution : HIMALAYAS; INDIA, (KASHMIR-Bhutan), Meghalaya, TIBET.
Note : Endemic to Eastern Himalaya.

Sinocarum H. Wolff

Sinocarum minusum M.F. Watson in Edinburgh. J. Bot. 53(1): 140. 1996; Watson in Grierson & Long Fl. Bhutan 2(2): 471. 1999.

Herbs slender, diminutive, multi-stemmed perennial up to 1.3 m tall. **Leaves** basal and cauline, 1-2x ternate, to 4x1cm (including **petiole**); leaflets ovate, to 4 x 4mm, deeply ternately lobed to pinnatifid, segments 4-lobed at apex, ultimate segments oblong-elliptic acute; petiole to 3-6 cm long with broad sheathing base c 4x 3 mm. **Umbels** held just above the leaves, 5-14 mm across, 4 - 6- rayed. **Flower** 3 - 5mm across; pedicels 0.5 - 2 mm; bracteoles 0.4 - 3 mm; bracteoles 0 - 3, linear, to 1.5mm. **Calyx** teeth obsolete. **Petals** dark purple or white flushed purple, ovate, acute. Stylopodium domed, dark purple; styles reflexed. Fruits not observed.

Flower : June
Exsiccatus : Donkyala, 3800 m, **SR Lepcha & AP. Das** 770, dated 13.09.2007
Status : Common.
Local Distribution : KAS, PWS upto 4000 m,
General Distribution : Himalaya; INDIA; BHUTAN.
Note : A new distribution record for Sikkim

Vicatia DC..

Vicatia conifolia DC., Prodr. 4: 243.1830; C.B. Clarke in Fl. Brit. India 2: 671. 1871; Kanai in Fl. E. Him. 232. 1966; Hara *et. al* Enum. Fl. Pl. Nepal 2: 190. 1979. *Sison conifolium* Wallich, cat. 18, n.591.1829. *nom.nud.* *Chacrophyllum gracillimum* Klotzset, B. Reise. pr. waldem. 149, t. 46. 1862.

Herbs perennial, erect. Stem single with short root stock upto 32 cm tall. **Leaves** ; **petiole** narrowly sheathing at base; leaves pinnatifid into linear acute ultimate segments 18 x 12 cm; lamina 2 - 3.5 x 0.3 - 0.8 mm. **Flowers** with compound umbel of 7 - 10 rayed. Bracts 1 - 2, usually nearly similar to upper leaves, rays 0.5 - 4cm; very unequal. **Bracteole** 1 - 4, 1.2 - 4.5mm; umbellules upto 2cm across., 8 - 9 flowered, **pedicels** elongated to 9mm in fruit. **Petals** obovate. Fruit ovoid - oblong.

Flower : July *Fruit* : August
Exsiccatus : Ramitey, 1900 m, **SR Lepcha & AP. Das** 27245, dated 10.10.2004
Status : Less common
Local Distribution : 17th mile, Changu, Sherabthang, (1800 - 3700 m)
General Distribution : HIMALAYAS; AFGHANISTAN, BALISTAN, INDIA (Kashmir), NEPAL.

Note: A new distribution record for Sikkim

Subclass: Asteridae

Order: Gentianales

GENTIANACEAE A. L. Jussieu

Key to the Genera:

- | | |
|--|------------------------|
| 1. Plants climbing | 2 |
| + Plants erect or procumbent | 3 |
| 2. Fruits berry-like | <i>Tripterospermum</i> |
| + Fruits capsular | <i>Gentiana</i> |
| 3. Corolla spurred | <i>Halenia</i> |
| + Corolla not spurred | 4 |
| 4. Petals with distinct nectarines | <i>Swertia</i> |
| + Petals without nectarines | <i>Gentiana</i> |

Gentiana Linnaeus

Key to the Species:

- | | |
|---|-----------------------|
| 1. Plant Less than 15 cm tall | 2 |
| + Plant more than 15 cm tall | 3 |
| 2. Leaf lamina ovate – orbicular; margin non-ciliolate | 4 |
| + Leaf lamina oblong – spatulate, margin ciliolate | <i>G. sikkimensis</i> |
| 4. Leaf margin cartilaginous; stigma lobes oblong | <i>G. micans</i> |
| + Leaf margin non-cartilaginous; stigma lobes suborbicular | <i>G. prolata</i> |
| 3. Leaf lamina oblong elliptic; corolla blue; capsule ovoid- ellipsoid..... | <i>G. elwesii</i> |
| + Leaf lamina ovate; corolla blue – purple ; capsule ellipsoid | <i>G. speciosa</i> |

Gentiana elwesii C.B. Clarke in Hook.f., Fl. Brit. India 4: 115. 1885; Hara *et al*, Fl. E. Him. 254. 1966; Chater in Hara *et al*, Enum. Fl. PL. Nepal 3: 92. 1982; Aitken in Grierson & Long, Fl. Bhutan 2(2): 644. 1999.

Herbs perennial up-to 20cm tall. **Stems** purple, erect. **Lamina** 1.5 - 2 x 4 – 7 mm, blade oblong-elliptic, apex obtuse; base narrowed, margin smooth. **Flowers** in clusters, sessile rarely with lower pedunculate. **Calyx** tube, narrowly obconic, membranous. **Lobes** lanceolate apex acute. **Corolla** blue to truncate, oblique. **Stamens** inserted at basal part of corolla tube, anther narrowly ellipsoid. **Capsule** ovoid ellipsoid. **Seeds** light brown.

Flower : September
Exsiccatus : Singhaney 2350 m, *SR Lepcha & AP. Das 0257*, dated 16.09.2007.
Status : Common
Local Distribution : Chhangu, KAS, Dokala. 2300 – 4400 m.
General Distribution : HIMALAYA; INDIA, NEPAL, BHUTAN, S.E. TIBET.

Gentiana micans C.B. Clarke in Hook.f., Fl. Brit. India 4: 112.1885; Chater in Hara *et al*, Enum.Fl. Pl. Nepal 3: 93. 1982; Aitken in Grierson & Long, Fl. Bhutan 2(2): 649. 1999. *G. argentea* C.B. Clarke in J. Linn. B. 14: 436. 1875.

Herbs, annuals upto 7cm tall. **Stems** radically branched from base. **Petiole** 0.3 - 1.7 mm ; lamina 3.5 - 5 × 1.5 - 4.5mm, leaf blade ovate to ovate-orbicular, margin cartilaginous, apex obtuse and mucronate; veins 1-3; Cauline leaves crowded, folded; lamina subulate, 0.6 - 0.9 cm × 1.5 - 2.5 mm, subleathery, apex acute, midvein prominent. **Flowers** few, actinomorphic, subsessile, greenish white. **Calyx** narrowly obconic, tube membranous; lobes subulate, as long as or longer than tube, apex acuminate, apiculate, midvein prominent. **Corolla** pale blue, tubular, tube 1.5 - 3cm; lobes ovate, margin entire, apex obtuse and mucronate; **Stamens** inserted at middle of corolla tube, equal; anthers linear, 1-1.2 mm. **Stigma** lobes broadly oblong. **Capsules** obovoid-ellipsoid.

Flower : March. *Fruit* : September
Exsiccatu : Bhimbase 4350 m, *SR Lepcha & AP Das* 30983, dated 24.07.2005.
Status : Frequent.
Local Distribution : Rachel, Mulkharka. 2000-2550m.
General Distribution : TEMPERATE AND SUBALPINE HIMALAYAS; AFGHANISTAN, INDIA, NEPAL, BHUTAN, CHINA.

Gentiana prolata I.B. Balfour, Trans. & Proc. Bot. Soc. Edinburgh. 27: 266. 1918; Hara in Fl. E. Him. 1: 255. 1966; Smith in Hara *et al*, Enum. Fl. Pl. Nepal 3. 93. 1982; Aitken in Gierson & Long, Fl. Bhutan 2(2): 641. 1999.

Herbs perennials upto 8 cm tall. **Leaf** triangular; stem leaves larger toward apex, petiole tube to 3.5 mm; leaf ovate to orbicular or upper leaves lanceolate to elliptic, lamina 2.5 - 5 (-13) × 2.5 - 4 mm, margin smooth, apex obtuse to rounded. **Flowers** terminal, solitary, sessile, pentamerous. **Calyx** tube tubular, to 9 mm; lobes erect, lanceolate to oblong, apex acute to obtuse. **Corolla** blue, with pale yellow-white base and dark blue stripes, streaks, and spots, tubular, lobes ovate to triangular, margin entire, apex obtuse; plicae broadly triangular to subtruncate; **stamens** inserted at middle of corolla tube; **filaments** to 8.5 mm; anthers narrowly ellipsoid ; stigma lobes suborbicular. **Capsules** ellipsoid.

Flower : August *Fruit*: March - November
Exsiccatu : Singaney 2500 m, *SR Lepcha & AP. Das* 0236, dated 16.09.2007.
Status : Frequent.
Local Distribution : Nathang, 15th mile Kyongnosla . 3400 - 4500 m.
General Distribution : E. HIMALAYA; INDIA (Sikkim, BHUTAN).
Note : Endemic to Eastern Himalaya

Gentiana sikkimensis C.B. Clarke in Hook.f., Fl. Brit. India. 4: 114. 1885; Smith in Hara *et al*, Enum. Fl. Pl. Nepal. 3: 93. 1982; Aitken in Gierson & Long, Fl. Bhutan 2(2): 645. 1999.

Herb, perennial 4 - 12 cm tall. **Petiole** slightly shorter than blade, broadened toward stem apex; **lamina** oblong to spatulate, 0.4 - 1.9 × 4 - 7.5 mm base narrowed, margin ciliolate, apex rounded; basal blade suborbicular, 5 -12 mm. **Inflorescences** 3 - 8 flowered. **Calyx** tube short upto 7.5 mm, lobes linear to linear-lanceolate, unequal, 1-veined, apex acute. **Corolla** blue, with dark blue streaks, tubular, 1.5 - 2.5 cm; lobes ovate, apex obtuse; plicae truncate; **stamens** inserted at middle of corolla tube; filaments 5 - 6 mm; **anthers** narrowly ellipsoid; stigma lobes oblong. **Capsules** ellipsoid, seeds ellipsoid to subglobose.

Flower : August *Fruit*: November.
Exsiccatu : Singaney ban 2450 m, *SR Lepcha & AP. Das* 0217, dated 16.09.2007.
Status : Frequent.
Local Distribution : Mulkharka. 3400 - 4500 m.

General Distribution : E. HIMALAYA; INDIA (NEPAL to BHUTAN), Assam, Manipur, S. TIBET, and N. BURMA

Gentiana speciosa (Wall.) Marquand in Kew Bull. 1931: 70. 1931; Hara in Fl. E. Him. 255, t. 4b. 1966; Chatter in Hara *et al.*, Enum. Fl. Pl. Nepal 3: 93. 1982; *Crawfordia speciosa* Wall., Tent. Fl. Nep. 64, t. 48. 1826; Hook. f. in Fl. Brit. India 4: 6. 1885.

Herb upto 30 cm, with stems twining, terete, glabrous. **Petiole** to 6 mm; **lamina** ovate, 3.5 - 6.5 × 1.5 - (2-3) cm, base rounded, margin crenulate, apex acuminate, veins 3 - 5. **Inflorescences** 1-flowered or cymes. **Pedicel** 1- 5 cm; **bractlets** 1 pair, lanceolate, less than 8.5 × 2.5mm. **Calyx** campanulate; tube 1 - 1.5cm, apex with a transparent membrane, entire or less often split on 1 side; lobes triangular, 2.5 - 3 × 1.4 - 1.8 mm, apex acute. **Corolla** blue-purple to purple, campanulate, 3.5 - 4 cm; lobes broadly ovate-triangular, apex acute; plicae semiorbicular to truncate, oblique, margin crenulate. **Stamens** inserted at middle of corolla tube; filaments linear-subulate, **anthers** sagittate, **Nectaris** narrowly ovate. **Style** linear, ca. 6mm including linear stigma lobes. **Capsules** dark brown, ellipsoid, compressed.

Flower : August **Fruit**: November.
Exsiccatus : Nathang 3950 m, **SR Lepcha & AP Das** 0290, dated 27.10.2004.
Status : Frequent.
Local Distribution : Bhimbase, Dokala, 3400 - 4400 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL to BHUTAN) Assam, Manipur, S. TIBET and N. BURMA.

Swertia Linnaeus

Key to the species:

1. Nectaries on petals naked..... *S. bimaculata*
+ Nectaries on petals covered, forming a pocket like structure..... 2
2. Basal leaves 5 or 7 nerved at base..... 3
+ Basal leaves 3 nerved at base..... *S. dalatata*
3. Radical leaves long (upto 3cm), petioled, 7nerved..... *S. speciosa*
+ Flowers 4-merous..... 4
4. Flowers almost sessile..... *S. chirayita*
+ Flowers with 0.3-1 cm long pedicels..... *S. hookeri*

Swertia bimaculata (Sieb. et Zucc.) Hook. f. & Thoms. ex C. B. Clarke in Journ. Linn. Soc. 14: 449. 1875; C.B. Clarke in Hook. f., Fl. Brit. India 4:123. 1885; Hara in Fl. E. Him 256. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 96. 1982; Aitken in Grierson & Long. Fl. Bhutan 2(2): 624.1996. *Ophelia bimaculata* Sieb. & Zucc. in Abh. Akad. Wiss. Munchen, 4 (3): 159. 1946.

Local Name: *Bhalay Chireto* (Nep.).

Herbs, annual, erect upto 1m tall. **Stem** hollow. **Leaves** opposite, cauline ones petiolate (upto 0.9cm), **lamina** 1.5 - 6.5 × 0.5 -3.5 cm, broad elliptic-lanceolate, entire, acute, base rounded pointed, glabrous both sides, distinctly 3-nerved. **Inflorescence** both axillary and terminal clusters. **Flowers** tetra-pentamerous. **Sepals** 5, small and shorter than corollas, nearly elliptic; **Corolla** larger and longer upto 1.5cm, white, many nerved, apical portion spotted; **stamens** 4 - 5; filament long upto 0.7cm, **anthers** dorsifixed. **Seeds** reddish black, numerous.

Flower : August - October *Fruit*: October - March.
Exsiccatu : NNP boarder 2750 m, *SR Lepcha & AP. Das 31025*, dated 02.10.2004.
Status : Abundant.
Local Distribution : Rachela, Panglakha. 1950 – 3000 m.
General Distribution : E. HIMALAYA, INDIA, MYANMAR, CHINA, JAPAN.

Swertia chirayita (Roxb. ex Fleming) Karsten, Deuts. Fl. 1025. 1880-83; C.B. Clarke in Hook.f., Fl. Brit. India 4: 124. 1885, ut *chirata*; Hara in Fl. E. Him. 1: 257. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 96. 1982; Aitken in Grierson & Long, Fl. Bhutan 2(2): 626. 1996. *Gentiana chirayita* Roxb. ex Fleming in As. Res. 11. 167. 1812. *Swertia tongluensis* Burkill in ASB n.s. 2: 319. 1906; 3: 33. 1907.

Local Name: Rungken (Lep.), Chireto (Nep.); Chirata (Beng.).

Herbs, perennial upto 55cm tall. Stem usually subterete. **Leaves** opposite, sessile or very shortly stalked (subsessile), lamina 3.8 – 8.5 x 1.3 – 4.2 cm, elliptic, entire, acute, base narrowed, basally 5-nerved, dark green. **Panicles** terminal as well as axillary, leafy, many flowered. **Flowers** sessile to very shortly pedicelled (pedicel 0.1cm), 4-merous, lurid bluish yellow; **calyx** lobed, segments lanceolate; **corolla** lobes, ovate, acuminate, variously tinged, 2-glands on each lobe; filaments free; anthers and stigma oblong. **Capsule** ovate.

Flower : September - November *Fruit*: November - February.
Exsiccatu : Singaney bans 2400m, *SR Lepcha & AP. Das 216*, dated 16.09.2004.
Status : Rare
Local Distribution : Rachela Peak, Tungsay RF. 2000 – 3100 m.
General Distribution : HIMALAYAS;INDIA, (Kashmir to BHUTAN) and Khasia
Note : 1. Endemic to Himalaya.
 2. Species of a highly potential traditional medicine.

Swertia dilatata C.B. Clarke in Hook.f., Fl. Brit. India 4: 122. 1885; Hara in Fl. E. Him. 1: 257. 1966; Hara *et al.* Enum.Fl. Pl. Nepal 3: 97. 1982.

Herbs, annual, upto 50cm tall. Stem round, hollow. **Leaves** opposite, sessile or shortly petiolate, lamina 1.5 - 3.8 x 0.5 - 0.8 cm, lanceolate, acute-acuminate, base rounded or pointed, glabrous, triplinerved. **Flowers** in panicles, pentamerous; **sepals** broad, upto 1cm, elliptic-lanceolate, pointed acuminate, persistent; **petals** shorter than calyx, acute, base provided with a purplish band, pale membranous, greenish yellow, distinctly 5-nerved, mid nerve thick and prominent; glands horse-shoe shaped; scales hanging. **Capsules** round, green yellow, numerous.

Flower : September - November. *Fruit*: October – January
Exsiccatu : NNP boundary 2280m, *SR Lepcha & AP. Das 0258*, dated 16.9.2007.
Status : Common.
Local Distribution : Rachela, Jorpokhari. 2200-3050m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL) Khasia.
Note : Endemic to Eastern Himalaya

Swertia hookeri C.B. Clarke in Hook.f., Fl. Brit. India 4: 127. 1885; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 97. 1982. Aitken in Grierson & Long. Fl. Bhutan 2(2): 629. 1999

Herbs, small, erect, upto 35 cm tall, rootstock perennial. Stem hollow. **Leaves** cauline; lamina 5 - 12 x 2.5 - 3.3 cm, spatulate-elliptic, basally connate, entire, narrowed at both ends, 5-nerved; radical leaves sessile, smaller than cauline, lamina ovate, terminal ones flushed with purple colour. **Cymes** axillary, densely flowered. Pedicels 0.5 - 1 cm. **Flowers** modding, bell-shaped, 4-merous, maroon, darkly veined. **Calyx**

upto 0.8cm, lobes ovate, acute, green. Corolla-lobes 1.5 x 0.6cm, obtuse, nerved with bluish lines; filaments linear; anthers oblong; style with very short stigma.

- Flower & Fruit* : September - December.
Exsiccatus : Thamay dara 2490m, SR Lepcha & AP Das 015, dated 13. 10. 2004.
Status : Common.
Local Distribution : Dorok, kyongnosla. 2100 - 2500 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, S.E. TIBET.
Note : Endemic to Eastern Himalaya

Swertia speciosa D. Don in London Edinberg Philos. Mag. J. Sci 8: 77. 1836; C.B. Clarke in Hook.f., Fl. Brit. India 4: 128. 1885; Hara *et al*, Enum. Fl. Pl. Nepal 3: 97. 1982; Aitken in Grierson & Long. Fl. Bhutan 2(2): 627. 1996. *S. perfoliata* Royle ex G. Don, Gen. Syst. 4:176. 1837.

Herbs, erect herbs upto 55 cm tall. Stem oftenly hollow. Radical leaves opposite, long petioled (upto 3.5 cm long), lamina 4.5 - 10 x 1.5 - 5.5 cm, entire, acute, base narrowed downwards, dark green, upto 7-nerved; cauline leaves elliptic, acute or acuminate, sometimes clasping the stem. **Cymes** paniculate. Pedicels long. **Flowers** pentamerous, 1.2 - 2.2cm diam.; calyx-lobes to 1.8cm long, elliptic, acute, serrate, overlapping basally. **Corolla-lobes** 5, spreading, 1.5 - 2.5 cm, elliptic, grey, each with fimbriae at base; **filaments** linear, flattened; **anthers** ovate.

- Flower* : July
Exsiccata : Neora phatak 2700 m, SR Lepcha & AP. Das 258, dated 16.09.2007.
Status : Common.
Local Distribution : Singaney bans, Padamchen, Kyongnosla 2100 - 2600 m.
General Distribution : EASTERN HIMALAYA; INDIA, (NEPAL - BHUTAN).
Note : Endemic to Eastern Himalaya.

Swertia ciliata (D. Don ex G. Don) B.L. Burtt, Notes Roy. Bot. Gard. Edinburgh. 26: 272. 1965. *Ophelia ciliata* D. Don ex G. Don, Gen. Hist. 4: 178. 1837; Smith in Enum. Fl. Pl. Nepal 3. 96.1982; Aitken in Grierson & Long. Fl. Bhutan 2(2): 623. 1999;

Herbs, annuals 20 - 55cm tall. Stems erect, sub-quadrangular, branched. **Lamina** 0.8 - 5.5 x 0.4 - 2.5 cm, sessile or short petiolate; leaf blade lanceolate to ovate-lanceolate, base obtuse, margin slightly revolute, apex acute, veins 3 - 5. **Inflorescences** panicles of cymes, many flowered, spreading. **Flowers** pentamerous; pedicel erect, upto 2cm, filiform. **Calyx** lobes reflexed at anthesis, lanceolate, 5.5 - 6.5 x 2 - 2.5 mm, margin and midvein dark purple, apex acuminate. **Corolla** dirty purple, with 2 purple spots above each nectary, 1 - 2cm in diam. Nectaries 1 per corolla lobe, horseshoe-shaped, naked; **filaments** dark purple, 3.5 - 5mm, basally much enlarged and connate; anthers blue-purple, ellipsoid; style slender; stigma lobes capitate. **Capsules** ovoid, Seeds pale yellow, subglobose.

- Flower* : July *Fruit*: September
Exsiccatus : Singaney bans 2350 m, SR Lepcha & AP. Das 0266, dated 16.09.2004.
Status : Frequent.
Local Distribution : Kupup Nathang, Bombay hills (KAS) 3600 - 3700m
General Distribution : AFGHANISTAN, HIMALAYA; INDIA, NEPAL, CHINA.

Halenia Borkhausen

Halenia elliptica D. Don in London Edinberg Philos. Mag. J. Sci. 8: 77. 1836; C.B. Clarke in Hook.f., Fl. Brit. India 4: 130. 1885; Hara & Ohashi in Fl. E. Him. 256. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 95. 1982; Aitken in Grierson & Long. Fl. Bhutan 2(2): 611.1999. *Swertia centrostemma* Wall., Cat. 154, n. 4385. 1831, *nom. nud.* *Swertia pelons* Griff., Itin 197.1848.

Herbs, annual. **Stem** with 4-angled. **Leaves** opposite, sessile to shortly stalked, **lamina** 0.6 - 2.3 x 2.7 - 1.5 cm, narrow-elliptic, entire, acute-subglobose, base slightly rounded. **Flowers** in branched terminal and axillary cymose panicle pale blue. **Calyx** 4-lobed, lobes lanceolate-ovate. **Corollas** upto 0.6cm across, deeply 4-lobed, 4 short blue spurs 0.5cm projecting backward and outward from the petal base. **Fruit** not recorded.

Flower : September - October
Exsiccatus : Panglaxha 3040m, **SR Lepcha & AP. Das** 29398, dated 30.09.2004.
Status : Less Frequent.
Local Distribution : Rachela Peak, Memenchu, Changu, 2600-3100m.
General Distribution : ASIA; INDIA, NEPAL, BHUTAN, TIBET, CHINA, MYANMAR.

Tripterospermum Blume

Tripterospermum volubile (D. Don) Hara in Journ. Japan Bot. 40: 21. Jan. 1965; Hara & Ohashi in Fl. E. Him. 1: 258. t. 4c 1966; Hara *et al.*, Enum. Fl. Pl. Nepal. 3: 98. 1982; Aitken in Grierson & Long. Fl. Bhutan 2(2): 610.1999. *Gentiana volubilis* D. Don, Prodr. Fl. Nepal 126. 1825. *Crawfordia fasciculata* Wall., Tent. Fl. Nepal 63. t. 47. 1826; C.B. Clarke in Hook.f., Fl. Brit. India 4: 107. 1885.

Climber or twinnings. **Leaves** often opposite; **lamina** 1.5 - 4 x 0.4 - 2.2 cm, ovate-lanceolate, denticulate, acute, base narrow rounded, glabrous both surfaces, 3-nerved. **Flower** axillary, short pedicellate, light pinkish; **sepals** toothed, teeth linear; **petals** campanulate, pinkish white. **Berry** ellipsoid, reddish, succulent,

Flower : June- September. *Fruit:* October - November
Exsiccatus : Rachela 2950 m, **SR Lepcha & AP. Das** 31051, dated 02.10.2004.
Status : Common.
Local Distribution : Rechela, Jorepokhri, Mulkharka, 2000 - 3010 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, TIBET, MYANMAR.

ASCLEPIADACEAE R. Brown

Key to the Genera:

1. Terrestrial climbers; leaves ovate, non-succulent 2
+ Epiphytic undershrubs; leaves linear, succulent, both sides densely hirsute *Hoya*
2. Leaves coracious; flower pale pink to dark purple; stigma dome-shaped .. *Treutlera*
+ Leaves non-coracious; flower yellow, greenish, purple; stigma depressed, bifid ... *Ceropegia*

Ceropegia Linnaeus

Key to the species:

1. Lamina ovate; cymes upto 12 flowered *C. pubescens*
 + Lamina linear lanceolate rarely ovate; cymes upto 4 flowered *C. longifolia*

Ceropegia longifolia Wallich, Pl. Asiat. Rar. 1: 56 t. 73. 1830; Hook.f., Fl. Brit. India 4: 69. 1883; Hara *et al.* Enum.Fl. Pl. Nepal 3: 85.1982; Fasc. Fl. Ind.16: 20.1984; Grierson & Long in Fl. Bhutan 2(2): 732. 1999.

Climbers or twinner, slender glabrous. **Leaves**; petioles to 0.90 cm long; **lamina** 9 - 20 x 2 - 4.5 cm, linear-lanceolate, rarely ovate lanceolate, base rounded, acuminate, entire. **Cymes** extra-axillary.; peduncles upto 5 cm long, 1-4 flowered hairy; pedicels to 1cm long. **Flowers** dark purple. **Sepals** to 4.6 cm, purple with curved tube and bulbous base, lobes ovate, bristly ciliate and blackish, corona 10-lobed, ciliate, horns linear, **follicles** upto 13 cm long; **seeds** oblong.

Flower : August - September *Fruit* : October - January
Exsiccatus : Rachela below 2600 m, **SR Lepcha & AP. Das** 31502, dated 16.07. 2008

Status : Not common
Local Distribution : Rachela, Panglakha, PWS, NNP (WB), 2200 - 2600 m.
General Distribution : HIMALAYAS; INDIA (Simla-Sikkim, Assam) MYANMAR.
 Note : Endemic to Himalaya.

Ceropegia pubescens Wallich, Pl. As. Rar. 2: 81, t. 187. 1831; Hook.f. in Fl. Brit. India 4: 73.1883. Hara in Fl. E.Him. 1: 260.1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 85.1982; Fasc. Fl. India. 16: 28. 1984; Grierson & Long in Fl. Bhutan 2(2): 729. 1999

Climbers, slender, glabrous, pubescent. **Leaves**; petioles to 5cm long; leaves **lamina** 6 - 12 x 4.5 - 6.5cm, ovate, acuminate, base rounded, glabrous or sometime sparsely pubescent. **Flowers** in cymes, to 12 flowered; peduncles upto 5.5 cm long; pedicels 2 - 3 cm. **Calyx** upto 0.6 cm long, linear. **Corolla** 3.5 - 4.5 cm long, subcylindric, with dilated throat, spotted greenish, lobes elliptic. Coronal processes minute or obsolete, ciliated. **Follicles** to 11cm long; **seeds** oblong.

Flower : August - September *Fruit*: October - January
Exsiccatae : Panglakha 3000 m, **SR Lepcha & AP. Das** 29392, dated 30.09.2004. Dohrok - Phusrey, 2300m, **SR Lepcha & AP. Das** 30207, dated 0610.2004.

Status : Less common.
Local Distribution : Panglakha, Phusrey, Hangey 1200 - 2000 m.
General Distribution : HIMALAYAS; INDIA, MYANMAR.

Hoya R. Brown

Key to the species:

1. Lamina linear, elliptic - suborbicula 2
 + Lamina ovate lanceolate *H. lanceolata*
2. Leaves petiolate; flowers not sweet scented; corona rounded oblong *H. linearis*.
 + Leaves sessile; flowers sweet scented; corona lobes ovate oblong *H. serpens*

Hoya linearis Wallich ex D. Don, Prodr. Fl. Nepal 130. 1825; Bot. Mag. t. 6682. 1883; Hook. f., in Fl. Brit. India 4: 53. 1883; Hara in Fl. E. Him. 1: 261. 1966; Hara et al. Enum. Fl. Pl. Nepal 3: 87. 1982; Grierson & Long in Fl. Bhutan 2(2): 716. 1999. *Hoya linearis* var. *nepalensis* Hook. f. in Fl. Brit. India 4: 53. 1883.

Epiphytic, undershrubs. Stem usually 20 - 35cm, trailing, flaccid, densely hirsute. Leaves sessile; lamina 3.5 - 5 x 0.4 - 0.5cm, linear, narrowly terete, entire, acute, densely hirsute both surfaces, coarse, isobilateral, nerves not distinct. Umbels many flowered, terminal and sessile. Flowers ebracteate, white, fragrant. Calyx lobes small, hirsute, linear lanceolate. Petals broadly ovate; corona rounded oblong, spreading stellately.

Flower : September – October Fruit: December - April
Exsiccatus : Between Phusrey -Mulkharka, 2240 m *SR Lepcha & AP. Das* 27800, dated 30.07.2004
Status : Common.
Local Distribution : Mulkharka, Middle Rachel Chowk, 1700 – 2400 m.
General Distribution : HIMALAYAS, NEPAL INDIA (ARUNACHAL PRADESH, ASSAM, SIKKIM, MEGHALAYA, W. CHINA.

Hoya lanceolata Wallich ex D. Don, Prodr. Fl. Nep.130. 1825; Hook.f., Fl. Brit. India 4: 54. 1883; Hara in Fl. E. Him. 1: 261. 1966; Hara et al. Enum. Fl. Pl, Nepal 3: 87. 1982; Grierson & Long in Fl. Bhutan 2(2): 717. 1999.

Epiphytic, shrub, upto 90 cm tall with pendent branches. Branchlets pubescent. Leaves; petioles 0.18 - 0.29 cm long; lamina 2.5 – 6.5 x 0.7 – 3 cm, ovate-lanceolate, acuminate, base acute, glabrous, succulent. Cymes terminal and axillary, umbellate, 6-10 flowered. Sepals to 0.7 cm, oblong-lanceolate, pubescent. Corolla to 1.5 cm diam., whitish, centrally pinkish, tube upto 1.2 cm long, lobes spreading, coronal processes terete, spreading. Follicles to 15 cm, slender.

Flower : May - June Fruit : August - December
Exsiccatus : Phusrey forest barrack - Mulkharka, 1600 m, *SR Lepcha & AP. Das* 31504, dated 15.07. 2008
Status : Less common.
Local Distribution : Mulkharka, Middle Rachel, NNP, 1700 – 2400 m.
General Distribution : HIMALAYAS; INDIA (Kumaon – BHUTAN), Meghalaya, MYANMAR.

Note : Endemic to E.Himalaya.

Hoya serpens Hook. f., Fl. Brit. India 4:55. 1883; Hara in Fl. E, Him. 1: 261.1966; Hara et al. Enum. Fl. Pl. Nepal 3: 87.1982; Grierson & Long in Fl. Bhutan 2(2): 715. 1999.

Epiphyte, herbs, ramous to 1 m tall. Stem slender, creeping, rooting on the bark. Leaves; petioles to 0.30 cm long; lamina to 2 cm across, broadly elliptic to sub-orbicular, acute, base rounded, succulent, hairy both sides. Umbels axillary; peduncles to 45 cm, stout; pedicels to 2.3 cm long. Flowers white, sweetly scented. Sepals upto 0.45 cm, ovate. Corolla 1.5 – 2 cm across, dull white-brown, tomentose within, lobes ovate and obtuse; corona lobes ovate- oblong rarely ellipsoidal. Follicles not seen .

Flower : April - May *Fruit*: August - October
Exsiccatus : Mulkharka, 1700 m, **SR Lepcha & AP Das** 31503, dated 15.07. 2008
Status : Common.
Local Distribution : Mulkharka, Rigu, NNP, 1600 - 1800m.
General Distribution : E. HIMALAYAS; INDIA (Sikkim , Darjeeling), BHUTAN.
Note : Endemic to E. Himalaya.

E

Treutlera Hooker f.

Treutlera insignis Hook.f. in Hooker, Icon. Pl. t. 1425. 1883; Hook.f. Fl. Brit. India 4: 45. 1883; Hara in Fl. E. Him. 1: 262. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 88. 1982; Grierson & Long in Fl. Bhutan 2(2): 712. 1999.

Shrubs, twinning branched, with milky latex. Branches terete, glabrous, silvery white. **Leaves** placed in distantly; petiole to 4.5 cm; lamina 7 - 13 x 3- 4 cm, elliptic, entire, acuminate, base rounded to shallowly lobed inward medianly, glabrous both surfaces except in the nerves above, dark green and leathery above, paler to silvery white below, midrib broad below, lateral nerves 5-6 pairs. **Umbels** axillary; peduncles to 5 cm; bracts lanceolate. **Flowers** to 2.8 cm across, dark purples. **Sepals** ciliate, small. **Corolla** larger, nearly rotate, 5-lobed, lobes ovate. **Fruit** not collected.

Flower : August *Fruit*: September - December
Exsiccatus : Mid-Rachela 2300 m, **SR Lepcha & AP. Das** 31263, dated 13.07.2008.
Status : Common.
Local Distribution : Mulkharka - Phusrey, 2000 - 2400 m.
General Distribution : E. HIMALAYAS; INDIA (Sikkim, Darjeeling, Meghalaya), NEPAL, BHUTAN.
Note : Endemic to E. Himalaya.

Order: Solanales

SOLANACEAE A. Jussieu

Key to the Genera

1. Plants <2 m tall; branches lenticellate; corolla campanulate, orange / yellow ... **Cestrum**
- + Plant >2 m tall; branches setulose; Petals oblong, purplish white or light pink ... **Lycianthes**

Cestrum Linnaeus

Cestrum aurantiacum Lindley, Bot. Reg. 71. 1844; Hara in Fl. E. Him. 1:282. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3:108. 1982

Local Name: Malami Phul (Nep.).

Shrubs upto 4 m tall. Branches lenticellate. **Leaves** alternate; petioles to 3.5 cm long; lamina 5.2 -11. 8 x 2.5 - 6.5 cm, ovate-elliptic, entire acute, glabrous on both surfaces. **Inflorescence** in terminal and axillary cymes, branched, 1 - 5 flowered, terminal flowers fascicled; bracts to 1.2 cm, ovate lanceolate. **Corolla** tubular, orange yellow. **Calyx** tube green, 5-lobed, linear.. **Corolla**

to 2.4 cm long, bell shaped, orange yellow; stamens 5, epipetalous; ovary bi-locular; stigma usually notched. **Berries** globose, white, to 1.3 cm long.

Flower : July – August *Fruit*: August – September
Excissscaus : Premlakha 2700m, SR *Lepcha & AP. Das* 2345, dated 17.05.2003.
Status : Abundant.
Local Distribution : Premlakha 1500 – 2700 m
General Distribution : HIMALAYA; INDIA,(NEPAL – BHUTAN).
Note : A native of Central America; naturalized in the Himalayas. Cultivated elsewhere

Lycianthes (Dunal) Hassler

Lycianthes biflora (Loureiro) Bitter in Abh. Naturw. Ver. Bremen. 24:461. 1920. sub-sp. *macrodon* (Wallich ex Nees) Deb in Bot. Jour. Lin. Soc. 76: 293. 1978; Hara in Enum. Fl. Pl. Nepal 3: 109. 1982; *Solanum macrodon* Wallich ex Nees in Tr. Lin. Soc. 17: 43. 1834; C.B. Clarke in Fl. Brit. India 4: 232. 1885. *Lycianthes macrodon* (Wallich ex Nees) Bitter in Abh. Naturw. Ver. Bremen 24: 468. 1920.

Shrub upto 1.8 m tall with many brached. **Branches** usually setulose, nodes slightly jointed. **Lamina** elliptic, 5 – 13 x 3.6 – 6 cm, elliptic-lanceolate, entire or distantly toothed, acuminate, base narrowed to petiole, setulose both upper and lower surfaces. **Inflorescence** cymes with upto 2 – 6 flowered, oftenly sessile; pedicels to 2 cm. **Sepals** linear lanceolate. **Petals** to 1.4 cm, oblong, purplish white or light pink. **Berries** globose, red, seeds triangular.

Flower : July – September *Fruit*: August – December
Exciccatus : Below Phusrey 2100m, SR *Lepcha & AP. Das* 1500, dated 20.08. 2003.
Status : Abundant.
Local Distribution : Phusrey 1800 – 2250 m
General Distribution : Throughout tropical & subtropical ASIA, NEW GUINEA and HAWAII.

CONVOLVULACEAE A. Jussieu

Key to the Genera:

1. Corolla white, capsules one-seeded; fruiting sepals enlarged 3.5 cm *Porana*
+ Corolla pink or purple, capsules generally 4-seeded; fruiting sepals not enlarged ... *Ipomoea*

Ipomoea Linnaeus

Key to the species:

1. Flowers 1 – many; Sepals ovate elliptic *I. nil*
+ Flowers 1 – 5; Sepals oblong lanceolate *I. purpurea*

Ipomoea nil (L.) Roth, Cat. Bot. 1: 36. 1797, Ooststroom in Blumea 3: 499. 1940; Mill in Grierson & Long, Fl. Bhutan 2(2): 846. 1999. *Convolvulus nil* L., Sp. Pl. ed. 2. 1: 219. 1762.
Ipomoea hederacea auct, non Jacq.: C.B. Clarke in Fl. Brit. India 4: 199. 1883.

Twiner, rarely prostrate. **Stem** hirsute. **Petiole** 2.5 – 13 cm; broadly ovate to orbicular in outline, **lamina** 3.5 -13 x 4 – 15 cm, entire or 3 lobed, acute to acuminate, base cordate, appressed hairy on both surfaces; pedicel short 2 – 8 mm; bracts, linear. **Flowers** 1 – many. **Sepals** ovate elliptic at basal part, narrowed to long, linear lanceolate, with yellowish bristles, slightly hairy

above. **Corolla** infundibular, glabrous, whitish or lime blue, turning red to reddish-purple; **stamen** and style included. **Capsules** ovoid to globose, 3 celled or 3 valved; **seeds** black, pear shaped.

Flower : Almost round the year

Exsiccatus : Neora boundary 2700 m, , *SR Lepcha & AP. Das 30285*, dated 16.09.2007

Status : Common

Local Distribution : Gangtok, Bhusuk, Haticherey 1100 – 3100 m.

General Distribution : CIRCUMTROPICAL; INDIA, CHINA, MYANMAR, NEPAL, NEW GUINEA, PAKISTAN, SRI LANKA, THAILAND, AFGANISTAN, BALUCHISTAN, CHINA, JAVA, JAPAN; NATIVE OF S. AMERICA

Note : The seeds are used in local medicine in China.

Ipomoea purpurea Roth. Abh. 27. 1797; C.B. Clarke in Fl. Brit. India 4: 200. 1885; Mill in Grierson & Long, Fl. Bhutan 2(2): 848. 1999.

Twiner, annual, herbaceous. **Stem** with short appressed hairs. **Lamina** ovately to suborbicular, 2.5 - 13 x 2 - 14 cm, unlobed, rarely 3 lobed, acuminate, base deeply cordate. **Flowers** in axillary, 1 - 5 flowered in cymes; pedicels to 13 mm long. **Sepals** oblong lanceolate, acute, outer oblong, inner narrower and scarious margined. **Corolla** infundibular, glabrous, tube white or pink, limb white or red purple; mid petals distinctly reddish then others; **stamens** and style included. **Capsules** globose.

Flower : May - October

Exsiccatus : Padamchen, 2800 m, *SR Lepcha & AP. Das 0299*, dated 16.09.2007

Status : Common

Local Distribution : Padamchen, Subaney, Premlakha, Phusrey 1100-3100m.

General Distribution : CIRCUMTROPICAL

Note : Weeds or sometime cultivated as an ornamental.

Porana Burmann f.

Porana grandiflora Wall. in Roxb., Fl. Ind. ed. Carey 2: 41. 1824; C.B. Clarke in Fl. Brit. India 4: 221. 1885; Hara in Fl. E. Him. 1: 265. 1966; Hara in Enum. Fl. Pl. Nepal 3: 108. 1982; Mill in Grierson & Long, Fl. Bhutan 2(2): 855. 1999. *Ipomoea cuspidata* D. Don. Prodr. 98. 1825; Clarke in Fl. Brit. India 4: 215. 1883. *Dinetopsis grandiflora* (Wall.) Roberty in Candollea 14: 27. 1952.

Twiner slender, thinly pubescent. **Stem** reddish, pubescent, **Petioles** upto cm long. **Lamina** 7.5 - 13 x 6.5 - 15cm, broadly ovate, entire, acuminate, deeply cordate. **Racemes** usually 4- 12 flowered, 5 - 7.8 cm long, pubescent; **peduncles** 5 -11 cm, few to many flowered; **bracts** small 0.2 - 0.35 cm, linear; pedicels upto 1 cm long. **Calyx** linear-lanceolate, acuminate, hairy. **Corolla** usually infundibular, mauve, scented, tube 2.2 cm, linear, with limb 3 -5 cm long. **Capsules** subglobose, with persistent enlarged sepals.

Flower : August - October . *Fruit*: October - January

Exsiccatus : Talkharka, 2120m, *SR Lepcha & AP. Das 0300*, dated 05.06.2005.

Status : Common.

Local Distribution : Middle Rachel, 1820 - 2400 m.

General Distribution : E. HIMALAYAS; INDIA,(NEPAL- Sikkim).
Note : Endemic to Eastern Himalaya.

CUSCUTACEAE Dumitriu

Cuscuta Linnaeus

Cuscuta reflexa Roxb., Pl. Cor. 2:3, t. 104. 1798; in Fl. Indica 1: 446. 1820; ed. 2, 1: 466. 1832; C.B. Clarke in Fl. Brit. India 4: 225. 1883; Hara in Fl. E. Him. 263. 1966; Hara *et. al.* Enum. Fl. PL. Nepal 3: 105. 1982; Mill in Grierson & Long, Fl. Bhutan 2(2): 863; 1999; *Cuscuta verrucosa* Sweet, Br. Flow. G. Ser. 1., 1: t. 6. 1823. *Cuscuta grandiflora* Wall. [Cat. 35, n. 1318. 1829, *nom. nud.*]

Twinner, parasitic. **Stem** reddish or yellowish brown, profusely branched. **Flowers** in short lax racemes of upto 12 flowers. **Bracts** leaves like. **Calyx** lobes 5, ovate – obtuse, 0.9 x 3 mm, shorter than corolla tube, margin scarious. **Corolla** creamy white, with scented, lobe obtuse 1.5 x 0.5 mm. **Stamens** 5; filament linear; anther basifixed; stigma 2 unequal. **Capsules** globose conical.

Subsp. reflexa.

Large flowers, corolla 1/3 of the tube

Flower : February *Fruit:* October
Exsiccatus : Singaney 2650m, **SR Lepcha & AP. Das 1011**, Dated 16.09.2007
Status : Common
Local Distribution : 1200 – 2700 m.
General Distribution : AFGANISTAN, BALUCHISTAN, INDIA, NEPAL, BHUTAN, SRI LANKA, W. CHINA and MALAYSIA (JAVA)

Note : Stem is medicinal.

Order: Lamiales

BORAGINACEAE A. Jussieu

Key to the Genera:

1. Leaf with whitish hair on both surface; flowers in racemes *Cynoglossum*
+ Leaf glabrous except mid veins; flowers axillary *Hackelia*

Cynoglossum Linnaeus

Key to the species:

1. Plants more than 1 m tall 2
+ Plants less than 1 m tall *C. glochiadiacum*
2. Corolla deep blue with limb throat scale blueish - white *C. wallichii*
+ Corolla white with limb throat scale blue *C. lanceolatum*

Cynoglossum glochiadiatum Wallich *ex* Benth. in Royle, III. Bot. Him. 306. 1836; C.B. Clarke in Fl. Brit. India 4: 156 1993; Hara & Ohashi in Fl. E. Him. 1: 266. 1966; Hara *et al.* Enum. Fl. Pl.

Nepal 3: 100. 1982; Grierson & Long, Fl. Bhutan 2(2): 167. 1999. *C. wallichii* G. Don, Gen. Hist. 4: 354. 1832; C.B. Clarke in Fl. Brit. India 4: 157. 1883. *C. denticulatum* DC., Prodr. 10: 105. 1846; C.B. Clarke in Fl. Brit. India 4: 157. 1883.

Herbs upto 45cm tall. Branches ascending. **Stem** hispid with hairs rising from tubercles. **Leaves lamina** 3 – 6.5 x 0.5 - 2.5cm, alternate, sessile, lanceolate, acute, base attenuate, 3-nerved, hairy on both surfaces, hairs whitish, dense and almost erect. **Flowers** in elongated racemes, purple. **Calyx** lobed ovate to obtuse. Nutlets ovate, margined.

Flower : July - November *Fruit:* August- December.
Exsiccatus : Sano-Ramitey, 2250 m, **SR.Lepcha & AP. Das 31133**, dated 03.10.2004.
Status : Common
Local Distribution : Changu, Rongchu, Padamchen, Rongchu 1500 – 2300 m:
General Distribution : AFGHANISTAN, TURKESTAN, INDIA, TIBET, WEST CHINA C. ASIA.

Cynoglossum lanceolatum Forsskal, Fl. Aegypt. Arab. 41.1775; C.B. Clarke in Fl. Brit. India 4: 156. 1853; Grierson & Long, Fl. Bhutan 2(2): 907. 1999
Local Name:Khirpatey (Nep.)

Herbs annual or biennial, perennial hispid. Stems erect, to 125 cm, much branched. **Leaves;** petiole to 23 cm., basal leaves absent in Flower; subacute – acute, base shortly attenuate; upper surface grays strigose- hispid on veins. **Inflorescent** intricately branches, ultimate branched slightly divaricated on fruits. **Calyx** lobes to 1.3 mm, ovate, obtuse, strigose,. **Corolla** white to 2.3 mm long; limb to 3.4 mm in diam. throat scale blue, slightly crecent. **Nutlets** to 2.2 mm, ovate orbicular, emarginated.

Flower : Throughout the years
Exsiccatus : Phusrey – Singahney 2450 m, **SR Lepcha & AP. Das 0261**, dated 15.09.2005
Status : Common
Local Distribution : 1200 – 3600 m.
General Distribution : AFRICA, ARABIA, AFGHANISTAN, INDIA, BURMA, THAI, INDO-CHINA, MALAYSIA, AND CHINA.

Cynoglossum wallichii G. Don, Gen. Hist. 4: 354. 1832; C.B. Clarke in Fl. Brit. India 4: 157. 1883; Grierson & Long., Fl. Bhutan 2(2): 909. 1999.

Herbs biennial, robust. Stems to 80 cm., hispid with spreading hair. **Leaves;** radical leaves absent during flowering; lower cauline leaves elliptic lamina 40 – 80 x 20 – 24 mm, middle leaves sessile and de-current, oblong elliptic, lamina 50 – 110 x 17 – 23 mm, upper leaves sessile, ovate, apex acute, acuminate, margin entire, both upper and lower surface sparsely short hispid; mid rib brownish, lateral veins indistinct, margins in upper leaf with setules, **Inflorescent** with branches of 7 – 12 flowered. **Calyx** velvety blackish or dark purplish, lobes broadly ovate – suborbicular, uptuse or rounded. **Corolla** deep blue, to 4.5 mm long, limb throat scale bluish white, hairy. **Nutlets** to 3 mm, ovate elliptic marginate.

Flower : May *Fruit:* October
Exsiccatus : Sano-Ramitey 2220 - 2300m, **SR.Lepcha & AP. Das 0260**, dated 15.09.2005.

Status : Common
Local Distribution : Kyongnosla, Karponang, 1800 – 2900 m.
General Distribution : AFGHANISTAN, TURKESTAN, INDIA, TIBET, E. ASSAM, WEST CHINA

Hackelia Opiz

Key to the species:

1. Plants upto 70 cm tall; corolla funnel shaped; fruits pyramidal..... *H. uncinata*
 + Plants morethan 70 cm tall; corolla not funnel shaped; fruit ovoid..... *H. bhutanica*

Hackelia bhutanica R.R. Mill in Edinburgh J. Bot., 53(1): 117. 1996; Grierson & Long. Fl. Bhutan 2(2): 902. 1999.

Herbs perennial, upto 70 cm tall. Stems erect, pilose. **Leaves** both cauline and radical; petioles upto 20 cm long; cauline leaves, petiolate; **lamina** 23 – 90 x 13 – 65 mm, acuminate, shortly pilose above, sparsely hairy to 1.2 mm, glabrous except on veins beneath. **Flowers** in axillary, few flowered, terminal cymes subtended by a bracts (leaves like); pedicels filiform, upto 14mm long. **Calyx** partite, to 1.4 mm, lobes lanceolate, acute, with white hirsute on veins. **Corolla** white; tube 1 – 1.8 mm, pilose at base, limb to 5.6 diam. **Nutlets** small grayish. ovoid.

Flower : May - July *Fruit* : August - November
Exsiccatus : Below Jorpokhari, 2750 m, **SR Lepcha & AP. Das 30887**, dated 30.07.2005.

Status : Less Common.
Local Distribution : Kyongnosla, Padamchen, Subaney, 1880 – 3000 m.
General Distribution : E. HIMALAYA; India, NEPAL, BHUTAN.
 Note : Endemic to Himalaya

Hackelia uncinata (Royle ex Benth) C.E.C. Fischer, Kew Bull. 298. 1939: 336. 1939. var. *brachytuba* (Diels) Hara in Fl. E. Him. 1:267. 1966; Hara in Enum. Fl. Pl. Nepal 3: 101. 1982; Grierson & Long. Fl. Bhutan 2(2): 902. 1999. *Cynoglossum uncinatum* Benth in Royle, Illustr. Bot. Himal. 1: 305. 1836. *Paracaryum brachytubum* Diels in NRBGE 5: 168. 1912. *Hackelia brachytuba* (Diels) Johnson in JAA 18: 25. 1937.

Herbs upto 5 m tall. Stems hairy. **Leaves** usually both cauline and radical; petioles upto 11 cm long; cauline leaves 4.2 - 7.3 x 2.5 - 4.5 cm, elliptic, acuminate, base obtuse; radical leaves oftenly larger than cauline, ovate, cordate, 4 - 6 nerved from base. **Inflorescence** in racemose to 13 cm, furcated; pedicels upto 1.3cm long. **Flowers** blue. **Sepals** to 0.6 cm, oblong-ovate, acute, glabrous, much elongated in fruit. **Corolla** funnel shaped, lobes upto 0.4 cm, rounded, overlapping. **Fruits** in small nutlets to 1 cm, pyramidal

Flower : June – August *Fruit*: August – November
Exsiccatus : Padamchen – Premlakha, 2200 m, **SR Lepcha & AP. Das 0261**, dated 16.09.2005.

Status : Less Common.
Local Distribution : Padamchen, Kyongnosla, 2280 – 3000 m.
General Distribution : HIMALAYAS; INDIA, NEPAL-BHUTAN, MEGHALAYA, S. TIBET, W. CHINA.

Note : Endemic to Himalaya

LAMIACEAE Lindley (*alt. nom.*)
LABIATAE A.L. Jussieu (*nom. cons.*)

Key to the Genera:

- 1. Plant with stellate hairs on leaves and stems 2
- + Plant with simple hairs 3
- 2. Bracts and calyx teeth spinose with strongly hooked *Notochaete*
- + Bracts and calyx teeth without hook tip 4
- 4. Calyx 5 mm or less at anthesis *Isodon*
- + Calyx 5 mm or more at anthesis 5
- 5. Flowers in dense terminal spike 6
- + Flowers in whorls or axillary not forming a dense spike *Phlomis*
- 6. Calyx sub bilabiate; stamens 4; nutlets cuneate *Leucosceptrum*
- + Calyx bilabiate; stamens 2; nutlets trigonous *Salvia*
- 3. Fruit calyx tubular 7
- + Fruit calyx bilipped and not tubular 9
- 7. Herbs ascending or procumbent sometime erect 8
- + Herbs erect *Melissa*
- 8. Flowers in axillary verticillaster; corolla-tube exceeding calyx *Clinopodium*
- + Flowers in unbranched spike; corolla-tube not exceeding calyx *Prunella*
- 9. Plants prostrate or decumbent *Ajuga*
- + Plants erect, stout 10
- 10. Corolla white or pink; inflorescence compact *Elsholtzia*
- + Corolla lavender-blue; inflorescence generally lax *Siphocranion*

Ajuga Linnaeus

Key to the species:

- 1. Herbs aromatic; flowers in spike ; corolla light purple, turning to white *A. macrosperma*
- + Herbs non- aromatic; flowers in lax whorls; corolla lilac, violet *A. lobata*

Ajuga lobata D. Don, Prodr. Fl. Nep. 108. 1825; Hook.f. in Fl. Brit. India 4: 702. 1885; Lab. Ind. 224. 1940; Murata in Hara Fl. E. Him. 271. 1966; 2: 113. 1971; 3: 92. 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 149. 1982; Clement in Grierson & Long, Fl. Bhutan 2(2): 944. 1999.

Herbs perennial, prostrate and aromatic. Stem flexuous, ± procumbent, deep brown and softly hairy. **Leaves**; petioles to 6.5 cm, white pubescent; lamina 4.5 - 11 x 3 - 5.5 cm, broadly oblong, margins hairy and sinuate-lobed, base slightly cordate, white hairy above, deep brown and hairy along nerves beneath; bracts oblong, dentate. **Flowers** in whorls lax, axillary, lilac, violet. **Calyx** 5-lobed, teeth lanceolate, thinly hairy. **Corolla** tube 2 cm, slender, straight, deeply 2-lipped, upper lip short, violet, limbs reticulate with dark violet lines; stamens 4, exerted, ascending; **ovary** with sub-equal lobes; **Fruit** calyx tubular.

Flower & Fruit : April - August

Exsiccatus : Below Rachel 2790 m, **SR Lepcha & AP. Das 32918**, dated 28.10.2004.
Status : Less Common
Local Distribution : Gangtok – Karponang, Neora patak, Chitray. 2700 – 3000 m
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, MYANMAR, S.W. CHINA.

Ajuga macrosperma Wall. ex Benth. in Wallich, Pl. Asiat. Rar. 1: 58. 1830; Clement in Grierson & Long, Fl. Bhutan 2(2): 944. 1999. var. *breviflora* Hook. f. in Fl. Brit. India 4: 704. 1885; Mukherjee, Lab. Ind. 220. 1940; Murata in Hara Fl. E. Him. 271. 1966; 2: 113. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 149. 1982.

Herbs perennial and prostrate. Branches slender, decumbent, villous. **Lamina** ovate oblong, 5 – 13 x 2 – 4.8 cm including petioles; sinuate-crenate and hairy, base subcordate, thickly white hairy above, sparsely hairy along nerves to almost glabrous below. **Spike** terminal, whorls interrupted; **bracts** ovate. **Calyx** obconic, to 0.30 cm, teeth short and obtuse. **Corolla** inflated at base, to 0.65 cm, 2-lipped, upper lip nearly erect, light purple to white during maturity ; stamens 4, exerted; ovaries shortly 4-lobed. **Nutlets** deeply pitted; Fruit calyx tubular.

Flower : May – July *Fruit*: June – September
Exsiccatus : Dohrok 2300, **SR Lepcha & AP. Das 32926**, dated 28. 10.2004.
Status : Frequent
Local Distribution : Gangtok, Phusrey, Deorali dara. 2150 – 3050 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL-Arunachal Pradesh).
Note : Endemic to Eastern Himlaya

Phlomis Linnaeus

Phlomis macrophylla Wall. [Cat. 57.n.2065.1829; *nom. nud.*] ex Benth. in Wallich., Pl. Asiat. Par. 1: 62.1830; Hook.f. in Fl. Brit. India 4: 692.1885; Aurata in Hara Fl. E. Him. 3: 94. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 16. 1982; Clement in Grierson & Long, Fl. of Bhutan 2(2): 958. 1999.

Herbs, stout upto 15 cm tall. **Stem** erect, hairy. **Leaves** ovate; petioles 6 - 10 cm long, verticillasters, lamina 9 – 16 x 5. 5 - 13 cm, acuminate, base cordate – truncate, margin coarsely serriate, villous above. **Calyx** to 15 mm, pubescent or red on white marked, tube obliquely at base; upper lip plane brown villous. **Corolla** pink sparsely stellate hair beneath. bracts linear – lanceolate , hairs. **Nutlets** oblong – obovate, truncate apically.

Flower : July – August
Exsiccatus : Panglakha ridge 2990 m, **SR Lepcha & AP. Das 31060**, dated 8.10.2004
Status : Common
Local Distribution : Rachel, Bara Ramitey Dara. 2500 – 2900 m
General Distribution : HIMALAYA; INDIA, (Punjab – BHUTAN)
Note : Endemic to Himalaya

Clinopodium Linnaeus

Clinopodium umbrosum (M.-Bieb) C. Koch in Linnaea 21: 673. 1848; Murata in Hara Fl. E. Him. 272. 1966; 2: 114. 1971; 3: 92. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 150. 1982. Clement in Grierson & Long, Fl. Bhutan 2(2): 977. 1999. *Melissa umbrossa* M.- Bieb., Fl. Taur. Cauc. 2:

63. 1808; *Calmintha umbrosa* (M.-Bieb.) Fisch. & Mey., Ind. Sem. Hort. Petrop. 6:6. 1840; Hook.f., Fl. Brit. India 4: 650. 1885; Lab. Ind. 98. 1940.

Herbs, annual, procumbent, slender upto 40 cm tall. Stem 4-ribbed, hairy. **Leaves**; petioles upto 0.8 cm; **lamina** 1 - 2.5cm, ovate, dentate, subacute, rounded, both-sides pubescent. Verticillaster dense, globose, densely pubescent. **Flowers** upto 0.50 long. **Calyx** 13 nerved, bilipped, upper teeth triangular. **Corolla** light purple to pinkish-white, tube straight, bilipped, upper lip erect, throat villous; stamens included; style lobed, lobes equal. **Nutlets** minute, subglobose.

Flower : June - September *Fruit*: August - October
Exsiccatus : Rachela 2880 m, *SR Lepcha & AP. Das* 27732, dated 30.09.2004.
Status : Abundant
Local Distribution : Lower Rachela Chowk, Rachela Middle. 1500 - 2700 m.
General Distribution : HIMALAYAS; IRAN, AFGANISTAN, PAKISTAN, INDIA, NEPAL, BHUTAN, TIBET, CHINA, MYANMAR.

Elsholtzia Willdenow

Key to the species:

1. Leaves elliptic lanceolate 2
- + Leaves ovate 3
2. Spikes paniced-secund; Flowers sessile *E. blanda*
- + Spike fascicled; Flowers shortly pedicelled *E. fruticosa*
3. Bracts nearly semi-circular; Nutlets obovoid *E. strobilifera*
- + Bracts broadly ovate; Nutlets oblong *E. ciliata*

Elsholtzia blanda (Benth.) Benth., Lab. Gen. Sp. 162. 1833; Dyer in Hook.f., Fl. Brit. India 4: 643. 1885; Mukherjee, Lab. Ind. 89. 1940; Murata in Hara Fl. E. Him. 1: 273. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3:152. 1982; Clement in Grierson & Long, Fl. Bhutan 2(2): 979. 1999. *Aphanochilus blandus* Benth. in Wallich, Pl. As. Rar. 1: 29. 1830.

Shrubs or undershrubs, slender, strongly aromatic upto 120cm tall. Branch pubescent. **Petioles** to 1.5 cm long; **lamina** elliptic-lanceolate, 2.5 - 5.5 x 1.5 - 3.5 cm, serrate, acuminate, base narrowed, puberulous above, gland-dotted beneath. **Spikes** terminal and an short lateral branches, 5 - 13cm long, paniced, secund; **bracts** subulate. **Flowers** sessile. **Calyx** 0.22 - 0.25cm, urceolate, glandular-pubescent, lobes lanceolate; pubescent, white, tube oblique. **Corolla** white. **Nutlets** minute ellipsoid.

Flower : September - November *Fruit*: November - February.
Exsiccatus : Dohrak 2350 m, *SR Lepcha & AP. Das* 30281, dated 6.10.2004.
Status : Frequent.
Local Distribution : Singhaney Dara, Lower Padamchen 1600 -2200 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, MALAYSIA.

Elsholtzia fruticosa (D. Don.) Rehder in Pl. Wilson. 3: 381. 1916; Murata in Hara Fl. E. Him. 1: 274. 1966; 3: 93. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 153. 1982; Clement in Grierson & Long, Fl. Bhutan 2(2) : 981. 1999. *Perilla fruticosa* D. Don, Prodr. Fl. Nepal 115. 1825. *E.*

polystachya Benth., Lab. Gen. Sp. 161. 1833; Hook. f. in Fl. Brit. India 4: 645. 1885. *Cyclostegia strobilifera* Benth. In Wallich, Pl. Asia. Rar. 1: 30. 1830, excl. *syn.*

Shrubs or undershrubs, highly aromatic. Branches obscurely 4-ridged. **Leaves** sub-sessile-shortly petioled; **lamina** elliptic-lanceolate, 3.5 - 8 x 1.5 - 2.5cm, serrate, acute to shortly acuminate, base cuneate-acute, glandular and finely haired both sides. **Spikes** long, fascicled, terminal, slender; **bracts** small, linear subulate and puberulous. **Flowers** tiny, shortly pedicelled. **Calyx** ribbed and 5-6 toothed, teeth short and sharply triangular, pubescent. **Corolla** tubular, notched, twice the length of sepals, densely hairy, white, strongly fragrant; **stamens** 4, exerted, filament long, base thickened and hairy; style exerted, bifid. **Nutlets** narrow with persistent calyx, often shiny.

Flower : September - November *Fruit:* November - January
Exsiccatus : Bhimbase 4320 m, *SR Lepcha & AP. Das 30943*, dated 24.07.2004.
Status : Common.
Local Distribution : Rachel Chowk, 2100 - 2550 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, TIBET, CHINA.

Elsholtzia strobilifera (Benth.) Benth., Lab. Gen. Sp. 163. 1833; Hook. f., in Fl. Brit. India 4: 645. 1885; Mukherjee, Lab. Ind. 92. 1940; Murata in Hara Fl. E. Him. 274. 1966; 3: 93. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 153. 1982; Clement in Grierson & Long, Fl. Bhutan 2(2): 983. 1999. *Cyclostegia strobilifera* Benth. in Wallich, Pl. Asia. Rar. 1:30. 1830, excl. *syn.*

Herbs, annual upto 30cm tall. Branches white-hairy. **Petioles** to 0.7cm long, hairy; **lamina** ovate, 1- 3.5 x 0.5 - 1.5 cm, serrate, obtuse-acute, base cuneate to rounded, white hairy along nerves on both surfaces. **Spikes** short 1.5 -2.8cm, cylindric, compact, pubescent, peduncled; **bracts** large, nearly semi-circular, longer than sepals, membranous, ciliate and nerved. **Flowers** minute. **Calyx** narrowly tubular, 5-toothed, teeth lanceolate, hyaline. **Corolla**-tube slender, longer than calyx, pinkish, glabrous, lobes narrowly, spreading; **stamens** and **styles** long, exerted, brown. **Nutlets** oblong, not shiny, light brown.

Flower : August - November *Fruit:* October - January
Exsiccatus : Panglakha 3000 m, *SR Lepcha & AP. Das 31090*, dated 2.10.2004.
Status : Common
Local Distribution : Rachela trijunction, Tungsay. 2000 - 3100m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, TIBET.

Elsholtzia ciliata (Thumb.) Hylander in Bot. Not. 1941: 129. 1941; Murata in Hara Fl. E. Him. 273.1996. Grierson & Long. Fl. Bhutan 2(2) : 982. 1999. *Sideritis cilliata* Thumb., Fl. Zap. 245. 1784. *Elsholtzia cristata* Willd. In Rohmer & Usterr, Mag., Bot. 4- 2 : 5, t. 1. 1790; Hook. f., Fl. Brit. India 4: 645. 1885.

Herbs erect upto 110 cm tall. Stem quadrangular. **Petiole** to 4.3 cm; **lamina** ovate, 1.3 - 7.5 x 1.2 - 4.3 cm, acute or shortly acuminate, base cuneate, margin crenate serrate, pubescent to pilose with sessile gland beneath,. **Spikes** second, **bracts** broadly ovate, apiculate 3 - 5 x 4. 5 mm, ciliate. **Calyx** ca 2.2 mm, teeth triangular, Fruit calyx to 5.5 mm. **Corolla** purple to pale pink to 5 mm; **stamens** slightly exerted. **Nutlets** obovoid.

Flower : September - November *Fruit:* November - January
Exsiccatus : Bhimbase 4280m, *SR Lepcha & AP Das 30943*, dated 24.07.2004.

Status : Common.
Local Distribution : Rachel Chowk, 2100-2550 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, CHINA, TIBET, MYANMAR.

Notochaete Bentham

Notochaete hamosa Benth. in Wallich, Pl. Asiat. Rar. 1: 63. 1830; Hook.f. in Fl. Brit. India 4: 694. 1885; Mukherjee, Lab. Ind. 202. 1940; Murata in Hara Fl. E. Him. 279. 1966; 2: 116. 1971; 3: 94. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 159. 1982; Clement in Grierson & Long. Fl. Bhutan 2(2): 955. 1999.

Herbs, perennial erect upto 70cm tall. Stem nearly quadrangular and stout. **Leaves**; petioles long, 1.5 -6cm, pubescent; **lamina** 3.5 -13 x 2 - 7cm, broadly ovate, toothed, acuminate, sub-cordate, white hairy above, nerves pubescent below. **Verticillaster** axillary, upto 3.5cm in diam., many flowered, spiny; **bracts** many, slender. **Calyx** tube 2 - 5cm, 5-toothed, teeth spinous and hooked, villous. **Corolla** white, as long as calyx spines, upper lip concave and erect, lower 3-lobed; stamens 4, anther-cells divaricate; style lobed, minute and nearly equal. **Nutlets** oblong, narrow.

Flower : July – September *Fruit*: September. - November
Exsiccatus : Dohrok 2300 m, *SR Lepcha & AP. Das 31268*, dated 13.09.2008.
Status : Common. 1900 – 2600 m.
Local Distribution : Changu lake, Kyongnosla, Padamchen.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR.

Siphocranion Kudo

Siphocranion macranthum (Hook.f.) C.Y. Wu, Acta Phytotax. Sin. 8: 56. 1959; Clement in Grierson & Long, Fl. Bhutan 2(2): 999. 1999. *Plectranthus macranthus* Hook.f., Fl. Brit. India 4: 616. 1885.

Herbs with 70 cm tall. Stem tomentose, glabrescent below. **Leaves** ovate – elliptic ; petiole to 4 cm long; lamina 4 – 9 x 2.5 – 4.5 cm, base cuneate , rounded, apex acute – acuminate, margin serrate, tomentose on veins on either sides. **Flowers** 7 – 18 cm, in whorls – 2 flowered ; pedicels to 4.5 mm . bracts ovate – acuminate. **Calyx** puberulant, sessile gland, upper lip (subulate teeth) ; lower shorter than upper. **Corolla** pink – purple, upto 4.5 cm ; tube straight to 2 cm, upper lobe obtuse; lower sub-equal. **Stamens** inserted in throat, Nutlets globose upto 2.

Flower : August – October
Exsiccatus : Ramitey dara 2550 m, *SR Lepcha & AP. Das 31193*, dated 05.10.2004.
Status : Frequent.
Local Distribution : Racheal, Singhaney, Padamchen. 2500 – 3200 m
General Distribution : INDIA, BHUTAN, CHINA, MYANMAR, VIETNAM

Note : A medicinal herb

Prunella Linnaeus

Prunella vulgaris L., Sp. Pl. ed. 1: 600. 1753; Hook.f. in Fl. Brit. India 4: 670. 1885; Mukherjee, Lab. Ind. 14. 148. 1940; Murata in Hara Fl. E. Him. 1: 281. 1966; 2: 117. 1971; 3: 95. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 162. 1982; Clement in Grierson & Long. Fl. Bhutan 2(2): 995. 1999.

Herbs, perennial, small, hairy upto 25cm tall. Stem erect, brown hairy. Root-stock creeping. **Lower leaves** to 1.8 cm long including petiole; upper leaves sessile; **lamina** 1.3 – 2.5 x 0.5 – 1.5cm, much variable, ovate or oblong, entire to dentate ciliate, rounded-acute, round to even notched/lobed, densely hispid above, nerves prominent below. **Spike** compact, cylindric. Bracts ovate-cordate, ciliate. **Flowers** deep purple. **Calyx** reticulate, toothed, teeth variable. **Corolla** small, purple, bilipped, lower lip spreading and upper one erect; **stamens** 4, exerted; filament 2-fid; anther cells diverging; ovary 4-lobed; style lobes subulate. **Nutlets** oblong.

Flower : June - September. Fruit: August - October
Exsiccatus : Rachela 2990 m, **SR Lepcha & AP Das** 31047, dated 02.10.2004.
Status : Common
Local Distribution : Panglakha, Padamchen. 1600-2600m.
General Distribution : ALL OVER EUROPE AND TEMPERATE ASIA.

Leucosceptrum Smith

Leucosceptrum canum Smith, Exot. Bot. 2: 113. 1806; Hook.f., Fl. Brit. India 4: 699. 1885; Murata in Hara, Fl. E. Him. 278. 1966; Clement in Grierson & Long. Fl. Bhutan 2(2): 948. 1999. *Clerodendrum leucosceptrum* D. Don. Prodr. 103. 1825. *Comanthosphace nepalensis* Kitamura & Murata; et. Phytotax. Geobot. 15: 109.1954.

Local name: *Cheong* (Lep.), *Gurpis* (Nep.)

Tree upto 7 m tall. Branches densely gray or puberulent or subglabrous. **Petiole** upto 4 cm, densely yellowish tomentose; lamina elliptic - lanceolate, 9 – 18 x 3.5 - 10 cm, densely gray or yellowish tomentose, adaxially glabrescent or puberulent on midrib, base cuneate, margin serrate or rarely crenate, apex acuminate. **Flowers** in spikes 9 -13 cm, usually densely stellate-tomentose. 6 - to many flowered, bracts acute, margin entire or irregularly crenate. Pedicel ca. 1.5 mm. **Calyx** upto 8 mm, densely yellowish stellate-tomentose, glabrous inside. **Corolla** 7 - 10 mm, stellate-tomentose outside. **Nutlets** smooth, with sparse ± transparent above.

Flower : November - March, *Fruit*: March - May.
Exsiccatus : Rachela 2500 m, **SR Lepcha & AP. Das** 31201, dated 13.07. 2008.
Status : Common
Local Distribution : Panglakha, Singhaney. 1500 – 2700 m
General Distribution : ALL OVER EUROPE AND TEMPERATE ASIA. INDIA , NEPAL, BHUTAN, MYANMAR, LAOS, VIETNAM

Isodon (Bentham) Spach

Key to the species:

1. Herbs slender, procumbent 2
- + Herbs erect *I. lophanthoides*
2. Leaves base subcordate; corolla lip lower straight *I. rugosa*.
- + Leaves base slightly truncate; corolla lip lower deflexed *I. repens*

Isodon rugosa (Hand. -Mazz.) Hara in J.Jap.Bot., 60(8): 236.1985; (Bentham) Codd.; Clement in Grierson & Long. Fl. Bhutan 2(2): 997. 1999. *Rabdosia rugosa* (Wallich ex Benth.) Hara in Journ. Japan Bot. 47:199. 1972; Hara et al. Enum. Fl. Pl. Nepal 3:161. 1982; *Plectranthus rugosus* Wallich ex Benth., Pl. As. Rar. 2:17. 1831; Hook.f. in Fl. Brit. India 4:620. 1885; Lab.

India 47. 1940. *Isodon plectranthoides* Schrad. in Benth., Lab. Gen. Sp. 43. 1832; Acta. Phyt. Geobot. 24.82. 1969.

Herbs slender upto 1.3 m tall. Stem pubescent, woody below. **Petiole** to 0.45 cm ; **lamina** ovate, 2 – 4 x 1.3 -1.7 cm, crenate, obtuse to subacute, base subcordate, rugose above, white tomentose beneath. **Flowers** in cymes terminal and axillary paniced. **Fruit** calyx to 0.5 cm, shortly bilipped, teeth subequal, acute and pubescent. **Calyx** bilabiate, campanulate, white, teeth 5, subequal, broadly triangular, Fruit calyx tubular. **Corolla** to 0.70 cm, white with purplish spots, upper lip to 2 mm, lower straight. . **Nutlets** oblong.

Flower : August- October *Fruit*: October - December.
Exsiccatus : Singhaney Dara 2300m, *SR Lepcha & AP. Das 31264*, dated 13.07.2004.
Status : Abundant in open places.
Local Distribution : Dohrok, Lower Padamchen. 1900 – 2450 m.
General Distribution : AFGANISTAN, PAKISTAN, INDIA, NEPAL, BHUTAN, CHINA.

Isodon repens (Wall.) Murata, Acta Phyl. Geobot. 22: 21. 1966; in Fl. E. Him. 276. 1966; Clement in Grierson & Long, Fl. Bhutan 2(2): 992. 1999. *Rabdosia repens* (Wall. ex. Benth.) Hara in Journ. Jap. Bot., 47: 199. 1972

Herbs perennial, procumbent. Stem ascending, to 30 cm, unbranched. **Leaves** ovate orbicular; petiole upto 3 cm long; **lamina** 3 – 5 x 3.2 – 4.5 cm, pilose , puberulant, base slightly truncate, apex subacute , rarely rounded, margin crenate, villous hairs – puberulant on both sides. **Flowers** in terminal cymes, paniculate to 16 mm; 5 – 7 flowered. **Calyx** bilabiate, campanulate to 1. 8 mm, puberulent teeth triangular; upper lip shorter than lower. **Corolla** white with purple marked, mauve to dark blue, upper lip recurved, lower deflexed; **Nutlets** oblong – ovoid, brown.

Flower : September – October
Exsiccatus : Salami RF 3300 m, *SR Lepcha & AP. Das 31265*, dated 13, 07. 2008
Status : Frequent.
Local Distribution : Kaphyokla. 2000 – 3500 m
General Distribution : E. HIMALAYA; INDIA, (NEPAL – BHUTAN).
Note : Endemic to Eastern Himalaya.

Isodon lophanthoides (Hamlet. ex D. Don) Hara in J.Jap. Bot., 60(8): 235.1935; Clement in Grierson & Long, Fl. Bhutan 2(2): 995. 1999. *Rabdosia lophanthoides* (Buch.-Ham. ex D. Don) Hara in Journ. Japan Bot. 47:197. 1972; Hara in Fl. E. Him. 3:95. 1975; Hara et al. Enum. Fl. Pl. Nepal 3: 162. 1982. *Hyssopus laphanthoides* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal 110. 1825; Fl. Brit. India 4: 618, 625. 1885. *Plectranthus striatus* Benth. in Pl. As. Rar. 2:17. 1831; Hook.f. in Fl. Brit. India 4: 618. 1885.

Herbs pubescent, erect upto 45 cm tall, unbranched or rarely branched. **Petiole** of upper leaves sessile, lower leaves to 3 cm, usually clasping; broadly ovate, **lamina** 3.5 - 8 x 4 - 6 cm, crenate, acuminate, base cuneate, thinly villous. **Flowers** in panicles axillary and terminal, with slender branches. **Calyx** to 0.30 cm, oftenly 5-toothed, 2-lipped, lobes obtuse, hispid. **Corolla** to 0.8 cm, white and pink striped, tube subcylindric; stamens 4, long exerted. **Nutlets** oblong.

Flower : September - November *Fruit*: October - January
Exsiccatus : Gumsay 2240m, *SR Lepcha & AP. Das 32919*, dated 28.10.2004.
Status : Less Common.

Local Distribution : Phusrey, Dohrok. 1600-2550m.

General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Isodon coetsa (Buch.-Ham.) Kudo, Lab. Sino-Jap. 131. 1929; Hara & Ohashi in Fl. E. Him. 275. 1966; Clement in Grierson & Long, 2(2): 998. 1999. *P. coetsa* Buch.-Ham. ex D. Don, Prodr. 117. 1825; Hook.f. in Fl. Brit. India 4: 619. 1885. *Plectranthus comenthoides* Benth. in Pl. As. Rar. 2: 17. 1830; Hook.f. in Fl. Brit. India 4: 620. 1885.

Herbs or undershrubs, aromatic. Stem quadrangular. **Leaves** opposite; petioles upto 2 cm; **lamina** 1.5 – 3.5 x 1-5cm, ovate or ovate-lanceolate, margin crenate or dentate, acute or acuminate, membranous, thinly pubescent, nerves prominent and bright white beneath. **Flowers** in paniculate cymes, lavender-blue; calyx 5-toothed hispid; corolla bilipped, recurved, tube exerted; **stamens** 4, didynamous; ovaries 4 loculed; **styles** slender, bifid. **Fruits** ovoid or orbicular; **Fruit** calyx enlarged bilabiate with acute teeth.

Flower : August – October *Fruit* September - December

Exsiccatus : Chandaney RF 2000 m, *SR Lepcha & AP. Das 31267*, dated 13.09. 2008.

Status : Frequent.

Local Distribution : Subaney. 1700 – 2200 m.

General Distribution : INDIA, NEPAL, BHUTAN, SRI LANKA, N. MYANMAR, W. CHINA.

Melissa Linnaeus

Melissa axillaris (Benth.) Bakhuizen, f., in Backer & Back. f., fl. Jav. 2: 629. 1965; Murata in Fl. E. Him. 2: 115. 1971; 3: 93. 1975; Hara *et al.* Enum. El. Pl. Nepal 3: 157. 1982. Clement in Grierson & Long, Fl. Bhutan 2(2): 975. 1999. *M. parviflora* Benth. in Wallich, Cat. 9, n. 2125. 1829. *nom. nud.* Jpl. As. Rar. 1: 65. 1830.

Herbs perennials. Stem to 120 cm, puberulent. **Lamina** ovate – narrowly ovate; petiole to 25 mm; usually purplish, 1 - 6 x 0.5 – 3.5 cm, acute, base truncate- crenate, margins crenate, puberulent above, glabrous beneath. **Flowers** few – numerous, verticillasters in leaf axils. **Calyx** hairy on mid veins, teeth; **Fruit** calyx to 9 mm. **Corolla** white to pale yellow with purple marked; tube straight, to 9 mm. **Nutlets** 2 mm.

Flower : June - September

Exsiccatus : Panglakhha 3050 m, *SR Lepcha & AP. Das 32920*, dated 28.10. 2004.

Status : Not common

Local Distribution : Singhaney dara, 1200 – 3500 m.

General Distribution : E. HIMALAYA (NEPAL – BHUTAN), Assam, S. CHINA, Formosa, JAVA.

Salvia Linnaeus

Salvia campanulata Wall. ex Benth. In Wallich, Pl. Asiat. Rar. 1: 67. 1831; Clement in Grierson & Long., Fl. Bhutan 2(2): 972. 1999.

Herbs perennial, glandular. **Stems** erect upto 80 cm tall with spreading glandular hairs above, tomentose or glabrescent below. **Petiole** to 20 cm long, **lamina** of basal ovate to ovate oblong, 11 – 22 x 6-13 cm, acute to obtuse, base cordate, serrate to crenate, upper surface pubescent; lower

surface tomentose with numerous sessile glands. Inflorescence branched; bract ovate - acuminate. Verticillasters distant, 2 - 6 flowered. **Calyx** campanulate to 17 mm long, dull red purple on upper lip, glandular hairy on fruit. **Corolla** yellow, with brownish or purple marking on upper lip. **Nutlets** obovoid.

Flower : June - September
Exsiccatus : Changu 4000 m, *SR Lepcha & AP. Das 31271*, dated 28.10. 2008.
Status : Less common
Local Distribution : KAS, PWS. 1200 - 3500 m.
General Distribution : E.HIMALAYA; INDIA, (NEPAL - BHUTAN)
Note : Endemic to the Eastern Himalaya

Order: Plantaginales

PLANTAGINACEAE A.L. Jussieu

Plantago Linnaeus

Key to the species:

1. Leaf oblong or oblong ovate; flowers sessile; petals longer than sepals *P. erosa*
+ Leaf elliptic to elliptic lanceolate; flowers subsessile; corolla equals to calyx .. *P. depressa*

Plantago depressa Willd., Enum. Pl. Hort. Berol, Suppl. 8. 1813. Patzak & Rech.f. in Rech. f., Fl. Iran. 15: 7. 1965; Hartmann, Bot. Jb. 85: 351. 1966; Springate in Grierson & Long, Fl. Bhutan 2(3): 1343. 2001.

Herbs annual- perennial, stemless, up to 13 cm tall. **Leaves** few to many in rosettes, erect to decumbent; petiole to 2.2 cm, base broadly dilated.; Leaf **lamina** 4.5 - 6.5 x 1.8 - 3 cm, dentate, elliptic to elliptic-lanceolate, sparsely irregularly denticulate, teeth obtuse, villose - sparsely hairy, 5-7 nerved. **Flowering** head to 15 cm, upto late anthesis, **Spikes** nearly equalling the peduncle, narrow, dense; **Flower** sub sessile; bract suborbicular, ovate or elliptic, to 2.5 mm., bracts shorter than the calyx, concave. **Sepals** 2 mm long, slightly concave, obovate, elliptic to broad elliptic. **Corolla** tube equal to the calyx, lobes small, elliptic to ovate, obtuse to truncate-obtuse. Anthers exerted. **Capsule** conically attenuated. Seeds 5, purplish brown, compressed.

Flower : July - October
Exsiccatae : Panglakhha 3000m, *SR Lepcha & AP. Das 27773*, dated 30.09.2004; Dorok 2300m, *SR Lepcha & AP. Das 20229*, dated 28.10.2004.
Status : Abundant
Local Distribution : Rachel, Kyongnosla upto 3300 m.
General Distribution : EAST URAL, SIBARIA, AMUR, RUSSIA, AFGHANISTAN, INDIA, NEPAL, BHUTAN, SRI LANKA, TIBET, CHINA, MANCHURIA, MONGOLIA, JAPAN.

Plantago erosa Wall. in Roxb., Fl. Indica 1: 423. 1820; Hara in Fl. E. Him. 306. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 166. 1982; Grierson & Long, Fl. Bhutan 2(3): 1342. 2001. *P. major auct. non. L.*: Hook. f. in Fl. Brit. India 4: 705. 1885 p.p; Springate in Grierson & Long, 2(3): 1342. 2001

Herbs small. Root-stock, perennial. **Leaves** radical, exstipulate; petiole 1.8 – 4.5cm long, glabrous or sparsely pubescent; **lamina** 2.5 – 5.5 x 1.5 – 3.2cm, oblong or oblong-ovate, entire to repand or irregular-dentate, acute or obtuse, base cuneate or rounded glabrous above, pubescent to glabrous beneath, 3 - 5 nerved, nerves pubescent beneath. **Spikes** axillary. **Peduncles** long upto 18cm, slender, sparsely hairy. **Flowers** small, sessile, densely crowded on spike, white;. **Sepals** 4, basally connate, glabrous, medianly black thick-lined, persistent. **Petals** longer than sepals, salver-shaped, scarious, filament short, capillary and persistent. **Capsule** few seeded; seeds small, cylindric.

Flower : April - July *Fruit:* June - October.
Exsiccatae : *Kupup, SR Lepcha & AP. Das 31426, 27.07.05*
Premlakha SR Lepcha & AP. Das 32936, 31.07.2005.
Status : Abundant
Local Distribution : Mulkharka, Rachela Middle, Neora-Sikkim Border, 1400 – 2900 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, SRI LANKA, MYANMAR, TIBET, CHINA..

Order: Scrophulariales

BUDDLEJACEAE Wilhelamina

Buddleja Linnaeus

Key to the species:

1. Plant \geq 3 m tall 2
- + Plant more than 5 m tall *B. asiatica* .
2. Leaves crenulate dentate, Capsule oblong and acute *B. macrostachya*
- + Leaves lanceolate or oblanceolate, Capsule broadly ellipsoid *B. colvillei*

Buddleja asiatica Lour., Fl. Cochinch. 72. 1790; C.B. Clarke in Fl. Brit. India 4: 82. 1883; Yamajaki in Fl. E. Him. 1: 253.1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 89. 1982; Rae in Grierson & Long. Fl. of Bhutan 2(3): 1081. 2001

Shrubs upto 5.5m tall. **Leaves** narrowly lanceolate , lamina 5.5 – 13 x 2 – 5 cm, acuminate base cuneate; margins minutely dentate, stellate pubescent or tomentose beneath, glabrous to stellate pubescent above; petiole short 2-8mm. **Inflorescence** terminal and axillary in dense panicles upto 22cm long, not fragrant. **Calyx** 2-4mm, stelletate pubescent lobes triangular. **Corolla** stelletate pubescent outside, lobes orbicular, white, or violet. **Capsules** ovoid, compressed.

Flower : September – December *Fruit:* December – April.
Exsiccatus : Rachela 2950 m, *SR Lepcha & AP. Das 31063, dated 02.10.2004.*
Status : Less common.
Local Distribution : Rachela, Panglakha 1900 – 2550 m.
General Distribution : E.HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, VIETNAM.

Buddleja colvilei Hook.f. & Thoms. in Hook.f, Illstr. Him. Pl. t. 18. 1855; C.B. Clarke in Fl. Brit. India 4: 81. 1883; Yamajaki in Fl. E. Him. 253. 1966; 2: 106. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 3: 89. 1982; Rae in Grierson & Long, Fl. Bhutan 2(3): 1080. 2001

Shrubs to small tree upto 3m tall. **Leaves**; petiole short 0.6mm; elliptic lanceolate to oblanceolate, **lamina** 5 -18 x 2 – 6cm , acuminate, base attenuate , margins shallowly serrate, glandular and sparsely to densely stallate hairs beneath. **Inflorescence** in cymose, terminal, axillary, flower mostly 3. **Calyx** upto 6mm, glandular, subglarous to densely tomentose. **Corolla** tubular campanulate, red wine coloured, glandular and sparsely hairy outside. Ovary stellate tomentose. **Capsule** broadly ellipsoid.

Flower : September – December *Fruit*: December – April
Exsiccatus : Bara Ramitey 2650 m, *SR Lepcha & AP. Das 31157*, dated 04.10.2004
Status : Less common.
Local Distribution : Rachela Chowk, Panglakha 1900-2550m.
General Distribution : E.HIMALAYA, INDIA (Assam), MYANMAR, VIETNAM, CHINA.

Buddleja macrostachya Bentham [ex Wallich, cat. 218,n. 6407. 1832, *nom.nud*],. Scroph. Ind. 42. 1935; C.B. Clarke in Fl. Brit. India 4: 81. 1883; Har *et al.* Enum. Fl. Pl. Nepal 3: 89. 1982. Grierson & Long, Fl. Bhutan 2(3): 1081. 2001. *B. griffithii* (C.B. Clarke) Marquand in Kew Bull. 1930: 194. 1930; Yamajaki in Hara Fl. E. Him. 2: 106. 1971.

Local Name: *Bhimsen Paati* (Nep.)

Shrubs upto 3m tall. **Leaves** opposite; stipules much developed and eared uniting the opposite leaves; petioles upto 0.5cm; **lamina** 13 - 27 x 2.5 - 4.5cm, crenulate-dentate, acuminate, base attenuate, rusty wooly beneath, mid rib very thick, veins prominent below. **Spikes** both terminal and axillary, 2.5 – 18 cm, elongate sub-paniced. **Flowers** rusty-white, villous; **Calyx** campanulate, 4-lobed, teeth lanceolate, acute; **Corolla** 4-merous, silvery white tinged with pinkish tube; **stamens** 4; **anthers** ovate to oblong, subsessile; **ovaries** 2-chambered with clavate and linear style; ovules numerous. **Capsules** oblong and acute, seeds elongated.

Flower : September – December *Fruit*: December – April
Exsiccatus : Rachela below 2750 m, *SR Lepcha & AP. Das 31187*, dated 05.10.2004
Status : Less common.
Local Distribution : Rachela Chowk, Singhaney 1900 – 2550 m.
General Distribution : E. HIMALAYA, INDIA (Assam, Sikkim), MYANMAR, VIETNAM, CHINA.

OLEACEAE Hoffmann & Link

Key to the Genera:

1. Climbing shrubs.....*Jasminum*
- + Shrubs to small trees.....2
2. Leaves imperipitunate; pedicels 0.4-0.65cm..... *Fraxinus*
- + Leaves simple; pedicels upto 0.25cm.....*Ligustrum*

Fraxinus Linnaeus

Fraxinus floribunda Wall. in Roxb., Fl. Indica ed. Carey 1: 150. 1820; C.B. Clarke in Hook.f., Fl. Brit. India 3: 605. 1882; Hara in Fl. E. Him. 251. 1966; 2: 105. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 79. 1982; Watson in Grierson & Long, Fl. Bhutan 2(2): 594. 1991.

Local Name: Lankuri (Nep.).

Trees deciduous upto 22 m tall. **Leaves** opposite, rachis 13 - 19cm, lateral leaflets 7 - 13. **Lamina** 7 - 15 x 3.5 - 7.5 cm, oblong elliptic, shallowly serrate, caudate - acuminate, base cuneate, glabrous above, pubescent beneath, membranous, nerves pillose beneath. **Inflorescence** terminal panicle, compound, subfascicle on branches, emerging before new leaves. **Flowers** bisexual. **Sepals** to 0.20cm, with triangular teeth, **Corolla** 4, linear-oblong, concave; stamens 2; stigma long. **Samara** oblanceolate, with fruiting enlarged calyx and emarginate wings upto 1.60cm.

Flower & Fruit : May - December.

Exsiccatus : Lower Phusrey 2250 m, *SR Lepcha & AP. Das 31273*, dated 13.07.2008.

Status : Common.

Local Distribution : Phusrey below, Subaney, 1700 - 2160 m.

General Distribution : HIMALAYAS; INDIA,(Kashmir- BHUTAN) Khasia, THAI, INDO-CHINA, and W. CHINA

Note : Use in traditional medicines.

Jasminum Linnaeus

Jasminum dispernum Wall. in Roxb., Fl. Indica ed. Carey, 1: 99. 1820; C.B. Clarke in Hook.f., Fl. Brit. India 3: 602. 1882; Hara in Fl. E. Him. 251. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 80. 1982; Watson in Grierson & Long, Fl. Bhutan 2(2): 591. 1991.

Local Name: Harhey Lahara, Charpatay Lahara (Nep.).

Shrubs, climbing. Stem woody, terete. **Leaves** opposite 3 - foliate; petioles short to 0.20cm.; lateral leaflets smaller, 2.5 - 5 x 0.6 - 3 cm, terminal leaflet generally large, 4 - 8 x 1 - 3.5 cm, ovate-lanceolate, entire, acute-acuminate, base obliquely rounded to obscurely lobed inwards, glabrous, slightly coriaceous, 3-nerved, from base, reticulate. **Inflorescence** axillary, terminal cymes 5 - 15 flowered. Pedicels minutely coarse hairy. **Flowers** bracteate. **Calyx** tube greenish, with 5 triangular teeth. **Corolla** infundibuliform, white-pinkish, vertically lined, lobes 6, 0.5-0.6cm long, elliptic with a sharp mucro, spreading with indistinct vertical lines; stamens included; anthers 2-celled. **Fruits** long-cylindric.

Flower & Fruit : May. - March

Exsiccatus : Singhaney 2220 m, *SR Lepcha & AP. Das 31574*, dated 13.07.2008.

Status : Rare.

Local Distribution : Mulkharka, Singhaney 15090 - 2500 m.

General Distribution : HIMALAYAS; INDIA,(Kashmir - NEFA) Khasia, Manipur, THAI, W. CHINA.

Ligustrum Linnaeus

Ligustrum lucidum Buch.-Ham. ex Wall., Cat. n..2816. Aiton f., Hort. Kewed. 2(1): 19. 1810; Hara *et al.*, Fl. E. Him. 1: 252. 1966. *Ligustrum nepalense* Hooker in Bot. Mag. t. 2921. 1829; Fl.

Brit. India 3: 617. 1882. *Olea clavata* G. Don, Gen. Hist. 4: 49. 1938; Hara *et al*, Enum. Fl. Pl. Nepal 3: 81. 1982

Shrub to small tree. Branches lenticellate. **Leaves** opposite; petiole to 0.6cm long, glabrous; lamina 3 – 6.5 x 1.5 – 3 cm, ovate-lanceolate, entire, acute, base unequal-cuneate, both surfaces glabrous, coriaceous, glossy above, nerves slightly impressed above, prominent beneath, lateral nerves 7-9 pairs, irregular. **Inflorescence** terminal panicles branched, densely rusty villous. **Bract** lanceolate; pedicel very short to 0.20cm, villous. **Bracteoles** 0.3cm, linear, pubescent. Floral buds scattered or clustered. **Calyx** very short, 0.1cm, indistinctly 4-toothed. **Corollas** slightly longer than calyxes, upto 0.10cm, white-light red, glabrous; **stamens** 2, included.

Flower & Fruit : May– July

Exsiccatus : Dohrok 2380m, *SR Lepcha & AP. Das 31275*, dated 13.07.2008.

Status : Rare.

Local Distribution : Dohrok 1300 – 2300m

General Distribution : NATIVES OF CHINA.

Note : Planted for ornamental value.

SCROPHULARIACEAE A. Jussieu

Key to the Genera

- | | |
|--|----------------------|
| 1. Plants rhizomatous hemi-parasitic | 2 |
| + Plants non rhizomatous | 3 |
| 2. Leaves strictly basal, non-pinnatifid | <i>Pedicularis</i> |
| + Leaves non basal, pinnatifid | 4 |
| 4. Calyx cylindrical | <i>Neopicrorhiza</i> |
| + Calyx oblong, ovate or suborbicular | <i>Scrophularia</i> |
| 3. Plants perennial | 5 |
| + Plants annual | <i>Calceolaria</i> |
| + Flower many | 6 |
| 5 Flower solitary | <i>Mimulus</i> |
| 6. Stamens 4 | 7 |
| + Stamens 2 | 8 |
| 7. Sepals 2; corolla blue or pinkish; tube rotate; scarcely zygomorphic | <i>Veronica</i> |
| + Sepals 4 -5; corolla blue, purple, or white; tube curved; zygomorphic | <i>Lagotis</i> |
| 8. Plants procumbent- decumbent – erect; leaves mainly crowded at the base .. | <i>Mazus</i> |
| + Plants slender and creeping; leaves dimorphic | <i>Hemiphragma</i> |

Calceolaria Linnaeus

Calceolaria gracilis Kunth in Humb. Bonpl. & Kunth, Nov. Gen. Sp. 2:339. 1818; Hara *et al.* Enum.Fl. Pl. Nepal 3:113. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1104. 2001. *C. mexicana* Benth in DC., Prodr. 10:205. 1846; Hara & Ohashi, Fl.E.Him. 285. 1966.

Herbs, annual, pubescent upto 35cm tall. Stem usually spongy. **Leaves** opposite; lamina 2 – 5.5 x 1.5 - 2.8cm, coarsely toothed or pinnately lobed, upper lobe ovate-lanceolate, acute, incisedentate, pubescent above, glabrous beneath. Pedicels upto 2.5cm long. **Flowers** axillary solitary. **Calyx** lobes to 0.5cm long, lanceolate, pubescent. **Corolla** to 1.5cm long, obovate-orbicular, deep yellowish, tube slender, with concave lower lip; stamens 2, included. **Capsules** subglobose.

Flower : June- October. *Fruit*: September - December
Exsiccatus : Rachela below, **SR Lepcha & AP. Das** 31096, dated 02.10.2004.
Status : Less Common.
Local Distribution : Bara-Ramitey, Dohrok, Phusrey 1900 – 2600 m.
General Distribution : NATIVE OF MEXICO, NATURALISED IN INDIA, MALAYSIA etc.

Hemiphragma Wallich

Hemiphragma heterophyllum Wallich in Trans. Linn. Soc.13: 612 (*ut heterophyllum*) 1822; Hook. f. in Fl. Brit. India 4: 289.1885; Yamazaki in Hara, Fl. E. Him. 286. 1966; Hara *et al.* Enum.Fl. Pl. Nepal 3: 114.1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1129. 2001

Local Name: Mala Phul (Nep.).

Herbs perennial, prostrate covering, stone and ground. **Leaves** on main stems with petiole 2 - 5 (- 10) m or sometime sessile, orbicular, cordate or reniform, base truncate, subcordate or cuneate, margin serrately 2 - 7 toothed, obtuse to acuminate, veins inconspicuous, crowded, needle like sometime linear-lanceolate upwards. **Flowers** subsessile or short pedicelled. **Calyx** lobes narrowly triangular-lanceolate, 3-5 mm, subequal. **Corolla** white or rose; tube short campanulate, lobe 5, orbicular to oblong, subequal. **Filaments** filiform, adnate to corolla tube; anther, locule apically confluent. **Capsule** red, ovoid to globose. **Seeds** pale yellow brown aloid.

Flower : March - July *Fruit*: July - October
Exsiccatus : Rachela, **SR Lepcha & AP. Das** 27738, Dated 30.09.2004.
Status : Common
Local distribution : Jorpokhari, Chitray Bunglow, Rachela Peak, 1800 – 3500 m
General distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, TAIWAN, PHILLIPINES.

Note : Roots used as medicinal. Fruits edible.

Lagotis Gaertx.

Lagotis kunawurensis (Royle ex Benth.) Ruprecht in Mem. Acad. Sci. St. Pet. Ser. 7, 14:64.1869; Yamazaki in Fl. E. Him. 286. 1966; 3:98.1975; Hara *et al.*, Enum. Fl.Pl. Nepal 3:114. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1145. 2001. *Gymnandra Kunawerensis* Royle ex Benth., Scroph, India 47. 1835. *Lagotis glauca* var. *Kunawerensis* (Royle ex Benth.) Hook. f. in Fl. Brit. India 4:560.1885. *Lagotis kunawerensis* var. *Sikkimensis* (Hook.f.) Yamazaki in Fl. E. Him. 286. 1966.

Herbs, perennial, sheathes rosette. **Leaves** several, erect; **petioles** to 15 cm, elliptic to narrowly oblong; **lamina** 5 – 20 x 2 – 8 cm, obtuse or sub-acute, base attenuate or cuneate, margin crenate, rarely entire. Scapes to 32 cm. **Scape leaves** sessile, ovate, crenate – sub entire. **Flower** oblong ovate, narrowly oblong dense spike; bracts rhombic to elliptic, variably dentate- entire. **Calyx** to 4 – 8 x 3 – 6 mm, shortly mucronate lobes. **Corolla** blue or pale blue – violet, turning white, upper lip 3 – 5 x 1.8 – 4.2 mm, obtuse, entire, occasionally 3 notch; lower lip 2 linear, strongly recurved segment. **Stigma**, unequal branches. **Ovary** to 1.8 mm.

Flower : June – August *Fruit*: September
Exsiccatu : Kupup 4200m, **SR Lepcha & AP. Das 2324**, dated 15.08.20005.
Status : Less Common.
Local Distribution : Kupup, Padamchen KAS, 2700 – 4200 m.
General Distribution : HIMALAYAS; BALTISTAN, INDIA, BHUTAN, S. TIBET.

Mazus Loureiro

Key to the species

1. Plant with prominent rootstock; calyx tubular *M. dentatus*
 + Plant with small runners; calyx triangular..... *M. surculosus*

Mazus dentatus Wallich ex Benth, Scroph. Ind. 27. 1835; Hook.f. in Fl. Brit. India 4: 260. 1885; Yamazaki in Fl. E. Him. 288. 1966; 2: 119. 1971; Hara in Enum. Fl. Pl. Nepal 3: 117. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1101. 2001.

Herbs, perennial with prominent rootstock. Stem upto 22 cm. **Leaf**: petioles to 5.3 cm long; lamina broadly ovate or oblong-elliptic, 3-9.5 x 2-6 cm, sinuate or waxy, deep purple beneath. **Flowers** to 8cm long, very few flowered in racemes; pedicels to 1.2 cm long; bracts setaceous. **Calyx** to 0.7 cm, tubular, lobes to 0.23 cm, acute. **Corolla** upto 2.3 cm long, funnel-shaped, oftenly drooping, purple to white, lower lip 3-lobed, spreading. **Capsules** globose, with sub-erect persistent calyx.

Flower : April - June *Fruit* : June - September
Exsiccatu : Rachela below, 2850 m, **SR Lepcha & AP. Das 32311**, dated 13.09. 2005.
Status : Less Common.
Local Distribution : Rachela Middle, Padamchen, Subaney 2100 – 2800 m.
General Distribution : HIMALAYAS; INDIA, (Kumaon-Arunachal Pradesh), Meghalaya.
Note : Endemic to Himalaya

Mazus surculosus D. Don, Prodr. Fl. Nep. 87. 1825, *ut surculosa*; Hook.f., in Fl. Brit. India 4: 260. 1885; Yamazaki in Fl. E. Him. 288. 1966; Hara in Enum. Fl. Pl. Nepal 3: 118. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1101. 2001.

Herbs perennial, small runners. **Leaves** usually in lax rosette, radical leaves larger, opposite; **lamina** 12 - 3 x 0.8 - 1.5 cm, obovate-spathulate or sub-pinnatifid, crenate, base narrowed to petioles, surfaces pubescent; pedicels bracteate. **Flowers** to 6 cm long. **Calyx** lobes triangular, sub-erect. **Corolla** bluish white or pinkish violet, 2 - lipped, upper lip dark and shortly two-lobed, lower of 3-rounded lobes.

Flower : May - July *Fruit* : July - September
Exsiccatu : Bombay hill, below Changu, 3500 m, **SR Lepcha & AP. Das 2327**, dated 23.08.2006.

- Status* : Common.
Local Distribution : Mulkharka Pokhari, Below, Changu, 1500 – 2750 m.
General Distribution : E.HIMALAYAS; INDIA, (Kashmir-BHUTAN), Assam, TIBET, W. CHINA.
 Note : Endemic to Himalaya

Mimulus Linnaeus

Mimulus nepalensis Benth, Scroph. Ind. 29. 1835; Yamazaki in Fl. E. Him. 289. 1966; 2: 119. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 118. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1099. 2001. *M. assamicus* Griffith in Linnaea 12: 199. 1836. *M. tenellus* Bunge *sensu* Handel-Mazzetti, Symb. Sin. 7: 832. 1936, p.p. var. *nepalensis*.

Herbs prostrate very small 4 – 13 cm. **Leaves** opposite; petioles to 0.50cm; **lamina** 0.6 - 2.4 x. 05 -1.8 cm, ovate, coarsely serrate, acute, base slightly rounded, glabrous or sparsely hairy, nerves not prominent above. **Pedicels** to 3 cm, slender, axillary, addressed hairy. **Flowers** in solitary. **Calyx** 0.7 - 1.4cm, truncate, tubular, 5-angled, with 5 short unequal lobes, sparsely pubescent. **Corolla** longer than calyx, yellow, upper lip erect, 2-lobed, palate 2-lobed, slightly swollen; anther cells divergent. **Capsules** included with inflated sepals

- Flower* : May - September *Fruit* : July - October
Exsiccatus : Phusrey below 2200 m, **SR Lepcha & AP. Das** 2323, dated 15. 07. 2006.

- Status* : Common.
Local Distribution : Dhorok Phusrey 1300 – 2700 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL-BHUTAN), Assam, W. and C. CHINA.

Neopicrorhiza D.Y. Hong

Neopicrorhiza scrophulariiflora (Pennell) D.Y. Hong, Opera Bot. 75: 56. 1984; Grierson & Long, Fl. Bhutan 2(3): 1131. 2001. *Picrorhiza scrophulariiflora* Pennell in Manogr. Acad. Nat. Sci. Philad. S: 65, t. 6B. 1943; Yamasaki in Fl. E. Him. 290. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 126. 1982. *Vernica lindleyana* Wallich, Cat. 13 & 23, n. 404. 1829. *nom.nud.* *Picrorhiza kurrooa* *auct. non.* Royle; Hook.f. in Fl. Brit. India 4: 290. 1885.

Herbs perennials upto 12 cm tall. **Leaves** spatulate to ovate, black when dry 3 - 6cm, base tapering, margin serrate or rarely double serrate; scape brown glandular hairy. **Flowers** in spike 1-2 cm. **Pedicel** upto 30mm long. **Calyx** to 1 cm in fruit; lobes lanceolate to obovate-oblong, upper lobe sublinear, brown glandular hairy. **Corolla** dark purple, pubescent outside; lower lip ca 1/2 as long as upper 3 lobe, lateral lobes with 2 or 3 small teeth ; upper lip \pm hooked. **Filaments** glabrous. **Ovary** 1 - 1.2 mm long, style 5 - 6 x as long as ovary. **Capsules** narrowly avoid.

- Flower* : July – September
Exsiccatus : Kupup 3950 m, , **SR Lepcha & AP. Das** 0119, Dated 13.06.2006.
Status : Rare & Threatened
Local Distribution : Baba- Mandir, Kupup Gnathang, Dokala 3500 – 4800 m
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, MYANMAR, W. CHINA.

Notes : The rhizomes in traditional medicine.

Pedicularis Linnaeus

Key to the species

- 1. Herbs annual 2
- + Herbs perennial 3
- 2. Plants less than 30 cm tall; flowers axillary; corollas yellows *P. longiflora*
- + Plants more than 30 cm tall; flowers centrifugal; corollas red roses ... *P. megalantha*
- 3. Leaf segments more than 20 pairs 4
- + Leaf segments less than 20 pairs 5
- 4. Corolla purple-rose; galea with red-brown pubescent *P. pantlingii*
- + Corolla blackish purple; galeae with purple-red hairs *P. trichoglossa*
- 5. Leaves opposite *P. flexuosa*.
- + Leave alternate 6
- 6. Flowers axillary 7
- + Flowers laxly racemose *P. furfuraceae*.
- 7. Stems erect; Capsule oblong, apiculate; Corolla pink or purple..... *P. microcalyx*
- + Stems \pm erect; Capsule lanceolate ellipsoid; Corolla core red *P. siphonantha*

Pedicularis flexuosa Hook.f. in Fl. Brit. India 4: 308. 1884; Yamazaki in Fl. E. Him. 2: 120. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 123. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1189. 2001. *Pedicularis armatoides* Yamazaki in J. Japan Bot. 45: 147, f.5, 6, 1970.

Herbs perennial, upto 40 cm tall. Stems usually flexuous striate apically. Leaves opposite; petiole pubescent; lamina ovate-oblong, 5 x 2.5 cm; segments 8 - 14 pairs, oblong, pinnatisect, dentate, teeth callose. Flowers in lax terminal, interrupted basally; bracts leafy (leaflike). Calyx cylindrical - campanulate, villous, lobes 5, unequal, posterior one entire, serrate. Corolla tube pilose; falcate, beak bent downward, straight; lower lip ovate-rounded. Filaments of pubescent to glabrous. Capsules oblong-lanceolate, apex acute; seeds blackish ellipsoid.

Flower	: June-August	Fruit	: July-September
Exsiccatus	: Kupup, SR Lepcha & AP. Das 31409 , Dated 27.07.2005		
Status	: Not common		
Local Distribution	: Kupup, Sherabthang 3000 - 3900 m		
General Distribution	: HIMALAYAS; INDIA, (NEPAL -BHUTAN), CHINA		

Pedicularis furfuraceae Wallich [Cat. 13, n. 412.1829, *nom. nud.*] ex Bentham, Scroph. India 54. 1835; Hook f. in Fl. Brit. India 4: 316. 1885; Yamazaki in Fl. E. Him. 2: 120. 1977; Hara *et al.*, Enum Fl. Pl. Nepal 3: 123. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1207. 2001.

Herbs perennial, upto 45 cm tall. Stem branched at base; braches widely spaced, pubescent. Leaves alternate, few; petiole slender, pubescent; lamina oblong-ovate to ovate, upper surface sparsely pubescent and densely white scurfy, pubescents or subglabrous in lower surface; pinnatifid; segments 4 - 6 pairs, ovate to lanceolate, dentate. Flowers in lazily racemose; bracts leaflike, longer than flowers. Pedicel subglabrous. Calyx oblique ovate, membranous, dense white pubescent; lobes 5. Corolla purplish, tube glabrous, expanded apically; lower lip longer than galea, middle lobe oblong apex emarginate. Filament pubescent, glabrous. Capsules lanceolate; seeds ovoid.

Flower	: June - July	Fruit:	July - August
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ExsiccatUS : Panglakha 2760 m, **SR Lepcha & AP. Das** 27753, dated 30.08.2004.
Status : Less common
Local Distribution : Panglakha 2700 – 4100 m.
General Distribution : E. HIMALAYA; INDIA, Assam, Darjeeling (NEPAL to BHUTAN)
 CHINA.

Note : Endemic to E. Himalaya.

Pedicularis longiflora Rudolph in Mem. Acad. Sci. St. -pet. 4:345,t.2.1811; Hara *et al.* Enum. Fl. Pl. Nepal 3:123.1982; Grierson & Long, Fl. Bhutan 2(3): 1228. 2001; *Var tubiformis* (Klotzsch) Tsoong in Acta Phyt. Sin. 3:278.318 Jan. 1955; Yamazaki in Fl. E. Him. 3:100.1975. *Pedicularis tubiformis* Klotzsch, B. Reise Pr. Waldem. 106, t. 57.1862. *Pedicularis longiflora* subsp. *Tubiformis* (Klotzsch) Pennell in Monogr. Acad. Nat. sci. Philad. 5:150. 1943. *Pedicularis tubiflora* auct. non Hook. f. in Fl. Brit. India, 4: 315. 1885.

Herbs, annual upto 18 cm tall. **Stems** usually short, glabrescent. **Leaves** basal leaves in a rosette sparsely long ciliate; **lamina** lanceolate to narrowly oblong, glabrous on both surface, bipinnatifid to pinnatifid; segment 5 - 9 pairs, margin double dentate. **Flowers** in axillary; pedicel short. **Calyx** tubular, lobes 2 or 3. **Corolla** yellow, small, lower lip with a narrow maroon stripe; tube pubescent; filament densely pubescent. **Capsules** lanceolate seeds narrowly ovoid.

Flower : June – September *Fruit*: August – October
Exsiccatus : Bhimbase, **SR Lepcha & AP. Das** 31406, dated 27.07.2005.
Status : Not common
Local Distribution : Bhimbase, Dokala 2500 – 4100 m
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, CHINA.

Pedicularis megalantha D. Don, Prodr. Fl. Nepal 94. 1825; Hook. f. in Fl. Brit. India 4: 312. 1885; Yamazaki in Fl. E. Him. 2: 120. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 124.1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1223. 2001. *Pedicularis megalantha* var. *typical* Prain in Ann. Bot. Gard. Calc. 3: 118. 1890. pp.

Herbs annual upto 50 cm tall. **Stems** glabrescent. **Leaves** basal usually withering early; **lamina** linear oblong, 5-7 x 2-3.5 cm, upper surface sparsely white scurfy, lower surface sparsely pubescent; pinnatifid; segments 7 - 12 pairs, triangular lanceolate to oblong ovate, sinuate dentate. **Flowers** centrifugal, to more than 30 cm, bracts leaflike. **Calyx** oblong, pubescent; lobes 5, unequal. **Corolla** usually red rose; tube as long as calyx, beak circular; leaves lip enveloping galea, ciliate; anterior filament pair pubescent. **Capsules** ovoid. Lanceolate.

Flower : June – August *Fruit*: July – September
Exsiccatus : Kupup 4100 m, **SR Lepcha & AP. Das** 146, dated 13.05.2008.
Status : Common
Local Distribution : Kupup, Gnathang 3100 – 4300 m.
General Distribution : PAKISTAN, INDIA, NEPAL, BHUTAN, S.E. TIBET.

Pedicularis microcalyx Hook.f. in Fl. Brit. India 4: 315. 1885; Hara *et al.*, in Enum. Fl. Pl. Nepal 3: 124. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1212. 2001

Herbs perennial, root spreading, fusiform. **Stems** to 30 cm, erect, simple or branched from base, glabrous below, pubescent above. **Leaves** radical, caulines absent or reduced, 2 -3 in upper half of stem, alternate, petiolate; **lamina** lanceolate, oblong, 8 – 50 x 5 – 13 mm, pinnatifid with 5 – 10 pairs of ovate oblong, acute, bi-serrate. **Flowers** a loose head, several alternate, axillary flowers; pedicels to 7 mm, puberulent. **Calyx** campanulate, to 7 mm, 5 sub equal lobes. **Corolla** bright pink or purple, to 22 mm, tube straight, with lines of hairs; **galea** decurved near middle;

anther deep purple, gradually narrowed to tapering straight beaked; lateral lobe reniform, to 7 mm wide, margin entire, pilose; stamens inserted in middle; filaments glabrous; anther upturn at base. Capsules oblong, apiculate.

Flower : June – August
Exsiccatus : Kyonglasha 3500 m, *SR Lepcha & AP. Das 31461*, dated 13.08.2006.
Status : Common
Local Distribution : Changu, Kyonglasha 3200 – 4300 m.
General Distribution : E. HIMALAYAS; INDIA, (E. NEPAL – BHUTAN) S. TIBET.
Note : Endemic to Himalaya.

Pedicularis pantlingii Prain in J. Asiat. Soc. Beng. 58 (2): 273. 1889; Yamakazi in F. E. Him. 285. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 123. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1210. 2001. *P. furfuracea* Wallich var. *integrifolia* Hook.f. in Fl. Brit. India 4: 316. 1885.

Herbs perennial upto 50 cm tall. **Stems** usually 2-5, sometimes to 8. Branches pubescent, base with petioles remnants from preceding years. **Lamina** 16 x 1-2.6 cm, clustered at base; petiole upto 8 cm; lanceolate-linear, pinnatisect; segments 20 - 40 pairs, lanceolate, double dentate. **Flowers** racemose, usually interrupted; bracts linear shorter than flowers. **Calyx** cylindrical-oblong, cleft more deep; lobes 5, ±entire. **Corolla** purple-rose, galea densely red-brown pubescent abaxially and at margin; beak ca 4mm; lower lip densely red-brown ciliate; filament glabrous. **Capsules** long ovoid.

Flower : July – September. *Fruit*: August – October
Exsiccatus : Dokala, *SR Lepcha & AP. Das 31427*, dated 27.07.2005.
Status : Frequent
Local Distribution : Rachel Peak, Chowk, Tinsimana, 2400 – 3100 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, W. CHINA.

Pedicularis siphonantha D. Don, Prodr. Fl. Nepal 95.1825.; Hook.f. in Fl. Brit. India 4: 313. 1885; Yamazaki in Fl. E. Him. 3: 102. 1975; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 125. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1223. 2001. *Pedicularis hookeriana* auct. non Wallich ex Bentham; Yamazaki in Fl. E. Him. 3: 220. 1975.

Herbs perennial, 40 cm tall. **Roots** usually cylindrical. **Stems** single, ±erect. **Leaves** alternate, mostly radical except on well developed stem; petiole winged, glabrescent or sparsely long pubescent; basal leaves and on stem; **lamina** 1- 6 x 0.7 – 1.6 cm, leaf lanceolate –oblong to oblong, rarely elliptic, upper surface long pubescent; lower surface sparsely pubescent, pinnatisect; segments 6 - 15 pairs, ovate or triangular, pinnatifid. **Flowers** solitary axillary, dense; bracts leaflike, glabrescent, or ciliate. **Calyx** pubescent; tube to 1/3 cleft interiorly; lobes 2, (or 3 or 5). **Corolla** core red; finely pubescent; galea strongly twisted apically; beak semicircular or slightly s. shaped slender, lower lip, lobes 2. **Capsules** lanceolate ellipsoid.

Flower : May – July *Fruit*: September
Exsiccatus : Gnathang 3890 m, *SR Lepcha & AP. Das 30857*, dated, 29.07.2005.
Status : Common
Local Distribution : Gnathang 3000 – 4000 m.
General Distribution : E. HIMALA; INDIA, (C. NEPAL –BHUTAN).
Note : Endemic to Himalaya.

Pedicularis trichoglossa Hook.f. in Fl. Brit. India. 4: 310. 1885; Hara *et al.*, Enum Fl. Pl. Nepal 3: 125. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1198. 2001

Herbs perennial, upto 60 cm tall. Stems striate and hairy. **Leaves** sessile, linear lanceolate, pinnatifid to pinnapartite; segments upto 25 pairs, lamina 3 - 6cm x 4 - 12 mm. **Flowers** in racemose, upto 18 cm; axis usually densely pubescent, bracts linear. Pedicel to 3 mm, pubescent. **Calyx** densely blackish purple villous, 5-lobbed. **Corolla** blackish purple; tube basally bent; galae apically pubescent, with purple-red hairs; beak slender, incurved. **Capsule** broadly ovoid, slightly exceeding calyx.

Flower : July – August *Fruit*: August – September.
Exsiccatu : Bhimbase 4350 m, **SR Lepcha & AP. Das 31471**, dated 27.07.2005.
Status : Less common
Local Distribution : Lampokhri, Bhimbase, Dokala 3000 – 5200 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, TIBET, CHINA

Scrophularia Linnaeus

Key to the species

1. Herbs < 1 m tall; lamina acuminate; calyx lobes elliptic, acute *S. elaitor*
 + Herbs > 1 m tall; lamina acute; calyx lobes rounded *S. urticaefolia*

Scrophularia elaitor Benth, Scroph. Ind. 18. 1835; Hook.f. in Fl. Brit. India 4: 255. 1885; Yamazaki in Fl. E. Him. 290. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 126. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1092. 2001

Herbs, annual, glabrous upto 1.5 m tall. Stem usually stout, 4-winged. Leaves: petioles upto 8.0 cm long; **lamina** 8 – 22 x 4 – 7.5 cm, ovate-lanceolate, margin coarsely dentate, acuminate, subcordate nerves distinct beneath. **Flowers** in branched cymes, spreading. **Peduncles** 3 – 6 cm long. Bracts linear. **Calyx** lobes elliptic, subacute. **Corolla** to 0.6.5cm, green. **Stamens** upto 0.7cm, exerted. Styles equal to stamens, much exerted. **Capsules** ovoid.

Flower : July – August *Fruit*: September – October
Exsiccatu : Rachel, **SR Lepcha & AP. Das 31066**, dated 02.10.2004.
Status : Less Common.
Local Distribution : Todhay, Mulkharka, 1900 – 2700 m.
General Distribution : HIMALAYAS; BHUTAN, (Kumaon-BHUTAN), Assam, Meghalaya.
 Note : Endemic to Himalaya.

Scrophularia urticaefolia Wallich *ex* Benth, Scroph. Ind. 18. 1935; Prodr. 10: 306. 1846; Hook.f. in Fl. Brit. India 4: 254. 1885; Lloydia 16: 168. 1953; Yamazaki in Fl. E. Him. 291. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 127. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1091. 2001.

English Name: Figwort

Herbs annual erect to 60 cm tall. Stem thinly pubescent, slender and quadrangular. Cauline leaves opposite, sessile to shortly petioled (upto 0.4 cm); **lamina** 3 - 5 x 2 – 4 cm, ovate, coarsely dentate, acute, cordate, much smaller in inflorescence, glabrous, pale beneath. **Flowers** many in lax, leafy terminal branched cymes. **Calyx** lobes rounded. **Corolla** to 0.8 cm, bilipped, upper 2 lobes longer than the lower anterior ones; **stamens** 4, included; **staminode** 1, obovate and scaly. **Capsules** beaked.

Flower : July – August *Fruit*: September – October
Exsiccatu : Dohrok 2350 m, **SR Lepcha & AP. Das 2700**, dated 16.06.2006.
Status : Less Common.
Local Distribution : Phusrey, Dohrok, PWS 1900 – 2400 m.

General Distribution : E. Himalaya; INDIA, (NEPAL – Sikkim) W. CHINA..

Note : Endemic to Eastern Himalaya.

Veronica Linnaeus

Veronica cana Wallich ex Benth, Scroph. Ind. 45. 1835; Hook.f., in Fl. Brit India 4: 295. 1884; Yamazaki in Fl. E. Him. 294. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 129. 1982; Mill in Grierson & Long, Fl. Bhutan 2(3): 1136. 2001.

Herbs erect, hairy 5 – 8 cm tall. **Stem** unbranched. **Leaves** ; petioles upto 0.38 cm long; leaf lamina 0.7 - 1.4 x 0.4 - 1.3cm, ovate, margin toothed, with rounded teeth, acute, base rounded, pale green beneath, nerves not much prominent. **Flowers** in spikes usually terminal, 3cm long. **Flowers** upto 0.8 cm across, pale blue. **Calyx** linear-oblong. **Corolla** 4-lobed, lobes unequal and spreading, upper being larger; **stamens** 2. **Capsules** to 0.80 cm diam., notched and laterally 2-winged, wings being triangular.

Flower : June – August *Fruit*: July – December

Exsiccatus : Bhimbase 4300 m, *SR Lepcha & AP. Das 30918*, dated 24.07.2005.

Status : Common

Local Distribution : Jorpokhari, 2100-2800m.

General Distribution : HIMALAYAS; INDIA, (Kashmir-BHUTAN)

Note : Endemic to Himalaya.

GESNERIACEAE Dumort

Key to the Genera:

1. Corolla funnel shaped, Stamen 2 2
+ Corolla tubular ventricose, cylindrical; Stamen 2 or 4 3
2. Ovary stipitate *Didymocarpus*
+ Ovary linear *Chirita*
3. Seed rugose or papillate or hairy near helium; Disc cupular 4
+ Seed appendages at both end; Disc cupular or annular *Loxostigma*
4. Undershrubs usually epiphytic or lithophytic; leaves opposite *Aeschynanthus*
+ Herbs annual or perennial; leaves alternate *Rhynchoglossum*

Didymocarpus Wallich

Key to the species:

1. Leaves ovate, rarely suborbicular 2
+ Leaves ovate or elliptic 3
2. Calyx triangular; capsule with stipitate *D. pulcher*
+ Calyx campanulate and rounded; capsule without stipe *D. albicalyx*
3. Leaves lamina 3 – 4.5 x 1 – 3 cm; ovary disc cupular *D. aromaticus*
+ Leaves lamina 6 - 13 x 4 – 10 cm; ovary disc oblique *D. podocarpus*

Didymocarpus pulcher C.B. Clarke in DC., Monogr. Phan. 5: 79. 1883; in Hook.f., Fl. Brit. India 4: 348. 1884; Hara in Fl. E. Him. 3: 105. 1975; Hara *et al.*, Enum Fl. Pl. Nepal 3: 135. 1982; Hilliard in Grierson & Long, Fl. Bhutan 2(3): 1314. 2001.

Herbs rarely shrubs, perennial, upto 28 cm tall. **Leaves** usually with the whorl of 3 – 4 eaves rarely 2 ; **petiole** to 5.5cm; leaves lamina 2 – 9 x 2 – 6.5 cm, blade ovate to broadly ovate, herbaceous, adaxially sparsely oppressed puberulent, with yellow glandular, abaxially puberulent along veins, base oblique, cuneate to cordate, crenate to serrate, apex acute. **Flowers** in cymes 7 – 9; bract broadly ovate. **Calyx** slightly zygomorphic, 5 lobed nearly equal, triangular, glabrous, acute or sub-acute, margin entire. **Corolla** glandular pubescent, purple, rarely glabrous; tube cylindrical; **filament** glabrous; **anthers** puberulent; **staminode** 3.; pistil glabrous; ovary small. **Capsule** stipitate, often falcate.

Flower : July – August

Exsiccatus : Panglakh 2950 m, *SR Lepcha & AP Das* 27776, dated 30.09.2004.

Status : Common

Local Distribution : Dohrok, Premlakha, Hangay, Singhaney upto 1200-2700 m.

General Distribution : E. HIMALAYA; INDIA, (NEPAL – BHUTAN).

Note : Endemic to Eastern Himalaya

Didymocarpus albicalyx Clarke in DC., Monog. Phaner. 5: 78. 1883; Hara in Fl. E. Him. 1: 298. 1966; 2: 122. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 3: 134. 1982; Hilliard in Grierson & Long, Fl. Bhutan 2(3): 1312. 2001. *D. villosa* DC. *sensu* Clarke Comm. & Cyrt. Beng. 89, t. 59. 1874. *D. leucocalyx* Clarke in Hook.f., Fl. Brit. India 4: 348. 1885.

Herbs upto 35 cm tall. **Leaves** ovate, rarely suborbicular, unequal in size; 1- 3 pairs less leaves above, lowermost internodes elongating, **lamina**, 3 – 22 x 3 – 13 cm, apex acute to obtuse, base cordate to rounded, rarely oblique, margin doubly serrate, acute hairs above, acute hairs on veins beneath. **Flowers** usually many in spreading cymes; bracts ovate to suborbicular, pubescent, quickly deciduous. **Calyx** pale, rarely purplish,, purplish below, glabrous, campanulate, lobe rounded. **Corolla** glabrous shade of purple, limb oblique, lobes rounded,. Anthere bearded.

Capsule without stipe.

Flower : June – September

Exsiccatus : Dohrok 2200 m, *SR Lepcha & AP. Das* 1070, dated 15.10. 2004.

Status : Common

Local Distribution : Singhaney, Subhaney, Premlakha. 1600 - 2800 m.

General Distribution : E. HIMALAYA, INDIA, (NEPAL to BHUTAN).

Note : Endemic to Eastern Himalaya.

Didymocarpus aromaticus Wall. *ex* D. Don, Prodr. Fl. Nep. 123. 1825, *ut aromatica*; Hara in Fl. E. Him. 3: 104. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 134. 1982; Hilliard in Grierson & Long Fl. Bhutan 2(3): 1314. 2001. *E. subalternatus* Wall. *ex* R. Br. in Bennett, Pl. Jav. Ror. 118. 1840; Fl. Brit. India 4: 347. 1885.

Local Name: Kumkumpaati (Nep.).

Herbs, erect. **Stem** unbranched, hairy. **Leaves** 4, epically to 13 cm; petioles unequal, upto 0.7cm, pale hairy; **lamina** 3 – 4.5 x 1 – 3 cm, ovate or elliptic, crenately serrate but unequal, acute, base narrowly cuneate, light red below, dense golden wooly and coarse above, distinct beneath, impressed above. **Flowers** shorter than leaves, in terminal, in two distinct lower and upper rings/layers, shorter ones to 21cm, longer ones to 6 cm. **Flowers** purple-green. **Calyx** upto 0.5 cm, campanulate, deeply 5 – lobed. **Corolla** to 1.3 cm long, purplish green; ovary disc copular. **Capsules** sessile or with stipe, often curved.

Flower : June – August *Fruit*: August - December

Exsiccatus : Ramitey Dara 2600 m, *SR Lepcha & AP. Das* 31149, dated 03.10. 2004.

Status : Common.

Local Distribution : Rachel Middle, 1700 – 2400 m.
General Distribution : HIMALAYA; INDIA, (Kumaon to BHUTAN)
Note : 1. Endemic to Himalaya.
2. Traditional used as incense religious offerings.

Didymocarpus podocarpus Clarke in DC., Monogr. Phaner. 5: 76. 1883, ut *podocarpa*; C.B. Clarke in Hook.f., Fl. Brit. India 4: 347. 1885; Hara in Fl. E. Him. 1: 298. 1966; 2: 122. 1971; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 134. 1982; Hilliard in Grierson & Long Fl. Bhutan 2(3): 1314. 2001.

Herbs, pubescent, upto 20cm tall. **Leaves** 4 all apical, opposite; petioles to 2 cm; **lamina** ovate-elliptic, 6 - 13 x 4 – 10 cm, crenate, obtuse acute, sparsely hairy above, glabrous in lower, except nerves; peduncles to 6cm long; bracts to 0.5 cm. **Flowers** many in spreading cymes. **Calyx** to 0.8cm, campanulate, purple, lobes obtuse. **Corolla** to 2.3 cm long, mostly purplish, and minutely hairy; ovary disc oblique. **Capsule** stipitate, falcate, to 1 cm long stalk.

Flower : July – October *Fruit*: October – March
Exsiccatus : Tungsay RF 2700 m, *SR Lepcha & AP. Das 31149*, dated 03.10. 2004.
Status : Common.
Local Distribution : Ramitey, NNP Border. 1900 – 3500 m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL to BHUTAN).
Note : Endemic to Eastern Himalaya.

Chirita Buchanon-Hamilton *ex* D. Don

Key to the species:

1. Leaves elliptic to broadly elliptic; calyx lanceolate.....*C. urticifolia*
+ Leaves ovate; calyx triangular-acuminate..... *C. microphylla*

Chirita urticifolia Buch.-Ham. *ex* D. Don, Prodr. Fl. Nepal. 90. 1825; C.B. Clarke in Hook.f., Fl. Brit. India 4: 359. 1885; Hilliard in Grierson & Long, Fl. Bhutan 2(3): 1320. 2001; Hara in Fl. E. Him. 2: 298. 1966.

Herbs, perennials upto 80 cm tall. **Leaves** opposite: **petiole** to 5.5 mm, **lamina** 3 - 13 x 3 – 5 cm, elliptic to broadly elliptic, rarely ovate or obovate, puberulent, e-glandular, prominent veins above, base oblique, broadly cuneate to rounded, margin dentate to serrate, apex acute to abruptly acuminate; lateral veins 5 - 10. **Flowers** 1- 2, in cymes; peduncle, puberulent to puberulent; bracts 2, free, lanceolate to ovate, apex acute. **Pedicel** puberulent or pilose. **Calyx** 4cm, 5- lobed; lobes unequal, lanceolate, margin entire. **Corolla** purple to pink, outside puberulent to pilose, inside glabrous; tube narrowly funnel-form; anthers fused by entire; **staminodes** 2; **stigma** deeply 2-lobed. **Capsules** c 9 cm long.

Flower : July – September *Fruit* : September – October
Exsiccatus : Jorepokhri 2650 m, , *SR Lepcha & AP. Das 31010*, dated 02.10.2004.
Singaney bans 2300 m, *SR Lepcha & AP. Das 276*, dated 16.09.2007.
Status : Less Common.
Local Distribution : Premlakhal, Hangey 1500 – 2650 m.
General Distribution : E. HIMALAYA INDIA, (NEPAL – BHUTAN).
Note : Endemic to Eastern Himalaya.

Chirita macrophylla Wall., PAR 1: 56, T. 72. 1830; C.B. Clarke in Hook.f., Fl. Brit. India 4: 358. 1885; Wood in NRBGE 33: 167. 1954; Hara *et al*, Enum. Fl. Pl. Nep. 3: 133. 1982; Hilliard in Grierson & Long Fl. Bhutan 2(3): 1318. 2001.

Herbs, perennials with small rhizome. Stem upto 28 cm. **Leaves** 1 -2 radical; petioles upto 23 cm long; **lamina** ovate 4 – 16 x 2.5 – 13 cm, acute, base rounded or cordate, rarely oblique, margin serrate, hairy above, hair on veins on veins beneath; cauline leaves smaller. **Inflorescence** terminal with few flowered. **Calyx** divided, tubes upto 16 mm long, triangular-acuminate, glabrous. **Corolla** puberulous, tube cylindric, curved, inflated above, tube white or yellowish, lobes yellow, throat orange vein red, tube glandular on apex; **ovary** puberulous; style puberulous.

Flower : May – August
Exsiccatu : Rachelia below 2800 m, **SR Lepcha & AP. Das** 31173, dated 08.09.2004
Status : Sparse Less common
Local Distribution : Dorok, Hangey, Beusa 1500– 2600 m.
General Distribution : E. HIMALAYA INDIA, (NEPAL – BHUTAN).
 Note : Endemic to Eastern Himalaya.

Loxostigma Clarke

Loxostigma griffithii (Wight) Clarke in DC., Monogr. Phaner. 5: 60. 1883; C.B. Clarke in Hook.f., Fl. Brit. India 4: 344. 1885; Hara & Ohashi in Fl. E. Him 1: 299, t. 5a. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 135. 1982; Hilliard in Grierson & Long, Fl. Bhutan 2(3): 1305. 2001. *Didymocarpus griffithii* Wight, Ill. Ind. Bot. 2: 182, t. 153. 1850. *Dichrotrichum griffithii* Clarke, Com. & Cyrt. Beng. 79, t. 51. 1874.

Shrubs, small upto 1m tall. Stem herbaceous, pubescent. **Leaves** in unequal pairs; **petioles** upto 5cm long; **leaves** lamina 5.3 – 10 x 3 - 5.5cm, elliptic, subfalcate, finely serrate, acuminate, base unequal, pubescent. Flowers in cymes with many flowered; peduncles upto 8cm long. **Bracts** 0.60 - 0.4cm. **Calyx** oblong, acute, denticulate; corolla tubular, inflated above the base, pale yellow, 5-lobed; stamens 4, included; **anthers** in pairs; ovary shortly stalked. **Capsules** linear; seeds pendulous.

Flower : September – November *Fruit*: December – March
Exsiccatu : Dohrok 2300 m, , **SR Lepcha & AP. Das** 27776, dated 30.09.2004.
Status : Sparse / Less Common.
Local Distribution : Rachelia trijunction, upto 3000m.
General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, CHINA,

Aeschynanthus Jack

Aeschynanthus hookeri C.B. Clarke in A. & C. DC., Monogr. Phan. 5: 21. 1883; Hara in Fl. Him. 297. 1966; Hara *et al* in Enum. Fl. Pl. Nepal 3: 133. 1982; Hilliard in Grierson & Long, Fl. Bhutan 2(3): 1302. 2001.

Herbs, epiphytes with glabrous stems upto 40 cm tall. **Leaves** opposite; petiole 2.- 3cm; leaf blade narrowly elliptic to oblong, **lamina** 5.5 x 3.5cm, leathery, glabrous, adaxially smooth or wrinkled, abaxially not punctate, base broadly cuneate, margin entire, apex acuminate; lateral veins indistinct. **Flowers** in pseudoterminal cymes, 4 - 10-flowered; peduncle absent; bracts persistent, **Calyx** red or purple, 5-lobed ; lobes ovate to broadly triangular, outside glabrous. **Corolla** scarlet to orange-scarlet, outside puberulent, inside glabrous ; **lips** nearly equal ; **stamens** exerted; anthers coherent in pairs at apex, **staminode** ca. 1.3 mm. ovary glabrous. **Capsule** ca. 25cm. Seeds with 2 hair like appendages at opposite end.

- Flower & Fruit* : May – October
Exsiccatus : Phusrey 2150 m, **SR Lepcha & AP Das** 30232, dated 06.10.2004.
Status : Rare
Local Distribution : Dohrok, Phusrey 1200 – 2100 m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, MYANMAR

Rhynchoglossum Blume

Rhynchoglossum obliquum Blume, Bijdr. 471. 1826; C.B. Clarke in Hook.f., Fl. Brit. India 4: 367. 1885; Hara & Ohashi in Fl. E. Him. 1: 299. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 135. 1982; Hilliard in Grierson & Long, Fl. Bhutan 2(3): 1328. 2001. *Wulfenia obliqua* Wall., Tent. Fl. Nepal 5, t. 35. 1826. *R. obliquum* var. *parviflora* Clarke in DC., Monogr. Phaner. 5: 162. 1883; C.B. Clarke in Hook.f., Fl. Brit. India 4: 367. 1884.

Herbs, annuals. **Stems** upto 80 cm long, sparsely puberulent. **Petiole** upto 2.5 cm; oblique, 1 side elliptic, other side ovate, 3.5 - 13 x 2.5 - 7 cm, glabrous above, rarely puberulent, glabrous beneath, base oblique, cuneate to cordate on smaller side, cordate on other, margin entire to undulate, apex acute - acuminate. **Flowers** in cymes with 10 - 30-flowered, appressed puberulent; peduncle glabrous. **Calyx** tinged blue, 2.5 x 4 mm; lobes 1.3 - 3.5 mm. **Corolla** pale to dark purple or violet blue, 6.5 - 13 mm, puberulent near mouth; tube upto 2.5 mm; 3-lobed to undivided. **Stamens** 2; staminodes 2, ca. 0.6 mm. **Pistil** glabrous. **Capsules** ovoid ellipsoidal to 5 mm.

- Flower & Fruit* : August – November
Exsiccatae : Dohrok 2300 m, **SR Lepcha & AP. Das** 30256, dated 06.10. 2004.
 Singhaney 2200 m, **SR Lepcha & AP. Das** 20281, 28. 10. 2004.
Status : Common.
Local Distribution : Deorali dara (NNP border), Singhaney. 1400 – 2000 m.
General Distribution : INDIA, NEPAL, BHUTAN, SRILANKA, MYANMAR, CHINA, MALAYSIA, THAILAND, VIETNAM, CAMBODIA, INDONESIA, PHILIPPINES

ACANTHACEAE A. Jussieu

Key to the Genera :

1. Plant climbers *Thunbergia*
 + Plants non climbers 2
2. Leaves margins entire *Asystasia*
 + Leaves margins tooth, crenate 3
3. Herbs much branched; Capsule clayate *Hypoestis*
 + Shrubs, undershrubs, moderately branched; capsule oblong *Strobilanthes*

Asystasia Blume

Asystasia macrocarpa Nees in Wallich, Pl. As. Rar. 3: 89. 1832; C.B. Clarke in Fl. Brit. India 4: 495. 1885; Yamajaki in Fl. E. Him. 1: 300. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 139. 1982; Grierson & Long, Fl. Bhutan 2(3): 1282. 2001.

Undershrubs, usually decumbent upto 1.5 m high, erect. Stem pubescent, with swollen nodes. **Leaves**; petioles to 0.8 cm long; lamina 8 – 13 x 3.5 – 6 cm, lanceolate, acuminate, entire, cuneate at base, margin undulate, dark green, slightly puberulous mainly on vein below. **Recemes** upto 12 cm long, solitary, terminal. Rachis pilose, **flowers** in opposite pairs, ; pedicels upto 0.4.5 cm long. Bracts linear to 0.4 cm long. **Sepals** 0.3 - 0.70 cm, lanceolate, pubescent. **Corolla** upto 4 cm, tubular, pink-white; stamens 4. **Capsules** cylindric, usually 2-seeded.

Flower : February – May *Fruit*: June - July
Exsiccatus : Mulkharka – Phusrey upto 2100 m, **SR Lepcha & AP. Das** 31252, dated 13. 07. 2008.
Status : Rare
Local Distribution : Neora Border, Premlakha, 1600 – 2 350 m
General Distribution : SUB-TROPICAL HIMALAYAS; INDIA, (NEPAL-BHUTAN).
Note : 1. Endemic to Himalaya
 2. Flowers ornamental.

Hypoestis Soland ex R. Br.

Hypoestis triflora Roemer et Schultes, Syst. Veg. 1: 141. 1817; Prodr. 11: 506. 1847; C.B. Clarke in Fl. Brit. India 4 : 557. 1885; Hara in Fl. E. Him. 2:123. 1971; Hara et al. Enum. Fl. Pl. Nepal 3:141. 1982. *Justica triflora* Forssk., Fl. Aegypt.- Arab. 4.1775. *H. wallichii* Nees in Wallich, Pl. As. Rar. 3:114. 1831. *Dicliptera roxburghiana* auct. non Nees: Yamazaki in Fl. E. Him. 1: 301. 1966.

Herbs decumbent or semi-erect upto 30 cm tall. **Stem** usually ribbed, pubescent. **Leaves**; petioles to 3 cm long; lamina 5.5 - 9 x 3 – 4 cm, ovate, acute, obscurely rounded at base, margin crenate, pubescent on both surfaces. **Flowers** in capitellate cymes, 1-5 flowered; **bracts** 2, to 0.3 cm, opposite, ovate – oblanceolate, foliaceous. **Bracteoles** 2, to 0.8 cm long, lineae lanceolate. **Sepals** to 1 cm, lanceolate, greenish white. **Corolla** tube to 1.5 cm long, pinkish to white, bilipped, lower lip trilobed and recurved, red-spotted within; stamens 2. **Capsules** clavate-ellipsoid with few hairs on tip; **seeds** 4.

Flower : September *Fruit*: November
Exsiccatus : Rachela - Panglakha, m, **SR. Lepcha & AP. Das** 31255, Dated 13. 07. 2008.
Status : Common
Local Distribution : Jorepokhri, Premlakha – Panglakha 1400 – 2400 m.
General Distribution : W. ASIA, HIMALAYAS; INDIA, (NEPAL-BHUTAN), W. CHINA.

Strobilanthes Blume

Key to the Species:

- | | |
|---|-----------------------|
| 1. Flowers in axillary; corolla blue, pink | 2. |
| + Flowers in capitata; corolla pale lilac | <i>S. achinata</i> |
| 2. Spikes divaricate; bracteoles obovate – oblong | <i>S. divaricatus</i> |
| + Spike non divaricate; bracteoles linear- oblong | <i>S. wallichii</i> |

Strobilanthes echinata Nees in Wallich, Pl. As. Rar. 3: 85. 1832; Grierson & Long. Fl. Bhutan 2(3). 1262. Basionym: *Goldfussia echinata* (Nees) Haridasan et R.R. Rao, Comb. Nov.; Fl. Meg. 2: 663. 1987.

Undershrub or cabrous shrubs. **Leaves**; petioles to 2.5 cm long, lamina 3 – 13 x 1.5 – 3 cm, lanceolate, elliptic-lanceolate, coarsely dentate, long acuminate, base cuneate, coriaceous, thinly haired above, undersurface villous, lateral nerves 6 - 8 pairs, sub-parallel, villous. **Spikes** capitate, peduncled, hairy; **bracts** to 2.5 cm long, ovate, and pectinate; bracteoles small. **Flowers** to 4.5 cm long, purplish-white. **Sepals** segmented, scarious. **Corolla** infundibular, pale lilac, nearly glabrous. **Capsules** to 1.5 cm long.

Flower : May *Fruit*: October
Exsiccatus : Mulkharka – Phusrey 1950 m, **SR. Lepcha & AP. Das**, 31254, dated 13. 07. 2008.
Status : Common
Local Distribution : Phusrey, Subaney , PWS, 2100 – 2400 m.
General Distribution : E. HIMALAYA; INDIA (Sikkim - Meghalaya),
BHUTAN

Note : Endemic to E. Himalaya

Strobilanthes divaricatus (Nees) T. Anders in Journ. Linn. Soc. 9: 478. 1867; C.B. Clarke in Fl. Brit. India 4: 468. 1884; Yamajaki in Fl. E. Him. 1: 305. 1966; Grierson & Long. Fl. Bhutan 2(3): 1273. 2001. *Disflugossa divaricata* (Nees) Bremek. in Verh. Ned. Akad. Wetens. Sect. 2, 41(1): 246. 1944; Hara et al. Enum. Fl. Pl. Nepal 3: 140. 1982. *Goldfussia divaricata* Nees in Wallich, Pl. As. Rar. 3: 89. 1832

Shrubs upto 1.3 m tall. **Leaves**; petioles to 1 cm ; lamina 7 - 13 x 2.5 - 4.5 cm, lanceolate, serrulate, acuminate, minutely setulose, nerves pinnate, 7-pairs. **Spikes** axillary, lax, divaricate; **upper flowers** alternate; **bracts** to 0.8 cm, ovate, caducous; **bracteoles** slightly smaller than bracts, obovate - oblong, caducous. **Calyx** to 3 cm long, unequal, lobes narrow-lanceolate, long-caudate. **Corolla** to 4.2 cm long, tubular, slightly curved, purplish; filament hairy. **Capsules** glabrate; seeds 4.

Flower : August – October *Fruit*: October – December
Exsiccatus : Phusrey, 2050 m, **SR. Lepcha & AP. Das**, 31251, dated 13.07. 2008
Status : Frequent
Local Distribution : Mulkharka, Karponang, Gangtok, 1600 – 2300 m.
General Distribution : E. HIMALYA; INDIA (Meghalaya), NEPAL-BHUTAN, CHINA.
Note : Endemic to E. Himalaya

Strobilanthes wallichii Nees in Wallich, Pl. As. Rar. 3: 87. 1832; C.B. Clarke in Fl. Brit. India 4: 471. 1884; Yamajaki in Fl. E. Him. 1: 305. 1966. Grierson & Long. Fl. Bhutan 2(3): 1271. 2001. *Strobilanthes alatus* Nees in DC. Prodr. 11. 194. 1847 non Blume 1825-26. *Pteracanthus alatus* (Wallich ex Nees) Bremek in Verh. Nederl. Akad. Wet. 41. 199. 1944; Hara et al. Enum. Fl. Pl. Nepal 3:143. 1982. *Ruellia alata* Wallich, Pl. As. Rar. 1: 26, t. 31. 1830. *Goldfussia thomsonii* Hk. in Bot. Mag. t. 5119. 1859.

Herbs perennial upto 1m tall. Stem erect, glabrous or rarely pilose. **Leaves**; petioles to 2 cm ; lamina 1.5 - 13 x 1 - 5.5 cm, unequal, ovate elliptic. Acute, base rounded - attenuate, shortly decurrent, serrate - coarsely crenate, glabrous or pilose. **Flowers** in opposite pairs in axils of leaf-like bracts forming axillary spike. **Flowers** reduced to solitary, in axillary of leaves on main stem. ; **bracts** persistent ; **bracteoles** linear - oblong. **Calyx** to 2 cm long, lobes linear, subacute, unequal. **Corolla** to 15 cm long, blue, glabrous, tube inflated above. **Capsules** glabrous.

Flower : June - July *Fruit*: September - October
Exsiccatus : Below Rachel, 2900 m, **SR. Lepcha & AP. Das**, 31253, dated 13. 07. 2008.
Status : Frequent
Local Distribution : Rachel, Panglakha, NNP border, 2800 - 3800 m.
General Distribution : INDIA (Sikkim, Darjeeling, Meghalaya), CHINA.
 Note : Endemic to E. Himalaya

Thunbergia Retzius (*nom. cons.*)

Key to the species

1. Flowers in fascicle raceme, orange red; leaf entire or remotely toothed *T. coccinea*
 + Flowers in solitary axillary, creamy white; leaf dentate *T. lutea*

Thunbergia coccinea Wallich, Tent. Fl. Nepal 49: 58.t. 37. 1824; C.B. Clarke in Fl. Brit. India 4: 393. 1884; Man. India Timb. 518. 1902; Indian Trees 497. 1906; Yamazaki in Fl. E. Him. (1) 305, 1966; Grierson & Long. Fl. Bhutan 2(3): 1246. 2001.

Climber with profuse and pendent branches. **Leaves**; petiolate, petioles upto 5 cm long; lamina 5 - 17 x 2 - 7 cm, ovate-elliptic or ovate-lanceolate, margin entire or remotely toothed, acuminate, base truncate or shallow cordate, glabrous, membranous, 3 - 5 nerved. **Flowers** in fascicled at the pendent racemes, 3-4 cm long, orange red. **Corolla** lobes reflexed. **Capsules** upto 5 cm long.

Flower : September - November *Fruit*: December - February
Exsiccatus : Mulkharka 1950 m, **SR. Lepcha & AP. Das**, 27715, dated 30.09.2004
Status : Rare
Local Distribution : Mulkharka 1800 - 2150 m
General Distribution : SUBTROPICAL TO TEMPERATE HIMALAYAS; INDIA (Sikkim), CHINA, INDO-CHINA

Note : Flowers ornamental.

Thunbergia lutea T. Anderson in Journ. Lin. Soc. Bot. 9: 448. 1867; C.B. Clarke in Fl. Brit. India 4: 392. 1884; Yamajaki in Fl. E. Him. 1:305. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3: 144. 1982.

Shrubby twiner, dextrose perennial. Stem slender, glabrous. **Leaves**; petioles 1to 3 cm long; ovate lanceolate, **lamina** 4 - 8 x 3 - 4.5 cm, acuminate, base cuneate, margin dentate, ciliate, hairy above. Bracteoles broadly ovate. **Flowers** solitary and axillary. **Calyx** 0.3 - 0.6 cm,

crenulate. **Corolla** 2.5 – 3 cm, creamy white, with oblique limbs; **stamens** 4; staminode rudimentary; filaments glandular at apex; style sparsely hairy on the upper. **Capsules** 2 – 3.5 cm, globose, beaked above.

- Flower* : August - September *Fruit* : October - December
Exsiccata : Mulkharka – NNP Boarder, 1800m, **SR. Lepcha & AP. Das**, 27720, dated 30.09.2004
Status : Less frequent
Local Distribution : Mulkharka, 1800 – 2150 m
General Distribution : E. HIMALAYA (Sikkim, Darjeeling,) NEPAL.
 Note : Endemic to E. Himalaya

LENTIBULARIACEAE L.C. Richard

Utricularia Linnaeus

Utricularia striatula Smith in Ress, Cyclop. 37, n. 17. 1818; Hara in Fl. E. Him. 300. 1966; Taylor in Hara *et al.* Enum. Fl. Pl.Nepal 3: 133. 1982; Noltie in Grierson & Long, Fl. Bhutan 2(3): 1338. 2001. *U. orbiculata* Wall. ex DC., Prodr. 8: 18. 1844; C.B. Clarke in Hook.f., Fl. Brit. India 4: 334. 1885.

Herbs delicate, minute, annual, grows on moist tree bark and rocks. **Leaves** bladder small, orbicular to elliptic, **lamina** 0.5 - 0.6 x 0.35 - 0.4 mm across, orbicular. Basal leaves much dissected and with bladder. **Scape** 4.5 - 12cm, erect, very slender. Inflorescence in racemes 1-5 flowered. Pedicels 0.3 - 0.45 mm. Calyx lobes 0.13 - 0.3 mm. **Corolla** 0.22 - 0.42 mm, ligulate with lower lip, lower lip 5-lobed, lobes sub-equal, obtuse, white-pink. **Spur** to 0.5 mm, linear; stamens included. **Capsules** globose, with ovoid and glochidiate seeds.

- Flower & Fruit* : July – December
Exsiccatus : Dorok 2280 m, **SR Lepcha & AP. Das** 32927, dated 28. 07. 2005.
Status : Less frequent
Local Distribution : Hangey, Beusa, Premtlakha. 1855 – 2150 m.
General Distribution : AFRICA, PAKISTAN, INDIA, MYANMAR, CHINA, MALAYSIA , NEW GUINEA.

Order: Campanulales

CAMPANULACEAE A. Jussieu

Key to the Genera:

1. Plant tuberous with foetid smell *Codonopsis*
 + Plant non- tuberous without foetid smell 2
 2. Calyx tube adnate to ovary *Campanula*
 + Calyx tube adnate to ovary *Cyananthus*

Campanula Linnaeus

Campanula argyrotricha Wallich (Cat. No. 7138) ex DC. Prodr. 7: 473. 1839; Grierson & Long Fl. Bhutan 2(3): 1379. 2001.

Herbs villous, with woody base. **Stem** decumbent, branched upto 35 cm with spreading hairs. **Leaves** sessile or shortly petiolate, elliptic to ovate, **lamina** 3.5 – 18 x 3 – 13 mm, sub-entire or slightly serrulate – crenulate, tomentose with long villous hairs, whitish beneath. **Flowers** solitary at tips of branches; flower very small ca 2.5 mm. **Calyx** lobes narrowly triangular to 6 mm, as long as corolla. **Corolla** tubular – campanulate, blue to violet; lobes ovate oblong. **Ovate** to 1.5 mm. capsule broadly obovate.

Flower : May *Fruit:* October
Exsiccatu : Serabthang 4200 m, **SR Lepcha & AP. Das** 0270, dated 19.09.2007.
Status : Common
Local Distribution : Kyongnosla, Changu, Serathang 3500 – 4500 m
General Distribution : INDIA (Sikkim, Darjeeling), BHUTAN.

Codonopsis Wallich

Key to the species:

1. Leaf margins entire-subentire 2
+ Leaf margins obscurely dentate, serrate – crenate, sinuate 3.
2. Stems ascending; leaf surface glabrescent above glaucescent below *C. foetens*
+ Stems decumbent to suberect; leaf surface pubescent in both sides *C. dicentrifolia*
3. Stem ascending; leaf base rounded or cuneate; *C. subsimplex*
+ Stem twining; leaf base deeply cordate; 4
4. Calyx lobes triangular – acuminate; sordid yellow with purple veins *C. inflatus*
+ Calyx lobes oblong; corolla pale; corolla greenish with apex reddish *C. affinis*

Codonopsis affinis Hook. f. & Thomson in Journ. Lin. Soc. 2: 12. 1857; C.B. Clarke in Fl. Brit. India 3: 431. 1881; Hara in Fl. E. Him. 1: 326. 1966; Hara *et al.* Enum Fl. Pl. Nepal 3: 50. 1982; Grierson & Long., Fl. Bhutan 2(3): 1387. 2001.

Local Name: Syal ko Moot (Nep.).

Twinner perennial with strongly foetid smell. Stem usually soft. **Leaves;** petioles 1.3 - 2.3 cm long; ovate, sub-entire, acute, base cordate, villous beneath, thinly pilose above, lamina 5.5-9.5 x 3-5cm. Peduncles 4 – 6.5cm. **Flowers** solitary, axillary, foetid. **Calyx** 0.6 -1.5 cm, oblong distant, pilose. **Corolla** 1.4 - 1.6cm, greenish or purplish, lobes triangular, mouth upto 1.5 cm across. **Stamens** 5, free; stigma usually trilobed. **Capsules** hemispherical, beak upto 2-3mm long; seeds ellipsoid.

Flower : August – October. *Fruit:* September – November.
Exsiccatu : Middle Rachel, 2420 m, **SR Lepcha & AP. Das** 0313, dated 23.4.1995.
Status : Less common.
Local Distribution : Padamchen, Rachel, above Phusrey, 900 – 2500 m.
General Distribution : E. HIMALAYA (West Bengal, Sikkim), NEPAL, BHUTAN.

Note : 1. Endemic to eastern Himalaya.
2. Poisonous to human being.

Codonopsis dicentrifolia (C.B. Clarke) W.W. Smith in Rec. Bot. Surv. India 4: 388. 1913; Hara in Fl. E. Him. 3: 109.1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 51. 1982; Grierson & Long, Fl. Bhutan 2(3): 1385. 2001.

Herbs perennial often with tuber root. **Stem** decumbent to sub erect, 25- 70cm, glabrous, branched. **Leaves** usually ovate, **lamina** 1.5 – 4 x 0.6 – 3cm, usually glabrescent above, glaucous below, margin entire, some what sinuate. **Peduncle** upto 8 cm long. **Flowers** solitary, axillary. **Calyx** 13 – 17 mm lobes linear oblong 6-11mm. **Corolla** campanulate, 19 – 27 mm, blue, lobes ovate. **Fruits** obconical with short beak upto 10 mm long.

Flower : July – October
Exsiccatus : Nathang 3850 m, *SR Lepcha & AP. Das 31073*, dated 27.07.2005
Status : Common.
Local Distribution : Dongkyala, Kupup, Bhimbase, 3800 – 4200 m.
General Distribution : INDIA (Sikkim, Darjeeling), BHUTAN, NEPAL
Note : Endemic to Eastern Himalaya.

Codonopsis foetens Hook.f. & Thoms in Journ. Linn. Soc. 2: 16. 1858; C.B.Clarke in Fl. Brit. India 3: 433.1882; Grierson & Long., Fl. Bhutan 2(3): 1385. 2001.

Herbs with stem ascending upto 45 cm tall. **Stem** glabrescent with lateral braches near base. **Leaves**; petiole to 3 mm long; ovate, **lamina** 0.7 – 1.3 x 0.5 – 0.9 cm, grayish green, base truncate – ovate, pubescent in both sides, margin subentire; peduncle to 13 cm long. **Calyx** lobe oblong elliptic, margin slightly sinuate. **Corolla** campanulate or slightly globose, mauve or blue, lobes ovate, tip hooded. **Fruits** hemispherical to obconical.

Flower : July *Fruit*: September -
Exsiccatus : Premlakha – Panglakha 2750 m, *SR Lepcha & AP Das 0266*, dated 17.10.2004.
Status : Less common
Local Distribution : Singhaney, Rongchu (KAS), (2800 -4800 m).
General Distribution : E. HIMALAYA; INDIA (Sikkim), BHUTAN.
Note : Endemic to Eastern Himalaya.

Codonopsis inflata Hook.f. & Thomson in Journ. Linn. Soc. 2: 18. 1858; Hara *et al* in Enum. Fl. Pl. Nepal 3: 51. 1982; Grierson & Long., Fl. Bhutan 2(3): 1387. 2001.

Twinnings perennial with twinning stem of 5.5m. **Leaves** ovate, deeply cordate at base, lamina 4.8- 13 x 1.9 – 6.8cm, upper surface, sparsely pubescent and glabrous, lower surface glabrescent and glaucous, margin obscurely dentate; petiole upto 78mm; **Peduncle** upto 8cm. **Calyx** 13 – 18mm, lobes triangular acuminate. **Corolla** broadly tabular, campanulate, pale – sordid yellow with purple veins, lobes triangular. **Fruits** suglobose, purple black, glaucous.

Flower : June – August
Exsiccata : Gnathang 3800m, *SR Lepcha & AP. Das 30295*, dated 27.07.2005
Status : Common.
Local Distribution : Kyongnosla, Zuluk, Thamjay 3000 – 4100 m.
General Distribution : INDIA (Sikkim, Darjeeling), NEPAL, BHUTAN
Note : Endemic to Eastern Himalaya.

Codonopsis subsimplex Hook.f. & Thoms in Journ. Linn. Soc. 2: 16. 1858; C.B. Clarke in Fl. Brit. India 3: 432. 1882; Grierson & Long., Fl. Bhutan 2(3): 1386. 2001.

Herbs with stem ascending upto 60 cm tall. Stem trailing at upper part, glabrescent. **Leaves** ovate- ovate acuminate; petiole to 3 mm long; ovate, **lamina** 1.5 – 8 x 1- 6 cm, base slightly unequal, cuneate to rounded, both upper and lower surface pilose but slightly glaucose below, margin shallowly serrate or crenate; peduncle to 20 cm long. **Calyx** lobe ovate to ovate-oblong, glaucose. **Corolla** campanulate - globose, white or cream with purple markings inside; lobes ovate. **Fruits** hemispherical with beaked

Flower : July *Fruit:* September -
Exsiccatus : Baba Mandir- Kupup 3850 m, **SR Lepcha & AP Das** 0267, dated 20.09. 2005.
Status : Less common.
Local Distribution : Nathang, Dongkyala 3350 - 4100 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN
Note : Endemic to Eastern Himalya

Cyananthus Wallich

Key o the species:

1. Corolla yellow *C. spathulifolius*
+ Corolla blue – violet 2
2. Stem decumbent; corolla funnel shaped; capsule ovate- acuminate *C. lobatus*
+ Stem procumbent, prostrate; Corolla campanulate; capsule ovate 3
3. Plants with woody rootstock; leaf lamina oblong – elliptic at base *C. pedunculatus*
+ Plants with fleshy rootstock; leaf elliptic spatulate *C. incanus*

Cyananthus incanus Hook. f. & Thoms. in Journ. Linn. Soc. Bot. 2: 20. 1858; C.B. Clarke in Fl. Brit. India 3: 434. 1881; Hara in Fl. E. Him. 2: 129. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 3: 58. 1982. *Cyananthus leicalyx* (Franch.) Cowen in New Fl. Silv. 10: 187. 1938. *Cyananthus incanus* var. *albicalyx* Franch. in J. de B. 1: 279. 1887.

Herbs perennial. Rootstock fleshy. Stem prostrate to 18 cm.. **Leaves** sessile to shortly petiolate; lamceolate, elliptic or spatulate lamina 3 – 7 x 1.5 – 3 mm, margin entire, often recurved, appressed hairy above, white tomentose beneath. **Pedicels** to 4.5 mm long, yellowish brown hairs. **Calyx** tubular to 10 mm, glabrous, or densely white or yellowish brown villous outside; lobes narrowly triangular, usually hairy inside. **Corolla** tubular to 22 mm long, deep blue to violet, rarely white, throat villous; lobes oblong. **Capsules** ovate.

Flower : July *Fruit:* September
Exsiccatus : Bhimbase 4300 m, **SR Lepcha & AP. Das** 0268, dated 13.09.2005.
Status : Common
Local Distribution : Kupup, Nathang, 3000 – 4500 m
General Distribution : E. Himalaya; INDIA, (NEPAL – BHUTAN), S. TIBET, and W.CHINA
Note : Endemic to Eastern Himalaya.

Cyananthus lobatus Wall. (Cat. 40, n. 1829, *nom.nud.*), ex Benth. in Royle, Illustr. Bot. Him. t. 69, f. 1835; C.B. Clarke in Fl. Brit. India 3: 433.1881; Hara *et al.* Enum. Fl. Pl. Nepal 3: 52. 1982.

Herbs perennial, decumbent. Stem upto 50 cm , sub glabrous to pilose. **Leaves** cuneate spatulate, **lamina** 9 - 30 x 7 - 22mm, usually with 3 lobes at apex, or rarely subsidiary lobe, sub glabrous or oppressed pilose above, pilose to lanate or rarely glabrouse below. Pedicel upto 30mm long, densely brownish black villouse. **Calyx** broadly tubular, lobes triangular densely brownish - lack villous. **Corolla** broadly funnel shaped, blue, rarely white; lobes broadly obovate. **Capsule** ovate- acuminate.

Flower : June. *Fruit:* September
Exsiccatus : Rachela below, 2420 m, *SR Lepcha & AP. Das 30829*, dated 23. 4.1995.
Status : Common.
Local Distribution : Padamchen, Rachela, above Phusrey, 900 - 2500 m.
General Distribution : HIMALAYA; INDIA,(Punjab to BHUTAN), TAR., W. CHINA
Note : Endemic to Himalaya

Cyananthus pedunculatus C.B. Clarke in Fl. Brit. India 2: 434. 1881; Grierson & Long, Fl. Bhutan 2(3): 1389. 2001.

Herbs perennial. Rootstock woody. Stem procumbent, unbranched to 26 cm.. **Leaves** sessile to oblong, rarely elliptic towards base, lamina 4 - 17 x 1.5 - 6 mm , margin entire, pubescent on both surface. **Pedicels** to 15 mm long, spreading brown black hairs, **Calyx** tubular to 13 mm, villouse brown black; lobes narrowly triangular to 5.5 mm. **Corolla** campanulate, to 40 mm, violet - blue, lobes obovate. **Capsule** ovate, nearly equal to calyx..

Flower : July *Fruit:* September
Exsiccatus : Baba Mandir - Memenchu lake 3850 m, *SR Lepcha & AP. Das 0269* , Dated 13. 10. 2004
Status : Common
Local Distribution : Kyongnosla , Changu, Serathang 3500 - 4500 m
General Distribution : E.HIMALAYA; INDIA (Sikkim), BHUTAN.
Note : Endemic to Eastern Himalaya

Cyananthus spathulifolius Nannfeldt in Acta. Hort. Gothoburg v. 30. 1930; Grierson & Long., Fl. Bhutan 2(3): 1390. 2001.

Herbs perennial. Stems prostrate to procumbent upto 18cm long. **Leaves** sub-rhomboid-spatulate, **lamina** 5 -13 x 3 - 7.5mm, usually villouse to pilose on both sides, rarely glabrescent above, margin entire to crenulate near apex. Pedicel upto 20mm long, hairy. **Calyx** tubular - globose, 5 -9mm long, glabrescent with few white or yellow brown villouse hairs on outside; lobes narrowly triangular, villous on outside. **Corolla** tubular campanulate, yellow , throat densely villous; lobes obovate oblong. **Capsules** ovate.

Flower : January *Fruit:* September
Exsiccatus : Gnathang - Zeluk 3850 m, *SR Lepcha & AP. Das 32842*, dated 26.10.2004.
Status : Less Frequent.

Local Distribution : Kyongnosia, Changu, Tamzey , Gnathang 3000 – 4000 m.
General Distribution : EASTERN HIMALAYAS; INDIA (Sikkim), BHUTAN
Note : Endemic to E.Himalaya.

Order: Rubiales

RUBIACEAE A.L. Jussieu

Key to the Genera:

- | | |
|---|----------------------|
| 1. Annual or perennial herbs | 2 |
| + Perennial tree or shrub | 3 |
| 2. Stem erect | Ophiorrhiza |
| + Prostrate, scrambling, scandant or climbing | 4 |
| 3. Stamens at top of tube | 5 |
| + Stamens inserted below throat of corolla | 8 |
| 4. Leaves opposite | Neanotis |
| + Leaves in whorls of whorls of 4-8 | 6 |
| 5. Flower scented | Hymenodictyon |
| + Flower not scented | 9 |
| 6. Calyx adnate to ovary | Rubia |
| + Calyx tube absent above hypanthium | Galium |
| 8. Corolla lobe incurved, fruit ellipsoid | Neohynopogon |
| + Corolla lobe recurved or spreading, fruit globose or oblong | Psychotria |
| 9. Corolla tube cylindric | Mussaenda |
| + Corolla tube ± infundibular | Lasianthus |

Hymenodictyon Wallich

Hymenodictyon flaccidum Wall. in Roxb., Fl. Indica ed. Carey, 2: 152. 1824; Hook.f. in Fl. Brit. India 3: 36. 1882; Hara in Fl. E. Him. 310. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 203. 1979; Springate & Wright in Grierson & Long Fl. Bhutan 2(2): 747. 1999.

Shrubs epiphytes much branched. Branches pendulous. **Leaves**; stipules broadly ovate, serrate, glandular; petioles to 10 cm long; **lamina** 7 – 16 x 5 – 11 cm, obovate-elliptic, entire, slightly acuminate, base narrowed into the petiole, pubescent in lower surface. **Flowers** in racemose to 27 cm, many flowered. Bracts ovate. **Flowers** subsessile, white. **Calyx** to 0.5cm. **Corolla** to 0.5cm, white; style exerted. **Capsules** reflexed; seeds usually winged.

Flower : June - August *Fruit*: November - February
Exsiccatus : Above Dohrok 2390 m, **SR Lepcha & AP. Das 31284**, dated 13.09.2008.
Status : Rare
Local Distribution : Dokrok, Phusrey upto 2390 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, W. CHINA.

Galium Linnaeus

Key to the species:

1. Leaves more than 5 in whorls 2
- + Leaves less than 5 in whorl *G. elegans*
2. Lamina elliptic-lanceolate; veins obscure beneath *G. Acutumm*
- + Lamina linear or narrowly linear-obovate; veins strong beneath *G. asperifolium*

Galium acutum Edgew. in Trans. Linn. Soc. 20: 61.1846; Hook.f. in Fl. Brit. India 3: 208. 1882; Hara & Ohashi in Fl. E. Him. 308. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 200. 1979; Mill in Grierson & Long, Fl. Bhutan 2(2): 831. 1999. *G. himalayense* Koltzsch in Bot. Erg. Reis. Pr. Waldem. 88, t. 73. 1862.

Herbs, small decumbent, with short internodes. **Leaves** usually 5 - 6 in each whorl, sessile; **lamina** 0.5 - 1.5 x 0.4 - 0.4 cm, elliptic-lanceolate, entire and slightly recurved, acute, base narrow pointed, mid nerve strong beneath, veins obscure. **Peduncle** shorter than leaves. **Calyx** tube small. **Corolla** 4-lobed, segment 0.3 - 0.13 cm, lanceolate, acuminate. **Stamens** 4; filaments short; **stigma** 2, capitate. **Fruits** small, black.

Flower : July - October *Fruit:* September - December
Exsiccatae : Bhimbase 4300 m, **SR Lepcha & AP.. Das 31476**, dated 28.07.2005;
Kyonglasha 3600 m, **SR Lepcha & AP.. Das 32813**, dated 25.10.2004;
Nathang - Panglakha 2800 m, **SR Lepcha & AP.. Das 32964**, dated
28.07.2005.
Status : Common
Local Distribution : Jorpokhari, Bhimbase, Rachela trijunction upto 4300 m.
General Distribution : HIMALAYAS; INDIA, (Kunawar - Sikkim) BHUTAN
Note : Endemic to Himalaya

Galium asperifolium Wall. *ex* Roxb., Fl. Indica 1: 391. 1820; Hara & Ohashi in Fl. E. Him 308. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 201. 1979; Mill in Grierson & Long, Fl. Bhutan 2(2): 834. 1999. *G. mollugo* L. *sensu* Hook.f. in Fl. Brit. India 3: 207. 1882. *var sikkimense* (Gandoger) Cufodontis in Oesterr. B. Zeits. 89: 241. 1940. *G. sikkimense* Gandoger in Bull. Soc. Fran. 66: 307. 1920.

Herbs, perennial, scandent. **Stem** shortly branched, filiform. **Leaves** in whorls of 4 - 6, sessile to minutely stalked; **lamina** 0.5 - 1.2 x 0.13 - 0.5 cm, linear or narrowly linear-obovate, entire, acute or obtuse, glabrous to slightly scabrid both surfaces, mid-vein strong beneath. Flower in axillary and terminal cymes, many flowered, divaricately branched. **Pedicels** recurved in fruits. **Corolla** white, minute and lobed with ovate segments. **Fruits** small, black coloured.

Flower : July - September *Fruit:* October - December
Exsiccatae : Nathang- Panglakha 2900 m, **SR Lepcha & AP.. Das 30912**, dated
27.10.2004; Rachela 2950 m, **SR Lepcha & AP.. Das 27735**, dated
30.09.2004.
Status : Common
Local Distribution : Rachela, Panglakha 1900 - 2700 m,
General Distribution : AFGHANISTAN, HIMALAYA (East to BHUTAN) INDIA (Khasia,),
SRI LANKA, N. BURMA, THAI, W.CHINA.

Galium elegans Wall. ex Roxb., Fl. IndiCa 1: 382. 1820; Hara & Ohashi in Fl. E. Him. 308. 1966; Mill in Grierson & Long, Fl. Bhutan 2(2): 828. 1999. *G. rotundifolium* L. sensu Fl. Brit. India 3: 204. 1881.

Herbs, small, trailing diffused. **Stem** usually unbranched, white pubescent. **Leaves** in whorl of 3 - 4, sessile or sub sessile to 0.13 cm; **lamina** 1 - 1.4 x 0.4 -1.5 cm, ovate to almost rounded, entire, acute or mucronate, base broad rounded or narrow, hirsute and scabrid both sides, basally 3 -nerved, convergent, pubescent. **Flower** in cymes slightly longer than leaves and with divaricate branching. **Corolla** white, small. **Fruits** adpressed hooked hairs.

Flower : June – August *Fruit:* July – December •
Exsiccatae : Panglakha –Rachela 2780 m, **SR Lepcha & AP. Das 31093**, dated 02.10. 2004. Zeluk 3600 m, **SR Lepcha & AP. Das 27093**, dated 08.09.2004.

Status : Not common

Local Distribution : Middle Rachela, Panglakha 2100-2850 m.

General Distribution : HIMALAYA; INDIA, (Kashmir to Sikkim) Khasia, Manipur, THAI, N.BURMA, W.CHINA and FORMOSA.

Lasianthus Jack

Lasianthus sikkimensis Hook.f. in Fl. Brit. India 3: 180. 1882; Springate in Grierson & Long, Fl. Bhutan 2(2): 808.1999.

Shrubs, evergreen, brownish tomentose. **Lamina** narrowly oblong rarely lanceolate, 13 – 23 x 2 – 4 cm, acuminate or caudate, acute at base, glabrous above, sparsely hairy below. Lateral veins 8 - 9 pairs. **Flowers** sessile or with upto 3 subsessile. Bracts subulate, villous. **Calyx** tube upto 1.5 mm, glabrous, ovate, acuminate. **Corolla** tube upto 4 mm. **Fruits** subglobose.

Flower : July – August

Exsiccatu : Phusrey 2250 m, **SR Lepcha & AP. Das 30298**, dated 07.10.2004.

Status : Abundant

Local Distribution : Middle Rachela , Phusrey upto 2500 m.

General Distribution : EASTERN HIMALAYAS; INDIA.

Note : Endemic to Eastern Himalaya

Mussaenda Linnaeus

Key to the species:

1. Leaf hairy on both surface; calyx linear-subulate; corolla lobes triangular ... *M. treutleri*
+ Leaf densely pilose in lower surface only ; calyx filiform; corolla lobes ovate ...*M. roxburghii*

Mussaenda macrophylla Wallich in Roxb., Fl. Ind. 2:228. 1824; Hook.f. in Fl. Brit. India 3:89. 1880; Hara *et al.* Enum. Fl. Pl. Nepal 2; 205. 1979; *M. hispida* D. Don, Prodr. Fl. Nepal 139. 1825.

Local Name: Dhobini Phul, Shitalu (Nep.).

Shrubs erect or sub-scandent upto 4 m tall. Branches straggling. **Leaves**; petioles upto 4cm long; lamina 6 - 16 x 2.5 - 9 cm, elliptic or oblong-lanceolate, entire, acuminate, base cuneate,

pubescent beneath, lateral nerves 7 - 10 pairs, subparallel. **Stipules** ovate, bifid, recurved. **Inflorescence** cymes trichotomous. **Bracts** foliaceous, lacinate. **Flowers** upto 4 cm long. **Calyx** 5-lobed, lobes foliaceous, petaloid, ovate; **Corolla** tube to 3 cm long, orange yellow, hirsute, throat villous with 5 orbicular lobes; **stamens** 5; stigmas 2, linear. **Berries** globose.

Flower & Fruit : May – October.
Exsiccatus : Phurey below 1800 m, **SR Lepcha & AP. Das 30276**, dated 07.10.2004.
Status : Less Frequent.
Local Distribution : Dohrok, Phusrey, Beusa 1600 – 1800 m.
General Distribution : HIMALAYAS; INDIA (NEPAL-BHUTAN), ASSAM, MYANMAR, W. CHINA.

Note : Endemic to Eastern Himalaya

Mussaenda treutleri Stapf in Bot. Mag. 135:t. 8254. 1909; Hara in Fl. E. Him. 312. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 205. 1979; Wood in Grierson & Long, Fl. Bhutan 2(2): 783. 1999. *frondosa* L. var. *grandiflora* Hook. f., Fl. Brit.India 3: 90. 1882.

Local Name: Dhobini Kaath (Nep.).

Shrubs upto 3m tall. **Petioles** upto 35 cm long; **lamina** 9 - 16 x 5.5 - 9.5 cm, elliptic-ovate, entire, acute, base cuneate, hairy on both sides. **Stipules** bifid. **Flowers** in terminal corymbs oftenly at the axils of uppermost leaf, many flowered. **Calyx** teeth 0.45 – 2.5 cm, herbaceous, linear-subulate, herbaceous, enlarged segment 10 - 13 x 5 – 7 cm, bright white. **Corolla** upto 4 cm, orange yellow, pubescent within, lobes triangular. **Berries** globose, glabrescent.

Flower : May – July
Exsiccatus : Beusa 1960 m, **SR Lepcha & AP. Das 31283**, dated 13.09.2008.
Status : Frequent.
Local Distribution : Beusa, Hangey, Dohrok 1200 – 2300 m.
General Distribution : HIMALAYAS; INDIA, (Kumaon – BHUTAN) and Khasia.
Note : Endemic to Eastern Himalaya.

Neanotis W.H. Lewis

Key to the species :

1. Leaf puberulent, paler beneath; Corolla white *N. gracilis*
+ Leaf both surfaces pubescent; Corolla bluish-purple to white *N. wightiana*

Neanotis gracilis (Hook.f.) W.H. Lewis in Ann. Miss. Bot. Gard. 53: 38. 1966; Hara & Ohashi in Fl. E. Him. 313. 1966; Hara *et al.* Enum. Fl. Pl. Nepal Enum. Fl. Pl. Nepal 2: 205. 1979; Mill in Grierson & Long, Fl. Bhutan 2(2): 768. 1991. *Hedyotis wightiana* Wall. ex Wight *et* Arnt., Prodr. Fl.India Or. 410. 1834.. *Anotis wightiana* Wall. ex Hook. f., Fl. Brit. India 3 : 65. 1882.

Herbs, perennial, diffused. **Branches** prostrate, rooting at nodes. Leaves opposite, lamina 1.5 – 3.5 x 1.5 – 2.5 cm, lanceolate or ovate lanceolate, base cuneate, acuminate, membranous, thinly hairy yellow puberulent, paler beneath. **Flower** upto 7.5cm long, axillary and terminal, dichotomously forked. **Heads** 0.45 - 0.50cm across. **Flowers** clustered. **Calyx** 0.30 - 0.5cm, lobes lanceolate. **Corolla** slightly longer than sepals, tube broader, with obtuse lobes, white, glabrous. **Capsule** laterally compressed.

Flower : July – December *fruit:* October – January
Exsiccatus : Ramitey bara 2480m, **SR Lepcha & AP. Das 31026**, dated 13.09.2008.
Status : Abundant

Local Distribution : Middle Rachela, 1600 – 2250 m.
General Distribution : E.HIMALAYA ; INDIA(Sikkim , Khasia), NEPAL.
Note : Endemic to Eastern Himalaya.

Neanotis wightiana (Wallich ex Wight et Arnt.) W. H. Lewis in Ann. Miss. Bot. Gard. 53:40. 1966; Hara & Ohashi in Fl. E. Him. 1:313. 1966; Hara et al. Enum.Fl.Pl.Nepal 2:205. 1979;
Hedyotis wightiana Wallich ex Wight et Arnt., Prodr. Fl. Ind. Or. 410. 1834.
Anotis wightiana Wallich ex Hook. f., Fl. Brit. India 3: 65. 1880.

Herbs perennial diffused, upto 45 cm tall, tomentose. **Branches** prostrate or decumbent. **Leaves** sessile to subsessile; **lamina** 3.5 - 7 x 2 – 2.5 cm, ovate, entire, acute, both surfaces pubescent. Stipules deeply toothed. **Cymes** terminal and axillary, capitate, involucrate. **Flower** heads to 1.5 cm across, capitate, few flowered. **Flowers** minute, white. **Calyx** 0.3 - 0.5 cm, lobes subulate. **Corolla** longer than sepals, 0.2 - 0.4cm, bluish-purple to white. **Capsule** orbicular, seeds rugose.

Flower : May – September *fruit:* August - October
Exsiccatus : Panglakha ridge, 2440m, **SR Lepcha & AP.Das 03055**, dated 15. 07. 2005.
Status : Abundant
Local Distribution : Panglakha, Middle Rachela , 1600 – 2250 m.
General Distribution : HIMALAYAS; (NEPAL- BHUTAN) INDIA Sikkim, MYANMAR.

Neohymenopogon Bennet

Neohymenopogon parasiticus (Wallich) Benn. in IF 107: 436. 1981; Yamazaki in Fl. E. Him. 310. 1966; Long in Grierson & Long, Fl. Bhutan 2(2): 746. 1999; *Hymenopogon parasiticus* Wall. in Roxb., Fl. Indica 2: 157. 1824; Hook.f. in Fl. Brit. India 3: 34. 1882; Hara et al., Enum.Fl. Pl. Nepal 2: 203. 1979

Local Name: Lekh Biri (Nep.).

Shrubs, deciduous, epiphytic. Stipules persistent. **Leaf** ; stipules persistent; **lamina** 5.5 - 25 x 2.5 -13 cm, oblanceolate, entire, ciliate, acute-acuminate, cuneate, both sides thinly hairy, lateral nerves 16 - 17 pairs, pubescent. **Braets** narrow-oblanceolate, stalked, white, pinnately veined, petaloid, thinly pubescent. Pedicel long, short-hairy. **Flowers** in trichotomous cymes. **Calyx**-lobes upto 1.3 cm, linear. **Corolla** tube long, slender, lobes 5, spreading, hairy. **Capsules** 1.5 - 1.5cm, turbinate-cylindrical, with persistent sepals; seeds numerous.

Flower : June – August *Fruit:* October – January
Exsiccatae : Panglakha 2600 m, **SR Lepcha & AP. Das 31151**, dated 13.07. 2004.
 Rachela 2700 m, **SR Lepcha & AP. Das 27778** dated 30.09.2004.
Status : Less common
Local Distribution : Middle Rachela , Panglakha 2100-2800 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, CHINA, MYANMAR

Ophiorrhiza Linnaeus

Key to the species:

- 1. Leaf lamina ovate-lanceolate; Corolla creamy-white *O. rugosa*
- + Leaf lamina ovate- elliptic; Corolla pink – yellow 2

Psychotria Linnaeus

Psychotria erratica Hook.f., Fl. Br. Ind. 3: 168. 1880; Yamazaki in Fl. E. Him. 315.1966; Wood in Grierson & Long, Fl. Bhutan 2(2): 808. 1999. *Psychotria erratica* var. *pedunculata* Hook.f., Fl. Brit. India 3: 169. 1882.

Shrubs, 1- 2 m tall. Stem usually glabrous. **Leaves** opposite pair, oblong- lanceolate, or narrowly oblong – elliptic, **lamina** 5 – 15 x 2 – 5 cm, shortly acuminate, base attenuate, entire, glabrous on lower surface, scurvy on veins; stipules narrowly ovate. **Flowers** in terminal, subsessile, few flowered puberulous. Bracteole scale link. **Calyx** teeth triangular, acute. **Corolla** greenish white, lobes ovate. **Fruits** oblong.

Flower : May – July
Exsiccatus : Dohrok 2320 m, **SR Lepcha & AP. Das 30287**, dated 07.10.2004.
Status : Abundant
Local Distribution : Middle Rachela , 1500 – 2200 m.
General Distribution : E.HIMALAYA; INDIA (Assam, Meghalaya), NEPAL, BHUTAN.
Note : Endemic to Himalaya.

Rubia Linnaeus

Key to the species

1. Plant reddish tinged through out, Corolla tips incurved *R. manjith*
+ Plant greenish through out, Corolla tips subulate *R. wallichianum*

Rubia manjith Roxb. ex Flem. in Asia Res. 11: 177. 1810; Hara & Ohashi in Fl. E. Him. 315. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 207. 1979; Long in Grierson & Long, Fl. Bhutan 2(2): 821. 1991. *R. cordifolia* L. *sensu* Hook. f., Fl. Brit. India 3: 202. 1882, p.p.

Local Name: Vyem (Lep.) Majito (Nep.).

Climber, perennial, herbaceous. **Stem** quadrangular, slender. **Leaves** usually 4 in a whorl (includes leafy 2-stipules); petioles unequal, 0.8 - 6.5 cm, lower spiny; lamina variable, ovate lamina 2.5 - 6.5 x 1.5 -2.5 cm, entire, long-pointed, base cordate, scabrid, rusty when young, basal nerves 3 - 5, convergent. **Flowers** in axillary panicles. **Bracts** small, leafy. Pedicel, 0.5 - 0.30cm. **Flowers** head 0.30 - 0.5cm in diam., 5-merous. **Corolla** rust-coloured, lobes lanceolate, tips incurved. **Berries** globular, black purple.

Flower : July - September *Fruit*: September - March
Exsiccatae : Phusrey 2150 m, **SR Lepcha & AP. Das 31007**, dated 13.09.2008;
Nathang 3890 m, **SR Lepcha & AP. Das 30896**, dated
29.07.2005; Hangey 1960 m, **SR Lepcha & AP. Das 20262**, dated
28.10.2004; Dohrok 2300 m, **SR Lepcha & AP. Das 30215**, dated
06.10. 2004.
Status : Abundant.
Local Distribution : Phusrey, Nathang, Rachela trijunction 2000 – 3900 m.
General Distribution : HIMALAYAS; INDIA (Simla, Khasia) NEPAL, BHUTAN,

Note : 1. Endemic to Himalaya.
2. The red dyes obtained from fruits & root is used in colouring the dresses (Lepchas)

Rubia wallichianum Roxb. in Asia Res. 11: 177. 1810; Hara & Ohashi in Fl. E. Him. 315. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 207. 1979; Long in Grierson & Long Fl. Bhutan 2(2): 824. 1999. *R. cordifolia* L. *sensu* Hk. f., Fl. Brit. India 3: 202. 1882, p.p.

Local Name: *Vyem* (Lep.), *Majito* (Nep.).

Climber, perennial, green herbaceous. **Stem** prickly with hook prickles, slender. **Leaves** lanceolate to ovate, variable in size; lower leaves cordate at base. **Flowers** in axillary panicles, large, rarely small, yellow or reddish. **Corolla** lobes upto 3 mm, subulate apex.

- Flower* : April – September
- Exsiccata* : Sokpa pokhri 2000m, *SR Lepcha & AP. Das* 27775, dated 30.09.2004.
- Status* : Abundant.
- Local Distribution* : Beusa, Hangey, 1600 – 2200 m.
- General Distribution* : HIMALAYAS; INDIA (Simla, Khasia) NEPAL, BHUTAN,
- Note* : Endemic to Eastern Himalaya.

Order: Dipsacales

CAPRIFOLIACEAE A. Jussieu

Key to the Genera:

- 1. Flowers in umbels- corymbs or panicles *Viburnum*
- + Flowers in spikes 2
- 2. Flowers axillary or terminal; regulars; seeds numerous. *Leycesteria*
- + Flowers axillary; regular or irregulars; seeds 2 *Lonicera*

Leycesteria Wallich

Key to the species :

- 1. Stem hollow 2
- + Stem solid *L. stipulata*
- 2. Calyx unequal; corolla white – pink *L. formosa*
- + Calyx equal; corolla greenish white – cream, pale yellow 3
- 3. Stipules present; calyx lobes unequal *L. glaucophylla*
- + Stipules absent; calyx lobes equal *L. gracilis*

Leycesteria formosa Wall. in Roxb., Fl. India ed. Carey 2: 181. 1824; C.B. Clarke in Fl. Brit. India 3: 16. 1880; Hara & Ohashi in Fl. E. Him. 1: 317. 1966; 2: 124. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 195. 1979; King in Grierson & Long. Fl. Bhutan 2(3): 1355. 2001

Local Name: *Dhongray* (Nep.)

Shrub, small upto 3 m. **Stems** hollow. **Leaves** opposite, distichous; petioles 0.5 – 2.5 cm, broadly ovate-lanceolate, lamina 2.5 - 8 x 1 - 4cm, entire to dentate-serrate, acute-acuminate, base rounded, glabrous, whitish beneath. **Spikes** small, pubescent; **bracts** cordate, leafy, purplish

brown. **Calyx** 5-lobed, brown, persistent. **Corolla** funnel-shaped, purplish-yellow; **stamens** 5; ovary brown; style slender, glabrous; ovules many. **Berries** subglobose red.

- Flower* : May – June. *Fruit*: September. - November.
Exsiccatu : Sano-Ramitey 2230 m, *SR Lepcha & AP. Das 31143*, dated 04.09.2004, Thamey dara 2600 m, *SR Lepcha & AP. Das 31143*, dated 04.09.2004.
Status : Common.
Local Distribution : Kyonglasha, Ramitey, Rachela below, 1900 - 2400 m.
General Distribution : HIMALAYAS; INDIA (Kashmir, Meghalaya, Sikkim, Khasia Hills) BHUTAN S.E. TIBET, N. MYANMAR, CHINA

Note : Endemic to Himalaya

Leycesteria glaucophylla (Hook.f. & Thoms.) Clarke in Fl. Brit. India 3:16: 1880 p.p.; Hara in Fl. E. Him. 317. 1966; 2: 124. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 195. 1979; King in Grierson & Long. Fl. Bhutan 2(3): 1355. 2001. *Leycesteria glaucophylla* Hook. f. & Thoms. in Journ. Linn. Soc. Bot. 2: 165. 1858. *Leycesteria belliana* W.W. Smith in Tr. & Proc. Bot. Soc. Edinb. 24: 173, t. 13. 1911.

Shrub with flexuous branches. **Stem** hollow. **Leaves**; petiole to 0.5cm long; lanceolate; stipules semicircular, **lamina** 4.5 - 13 x 1.5 - 4 cm, entire to sinuate toothed, acuminate, base almost rounded, glabrous, whitish below, veins more prominent below, mid-vein sparsely hairy beneath. **Spike** axillary, drooping few flowered, 3 cm long; **bracts** shorter, ovate-subulate, brown. **Flowers** 1cm long; pedicellate. **Calyx** unequally 5-lobed, 0.3 cm long; persistent. **Corolla** infundibuliform extending upto 1.4 cm, limb 5-merous, white; **stamens** 5, inserted on the corolla-throat; ovary brown; style slender; ovules many, arranged in 2 rows in each chamber. **Berry** to 12, dark red; seeds numerous, ellipsoidal.

- Flower* : September – December *Fruit*: February – June
Exsiccatae : Panglakha 3040 m, *SR Lepcha & AP. Das 27793*, Dated 30.09.2004.
; Padamchen – Panglakha 2500 m, *SR Lepcha & AP. Das 32878*, dated 27.10.2004.
Status : Common.
Local Distribution : Middle Rachela, Padamchen, Panglakha, 2490 – 3040 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, W. CHINA.

Note : Endemic to Eastern Himalaya

Leycesteria gracilis (Kurz) Airy Shaw in Hook., Icon. Pl. Ser. 5. 2:t. 3166. 1932; Hara in Fl. E. Him. 1: 317. 1966; 2:124. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 2: 195. 1979; King in Grierson & Long, Fl. Bhutan 2(3): 1355. 2001. *Lonicera gracilis* Kurz in Journ. Asia. Soc. Beng. 39 (2): 77. 1870. *Leycesteria glaucophylla* Hook. f. *sensu* Fl. Brit. India 3: 16. 1880, p.p.

Local Name: Dhongray (Nep.).

Shrub with flexous branches. **Stem** hollow. **Leaves** opposite; petiole upto 0.5 cm long; lamina 4 -13 x 1.5 - 4 cm, lanceolate, entire to sinuate toothed, acuminate, base rounded, glabrous, whitish below, veins distinct below, mid-vein hairy below. **Spike** axillary, drooping few flowered; bracts shorter, ovate-subulate, brown. **Flowers** 1.3 cm long. **Calyx** unequally 5-lobed, to 0.4 cm long.

Corolla infundibuliform, limb 5-merous, white; **stamens** 5, inserted on the corolla-throat; **ovary** brown; **styles** slender; ovules many, arranged in 2 rows per chamber. **Berries** 6-12, dark red; seeds, ellipsoidal and shining.

Flower : September - December *Fruit*: February - June
Exsiccatus : Rachela - Jorepokhri 2400 - 3000, **SR Lepcha & AP Das** 20297, dated 17.07.2005.
Status : Common.
Local Distribution : Middle Rachela, trijunction 2490 - 3040 m.
General Distribution : E.IMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, W. CHINA.

Leycesteria stipulata (Hook.f. et Thoms.) Fritsch in Engl. Pfl.-fam. 4. 4: 169. 1891; Hara in Fl. E. Him. 1: 318. 1966; 2: 125. 1971; King in Grierson & Long, Fl. Bhutan 2(3): 1355. 2001. *Lonicera stipulata* Hook. f. & Thoms. in Journ. Lin. Soc. 2: 165. 1858. *Pentaptyxis stipulata* (Hook. f. & Thoms.) Hook. f., Fl. Brit. India 3: 17. 1880.

Shrubs erect upto 3 cm tall. **Branch** flexuous or semiscandant with solid stem. **Leaves** opposite, distichous; stipules leafy, orbicular; petiole to 0.2 cm; **lamina** 3 - 8 x 1 - 4 cm, ovate-lanceolate, coriaceous, sinuate-toothed, caudate-acuminate, base rounded, coriaceous, glossy and glabrous above, densely wooly below, veins deeply impressed below; peduncle upto 1 cm long, wooly; bracts and bracteoles green, very stout. **Flowers** clustered in axillary spikes, wooly, white. **Calyx** 5-cleft, hairy, persistent. **Petals** upto 2.2 cm, funnel shaped, limb 5-lobed, white, hairy; **stamens** 5, ovary 5 celled; style slender; stigma capitate. **Berries** with seeds many, ellipsoid.

Flower : April - May *Fruit*: June - September
Exsiccatus : Rachela below, 2700 m, **SR Lepcha & AP. Das** 20298, dated 17.07.2005.
Status : Very Common.
Local Distribution : Rachila below & trijunction 2100 - 2700 m.
General Distribution : E.IMALAYA; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Lonicera Linnaeus

Key to the species:

1. Branchlets pith hollow; leaf acute - mucronate 2
- + Branchlets pith solid; leaf acuminate *L. angustifolia*
2. Corolla creamy white; berries violet- black *L. acuminata*
- + Corolla yellow ; berries black *L. macrantha*

Lonicera acuminata Wall. ex Roxb., Fl. Ind. ed. Carey, 2: 176. 1824; Hook. f., in Fl. Brit. India 3: 10. 1880; Hara & Ohashi in Fl. E. Him 1: 318.1966; Hara et al. Enum. Fl. Pl. Nepal 2: 195. 1979; Meyer in Grierson & Long, Fl. Bhutan 2(3): 1353. 2001

Shrub climbing. Stem golden yellow, densely pilose. **Branchlet** pith hollow. **Leaves**; petiole short upto 0.6cm, yellowish, hairy; cordate-oblong, **lamina** 1.5 - 6 x 1- 2.5 cm, entire, acuminate, coriaceous, brown and pilose on both sides, mid-rib thick and densely pilose, yellowish brown. **Inflorescence** terminal and axillary, few flowered; peduncles short ca 1 cm long. **Flowers** to 1.5cm long. **Calyx**-tube to 5 cm long, ovoid, glabrate, persistent, limbs 5, short, hairy. **Corolla** yellow, tubular, lobes hirsute in bud; **stamens** 5, inserted. **Berries** globose, violet-black.

Flower : June - July *Fruit*: August – December.
Exsiccatus : Panglakha 3020m, **SR Lepcha & AP. Das** 27771, dated 30.09.2004.
Status : Common
Local Distribution : Rachela Middle, Kyongnosla, 1900 – 2900 m.
General Distribution : E. HIMALAYAS; NEPAL, BHUTAN, MYANMAR, MALAYSIA, S. CHINA.

Lonicera angustifolia Hayata, Ic. Pl. Formos. 2:75. 1912; C.B. Clarke in Fl. Brit. India 3: 13. 1880; Meyer in Grierson & Long, Fl. Bhutan 2(3): 1347 .2001.

Shrub up to 5 m tall. **Branchlets** brown to black, pith solid. **Leaves** oblong to lanceolate; **petioles** upto 4.6cm, glabrous, leaving persistent leaf scar, lamina 1.3 – 5 x 0.4 -2 cm. acute to mucronulate, base attenuate, upper surface glabrous, lower surface pilose or rarely glabrous, silvery , rarely sparsely glandular ciliate; peduncle 1- 2.8 cm ; **bracts** linear to lanceolate, 3.5 – 6.5 mm; bracteolate usually connate. **Flowers** actinomorphic. **Corolla** white, greenish, pale pink, tube 7 -11 mm, glabrous; stamens usually shorter than tube. **Fruits** red, connate.

Flower : May – August
Exsiccatus : Rachela below, 2700 m, **SR Lepcha & AP. Das** 31156, dated 13. 09.2008
Status : Common
Local Distribution : 2200 – 3960 m Rachela, Panglakha upto 2950 m.
General Distribution : HIMALAYAS; INDIA (Kashmir – BHUTAN).
 Note : Endemic to Himalaya

Lonicera macranthus (D. Don.) Spreng., Syst. Veg. 4(2): 82. 1827; Hara in Fl. E. Him. 318. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 196: 1979; Meyer in Grierson & Long Fl. Bhutan 2(3): 1354 .2001. *Lonicera macranthum* (D. Don) DC., Prodr. 4: 333. 1880; C.B. Clarke in Fl. Brit. India 3: 10. 1880. *Caprifolium macranthum* D. Don, Prodr. Fl. Nep. 140. 1825.

Shrub scandent, up to 5 m tall. Branches pendulous; **branchlet**, pith hollow. **Leaves** oblong to oblong-lanceolate; petioles upto 5.5 mm, villous hairs; **lamina** 4 – 8 x 2.8 – 4 cm. acuminate, base subcordate to truncate, glabrous in upper surface, pilose hairs on midrib; peduncle to 13 mm, villous, bract linear, bractlets free, ovate, ciliate. **Flowers** zygomorphic. **Calyx** lobes to 4.5 mm, ciliate. **Corolla** creamy white, tube glandular hairy, to 6.5 mm. **Fruits** black.

Flower : June - July
Exsiccata : Rachela 3000 m, **SR Lepcha & AP. Das** 31193, dated 13.09.2008.
Status : Common
Local Distribution : Rachila Middle, Panglakha, Beusa 1700 – 3000 m.
General Distribution : HIMALAYAS; NEPAL, INDIA (Sikkim, Darjeeling, Assam) BURMA BHUTAN,, MALAYSIA, CHINA.

Viburnum Linnaeus

Key to the species:

1. Drupe ellipsoid 2
 + Drupe oblong *V. mullaha*

2. Leaves base obtuse; corolla white to creamy; drupe red *V. erubescens*
 + Leaves base cuneate; corolla white to rose-pink; drupe black *V. nervosum*

Viburnum erubescens Wallich ex DC., Prodr. 4:329. 1830; C. B. Clarke in Fl. Brit. India 3: 7. 1882; Hara & Ohashi in Fl. E. Him. 1:230. 1966; Hara et al. Enum. Fl. Pl. Nepal 2: 198. 1979.

var. *erubescens*: King in Grierson & Long. Fl. Bhutan 2(3): 1356. 2001.

Local Name: Asaray (Nep.).

Shrubs deciduous upto 4 m tall. **Leaves** opposite; petioles upto 0.9 cm; **lamina** 3 - 15 x 1.5 - 7 cm, ovate-elliptic, toothed, acute, base obtuse, lower surface fading, upper greenish, nerves beneath pilose. **Flowers** cymes panicled; panicles long, drooping, terminal and on short leafy lateral branchlets. Flowers 1.2 cm long. **Calyx** teeth short, oblong, pubescent. **Corolla** tube slender with rounded spreading lobes upto 0.8 cm, white to creamy, glabrous; stamens 5, inserted within the corolla tube; anthers dark purple; ovary 2 - 3 celled; ovules 1 in each chamber; style short. **Drupe** ellipsoid, red, crowned.

Flower : April - May *Fruit*: June - September

Exsiccatus : Ramitey dara 2395m, *SR Lepcha & AP. Das 31142*, dated 03.10.2004.

Status : Common.

Local Distribution : Ramitey, Dohrok, Premlakha 2000 - 2600 m.

General Distribution : HIMALAYAS INDIA, (Kumaon, Sikkim, Darjeeling, Arunachal Pradesh), MEGHALAYA, MYANMAR, S. TIBET, W. & C. CHINA.

Note : Fruits edible.

Viburnum nervosum D. Don, Prodr. Fl. Nepal 141. 1825; Hara in Fl. E. Him. 3: 107. 1975; Hara et al. Enum. Fl. Pl. Nepal 2: 199. 1975; King in Grierson & Long. Fl. Bhutan 2(3): 1358. 2001.

Viburnum cordifolium Wall. [Cat. 15, n. 462. 1829, nom. nud.] ex DC., Prodr. 4: 327. 1830.

Viburnum grandiflorum Wall. ex DC., Prodr. 4:329. 1830. Hara in Ham & Williams, Enum. Fl. Pl. Nep. 2: 198. 1979.

Shrubs, deciduous, upto 3 m tall. Branches with stiff winter buds protected by scales. **Leaves** elliptic, oblong, lamina 4.5 - 10 x 2.2 - 5.5cm, acute, sharply toothed, cuneate at the base, slightly hairy on the nerves. lateral nerves 7 - 10 pairs, prominent, closely parallel, undivided. **Flowers** in terminal sessile corymbs. **Bracts** hairy. **Calyx** tube glabrous; lobes short, ciliate. **Corolla** long-tubular, 12 - 14 mm lobes rounded, spreading, white to rose-pink. **Stamens** in two series, 2 attached near the mouth of corolla tube, 3 lower down, anthers included; **stigma** subsessile, 3 -lobed. **Drupe** ellipsoid, compressed, blackish; seed grooved on one side.

Flower : April - September

Exsiccatus : Dohrok 2200m, *SR Lepcha & AP. Das 31049*, dated 02.04.2004

Status : Common

Local Distribution : Dohrok, Phusrey, Subaney, 2600 - 3500 m.

General Distribution : HIMALAYA; INDIA (Kumaun, Sikkim, Assam) BHUTAN, TIBET, N. BURMA, W. CHINA.

Viburnum mullaha Buch.-Ham. ex D. Don., Prodr. Fl. Nepal 141. 1825; Hara in Fl. E. Him. 320: 1966; Hara et al. Enum. Fl. Pl. Nepal 2: 198. 1979; King in Grierson & Long. Fl. Bhutan 2(3); 1357. 2001. *Viburnum stellulatum* var. *glabrescens* C.B. Clarke in Fl. Brit. India 3: 4. 1882.

Shrub upto 3 m tall. Branches with stellate pubescence. **Leaves** ovate or ovate-lanceolate, long acuminate, serrate, glabrous above, pubescent on the nerves beneath, membranous, lateral nerves

5 - 6 pairs, conspicuous, narrowly sharpen as teeth, undivided, only the lowest pair. **Flowers** small c. 3.5mm long, in terminal with long-stalked. **Inflorescence** umbellate corymbs. Bracts 3 - 4 mm long, linear, pubescent, caducous. **Calyx** pubescent. **Corolla** rotate, tube shorter than lobes, c. 1.5mm long, lobes spreading, pubescent. **Drupe** oblong, slightly compressed; 2 seeded, grooved.

Flower & Fruit : June – July
Exsiccata : Sano-Ramitey 2200 m, **SR Lepcha & AP. Das 31152**, dated 02.10.2007.
Status : Common
Local Distribution : Rachela, Panglakha, Kyongnosla, 2500 – 4000m.
General Distribution : HIMALAYA; INDIA (Punjab - Sikkim), BHUTAN, NEPAL.
Note : Endemic to Himalaya

VALERIANACEAE Batsch.

Key to the Genera

1. Plant more than 40 cm tall ; Leaves both cauline & radical; Petals white *Valeriana*
+ Plant upto 30 cm tall; Leaves basal ; Corolla tube pink – purple *Nardostachys*.

Nardostachys DC.

Nardostachys grandiflora (D.Don) DC., Prodr. 4: 624. 1830; Hara in Fl. E. Him. 3: 107. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 2: 209. 1979; Clement in Grierson & Long, Fl. Bhutan 2(3): 1364. 2001. *Valeriana jatamansi auct. non* Jones, D. Don in Lamb., 111. Gen. Cinchona 180, t. 1821. *Fedia grandiflora* Wall. Cat. 32, n. 1187, *nom. nud.* *Nardostachys jatamansi* DC., Prodr. 4: 624. 1830. p.p. excl. basionym et syn; c. *Nardostachys gracilis* Kitam. in Acta. Phyt. Geobot. 15: 134. 1954; Grierson & Long, Fl. Bhutan 2(3): 1366. 2001

Herbs, perennial, rhizomatous, glabrous upto 30 cm tall. **Rhizomes** to 13 cm long, aromatic, covered with leaf remains at base. **Leaves** simple, rosette at base; basal leaves linear to spatulate; **lamina** 2.5 – 25 x 2.6 – 2.3 cm, glabrous or pilose on mid veins, margin entire; Cauline leaves ovate – ovate or oblong, margin entire or occasionally serrulate. **Flowers** in bracteate capitates heads; flowering stems erect, rarely branched above. Flowers head to 2.5 cm in diam. **Calyx** 5 lobed, 2 – 3.1 mm. **Corolla** 5-lobed unequal at base, pink-purple, tubular campanulate, lobes to 4.5 mm, obtuse; stamens 4; ovary tri-locular **Fruits** obovate, 1.5 x 2.8 mm.

Flower : June – September
Exsiccatae : Chhangu 4000 m, **SR Lepcha & AP. Das 047**, dated 13.10.2003; Baba Mandir 4000 m, **SR Lepcha & AP. Das 122**, dated 14.10.2003.,
Status : Rare & Threatened
Local Distribution : Baba Mandir, Changu, 3600 - 4500m.
General Distribution : Himalaya INDIA (Sikkim), BHUTAN
Note : 1. Endemic to Himalaya.
2. Roots used as medicine by local people

Valeriana Linnaeus

Valeriana hardwickii Wallich in Roxb., Fl. India 1: 166. 1820; Hara & Ohashi, Fl. E. Him. 320. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 2: 209. 1979; Clement in Grierson & Long Fl. Bhutan 2(3): 1366. 2001. *Valeriana elata* D. Don, Prodr. Fl. Nepal 159. 1825. *Valeriana repens* Wallich, Cat. 14, n. 434. 1829. *nom. nud.* *Valeriana acuminata* Royle, Ill. Bot. Him. 241. 1835. *nom. nud.*

Herbs perennial, rhizomatous upto 70 cm tall. Rhizome woody to 5 mm. **Leaves** petiolules hairy, lateral ones to 0.4cm, terminal ones to 0.4.5cm; radical leaves with long petioles, pinnate with upto 5.5cm long petioles pubescent; cauline leaves few, opposite, upper ovate with pairs; leaflets 3, lateral ones smaller, terminal one larger (1.4 – 3.5 x 0.9 -1.9cm), ovate-lanceolate, obscure-serrate, acuminate, base cuneate. **Flowers** 0.3 - 0.40 cm long; bracts linear, glabrous; bracteoles short. Pedicels 0.3cm long. Flowering stems 5 – 39 cm long. **Calyx** to 0.4 mm, sepal pappose. **Petals** white. **Fruits** dorsally ribbed and hairy; fruiting pedicels somewhat elongated.

Flower : June.- October. *Fruit*: August - December.
Exsiccatae : Baba Mandir, 4000 m, *SR Lepcha & AP. Das 31016*, dated 13.10.2006
Kupup 4300 m, *SR Lepcha & AP. Das 31472*, dated 27.07.2005
Status : Rare
Local Distribution : Jorpokhari, Hattidara, Rachel, 1900 – 3050 m
General Distribution : HIMALAYAS; INDIA (Kashmir-BHUTAN), Meghalaya, Myanmar, East to CHINA, JAVA

Note: Roots medicinal.

DIPSACEACEAE Juss.

Key to the genera:

1. Corolla 5 lobed; stigma capitate *Triplostegia*
+ Corolla 4 lobed; stigma elliptic – oblique *Dipsacus*

Dipsacus Linnaeus

Key to the species:

1. Involucral bracts lanceolate; corolla tubular..... *D. inermis*
+ Involucral bracts ovate oblong; corolla tubular but expanded into campanulate... *D. atratus*

Dipsacus atratus Hook.f. & Thoms. ex Clarke in Hook.f., Fl. Brit.India.3: 218. 1881; Yamazaki in Fl. E.Him. 1: 321. 1996; Clement in Grierson & Long.Fl. Bhutan 2(3): 1370. 2001

Herbs, perennial upto 3 m tall. **Leaves** mostly basal and pinatifid; lamina 8 - 16cm x 2.5 - 6cm, middle and upper cauline leaves entire, sparsely pubescent. **Flowering** heads few, subglobose **Involucral** bracts ovate oblong to 4 – 11 x 3.5 – 6.3 mm; bracteoles lanceolate to 8.5 mm; involucl, toothed at apex. **Calyx** obtusely lobed, upto 1.3 mm. **Corolla** usually tubular in lower portion but slightly expanded into campanulate, lobes unequal, blue black – tinge purple.

Flower & Fruit : August – September
Exsiccatu : Bhimbase 4100 m, *SR Lepcha & AP. Das 3044*, dated 12. 10. 2004.
Status : Common
Local Distribution : Changu, kyongnosla , 3500 - 3900m.
General Distribution : INDIA, (Sikkim), BHUTAN, CHINA,

Dipsacus inermis Wall. in Roxb., Fl. India 1: 367. 1870. [Wall., Cat, 19, n. 427. 1829. *nom.nud.*]; Hara *et al.* Enum. Fl. Pl. Nepal 2: 210 1979. *Dipsacus strictus* D. Don, Prodr. F. Nepal 160. 1825., *nom. illegit.* C.B. Clarke in Hook.f., Fl. Brit. India 3: 217. 1881. var. *mitis* (D. Don) Y. Nasir in Fl. W. Pakistan 94: 10. 1975; Yamazaki in Fl. E. Him. (1): 321. 1966; Clement in Grierson & Long. Fl. Bhutan 2(3): 1370. 2001. *Dipsacus inermis* Wall. var. b. Wall. in Roxb., Fl. India 1: 367. 1820. *Dipsacus mitis* D. Don, Prodr. Fl. Nepal 161. 1825. *Cephalaria cachmerica* Decne. in Jocquem., *very 4 (Bot.)* 86; t. 94. 1835.

Herbs, perennial upto 3 m tall. **Stem** glabrescent or with prickles. **Leaves** lamina 8 - 16cm x 2.5 - 6cm, middle and upper cauline leaves usually entire, sparsely pubescent. **Flowering** heads few, sub-globose 2.2 - 4.3 cm broad. **Involucral** bracts lanceolate, leafy than the receptacular ones. Receptacular bracts linear. **Flowers** cream-white, all alike, larger than the receptacular bracts. **Calyx** substipitate, 4-lobed. **Corolla** tube lobes obtuse..

Flower : August. *Fruit*: September
Exsiccatus : Nathang 4100 m, **SR Lepcha & AP Das** 30849, dated 29.04.2005.
Status : Common
Local Distribution : Changu, Kyongnosla , 1400-4100m.
General Distribution : INDIA, CHINA, BHUTAN, AFGHANISTAN, MYANMAR, TIBET

Triplostegia Wallich *ex DC.*

Triplostegia glandulifera Wallich [Cat. 14, n. 436. 1836, *nom. nud.*] *ex DC.*, Prodr. 4: 642. 1830; Clarke in Hook.f., Fl. Brit. India 3: 215. 1881; Yamazaki in Fl. E. Him. 321. 1966; Hara in Fl. E. Him. 3: 108. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 2: 210-211. 1979; Clement in Grierson & Long, Fl. Bhutan 2(3): 1369. 200. *Triplostegia glandulosa* DC., Mem. Fam. Valerian. 20, t. 5. 1832.

Herbs, perennial, erect. **Leaves** mostly grouped in basal, oblong to obovate, lamina 1.7 - 9.2 x 0.9 x 3.5 cm, occasionally pinnatifid, with 1 - 2 pairs leaves, margin serrate, pilose on main veins only beneath, base attenuate- petiolate. **Flowers** few on branched heads; bracts inclosing base of flowers, linear, apex mucronate, hook in fruit. **Corolla** obconical, to 3.2 mm, white, lobes tips tinged to purple, tube to 2.2 mm.

Flower & Fruit : August - September.
Exsiccata : Nathang 4000 m, **SR Lepcha & AP. Das** 1004; dated 10.10.2004
Status : Common
Local Distribution : Changu, Kyongnosla , 2000 - 3900 m.
General Distribution : HIMALAYA; INDIA (Gharwal - BHUTAN), W. & C. CHINA, and Formosa

Order: Asterales

ASTERACEAE Link (*nom. alt.*) COMPOSITAE (*nom. cons.*)

Key to the Genera:

1. Pappus absent or reduced	12
+ Pappus present	2
2. Pappus capillary, sometimes bristled	3
+ Pappus bristled or retrorsely barbed awned or much reduced	6
3. Involucre less than equal to 2 – seriate	4
+ Involucre 2- several seriate	5
4. Achenes cylindrical or linear	19
+ Achenes oblong-elliptic or obovoid	10
5. Achenes obovoid-ellipsoides	26
+ Achenes oblong.....	17
6. Phyllaries less than equal to 3- seriate	8
+ Phyllaries 3-several seriate	7
7. Style branch rounded or flattened	<i>Ainslea</i>
+ Style branch subacute or obtuse	13
8. Annual herb	18
+ Perennial herb	11
9. Flower unisexual	<i>Anaphalis</i>
+ Flower bisexual	<i>Saussurea</i>
10. Rhizomatous or stoloniferous or fleshy rootstock	14
+ Non – rhizomatous	15
11. Leaves opposite or basal rosette	16
+ Leaves alternate	<i>Gynura</i>
12. Leaf lyrate,ly. pinnatifid or pinnatisect, palmately divided	22
+ Leaf entire or sub entire, denticulate, alternate	23
13. Flower unisexual	<i>Anaphalis</i>
+ Flower bisexual	<i>Erigeron</i>
14. Style branches linear	<i>Sorosseris</i>
+ Style branches oblong, truncate	<i>Tanacetum</i>

15. Receptacles domed or \pm conical	20
+ Receptacles flat or concave	<i>Artemesia</i>
16. Leaves opposite, toothed	<i>Eupatorium</i>
+ Leaves rosette, entire – dentate	<i>Cremanthodium</i>
17. Corolla pink or mauve	<i>Laggera</i>
+ Corolla yellow , sometimes purple	21
18. Leaves oblanceolate, deltoid	24
+ Leaves partly tripinnatifid	<i>Bidens</i>
19. Rhizomatous herb	<i>Tusilago</i>
+ Non-rhizomatous herb	<i>Synotis</i>
20. Style branches with short lanceolate appendages	<i>Myriactis</i>
+ Style branches obtuse	<i>Acmella</i>
21. Style branches linear, obtuse or flattened	25
+ Style branches truncate	<i>Ligularia</i>
22. Leaves spiny at margins	<i>Cirsium</i>
+ Leaves unarmed	<i>Senecio</i>
23. Leaves alternate	<i>Carpesium</i>
+ Leaves opposite	<i>Adenostemma</i>
24. Achene obconic – cylindrical	<i>Cacalia</i>
+ Achene oblong	<i>Gnaphalium</i>
25. Leaves finely toothed	<i>Duhaldea</i>
+ Leaves coarsely toothed	<i>Aster</i>
26. Leaves with distinct petiole	27
+ Leaves without distinct petiole, auriculate at base	<i>Sonchus</i>
27. Style branches short rounded	<i>Ainslea</i>
+ Style branches linear	<i>Lactuca</i>

Acmella Richard

Acmella paniculata (Wallich ex DC.) Jansen Syst. Acmella (Asterac.-Heliantheae) (Syst. Bot. monog.8): 67. 1985; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1605. 2001. *Spillanthes paniculata* DC. in Wight, Contr. Bot. Ind. 19. 1834; Prodr. 5: 625. 1836; Hara *et al.* Fl. E. Him. 2: 141. 1971; Chater & Kitamura in Enum. Fl. Pl. Nepal 3: 45. 1982; Hajra in Hajra *et al.* Fl. India 12: 409. 1995. Kumar & Singh, Astera. Sikkim 171. 2001. *S. pseudo-acmella* Murr., Syst. ed. 13: 610. 1774, *non* L. *S. acmella* var. *calva* (DC.) Clarke, Comp. India 138. 1876; Hook.f., in Fl.Brit.India 3: 307. 1881.

Local Name: Muuknok (Lep.) Kalijhar (Nep.).

Herbs annual, erect or decumbent, upto 40cm tall. **Leaves** lamina .3.5 - 7 x 1.8 -3 cm, acutel or subobtuse, attenuate at base, subentire or serrate, subglabrous or sparsely pubescent on both surface. **Flowers** capitula discoid, to 10mm diam. rather many interterminal, corymbose panicles; **Involucres bracts** 2 – serrate with phyllaries in each whorls. **Palea** to 4 mm; **Corollas** 4 and 5 lobes in same head. **Achenes** with pale strongly ciliate border. **Pappus** bristle not exceeding cilia.

Flower : July – September *Fruit:* August - November
Exsiccatu : Lingtam – Padamchen 1500 m, *SR lepcha & AP. Das* 0224, dated 19.09.2004.
Status : Common in low altitude
Local Distribution : 500- 1800m.
General Distribution : E. HIMALAYA INDIA (Darjeeling, Sikkim, Assam), NEPAL, SRI LANKA, CHINA, MYANMAR, INDONESIA, MALAYSIA

Adenostemma Forster

Adenostemma lavenia (L.) O. Kuntze, Rev. Gen. Pl. 1:304. 1891; Hara in Fl. E. Him. 1: 329. 1966; Chater in Hara Enum. Fl. Pl.Nepal 3: 9. 1982; Hajra in Hajra *et al.* Fl.India 12: 346. 1995; Grierson & Springate in Grierson & Long Fl.Bhutan 2(3): 1626. 2001. Kumar & Singh, Astera. Skim 20. 2001. *A. lavenia* var *elatatum* (D.Don.) Hochreutiner in Candollea 5: 298. 1934. *A. latifolium* D. Don, Prodr. 181. 1825.

Herbs erect slender upto 35 cm tall. Stem usually glabrous or glandular pubescent, unbranched. Petiole upto 1.5cm long. **Leaves** lamina 2.5 -6 x 1.7 – 4.5cm, opposite; broadly ovate or cordate, serrate, acute, base obtuse to subcordate or shallow-cordate, glabrous or thinly pubescent, 3-nerved. **Inflorescence** in lax panicles or corymbs. **Involucral** upto 6mm diam. in flower; bracts campanulate, oblong, obtuse, rarely acute, scabrid. **Phyllaries** 3 -3.5 x – 1.5 – 2mm, face and margin usually more hairy. **Corolla** lobes white or pnk all densely pubescent Inflorescence in diam., in lax panicles or corymbs. **Pappus** hairs 3-5, clavate. **Achenes** warted, glandular.

Flower : August – November *Fruit* : September – December
Exsiccatu : Rachela below 2800 m, *SR Lepcha & AP. Das* 27790, dated 30.09.2004.
Status : Less common
Local Distribution : Rachela, KAS, 1850 – 2500 m.
General Distribution : PANTROPIC

Ainsliaea DC.

Key to the species:

1. Leaf base rounded; petiole winged; Flowers heads discoid..... *A. latifolia*
+ Leaf base cordate; petiole not winged; Flowers heads cylindrical..... *A. aptera*

Ainsliaea aptera DC., Prodr. 7: 14. 1838; C.B. Clarke, comp. Ind. 247. 1876; Hook.f., Fl. Brit. India 3: 388. 1881; Kitamura in Fl. E. Him. 1: 330. 1966; 2: 131. 1971; Hara *et al.* Enum. Fl. Pl. Nepal 3: 9. 1982; Hajra in Hajra *et al.* Fl.India 13: 165. 1995; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1418. 2001. Kumar & Singh, Astera. Sikkim 22. 2001.

Herbs, perennial erect upto 42 cm tall. **Stem** usually leafless in spring, stout. **Leaves** ; petioles upto 2 cm; ovate or orbicular, **lamina** 2.7 – 4.5 x 1.5 - 4cm, sinuate toothed, acute, base cordate, glabrous, nerves distinct above. Spikes usually slender, stout, red-brown. **Flower** heads 1- 2 cm long, cylindrical, sub-sessile. **Disc-florets** white or pinkish. **Involucral bracts** lanceolate, thin, glabrous, inner larger than outer. **Pappus** feathery, brown. **Achenes** ribbed, usually hairy.

Flower : March - May *Fruit*: October - December
Exsiccatus : Rachela 2990 m, **SR Lepcha & AP. Das** 31131, dated 03.10.2004
Status : Not common.
Local Distribution : Kyongnosla, 1900 – 3400 m.
General Distribution : TEMPERATE HIMALAYAS.
Note : Endemic to Himalaya.

Ainsliaea latifolia (D. Don) Schulz-Bip., Pollichia 18-19: 169. 1861; Brittonia 4: 182. 1941; Kitamura in Fl. E. Him.1: 330. 1966; 2: 132.1971; 2: 110. 1975; Chater in. Hara Enum. Fl. Pl. Nepal 3: 10. 1982; Hajra in Hajra *et al.*India 13: 167. 1995; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1425.2001; Kumar & Singh, Astera. Sikkim 22. 2001. *Liatris latifolia* D. Don, Prodr.Fl. Nep. 169. 1825. *Ainsliaea pteropoda* DC, Prodr. 7: 14. 1838; Hook.f.in Fl.Brit.India 3: 388. 1881.

Herbs, perennial, erect upto 60 cm tall. **Stem** usually slender. **Leaves** mainly radical,; petioles upto 5.5 cm long, broadly winged, wings narrowed towards base; broadly ovate **lamina** 3 – 4.5 x 1.5 – 3.5 cm, finely toothed, acute, base rounded, pubescent both sides (white tomentose beneath in young stage), dark green, mid-vein thick and prominent; **cauline leaves** few, sessile, small, linear oblong or oblanceolate, toothed, pubescent. Flower spikes glabrous. **Flowers** heads upto 1.5 cm long, inner involucral bracts usually longer than outer, lanceolate, **Florets** 1- 4, white or tinged with pink. **Pappus** feathery, pale brown. **Achenes** ribbed.

Flower : April - June *Fruit*: July - November
Exsiccatus : Kyongnosla 3500 m, **SR Lepcha & AP. Das** 182, dated 23.07.2007.
Status : Common.
Local Distribution : Middle Rachela. 1800 – 3500 m,
General Distribution : INDIA , BHUTAN, MEGHALAYA, MANIPUR, MYANMAR, THAILAND, CHINA, TAIWAN, AND PHILIPPINES

Anaphalis DC.

Key to the species:

- 1. Herbs non-rhizomatous 2
- + Herbs rhizomatous 8

- 2. Herbs perennial 3
- + Herbs annual..... *A. margaritacea*

3. Involucral bracts 3 - 6 seriate. *A. royleana*
 + Involucral bracts many seriate..... 5
5. Leaf base cordate or recurved..... 6
 + Leaf base sub - semi aplexicaulis..... 7
6. Involucral bracts 3 - 4 seriate..... *A. contorta*
 + Involucral bracts 5 - 6 seriate..... *A. virgata*
7. Herbs less than 50 cm tall; Involucral bracts ovate- linear oblong..... *A. wightiana*
 + Herbs more than 50cm tall; Involucral bracts ovate -elliptic..... *A. griffithii*
8. Lower leaves usually petiolate; leaf 1 or 3 veined *A. triplinervis* var. *intermedia*
 + Lower leaves often sessile; leaf 1 veined *A. triplinervis* var. *monocephala*

Anaphalis contorta (D. Don) Hook.f. in Fl. Brit. India 3: 284.1881; Kitam in Hara Fl. E. Him. 331. 1966; in Fl. E. Him. 2: 132. 1971; 3: 110. 1975; Hara *et al.* Enum. Fl. Pl. 3: 10. 1982; Hajra in Hajra *et al.* Fl. India 13: 59. 1995; Grierson & Springate in Grierson & Long Fl. Bhutan 2 (3): 1518.2001; Kumar & Singh, Astera. Sikkim 26. 2001. Var. *contorta*. *Antennaria contorta* D. Don in B. Reg. 7: t.605. 1821. *Gnaphalium contortum* Buch -Ham.ex. Spreng., Syst. Veg.3: 479. 1826. *Anaphalis hondae* Kitamura in Act. Phytotax. Geobot. 15: 78. 1953; BBSI 15: 206. 1976.
 Local Name: Bukki Phool (Nep.).

Herbs, perennial, hairy. **Leaves** sessile, numerous and usually overlapping, **lamina** 2 - 3 x 1.5 - 2.5 cm, upper linear to narrow lanceolate, base cordate and densely clustered, margins usually inrolled, acute-blunt, green above, white tomentose on both surface, more dense lower, 1-nerved, nerve thick and prominent beneath. **Flowers** heads small 0.45 cm in diam., grouped in terminal compact corymbose clusters upto 2 cm in diam. **Involucral bracts** 0.3 - 0.3.5 cm, ovate, erect, blunt, papery and shining whit, 5 - 6 seriate. **Disc florets** whitish-yellow. **Achene** papillose,

- Flower* : August - January *Fruit*: November - March
Exsiccatae : Kupop - Bhimbase 4300 m, *SR Lepcha & AP. Das* 31416, dated 27.07.2005. Kyongnosla, 3100 m, *SR Lepcha & AP. Das* 32820, dated 25.10.2004. Zeluk 3900 m, *SR Lepcha & AP. Das* 32855, dated 26.10.2004.
Status : Common.
Local Distribution : Middle Rachila, Bhimbase, Zeluk, 1600 - 4350 m.
General Distribution : AFGHANISTAN, Temperate HIMALAYAS; INDIA CHINA,

Anaphalis griffithii Hook. f. in Fl. Brit. India 3: 280. 1881; Hajra in Hajra *et al.*, Fl. India 13: 61. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1519. 2001; Kumar & Singh, Astera. Sikkim 28. 2001.

Herbs perennial, erect, or ascending to 60 cm tall. **Stem** slender subbranched. **Leaves** lamina 2 - 3.4 x 0.3 - 0.5mm, linear -lanceolate, acute or apiculate at apex, semi-amplexicaul at base, margin entire or flat. Upper surface sparsely hairy, lower surface wooly, 1 nerved. **Flowers** in terminal corymb., **Peduncle** upto 4mm long, densely ferigenous tomentose. **Involucral bracts** 3 - 4 seriate, glistening white, ovate to elliptic-ovate. **Ray florets** with filiform. **Corolla**, obscurely toothed. **Disc florets** 5 toothed. **Achenes** oblong, hairy. **Pappus** hairs white, slender.

Herbs erect rhizomatous upto 50 cm tall. Stem flexuous, white hairy. **Leaves** variable; stem often sessile to shortly stalked; petiole to 1.5cm, **lamina** 1.5 – 3.5 x 1 -1.8 cm, basal leaves 3 - 5 veins, elliptic – linear, oblong or lanceolate, or lowest obovate, spatulate, obovate to elliptic, apex acuminate, margin entire, blunt or acute, base narrow cuneate, green above, paler and wooly beneath, 3-nerved. **Flower**; capitula 9- 70 per inflorescence. Flowers heads 1.5 cm across, solitary, **Involucral bracts** 0.5 cm, glistening white, scarious, many seriate, ovate or aeliptic-lanceolate; acute or obtuse, brownish at base. **Ray florets** female, filiform. **Corolla** to 3 mm, long, distinctly 4 toothed,. **Disc florets** bisexual, to 3,3 mm long, 5 toothed, yellowish-white.. Style bifid. **Achenes** blong. **Pappus** hairs white, bristly.

Var. var.intermedia DC., Prodr. 6: 270. 1838; Chater in Enum.Fl.Pl. Nepal 3: 11. 1982; Hajra *et al.* Fl. India 13: 77.1995. Kumar & Singh, Astera. Sikkim 32. 2001. *Anaphalis nubigena* DC., Prodr. 6: 270. 1838; Hook.f. in Fl. Brit. India 3: 279. 1881p.p. *A. cuneifolia* (DC.) Hook.f., in Fl. Brit. India 3: 280. 1881.

Herbs upto 65 cm tall; **Leaf** 1 or 3 veined; **inflorescence** with (1)7 – 15 capitular

Flower : June – July *Fruit*: September - October
Exsiccatae : Kupup 3900m, **SR Lepcha & AP. Das** 30840, dated 29.07.2005.
 Bhimbase – Dongkyala 4200 m, **SR Lepcha & AP. Das** 31405, dated 23.07.2005.
Status : Common.
Local Distribution : Zeluk, Rachila Middle. 2300 – 4000 m.
General Distribution : HIMALAYAS; INDIA (Kashmir – BHUTAN).
Note : Endemic to Himalaya.

Var. monocephala (DC.) Airy Shaw in Bot. Mag. 158: t. 9396. 1935; Chater in Enum.Fl. Pl. Nepal 3: 11. 1982; Hajra *et al.* Fl. India 13: 79.1995. Kumar & Singh, Astera. Sikkim 32. 2001. *A. monocephala* DC., Prodr. 6: 272. 1838. *A. nubigena* DC., Prodr. 6: 272. 1838; Hook. f., in Fl. Brit. India 3: 279. 1881.p.p.

Herbs to 20 cm tall; **Leaf** usually with 1 veined; **Capitulala** usually solitary or rarely 2 -4

Flower : June – July *Fruit*: September – October
Exsiccatae : Kyongnosla 3500 m, **SR Lepcha & AP. Das** 32807, dated 25.10.2004.
 On way to Panglakha 2890 m, **SR Lepcha & AP. Das** 130, dated 25.08. 2006.
Status : Common.
Local Distribution : Kyongnosla, Panglakha, 2800 – 4300 m.
General Distribution : HIMALAYA; INDIA, NEPAL, BHUTAN,
Note : Endemic to Himalaya.

Anaphalis virgata Thomson ex C.B. Clarke, Comp. Ind. 107. 1876 ; Hajra *et al.* Fl. India 13: 79. 1995; Hajra in Hajra *et al.* Fl. India 12: 79. 1995. Kumar & Singh, Astera. Sikkim 34. 2001. *A. stolicical* C.B. Clarke, Comp. Ind. 108. 1876 .Hook.f. Fl.Brit. India 3: 283. 1889.

Herbs perennial, erect branched to 50cm tall. **Stem** slender. **Leaves** lamina 0.8 - 4 x 0.3 – 0.6cm, narrowly lanceolate, linear oblong, recurved at base, acute at apex, rarely mucro, margin flat or

recurred, upper surface hairy dull green, under surface ashy white, 1 nerved. **Flowers** in terminal corymb with heads. Peduncle upto 3 cm, wooly. **Involucral bracts** 3 - 4 serriate, outer ovate-oblong; inner linear. **Ray florets** with filiform. **Corolla**, obscurely toothed. Style bifid. **Disc florets** pale yellow. **Corolla** 5 toothed. **Achenes** brown, oblong. **Pappus** hairs silky white.

Flower & Fruit : July – September
Exsiccatus : Bhimbase 4200m, **SR Lepcha & AP. Das** 31416, dated 27.07.2005.
Status : Rare
Local Distribution : Bhimbase, Donkyala PWS, 1400 – 4150 m.
General Distribution : W. – E. HIMALAYAS, INDIA, PAKISTAN, BHUTAN, TIBET, CHINA.

Anaphalis wightiana (DC.) DC., Prodr. 6: 273. 1838; Hook.f., in Fl. British India 3: 286. 1881; Hajra in Hajra *et al.* Fl. India 13: 81.1995.

Herbs perennial, erect branched to 65cm tall. **Stem** grooved. **Leaves** lamina 2 - 5 x 0.6 – 0.9cm, linear lanceolate, sub-amplexicaul, obtuse-acute at apex, margin recurved, upper surface pilosa scabrous, lower grey white, wooly, 1 nerved, sessile. **Flowers** head with dense corymbs clusters, peduncle short, c 0.8mm, long tomentose. **Involucral bracts** 3 - 4 serriate, outer ovate white, inner with short limb and inner linear oblong, brown. **Ray florets** with filiform, corolla, minutely 4 toothed. **Corolla** in disc florets 5 lobes. **Achenes** terete or papillose. **Pappus** hairs white.

Flower & Fruit : June
Exsiccatus : Kyongnosla 3400 m, **SR Lepcha & AP. Das** 32830, dated 25.07.2004.
Status : Rare
Local Distribution : Kyongnosla, Changu 750- 2340m.
General Distribution : INDIA Western Ghats, Tamil Nadu, Karnataka, Kerala, Sikkim.
Note : 1. Endemic to India.
 2. A new record for Sikkim and Eastern India.

Artemisia Linnaeus

Key to the species:

- | | |
|--|-------------------------|
| 1. Plant upto 1.5 m tall; not strongly aromatic | 2 |
| + Plant more than 1.5 m tall; strongly aromatic | <i>Artemisia indica</i> |
| | |
| 2. Capitula in on short lax racemes; phyllaries sparsely pubescent | <i>A. thellungiana</i> |
| + Capitula in distant broad panicles; phyllaries scarious | <i>A. dubia</i> . |

Artemisia dubia Wallich ex Besser in Nouv. Memb. S. Imp. Nat. Mos. 3: 39. 1834; Hara in Fl. E. Him. 1: 332. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 3:12. 1982; Hajra in Hajra *et al.* Fl. India 12: 19. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1563. 2001.
lavandulaefolia DC., Prodr. 110. 1838, p.p.

Local Name: Tuknil (Lep) Titepaati (Nep.).

Herbs or undershrubs, perennial, aromatic upto 1.5 m tall. Root-stock woody. **Stem** usually paniculately branched, pale green, ribbed; branches shorter.; **lamina** to 7.5cm, sessile, pinnatisect, irregularly serrate, acute, pale underside. **Flowers**; capitula 0.30 - 0.45cm across, nodding, borne

on lax racemes, reddish brown. **Involucre**; phyllaris scarious. **Receptacle** naked; uter florets female. **Corolla** yellowish green.

Flower : August - October *Fruit*: October- January
Exsiccatus : Premlakha – Panglakha 2800 m, **SR Lepcha & AP. Das** 28.07.2005.
Status : Common
Local Distribution : Premlakha, Kyongnosla, 1400 – 2300 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, CHINA.

Artemisia indica Willdenow, Sp. Pl. 3: 1846. 1803; Hara in Fl.E.Him 1: 332. 1966; 2: 133. 1971; Kitamura in Hara *et al.* Enum.Fl. Pl. Nepal 3: 12. 1982; Hajra in Hajra *et al.* Fl.India 12: 27. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1561.2001 Kumar & Singh, Astera. Sikkim 36. 2001. *A. grata* Wallich *ex* Bess. in Nouv. Mem. Soc. Nat. Mosc. 3: 57. 1834. *A. vulgaris auct. non* L., Hook.f. in Fl. Brit. India 3: 325. 1881. p.p.

Local Name: Tuknil (Lep), Titepaati (Nep.).

Shrubs, aromatic, bushy upto 2m tall. **Stem** leafy, whitish hairy or rarely glabrescent. **Leaves** alternate, sessile, highly aromatic, **lamina** 3 – 6.5 x 1.30 - 3.5 cm, ovate, lobed, laciniate or deeply pinnatisect, segments linear-lanceolate, acute, pubescent above, cottony white beneath; terminal leaves comparatively smaller, entire or 3-lobed. **Flowers** heads 0.25 - 0.35cm diam., ovoid or subglobose, arranged in long pyramidal panicles. **Involucral bracts** ovate, ovate-oblong, villous, margins scarious. **Anther** base obtuse, entire. **Achenes** oblong.

Flower : August - December *Fruit*: October – February
Exsiccatus : On way Nathang – Panglakha 4300 m, **SR Lepcha & AP. Das** 32973, dated 28.07.2005.
Status : Common
Local Distribution : 700-2250m.
General Distribution : SUBTROPICAL-TEMPERATE REGIONS OF INDIA, MYANMAR, THAILAND, CHINA, JAPAN.

Note : Traditionally used as medicine in hills of Sikkim and Darjeeling, antiseptic, also used as mosquito and insect repellent.

Artemisia thellungiana Pampamu in Nuovo Giorn. Bot. Ital. n.s. 33: 457. 1926; Razi in Rec. Bot. Surv. Ind.185. 1959; Grierson & Springate in Grierson & Long Fl, Bhutan 2(3): 1562. 200; Kumar & Singh, Astera. Sikkim 38. 2001. *A. vulgaris sensu*, Fl. Brit. India, p.p. non.

Local Name: Tuknil (Lep.) Titepaati (Nep.).

Herbs, perennial upto 1.5m. **Stem** often puberulous. **Leaves**; mid cauline leaves 1 -2 pinnatisect, ovate – elliptic, **lamina** 5 – 13 x 8 - 9 cm, 3 pairs of primary segments rarely pair of basal stipuliform lobes., subglandular, sparsely pubescent, tomentose below, ultimate segments subentire. **Flowers**; capitula in distant, broad panicles. **Involucral bracts** to 3 mm. **phyllaries** ovate – obovate, subglabrous, or sparsely arrenous, often purplish. **Achenes** oblong.

Flower & Fruit : August – September
Exsiccatus : Way to panglakha from Premlakha 2600 m, **SR Lepcha & AP. Das** 161, dated 23. 07. 2006.

Status : Common.
Local Distribution : Premlakha, Panglakha, 2800 – 3350 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, TIBET, CHINA.

Aster Linnaeus

Key to the species:

- 1. Herbs less than 30 cm tall 2
- + Herbs more than 30 cm tall 3

- 2. Herbs (Rhizomatous); Pappus white *A. himalaicus*
- + Herbs (Non- rhizomatous); Pappus brownish *A. albescens*

- 3. Herbs with villous hairs; Leaves margin entire *A. strachiyi*
- + Herbs with glandular hairs; Leaves margin ciliate *A. flaccidus*

Aster albescens (DC.) Koehne, Hand.-Mazz. in Acta Hort. Goteb. 12: 1938; Kumar & Singh, Astera. Sikkim 42. 2001. *Amphirhapis albescens* DC., Prodr. N5: 343. 1836. *Microglossa albescens* (DC.) Benth. ex C.B. Clarke, Comp. Ind. 59. 1876. *Aster cabulicus* Lindl. in Bot. reg. 62. 1843; Grierson & Springate in Grierson & Long., Fl. Bhutan 2 (3): 1533. 2001;

Shrubs perennials erect. Stem to 2.5 m, sparsely pubescent with gland. **Leaves** sessile or shortly petiolate; ovate lanceolate, **lamina** 2 – 11 x 0.6 – 3cm; acute or acuminate, cuneate at base, entire or finely serrate, sparsely pubescent in lower surface or rarely bearing of few glands. **Capitula** numerous, in terminal corymbs; **involucral bracts** to 6mm in diam. phyllaries upto 20 linear lanceolate, green or purplish at tip; pubescent or tomentose towards base. **Flower** 12 – 30. **Corolla** tube to 3 mm. **Achene** sparsely pubescent. **Pappus** brownish, to 4mm.

Flower : May – October
Exsiccatus : Padamchen – Zuluk, 2900 m, **SR Lepcha & AP. Das** 070, dated 21.08. 2005.
Status : Common.
Local Distribution : Kyongnosla – Changu, 1900 – 3400 m
General Distribution : E. HIMALAYA; INDIA, TIBET, CHINA

Aster flaccidus Bung, in Mem. Acad. Sci.st.-pet .2: 599.1835; Kitam in Fl. E. Him.3: 112. 1975; Hara *et al.* Enum. Fl. Pl. Nepal. 3: 14. 1982. 1995; Hajra in Hajra *et al.* Fl. India 12: 86. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1537. 2001; Kumar & Singh, Astera. Sikkim 43. 2001. *Aster heterochaeta* C.B. Clarke, Comp. India 44. 1876; Hook .f. in Fl. Brit. India 3: 250.1881, p.p.; Hajra in Hajra *et al.* Fl. India 12: 96. 1995. *A. tibeticus* Hook.f. in Fl. Brit. India 3: 251. 1881.

Herbs, perennials glandular hairy upto 15 cm tall. **Leaves** basal spatulate or obovate, **lamina** 2 – 5 x 0.5 – 2 cm; acute or obtuse, attenuate at base, ciliate at margins. **Flower** head solitary; **involucral bracts** 2 – seriate, linear lanceolate. **Ray florets** many tubes ca 2 – 5 mm long. Ligule oftenly blue or mauve. **Disk florets** yellow. Style appendages lanceolate. **Achenes** brownish, 2 ribbed; **pappus** outer white.

Flower : May – October
Exsiccatu : Kupup – Bhimbase 4800m, *SR Lepcha & AP. Das* 183, dated 27.07.2005.
Status : Common.
Local Distribution : PWS, Lampokhri, 4200 – 4900 m
General Distribution : SIBERIA.HIMALAYAS; INDIA, MONGOLIA, CHINA

Aster himalaicus C.B. Clarke, Comp.India 43. 1876; Hook.f. in Fl.Brit. India 3: 250.1881; Kitam in Fl.E. Him. 3: 112.1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 14.1982; Hajra in Hajra *et al.* Fl. India 12: 90. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1535. 2001; Kumar & Singh, Astera. Sikkim 44. 2001.

Herbs perennials, rhizomatous, upto 45cm tall. **Leaf** cauline sessil, lanceolate, rarely oblanceolate to broadly elliptic, oblong, lamina 2 x 0.5 – 3cm, acute, or obtuse, mucronates, entire. **Flower** heads head solitary; **involucral bracts** purplish tinged, **Ray Florets** many, tube, short upto 2.5mm long ; ligule purplish blue. **Disk florets** yellow or purplish. Style appendages broadly triangular. **Achene** brownish, obovate. **Pappus** white.

Flower : July. *Fruit:* October
Exsiccatae : Padamchen – Zuluk, 2500 – 3500 m, *SR Lepcha & AP. Das*, 32830, Dated 27.10.2004; Changu – Serabthang, 4000 – 4200 m, *SR Lepcha & AP Das* 096, dated 30.08.2005.
Status : Common.
Local Distribution : Kyongnosla, KAS, 3500 – 5200 m
General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, TIBET, CHINA.

Aster strachiyi Hook.f. in Fl.Brit. India 3: 250.1881; Kitam in Fl. E. Him.3: 112.1975; Hara *et al* Enum.Fl.Pl. Nepal 3: 15.1982; Hajra in Hajra *et al.* Fl. India 12: 96. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1536. 2001; Kumar & Singh, Astera. Sikkim 46. 2001.

Herbs villous upto 25 cm tall. **Leaves** alternate or rosset, sessile or attenuate to a short petiole; elliptic, spatulate , oblong or obovate , lamina 2 - 3 x 0.8 – 2 cm, obtuse or acute at apex, attenuate at base , entire **Flower** head solitary; **involucral bracts** purplish tinged, 2- seriate, cilliate at base, lanceolate. **Ray florets** many 30-40; ligule blue or mauve. **Disc florets** yellow, tubes 2.5 mm long. Style appendages lanceolate. **AcheneS** obovate, densely, white pubescent. **Pappuas** white of purplish.

Flower : July *Fruit:* September
Exsiccatu : Nathang 4300m, *SR Lepcha & AP. Das* 185, dated 21.07.2005.
Status : Common.
Local Distribution : Padamchen, PWS, Bhimbase 900 – 4700 m
General Distribution : INDIA (Kultu – Sikkim) BHUTAN, NEPAL.
 Note : Endemic to Himalaya.

Bidens L.

Bidens pilosa L., Sp. Pl. ed. 1. 832. 1753; Hook.f., in Fl. Brit. India 3:309. 1881; Hara in Fl.E.Him. 1: 333. 1966; Hara *et al.* Enum.Fl.Pl.Nepal 3: 15. 1982; Hajra in Hajra *et al.* Fl. India 12:372. 1995; Grierson & Springate in Grierson & Long., Fl. Bhutan 2(3). 1609. 2001; Kumar & Singh, Astera. Sikkim 50. 2001.

Local Name: Kuro (Nep.)

Herbs, erect upto 65cm tall. **Stem** glabrous. **Leaves** opposite; petiole upto 2.6cm; lamina much variable, 3-lobed, 1-2 pinnatisect or undivided; leaflets ovate **lamina** 2.5 – 4.5 x 1.5 - 2cm, toothed, acute, narrow cuneate, pilose above, nerves distinct. **Peduncles** long upto 7.5cm, stout. **Involucral bracts** with scarious margin. **Flowers** heads 0.7 - 1.6 cm across, elongating in fruits. **Ray-florets** ligulate, white. **Achenes** 1 – 2 cm, linear, black. **Pappus** unequal of barbed bristles.

Flower : June - January *Fruit*: September - March
Exsiccatae : Jorepokri (between Panglakha & Rachel) 2600 m, **SR Lepcha & AP. Das** 27762, dated 30.09.2009; Mulkharkha (W.B. border) 1990 m, **SR Lepcha & AP. Das** 330, dated 20.08.2005.
Status : Common.
Local Distribution : Rachel Chowk, Padamchen; upto 2500 m.
General Distribution : PANTROPIC, ALSO EXTENDING TO TEMPERATE REGIONS.

Cacalia L.

Key to the species:

1. Plant with flexuose stem; petiole not winged; Capitula drooping in axillary and terminal racemes; Achenes obconic; bract broadly oblong; Achenes obconic
..... *C. chinopodifolius*
- + Plant without flexuous stem; petiole winged; Capitula discoid; bract linear oblong; achenes cylindrical
..... *C. levingii*

Cacalia chinopodifolius (DC.) Kitamura ex H. Koyama in Mem. fac. Sci. Kyoto Univ., Biol., 2(2): 170. 1969; Kitamura & Gould in Enum. Fl. Pl. Nepal 3: 17. 1982; Hajra in Hajra *et al.* Fl. India 13: 188. 1995; Kumar & Singh, Astera. Sikkim 61. 2001. *Snecio chinopodifolius* Prodr. 6: 634. 1838; Hook. f., Fl. Brit. India. 3: 354. 1881; Grierson & Springate in Grierson & Long., Fl. Bhutan 2(3): 1574. 2001.

Herbs perennial, pubescent. **Stem** flexuous; branch and inflorescence densely fulvous pubescent. **Leaves**; petiole upto 9 cm long, pubescent; triangular or obscurely 3 lobed, **lamina** 1.3 – 1.6 x 1.3 – 1.5 cm, dark green on the upper surface, base cordate or truncate, broadly with auricle tooth, acuminate, margins regularly sinuate toothed; teeth mucronulate. **Capitula** drooping in axillary and terminal racemes panicle; peduncle to 2 mm pubescent; bracts 5, broadly oblong, 2.5 – 1.5 mm, obtuse, imbricate. **Disc florets** limb 5 lobed; uprose. **Achenes** obconic to 3 mm long, scabrid.

Flower : August *Fruit*: October
Exsiccatae : Panglakha 2900 m, **SR Lepcha & AP. Das** 31059, dated 08.10.2004; Changu - Kyongnosla, 3300 m, **SR Lepcha & AP. Das** 32890, dated 27.10.2004.
Status : Less Common
Local Distribution : Kupu, Nathang, Kyongnosla, 3800 - 4400m .
General Distribution : INDIA (Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, Sikkim), BHUTAN.

Note : Endemic to Himalaya

Cacalia levingii (C.B.Clarke) R.R. Mathur in R.R.Rao *et al.*, Fl. Indicae Enumir. Asterac. 20. 1988; Hajra in Hajra *et al.* Fl. India 13: 188.1995. *Senecio levingii* C.B. Clarke, Comp. India 3001. 1876; Hook.f., Fl. Brit. India 3: 353. 1881.

Herb perennial. Stem pale brown, glabrous, smooth ; young branches and inflorescence pubescent. **Leaves**; petiole to 2.3 cm long, winged; lobes deltoid, 3 lobed; **lamina** 1.7 – 13 x 1 – 14, cm, glabrous, upper surface dark green, lower surface pale with distinct venation; acuminate, base cuneate, coarsely mucronulate, margins dentate. **Capitula** discoid; peduncle ca 4.5 mm long, pubescent; bracteate; bracts linear-subulate. Involucre cylindrical, to 7 mm long, **bracts** linear-oblong, acute. **Disc florets** to 7.5 mm long. **Achenes** cylindrical to 6 mm long, glabrous, distinctly ribbed. **Pappus** white unequal hairs., ca 6.5 mm long.

Flower : September **Fruit** : October
Exsiccatus : Pangolakha 2950 m, *SR Lepcha & AP Das* 32818, dated 25.10. 2004.
Status : Not common
Local Distribution : Kyongnosla, Changu 3700 - 4400m .
General Distribution : NORTH HIMALAYAS; INDIA (Jammu & Kashmir).
Note : Endemic to India,

Carpesium Linnaeus

Key to the species:

1. Plants densely viscid and covers with hispid hairs, Leaf ovate – cordate; Achene Cylindrical *C. trachelifolium*
- + Plants slightly pubescent or glabrous; Leaves elliptic – linear; achene globose *C. nepalensis*

Carpesium nepalensis Lessing in Linnaea 6: 234. 1831; Kitamura in Hara Fl. E. Him. 1: 334. 1966; Kitamura & Gould in Enum.Fl. Pl. Nepal 3: 18. 1982; Kumar & Singh, Astera. Sikkim 65 . 2001. var. *nepalensis*

Herbs, annual viscid. Stem slender, to 70 cm densely hispid with hairs. **Leaves** sessile, narrowly elliptic to linear, **lamina** 8 – 32 x 1- 4 mm, obtuse or subacute, attenuate at base, hispid in upper and lower, with hairs arising from cystolic bases, viscid. **Flowers** axillary to sessile, opposite or alternate. **Calyx** to 6-mm. densely hispid. **Corolla** deep pink to dull crimson, to 22 mm, sparsely pubescent. **Achene** globose.

Flower & Fruit : July – November
Exsiccatus : Phusrey 2000 m, *SR Lepcha & AP. Das* 0773, dated 13.07.2006
Status : Less common
Local Distribution : Kyongnosla, Karponang, 1500 – 2350 m
General Distribution : TEMPERATE HIMALAYA; INDIA, NEPAL, CAUCASUS, FRANCE, JAVA, JAPAN, CHINA, TAIWAN.

Carpesium trachelifolium Lessing in Linnaea 6: 233. 1831; Hook.f., in Fl. Brit. India 3: 301. 1881; Hara in Fl. E. Him. 1: 335. 1966; 3: 113. 1975; Kitamura & Gould in Enum.Fl.Pl.Nepal 3: 18. 1982; Hajra in Hajra *et al.* Fl.India 13: 11. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1494. 2001; Kumar & Singh, Astera. Sikkim 68. 2001.

Herbs, slender upto 60cm, Stem pubescent or glabrate, **Leaves** ovate-cordate, **lamina** 3.5 – 6 x 2.5 - 5 cm, oftenly acuminate ; subcordate to attenuate at base, subentire to coarsely serrate,

sparingly pubescent on both surface, sinuate-toothed or lobulate; upper leaves ovate or elliptic-lanceolate, serrate or entire. **Flowers** subracemose – pendulous, with capitula upto 0.5cm across. **Involucral** 4-5 seriate; **phyllaries** mostly oblong, obtuse, scarious, rounded at apex. **Disc florest** 5-toothed, tubular. **Achenes** cylindrical, narrowed in at base and apex.

Flower : June – August *Fruit* : July – October
Exsiccatus : Nathang – Zuluk 3600m, **SR Lepcha & AP Das** 32863, dated 27.10.2004
Status : Less common
Local Distribution : Nathang, Zeluk 2200 - 3600m
General Distribution : HIMALAYAS; INDIA (Sikkim, Kashmir) BHUTAN AND CHINA.
Note : 1. Endemic to Himalaya.
 2. Cypsela very sticky on clothes.

Cirsium Miller

Cirsium falconeri (Hook.f.) Petrak in Biblioth. Bot. 78: 9. 1912; Kitamura & Gould in Enum.Fl.Pl.Nepal 3: 20. 1982; Grierson & Springate in Griserson & Long, Fl. Bhutan 2(3): 1428. 2001; Kumar & Singh, Astera. Sikkim 73. 2001. *Gnicus falconeri* Hook. f. in Fl. Brit. India 3: 362. 1881. *Gnicus involucratum* Hook.f. Fl. Brit, India 3: 363. 1881. *Cirsium verutum* (D.Don) Sprengel, Syst. Veg 3: 370. 1826; Kitamura & Gould in Enum.Fl. Pl. Nepal 3: 20. 1982

Herbs upto 1.5m tall. **Stem** sparsely pubescent at base. **Leaves** lamina 15 – 45 x 6 – 23cm, densely setulose to almost smooth above, white araneus beneath broadly auriculate at base; lowest 1-2 pinnatisect, oblanceolate in outline 7- 12 pairs of leafy segments, spinous tip, upper leaves smaller, ovate lanceolate in outline. **Flowers** in solitary branched, corymb. **Involucral bracts** upto 22cm diam. **Phyllaries** lanceolate to linear narrow acuminate; sparsely araneus; outer and middle one spiny. Suberect to recurved inner one cartiligenous. **Flower** pale to dark purple. **Corolla** tube tapered abruptly campanulate. **Achenes** obovoid, dark brown, **pappus** brownish.

Flower & Fruit : July – October
Exsiccatae : Bhimbase 4300 m, **SR Lepcha & AP. Das** 31496, dated 27.07.2005.
 Zeluk 3700 m, **SR Lepcha & AP. Das** 32947, dated 28.07.2005.
Status : Common.
Local Distribution : Donkyala, Changu, 2750 – 4300 m
General Distribution : HIMALAYAS; INDIA, (NEPAL – BHUTAN), S. TIBET, MYANMAR.

Cremathodium Bentham emend R. Good

Key to the species:

1. Achene oblong; pappus white 2
- + Achene oblanceolate; pappus brown; Achee *C. thomsonii*

2. Capitula campanulate, mostly solitary; Ray of ray floret linear oblong ... *C. decaisnei*
- + Capitula radiate 1 – many; ray of ray floret elliptic *C. cremanthoides*

Cremathodium cremanthoides (Handel – Mazzetti) R. Good in J. Linn. Soc. 48: 279. 1929; Hajra in Hajra *et al.* Fl. India 13: 309. 1995; Kumar & Singh, Astera. Sikkim 81. 2001. *Ligularia cremanthoides* Handel – Mazzetti in Anz. Acad. Wiss. Wien. Math. Node 62.1925; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1574.2001.

Herbs upto 55 cm tall, erect, glabrous, short black glandular hairy above. **Leaves**; radical leaves reniform, glabrous, acutely dentate, petiolated; Cauline leaves reniform to linear with broad sheathing base. **Capitula** radiate 1 – many, arranged in corymb or in umbel. **Involucre** campanulate; bract dark brown or black, narrow, acute. **Ray** florets yellow, long; rays elliptic, ca 5 - 6 nerved, slightly longer than tube. **Disk** florets tubular. Achenes oblong, **Pappus** white.

Flower : July – September
Exsiccatus : Lam-pohkri 4300 m, *SR Lepcha & AP. Das* 222, dated 13.07.2003.
Status : Rare
Local Distribution : PWS, 3600 – 4500 m.
General Distribution : EASTERN HIMALAYA; INDIA (Sikkim) in wet & rocky alpine region.

Note : Endemic to Eastern Himalaya.

Cremathodium decalanei C.B. Clarke, comp. Ind. 168. 1876; Hook. f., in Fl. Brit. India 3:331. 1881; Kitamura in Fl. E. Him. 3: 114. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 22. 1982; Hajra in Hajra *et al.* Fl. India 12:310. 1995; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1581.2001; Kumar & Singh, Astera. Sikkim 83. 2001.

Herbs, perennial, brownish black, upto 30 cm tall. **Stem** grooved brownish pubescent above. **Leaves** reniform (radical), **lamina** 3 x 5cm across, glabrous appressed brownish white tomentose beneath. **Flowers** in solitary nodding; **capitula** campanulate, bracteolate, pubescent, bracteoles black 2 -3, linear, **Involucral** phyllaries 10 -15, campanulate, pubescent, broad, in two series. Outer linear, lanceolate, inner bracts elliptic, oblong, 3 -5 ribbed. **Ray** florets yellow, linear oblong. **Disk** florets with 0.5 cm limb. Achenes of ray florets oblong, glabrous, white hairs.

Flower : June – October
Exsiccatus : Kupup 4300 m, *SR Lepcha & AP. Das* 30990, dated 27.07.2003
Status : Sparse
Local Distribution : Kupup, Nathang 1800 – 2400 m.
General Distribution : HIMALAYAS; INDIA (Kashmir to BHUTAN).
Note : Endemic to Himalaya

Cremathodium thomsonii C.B. Clarke, Comp. India. 169. 1876; Hook.f., in Fl. Brit. India 3: 331. 1881; Hara *et al.* Enum. Fl. Pl. Nepal. 3: 23. 1982; Grierson & Springate in Grierson & Long. Fl. Bhutan 2(3): 1581. 2001; Kumar & Singh, Astera. Sikkim 87. 2001.

Herbs, erect perennial, 40 cm tall. **Leaves**; petiole to 13 cm; basal leaves reniform; **lamina** 28 x 1.7 – 3.8 cm, obtuse, crenate apiculate tooth, deeply cordate at base, glabrous or sparsely puberulus at lower surface; cauline leaves few, reniform. **Capitulum** solitary; peduncle hairy above. **Involucral** to 18 mm in diam; **phyllaris** ovate to lanceolate, 9 – 14 x 2.4 – 5 mm, glabrous or ciliate. **Ray corolla** tube to 5 mm; **ligule** oblanceolate, yellow, deeply toothed. **Disk corolla** to 7.8 mm; **Achenes** oblanceolate. Pappus brownish, to 6.5 mm.

Flower : June – September
Exsiccatu : Kupup 4200 m, *SR Lepcha & AP. Das* 30951, dated 24.07.2005
Status : Sparse
Local Distribution : Changu, Rachela , Panglka , Donkyala, Kupup 3000 – 4200 m.
General Distribution : E.HIMALAYA; INDIA, (NEPAL – BHUTAN), TIBET, CHINA.

Dubyaea DC.

Dubyaea hispida DC., Prodr. 7: 247. 1838; Kitamura in F. & Fl. Nepal Him. 338. 1966; Fl. E. Him. (1): 338.1996; Hara *et al.* Enum. Fl. Pl. Nepal 3: 25. 1882; Hajra in Hajra *et al.*, Fl. India 13: 275. 1995 ; Grierson & Springate in Grierson & Long.Fl. Bhutan 2(3): 146. 2001. Kumar & Singh, Astera. Sikkim 90. 2001. *Hierocium hispidum* D.Don, Prodr. Fl. Nepal 165. 1825, *nom. illegit.* *Lactuca dubyaea* C.B. Clarke, Comp. India 271. 1876.

Herbs, perennial, densely hispid. Stems with creeping rhizome upto 75cm tall, erect, leafy, robust. **Leaves** lamina 6 - 13 x 2.5 - 8cm; lower leaves ovate-lanceolate or ovate oblong, rarely lyrate, pinnately lobed at base; petiole winged. Inflorescence oftenly in loosely panicked or corymbs. **Flowers** heads nodding with purplish glandular hairs. **Involucral** bracts unequal; acuminate, linear lanceolate; inner linear lanceolate or linear oblong. Ligules usually yellow. **Anthers** yellow. **Achenes** fusiform lanceolate, brownish or blackish. Pappas pale whitish, much persistent.

Flower : July – September
Exsiccatae : Bhimbase 4150 m, *SR Lepcha & AP. Das* 31477, dated 27.07.2005
 Nathang 3950 m, , *SR Lepcha & AP. Das* 30852, dated 29.07.2005
Status : Common.
Local Distribution : Bhimbase, Kupup, Changu, Nathang 3800 – 4200 m.
General Distribution : E.HIMALAYA; INDIA, (NEPAL – BHUTAN),
Note : Endemic to Eastern Himalaya.

Duhaldea DC.

Key to the species :

1. Leaves sessile; capitula heterogamous; ray florets tubes dilated *D. rubricaulis*
 + Leaves petiolated; capitula a loose corymbose ; ray floret tube not dilated *D. nervosa*

Duhaldea nervosa (Wallich ex DC.) AA. Anderberg in Pl. Syst. Evol., 176 (1-20: 104. 1991; Grierson & Springate in Grierson & Long., Fl. Bhutan 2(3): 1496. 2001. *Inula nervosa* Wallich Cat.no. 2960, *nom nud.* ; Kumar & Singh, Astera. Sikkim 110. 2001.

Shrubs upto 2 m tall. **Stem** decumbent, simple, sparsely hairy, strigose. **Leaves**; petiole to 5 mm long; elliptic **lamina** 4 – 13 x 1.5 – 4 cm, acute or acuminate, base cuneate, margin distantly serrate, , sparsely pilose ob both surfaces. **Capitula** 1 or few, loosely corymbose. **Involucre** 5 (-8) serrate; inner phyllaries linear lanceolate acute to acuminate, purple. **Outer phyllaries** suberect, dilated above. **Ray florets** tubes dilated above; ligule white. **Achenes** to 2 mm long, sericous; **pappus** white as long as disc flower.

Flower : July *Fruit*: October
Exsiccatu : On way to Rachela towards NNP border 1950 m, **SR Lepcha & AP. Das** 0230, date 13.10.2005.
Status : Less Common.
Local Distribution : Rachela Durpinay, 1600 – 2400 m.
General Distribution : HIMALAYAS AND N.E. REGION; INDIA, NEPAL, BHUTAN, CHINA, MYANMAR.

Duhaldea rubricaulis (Wallich ex DC.) AA. Anderberg in Pl. Syst. Evol., 176 (1-20): 104. 1991.
Inula rubricaulis Clarke, Comp. Ind. 126. 1876; Hook.f. in Fl. Brit. India 3: 296. 1881; Hara *et al.* Enum. Fl. Pl. Nepal 3: 31. 1982; Hajra *et al.*, Fl. India 13: 25. 1995; Kumar & Singh, Astera. Sikkim 110. 2001. *Amphiraphis rubricaulis* DC., Prodr. 5: 343. 1936.

Shrubs upto 2 m tall. Stem flexuous, pubescent. **Leaves** sessile; lamina 8 - 13 x 3 – 5 cm, elliptic-lanceolate, acuminate, serrate, glabrous, nerves parallel. **Heads** heterogamous, to 2 cm in diam., in a cluster of 3 - 5 borne in axillary racemes; peduncles stout and tomentose. **Involucral** bracts upto 0.9 cm long, lanceolate, acuminate, purple. **Ray florets** revolute, yellow; **ligules** to 0.5 x 0.4 cm, trilobed. **Disc florets** tubular, yellow. **Ray floret** achenes to 0.3 cm long, cylindrical; disc floret achenes to 0.13 cm long, hairy. **Pappus** to 0.6cm long, white.

Flower : December 0- February *Fruit*: June - April
Exsiccatu : On way to Rachila 2050 m, **SR Lepcha & AP. Das** 0229, dated 13.10. 2005.
Status : Less Common.
Local Distribution : Rachela Durpinay, 1800 m.
General Distribution : INDIAN PART OF SUBTROPICAL HIMALAYAS AND N.E. REGION, NEPAL, BHUTAN, MYANMAR, CHINA.

Erigeron Linnaeus

Erigeron karvinskianus DC., Prodr. 5:85. 1836, Contree Gray Herb. n.s. 52: 30. 1917; Fl. Java 2: 385. 1965; Kitamura & Gould in Enum. Fl. Pl. Nepal 3: 27. 1982 ; Hajra in Hajra *et al.* Fl. India 12: 122. 1995. Grierson & Springate in Grierson & Long., Fl. Bhutan 2(3): 1540. 2001; Kumar & Singh, Astera. Sikkim 96 . 2001. *E. mucronatus* DC., Prodr. 5: 285. 1836. *Vittadenia triloba* auct. DC.: Fl.E.Him. 1: 347. 1966.

Herbs, perennial, rhizomatous, diffused tufted upto 50cm.. **Stem** much branched from base. **Leaves** lamina 0.5 -1.7 x 0.3 - 0.6cm, sessile, alternate, lanceolate, (basal leaves larger and variable, often lobed), subtentire, acute, base narrowed, hairy both sides, uninerved. Peduncles upto 6.5cm, thinly hairy. **Inflorescence** solitary, terminal - axillary, Heads upto 2.5cm across, radiate. **Involucral** ca. 4mm, 3 - 4 seriate, **Phyllaris** lanceolate, acuminate, pubescent, mid vein brownish. Ligule white, raelly becoming pink or fading. **Ray-florets** usually 2 seriate, longer than disc florets, white or even pink. **Disc corolla** yeallow. **Achenes** oblong. **Pappus hairs** upto 0.22cm, light white.

Flower : March – October *Fruit*: July – December
Exsiccatu : Kupup lake 4050m, **SR Lepcha & AP. Das** 30826, dated 29.07.2005.
Status : Common
Local Distribution : Karponang, Kyongnosla, 1600 – 2200 m.

General Distribution : Native of NEW ZEALAND; naturalised in SUBTROPICAL-TEMPERATE CENTRAL ASIA.

Eupatorium Linnaeus

Eupatorium adenophorum Sprengel, Syst. Veg. 3: 420. 1826; Contree Gray Herb. n.s. 60: 85. 1919 (in obs.); Blumea 1:502. 1935; Hara in Fl.E.Him 1:339. 1966; 2:137. 1971; Kitamura & Gould in. Enum. Fl. Pl.Nepal 3: 27. 1982; Grierson & Springate in Grierson & Long., Fl. Bhutan 2(3): 1624. 2001; Kumar & Singh, Astera. Sikkim 100. 2001. *E. glandulosum* H.B.K. Nov. Gen. & Sp. 4: 122. 1820; *non* Michaux (1803); Journ. Bom. Nat. Hist. Soc. 64 (1): 83. 1967.

Local Name: Vongnokbu (Lep.) Kalo Banmara (Nep.).

Undershrubs, perennial upto 1m tall. **Stem** reddish, covered with fulvous-glandular hairs, reddish. **Leaves** opposite, rhomboid-elliptic or almost triangular, **lamina** 3 - 8 x 1.7 - 4 cm, crenate-serrate, acute, base cuneate, dark green, coarse, almost glabrous above, glandular-hairy beneath. **Flowers heads** 0.5 cm across, discoid, arranged in corymbs. **Involucral bracts** tri-seriate. **Florets** white, longer than involucre. **Achenes** 5-angled, linear-oblong, glabrous. **Pappus** less than 0.4cm long, hairs minutely barbed, ash white.

Flower : June - September *Fruit*: July - October
Exsiccatus : Rigu 1700 m, **SR Lepcha & AP. Das** 0221, dated 15.08.2005.
Status : Common.
Local Distribution : Rigu, Southern Pangolakha, 1700 - 3300 m.
General Distribution : Pantropic weed. Native of Mexico..
Note : Dried leaves used extensively as potent manure in the cultivation of ginger. (Rai & Das, 2005)

Galingsoga Ruiz & Pavon

Galingsoga parviflora Cavailles Ic. Descr. Pl. 3: 41. t. 281. 1795; Hook.f., Fl. Brit. India 3: 311. 1881; Grierson & Springate in Grierson & Long., Fl. Bhutan 2(3): 1610. 2001; Kumar & Singh, Astera. Sikkim 101. 2001.

Herbs upto 70 cm. stems pubescent above. **Leaves**; petiole to 1.5 cm; ovate - lanceolate, **lamina** 1.8 - 5 x 1.6 - 4cm, acuminate, rounded or attenuated at base, shallowly seriate to crenate, ciliate and sparsely pilose on both surfaces; peduncles short pubescent, glandular eglandular. **Involucral** outer phyllaris to to 3.5mm, inner ones to 4mm, ovate. Outer palea oblong- elliptic, to 4.3 mm, ; inner palea oblanceolate; to 3.4 mm, free, trifids. **Ligule** to 1.7 mm. Disc corolla to 13 mm. Ray achene 2 mm, pappus of bristle, to 0.3 mm. Disc achenes 1.6mm.

Flower & Fruit : July - September
Exsiccatus : On way to Panglakha 2950 m, **SR Lepcha & AP. Das** 27717, dated 30.09.2004.
Status : Less common
Local Distribution : PWS, 3500 - 4300 m.
General Distribution : Cosmopolitan weed; native of TROPICAL AMERICA.

Gnaphalium Linnaeus

Gnaphalium luteo-album L., Sp. Pl. 851. 1753; Hook.f., in Fl.Brit.India 3: 288. 1881. subsp. *affine* (D. Don) Koster in Blumea 4 (3): 484. 1941; Hajra in Hajra *et al.* Fl.India 13: 87. 1995; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1581.2001; Kumar & Singh, Astera. Sikkim 103. 2001. *Gnaphalium affine* D. Don., Prodr. Fl. Nep.173. 1825; Hook. f., in Fl. Brit. India 7: 288. 1881; Hara *et al.* Fl. E. Him. 1: 339. 1966; 3: 116. 1975; Hara *et al.* Enum.Fl. Pl. Nepal 3: 29. 1982. *G. luteoalbum* var. *multiceps* (Wallich ex DC.) Hook. f. in Fl. Brit. India 3: 288. 1881; Kumar & Singh, Astera. Sikkim 103. 2001.

Herbs, annual, erect upto 25 cm tall. **Stem** usually unbranched, white hairy. **Leaves** sessile, half-clasping, **lamina** 1.5 - 5 x 0.5 - 0.8 cm, oblong spatulate, entire, acute to rounded, gray, or white wooly-haired, usually medianly uninerved. **Flowers**-heads small upto 0.5 cm across, globular, clustered in solitary, or dense branched, bright yellow. **Involucral** bracts 0.30cm, oblong, papery. **Ray florets** absent. **Disc florets** tubular, outer female, inner ones bisexual. **Style** arms truncate.

Flower & Fruit : February - October

Exsiccatus : Padamchen - Zuluk 2200 - 3600 m, *SR Lepcha, & AP. Das* 20225, dated 29.10.2004.

Status : Most Common

Local Distribution : Padamchen above 2800 m, KAS, PWS, 2200 - 3300m, 1400 - 3600 m.

General Distribution : HIMALAYAS, MYANMAR, THAILAND, INDO-CHINA, JAVA, CHINA AND JAPAN.

Gynura Cassini

Key to the species:

1. Leaves sessile,; lamina rhombic or ovate to elliptic-lanceolate... *G. nepalensis*
+ Leaves petiolated; lamina oblong or oblanceolate..... *G. cusimbua*

Gynura cusimbua (D. Don) S. Moore in Journ. Bot. 50: 212. 1912; Kitamura in Fl. E. Him. 1: 340. 1966; Chater & Kitamura in Enum. Fl.PI.Nepal 3: 29. 1982; TBRI 50(4): 115. 1987; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1600.2001. *Cacalia cusimbua* D.Don., Prodr. 179. 1825. *Gynura angulosa* DC. Prodr. 6: 298. 1837; Hook.f., in Fl. Brit. India 3: 334. 1881.

Herbs upto 1.5 m tall. **Leaves** sessile, alternate, , oblong or oblanceolate, **lamina** 8 - 22 x 3 - 7 cm, margin irregularly toothed, acuminate, base attached to stem (base of upper leaves often lobed), glabrous to sparsely hairy, mid-nerve prominent and impressed above, elevated beneath, lateral nerves upto 22 pairs. **Flowers** in both terminal and axillary corymbs. **Involucral** bracts un-iseriate with scarious margins. Flower heads many, 1.2-1.8cm across, discoid. **Pappus** hairs whitish. **Achenes** ribbed and glabrous.

Flower : October - January *Fruit* : December - March

Exsiccatae : Dohrok 2300 m, *SR Lepcha & AP. Das* 30242, dated 06.10.2004.

Status : Frequent. Padamchen - Zuluk 2400 m - 3700 m, *SR Lepcha & AP. Das* 20216, dated 08.10.2004.

Local Distribution : Rachel, Mulkharka, Kyongnosla, Dohrok 1900 - 3300 m.

General Distribution : HIMALAYAS; INDIA-Nilgiri, MYANMAR, THAILAND, CHINA.

Gynura nepalensis DC., Prodr. 6: 300.1838; C.B. Clarke, Comp.Ind. 171.1876; Hook.f., in Fl. Brit. India 3: 333.1881; Kitamura in Fl.E. Him.340. 1966; 2: 137.1971; Hara *et. al* Enum Fl. Pl. Nepal 3: 30.1982 ; Hajra in Hajra *et al.* Fl. India 12: 310. 1995; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1600. 2001; Kumar & Singh, Astera. Sikkim 106. 2001.

Cacalia aurantiaca Wallich., Cat. 108 n.3146. 1831, *nom.nud.* *Cacalia foetens* Wallich., Cat. 108, n 3156, 1831, *nom.nud.* *Gynura foetens* DC., Prodr. 6: 300. 1838.

Shrubs perennial, bushy, tuberous upto 1.5 m tall. **Stem** corymbosely branched above. **Leaves**; petiolate (petiole upto 1.3 cm); rhombic or ovate to elliptic-lanceolate acute to acuminate , margins incised with mucronate teeth, **lamina** 2 - 22 x 2 - 7 cm with white hairs in upper surface , base cuneate into sessile. **Flowers** ; capitula discoid campanulate, slightly longer than broad, bracteolate, **bracteole** linear, subulate with white hairs on margins; bracts 14; linear lanceolate pubescent, scarious margiss. **Involute**; phyllaries narrowly oblong. **Florets** yellow. **Achenes** dark brown, cylindrical, pubescent, or glabrous, many ribbed. **Pappus** of white, slender hairs.

- Flower & Fruit* : March- May
Exsiccatae : Rachela – Panglakha 3100 m, *SR Lepcha & AP. Das* 31009, dated 02.10.2004; Dohrok 2300m, *SR Lepcha & AP. Das* 30242, dated 06.10.2004.
Status : Common
Local Distribution : Kyongnosla, Changu, Zuluk (3000 – 3800 m)
General Distribution : HIMALAYAS; INDIA (Kashmir- Assam, Sikkim) NEPAL, MYANMAR, BHUTAN, TIBET, CHINA.

Lactuca Linnaeus

Key to the Species

1. Rhizomatous herbs without stem; leaf margin entire or distantly toothed *L. cooperi*
+ Non- rhizomatous herbs with simple stem; leaf margins irregularly toothed *L. graciliflora*

Lactuca cooperi Anthony in Notes Roy. Bot. Gard. Edinb. 18: 198. 1934; Mangain & Rao in Hajra *et al.* Fl. India 12: 276. 1995; Kumar & Singh, Astera. Sikkim 114. 2001.

Youngia depressa (Hook.f & Thoms.) Babcock & Stebbins Gen. Youngia (publ. Carnegie Inst. Wash. No 484. 33.1937; Grierson & Springate in Grierson & Long. Fl. Bhutan 2(3): 1454. 2001.

Herbs, perennial with long rhizomes, stem absent. **Leaves**; petiole to 5 cm long, pubescent; all radicals, **lamina** oblong, ovate or orbicular, cordate at base, entire or minutely distantly denticulate, glabrescent. **Capitula** numerous; heads cylindric to 5.5 cm long, 10 – 15 flowered. **Flower** yellow. **Involute** cylindrical, crimson; outer phyllaries lanceolate, inner narrowly oblong- lanceolate. **Corolla** tube to 10 mm long, exceeding ligule; ligule 9 x 2.5 mm. **Achenes** upto 6.5 mm long, compressed 9 ribbed, oblong lanceolate, hispid towards apex, contracted at beak. **Pappus** to 10 mm long, whitish, or slightly reddish brown, shining.

- Flower & Fruit* : August – October
Exsiccatus : Bhimbase – Lampokhri 4300 m, *SR Lepcha & AP. Das* 20455, dated 10. 08. 2004.
Status : Not common
Local Distribution : Kupup, Bhimbase 4300 m.
General Distribution : INDIA (Sikkim), BHUTAN, Chumbi (TAR)

Note : Endemic to Eastern Himalaya

Lactuca graciliflora DC., Prodr. 7: 139. 1838; Hook.f. in Fl.Brit.India 3: 406. 1881; Hara *et al.* Enum. Fl. Pl. Nepal 3: 32. 1982; Hajra *et al.* Fl. India 12: 289. 1995. Kumar & Singh, Astera. Sikkim 115. 2001. *Lactuca rostrata* (Bl.) O. Kuntze, Rev. Gen. Pl. 1: 349. 1891; Hara in Fl. E. Him. 1: 341. 1966. *Stenosseris graciliflora* (Wall. Ex Dc.) C. Shih in Acta Phytotax.sin,29(5):431. 1991.

Herbs erect leafy upto 65 cm tall. **Stem** simple, sometimes branched above, stout at base. **Leaves**; petioles upto 3 cm long); lower ones pinnate or pinnatifid, terminal lobe triangular-ovate, irregularly toothed, upper ones sessile, ovate to lanceolate, glabrous both surfaces. **Panicles** spreading, large, upto 50 cm long, open; peduncles slender. **Heads** many, upto 1 cm long, drooping, white, glabrous; bracts to 0.9 cm, spatulate. **Ray florets** purple. **Achenes** narrowly oblong or often oblanceolate; **Pappus** white.

Flower : September - December *Fruit*. October - April
Exsiccatus : Rachel 2980 m, **SR Lepcha & AP. Das** 0228, dated 13.10.2005
Status : Less Common.
Local Distribution : Rachel Durpinay, Middle Rachel, 1800 – 2900 m.
General Distribution : HIMALYA; INDIA,(NEPAL – BHUTAN), JAVA, SUMATRA., W. CHINA.

Ligularia Cassini

Key to the species:

1. Stems densely covered with velvety tomentum *L. kingiana*
+ Stem glabrescent or slightly pubescent , 2
2. Leaf lamina broadly ovate to suborbicular *L. retusa*
+ Leaf lamina reniform – cordate *L. hookeri*

Ligularia hookeri (C.B. Clarke) Handel – Mazzetti in Engler, Bot. Jahrb. 69: 127. 1938; Hajra *et al.* Fl. India 13: 230.1995; Grierson & Springate in Grierson & Long. Fl. Bhutan 2(3): 1575. 2001 ; Kumar & Singh, Astera. Sikkim 126. 2001.

Cremanthodium hookeri C.B. Clarke, comp. India, 169.1876; Hook.f., Fl. Brit. India 3: 331. 1881.

Herbs perennial upto 60 cm. **Stem** erect, glabrescence – pubescent; surrounded by leaves remain at base. **Leaves**; petiole to 1.6 cm; basal leaves reniform – cordate; **lamina** 2.5 – 10 x 2.2 – 50 cm; obtuse, deeply cordate at base, sharply dentate, glabrous to punberulous in upper surface, subglabrous ro puberulus below; Cauline leaves similar to basal leaves. **Inflorescence** erect, racemose, hairs on apex of peduncle and base of involucre, rarely extending to phyllaries. **Capitula** 1 – 9; ligule more than 4 x width. **Disc corolla** lenth 1.2 x 3.2 mm, limp narrowly infundibular, toothed. **Achenes** oblong. **Pappus** white.

Flower & Fruit : July – September
Exsiccatus : Nathang 3950 m, **SR Lepcha & AP. Das** 30851, dated 29.07.2005.
Status : Less common
Local Distribution : Nathang, Kupup, 2500 – 4400 m.
General Distribution : E.HIMALAYA; INDIA (Sikkim), NEPAL. BHUTAN.
Note : Endemic to Eastern Himalaya.

Ligularia kingiana (W.W. Smith) Handel – Mazzetti in Journ. Bot., London 76: 289. 1938; R. Mathur in R.R. Rao *et al.* Fl. India Enum. Aster. 53. 1988; Hajra in Hajra *et al.* Fl. India 13: 235. 1995; Grierson & Springate in Grierson & Long. Fl. Bhutan 2(3): 1575. 2001; Kumar & Singh, Astera. Sikkim 128. 2001.

Senecio kingianus W.W. Smith in J. Pro. As. Soc. Bengal 7: 71.1911.

Herbs perennial, erect upto 1.5 m tall. Stem erect densely covered with velvety tomentum, corymbosely branched. **Leaves;** petiole to 30 - 45cm long, not winged; radcial leaf broadly orbicular – cordate, **lamina** 32 x 42 cm, obtuse, deeply cordate, mucronately denticulated; glabrous on upper surface, lower surface pubescent – velvety tomentum on veins; cauline leaves alternate, orbicular or reniform, denticulated, tomentose, base sheathing; sheath much dilated. **Capitula** narrowly radiate, campanulate, 9 x 2-5mm, 3 – 7flowered; bracteolate, bracteoles 3-5, to 4 mm, subulate. **Involucre** narrowly campanulate; bract oblong, suotuse, rare acute, with narrow scarios margins. 2. 8 mm in diam; **phyllaries** 5 - 8 oblong. **Ray flowers** 3-4, linear, apex denticulated. Disc frorets hermaphrodite, tunular. Corolla tube to 6.3 mm.; ligule to 13 mm. **Achenes** cylindrical – oblong, papus of short white hairs, to 11 mm. **Pappus** to 5 mm, white.

Flower & Fruit : July – September

Exsiccatus : Donkyala 3950 m, **SR Lepcha & AP Das** 0301, dated 13.07.2005.

Status : Not common

Local Distribution : Gnathang, Chhangu, Donkyala, PWS, 3200 – 4300 m.

General Distribution : E. HIMALAYA; INDIA (Sikkim)

Note : Endemic to E. Himalaya (Sikkim).

Ligularia retusa DC., Prodr. 6: 314. 1838. Hajra *et al.* 13: 317. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1574. 2001; **Cremanthodium retusum** (DC.) R. Good in Journ.Linn. Soc. Bot. 48: 278. 1929; Kumar & Singh, Astera. Sikkim 87. 2001.

Senecio retusus (Wallich ex Dc.) C.B. Clrake, Comp. India 206. 1876; Hook. f., Fl. Brit. India 3: 350. 1881.

Herbs perennial upto 1 m tall. **Stem** blackish, usually pubeulant towards apex. **Leaves;** petiole to 25 cm; broadly ovate to suborbicular, **lamina** 5.5 – 19 x 8 – 20 cm, deeply cordate, toothed, slightly glabrous on both upper and lower surfaces, cauline leaves sub-orbicular, bearing sheaths, radical leaves reniform. **Capitula** mostly 2 – 9 in panicles racemes, sometime solitary, Involucral to 2.7 cm in diam; phyllaries lanceolate, dark. **Ray corolla** yellow; **ligule** oblanceolate, toothed. **Disc corolla** short to 1.3 cm. **Achenes** oblong. Pappus white.

Flower : July - September

Exsiccatus : Lampokhri 4050 m, **SR Lepcha & AP. Das** 0206, dated 07.07.2005

Status : Not common

Local Distribution : Lampokhri, PWS, 3600 – 4500 m.

General Distribution : E. HIMALAYAS; INDIA (Sikkim)

Note : Endemic to the Eastern Himalaya.

Myriactis Lessing

Key to the Species

1. Leaves subsessile- sessile; flower heads globose; involucre bracts reflexed
 *M. nepalensis*
 + Leaves petiolated (winged) rarely sessile; flower heads semi-globose;
 involucre bracts not eflexed *M. wallichii*

Myriactis nepalensis Lessing in *Linnaea* 6: 128, t. 2F, 1831; C.B. Clarke, *Comp. India* 38. 1876; Hook f. in *Fl. Brit. India* 3: 247. 1881; Kitamura in *Fl. E. Him.* 342. 1966; 2: 139. 1971; 3: 117. 1975; Hajra in Hajra *et al.* *Fl. India* 12: 134. 1995; Grierson & Springate in Grierson & Long *Fl. Bhutan* 2(3): 1529. 2001; Kumar & Singh, *Astera. Sikkim* 130. 2001.

Lavenia dentata Wallich, *Cat.* 111, n. 3216. 1831, *nom. nud.* *Lavenia sphaerantha* Wallich, *Cat.* 111, n.3217. 1831, *nom. nud.* *Myriactis wallichii* Lessing in *Linnaea* 6: 129. 1831.

Herbs annual, 15-50cm tall hispid or glabrous. **Stem** prominently ribbed, glabrous at base and centre. hispid or glabrous. **Leaves** lamina 6 - 15 x 2.5 - 3, lanceolate or ovate, equally serrate, usually sub-sessile but sometimes sessile. **Flowers** heads globose, borne on short and rigid peduncles, oftenly sub-paniculate. **Involucre** bract, usually acute, reflexed. **Ray florets** ca 10-seriate. **Disc florets** very few. **Achenes** mucronate, Ca 1.5 mm long.

Flower : June *Fruit:* October
Exsiccatus : Nathang - Panglakha 3390m, **SR Lepcha & AP. Das** 27789, dated 30.09.2009.
Status : Common.
Local Distribution : Kyongnosla, Nathang - Panglakha 1700 - 3300 m.
General Distribution : INDIA (Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir, Sikkim, U.P.) AFGHANISTAN, BHUTAN, CHINA, IRAN, AND NEPAL.

Myriactis wallichii Lessing in *Linnaea* 6: 129.1831; Hook f., *Fl. Brit. India* 3: 247. 1881; Hajra in Hajra *et al.* *Fl. India* 12. 135. 1995; Grierson & Springate in Grierson & Long., *Fl. Bhutan* 2(3): 1530. 2001. Kumar & Singh, *Astera. Sikkim* 130. 2001.

Herbs, annual slender, rather low herbs, upto 25cm tall. **Leaves** elliptic lanceolate; petiolate, petiole often winged rarely sessile in upper part; **lamina** 1.5 - 6 x 0.4 - 2.5cm, elliptic lanceolate, unequally serrate, hispidulous on both surfaces,. **Flower** heads semi-globose slender pedicelled forming a wide paniculates inflorescence. **Involucre** bracts 2 - 3 seriate, lanceolate, erect not reflexed. **Ray florets** 3 - 5 seriate, ligule ovate, tip notched, style bifid. **Disc florets** 1mm long, 5 lobed, companulate. **Achenes** flattered smooth.

Flower : June *Fruit:* August
Exsiccatus : Durpiney dara (NNP border) 2400 m, **SR Lepcha & AP Das** 29383, dated 30.09.2004.
Status : Common.
Local Distribution : Durpiney dara, Above Dohrok, 2200 - 4000m.
General Distribution : INDIA (Himachal Pradesh, Sikkim, Uttar Pradesh) JAVA, NEPAL.

Saussurea DC.

Key to the species:

- | | |
|---|--------------------------|
| 1. Plants more than 50 cm tall | 2 |
| + Plants less than 50 cm tall | 3 |
| 2. Achene oblong | 4 |
| + Achene oblanceolate | <i>S. candolleana</i> |
| 4. Herbs less than 1 m tall | 5 |
| + Herbs more than 1 m tall | <i>S. deltoidea</i> |
| 5. Capitula 3 – 15; pappus oftenly fused in a ring | <i>S. auriculata</i> |
| + Capitula usually solitary, at branch end; pappus not fused in a ring | <i>S. uniflora</i> |
| 3. Flowers with solitary capitula | 6 |
| + Flowers with numerous capitula | <i>S. gossipiflora</i> |
| 6. Phyllaries mostly linear lanceolate | <i>S. taraxactifolia</i> |
| + Phyllaries obovate, oblong or oblanceolate | <i>S. eriostemon</i> |

Saussurea auriculata (Sprengel ex DC.) Sch. Bip. in *Linnaea* 19: 331. 1846; Hara in *Fl. E. Him.* 2: 139. 1971; 3: 117. 1975; Chatter & Kitamura in *Enum. Fl. Pl. Nepal* 3: 38. 1982; Hajra in Hajra *et al.* *Fl. India* 12: 192. 1995; Grierson & Springate in Grierson & Long., *Fl. Bhutan* 2(3): 1442. 2001. Kumar & Singh, *Astera. Sikkim* 139. 2001.
Cnicus auriculatus Wallich, *Cat.* 100 n. 2899. 1831. *Aplotaxis auriculata* Spreng. ex DC., *Prodr.* 6: 541. 1838. *Saussurea hypoleuca* Spreng. ex C.B. Clarke, *Comp. Ind.* 234. 1876; Hook. f. in *Fl. Brit. India* 3: 374. 1881.

Herbs, perennial, erect 95 cm tall. **Stem** leafy, branched or sometime unbranched above. **Leaves** auriculate basally, lower ones usually larger than upper ones, **lamina** 6 - 16 x 4 - 8 cm, pinnately lobed, terminal lobe slightly larger, triangular; thinly hairy and rough above, and white felted beneath. Capitula usually solitary, at branch end. **Flower** heads usually upto 4.5cm diam., globular, usually solitary, consisting of **disc florets** only. **Involucral bracts** usually many, linear or nearly lanceolate, rarely recurved, purple. **Receptacle** with bristly scales. Achene obovate, with 2 rows of pappus, inner ones being slightly longer bases of **pappus** oftenly fused in a ring.

Flower : July - September *Fruit*: September - January
Exsiccatus : Premlakha – Panglakha 2400 – 3100 m, **SR Lepcha & AP. Das** 20225, dated 29.10.2010.

Status : Common.

Local Distribution : Premlakha, Jorpokhari, Rachel Peak. 2700 – 3100 m.

General Distribution : HIMALAYAS; INDIA, (Jammu & Kashmir – Sikkim), NEPAL, BHUTAN

Note : Endemic to the Himalaya.

Saussurea candolleana Wallich ex DC., *Prodr.* 6: 541. 1838, *pro syn.* *S. candolleana* Wallich ex Sch.- Bip. In *Linnaea* 19: 331. 1846. Grierson & Springate in Grierson & Long, *Fl. Bhutan* 2(3): 1450. 2001; Kumar & Singh, *Astera. Sikkim* 141. 2001.

Aplotaxis candolleana DC., *Prodr.* 6: 541. 1838; Hook. f., *Fl. Brit. India* 3: 372. 1881.

Herbs upto 1 m tall narrowly winged, thinly puberulous, **Leaves** lamina 5 – 13 x 1.5 – 5.5, cauline leaves narrowly ovate elliptic, acuminate, narrowed and decurrent at base, remotely denticulate or finely dentate, sparsely puberulous or minutely scabridulous above, araceous beneath. **Flowers** in terminal or axillary corymb, dense 10-20. **Involucral** to 5mm in diam. **Phyllaries** obovate, acuminate – narrowly oblong or oblanceolate, acute or obtuse, dark violet at apex; outer ones sparsely araceous. **Corolla** upto 12mm including lobes. **Achenes** oblanceolate, compressed; pappus double, brownish, inner series upto 10mm, outer series upto 5mm, scabrid, caduceus.

Flower & Fruit : July – October
Exsiccatus : Padamchen – Panglakha 2800 m, **SR Lepcha & AP. Das** 32880, dated 27.10.2004.
Status : Common
Local Distribution : Kyongnosla – Changu 3000 – 4500 m
General Distribution : PAKISTAN, HIMALAYAS; INDIA, NEPAL, BHUTAN.

Saussurea deltoidea (DC.) C.B. Clarke, Comp. India 235.1876; Hook.f. in Fl.Brit.India 3: 374. 1881; Act. Phytotax. Geobot. 19: 13. 1961; Hara *et al.* Fl. E.Him.1: 342.1966; 2: 140. 1971; Hajra in Hajra *et al.* Fl. India 12:197.1995; Grierson & Springate in Grierson & Long., Fl. Bhutan 2(3): 1442.2001.; Kumar & Singh, Astera. Sikkim 143. 2001.
Aplotaxis deltoides DC., Prodr. 6:541. 1838.

Herbs, perennial, erect upto 2 m tall. **Stem** branched above, white hairy. **Leaves** with short petioled (0.2 - 0.5 cm); leaf lamina 2.5 – 7.5 x 1.5 - 2.8 cm, upper-deltoid or triangular ovate, lower lyrate-pinnatifid, sinuate-toothed, acute, base narrow, above glabrous and greenish, beneath white-tomentose, nerves usually prominent below. **Flower heads** 1.5 - 2 cm long, peduncled, usually scattered or nodding paniced. **Involucral bracts** ovate, purple margins. **Pappus** single. **Achenes** oblong, 4-5 angled.

Flower : September – December *Fruit*: October - January
Exsiccatus : Bhimbase – Donkyala 4200 m, **SR Lepcha & AP. Das** 31474, dated 28.07.2005;
Status : Less Common.
Local Distribution : Tinsimana, Jorpokhari, 2000 – 3000 m.
General Distribution : HIMALAYAS, INDIA, NEPAL, BHUTAN), MYANMAR, INDO-CHINA, CHINA, TAIWAN, THAILAND

Saussurea eriostemon Wallich ex C. B. Clarke Cent.: Wall. 2912 (type of *S. eriostemon*); olunin 1466. East: Stainton 1141; Nishioka 673; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1446.2001; Kumar & Singh, Astera. Sikkim 149. 2001.
Saussurea nepalensis Spreng., Syst. Veg. 3: 380. 1826.

Herbs upto 25 cm tall fibrous with leaf remains. **Leaves** lamina 5 – 15 x 1 – 4 cm, basal leaves pinnatisects, oblanceolate in outline, though slightly paler beneath, pubescent in veins particularly beneath; lateral segments 4 – 8 pairs, ovate or oblongacute or rounded, mucronate, denticulate or toothed. **Flowers** in solitary capitula. **Involucral bracts** campanulate, **Phyllaries** subglabrous, dark purplish margined. Outer ones ovate lanceolate with upper part sparsely araceous. **Corolla** upto 12mm including lobes. **Achenes** oblanceolate, compressed; **pappus** double, brownish, inner series upto 10mm, outer series upto 5mm, scabrid, caduceus.

Flower & Fruit : July – October

Exsiccatu : Kupup lake 4200 m, **SR Lepcha & AP. Das** 0717, dated 10.10.2002.
Status : Common
Local Distribution : Changu, Baba mandir, 3000 – 4500 m
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, S. TIBET.
Note : Endemic to Himalaya.

Saussurea gossipiphora D.Don in Mem.Wern.Nat.Hist.S.3: 414.1821; Hook.f., in Fl.Brit. India 3: 376; 1881; Chater & Kitamura in Enum. Fl. Pl. Nepal 3: 39.1982; Hajra in Hajra *et al.* Fl.india 12: 200. 1995; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1436. 2001; Kumar & Singh, Astera. Sikkim 145. 2001.

Aplotaxis gossipiphora DC., Prodr.6: 54. 1838.

Herbs, upto 30 cm tall. **Stem** covered with long white wooly hairs. **Leaves** linear, usually embedded in dense wooly hairs, runcinate pinnatifid, **lamina** 3 – 12 x 2 – 0.8cm, sessile. **Flowers** head cylindrical, sometimes few to many, embedded in wooly hairs. **Involucral** bract linear oblong, short, wooly. **Receptacle** pitted, bristles equaling achenes. **Corolla** purple. **Anthers** tails slender, nearly entire. **Achenes** narrowly obovoid; **papus** hairs few, scabrid or absent.

Flower & Fruit : July – August
Exsiccatae : Kupup – Bhimbase 4100 m, **SR Lepcha & AP. Das** 104, dated 13.10. 2007. Lam pokhri – Kupup 3990 m, **SR Lepcha & AP Das** 109, dated 17.10.2007.

Status : Less Frequent.
Local Distribution : Sherabathang, Kupup, Nathula upto 4400 m,
General Distribution : HIMALAYAS; INDIA (Jammu & Kashmir to Sikkim), BHUTAN, S. TIBET, S.W. CHINA (YUNNAN), NEPAL.

Note : Endemic to Himalaya

Saussurea taraxacifolia Wallich (Cat.100,n.2914.1831, *nom.nud.*) ex DC., Prodr.6: 532. 1838; C.B. Clarke, Comp.India 228. 1876; Hook.f.in Fl.Brit.india 3: 368. 1881; Chater & Kitamura in Enum Fl. Pl. Nepal 3: 40. 1982; Hajra in Hajra *et al.* Fl.India 12: 214. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1448.2001. Kumar & Singh, Astera. Sikkim 155. 2001.

Cyathidium taraxacifolia Lindl. Royle. 111. B. Him.251, t.56, t.2. 1835. *S.caespitosa* Wallich, Cat. 2913. 1831.

Herbs upto 30cm tall, senesed leave base surrounding several shoots. **Leaves** lamina, 20 – 1130 x 4 – 30 mm, deeply pinnatisect, linear in outline, subglabrous above, white araneous beneath; lateral lobes pairs, triangular to oblong, retrose rarely spreading, mucronate. **Flowers** in solitary. **Involucral bracts** to 10 mm in diam. **Phyllaries** mostly linear lanceolate, subglabrous or sparsely araneous; corolla upto 20mm including lobes. **Achenes** ribbed., **Pappus** double inner brownish, outer sparsely plumose.

Flower & Fruit : July – October
Exsiccatae : Lampokhri 4200 m, **SR Lepcha & AP. Das** 30238, dated 24.07.2005.
Status : Less Frequent.
Local Distribution : Lampokhri, Bhimbase, 3000 – 4500 m
General Distribution : HIMALYAS; INDIA(Jammu & Kashmir to Arunachal Pradesh), NEPAL, BHUTAN, S. CHINA, TIBET.

Note : Endemic to Himalaya

Saussurea uniflora (DC.) Wallich ex Sch.-Bip. In Linnaea 19: 330. 1846; Hook.f., Fl. Brit. India 3: 366. 1881; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1439. 2001; Kumar & Singh, Astera. Sikkim 156. 2001. *Aplotaxis uniflora* DC., Prodr. 6: 539. 1838.

Herbs erect upto 70 cm tall. **Stem** sparsely whitist above surrounded by leaf remains. **Leaves** ; Petiole upto 13cm.; **lamina** 3 - 120 x 1.5 - 4 cm, ± acute subatenuate at base, denticulate sparsely pubescent on both sides, mid cauline leaves ± ovate, sessile, upper one dark red or purplish, membranous, enveloping capitula. **Flowers** in terminal corymb, capitula 3 - 15. Involucral; **phyllaries** ovate - linear, blackish or purple, sparsely villous. Corolla upto 13 cm including lobes. **Achenes** oblong; ribbed. **Pappus** double, inner upto 14mm, outer scabrid.

Flower & Fruit : July - December

Exsiccatus : Bhimbase 4200 m, *SR Lepcha & AP. Das* 0124, dated 13.08.2006.
Donkya 3800 m, *SR Lepcha & AP. Das* 022, dated 15.06.2004.

Status : Less Frequent.

Local Distribution : Bhimbase, Kupup, Donkyala 3050 - 4500 m

General Distribution : E. HIMALAYA; INDIA (Sikkim), NEPAL, BHUTAN.

Note : Endemic to Eastern Himalaya.

Senecio Linnaeus

Key to the species:

- 1. Herbs 2
- + Climbers *S. scandens*

- 2. Involucral bracts campanulate - broadly campanulate 3
- + Involucral bracts linear *S. biligulatus*

- 3. Leaf bracts 2 - 3, linear; pappus hairs reddish *S. raphanifolius*
- + Leaf bracts 10 -13 linear lanceolate; pappus hairs whitish *S. wightiana*

Senecio biligulatus W.W. Smith in JASB n.s. 7: 69.1911; Hara *et al.* Enum. Fl. Pl. Nepal 3: 41. 1982. Hajra in Hajra *et al.* Fl. India 13: 243. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1596.2001. Kumar & Singh, Astera. Sikkim 159. 2001.

Herbs, perennial, rhizomatous upto 1m tall. **Stem** usually flexuous, hairy. **Leaves** ; petioles winged and basally auriculate, auricles dentate; **lamina** 6 -10 x 2.2 - 5 cm, lanceolate, margin pinnatifid and lobed into triangular, dentate lateral lobes, hairy above. **Flowers**; capitula densely arranged in terminal corymb. **Involucral bracts** upto 0.5cm long, linear, obtuse at apex. **Ray florets** 0.35 - 0.8 cm, linear-oblong, yellowish. **Disc florets** 0.30 - 0.5cm long, yellow. **Achenes** slightly ribbed, glabrous. **Pappus** whitish.

Flower & Fruit : June - September

Exsiccatus : Mulkharka -Phusrey 2100 m, *SR Lepcha & AP. Das* 107, dated 03. 10.2003.

Status : Less Frequent.

Local Distribution : NNP border, Mulkharka, 2100 - 2600 m.

General Distribution : EASTERN HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR.

Senecio scandens Buch.-Ham. ex D. Don, Prodr. Fl. Nepal 178. 1825; Hook.f. in Fl. Brit. India 3: 352. 1881. Hara in Fl. E. Him.1: 344. 1966; 2: 140. 1971; Kitamura in Enum. Fl. Pl. Nepal 3: 42. 1982. Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1593. 2001. Kumar & Singh, Astera. Sikkim 162. 2001.

Climber, oftenly with crisscross branches. **Stem** stout, slightly grooved, glabrous. **Leaves** ; petiolate, 0.5 – 1.8cm; **lamina** 3 – 7.5 x 0.7 – 2.5cm, hastate, entire or coarsely toothed, acuminate, base oblique, green and usually glabrous above, thinly pubescent beneath, lateral nerves upto 7 pairs. **Flower** heads 0.5 - 0.8 cm long, bright yellow, usually clustered in lax lateral and terminal corymbs. **Involucral bracts** linear - oblong, glabrous. **Ray-florets** 0.3 cm, ligulate. **Achenes** slender, ribbed.

Flower : October – January *Fruit*: December – March
Exsiccatae : Padamchen 3100 m, *SR Lepcha & AP. Das* 31084, dated 08.10.2004.
Status : Common.
Local Distribution : Rachel, 1900 – 2600 m.
General Distribution : INDIA, MYANMAR, INDIA, SRI LANKA, PHILIPPINES, JAPAN, THAILAND, S. CHINA.

Senecio raphanifolius Wallich ex DC. 6: 366. 1836; Hajra in Hajra *et al.* Fl. India 3: 275. 1995; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1595. 2001; Kumar & Singh, Astera. Sikkim 162. 2001.

Senecion diversifolia Wallich ex DC., Prodr.6: 366; Hook.f. in Fl. Brit. India 3: 340. 1881

Herb perennial rhizomatous, tomentose upto 1.5m tall. **Leaves**; petiole expanded above to 8cm long; auricle or amplexicaul; **lamina** 6 x 25 x 1.5 – 6 cm, both radical and cauline, radical leaves oblanceolate, pinnatifid into a large terminal lobe and few lateral lobes, dentate. **Flowers** heads in spicate globose clusters, ca 0.4cm across, campanulate, bracteolate; bracteole 2-3, linear. Peduncle stout. **Involucral bracts** campanulate; bract brownish, oblong acuminate above. **Ray florets** 4 veined. **Disc florets** numerous. **Achenes** glabrous. **Pappus** reddish

Flower : July - October
Exsiccatae : Kyongnosla (Bombay hill) 3200 m, *SR Lepcha & AP. Das* 32818, dated 25.10.2004. Zuluk – Panglakha 2900 m, *SR Lepcha & AP. Das* 32858, dated 26.10.2004.
Status : Common
Local Distribution : Changu, Padamchen, Panglakha, Rachel 2800 – 3200 m,
General Distribution : E. HIMALAYA; INDIA, (Sikkim, Meghalaya), NEPAL, BHUTAN, CHINA, MYANMAR

Senecio wightianus DC. in Wight. Contrb. Bot. India 22. 1834; Hajra *et al.* Fl. India 3: 283. 1995

Herb, perennial scandants, glabrous. **Stem** branched. **Leaves** ; petiole auricled; leaves **lamina** 2.2 – 13 x 3 - 4 cm, pale green, elliptic lanceolate or hastate, acuminate, cordate, deeply dentate, and cauline, radical leaves oblanceolate, pinnatifid into a large terminal lobe and few lateral lobes, dentate. **Flowers** in corymbose pannicale with capitula radiate. **Involucral bracts** broadly

campanulately glabrous; bract 10 -13 linear lanceolate membranous, with broad scarious margin. **Ray florets** yellow, linear oblong. **Disc florets** yellow. **Achenes** ribbed. **Pappus** hairs white.

Flower : September – December
Exsiccatus : Padamchen – Nathang 4100 m, *SR Lepcha & AP. Das* 32872, dated 27.10.2004.
Status : Commn
Local Distribution : Kyongnosla, Serathang, Memenchu 3500 – 4000 m.
General Distribution : INDIA (Himachal Pradesh, Meghalaya, Tamil Nadu, NEPAL, BHUTAN, MYANMAR, CHINA, THAILAND, JAPAN, PHILLIPINES

Note : A new distribution record for Sikkim

Siegesbeckia Linnaeus

Siegesbeckia orientalis L., Sp. Pl. ed 1: 100. 1753; Hook.f. in Fl. Brit. India 3: 304. 1881; Hara in Fl. E. Him. 1: 344. 1966; 2: 140. 1971; Chater & Kitamura in Enum.Fl.Pl.Nepal 3: 43. 1982; Hajra in Hajra *et al.* Fl. India 12: 407. 1995; Grierson & Springate in Grierson & Long., Fl. Bhutan 2(3): 1613. 2001; Kumar & Singh, Astera. Sikkim 163. 2001.

Herbs erect annual, upto 1.6m tall. **Leaves** long petioled; triangular ovate, **lamina** 7 - 14cm across, acute, crenate, base truncate, pubescent. **Capitula** ca 2 x 0.9-1.2cm, dull yellow. **Involucral bracts** 2 - seriate, herbaceous, glandular, inner spatulate and spreading, outer ones shorter and glandular. **Ray florets** female, to 0.3 cm long, trilobed, yellowish. **Disc florets** bracteate, bract to 1.7 long, glandular, with oblong anthers. **Cypsela** incurved, obtuse.

Flower : July – December *Fruit* : September - January
Exsiccatus : Singhaney 2400 m, *SR Lepcha & AP. Das* 0228, dated 17.10.2004.
Status : Common in low altitude
Local Distribution : 1200 – 2200 m.
General Distribution : AFGHANISTAN, AFRICA, IRAN, ASIA MINOR, CAUCASUS, INDIA, NEPAL, SRI LANKA, CHINA, MYANMAR, MALAYSIA, JAPAN, AUSTRALIA

Note: Cypsela sticks to clothes and rough surface.

Sonchus Linnaeus

Sonchus wightianus DC., Prodr. 7: 187. 1838; Ic. Pl. India Or. 3:t. 1142. 1846; B. Bot. 125: 295, 297. 1972; B. Not. 126: 185. 1973; Kitamura in. Enum.Fl. Pl. Nepal 3: 43. 1982; Hajra in Hajra *et al.* Fl.India 12: 321. 1995 ; Grierson & Springate in Grierson & Long. Fl. Bhutan 2(3): 1480. 2001. Kumar & Singh, Astera. Sikkim 167. 2001.

S. arvensis auct non L., Clarke in Comp. India 27. 1876, p.p.; Hook.f. in Fl. Brit. India 3: 414. 1881, p.p.; Hara in Fl.E.Him. 1: 345. 1966; 2:140. 1971; 3: 118. 1975.
Susp. wightianus

Herbs, perennial, upto 45cm tall. **Rootstock** usually creeping. **Stem** erect, leafy, usually glabrous, subumbellately branched above. **Leaves** lamina 4.5 - 9.5 x 1.5 – 4 cm, runcinate-pinnatifid, spinous-toothed; cauline leaves semiamplexicauled, auricles rounded. **Flowers**;

capitula upto 1 cm long, in lax corymbs, glandular hispid, dark yellow. **Ray florets** 0.55 - 0.9 cm long, yellowish. **Cypsel**a 0.22 - 0.5 m, narrow, and ribbed. **Pappus**, white.

Flower : April - October *Fruit*: July - December
Exsiccatus : Dohrok 2300m, **SR Lepcha & AP. Das** 30293, dated 06.10.2004.
Status : Common
Local Distribution : Dohrok, Thartharay towards NNP border. 700 – 1750 m.
General Distribution : PAKISTAN, AFGANISTAN, THROUGHOUT INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, INDONESIA, PHILIPPINES.
Note : The species is a potential fodder. Roots are used in the treatment of jaundice.

Sorosseris Stebbins

Sorosseris hookeriana (C.B. Clarke) Stebbins, in Mem. Torr. Bot. Cl. 19(3): 45. 940; Grierson & Springate in Grierson & Long., Fl. Bhutan 2(3): 1460. 2001. Kumar & Singh, Astera. Sikkim 168. 2001.

Crepis hookeriana Ball., in Journ. Bot. 11: 371. 1873. ssp. *hookeriana*: Sharma *et al* 12: 239. 1995.

Herbs perennial, dwarf. Stem hollow, to 32 cm exposed, scale leaves few or absent. Leaves; petiole to 5.6 cm, lanceolate – oblanceolate or linear, **lamina** 3 – 13 x 0.5 – 3.8 cm, shallowly pinnatifid – deeply pinnatisect. **Inflorescence** convex or elongate, - 15 c; bract densely hirsute at base; **involucral** 2.3 mm in diam; inner phyllaris to 13 mm, hirsute inner most to 5 mm wide. **Corolla** to 17 mm; tube 5.7 mm; **ligule** yellow, to 13 mm, bearing small teeth; anthers dark rarely yellowish. **Papus** white, bearing bluish tips, to 13 mm.

Flower & Flower : July – September
Exsiccatae : Kupup 4300 m, **SR Lepcha & AP. Das** 0173, dated 18.07.2005; Bhimbase 4300 m, **SR Lepcha & AP. Das** 018, dated 13.07.2005.
Status : Less common
Local Distribution : PWS, 3500 – 4300 m.
General Distribution : HIMALAYAS; INDIA (Sikkim), BHUTAN, TIBET
Note : Endemic to Eastern Himalaya.

Synotis (C.B. Clarke) Jeffrey *et* Chen

Key to the species:

1. Plants less than 1 m tall 2
+ Plants more than 1 m tall 3
2. Leaf obovate; pappus whitish *S. cappa*
+ Leaf elliptic or lanceolate; pappus yellowish *S. acuminata*
3. Petiole toothed and dilated wings; involucral bracts linear *S. alata*
+ Petiole without toothed and dilated wing; involucral bracts oblong ... *S. wallichii*

Synotis acuminata (Wallich ex DC.) C. Jeffrey & Y. Chan in Kew. Bull. 39(2): 323. 1984; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1587. 2001. Kumar & Singh, Astera. Sikkim 172. 2001.

Senecio acumintus Wallich (Cat.107, n. 3107. 1831, *nom. nud.*) ex DC., Prodr. 6: 368. 1838; C.B. Clarke, comp. Ind. 187. 1876; Hook.f., in Fl. Brit. India 3: 354. 1881; Kitamura in Fl. E. Him. 343. 1966; Hara *et al.* Enum Fl. Pl. Nepal 3:41. 1982.

Herbs perennial, scrambling upto 1.6m tall. **Stem** glabrous. **Leaves**; petiole upto 17mm; leaf elliptic or lanceolate, **lamina** 10 – 13 x 1.5 – 6 cm, acuminate, caudate or roundate base, denticulate, glabrous on both surface. **Flowers** axillary in corymb, capitula radiate, numerous. **Involucral** to 2 mm diam. **Phyllaries** oblong, 5 x 1.3 mm, acute glabrous, Corolla tube 3mm; ligule 2.5 x 4mm, bisexual. **Flowers** upto 3 mm. **Achenes** oblong, upto 3mm. **Pappus** yellowish.

Flower & Fruit : June – October

Exsiccatus : Dohok 2400 m, **SR Lepcha & AP. Das** 0772, dated 15.07.2006.

Status : Less Frequent.

Local Distribution : Dohrok, Jorepokhri, 2500 – 4300m

General Distribution : E. HIMALAYA; INDIA (Sikkim), NEPAL, BHUTAN, MYANMAR.

Synotis alata (Wallich ex DC.) Jeffrey *et* Y.L. Chen, KB 39(2): 308. 1984; Hajra in Hajra *et al.* Fl. India 13: 287. 1995; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1581.2001; Kumar & Singh, Astera, Sikkim 173. 2001.

Senecio alatus Wallich ex DC., Prodr. 6: 368. 1838; Fl. Brit. India 3: 353. 1881; Hara in Fl. E. Him. 1: 343. 1966; 2: 140. 1971; 3: 118. 1975; Hara *et al.* Enum. Fl. Pl. Nepal 3: 41. 1982.

Herbs, stout, pubescent upto 50cm tall. **Stem** long. **Leaves** usually few; petioles long upto 8.5cm, with toothed and dilated wings; **lamina** 7.5 - 13 x 5 - 10.5cm, ovate-cordate, upper stem leaves lanceolate, serrate, membranous, acuminate, base round-cordate, dark green, densely hairy, nerves distinct, lateral nerves upto 8 on either halves. **Flower** heads shortly pedicelled, ligulate, arranged in branched panicles. **Involucral bracts** linear, usually hairy. **Pappus** white.

Flower : October - January *Fruit*: December – May

Exsiccatae : On way to Panglakha from Dohrok, 2600 m, **SR Lepcha & AP. DAS** 29371, dated 30.09.2004; Jorepokhri (between Panglakha – Rachel), 2700 m, **SR Lepcha & AP. Das** 27718, dated 30.09.2004.

Status : Common

Local Distribution : Rachila, Panglakha 2200 – 2700 m.

General Distribution : HIMALAYAS; INDIA (Himachal Pradesh to West Bengal), NEPAL, BHUTAN, CHINA.

Note : Endemic to Himalaya.

Synotis cappa (Buch.-Ham. ex D. Don) C. Jeffrey *et* Y.L. Chen in KB 39(2): 319. 1984; Hajra in Hajra *et al.* Fl. India 13: 291. 1995; Kumar & Singh, Astera, Sikkim 173. 2001.

Senecio cappa Buch-Ham. ex D. Don, Prodr. Fl. Nepal 179. 1825. 1987. *S. densiflorus* Wallich ex DC. Prodr. 6: 369. 1838; Hook.f., in Fl. Brit. India 3: 355. 1881; Indian Trees 403. 1906; Fl. Assam. 3: 123. 1939.

Undershrubs; perennial upto 2 m tall. **Stem** stout, wooly, young parts gray-white. **Leaves** ; petioles upto 1.8cm long, auricled, with white felted; obovate, **lamina** 9 – 21 x 5 – 7.5cm, oblanceolate-elliptic or elliptic, margin doubly serrate, acute, stiff hairs above, adpressed gray or white cottony hairy beneath, lateral nerves 11 - 19 on either halves, raised and prominent on undersurface. **Flower** heads 0.5 - 0.8 cm in axillary and terminal paniced corymbs; **involucre** white, involucral bracts wooly, linear, acute. **Florets** yellow; **ray florets** 7 - 10; **anthers** tailed, yellow. **Achenes** brown; **pappus** white.

Flower : November - December *Flower*: February - April
Exsiccatus : Phusrey 2650m, **SR Lepcha & AP. Das** 30299, dated 07.10.2004.
Status : Common
Local Distribution : Rachela, Mulkharka, Dohrok 1800-2350m.
General Distribution : E. HIMALAYA; INDIA (Darjeeling-Sikkim to Meghalaya), NEPAL, BHUTAN, MYANMAR, W. CHINA.

Synotis wallichii (DC.) C. Jeffrey *et* Y. L. Chen, KB 39 (2): 305. 1984; Hajra in Hajra *et al.* Fl. India 13: 302. 1995; Grierson & Springate in Grierson & Long Fl. Bhutan 2(3): 1587. 2001 ; Kumar & Singh, Astera. Sikkim 178. 2001.
Senecio wallichii DC., Prodr. 6: 364. 1838; Hook.f., in Fl. Brit. India 3: 353. 1881; Kitamura in Fl. E. Him. 344. 1966: 2: 140. 1971. Hara *et al.* Enum. Fl. Pl. Nepal 3: 42. 1982.

Herbs upto 30 cm tall, usually pubescent. **Stem** leafless, Flower stem hairy towards apex. **Leaves** radicle whorled; petiole hairy; broadly ovate-cordate, **lamina** 2.5 – 11 x 2.4 – 6.5, broadly ovate-cordate, margins wavy and sinuate-toothed, membranous, acute-acuminate, base deep cordate, green and thinly hairy above, nerves distinct, hairy beneath. **Capitula** heads upto 1cm, with 2 ray-florets and a few disc-florets. **Involucral** bracts 0.3 cm broad, oblong and blunt. Ligules 2. **Achenes** glabrous. **Pappus** white.

Flower & Fruit : September – November
Exsiccatus : Rachela trijunction 2900m, **SR Lepcha & AP. Das** 0771, dated 17.09. 2004.
Status : Common.
Local Distribution : Rachela trijunction, 2100 – 2900 m.
General Distribution : HIMALAYAS; INDIA, (NEPAL – BHUTAN), CHINA.
 Note : Endemic to Eastern Himalaya.

Tanacetum Linnaeus

Tanacetum atkinsonii (C.B. Clarke) S. Kitamura in Enum. Fl. Pl. Nepal, 3: 45. 1982; Hara *et al.* Enum. Fl. Pl. Nepal 3: 45. 1982; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1549. 2001. *Chrysanthemum atkinsonii* C.B. Clarke, Comp. India 147. 1876; Hook f., in Fl. Brit. India 3: 315. 1881; Hajra in Hajra *et al.* Fl. India 12: 48. 1995 ; Kumar & Singh, Astera. Sikkim 69. 2001.

Herbs erect with fleshy rootstock. Stems erect, simple, to 45 cm, puberulous. **Leaves** ; basal leaves 3 – 4, pinnatisect, obovate, **lamina** 13 – 32 cm, pubescent with long fine hairs; ultimate segments oblong, acuminate, to 0.5 mm; cauline leaves reduced, mostly 2, pinnatisect. **Capitula** solitary, terminal more on lateral branches rarely 1 -3, radiate. **Involucre** hemispherical to 4.5 cm in diam, phyllaries oblong lanceolate, 4 – 12 x 1.4 – 3 .2 mm, obtuse, margin eroded. **Flowers** glandular below, corollas yellow. **Ray flowers** 15 – 25; ligules, densely papillose inside; staminodes exerted. Disc corolla to 5 mm. **Achenes** 5 ribbed, minutely glandular. **Pappus** absent.

Flower & Fruit : July – October
Exsiccatus : Nathang – Panglakha 3050 m, **SR Lepcha & AP. Das** 30822, dated 29.07.2005.
Status : Common in low altitude
Local Distribution : Changu, Kyongnosla, Nathang 3400 – 4400 m.

General Distribution : E. HIMALAYA; INDIA (NEPAL – BHUTAN), TIBET.

Note : Endemic to Eastern Himalaya.

Taraxacum F.H. wiggers

Taraxacum officinale Wiggers var. *eritopoda* (DC.) Hook.f. in Fl. Brit. India 3: 401. 1881; Kumar & Singh, *Astera*. Sikkim 178. 2001.

Taraxacum eritopodum DC., Prodr. 7: 147. 1938, van Soest in *Wentia* 10: 43. 1963; Hara *et al.* Enum. Fl. Pl. Nepal 3: 46. 1982; Hajra in Hajra *et al.* Fl. India 12: 257. 1995. Grierson & Springate in Grierson & Long., Fl. Bhutan 2(3): 1466. 2001.

Herbs, perennial upto 30cm tall. **Leaves** rosset, sessile, oblanceolate-linear lamina 4 -9 x 1.5 - 2.5cm, runcinate-pinnatifid below, sinuate above with acute lobes. **Flowers** in solitary capitula to 1.8 cm in diam., borne on long leafless peduncles, 5 – 10 cm. **Involucral bracts** multiseriate, herbaceous, subequal, linear-oblong, usually erect or sometimes reflexed. **Florets** all rayed, yellowish; ligules 0.30 - 0.45 x 0.2-0.40m, 5-lobed; anthers sagitate; style arms exerted. **Cypsel**a usually 4 - 5 angled, obovoid, ribbed, glabrous. **Pappus** usually unequal.

Flower : May – November

Fruit: June – February

*Exsiccat*us : On way to panglakha 2900 m, *SR Lepcha & AP. Das* 0223, dated 12. 09. 2006.

Status : Common

Local Distribution : Singhany, Kyongnosla, Changu, 1800 – 2050 m.

General Distribution : HIMALAYAS; INDIA (Jammu & Kashmir to Assam), NEPAL, BHUTAN.

Note : Endemic to Himalayas.

Tusilago Linnaeus

Tusilago farfara L.. Sp. Pl. 865.1753; Hook.f. in Fl. Brit. India 3: 330. 1882; Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1569. 2001.

Herbs perennial, rhizomatous. Petiole upto 13 cm. **Leaves** basal, lamina 7 – 14 x 4 – 17 cm at fruiting, obtuse or subacute, base cordate, margin toothed or denticulate, glabrous above, araneous beneath at least at first. Scapes upto 18cm inflower; scale leaves oblong. **Involucral bracts** to 10 mm in diam, sparsely araneous at base. **Phyllaries** lanceolate, upto 9 x 3 mm. Flowers yellow. Ligules often reddish. Disc corolla 10 mm. **Achenes** oblong, upto 5mm. **Pappus** white.

Flower & Fruit : April – May

*Exsiccat*us : Panglakha, 3000 m, *SR Lepcha & AP. Das* 29389, dated 30.09. 2004.

Status : Less common.

Local Distribution : Panglakha, Rachel, Hangey, 3000 – 3700 m

General Distribution : EUROPE, N. AFRICA, AFGHANISTAN, N.W. ASIA, INDIA (Jammu & Kashmir), BHUTAN.

Class: Liliopsida
Subclass: Arecidae
Order: Arales

ARACEAE Juss.

Key to the Genera

- | | |
|---|---------------------|
| 1. Plants strongly aromatic | <i>Acorus</i> |
| + Plants non aromatic | 2. |
| 2. Plants climbing | <i>Raphidophora</i> |
| + Plants not climbing (terrestrial herbs) | 3 |
| 3. Lamina peltate | 4 |
| + Lamina not peltate | <i>Arisaema</i> |
| 4. Plants with rhizome | <i>Colocasia</i> |
| + Plants with cormose tuber | <i>Remusatia</i> |

ACORUS Linnaeus

Acorus calamus L., Sp. Pl. ed. 1, 1: 324. 1753; Hook.f. in Fl. Brit. India 6: 555. 1893; Hara in Fl. E. Him. 1: 393. 1966; Noltie, in Fl. Bhutan 3(1): 158. 1994; Mandal in Hajra *et al.* Fl. Sikkim 1: 185. 1996.

Local Name: Ruk-Lop (Lep.) Bojho (Nep.);

Herbs strongly aromatic on marshy places with creeping rootstock. **Leaf lamina** 20 - 50 x 0.4 - 2.2cm, linear, margins waved, acute, base equitant dark green, thick, mid-rib thick, nerves parallel, aromatic. **Peduncle** leaf-like. **Spathe** upto 40cm, densiform. **Spadix** 3 - 5 x 0.5 - 2 cm, cylindric, dense flowered and slightly bent upward. **Sepals** 6, orbicular, tip curved inward; **stamens** equal to sepals; **anthers** reniform; **ovary** conical.

- | | |
|-----------------------------|--|
| <i>Flower & fruit</i> | : June - August |
| <i>Exsiccatus</i> | : Rachela trijunction 3000 m, SR Lepcha & AP. Das 03082, dated 20. 08. 2005. |
| <i>Status</i> | : Sparse. |
| <i>Local Distribution</i> | : Premlakha, Lingtam, Rachela trijunction 1500-2900m. |
| <i>General Distribution</i> | : EUROPE, SIBERIA, INDIA EAST TO JAPAN, AND C. and N. AMERICA. |

Note : A very common medicinal plant (domesticated at other parts of Sikkim)..

Arisaema Martius

Key to the species:

- | | |
|---|------------------------|
| 1. Plants more than 1 m tall | <i>A. tortoisum</i> |
| + Plants less than 1 m tall | 2 |
| 2. Leaf elliptic, oblanceolate | 3 |
| + Leaf rhombic – ovate | 4 |
| 4. Spathe blade reddish-brown; appendix thickened | <i>A. utile</i> |
| + Spathe blade purplish-black; appendix basally swollen | <i>A. griffithii</i> |
| 3. Leaves solitary in radiate | <i>A. concinnum</i> |
| + Leaves 1 - 2, trifoliolate or palmate | 5 |
| 5. Leaves palmate or pedate | 6 |
| + Leaves trifoliolate | <i>A. propinquum</i> |
| 6. Leaf palmate; cataphylls whitish or rarely dark brown to brownish pink | 7 |
| + Leaf pedate; cataphylls pale, tinged brownish or purplish | <i>A. flavum</i> |
| 7. Lamina of spathe auricled | <i>A. nepenthoides</i> |
| + Lamina of spathe not auricled | <i>A. jacquemontii</i> |

Arisaema concinnum Schott in Bonplandia 7: 27. 1859; Hook. f. in Curtis, Bot. Mag. 97: t. 5914. 1871; Hook.f. in Fl. Brit. India 6: 505. 1894; Hara *et al.* Enum. Fl. Pl. Nepal 1: 89. 1978; Noltie, Fl. Bhutan 3(1): 148. 1994; Hajra & Verma, Fl. Sikkim 1: 187. 1996. *Arisaema alicinatum* Schott, loc. cit.: 26. 1859. *Arisaema affine* schott. loc. cit.: 27. 1859.

Herbs dioecious with globose tubers, upto 70 cm tall. Pseudostem, cataphylls pinkish to purplish. **Leaves** solitary, radiate; leaflets 7 - 15, linear-oblanceolate, acuminate to 2 cm, sessile, cuneate base, 4 - 17 x 0.5 - 1.5 cm. **Petiole** 10 - 18cm. Peduncle often shorter than leaves; **spathe**; tube 3 - 4cm: blade oblong, scarcely wider than tube, not auriculate at base, green to dark purplish, with distinct whitish or sometime greenish stripes; appendix very slender rugose at apex. **Synadria** + sessile, yellowish, 4 loculed, **Fruiting** peduncle erect, often recurved

Flower & Fruit : April - July
Exsiccatus : Phusrey 2200 m, *S.R. Lepcha & AP. Das* 02503, dated 13.10.2005
Status : Common.
Local Distribution : Phusrey 2100 - 2500 m.
General Distribution : TEMPERATE HIMALAYAS, KHASIA HILLS AND MYANMAR.

Arisaema flavum (Forsk.) Schott in Prodr. 40. 1860; Hook.f. in Fl. Brit. India 6: 503.1894; Noltie, Fl. Bhutan 3(1): 146. 1994. *Arum flavum* Forsk., Fl. Aeg. Arab.157. 1775.

Local Name: Maney (Nep.)

Herbs monoecious with pseudo-stem upto 30 cm long. **Petiole** and peduncle green; cataphylls pale, tinge brownish or purplish; 1 - 2, central leaflet oblanceolate, acuminate, cuneate, sessile **lamina** 4 - 6 x 1 - 3.5 cm. 3 - 5 segments. **Peduncle** oftenly exceeding leaves. **Spathe** tube swollen, 0.6 - 0.9cm. blade sub-erect 0.6 - 2.9 x 0.6 - 1.7 cm, bright yellow, unstriped, purple at base and in tube. **Appendix** ellipsoid, sessile, yellowish. **Synadria** ± sessile, creamy.

Flower & Fruit : June - August.
Exsiccatus : Gnathang 3800 m, *S.R. Lepcha & AP. Das* 30854, .dated

25.07.2005

Status : Common
Local Distribution : Gnathang 1800 – 4000m
General Distribution : INDIA, BHUTAN, MYANMAR, S.E. TIBET.

Arisaema griffithii Schott, Syn. Aroid 26. 1856; Prodr. 54. 1860; Bot. Mag. t. 6491. 1880; Hook.f. in Fl. Brit. India 6: 499. 1894, Pfl. Reich IV-23 F, Ht. 73: 219, f. 53. 1920; Hara in Spring Fl. Sikkim Him. f. 110 - 112. 1963; Hara in Fl. E. Him. 395. 1966; Noltie, Fl. Bhutan 3(1): 151. 1994; Hajra & Verma, Fl. Sikkim 1: 188. 1996. *A. hookerianum* Schott in Oester. Bot. Wochenbl 7: 334. 1857. *A. hookeri* Schott, Gen. Aroid. t. 6, f. 11-19. 1858.

Herbs tuberous upto 35 cm tall. **Tuber** usually depressed. **Leaves** solitary, trifoliate or 2; petiole 20 cm, stout; leaflets 3, sessile; **lamina** 8 – 20 x 8 – 13 cm, rhombic-ovate, margins faintly yellow, entire to obscurely crenate, rounded-acute, dark green, glabrous, nerves sunk, impressed above, lateral nerves upto 12 on either sides. **Peduncle** shorter than petiole; basal bracts large. **Spathe** upto 13 cm long, conspicuously striped, tube broad, curved back, pale ribbed with white; limb incurved, rounded. **Spadix** often stout, narrowed to tail-like appendage.

Flower & Fruit : March - May
Exsiccatus : Singahey, 2490m, *SR Lepcha & AP. Das* 02504, dated 14.10.2005
Status : Frequent.
Local Distribution : Singhaney, Rachela below 1900 – 2500 m.
General Distribution : E.HIMALAYA; INDIA (Sikkim)

Note : 1. Endemic to E. Himalaya.
2. Bread can be prepared from its tuber paste through processing in running water.

Arisaema jacquemontii Blume in Rumphia 1: 95. 1835; Voy. t. 168. 1844; Pfl.-reich IV-23 F, Ht. 73: 197, f. 45 A-C. 1920; Hara in Fl. E. Him 395. 1966; Hara *et al*, Enum. Fl. Pl. Nepal 1: 90. 1978; Noltie, Fl. Bhutan 3(1): 146. 1994; Hajra & Verma, Fl. Sikkim 1: 189. 1996. *A. cornutum* Schott in Bonplanda 7: 27. 1859; Hook.f. in Fl. Brit. India 6: 506. 1894. *A. exile* Schott in Bonplanda 7: 26. 1859.

Herbs herbaceous upto 65 cm tall. **Petiole** and **peduncle** pale green; cataphylls whitish, sometime dark brown; palmate, leaflets 6 - 7, middle leaflet oblanceolate to elliptic acuminate, cuneate, sessile, **lamina** 1.5 x 13 x 2-5 cm, pale green. **Outer** leaflets narrowly acuminate. **Peduncle** exceeding leaves. **Spathe** usually pale green with whitish stripes, sometimes dark purple in whole blade. Tube 3-5.5cm. **Appendix** horizontal to decurved and base swollen greenish below, purplish above. **Synandria** widely spaced, cream or tinge dark purplish.

Flower & Fruit : June. – August
Exsiccatus : Kupup, 3900m, *SR. Lepcha & AP. Das* 02502, dated 13.02.2004
Status : Less Common.
Local Distribution : Kupup 1900 – 4200 m.
General Distribution : AFGANISTAN; HIMALAYAS; INDIA, (Kashmir – Sikkim).

Arisaema nepenthoides (Wall.) Mart. in Flora 2: 458. 1831; Hook.f. in Fl. Brit. India 6: 504. 1894; Pfl.-reich IV-23 F, Ht. 73: 218 f, 49. 1920; Hara in Spring Fl. Sikkim Him. 106. 1963; Hara in Fl. E. Him. 395. 1966; Noltie, Fl. Bhutan 3(1): 145. 1994; Hajra & Verma. Fl. Sikkim 1: 189. 1996. *Arum nepenthoides* Wall., Tent. Fl. Nepal 26, t. 18. 1824. *Arisaema ochraceum* Schott *sensu* Lacaita in Journ. Linn. Soc. 43: 483. 1916.

Local Name: Gurbay (Nep.).

Herbs upto 60 cm tall. Tuber globose. Stem clouded with dark streaks. **Leaves** 2, digitate; petioles 7 - 13 cm, green to red-brown spotted; leaflets 5 - 11, sessile to subsessile; **lamina** 3 - 13 x 0.7-3.2 cm, narrow elliptic or oblanceolate, entire, acute, glossy, green, glabrous, lateral nerves upto 23 on either sides. **Peduncles** shorter than petioles. **Spathes** triangular-ovate and slightly curved forward, like cobra hood, greenish-brown to reddish brown, with white stripes on the back, tube elongated, limb-base dilated into two conspicuous rounded lobes. **Spadix** much shorter than spathe, pale green or whitish.

Flower & Fruit : February - June
Exsiccatus : Singhaney 2350 m, **SR Lepcha & AP. Das** 02505, dated 14.10.2005
Status : Frequent.
Local Distribution : Singhaney, Rachel Middle, 1900 - 2600 m.
General Distribution : HIMALAYAS; INDIA, (NEPAL -BHUTAN), khasia, MYANMAR, W.CHINA.

Arisaema propinquum Schott in Oesterr. Bot. Wochenbl. 7: 333. 1857; Hook.f. in Fl. Brit. India 6: 501. 1894; Hara in Fl. E. Him. 397. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 1: 90. 1978; Noltie, Fl. Bhutan 3 (1): 153. 1994; Hajra & Verma, Fl. Sikkim 1: 190. 1996. *A. wallichianum* Hook.f., Fl. Brit. India 6: 500. 1893. *A. sikkimense* Chatterjee in Bull. Bot. Surv. India 3: 18. 1949. *A. costatum auct. non Mart*: Chatterjee in Bull. Bot. Surv. India 8: 137. 1955. *A. wallichianum* var. *sikkimense* (Chatterjee) Hara in Journ. Jap. Bot. 36: 76. 1961.

Herbs, upto 60 cm tall. **Tuber** globose, depressed. **Leaves** single; petioles upto 25 cm long, stout, brown-spotted, leaflets 3, shortly stalked, **lamina** 22 - 24 x 4 - 10 cm, elliptic to ovate, entire, caudate-acuminate, base oblique, dark green, lateral nerves many, very close, parallel and strong beneath. **Spathes** dark purple with longitudinal white stripes, limb incurved and narrowed into a tail-like tip. **Spadix** appendage long, stipitate.

Flower & Fruit : April - July
Exsiccatus : Beusa, 2370m, **SR Lepcha & AP. Das** 02506, dated 14.10.2005
Status : Frequent.
Local Distribution : Phusrey, Durpiney, 2000 - 2850 m.
General Distribution : HIMALAYAS; INDIA (Khashmir - BHUTAN) and S. TIBET.
Note : Endemic to Himalaya.

Arisaema tortuosum (Wall.). Schott in Schot. & Endl, Melet. Boy.: 17. 1832; Hook f., Fl. Brit. India 6: 502. 1894; Hara *et al.* Enum. Fl. Pl. Nepal 1: 90. 1978; Hara & Verma, Fl. Sikkim 1: 191. 1996; Noltie, Fl. Bhutan 3(1):147.1994. *Arum tortuosum* Wall., Pl. Asiat. Rar. 2: 10, t. 114. 1831. *Arisaema turtuosum* var. *halleborifolium* (Schoot) Engl. in DC., Monogle. Phan. 545. 1879.

Herbs, monoecious, upto 2 m tall. **Corm** usually rigid 2.5 - 4.5 cm in diameter. Cataphylls, pseudo stem blotched with pinkish, gray to purplish brown. **Leaves** usually 2 - 3, pedately 6 - 15 foliate, dull above, dark green below. **Central** leaflets narrow to elliptic oblong, acuminate, base cuneate, often petiolate (0.4 - 6.5 cm), outer petiolate, 3 - 7 segments each, petiole in upper 3.5 - 16.5 cm; Peduncle exceeds leaves. **Spathes** yellow-green, rarely stripped tube green 1 - 5 cm; blade oblong-lanceolate, acute to acuminate, spreading horizontally, 3.5 - 10.5 x 1.5 - 3.5 cm. **Appendix** ascending, sessile, acute apex, green, blue-purplish at base. **Synandria** often widely spaced, stalked (1 - 2 mm), creamy. **Anthers** 2 - 4 - 5 each with 2 locules, dehiscing by lateral slits.

Flower : April *Fruit*: June
Exsiccatae : Rachel 2850m, **SR. Lepcha & AP. Das** 31031, dated 07.10.2004:

Kupup 3950 m, **SR Lepcha & AP. Das** 31473 dated 27. 07.2005.
Status : Not frequent
Local Distribution : Kupup Bhimbace 1400 – 4300 m.
General Distribution : HIMALAYA; INDIA, (Punjab – Sikkim), Khasia, Nilgiris, Manipur, and W. CHINA.
Note : Endemic to Himalaya.

Arisaema utile Hook.f. ex Schott, Prodr. Syst. Aroid. 30. 1860; Hook.f. in Fl. Brit. India 6: 499. 1894; Hara *et al.* Enum. Fl. Pl. Nepal 1: 90. 1978; Noltie, Fl. Bhutan 3(1): 147.1994; Hajra & Verma, Fl. Sikkim 1: 191. 1996.

Herbs perennial, dioecious, corm 2 - 5.5 cm diameter. **Cataphylls** very wide (to 5.5 cm), often whitish matter with darker. **Leaves**; petiole 15 – 45 cm; solitary - 2, trifoliate, leaflets sessile-sub sessile, margin yellowish-reddish; rhombic, ovate or obovate with undulated pale green in colour in golden margins, less than 15cm, **lamina** 8 - 35 x 5.5 – 28 cm. . **Spathes** limb coarsely reticulate, blade paler reddish brown, lobes narrow 1-2 cm, without reticulate mark, truncate base tapering upwards, and petiole not unspotted.

Flower : May – July. **Fruit**: September – October
Exsiccatus : Bhimbace 4350m, **SR Lepcha & AP. Das** 30977, dated 27.07.2005:
Status : Less Common
Local Distribution : Karponang-Changu, Lachen, Gamothang. 2700 – 3900 m.
General Distribution. : E. HIMALAYA; INDIA.
Note : 1. Endemic to Eastern Himalaya
 2. Tubers of this species are locally eaten.

Colocasia Linnaeus

Colocasia esculenta (L.) Schott in Schott & Endl., Melet. Bot. 18. 1832; Hara *et al.* Enum. Fl. Pl. Nepal 1: 91. 1978; Noltie, Fl. Bhutan 3(1): 136. 1994; Hajra & Verma, Fl. Sikkim 1: 191. 1996. *Arum esculentum* L., Sp. Pl. 965. 1753. *Colocasia antiquorum* Schott in Schott and Endl., Melet. Bot. 18. 1832; Hook.f. in Fl. Brit. India 6: 523. 1894.

Local Name: Sungti (*Lep.*), Mane (Nep.).

Herbs, perennial, rhizomes tuberous. **Petioles** to 80 cm, sheathing below, greenish; **lamina** 13 – 45 x 7 – 35 cm, oblong-ovate to suborbicular, broadly cuspidate, base shallow-cordate, glaucous. Peduncle upto 30 cm. **Spathe**-tube 3 – 6 x 1 – 2 cm, greenish; lamina narrowly lanceolate, acuminate, creamy yellow. Monoecious. **Spadix**: basal part female separated by a zone of sterile male flowers ; male part to 6 cm; appendix to 4.5 x 0.4 cm. **Ovary** unilocular; stigma broadly peltate; ovules many, parietal. **Synandria** upto 0.2cm diam.; **anthers** subsessile.

Flower : June **Fruit**: December
Exsiccatus : Phusrey 2190 m, **SR Lepcha & AP. Das** 02501, dated 10.10.2004
Status : Less Common.
Local Distribution : Dhorok, Neora Valley National Park border, 1500 – 2100 m.
General Distribution : HIMALAYAS; INDIA, NEPAL, BHUTAN, BANGLADESH, SRI LANKA.

Note : Young petiole and rhizomes are eaten as vegetables. The plant is also an ideal fodder for pigs.

Raphidophora Hasskarl

Raphidophora glauca (Wall.) Schott in Blonplandia 5: 45.1875; Hook.f., Fl. Brit. India 6: 547. 1894; Noltie, Fl. Bhutan 3(1): 126. 1994. *Pothos glaucus* Wall., Pl. Asiat. Rar. 2: 45t.156. 1832.

Vern. name ; *Tuklop* (Lep.).

Liana climbing on tree trunk, stem 1 - 1.5 cm diameter. **Lamina** ovate, symmetric, acuminate, base cuneate, oblique, 9 - 28 x 8.5 - 20 cm, asymmetrically pinnately cut, pinnae 2 - 5 each side, ascending midrib, base round. **Mid-leaf-apex** truncate with 3 strong, parallel costae reaching midrib, round at base. **Sheath** reaches upto base of leaf blade. pulvinus indistinct. **Peduncle** spreading. **Spathe** oblong ovate. acuminate pale yellow. **Filaments** flat. **Ovary** apex truncate, **stigma** flat, sessile, circular or elliptic.

Flower & Fruit : August - April

Exsiccata : Hangey 1900 m, *SR Lepcha & AP. Das 30214*, dated 06.10.2004

Status : Fairly Common.

Local Distribution : Dhorok, Phusrey 1000 - 2500 m.

General Distribution : E. HIMALAYA; INDIA, (NEPAL -BHUTAN), Khasia, Manipur, Naga hills.

Note : 1. Endemic to Eastern Himalaya

2. This species is traditionally used as an ornamental plant..

Rhaphidophora grandis Schott in Oester. Bot. Wochenbl. 349.1858; Noltie, Fl. Bhutan 3(1): 128. 1994; Hajra & Verma. Fl. Sikkim 1:194. 1996.

Local Name: *Tungking* (Lep.), *Thulo Kanchirna* (Nep.).

Liana larger than *R. glauca*. **Stem** upto 5 cm thick. **Lamina** 34 - 90 x 35 - 70 cm, oblong, blunt, not glaucous beneath; pinnae broad, 6-10 per side, sometimes even upto 12 per side, more wider, pinna of mid-leaf 4 - 5 cm wide, truncate at apex, sinuses narrow, lateral costae not parallel. **Peduncles** stouter. **Spadix** big 20 - 25 x 3 - 7 cm; ovaries fibrous, domed; stigma raised.

Flower & fruit : May - March

Exsiccatus : Singhaney 2250 m, *SR Lepcha AP. Das 02500*, Dated 13.10.2005

Status : Common.

Local Distribution : Dhorok Phusrey 1800 - 2500 m.

General Distribution : TROPICAL AND SUBTROPICAL HIMALAYAS; INDIA, Kumaon, Sikkim, Darjeeling, Khasi Hills.

Note : 1. Endemic to Himalayas

2. A well known fodder plant.

Remusatia Schott

Remusatia pumila (D. Don) H. Li & A. Hay, Acta Bot. Yunn., Suppl. 5: 28.1992; Hajra & Verma, Fl. Sikkim 1: 193. 1996. Noltie, Fl. Bhutan 3(1): 135. 1994. *Gonatanthus pumilus* (D. Don) H. Li & A. Hay, Acta Bot. Yunn., suppl. 5: 28.1992. *Gonathanthus pumila* (D. Don) Engl. & Krause in Engler, Pflanzenreich iv -23E.Ht.71: 19,t.5a-m. 1920. *Caladium pumilum* D. Don, Prodr. Fl. Nepal 21. 1825.

Herbs perennial, tuberous. **Cataphyll** usually 1, slender, acute. **Leaf-blade** ovate or oblong – ovate, acute acuminate; base cordate without coloured on both sides, 1.5 - 5 x 7 - 20 cm, sometime purple below and above at between primary veins. **Petiole** short 8 - 28 cm. **Spadix** upper held at angle, lanceolate, acuminate, sessile with whorl of sterile ovaries and sometime also at apex, stiped 4-5 mm purple. **Ovary** green, streaked white.

Flower & Fruit : May – July
Exsiccatus : Dhorok 2300m, **SR Lepcha & AP. Das** 03024, dated 03.10.2004
Status : Common.
Local Distribution : Dhorok Phusrey 1900 – 2250 m.
General Distribution : HIMALAYAS; INDIA, (Simla-Sikkim), Khasia, Manipur, THAILAND, W. CHINA.

Subclass: Commelinidae

Order: Commelinales

COMMELINACEAE R. Brown.

Key to the Genera

- | | | |
|---|---|-----------------------------|
| 1. Lamina linear-lanceolate; stem much branched | 2 | |
| + Lamina elliptic-ovate; stem moderately or less branched, climbing | | <i>Streptolirion</i> |
| 2. Corolla tubular; stamens 6 | | <i>Cyanotis</i> |
| + Corolla not tubular; stamens 2 or 3 | | <i>Commelina</i> |

Commelina Linnaeus

Commelina paludosa Bl., Enum. Pl. Jav. 1: 2. 1827; Hook. f., Fl. Brit. India 6: 372. 1894; Hara *et al.* Enum. Fl. Pl. Nepal 1: 82. 1978; Hajra & Verma, Fl. Sikkim 1: 169. 1996. ***Commelina obliqua*** Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 45. 1825; Hook. f., Fl. Brit. India 6: 372. 1894.

Local Name: Tukjor Reep (Lep.)

Herbs perennial, straggling, much branched. **Stem** prostrate to semi- erect. **Leaves** sessile; upper stem leaves lanceolate, 6 - 15 x 2 - 6 cm, acuminate, base cuneate extended to be petiole like leaf sheath, densely brown hispid at month, glabrous on both surfaces; spathes terminal, shortly stalk, lanceolate, acuminate. **Involute** bracts often 3 - 8, forming a terminal heads, sessile, funnel form, ca 3 x 1.7 - 2cm, glabrous, apex acute; peduncle ca 1.5cm. **Flowers** many or solitary, white or pale blue. **Petals** 2, blue, oblong. Filaments coiled; outer anthers ellipsoid; anther 2 - 3mm. **Ovary** ellipsoid, style recurved at apex. **Capsules** oblong- trigonous; seeds 1 per valve, dark brown, ellipsoid, 3.5mm, slightly flattened.

Flower : August – October *Fruit:* October – April
Exsiccatus : Rachela 2750m, **SR Lepcha & AP. Das** 31004, dated 02.10.2004
Status : Common.
Local Distribution. : Rachela Panglakha, 1700 – 2890 m
General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, THAILAND,

MALAYSIA, LAOS, VIETNAM, CAMBODIA, INDONESIA.

Cyanotis D. Don

Cyanotis vaga (Lour.) J.A. & J.H. Schult. in R. & S., Syst. Veg. 7: 1153. 1830; Hara *et al.* Enum. Fl. Pl. Nepal 1: 82. 1978; Noltie, Fl. Bhutan 3(1): 220. 1994; Hajra & Verma, Fl. Sikkim 1: 169. 1996. *Transescantia vaga* Lour., Fl. Cochinch. 193. 1790. *Cyanotis barbara* D. Don, Prodr. Fl. Nepal 46. 1825; Hook. f., Fl. Brit. India 6: 385. 1894.

Herbs perennial, bulbiferous, bulbs globose. **Stem** decumbent, much branched, 7 – 55 cm. Basal leaves to 35 cm long. **Stem leaves** lanceolate; all cauline, 4 - 8 x 3 – 11 mm. **Inflorescence** rarely terminal. **Flowers** in axillary heads, peduncle present and absent. Subtended by leaf like spathes; bracteole overlapping, white hairs, purplish. **Sepals** fused oblanceolate, acute, 3.2 - 4 x 1 - 2mm, pale brown: **Petals** pale blue, lower half tubular, 5.5 – 7 mm. **Filaments** long exerted from corolla, blue. **Capsules** obovoid, trigonous. **Seeds** gray-brown, striate and finely reticulate.

Flower : July – September. *Fruit*: October – November
Exsiccatus : Phusrey 2250 m, *SR Lepcha & AP. Das* 507, dated 13.10.2005.
Status : Common.
Local Distribution : KAS, Dhorok, Phusrey, 915 – 2300 m,
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, LAOS, VIETNAM,
MYANMAR, THAILAND.

Streptolirion Edgeworth

Streptolirion volubile Edgew. in Proc. Linn. Soc. 1: 254. 1845; Trans. Linn. Soc. 20: 90, t. 2. 1846; Commel. & Cyrt. Beng. t. 40. 1874; Hook.f. in Fl. Brit. India 6: 389. 1894; Hara in Fl. E. Him. 402. 1966; Noltie, Fl. Bhutan 3(1): 219. 1994; Hajra & Verma, Fl. Sikkim 1: 172. 1996. *Tradescantia cardifolia* (non Swartz 1788) Griff., Priv. Journ. 208. 1847. *Streptolirion cordifolium* (Griff.) O. Kuntze, Rev. Gen. Pl. 2: 722. 1891.

Local Name: Pur'chyok bee (Lep.)

Herbs twining with stem upto 2 m, flaccid, often rooting from nodes, glabrous or thinly hairy. **Leaves** long petioled (petiole. 1 – 9 cm long), **lamina** 2 - 10 x 1.5 - 5.5 cm, ovate-cordata, entire, long acuminate, base inwardly deep-lobed, greenish, glabrous both surfaces, lateral nerves upto 15 arising from base, concentric, leaf-sheaths 2 cm with ciliate mouth, brownish and membranous.

Flower & fruit : August – October
Exsiccatus : Padamchen- Premlakha 2500 m, *SR Lepcha & AP. Das* 2508, dated 13.08.2004
Status : Common.
Local Distribution : Padamchen, Phusrey (Commonly grows in areas 1600 – 2800 m).
General Distribution : SUBTROPICAL AND TEMPERATE HIMALAYAS; INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, JAPAN, CAMBODIA, MALAYSIA, INDONESIA.

Order: Juncales

JUNCAECEAE A. Jussieu

Juncus Linnaeus

Key to the species

- | | |
|--|------------------------|
| 1. Stem leaves absent; bracts in continuation with stem | <i>J. inflexus</i> |
| + Stem leaves present; bracts not in continuation with stem | 2 |
| 2. Lamina flat, grass like, non-tubular or unchannelled | 3 |
| + Lamina filiform, not grass like, tubular or channeled | 4 |
| 3. Tepals dark reddish-brown; anthers sub-equaling filaments | <i>J. amplifolius</i> |
| + Tepals pale straw coloured; anthers much shorter than filaments | <i>J. clarkei</i> |
| 4. Inflorescences of fertile flowers; bracts not golden yellow | 5 |
| + Inflorescences of sterile flowers; bracts golden yellow | <i>J. ochraceus</i> |
| 5. Tepals white, creamy or pale straw coloured | 6 |
| + Tepals non white, brown or greenish | 11 |
| 6. Lowest bract non-foliaceous, brown or chestnut coloured | 7 |
| + Lowest bract foliaceous, green | 9 |
| 7. Scale leaves loosely encircling stem, not shiny | 8 |
| + Scale leaves tightly encircling stem, shiny | <i>J. leucanthus</i> |
| 8. Upper stem leaf present unitubular; septa visible externally | <i>J. allioides</i> |
| + Upper stem leaf absent pluritubular; septa not-visible externally | <i>J. thomsonii</i> |
| 9. Leaves aseptate or obscurely septate; septa not-visible externally..... | 10 |
| + Leaves prominently septate; septa visible externally | <i>J. grisebachii</i> |
| 10. Leaves 2-3; bitubular in cross-section | <i>J. benghalensis</i> |
| + Leaf single, X or Y shaped in cross-section | <i>J. khasiensis</i> |
| 11. Tepals greenish, seeds without tail | 12 |
| + Tepals brownish to reddish-brown or blackish, seeds tailed | 13 |
| 12. Annuals; stamens 6; capitula 1-flowered | <i>J. bufonius</i> |
| + Perennials; stamens 3; capitula 3- to 10 -flowered | <i>J. wallichianus</i> |
| 13. Inflorescences unbranched; capitulum single | 14 |
| + Inflorescences branched; capitula in pair or more | 15 |
| 14. Capitulum 2-5- flowered; anthers shorter than filaments | <i>J. triglumis</i> |
| + Capitulum 1-flowered anthers longer than filaments | <i>J. uniflorus</i> |
| 15. Capitula 3 or more; tepals reddish brown; capsule longer than tepals | <i>J. himalensis</i> |
| + Capitula 2; tepals chestnut or blackish-brown; capsules shorter or equaling tepals | <i>J. sikkimensis</i> |

Juncus allioides Franchet in Nouv. Arch. Mus. Hist. Nat. Paris Ser. 2, 10: 99. 1887; Noltie, Fl. Bhutan 3(1): 262. 1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 172. 1996; Shukla *et al.* in Indian J. Forest. 23(4): 469. 2000.

Local Name: Mung-chyit-muntsan (Lep.)

Herbs rhizomatous; rhizome short. Flower stems usually 10 – 52 cm, densely tufted. **Scale leaves** loosely encircling stem, shining brown or reddish brown. Leaves of non flowering shoots slender, usually shorter than flower stems; stem leaves 2, sub-basal, blades slightly cylindric, unitubular, septate; septa visible externally when dry, 3.5 – 18 cm, 0.6-1.9 mm, wide; upper leaf with conspicuous sheath and bristle like blade to 4.2 cm. Aurides blunt, brownish, free part 0.4 - 1.8 -1.5 mm. **Inflorescence** sub globose, usually 12 - 32 flowered; lowest bracts spathe like in bud, slightly exceeding capitulum, lanceolate, to 4.5 mm side, ribbed aristate; flowers distinctly pedicellate. **Tepals** narrowly lanceolate, sub acute, whitish. Filaments usually exceeding tepals at maturity; **anthers** linear, exserted, 2-2.8 mm. **Ovary** ellipsoid, 2.6-3 mm, abruptly contracted into style; stigma lobes stout, 0.6-1.6 mm. **Capsules** ellipsoid trigonous, 3.4-5.8 mm, beak party exserted; seeds 2 tailed.

Flower & Fruit : June – September.

Exsiccatae : Premlakha to Panglakha 2600, *SR Lepcha & AP. Das 32955 & 32960*, dated 26.10.2004; Kupup, 3800 m, *SR Lepcha & AP. Das 30967*, dated 08.08.2004; Lampokhari to Bhimbase 4280 m, *S.R. Lepcha & AP. Das 31418* dated 27.07.2005; Premlakha 2500 m, *S.R. Lepcha & AP. Das 32935*, dated 22.10.2005..

Local Distribution : Premlakha, Panglakha, Bhimbase 2400 – 4350 m.

General Distribution : INDIA: Kashmir, Meghalaya, Sikkim, BHUTAN, CHINA, NEPAL.

Note : Endemic to Himalaya

Juncus amplifolius A. Camus in Not. Syst. 1(10): 281. 1910; Noltie, Fl. Bhutan 3(1): 261. 1994; Shukla *et al.* in Indian J. Forest. 23(4): 469. 2000.

Local Name: Mung-chyit-syel (Lep.)

Herbs, rootstock stout, woody, bearing persistent, fibrous remain of old leaves non-flowering rosettes and singly inserted flower stem. **Scale leaves** 1 or sometime more, reddish. **Rosette leaves** to 12 x 0.5 cm. Flowering stem 6 – 42 cm; stem leaves usually 3, blades flat, gradually tapered to acute apex, ridged beneath, margin with transparent border, shorter than stems. Sheaths lacking aurides. **Inflorescence** terminal with (1-) 2 - 5 unequal peduncled, 3 - 5 (-7) flowered capitula; lowest bract leaf like, shorter than to joint over topping inflorescence. **Tepals** lanceolate, acute to finely acuminate, sub equal or outer shorter than inner, reddish brown. **Stamens** shorter than tepals; **anther** (1.8) 2 – 2.8 mm, shorter than equaling filaments; **Ovary** ellipsoid, 1.7 - 3.5 mm, narrowed into beak like style; stigma lobes erect, twisted, 2.6 mm. **Capsules** ellipsoid, contracted into slender, exserted beak, golden brown. **Seeds** 2 tailed, golden, tail usually long and thin.

Flower : June – July *Fruit:* August.

Exsiccatas : Zuluk 3200 m, *SR Lepcha, AP. Das 30048*, dated 08.06.2006.

Status : Less common

Local Distribution : Zuluk, 3270-4000

General Distribution : INDIA: Sikkim; BHUTAN, CHINA, NEPAL, MYANMAR, TIBET.

Juncus benghalensis Kunth, Enum. Pl. 3: 360. 1884; Lewis in Hara *et al*, Enum. Fl. Pl. Nepal 1: 84. 1978; Noltie, Fl. Bhutan 3(1): 267. 1994; Hajra *et al*. Fl. Sikkim 1: 172. 1996. *J. bracteatus* Buchenau in Engler Bot. Jahrb .6: 220. 1885; *J. membraceus auct.non.* Royle ex D.Don in Proc. Linn. Soc. 1: 10, 1839; Hook.f. ,Fl. Brit. India 6: 397. 1890.

Local Name: Mung-chyit-dyep (Lep.)

Herbs stoloniferous, stolon filiform. Flower stems slender, and born singly, 5 - 2cm. **Scale leaves** one or more, whitish brown; stem leaves usually 2 (-3); lower leaf basal, acute, filiform, channeled above and usually bitubular in section to 9.5 cm, c o.3m wide; upper stem leaf usually present but absent sometimes. Blade to 6.9 cm. Sheath long and slightly inflated of brown tinged. Auricles oblong, blunt, usually conspicuous, brownish. **Inflorescence** 3 - 12 flowered; lowest bract developed into leaf like point to 2.2 cm. **Tepals** sub acute, equal, and often narrowly lanceolate. **Anthers** usually very narrow, 1.9 - 2.8mm, exserted at maturity. **Ovary** ellipsoid, 2.5-3.8 mm; Style 1.8- 2.2 mm; stigma lobes erect. **Capsules** distinctly short stipitate, ellipsoid-trigonous, shorter than tepals, 2.8-3.5mm, contracted into beak 0.5-1.2 mm; seeds 2 tailed.

Flower : June – August

Fruit: September

Exsiccatus : Bhimbase 4200 m, **SR Lepcha & AP. Das 02519**, dated 08.08.2004.

Status : Common

Local Distribution : Bhimbase 4200 m

General Distribution : INDIA: Arunachal Pradesh, Jammu and Kashmir, Sikkim, W. Bengal, BHUTAN, S. CHINA, NEPAL.

Note : Endemic to Himalaya

Juncus bufonius L., Sp. Pl. 328.1753; Hook.f., Fl. Brit. India 6: 392. 1892; Noltie, Fl. Bhutan 3(1): 252. 1994; Shukla *et al.* in Indian J. Forest. 23(4): 471.2000.

Local Name: Mung-chyit-gung (Lep.)

Herbs annual slender, Flower stems to 25cm, branched usually from base. **Leaves**; stem leaves sub-basal, solid, filiform, channeled above, up to 5.5cm long 0.6 - 2.8mm wide. Auricles absent, flowers usually borne solitary, sessile, oftenly enclosed by 2 ovate-acuminate, transparent bracteoles. **Tepals** unequal; outer finely acuminate, margin membranous, 3.2 - 5.8mm; inner acute, membranous margin slightly wider, 3.5 - 5.2mm. **Stamens** 6, usually shorter than tepals; filaments 0.6 - 1.3mm; anthers 0.4 - 0.8mm. **Ovary** usually narrowly ellipsoid, 1.8 - 2.2mm; Style very short; stigma lobes very short, deflexed. **Capsule** narrowly ellipsoid-trigonous, apex truncate 3 - 5 x 1 - 2.5mm, oftenly shorter than inner lapels, straw coloured, seeds, without membranous testa, pale brown.

Flower : May

Fruit : September

Exsiccatus : Hatichirey to Tal-kharka upto 1600 m, **SR Lepcha & AP. Das 20227**, dated 08.10.2004.

Status : Common

Local Distribution : Haticheray , Phusrey upto 1800 m.

General Distribution : INDIA: Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jammu & Kashmir, Kerala, Madhya Pradesh, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh; AFGANISTAN, AUSTRALIA, BHUTAN, CHINA, EUROPE, JAPAN, KAZAKHSTAN, KOREA, MONGOLIA, NEPAL, PAKISTAN, RUSSIA, SRI-LANKA, THAILAND, VIETNAM, N&S AMERICA, S-W ASIA.

Juncus clarkei Buchenau in Engler Bot. Jahrb. 6: 210. 1885; Hook.f., Fl. Brit. India 6: 400. 1892; Satake in Hara, Fl. E. Him. 1: 402. 1966; Noltie, Fl. Bhutan 3(1): 260. 1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 174. 1996; Shukla *et al.* in Indian J. Forest. 23(4): 473. 2000.

Local Name: Mung-chyit-mundel (Lep.)

Herbs rhizomatous, flower stem usually 12 – 38 cm. **Stem leaves:** blade flat, gradually tapered to acute apex, upper usually over topping inflorescence margins sometimes narrowly membranous, minutely toothed at junction with sheath to 25cm, 2.5 - 4.2 mm wide. Sheath often reddish without aurides. **Inflorescence** lateral of 1- 4 unequally peduncled 4-13 flowered, hemispheric capitula; lowest bract erect, leaf like, exceeding inflorescence; flowers erect with very short pedicelled. **Tepals** usually lanceolate, outer acute, midrib inner broader, usually longer, pale straw-coloured, filaments (3.1-) 3.5 - 5.5 mm; anthers 1.6 - 2.8 mm partly exserted. **Ovary** ovoid inflated, gradually tapered into style, ovary + style 5.5 - 8.2 mm, straw coloured; **Stigma** lobes 0.1 - 2.1mm, **Capsules** ovoid, tapered into persistent style, long exserted from tepals, pale straw-coloured.

Flower : July *Fruit:* October
Exsiccatus : Panglakha to Rachela, upto 3090 m. **SR.Lepcha & AP. Das 31052**, dated 02.10.2004.
Status : Common
Local Distribution : Panglakha, Rachela, upto 3060 m,
General Distribution : EUROPE, HIMALAYA (Uttar Pradesh – BHUTAN) West Bengal Assam, Manipur, Nagaland,; CHINA,

Juncus grisebachii Buchenau in Abh. Naturwiss, Vereine Bremen 3: 295. 1872; Hook.f., Fl. Brit. India 6: 394. 1892; Satake in Hara, Fl. E. Him. 402. 1966; Noltie, Fl. Bhutan 3(1): 257. 1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 174. 1996; Shukla *et al.* in Indian J. Forest. 23(4): 476. 2000.

Local Name: Mung-chyit-gyel (Lep.)

Herbs stoloniferous. Flower stems erect, 18 – 80 cm. **Leaves;** stem leaves up to 4 near base, blade semi- to sub cylindrical, channeled above, septate, Septa usually visible externally, upto 30 mm long and 6 - 2.7mm wide. Auricles blunt, pale brown, usually membranous. **Inflorescence** terminal, branched, of 2 - 5 (-11) flowered capitula; lowest bract leaf-like, erect, usually exceeding inflorescence. **Tepals**, acute, usually lanceolate, outer usually shorter than inner, whitish to pale coloured. **Stamen** 6; filament 3.5 - 5.5 mm; anther linear, 2.8 - 3.7 mm; partly exserted, creamy. **Ovary** ellipsoid, 2.3 - 3.4 mm, tapered into long style (2.2 - 3.8 mm); **Stigma** lobes twisted and stout. **Capsules** broadly trigonous-ellipsoid, with short beak (0.2-1.6 mm), orange-brown; seeds 2-tailed, tails sub equal.

Flower & Fruit : July – October
Exsiccatae : Kupup to Nathang 4100 m, **SR Lepcha & AP. Das 30969**, dated 24.07.2005 ; Panglakha to Rachela 2840 m, **SR Lepcha & AP. Das 31068**, dated 02.10. 2004 (BSHC).
Status : Common
Local Distribution : Kupup, Nathang, Rachela, upto 4150 m.
General Distribution : HIMALAYA : , (Uttar Pradesh - Arunachal Pradesh), CHINA,
Note : Endemic to himalaya

Juncus himalensis Klotzsch in Klotzsch & Garcke, Bot. Reise Pr. Waldemar 60, t. 97. 1862; Hook.f., Fl. Brit. India 6: 398. 1892; Noltie, Fl. Bhutan 3(1): 255. 1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 174. 1996; Shukla *et al.* in Indian J. Forest. 23(4): 477. 2000.

Local Name: Mung-chyit-lhosa (Lep.)

Herbs stoloniferous, upto 65 cm. **Stem leaves** up to 4, erect stiffly, blade usually narrow, semi-cylindric, lapered, margins of channel very serrulate, septate, to 25 cm. Auricles conspicuous free part c.1 x 2.5 mm, tinged brown. **Inflorescence** terminal, with 10 - 12 unequalling peduncled, 2 - 10 flowered. Capitula, flowers sub sessile. **Tepals** lanceolate, acute, midrib, greenish, inner with membranous margins and tips. **Stamens** always shorter than tepals; **Ovary** ellipsoid, tapered into style; **Capsule** trigonous-ellipsoid oblong, exceeding tepals. Seeds 2 tailed.

Flower & Fruit : June - August.

Exsiccatus : Kupup lake surrounding, 3900 m, **SR Lepcha & AP. Das** 02560, dated 24.07.2005. Gnathang - Kupup, 3900 m, *S.R. Lepcha, AP. Das, T. M. Hynniewta & G. M. Chhetri* 30117, dated 24. 07. 2005.

Status : Less common

Local Distribution : Kupup lake, 3920 m

General Distribution : PAKISTAN, (Jammu & Kashmir - BHUTAN), CHINA, TIBET, E. ASIA.

Juncus inflexus L., Sp. Pl. 326. 1753; Noltie, Fl. Bhutan 3(1): 252. 1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 174. 1996; Shukla *et al.* in Indian J. Forest. 23(4): 478. 2000.

Local Name: Mung-chyit-dyem (Lep.)

Herbs rhizomatous. A flower stem bears no true leaves, erect, tufted, cylindric, longitudinally ridged, 32 - 98 cm, pith white. **Scale leaves** to 5.5 cm, blackish brown lower greenish uppermost, 16-19 cm aristate. **Inflorescence** compound head appearing lateral, a lax irregular, branches slender flowers small. **Tepals** unequal, acute, lanceolate, outer 2.5 - 3.8mm, inner 1.5 - 3.2mm, midrib brownish to greenish, margins membranous. **Stamen** 6, usually shorter than tepals; anther 0.7 - 0.8 mm, normally equaling filaments. **Ovary** oblong-ellipsoid, 0.3-1.1 mm; style short; stigma lobes very short (0.3 - 0.8 cm). **Capsule** trigonous ellipsoid-oblong, exceeding outer tepals, 2.3 - 2.9 mm; seeds not tailed, but membranous ridge on one side.

Flower & Fruit : April - September

Exsiccatus : Hatichiray to Talkharka, upto 1400, **SR Lepcha & AP. Das** 27781
Dated 08.10.2004.

Status : Not common

Local Distribution : Haticheray - Talkharka upto 1500 m.

General Distribution : AFRICA, PAKISTAN, (Jammu & Kashmir - Manipur), Maharashtra, Kerala, Tamil Nadu, Uttarakhand, SRI LANKA, MYANMAR, MALAYSIA, INDONESIA, PHILIPPINE ISLANDS.

Juncus khasiensis Buchenau in Engler Bot. Jahrb. Syst. 12: 407. 1890; Hook.f., Fl. Brit. India 6: 399. 1892; Noltie, Fl. Bhutan 3(1): 260. 1994; Shukla *et al.* in Indian J. Forest. 23(4): 478. 2000.

Local Name: Mung-chyit-nok (Lep.)

Herbs, flower stems 6 - 14 (-32) cm, slender. **Scale leaves** 7 or sometime 2, chaffy, pale. Stem leaf 1, sub basal, blade filiform with 3 or 5 deep channels, in Y or X-shaped in cross section, not

septate, to 15cm, 0.8 - 1.4mm wide. Auricle short 0.2-0.5 mm. **Inflorescence** with (1-) 3 (-5) unequal peduncled, 3 (-5) flowered **capitula**; lowest bract leaf like, usually half length to equaling longer peduncle. **Tepals** usually narrowly lanceolate, acute, sub equal or outer shorter (3.2 - 4.1) than inner (3.5 - 4.8 mm), pale straw coloured. Anther 1.1-1.9 mm usually exerted from tepals. **Capsule** narrowly ellipsoid, tapered into persistent style, exceeding tepals, golden brown; Stigma lobes 1-1.5 mm. Seeds 2 tailed, one wider than other.

Flower : June – September
Exsiccatus : Kupup to Nathang 3850 m, **SR Lepcha & AP. Das 30909**, dated 24.07.2005
Status : Not common
Local Distribution : Kupup Nathang, Rachel, upto 3850 m.
General Distribution : E. HIMALAYA (Uttarakhand; Sikkim, BHUTAN. Assam, Meghalaya, Nagaland, BANGLADESH,

Note : Endemic to Eastern Himalaya

Juncus leucanthus Royle ex D. Don in Trans. Linn. Soc. London 18: 318. 1840; Hook.f., Fl. Brit. India 6: 397. 1892; Satake in Hara, Fl. E. Him. 403. 1966; Noltie, Fl. Bhutan 3(1): 264. 1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 175. 1996; Shukla *et al.* in Indian J. Forest. 23(4): 480.

Local Name: Mung-chyit-kaak (Lep.)

Herbs perennial non stoloniferous, tuft. 4-15 (18) cm tall. Rhizome creeping. Stem subterete, 0.5-1 mm in diam. Catephylls few, **stem leaves** 2, sub basal, upper part of stem leaf less. Basal leaves 1 or 2; leaf sheath auricles absent or obtuse, membranous, ca. 0.5mm: leaf blade flat, unitubular, 2-7 cm x 0.5-1 cm, margin convolute to subterete. **Inflorescence** terminal, head solitary, 5-12 flowered; **bracts** 3-6, pale brown, lanceolate; basal 1-2 bracts leaf like. **Perianth** segments lanceolate, 4.-5.5 x ca. 1.5 mm, sub equal, margin yellowish, apex obtuse. **Stamen** 6; filaments 2.5- 4.5mm. **Ovary** ellipsoid-trigonous. Style 1.5-2 mm; stigmas lobes 0.5-1.5mm. **Capsule** ovoid-oblong, usually shorter than perianth. 3-septate, apex mucronet. Seeds sawdustlike; appendages 2, long tailed.

Flower & Fruit : June – September.
Exsiccatus : Kupup, 3900 m, **SR Lepcha & AP. Das 27552 & 27560**, dated 08.08. 2004.
Status : Fairly common
Local Distribution : Kupup, Jalepla (3650-4870m.)
General Distribution : HIMALAYA (Jammu & Kashmir -BHUTAN), CHINA.
Note : Endemic to Himalaya

Juncus ochraceus Buchenau in Abh. Naturwiss. Vereine Bremen 3: 262. 1872; Hook.f., Fl. Brit. India 6: 394. 1892; Satake in Hara, Fl. E. Him. 403. 1966; Noltie, Fl. Bhutan 3(1): 253.1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 176. 1996; Shukla *et al.* in Indian J. Forest. 23(4): 481. 2000.

Local Name: Mung-chyit-dangsa (Lep.)

Herbs, perennial, tufted, 10 – 35 cm tall. Rhizome short. Stem terete. Ca. 1.5 mm in dia. **Leaves** mostly basal, filiform, grooved, bi-tubular, septate; leaf sheath auricles obtuse, membranous; leaf blade linear 5 - 17cm, apex acute. **Inflorescence** cymose, much branched, to 11.5 cm; **Involucral** bract leaf like, golden, fertile flowers inconspicuous. **Perianth** segments lanceolate, center greenish, margin hyaline, apex acute. **Stamens** 5 - 6; shorter than tepals

filaments 1-2 mm; anthers 1.5 – 2 mm. Often twisted ovary widely ellipsoid. 1.5 - 2.5 mm. Stigmas erect, twisted 1.5 – 3 mm, **Capsule** trigonous oblong, ca 2.4 mm; Seeds (immature) apparently not append aged at both ends.

Flower & Fruit. : September – May
Exsiccatae : Rachel, 3000 m, **SR Lepcha & AP. Das** 30294, dated 06.10.2004;
Zuluk to Premlakha 3700 m, **SR Lepcha & AP. Das** 2556, dated
27.10.2004.
Status : Common
Local Distribution : Rachel, Changu, Panglakha, upto 3800 m.
General Distribution: : NE HIMALAYA (NEPAL – BHUTAN), West Bengal Arunachal Pradesh, Assam, CHINA,

Juncus sikkimensis Hook.f., Fl. Brit. India 6: 399.1892; Noltie, Fl. Bhutan 3(1): 256. 1994 & Edinb. J. Bot. 51(2): 134. 1994; Shukla *et al.* in Indian J. Forest. 23(4): 483. 2000.

Local Name: Mung-chyit-mungyal (Lep.)

Herbs stoloniferous, creeping, upto 25cm. **Scale leaves:** upper leaf blade narrowed below, apex blunt, semi-cylindric of large central hollow, septate, 3.5 - 25.5 cm, 1 - 2.5 mm wide; auricles short. **Inflorescence** lateral with usually 2 peduncle 2 unequal, capitula 2 - 4 flowered, bract lowest stout, exceeding, shortly pedicelled; **tepals** lanceolate irregular in length, mucronate, dark brown to blackish. **Stamens** usually shorter than tepals; anthers twisted. Stigma lobes erect, twisted usually yellowish-green. **Capsule** trigonous, ellipsoid, beak short; seeds 2 tailed.

Flower : June *Fruit.* October
Exsiccatae : Kupup 3900 m, **SR Lepcha & AP. Das** 25121 dated 13. 10. 2006;
Nathang 3880 m, **S.R. Lepcha & AP. Das** 30106, dated 24.07.2005.
Local Distribution : Kupup, Nathang upto 3900 m
General Distribution : E. HIMALAYA (NEPAL – BHUTAN) Arunachal Pradesh, S.TIBET.
Note : Endemic to Himalayas

Juncus thomsonii Buchenau in Bot. Zeit. 25: 148. 1867 & in Engler Pflanzenr. 25: 224. 1906; Noltie, Fl. Bhutan 3(1): 268.1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 177. 1996; Shukla *et al* in Indian J. Forest. 23(4): 484. 2000. *Juncus leucomelas sensu* Hook.f., Fl..Brit..India 6: 397. 1892 p.p.

Local Name: Mung-chyit-mundok (Lep.)

Herbs perennial, tufted in tussocks 8 - 25cm tall. Rhizome short. Stems terete, 0.5 - 1.5 mm in diameter. **Leaves** all sub-basal, usually 2: leaf sheath reddish brown, auricles acute; leaf blade linear, 4 – 8 cm, apex with a callus. **Inflorescence** terminal, solitary, 4-8 mm in diam., 2 – 7 flowered bract 2 or 3, ovate- lanceolate, shorter than head, apex obtuse. **Perianth** segments yellowish white, oblong lanceolate. **Stamens** 6: filaments 3 - 5.5 cm; **anther** linear, 1.5 – 2 mm style short. **Ovary** ellipsoid, 2-4mm, tapered into style. **Capsule** ellipsoid - trigonous equaling to exceeding tepals. 3.5 – 4.5 mm. Seeds orange, oblong 0.5 – 1 mm; appendages 2, whitish.

Flower : July – August *Fruit:* August – September
Exsiccatus : Kupup-Bhimbase, 4200 m, **SR Lepcha & AP. Das** 30905, dated 24.07. 2005.
Status : Sparse
Local Distribution : Kupup to Bhimbase, Talkharka, 2000 – 4000 m.
General Distribution : PAKISTAN, HIMALAYA (Jammu & Kashmir – BHUTAN),

BURMA, CHINA, C- ASIA.

Juncus triglumis L., Sp. Pl. 328. 1753; Hook.f., Fl. Brit. India 6: 396. 1892; Satake in Hara, Fl. E. Him. 404. 1966; Noltie, Fl. Bhutan 3(1): 269. 1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 178. 1996; Shukla *et al.* in Indian J. Forest. 23(4): 484. 2000.

Local Name: Mung-chyit-matsam (Lep.)

Herbs annual. **Scale leaves** reddish brown; stem leave 2, stem blade linear, apex erect blunt. Sheaths with membranous margins; auricles curved, acute. **Inflorescence** 4 -10 flowered; lowest bracts subequal, lanceolate to ovate normally boat shaped. **Tepals** lanceolate, subequal, **Ovary** ellipsoid. **Capsules** ellipsoid-trigonous. Seed 2 tailed.

Flower & Fruit : June - September

Exsiccatae : Kupup lake surrounding, 3900 m, *SR Lepcha & AP. Das 30961*, dated 24.07.2005, *SR Lepcha, AP Das, T.M. Hynniewta & Geeta Chettri 30116*, dated 24.07.2005.

Status : Not common

Local Distribution : Kupup, Nathang, upto 4000m.

General Distribution : N.AMERICA, EUROPE, RUSSIA, (NEPAL – BHUTAN)
Arunachal Pradesh, CHINA, JAPAN, KOREA, MONGLIA,

Juncus uniflorus W.W. Smith in Rec. Bot. Surv. India 6: 104. 1914; Noltie, Fl. Bhutan 3(1): 270. 1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 178. 1996; Shukla *et al.* in Indian J. Forest 23(4): 485. 2000.

Local Name: Mung-chyit-mungkaat (Lep.)

Herbs, Flower stems 2.5 - 4cm. **Scale leaves** striate, long aristate, yellowish brown coloured; Stem leaves usually 1- 2, narrowly filiform, bitubular, often twisted, deeply channeled above, to 3 – 4 cm, 0.3 - 0.6 mm wide. Auricle acute, transparent. **Inflorescence** a solitary with very short pedicelled flowered, anthesis spreading horizontally, sheathing base boat shaped, brown-membranous, upper bract often ovate. **Tepals** narrowly lanceolate, reflexed, acute to sometime acuminate, sub equal or inner slightly longer 2.2 - 3.5 (4.2) mm, pale reddish brown. **Stamens** shorter than tepals; filaments 0.6-0.8 mm; anthers 0.6-1.5-2 mm. **Ovary** ellipsoid, 0.7 -1.8mm, tapered upwards into style 1-1.8mm; stigma lobes erect, twisted, 1.6 - 3.5 (-4.8) mm, reddish. **Capsules** ellipsoid-trigonous, tapered into beak, darkish brown.

Flower & Fruit : June – October

Exsiccatatus : Kupup Lake surrounding 3900 m, *SR Lepcha & AP. Das 30113*, dated 24.07.2005.

Status : Rare

Local Distribution : Kupup, Bhimbase upto 4200 m.

General Distribution : E. HIMALAYA (NEPAL – BHUTAN), S.E TIBET.

Note : Endemic to Eastern Himalayas

Juncus wallichianus Laltarpe, Monogr. Junc. 139. 1827; Satake in Hara, Fl. E. Him. 403. 1966; Noltie, Fl. Bhutan 3(1): 231. 1994; Mandal in Hajra & Verma, Fl. Sikkim 1: 178. 1996; Shukla *et al.* in Indian J. Forest. 23(4): 485. 2000.

Local Name: Mung-chyit-vaalik (Lep.)

Herbs tuft perennial, upto upto 25 cm tall. **Leaves** upto 3, evenly placed along stem. Blades laterally compressed and tapered to acute apex, tubular, normally orange brown scale leaf, sheaths slightly inflated; auricles rounded; flower stem smooth grooves. **Inflorescence** much branched and with few flowers, **stamen** 3, oftenly septate. **Ovary** oblong to narrowly ovoid tapred to narrow beak. **Capsule** shorter than tepals obovoid –trigonous upto 3.5mm. **Seeds** pale brown with dark tip, without tail.

Flower & Fruit : May – October
Exsiccatus : Lampokhari-Bhimbase 4320 m, *SR Lepcha & AP. Das* 31100, dated 24.07.2005
Status : Not common
Local Distribution : Lampokhri, Bhimbase, Kupup, upto 4270 m.
General Distribution : RUSSIA (SIBERIA), NEPAL – BHUTAN), West Bengal, Assam, Arunachal Pradesh, SRI LANKA, CHINA, JAPAN, KOREA.

Order: Cyperales

CYPERACEAE A. Jussieu

Key to the Genera

- | | |
|---|---------------------|
| 1 Bristles absent | 3 |
| + Bristles present | 2 |
| 2. Stamens 1 – 2; stigmas 3 | <i>Erioscirpus</i> |
| + Stamens 3; stigmas 2 | <i>Blysmus</i> |
| 3. Leaves mostly basal or near base | <i>Fimbristylis</i> |
| + Leaves throughout stem | 5 |
| 5. Glumes spiral (rarely distichous) | 6 |
| + Glumes distichous | 7 |
| 6. Nuts trigonous | <i>Bulbostylis</i> |
| + Nuts obovoid-trigonous | 8 |
| 7. Stigmas 3 | <i>Cyperus</i> . |
| + Stigmas 2 | 9 |
| 8. Rhizomes non-creeper; flowers unisexual; leaf “V” shaped in section | <i>Carex</i> |
| + Rhizomes creeper; flowers rarely unisexual; leaf not “V” shaped in section .. | <i>Kobressia</i> |
| 9. Stems tufted; inflorescence condensed | <i>Pycneus</i> |
| + Stems not tuft; inflorescence a dense head | <i>Kyllinga</i> |

Bulbostylis Kunth

Bulbostylis densa (Wall. ex Roxb.) Karsten & Schenk, Vegetations 20 (7): 16. 1930; Koyama in Hara, Fl. E. Him 380. 1966; Noltie, Fl. Bhutan 3(1): 298. 1994; Hajra & Verma, Fl. Sikkim 1: 198. 1996. *Scirpus densus* Wall. ex Roxb., Fl. Indica ed. Carey, 1: 231. 1820. *Bulbostylis capillaris* C.B. Clarke var. *trifida* (Kunth) C.B. Clarke in Fl. Brit. India 6: 652. 1894.

Herbs annual, slender tufted. Stems to 20 cm, filiform. **Leaves** erect, basal and sub-basal, half the stem length or slightly more. Sheaths hairy at apex, pale brown. **Inflorescence** umbellate, sometime reduced to a single spikelet. **Spikelet** sessile, 0.25 - 0.50 x 0.13 - 0.30 cm, ovoid, acute; lowermost bract shorter than inflorescence and with filiform tip. **Glumes** spiral, rarely distichous, ovate, acute, fimbriate, 3-veined. **Stamens** 2; style upto 0.10 cm, glabrous; stigmas 3. **Nut** strongly trigonous, finely papillose.

Flower : April *Fruit*: September
Exsiccatus : Rachela below 2600 m, **SR Lepcha & AP. Das 2541**, dated 08.07.2005
Status : Common
Local Distribution : Changu, Padamchen upto 2600 m .
General Distribution : E. HIMALAYA; CHINA, JAPAN.

Blasmus Panzer ex J.A. Shultes

Blasmus compressus (L.) Panzer in Link. Hort. Berol. 1: 278. 1827; Noltie, Fl. Bhutan 3(1): 1994. *Schoenus compressus* L., Sp. Pl. 43. 1753. *Scirpus planifolius* Grimm., Nov. Act. Cur. 3: App. 259.1767. *Scirpus caricis* Retz., Fl. Scand. 11. 1799; C.B. Clarke in Hook.f., Fl. Brit. India 6: 660.1893.

Herbs stout, rhizomatous. Stem upto 50 cm tall. **Leaves** slightly wide near base, narrowly tapered at apex, inrolled, \pm equaling to the stem to 1.2 - 4.8 mm wide, lower sheath persistent, ribbed, brown. **Inflorescence** to 3 cm; lowest bract with glume-like base and green midrib extended into leaflike, slightly shorter than exceeding spike. **Spikelets** 2 - 12, lowest distant, linear ellipsoid. **Glumes** ovate, subacute to 4.5 x 2.5 - 3 mm, golden to reddish brown, margins hyaline. Bristle 6, retrosely barbed slender, reddish brown, to equaling stigma. Stigma exceeding style. **Nut** obovate flattend.

Flower : June *Fruit*: September
Exsiccatus : Kupup 3990 m, **SR. Lepcha & AP. Das 2540**, dated 20.0.2005.,
Status : Not common
Local Distribution : Changu, Padamchen upto 3600 m.
General Distribution : NE- INDIA, BHUTAN, NEPAL.
 Note : Endemic to Eastern Himalya

Carex Linnaeus

Key to the species

1. Midrib of female glumes prominently excurrent 2
- + Midrib of female glumes not excurrent *C. pulchra*
2. Utricle with beaked 3
- + Utricle without beak or rarely beaked *C. duthiei*
3. Margin of beaks setose 4
- + Beaks smooth 7
4. Spikes commonly drooping *C. myosorus*
- + Spikes not drooping 5
5. Utricle without deflexed beaked 6
- + Utricles with deflexed beaked *C. insignis*
6. Female spikes linear *C. setosa*
- + Female spikes cylindric *C. alopecuroides*

- 7. Spikes sessile 8
- + Spikes on slender peduncles 9
- 8. Female glumes with orange-brown tinges *C. inanis*
- + Female glumes with pale-yellow strip 10
- 11. Leaf sheath bases golden-brown, glazy *C. daltonii*
- + Leaf sheath bases chestnut-brown, shining *C. crassipes*
- 9. Rhizomes creeping; leaf sheath base reddish-purple *C. filicina*
- + Rhizomes not creeping; leaf sheath base pale brown 12
- 12. Utricles swollen, beaks straight..... *C. cruciata*
- + Utricles not swollen; beaks curved..... 13
- 13. Culms trigonous; utricles lanceolate and glabrous *C. nubigena*
- + Culms not trigonous; utricles rhomboid and hispid..... 14
- 14. Spikes 5-11, upper males, middle female; utricle beaked *C. teres*
- + Spikes 4-7, mostly females; utricle not beaked *C. obscura*

Carex alopecuroides D. Don ex Tilloch et Taylor var. *chlorostachys* (D. Don) Cl. in Jour. Linn. Soc. 36: 271. 1903; Noltie, Fl. Bhutan 3(1): 394. 1994; Hajra & Verma, Fl. Sikkim 1: 199. 1996. *C. chlorostachys* D. Don in Trans. Linn. Soc. 14: 330. 1825, non Steven 1813. *C. japonica sensu* Cl. in Fl. Brit. India 6: 736. 1894 p.p., non Thunb. *C. japonica*. ssp. *chlorostachys* (Kuk.) Koyama in Hara, Fl. E. Him. 382. 1966. *C. doniana* Spr., Syst. Veg. 3: 825. 1823.

Local name : Mongsher (Lep.).

Herbs annual or perennial, with creeping rhizomes, ribbed-scaly. Stems slightly tufted. **Leaves** basal, sheathing at the lower part of culm, blades to 1.8 cm. Culm to 50cm, acute, trigonous. **Inflorescence** terminal. **Male spike** 1, to 5.5 cm long, erect; peduncle to 3 cm long. **Female spikes** 3 - 5, erect, to 5 cm long, cylindrical, peduncled; **prophylls** fused forming utricles 0.3 - 0.42 x 0.13 cm, ellipsoidal, trigonous, gradually tapering into longer beak, apex herbaceous and glabrous; stigmas 3. **Female glumes** acuminate, midrib greenish. **Male glumes** oblong or lanceolate, subacute to acuminate, tip cabrid.

Flower & Fruit : April – May

Exsiccatus : Near Rachel Peak 2800 m, **SR Lepcha & AP. Das 2513** dated 25.10.2004

Status : Frequent.

Local Distribution : Gangtok, Tumlong, Karponang, 1700 – 2000 m.

General Distribution : E. HIMALAYA; INDIA, C. CHINA, NORTHEASTWARD TO JAPAN.

Carex crassipes Boeckeler in Linnacea, 11: 329. 1876; Notie, Fl. Bhutan 3 (1): 385. 1994.

Herbs perennial. Rhizome slender, creeping to 22 cm. **Lamina** 0.30 - 0.47 cm long, slightly narrowed, sheaths with shining dark brown towards bases. Fascicles with many slender peduncles, upto 13 cm, disposition of sexes similar, utricles hispid with bifid beak, gradually narrowed. **Spikes** and **glumes** comparatively less and smaller, straw-coloured to dark brown, awns very short (0.8 cm).

Flower & Fruit : May – July

Exsiccata : Phusrey 2250 m, **SR Lepcha & AP. Das 2514**, dated 23.10.2004

Status : Less Common.

Local Distribution : Phusrey 2000 – 2500 m.
General Distribution : E. HIMALAYA; INDIA (Darjeeling-Sikkim), Bhutan.
Note : Endemic to Eastern Himalaya.

Carex daltonii Boott, *Illust.* 1: i. 5, t. 16. 1958; C.B. Clarke in *Hook.f., Fl. Brit. India* 6: 726. 1894; Noltie, *Fl. Bhutan* 3(1): 384. 1994; Hajra & Verma, *Fl. Sikkim* 1: 202. 1996.

Herbs with creeping rhizome. **Leaves** in basal rosettes, usually solitary on lower part of culm, blades to 1.5 cm, slightly shorter than culm, more stiffy; leaf-sheaths golden brown at base. Culm 45 - 75 cm long, erect and stout. **Fascicles** numerous, usually pedunculate, desposition of male and female Flower distinctly similar. Peduncles to 14cm, slender. Utricles 0.5 x 0.2 cm, hispid, tapering into a bifid beak. **Female glumes** smaller, to 0.30 x 0.4 cm, dark brown or straw yellow; awn to 0.22 cm.

Flower & Fruit : March – July
Exsiccatu : Rachela Middle 2450 m, *SR Lepcha & AP. Das* 2515, dated 26.10.2004
Status : Less Frequent.
Local Distribution : Trijunction Rachela Middle, 2400 - 2900m.
General Distribution : E. HIMALAYA (Sikkim-BHUTAN).
Note : Endemic to Eastern Himalaya.

Carex cruciata Wahlenberg in *Vet.-Akad, Nya Handl. Stokh.* 24: 149. 1803; *Illust. Carex* 3: t. 247-249. 1862; C.B. Clarke in *Hook.f., Fl. Brit. India* 6: 715. 1894; Koyama in Hara, *Fl. E. Him* 381. 1966; Hajra & Verma, *Fl. Sikkim* 1: 201. 1996. *C. condensata* Nees ex Wight, *Contrib. Bot. India* 123. 1834; *Fl. Brit. India* 6: 716. 1894.

Herbs perennial rhizomatous. Stems with remnants of leaves at apex. Culm upto 90 cm. Leaf sheaths pale brown, dark veined at base. **Leaves** sub-basal, lamina 0.45 - 0.80 cm across. **Inflorescence** to 30 cm long; panicles pyramidal; bracts leafy. Bracteoles filiform. **Spikes** mostly female. Utricles glabrous, swollen, parallelly veined, abruptly tapered into a beak. **Female glumes** ovate, mucronate deep red with pale yellow stripe. **Male glumes** to 0.5 cm, lanceolate, obscurely mucronate. Utricles glabrous, slightly swollen, parallelly veined, tapered into beak.

Flower & Fruit : April - January
Exsiccatu : Phusrey 22 00m, *SR Lepcha & AP. Das* 2526, dated 07.07.2005.
Status : Frequent.
Local Distribution : Karponang, Kyongnosla, 2300 – 2900 m.
General Distribution : MEDAGASCAR, INDIA, NEPAL, BHUTAN, INDO-CHINA, FORMOSA, S. JAPAN

Carex duthlei C.B. Clarke in *Hook.f., Fl. Brit. India* 6: 831. 1804; Noltie, *Fl. Bhutan* 3(1): 388. 1994. *Carex atrata* L. ssp. *pullata* (Boott.) Kukenth. in *Eng.Pflanzenr.*38: 400. 1909. *Carex atrata* L., *Sp. Pl.* 1387. 1753; C.B. Clarke in *Hook.f., Fl. Brit. India* 6: 731:1894 var. *pullatta* Boott, *Illustr.* 3: 114.t. 364.1862.

Herbs perennial upto 15 - 90cm tall. Rhizome short, stem tufted. Bases of leaf sheaths striped brownish to blackish red. **Leaves** basal-sub-basal 1 - 3 on lower culm, blades about ½ lengths to culm, 2 - 5.5mm wide. Culm 20-90cm, trigonous. **Inflorescence** of 2 - 4 in drooping spikes, 2 - 3 upper peduncle short, crowded, longer peduncle distant. **Spikes** narrowly cylindrical, tapering to apex, 1.5 - 6 x 5 0.7cm, gynaeandrous terminal, lowest bract with setaceous and exceeding inflorescence, “auricles” short, clasping, upper bracts conspicuous. Utricles elliptic-oblong-trigonous, 2.5 - 3.6 x 1 - 1.7mm, glabrous, pale green, beakless, aperture entire, black; stigmas 3. **Female glumes** lanceolate, acuminate-acute, purplish-black, midrib excurrent.

Flower : June – July *Fruit*: July – October
Exsiccatu : Bhimbase 3660m, **SR Lepcha & AP. Das 30962**, dated 24.07.2005:
 Kupup 4200m, **SR Lepcha & AP. Das 30966**, dated 24.07.2005
Status : Common
Local Distribution : Changu, Kyonglasha, Sherathang 3260 – 4570 m.
General Distribution : ALPINE REGION of EASTERN HIMALAYA, E. TIBET. CHINA,
 and JAPAN.

Carex filicina Nees in Wight, Contrib. India 23.1834 (incl. var. *meiogyna* (Nees) Strachey); C.B. Clarke in Fl. Brit. India 6: 717.1894; Noltie, Fl. Bhutan 3(1): 377. 1994; Hajra & Verma, Fl. Sikkim 1: 207:1996. *Carex nilagirica* Steud., Syn. Cyp. 207. 1855. *Carex filicina* var. *minor* Boott, Illustr. 3: 106.t. 317 & 318.

Herbs perennial, stout with creeping rhizome creeping. Bases of leaf Sheaths cream or reddish purple, fibrillose margin; blade less sheaths with reddish-purple. **Leaves** basal, 1 - 2, blade equaling to culm, 1.5 – 1.5 cm wide. Culm 2.2 - 11cm. **Inflorescence** panicles in unequal pairs; bracts shorter than inflorescence. Partial panicles rigid, open, triangular in outline, spikes decreasing in length or variable in size within inflorescence, borne directly on axis in upper half and on other branches in lower half. **Spikes** initially female, utricle lax, deflexed at maturity; female section 4.5 - 18.5mm; male section 2.5 - 5.8mm. Utricles ellipsoid-trigonous, curved, narrowed into beak; ribbed, olive green; beak deflexed, apex hyaline, aperture oblique, not notched; **stigmas** 3. **Male glumes** lanceolate. **Female glumes** ovate, acute, hispid minutely; pale brown, straw coloured.

Flower & Fruit : July – August
Exsiccatu : Lungthung 3800m, **SR Lepcha & AP. Das 20277**, dated 28.10.2004:
 Panglakha 2700 m, **SR Lepcha & AP. Das 29374**, dated 30.09.2004:
 Zuluk- Padamchen 2500-3800 m, **SR Lepcha & AP. Das 32892**, dated
 27.10.2004.
Status : Common
Local Distribution : Karponang, Padamchen, Lungthung 600 – 4000 m.
General Distribution : INDIA, BHUTAN. MYANMAR, INDO-CHIN, MALAYSIA, CHINA,

Carex inanis Kunth, Enum. Pl. 2: 522. 1837; C.B. Clarke in Hook.f., Fl. Brit. India 6: 743. 1894; Pfl. Reich. IV-20, Ht. 38: 419. 1909; Hara *et al*, Enum. Fl. Pl. Nepal 1: 103, 1978; Noltie, Fl. Bhutan 3(1): 404. 1994; Hajra & Verma, Fl. Sikkim 1: 204. 1996.

Herbs with short rhizome. Stems densely tufted. Leaves usually longer than culms, inserted on base of column, to 0.3 cm wide, often sheathed, basal leaf sheaths fibrilous, purplish-brown, persistent. Culm to 40 cm, rounded - trigonous. Spikes 4 - 7, sessile, erect, apically crowded. **Male spike** terminal in position, to 2.3 cm long; **Female spike** with 3 - 6 spikes to 2.5 cm long, rarely branched at base into 1 or 2. Bracts often longer than inflorescence. Utricles 0.4 x 0.5 cm, broadly ellipsoid to obscurely obovoid with abrupt bidentate short beak, shortly whitish hairy, olive-brown; stigmas 3. **Female glumes** 0.28 x 0.18 cm, oblong to lanceolate, acute, sometime minutely emarginate, orange-brown with greenish midrib. **Male glumes** oblanceolate, deeply keeled midrib.

Flower & Fruit : June – October
Exsiccata : Karponang 2280 m, **SR Lepcha & AP. Das 2516**, dated 30.10.2004.
Status : Less Frequent.
Local Distribution : Karponang, Kyonglasha, 2300 – 3800 m.
General Distribution : TEMPARATE HIMALAYAS.

Note : Endemic to Himalaya.

Carex insignis Boott, Illustr.1: 5, t.14. 1858; C.B. Clarke in Hook.f., Fl. Brit. India 6: 725. 1894; Noltie, Fl. Bhutan 3(1): 384. 1994.

Herbs perennials, upto 60 cm tall. Rhizome stout. **Leaves** completely hidden by sheaths, blades evenly narrowed. **Inflorescence** slightly longer upto 13 nodes. Peduncle unequal. **Spikes** predominantly female, oftenly branched at each fascicles androgynous, uppermost fascicle entirely male flower. Beak deflexed. **Female glumes** smaller. 2 - 4 x 0.8 - 1.9 mm.

Flower : September *Fruit*: November
Exsiccatus : Phusrey 2200 m, *SR Lepcha & AP. Das* 30273 dated 27.10.2004
Status : Common
Local Distribution : Karponang, Kalapokhri, 2400 - 3750 m.
General Distribution : EASTERN HIMALAYA; (NEPAL - BHUTAN) and ASSAM.
Note : Endemic to Eastern Himalaya.

Carex myosurus Nees in Wight, Contrib. 122. 1834. C.B. Clarke in Fl. Brit. India 6: 723.1894; Noltie, Fl. Bhutan 3(1): 381. 1994; Hajra & Verma, Fl. Sikkim 1: 226. 1996.

Vern.Name.: Mungshel (Lep.)

Herbs perennial, with short rhizome, woody. **Stem** tufted. Sheath base reddish to brownish-purple. **Leaves** usually inserted along lower half of culm, leaves blade course, 0.6- 1.8cm wide. Culm angled rounded 60- 170cm long. **Inflorescence** slender, 15 - 70 cm long, nodes 5 - 11, bracts leaves like, often exceeding the inflorescences. **Spikes** upto 10, androgynous, drooping, rarely erect. Utricles male suberect, Utricles slightly ellipsoid trigonous, narrowed into short beak, stigma 3. **Female glumes** lanceolate to oblong, acute dark brown; midrib scabrous. **Male glumes** narrowly lanceolate, slightly tapered at apex, reddish brown.

Flower : August - October *Fruit*: September - July
Exsiccatus : Dhurok 2300m, *SR Lepcha & AP. Das* 30275, dated 07.10.2004
Status : Common
Local Distribution : Karponang, Premlakha, Padamchen, upto 2500 m
General Distribution : INDIA, NEPAL, BHUTAN.

Carex nubigena D. Don ex Tilloch & Taylor in Phil.Mag.62: 455.1823; C.B. Clarke in Fl. Brit. India 6: 702.1894; Noltie, Fl. Bhutan 3(1): 364. 1994; Hajra & Verma, Fl. Sikkim 1: 207. 1996.

Local Name: *Jyak cha* (Bhut. & Sherp.)

Herbs perennial. Rhizome short, woody stems. Leaf sheath base straw coloured, persistent as fiber. **Leaf** inserted along lower half of culm, blades shorter than to equaling culm., base straw coloured. Culm slender. **Inflorescence** narrowly cylindrical; spike greenish. **Spike**, androgynous. Lateral spike sessile, usually long and narrow. Utricles ellipsoid, dense, ascending. Male section scarcely visible at Fruit. Stigma 2. **Female glumes** oblong-lanceolate to ovate, acuminate 3 - 4 x 2 - 2.5mm; hyaline at midrib.

Flower : May - July *Fruit*: June - October
Exsiccatus : Gnathang 3990 m, *SR. Lepcha & AP. Das* 31104, dated 13.10.2004
Status : Common
Local Distribution : Karponang, Kyonglasha, Kupup, Nathang 2700 - 3900 m,
General Distribution : TEMPERATE HIMALAYAS; INDIA, NEPAL, BHUTAN and

CHINA

Note : Endemic to Himalaya.

Carex obscura Nees in Wight, Contrib. Bot. Ind. 126. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 731. 1894; Noltie, Fl. Bhutan 3(1): 390. 1994; Hajra & Verma, Fl. Sikkim 1: 207. 1996.

Herbs rhizomatous. Stem densely tufted. **Leaves** usually equal to culm, 0.2 - 0.60 cm wide. Leaves sheaths bladeless, shining dark purple. Culms 16 - 82 x 0.20 - 0.25 cm, erect. **Spikes** 4 - 7, crowded, subsessile, lower mostly females, terminal gynaeandrous; bracts to 0.45 cm wide, lowermost sheathless. Utricles rhomboid, trigonous beakless, hispid; stigmas 3. **Female glumes** smaller, ovate or orbicular, dark purple, mid nerve greenish.

Flower & Fruit : June - October.

Exsiccatus : Kyongnosla 2895 m, **SR Lepcha & AP. Das 2517**, dated 30.10.2004.

Status : Common.

Local Distribution : Kyongnosla, Trijunction Rachel, 2100 - 2900 m.

General Distribution : HIMALAYAS; INDIA (Kashmir-Kumaon), Sikkim, Darjeeling.

Note: Endemic to Himalaya.

Carex pulchra Boott, Illustr. 1: 4, t. 13. 1858; C.B. Clarke in Hook.f., Fl. Brit. India 6: 727. 1894; Noltie, Fl. Bhutan 3(1): 385. 1994; Hajra & Verma, Fl. Sikkim 1: 210. 1996.

Herbs perennial, rhizomatous, with tufted stems. **Leaves** in rosettes, almost to culm length, 0.20 - 0.5 cm wide, hispid above when young, leaf-sheaths bases dull, pale orange-brown, persistent. Culm 18 - 48 cm long. **Inflorescence** slender, nodding, originated at nodes; peduncle single or in pairs, each bearing single spike rarely more. **Fascicles** of 3-11 slender scabrid. Most spikes female, slightly longer peduncled. **Spike** of the fascicle sometimes gynaeandrous, spikes in terminal fascicle bears occasionally all male, female spikes to 3.5 cm long, linear, utricles ellipsoidal trigonous, beaked; stigmas 3. **Female glumes** to 0.30 x 0.13 cm, oblong-obovate, subacute, yellowish brown. **Male glumes** to 0.5 x 0.14 cm, narrow-lanceolate, acute with keeled midrib.

Flower & Fruit : July - October

Exsiccatus : Premlakha above 1900 m, **SR Lepcha & AP. Das 2518**, dated 30.10.2004.

Status : Frequent.

Local Distribution : Karponang, Premlakha, 1800 - 2550 m.

General Distribution : E. TO C. HIMALAYAS; INDIA, NEPAL - BHUTAN.

Note : Endemic to Central & Eastern Himalaya

Carex setosa Boott, Illus. 3:108, t. 327-329. 1862; C.B. Clarke in Hook.f., Fl. Brit. India 745. 1894; Noltie, Fl. Bhutan 3(1): 398. 1994; Hajra & Verma, Fl. Sikkim 1: 211. 1996.

Herbs rhizomatous. Stems tufted. **Leaves** shorter than culm, lamina 0.25 - 0.25 cm, wide, flat. Leaf-sheaths bases pale brown. Culm to 65 cm long, slender. **Inflorescence** lax. **Male spike** to 3 cm long, 1 oftenly terminal. **Female spikes** slightly longer than male spike, linear, slender, lowest spike sometime basally brached. Peduncles upto 9 cm long, slender. Bracts stiff, sheathed, brownish hyaline. Utricles 0.38 x 0.3 cm, linear-ellipsoidal, margins sparsely setose, beak notched; stigmas 3. **Female glumes** 0.3 x 0.20 cm, oblong-ovate, blunt, red-brown, midrib scabrid. **Male glumes** to 0.5 x 0.3 cm, acute.

Flower & Fruit : April – September
Exsiccatus : Rachela below 2400 m, *SR Lepcha & AP. Das* 2522, dated 30.10.2004
Status : Common
Local Distribution : Changu, Kupup, Nathula, Jalepla, Rachela, 1600 – 3500 m.
General Distribution : HIMALAYAS; INDIA, (Kashmir-Sikkim).
 Note : Endemic to Himalaya.

Carex teres Boott, Illustr. 1: 62, t. 167. 1858; C.B. Clarke in Hook.f., Fl. Brit. India 6: 707. 1894; Noltie, Fl. Bhutan 3(1): 372. 1994.

Herbs rhizomes. **Leaves** almost equal or slightly longer than culm, **lamina** 0.3 - 0.8 cm wide, apex trigonous; leaf sheaths red-brown, persistent. Culm to 65 cm long, stout; peduncles to 2 cm long. **Inflorescence** with 5 – 11 spikes, terminal male, gynaeandrous or usually female Flower in middle, usually shorter than female spikes; lower 4 - 10 spikes female; bract basal foliaceous, sheathed at base, upper filiform. Utricles to 0.33 x 0.3 cm, elliptic, biconvex, sharply 3 - 5 nerved, brownish-olive, purplish glandular; stigmas 2. **Female glumes** with scabrid awn 0.30 x 0.13 cm, oblong to elliptic, apex truncate or emarginate, mid-rib with 3 veins. **Male glumes** longer than female ones, oblanceolate, subacute to shortly mucronate.

Flower : April – July
Exsiccatus : Panglakha 2900m, *SR Lepcha & AP. Das* 2525, dated 07.07.2005.
Status : Frequent.
Local Distribution : Rachela trijunction, 2300 – 2900 m.
General Distribution : E. HIMALAYA; INDIA, (Darjeeling and Sikkim Himalayas).
 Note : Endemic to Darjeeling and Sikkim Himalayas.

Cyperus Linnaeus

Cyperus rotundus L., Sp. Pl. ed. 1, 45.1753; Fl. Brit. India 6: 614. 1893; Pfl.-reich IV -20, Ht. 101: 107, f. 13. 1935; Bull. Bot. Gard. Lucknow no. 85: t. 10. 1963; Koyama in Hara, Fl. E. Him 388. 1966; Noltie, Fl. Bhutan 3(1): 316. 1994; Hajra et Verma, Fl. Sikkim 1: 217. 1996. *C. retzii* Nees in Wt., Contrib. 82. 1834, *non* Poir. 1806. *C. tuberosus sensu* C.B. Clarke in Fl. Brit. India 6: 616. 1894 p.p. *non* Rottb.

Local Name: *Mothy* (Nep.); *Mutha* (Beng.); *Nut Sedge* (Eng.).

Herbs annual with slender stolons, tubers usually fibrous. Stems to 32 x 0.20 cm. **Leaves** compact at stem base, lamina half to length of stem, sheaths, membranous, pale. Inflorescence to 8 x 7 cm, usually 1, compound; primary rays 1-5 nos; involural bracts shorter or equal to inflorescence. **Inflorescence** with 4-7 spikelets forming cylindrical spikes; rachis to 0.30 - 0.55 cm. **Spikelets** 1 – 2.5 x 0.10 - 0.4 cm, linear, acute. **Glumes** upto 22 nos., ovate, overlapping, blunt, strongly 3 veined. **Stamens** 3; style short to 0.02 cm. **Nut** oblong-elliptic, concave, pale brown, papillose.

Flower : April *Fruit*: August
Exsiccatus : Phusrey 2300, *SR. Lepcha & AP. Das* 2542, dated 08.07.2005.
Status : Common
Local Distribution : Rachela below, Changu, Padamchen to 2350 m
General Distribution : COSMOPOLITAN WEEDS.

Erioscirpus Palla

Erioscirpus cosmosus (Wall.) Palla, Bot. Zeitung. Liv. I. 148, in obs. 151, in Clavi 1896; Noltie, Fl. Bhutan 3(1): 281. 1994. *Eriophorum comosum* (Wall.) Wall. ex Nees in Wight, contrib.. 110 (Wall. cat.n. 3446).

Herbs perennial tufted. Stem upto 35 m long, solid, obscurely trigonous. **Leaves** slightly exceeding stems, basal to 0.50 cm wide, serrate margin, blades narrow and channelled. Sheaths persistent. **Inflorescence** diffuse, terminal, compound panicle, to 45 cm; bracts leafy, exceeding inflorescence. **Spikelets** numerous, borne either singly or in pairs, narrowly ellipsoid, paniced, sessile. **Glumes** spirally inserted on axis, to 0.5 x 1 cm, ovate-oblong, acute or blunt, midrib greenish. **Stamens** 1-2; stigmas 3, papillose, reddish-brown. **Nuts** narrow, flattened, trigonous, oblong, dark brown.

Flower : May *Fruit*: December
Exsiccatus : Dohrok above 2300 m, **SR. Lepcha & AP. Das** 2531, dated 07.07.2005
Status : Common
Local Distribution : Padamchen, Lungthung, Neora Valley NP border, 1400 – 2300 m.
General Distribution : HIMALAYAS; INDIA, MYANMAR, TONKIN, CHINA.

Fimbristylis Vahl

Key to the species

1. Herbs rhizomatous 2
- + Herbs non rhizomatous 3
2. Leaf half the length of stem. *F. dichotoma*
- + Leaf almost equal to or slightly longer than stems *F. miliaceae*
3. Inflorescence compound; Nut trigonous *F. complanata*
- + Inflorescence simple ; Nut biconcave *F. stolonifera*

Fimbristylis complanata (Retz.) Link, Hort. Berol. Descr. 1: 292. 1827; C. B. Clarke in Hook.f., Fl. Brit. India 6: 646. 1894; Koyama in Hara, Fl. E. Him. 390. 1966; Noltie, Fl. Bhutan 3(1): 291. 1994; Hajra et Verma, Fl. Sikkim 1: 220. 1996. *Scirpus complanatus* Retz., Obs. Bot. 5: 14. 1789.

Herbs perennial, rhizomatous. Stems tufted, compressed above. **Leaves** basal and sub-basal, abruptly tapering at apex, **lamina** 6 – 32 x 0.3 - 0.55 cm, margins thickened, serrate, stiff; sheaths pale-brown, ligulate. **Inflorescence** compound with primary rays flattened and longest being upto 10 cm; lower most bract upto 5 cm long, leaf-like. **Spikelets** sessile, borne singly, linear-ellipsoid, acute. **Glumes** ovate, acute or apiculate, strongly keeled, brownish. **Stamens** 3; style basally swollen, glabrous; stigmas 3, erect. **Nuts** trigonous.

Flower : April – May *Fruit*: July – August
Exsiccatus : Phusrey 2300 m, **SR. Lepcha & AP. Das** 2533, dated 07.07.2005
Status : Less frequent
Local Distribution : Gangtok, Penlongla, Padamchen, Karponang, 1100 – 2300 m.
General Distribution : INDIA TO MALAYSIA, S. CHINA AND JAPAN.

Fimbristylis dichotoma (L.) Vahl, ssp. *dichotoma* Enum. Pl. 2: 287. 1806; Kew Bull. 1935: 150. 1935; Koyama in Hara, Fl. E. Him. 391. 1966; Noltie, Fl. Bhutan 3(1): 294. 1994; Hajra & Verma Fl. Sikkim 1: 220. 1996. *Scirpus dichotomus* L., Sp. Pl. ed. 1, 50. 1753. *F. diphylla*

(Retz.) Vahl, Enum. Pl. 2: 289 1806; C.B. Clarke in Hook.f., Fl. Brit. India 6: 636. 1894, incl. var. *annua* C.B. Clarke.

Herbs non-rhizomatous, tufted. Stems compressed, densely tufted, not less than 13 cm. **Leaves** basal and on lower stem part, nearly half in length of stem, ligulate, acute. Sheaths short hairy, brownish. **Inflorescence** to 13 cm, compound; primary rays unequal, longest being upto 8.5 cm. Lower bracts 5 - 11 cm long, leafy. **Spikelets** to 1.5 cm, borne singly. **Glumes** ovate, acute, 3-veined with distinct greenish mid nerve. **Stamen** 1; style deep brown with fimbriate margins basally; stigmas 2, deflexed.

Flower : March - May *Fruit*: October
Exsiccatu : Mulkharka 2250 m, *SR. Lepcha, & AP. Das* 2536, dated 08.07.2005.
Status : Common
Local Distribution : Gangtok, Dikchu, Karponang, 1600 - 3000 m.
General Distribution : TROPICAL AND SUBTROPICAL REGIONS OF THE WORLD.

Fimbristylis miliacea (L.) Vahl, Enum. 2:287. 1806 *quoad basionym, non sensu* Cl. in Hook.f., Fl. Brit. India 6: 644. 1894; Koyama in Hara, Fl. E. Him 391.1966; Noltie, Fl. Bhutan 3(1): 293. 1994; Hajra & Verma, Fl. Sikkim 1: 221. 1996. *Scirpus miliaceus* L., Syst. Veg. 10:868. 1759. *F. quinqueangularis* (Vahl) Kunth, Enum. 2: 229. 1873; C.B. Clarke in Hook.f., Fl. Brit. India 6: 664. 1894; Blumea 8: 118. 1955.

Herbs annual without rhizome. Stem to 50 cm long, compressed, 3 - 4 angled, densely tufted. **Leaves** almost equal to stem or often larger, stouter, stem-leaves reduced to elongated sheaths with minute blades, basal leaves with flat blades and minutely serrate margins. **Spikelets** to 0.55 x 0.4 cm, acute and strongly angled; **glumes** to 0.20 x 0.5 cm, acute with shortly excurved midnerve, strongly keeled. **Stamens** 1-2; style thickened and fimbriate at base; stigmas 3. **Nut** rounded-trigonous.

Flower : July - May *Fruit*: October
Exsiccatu : Dohrok 2300 m, *SR. Lepcha & AP. Das* 2536, dated 07.07.2005.
Status : Common
Local Distribution : Phusrey, Ramitey, 1400 - 2200 m.
General Distribution : OLD WORLD TROPICAS (FROM AFRICA-INDIA, EASWARD TO FORMOSA, MALAYSIA, AND N. AUSTRALIA).

Fimbristylis stolonifera Clarke in Hook.f., Fl. Brit. India 6: 637. 1893; Noltie, Fl. Bhutan 3(1): 295. 1994; Hajra & Verma, Fl. Sikkim 1: 221. 1996.

Herbs slender, usually with creeping stolon. Stem tufted, grooved. **Leaves** margin minutely serrate. **Inflorescence** simple. **Spikelets** 0.30 - 0.80 x 0.20 - 0.50 cm. **Glumes** 0.22 - 0.35 x 0.15 - 0.25 cm, dark red-brown, midrib green. **Stamens** 3; style fimbriate in upper half portion. **Nuts** biconcave, faces obovate, borne on conspicuous gynophore, wider and with 12 vertical rows of cell rows at each face, sometime tuberculate.

Flower : July - May *Fruit*: September - October
Exsiccatu : Phusrey 2250 m, *SR. Lepcha & AP. Das*, 2538, dated 07.07.2005.
Status : Common
Local Distribution : KAS, Phusrey, 1600 - 2300 m.
General Distribution : E. HIMALAYA (Nepal-Bhutan).
Note : Endemic to Eastern Himalaya.

Kobresia Willdenow

Key to the species

- | | |
|---|-------------------------|
| 1. Inflorescence branched | 2 |
| + Inflorescence not branched | 4 |
| 2. Lower bract shorter than inflorescence | <i>K. uncinoides</i> |
| + Lower bracts leaf-like, usually exceeding inflorescence | 3 |
| 3. Inflorescence linear, curved; lateral spikes overlapping | <i>K. fragilis</i> |
| + Inflorescence spike-like panicle; lateral spikes 5 – 8, not overlapping | <i>K. curticeps</i> |
| 4. Spikelets unisexual | 5 |
| + Spikes androgynous | <i>K. nepalensis</i> |
| 5. Plant extremely shorter less than 10 cm tall | <i>K. pygmaea</i> |
| + Plant not so short more than 10 cm tall | <i>K. stiebritziana</i> |

Kobresia curticeps Kukenthal in Engl. Pflanzenreich, Cyperac. – Caricoid. 47. 1909. Noltie, Fl. Bhutan 3(1): 340. 1994. *Carex curticeps* C. B. Clarke in Hook.f., Fl. Brit. India 6: 129. 1894.

Herbs rhizomatous with tufted stem and remains of old leaf sheaths at base. Culm trigonous; **leaf lamina** 20 – 90 x 1 – 2.6 cm, flat, equaling culm to 8 mm wide, keeled, pale brown. Flowers bisexual but rarely with female only. **Inflorescence** in a stiffly nodding; lateral spikes 3 – 12 ± appressed; lower bracts leaf-like, slightly exceeding the inflorescence. **Spikes**; terminal spike androgynous or entirely female, lateral spikes linear; upper spikelets single flowered male rarely female. **Prophyll** utriculation, linear lanceolate, open only near apex, ribbed, margins hairy rarely glabrous. **Nut** shortly stipitate, linear ellipsoid- trigonous pale brown. Racheola fimbriate at apex.

Flower & Fruit : June – October

Exsiccatu : Rachela trijunction 3000 m, **SR Lepcha & AP. Das 2511**, dated 07.08.2005

Status : Common

Local Distribution : Kyongnosla, Changu, Lungthung, Nathula, upto 3800m.

General Distribution : E. HIMALAYA; INDIA,

Note : Endemic to Eastern Himalaya.

Kobresia fragilis C.B. Clarke in Journ. Linn. Soc. 36: 267. 1903; Koyama in Hara et al, Enum. Fl. Pl. Nepal 1: 113. 1978; Noltie, Fl. Bhutan 3(1): 342. 1994.

Herbs perennial tufts. Culm to 40 cm, slightly curved. **Basal leaves** sub-basal, shorter than culm, margin inrolled. Sheaths fibrous, pale brown. **Inflorescence** linear, curved; lateral spikes overlapping, lower one branched. Lowest bract equal or slightly longer than inflorescence., filiform, base clasping. Lateral spikes androgynous. **Male spikelets** 1 – 4. **Female spikelets** 2 – 7, male and female single-flowered. **Female glumes** to 0.40 x 0.18 cm, ovate, rounded to acute, mucronate, hyaline yellowish-brown. **Prophyll** 0.30 x 0.13 cm, lanceolate, curved, pale brown; keels 2, greenish and glabrous. **Nuts** ellipsoidal, trigonous, brown; racheola cillaite, equal to prophyll, 2-nerved.

Flower & Fruit : June - October

Exsiccatu : Near Mulkharka at Neora Border, 2480 m, **SR Lepcha & AP Das 2509**, dated 07.08. 2005

Status : Less Common.

Local Distribution : Karponang, Kyongnosla, Changu, Nathula 2300 - 4000m.
General Distribution : E. HIMALAYA; INDIA, (NEPAL, Sikkim, Darjeeling, BHUTAN).
Note : Endemic to Eastern Himalaya.

Kobresia nepalensis Kukenthal in Engl. Pflanzenreich, Cyperac. – Caricoid. 40. 1909; Noltie, Fl. Bhutan 3(1): 348. 1994.

Herbs with densely tufted. **Tuft** with yellow- dark brown collar, fibrillose sheath bases. **Culm** stiffly erect, sub-terete. **Leaves** mostly basal, lamina filiform, semicircular in section, channeled above, equals to culm, not keeled. **Inflorescence** a linear spike, lax below, androgynous short. **Spikelets** all singled flowered upper few male, majority female. **Female glumes** ovate to lanceolate, subacute to blunt mucronate 2 – 4.5 x 2 – 3 mm, midrib with 1 strong central nerve rarely 2. **Prophyll** utriculiform, curved linear lanceolate open only near apex, keels ciliate. **Nuts** stipitate, oblong, pale brown, stout. **Racheola** linear, 2 veined, usually ciliate

Flower & Fruit : June - October
Exsiccata : Jalepla 4400 m, *SR Lepcha & AP. Das 2512*, dated 13.08.2005
Status : Common
Local Distribution : Nathula, Jalepla, Chakung Chu Rachela upto 4400 m.
General Distribution : HIMALAYA; INDIA, (NEPAL – BHUTAN).
Note : Endemic to Eastern Himalaya.

Kobresia pygmaea (Clarke) Clarke in Hook.f., Fl. Brit. India 6: 696. 1894; Noltie, Fl. Bhutan 3(1): 349. 1994; Hajra & Verma, Fl. Sikkim 1: 225. 1996. *Hemicares pygmaea* Clarke in Journ. Linn. Soc. Bot. 20: 383. 1883.

Herbs perennial tuft upto 5 cm tall. Leaf sheaths base brownish. **Culm** to 5 x 0.1i cm, sub-terete, erect. **Leaves** all basal, as long as culm, tubular, channelled above, not keeled. **Inflorescence** dense spike, 0.3 - 0.5 x 0.20 - 0.5 cm, androgynous. **Spikelets** single-flowered. **Male glumes** to 0.5 x 0.22 cm, apparently deciduous. **Female spikelets** 3 - 6, lowermost bract aristate and glume-like. **Female glumes** to 0.40 x 0.30 cm, ovate, acute, midrib broad and green. **Prophyll** to 0.25 x 0.13 cm, oblong-elliptic, opening towards base, keels ciliate at apex. **Nut** to 0.18 x 0.5 cm, obovoid-trigonus, apiculate, pale brown.

Flower & Fruit : May - September
Exsiccatum : Rachela trijunction 3100 m, *SR Lepcha & AP. Das 2510*, dated 07.08.2005
Status : Common
Local Distribution : Rachela tri-junction, Jalepla, Rachela middle, 3000 – 4400 m.
General Distribution : HIMALAYA; INDIA, S. TIBET.
Note : Endemic to Himalaya.

Kobresia stiebritziana Hand.-Maz. in Anz. Akad. Wiss. Wien, 1920, 57. 54. Noltie, Fl. Bhutan 3(1): 348. 1994; Hajra & Verma, Fl. Sikkim 1: 226. 1996.

Herbs perennial, extremely densely tuft, covered by yellowish dark brown fibrillose sheath bases. **Culm** stiffly erect, sub-erect, 10 - 35 cm x 0.5 - 1.5 mm wide. **Leaves** basal, blades stiffly, filiform, semicircular, about equaling glume. **Inflorescence** a linear spikes stouter, dense above, **glumes** narrowed, acute, sides' dark brown, more widely hyaline. **Prophyll** open almost to base at maturity; **racheola** shorter or less than half of nut.

Flower & Fruit : July - September

Exsiccatu : Bhimbase 4500 m, **SR Lepcha & AP. Das 30835**, dated 29.07.2005
Status : Less common
Local Distribution : Jalepla, Nathula, Bhimbase, 3900 – 4500 m
General Distribution : HIMALAYA; (NEPAL – BHUTAN).
 Note : Endemic to Eastern Himalaya.

Kobresia uncinoides (Boott) Clarke in Hook. f., Fl. Brit. India 6: 698. 1894; Pfl.- reich. Iv -20, Ht. 38: 46. 1909; Koyama in Hara Fl. E. Him. 3: 129. 1975; Noltie, Fl. Bhutan 3(1): 337. 1994; Hajra & Verma, Fl. Sikkim 1: 226. 1996. *Carex uncinoides* Boott, Illust. Carex 1: 8. t. 23. 1858.

Herbs perennial, rhizomes woody, not spreading **Leaves** basal and sub-basal, shorter than culm; 0.5 - 0.7 cm wide, acute; sheath bases thin, pale. Culm sub-terete, (2)-9 – 39 x 0.10 - 0.20 cm. **Inflorescence** spike-like panicle; lateral spikes 5 - 8, androgynous, short appressed; basal spike peduncled. Lower bract glum-like with clasping base, tip aristate. **Spike-lets** all single-flowered, lower ones female. **Female glumes** 0.5 - 0.62 x 0.30 - 0.40 cm, lanceolate to oblong-lanceolate, acute or obtuse, pale yellow, awn as long as 0.5 cm. **Prophyll** linear-lanceolate with ciliate keels, stipitate, oblong, brownish.

Flower & Fruit : June – October
Exsiccatu : Panglakha 2750 m, **SR Lepcha & AP. Das 30841**, dated 29.07.2005
Status : Fairly Common.
Local Distribution : Chola, Yakla, Sherabthang, Changu, Rachel, 1900-2750m.
General Distribution : E. HIMALAYAS; Tibet, S.W. CHINA,
 Note : Endemic to Himalaya.

Kyllinga Rottboell (*nom. cons.*)

Key to the species

- 1. Plant upto 50 cm tall; sheaths pale green or grey, reddish nerves; stamens 3*K. nemoralis*
- + Plant less than 40 cm tall; sheaths reddish brown; stamens 1 -3*K. brevifolia*

Kyllinga brevifolia Rottb., Descr. and Ic. 13. t. 4, f. 3. 1773; C.B. Clarke in Hook.f., Fl. Brit. India 6: 588. 1894; Nam. Noltie Fl. Bhutan 3 (1):324. 1994; Hajra & Verma, Fl. Sikkim 1: 227. 1996.

Herbs perennial rhizomatous (creeping). Stems to 35 cm, triquetrous. **Leaves** sub-basal, slightly shorter than stem, upto 0.40 cm wide. Sheaths reddish brown. **Inflorescence** to 0.90 x 0.9 cm, rarely hemispheric with 1-2 subsidiary heads. Involucral bracts 2 - 4, to 18 cm. **Spikelets** sessile, to 0.40 x 0.1 cm, lanceolate. **Glumes** 3, lowermost sterile, to 0.13 x 0.2 cm, ovate; **middle glume** sterile, oblong-ovate with recurved mucro, midrib greenish, keeled; upper glume fertile, to 0.3 x 0.1 cm, oblong-ovate. **Stamens** 1-3; style to 0.06 cm. **Nut** oblong-obovate or oblong-elliptic, truncate, red-brown.

Flower : April *Fruit:* August
Exsiccatu : Mulkharka – Phusrey **SR. Lepcha & AP. Das 2530**, dated 07.07.2005
Status : Common
Local Distribution : Padamchen, Lungthung upto 3650 m.
General Distribution : COSMOPOLITAN

Kyllinga nemoralis (J.R. & G. Foster) Dandy ex Hutch. & Dalziel, Fl. W. Trop. Afr. 2: 487. 1936. *K. monocephala* Rottb. Descr. & Ic. 13, t. 4, F, 4.1773 nom. *superfl.*; C.B. Clarke in Fl. Brit. India 6: 588.1894. *Cyperus kyllinga* Endl. Cat.Hort.Ac. Vindob. 1: 94. 1842.

Herbs perennial upto 50 cm tall. Rhizome slender, creeping. Stem slender. **Leaves** often as long as the stem or shorter, upto 4 cm. Leaves almost equaling stem; sheaths up to 45 mm, pale green or grey, with reddish nerves, mouth margin almost straight; blades, green or grayish green, flat or slightly keeled, margins smooth or scabrous, apex short, flat or trigonous, scabrous. **Inflorescence** a compact, **spikes** ovoid, head-like, globose or ellipsoid cluster of ca 10cm spikes, white or brownish; 3 - 4 bracts foliose, spreading, spikes spirally arranged, each on a minute pedicel, the two opposite glumes sharply keeled, folded, acuminate, midrib winged, sides brown-dotted, scarious, with 4 - 5 nerves. **Stamens** 3, ovoid, biconvex, brown, **Achenes** bearing glume broadly winged on the part of keel, wing gland-dotted, obovoid, yellowish brown.

Flower : March *Fruit*: August
Exsiccatae : Dohrok 2280 m, *SR Lepcha & AP. Das 30230*, dated 06.10.2004;
 Zeluk 3800 m, *SR Lepcha & AP. Das 32897*, dated 27.10.2004.
Status : Less common
Local Distribution : Padamchen, Lungthung upto 3700 m,
General Distribution : TROPICAL AFRICA S of SAHARA, MADAGASCAR,
 AKISTAN, INDIA, CHINA to JAPAN, S.MALAYSIA;

Pycreus P. Beauvois

Pycreus sanguinolentus (Vahl) Nees ex Clarke in Hook.f., Fl. Brit. India 6: 590.1894; Hara *et al*, Enum. Fl. Pl. Nepal 1: 117. 1978; Hajra & Verma, Fl. Sikkim 1: 232. 1996. *Cyperus sanguinolentus* Vahl, Enum. Pl. 2: 351.1806. *subsp. sanguinolentus*.

Herbs annual, decumbent at basal upto 42 cm tall. **Leaves** much shorter than stem, blade ½ to equaling stems. 0.5 - 1.5mm wide; sheath often reddish brown. **Inflorescence** with many flower 3 - 22 spikelets; involucre bract usually 1-3, spikelets linear oblong, culms with few to several nodes below the middle. **Glumes** ovate blunt, keeled, 3 veined. **Stamen** 2. Style short (ca. 0.4 mm). **Nut** ellipsoid, apiculate and black.

Flower & Fruit : May – September.
Exsiccatous : Panglaxha 3200 m, *SR Lepcha & AP. Das 27795*, Dated 30,09.2004
Status : Fairly common
Local Distribution ; Panglaxha, upto 3200 m
General Distribution : Wide spread in temperate, subtropical and tropical regions of the Mediterranean coast, AFRICA, ASIA AND OCEANIA.

POACEAE Barnhart (*nom. alt.*)

Key to the Genera:

1. Arboreal grass or bamboo like; woody, diameter 1-25 cm; sheath with minute blades or bladeless 2
- + Herbaceous grass like; culm soft, if slightly woody then reed like, diameter to 1 cm; sheath with normal blades 8

2. Culm diameter large 7-25 cm	3
+ Culm diameter smaller 1-7 cm	4
3. Internode smooth, shining	<i>Bambusa</i>
+ Internodes densely covered with furry wax	<i>Dendrocalamus</i>
4. Internode more than 50 cm long	<i>Cephalostachyum</i>
+ Internode less than 50 cm long	5
5. Plants grow spreading	<i>Yushania</i>
+ Plants grow tufted	6
6. Culms more than 5 m tall	<i>Himalayacalamus</i>
+ Culms upto 4.5 m tall	7
7. Nodes swollen with distinct ring, stem dark green	<i>Drepanostachyum</i>
+ Nodes not swollen, no ring, stem light reddish to yellowish	<i>Thamnocalamus</i>
8. Inflorescence digitate panicle	9
+ Inflorescence condensed cylindrical or spreading panicle	11
9. Racemes always 2, opposite, base of plant compressed	<i>Axonopus</i>
+ Raceme more than 2, base of plant not compressed	10
10. Rachis not winged; Sessile spikelet awned	<i>Arthraxon</i>
+ Rachis winged, margins hispid; spikelets unawnwd	<i>Digitaria</i>
11. Inflorescence linear or condensed cylindrical panicle	12
+ Inflorescence lax spreading panicle	14
12. Spikelets unawned or if present only at lower lemma	24
+ Spikelets awned	13
13. Florets 2 or 3, glumes shorter to equaling than spikelets	<i>Trisetum</i>
+ Florets 4 to 6, glumes long, much exceeding spikelets	<i>Danthonia</i>
14. Spikelets very minute under 1mm	15
+ Spikelets larger than 1.5mm	16
15. Plant reed like, unbranched; leaves more than 3cm wide	<i>Thysanolaena</i>
+ Plant herbaceous, much branched; leaves less than 1cm wide	<i>Capillipedum</i>
16. Some spikelets subtended by stiff bristle, leaves < 2cm wide ..	<i>Setaria</i>
+ Spikelets not subtended by stiff bristle, leaves > 1cm wide	17
17. Glumes shorter than spikelet	18
+ Glumes exceeding spikelets	23
18. Spikelets (lemmas) long aristate or awned	19
+ Spikelets unaristate or unawned	20
19. Plants herbaceous, soft, inflorescence long hairy	<i>Muhlanbergia</i>
+ Plants crustaceous, harder, inflorescence not hairy	<i>Festuca</i>
20. Spikelets always with 2 florets	21
+ Spikelets with more than 3 florets	<i>Poa</i>
21. Branches of panicle terminating with a single spikelet	22
+ Branches (Raceme) bear many spikelets along the lower side	<i>Paspalum</i>
22. Spikelets borne paired, falling entire at maturity	<i>Panicum</i>
+ Spikelets borne singly, breaking up at maturity	<i>Isachne</i>
23. Spikelets with 2 florets	<i>Arundinella</i>
+ Spikelets with more than 3 florets	<i>Agrostris</i>

24. Plant non rhizomatous and tuft; leaf linear lanceolate *Echinochloa*
 + Plant rhizomatous; leaf lanceolate *Coelachne*

Agrostis Linnaeus

Key to the species :

1. Herbs annual or short lived perennial; palea absent *A. pilosula*
 + Herbs perennial; palea ca one third of length of lemma or minute 2
2. Leaf abaxial surface scabrid; Lemma awned to 3.5 mm *A. triaistata*
 + Leaf abaxial surface smooth; Lemma awnless or rarely awnlet to 0.5 mm *A. nervosa*

Agrostis pilosula Trin. In Med. Acad. Sci. Petersls: Ser. 6, 6: 372. 1841; Hsu in Hara, Fl. E. Him. 349. 1966; Hara *et al*, Enum. Fl. Pl. Nepal 1: 120. 1978; Hajra & Verma, Fl. Sikkim 1: 278. 1996. *Calamagrostis pilosula* (Trin.) Hook.f., Fl. Brit. India 7: 263. 1897. Noltie, Fl. Bhutan 3(2): 605. 2000. *Calamagrostis Jacquemontii* Hook.f., Fl. Brit. India 7: 265. 1897.

Herbs annual or short-lived perennial. **Culms** usually decumbent at base and rooting from lower nodes, 25 – 90 cm tall, 3- or 4-noded. **Leaf sheaths** glabrous; leaf blades linear, upto 20 cm × 3 – 4.5 mm, both surfaces scabrid; ligule 3 – 5.5 mm, apex lacerate. **Panicle** lanceolate to ovate in outline, upto 30 cm, open or slightly contracted; branches 2 – 7 at each node, upto 6 cm, bearing branchlets mainly in distal half. **Spikelets** 3.5 – 5 mm, green or purple; **glumes** oblong-lanceolate, **lower glume** slightly longer than upper glume, **keel** conspicuously hispidulous, apex acuminate, upper glume scabrid upward on keel, apex acute; **lemma** ca. one third of spikelet length, villous except below apex, **awned**, apex truncate, erose; **awn** geniculate, 2.5 – 3.5 mm; **palea** usually ca. one third length of lemma. **Anthers** short 0.5 – 1.3 mm.

Flower : July – August *Fruit*: September – October
Exsiccatus : Panglakha 3000 m, **SR Lepcha & AP. Das 20561**, dated 12.10.2004
Status : Common
Local Distribution : Panglakha, Rachel, Dokyala, 3000 – 4200 m.
General Distribution : PAKISTAN, INDIA, NEPAL, BHUTAN, CHINA, SRI LANKA

Agrostis nervosa Nees ex. Trin. in Mim. Acad. Sci. Petersb. Ser. 6.6: 328. 1841; Hara *et al*, Enum. Fl. Pl. Nepal 1: 120. 1978; Hajra & Verma, Fl. Sikkim 1: 278. 1996. Noltie, Fl. Bhutan 3(2): 601.2000. *Agrostis Clarkei* Hook.f., Fl. Brit. India 7: 257. 1897.

Herbs perennial. **Culms** often slender, erect, upto 60cm tall. **Leaves**; leaf sheaths loose; leaf blades narrowly linear to setaceous, flat or involute, 2.5 – 13 cm × 0.6 – 3.5 mm, abaxial surface smooth, adaxial surface scabrid; ligule short 0.3 – 4 mm, back smooth or scaberulous, apex obtuse. **Panicle** pyramidal, open to laxly contracted, narrowly lanceolate to ovate; branches 2 – 5 per node, spreading, 1.5 – 5.5 (–9) cm. **Spikelets** 1.7 - 3.5 mm, dark purple or purplish green; glumes lanceolate, unequal; **lower glume** 1.5 – 3.5 mm, **keel** scabrid above middle, long acuminate, **upper glume** 1.5 – 3 mm, apex acute; callus glabrous; **lemma** two third to forth fifth of spikelet length, awnless or rarely of awnlet up to 0.5 mm below apex, apex obtuse or emarginate; **palea** minute.

Flower : August – September
Exsiccatus : Zeluk - Panglakha 2950 m, **SR Lepcha & AP. Das 20561**, dated 12.10.2004
Status : Common
Local Distribution : Panglakha, Rachel, 2000 – 4000 m.

General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, CHINA.

Agrostis triaistata (Hook.f.) Bor, Grass. Ind. 391. 1960.; Noltie, Fl. Bhutan 3(2): 604. 2000; Hajra & Verma, Fl. Sikkim 1: 279. 1996. *Calamgrostis tripilifera* Hook.f., Fl. Brit. India 7 : 262. 1897. *Deyeuxia triaristata* Hook.f., Fl. Brit. India 7: 266. 1897.

Herbs perennial, slender, tuft, perennial. **Culms** upto 45 cm tall. **Basal leaf** short filiform; culm leaf lamina 5 – 13 x 10 – 4.5 mm, linear- lanceolate, very acute. Leaf sheaths smooth; ligule acute. **Inflorescence** purplish or green to 13 cm, laxly pyramidal, branches filiform, lowest in 2-5 in whorls. **Spikelets** to 4 mm. Glumes glabrous, equal or subequal; lower to 5.5 mm, lanceolate, acuminate, margins with hyaline or purplish, 3- veined, keel green, hispid. **Callus** hairy; rachilla rudimentary. **Lemma** awned to 3.5 mm, broadly lanceolate, with mucros, in between two lateral and median awn to 3.5 mm, apex truncate- lacerate, lateral veins setae. **Palae** to 2.5 mm, linear lanceolate, acute. **Anthers** to 0.6 mm.

Flower : July- October

Exsiccatu : Rachela 2800 m, *SR Lepcha & AP. Das 02593*, dated 22.10.2005

Status : Less common

Local Distribution : Rachela 2800 - 4100m.

General Distribution : Tropical and temperate regions (Continental INDIA, Western TIBET, SRI LANKA).

Arthraxon P. Beauviosis

Arthraxon lancifolius (Trin.) Hochst., Flora 39: 188.1856; Hsu in Hara, Fl. E. Him. 350. 1966; Noltie, Fl. Bhutan 3(2): 815. 2000; Bhat & Nagendran, Sedg & Gras. 244. 2001. *Anthropogon lancifolius* Trin., Mem. Acad. Imp. Sci. Peterab. Ser. 6,2: 271.1832. *Arthraxon microphyllus* sensu Fl. Brit. India 7. 147 (non Trin.) Hochst., 1856).

Herbs annual, tuft. **Culms** upto 45 cm tall, very slender. **Leaf** linear lanceolate to ovate, lamina 0.5 – 2.5 x 0.3 – 0.7 cm, pilose above, and beneath, minutely serrate, tubercle- base cilia at margins, sheaths short, glabrous; ligule very small to 0.4 mm. **Inflorescence** of 7 – 12 unequal, to 2.5 cm long spike. **Spike** sessile to 4.5 cm long, linear- lanceolate, laterally compressed. **Lower glumes** lanceolate or linear oblong, bicuspidate, rounded at the back, not keeled. **Upper glumes** equal to lower, lanceolate. **Lower lemma** shorter than a lower glume, lanceolate, acuminate. **Upper lemma** equal to lower, ovate lanceolate, subacute, awned from near base; awn to 12 mm long. **Stamens** 2; **anthers** to 0.5 mm long.

Flower & Fruit : August – October

Exsiccatu : Bara Ramitey Dara 2380 m, *SR Lepcha & AP. Das 31098*, dated 02.10.2004.

Status : Rare

Local Distribution : Bara Ramitey, Tungya, 1700 - 2500m.

General Distribution : TEMP. HIMALAYAS; INDIA, SRI LANKA to BURMA, THAI, CHINA, MALAYSIA and tropical AFRICA.

Note : Thrives well in waste and dump sites (lower areas).

Arundinella Raddi

Arundinella setosa Trin., Gram. Panic. 63. 1826. Hook.f., Fl. Brit. India 7: 70.1897. Hsu in Hara, Fl. E. Him. 352. 1966; Noltie, Fl. Bhutan 3(2): 750.2000.

Herbs, perennial. Rhizome short with scaly buds. **Culms** erect 45 – 190 cm tall, rarely branched, 3 – 8 noded, nodes glabrous. **Leaves**; leaf sheaths usually shorter than internodes, glabrous; leaf blades linear, **lamina** 8 – 35 cm × 2.5 – 10 mm, glabrous, rarely tuberculate-hispid; ligule ca. 0.3 mm. **Panicle** open or slightly contracted, to 42 cm; branches 5 – 25 cm, ascending or spreading, solitary or fasciculate, loosely spiculate; pedicels scabrid, apex with long hairs. **Spikelets** 4.5 – 7 mm, green tinged purple; **glumes** glabrous or rarely setose, lower glume 3 (–5)-veined; upper glume 5 - veined; lower floret staminate, shorter or equaling lower glume; upper floret, lemma apex awned, awn flanked by 2 slender erect bristles; **awn** geniculate with brown twisted column, callus hairs one forth to one third length of lemma.

var. *setosa*

Leaf sheaths usually loose; leaf blades finely glabrous. **Panicle** 13 – 42 cm, branches up to 25 cm; pedicels with slightly long stiff hairs at apex. **Spikelets** 3.5 – 6.5 mm; **glumes** usually glabrous; upper lemma with numerous lateral bristles; awn 5.5 – 13 mm, geniculate, column twisted; **callus** hairs one forth to one third length of lemma.

Flower : August - September *Fruit*: December
Exsiccatus : Dhorok 2300 m, **SR Lepcha & AP. Das** 222, dated 17.04.2004
Status : Common
Local Distribution : Dhorok Phusrey, 200–2300 m.
General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, THAILAND, INDONESIA, MALAYSIA, SRI LANKA, NEW GUINEA, PHILIPPINES, VIETNAM; AUSTRALIA.

Axonopus P. Beauvois

Axonopus compressus (Swartz) P. Beauv., Ess. Agrostogr. 12. 1812. Hsu in Hara, Fl. E. Him. 352. 1966; Noltie, Fl. Bhutan 3(2): 70.2000. *Milium compressum* Swartz, Prodr. 24. 1788; *Paspalum compressum* (Swartz) Raspail (1825), not Rafinesque (1817).

Herbs, perennial with vigorous creeping stolons. **Culms** 15 – 60 cm tall, nodes bearded. **Leaves**: leaf sheaths loose, strongly compressed, keeled, basal sheaths imbricate, Leaf blades broadly linear to lanceolate, flat or folded, 4.5 – 13.5 × 0.5 – 1.5 cm, glabrous or adaxial surface pilose, apex obtuse; ligule 0.2 – 0.8 mm. **Racemes** 2 – 5, digitate or subdigitate, 4 – 13 cm, only slightly diverging; rachis glabrous. **Spikelets** oblong - lanceolate, 2.2 – 2.5 mm long, pilose or glabrous, apex acute; upper glume and lower lemma 2 – 4-veined, midvein absent, laterals marginal; upper lemma pale, oblong-elliptic, shorter than spikelet, obtuse with an apical tuft of hairs; stigmas pale.

Flower : June – July
Exsiccatus : Dhorok 2200 m, **SR Lepcha & AP. Das** 30296, dated 06.10.2004
Status : Very Common.
Local Distribution : Dhorok, upto 2250m.
General Distribution : NATIVE TO AMERICA, widely introduced and naturalized worldwide
Note : Used in lawn and fodder grass.

Bambusa Schreber

Bambusa nutans Wall. ex Munroe in Trans.Linn.Soc.26(1):92,1868; Gamble, Ann. Roy. Bot. Gard.Cal.7: 32,t.30, 1896; et Hook.f., Fl. Brit. India 7: 387. 1896; Stapleton in Noltie, Fl. Bhutan 3 (2): 490. 2000.

Local Name: Maat-lo, Walho, (Lep.), Mal-bans (Lep.)

Bamboo, arboreal grass like, straight, upto 25 m tall. **Culms** to 9 cm in diam; erect to drooping; nodes scarcely raised; branching uniform, branch 2 cm in diam. Culm sheath with appressed, black hairs; auricles large; broad; oral setae numerous, wavy, copper coloured; blade cupped, readily deciduous, interior pubescent. Leaf sheath glabrous; auricle small, oral setae few, erect, deciduous; ligule short, truncate, lamina to 35 cm.

Flower & Fruit : not observed.

Exsiccatus : Lingtam below 1330 m, **SR Lepcha, T. Sharma & AP. Das 3435**, dated 13. 10. 2008

Status : Common

Local Distribution : Lingtam, Rigu, 1500 m.

General Distribution : INDIA, NEPAL, BHUTAN.

Note : The leaves are good fodder. The matured culms is mainly used in construction of houses bridges, fences, etc. The spinous woody nails derived from the matured culms, is used as an alternative nails for numerous purpose. The long straight culms are also been used while hosting the prayer flags in Sikkim and other adjoining places.

Capillipedum Stapf

Capillipedum assimile (Steud.) A. Camus in Lecomte, Fl. Gen. De l' Indo-Chine 7: 314. 1922; Hsu in Hara, Fl. E. Him. 354. 1966; Hajra & Verma, Fl. Sikkim 1: 247. 1996; Noltie, Fl. Bhutan 3(2): 114. 2000; *Andropogon assimile* Steud. in Zoll. Syst. Verz. 58. 1854; Hook.f., Fl. Brit. India 7: 179. 1897. *Dichanthium assimilis* (Steud.) Deshpande in fasc. Fl. India 15: 6. 1894

Herbs perennial, tufted upto 1.5 m tall. **Culms** glabrous woody at base. **Leaf** lamina to 13 x 0.8 cm, acuminate, tapered to base, with scattered hairs above, more densely hairy beneath; sheath glabrous, shining, with tuft of long cilia at apex; ligule to 0.8 mm. **Inflorescence** pyramidal to 12 cm, racemes of 2 paired a terminal triad of spikelets, **internodes** to 2 mm, margins, with long a white cilia. Spikelets flushed beneath pinkish, sessile or to 3 mm. **Callus** hairs to 1 mm; **lower glumes** 2 – 3 x 0.3 – 0.6 mm oblong – elliptic, acute, oblong- elliptic, acute, truncate or bidentulate, back partly convex, 5 veined, keeled long – hispid in upper half, back sometime minutely hispid on surface; **upper glumes** to 3 mm long, oblong- lanceolate, subacute, ciliate margins, **awn** to 15 mm, **anthers** to 1.4 mm; **lower glumes** 2.6 – 4 m.

Flower & Fruit : June - December

Exsiccatus : Bekchung 1790 m, **SR Lepcha & AP. Das 30291**, dated 07.10.2004.

Status : Less common

Local Distribution : Bekchung –Phusrey, 1600 – 2400 m.

General Distribution : E. HIMALAYA, INDIA, NEPAL – BHUTAN, THALAND, CHINA, FORMOSA, MALAYSIA.

Cephalostachyum Munro

Cephalostachyum capitatum Munro, in Trans. Linn. Soc. 26: 139. 1868; Stapleton in Noltie, Fl. Bhutan 3(2): 496. 2000. *Schizostachyum munroe* S. Kumar & P. Singh in Ind. Bot. Soc. 1992. *Sczostachyum capitatum* (Munro) R.B. Mujumdar in Karthikeyan *et al.*, Fl. Enum. Monocot 281. 1989, non Rupr. 1840.

Local Name: Po-Young (Lep), Gapay bans (Nep.).

Bamboo, scandent to 13 m tall. Stems slightly yellowish. Internodes upto 1m long. **Culm**-sheaths 16 - 35 x 5 - 10 cm, truncate at the top, pale brown and pubescent. **Ligule** toothed. Leaf-sheaths glabrous. Leaves ovate-lanceolate, tip setaceous, base obliquely rounded, glabrous.

Flower & Fruit : Not observed
Exsiccatus : South Rigu border, 1500 m, **SR Lepcha, T. sharma & AP. Das 3440**, dated 19.10.2008.
Status : Fairly Common.
Local Distribution : Subhaney - Singhaney above, 1500 - 2500 m.
General Distribution : E. HIMALAYA;(Sikkim-BHUTAN), Naga Hills.

Note : 1. Endemic to Eastern Himalaya.

2. The matured culms are used for making, flutes including several folk musical instruments, walking stick etc. It is also being used by the Lepchas for making Bows and arrows. The fine strings derived from the matured culm along with cane are used in making "Sumok Thyaktuk "a Lepcha hat. Leaves also used as a fodder. The tribal of the hills including the Lepchas often used its small culms for making local straw for drinking brewed- millet (Chee; Lep).

Coelachne R. Brown

Coelachne simpliciuscula (Wt. & Arn.) Munro ex Benth. in Journ. Linn. Soc. 19: 93. 1881; Hsu in Hara, Fl. E. Him. 356. 1966; Hajra & Verma, Fl. Sikkim 1: 284. 1996; Noltie, Fl. Bhutan 3(2): 89. 2000. *Panicum simpliciuscula* Wt. ex Arn. ex Steud., Syn. Pl. Glum. 1: 96.1854. *Coelachne pulchella sensu* Hook.f., Fl. Brit. India 7: 270. 1897

Herbs perennial, rhizomatous, forming mat. **Culms** erect - decumbent upto 25 cm tall. Leaf lamina lanceolate- 0.5 - 3 x 0.1 - 0.7 cm, subacute, glabrous, nodes hairy; sheaths glabrous; ligules short. **Inflorescence** purplish to 6.5 cm. **Spikelets** to 2.8 mm. Lower glumes 0.7 - 1.3 x 0.7 - 1.5 mm, ovate, convex, 3 veined, margin with hyaline; upper widely ovate, truncate, 5-veined. Lower florets; **lemma** 2.5 - 1 mm, lanceolate, subacute. **Upper florets**; stipe to 1 mm; lemma lanceolate, hairy on back; **palea** equal to lemma.

Flower : July - October
Exsiccatus : Phede, 3250 m, **SR Lepcha & AP. Das 31096**, dated 02.10.2004
Status : Less common
Local Distribution : Panglakha-Rachela, 2800 - 4100 m.
General Distribution : INDIA, NEPAL - BHUTAN, SOUTH EAST ASIA, CHINA and MADAGASKAR.

Danthonia DC.

Danthonia cumminsii Hook.f., Fl. Brit. India 7: 282. 1896; Hara *et al*, Enum. Fl. Pl. Nepal 1: 128. 1978; Hajra & Verma, Fl. Sikkim 1: 286. 1996. Noltie, Fl. Bhutan 3(2): 645. 2000. *D. Cachemyryiana sensu* Hook.f., Fl. Brit. India 7: 281. 1897. *D. Jacquemontii* Bor in Kew Bull. 1952: 80. 1952.

Herbs, perennial, basal sheaths leathery, yellowish. **Culms** 13 - 60 cm tall. **Leaf** blades filiform, stiff, up to 25cm, 1.5 - 2.5mm wide, glabrous or abaxial surface pubescent. **Inflorescence**

variable, 3 – 13 cm, a dense, narrow, many-spiculate panicle few-spiculate raceme; branches and pedicels puberulous, rarely forming a ring of hairs below spikelet. **Spikelets** with 4 (– 6) florets spaced on a filiform rachilla; **glumes** (9 –)13 – 18 mm, gray-green and purple-tinged, elliptic-lanceolate, rarely hairy, denticulate or mucronate; callus villous; **lemma** elliptic, 7 – 9-veined, thinly hairy on upper margins, hairs sometimes weakly tufted, infrequently short hairs also on lower back, lobes acuminate into slender awns; central awn with dark brown column, awns of lobes 3.5 – 6.5 mm. **Anthers** 2.2 –3. 5 mm. Caryopsis narrowly elliptic-oblong; hilum linear.

Flower & Fruit : May – October

*Exsiccatu*s : Panglakha 3000 m, **SR Lepcha & AP. Das** 263, dated 29.09.2005

Status : Common

Local Distribution : Panglakha, 3000 – 4500 m.

General Distribution : PAKISTAN, INDIA, NEPAL, BHUTAN, CHINA.

Note : This is an important component of alpine pasture, providing excellent fodder for yaks.

Dendrocalamus Nees

Key to the species

1. Culm-sheaths glabrous or rarely with stiff hairs 2
- + Culm-sheaths velvety or with dark brown erect hairs 3
- 2 Internodes more than 40cm long; leaf tessellate *D. hamiltonii*
- + Internodes less than 35 cm long; leaf not tessellate *D. patellaris*
3. Internodes cavities medium; Culm-sheath dark brown with “V” shape lines ... *D. hookeri*
- + Internodes cavities large; Culm-sheath dark brown but no “V” shape lines *D. sikkimensis*

Dendrocalamus hamiltonii Nees et Arn. ex Munro, Trans. Lin. Soc. 26: 151. 1868; Hsu in Hara, Fl. E. Him. 379. 1966; Hajra & Verma, Fl. Sikkim 238.1996; Stapleton in Noltie, Fl. Bhutan 3(2): 492. 2000.

Local Name: Ruveet (Lep.); Choya Baans, Taama (Nep.).

Bamboo, arboreal grass like, straggling rarely straight to 20 m tall. **Culm** capitate, thick to 8 inches in diam, branched above, dull green. Nodes bearing old root-scars; internodes more than 40 cm long. **Culm-sheaths** long and stiff, to 42 cm long, glabrous or rarely with stiff hairs. Leaf-sheaths appressed hairy. Ligule truncate. **Leaves** tessellate, to 30 x 4 cm, broadly lanceolate, base rounded into a short petiole, serrate, smooth above.

Flower : Not seen

*Exsiccatu*s : Phusrey below 1530 m, **SR Lepcha, T. Sharma & AP. Das** 3438, dated 15.10.2008.

Status : Not common

Local Distribution : Phusrey below, Rigu, 500 -1800 m.

General Distribution : SUBTROPICAL E. HIMALAYA, Assam, MYANMAR and THAILAND.

Note: Fine string derived through the culms is excellent for knitting, mats, roofs, containers etc; the matured culms are generally used for making water vessels, and for house building, fences etc. Pickles prepared from its young shoots are quite popular in the hills; juvenile shoots are commonly eaten as vegetables.

Dendrocalamus hookeri Munro in Trans. Linn. Soc. 26 (1): 151. 1868 Gamble in Ann. Roy. Bot. Gard. Cal. 7: 83, t. 73, 1896; *et* Hook.f., Fl. Brit. India 7: 405. 1896; Hajra & Verma, Fl. Sikkim 238. 1996; Stapleton in Noltie, Fl. Bhutan 3(2): 492. 2000.

Local Name: Patu (Lep).

Bamboo, arboreal grass like, straight, upto 20 m tall. **Culms** to 9 cm in diam nodding to drooping, brown, waxy furry. **Internodes** cavity medium, **Nodes** with dense short aerial roots, branches usually absent near base. **Culm-sheaths** deciduous, broad, with "V" shapes lines of dense, dark brown erect hairs; auricle to 2.4 cm, rounded; oral setae few curved; **ligule** broad, serrate. **Leaf-sheaths** glabrous; ligule truncate; auricle absent; oral setae few, erect; lamina to 45 cm.

Flower & Fruit : Not seen

Exsiccatu : Lingtam above, 1330 m, *SR Lepcha & AP. Das 2602*, dated 09.08.2005

Status : Fairly Common.

Local Distribution : Rachela, upto 1600 m.

General Distribution : INDIA, NEPAL - BHUTAN, MYANMAR.

Dendrocalamus patellaris Gamble in Ann.Roy.Bot.Gard.Cal.7:86.t.75.1896; *et* in Hook.f., Fl. Brit. India 7: 406,1896; Hajra & Verma, Fl. Sikkim 238. 1996; Stapleton in Noltie, Fl. Bhutan 3 (2): 511. 2000.

Local Name: Niba (Nep.)

Bamboo, arboreal grass like, medium size upto 6 m ; **young shoots** thick, glutinous exudates, drying to a thin, white bracts internodes to 35 cm, smooth red above and below nodes, nodes white slightly raised. **Culm- sheaths** glabrous, apex broad, asymmetric, distally obtuse; **auricles** and oral setae absent; liguel broad, short. **Leaves** sheath glabrous; **auricle** and oral setae absent; ligule rounded, short, **lamina** glabrous.

Flower & Fruit : April – May

Exsiccatu : Subaney dara, 1700 m, *SR Lepcha & AP. Das 02603*, dated 09.08.2005

Status : Fairly Common.

Local Distribution : Singhaney, Panglakha-Rachela, 2000 – 3100 m.

General Distribution : INDIA, BHUTAN, NEPAL.

Dendrocalamus sikkimensis Gamble in Hook., Ic. Pl. t. 1770. 1888 *et* in Ann. Roy. Bot. Gard. Calc.7: 82.t.72.1896 *et* in Hook.f., in Fl. Brit. India 7: 405. 1896; Hsu in Hara, Fl. E. Him. 380. 1966; Hajra & Verma, Fl. Sikkim 239. 1996; Stapleton in Noltie, Fl. Bhutan 3(2): 492. 2000.

Local Name: Podyang (Lep.)

Bamboo, arboreal grass like, straight, upto 25 m tall. **Culms** to 15cm in diam erect to nodding, densely brown, furry waxy; glossy orange; **Internodes** cavities large; nodes with aerial roots; branches absent near base; central branch to 5.5 cm in daim. **Culms** sheaths deciduous, with velvety, dark brown erect hairs,; auricle to 5.5 cm, wavy; oral setae long; ligule curved , broad, rolled fimbriate. **Leaf-sheaths** glabrous; ligule short, truncate; auricle absent; **oral setae** numerous erect; lamina to 45 cm.

Flower & Fruit : not observed.

Exsiccatu : South Rigu border, 1400 m, *SR Lepcha & AP. Das 2604*, dated

09.08.2005

Status : Fairly Common.
Local Distribution : Rachela, 1400 m.
General Distribution : E. HIMALAYA, INDIA, (NEPAL – BHUTAN)

Note : 1. Endemic to Eastern Himalaya.
2. The matured culms is used in construction of house, bridges, fences, water vessels etc. and in other useful household materials. The young and matured culm is also being used in making bamboo vessel (Dungro) through which brewed millet (Chee; Lep.) are served.

Drepanostachyum P.C. Keng

Drepanostachyum intermedium (Munro) P.C. Keng, L. Bomb. Res. 2: 28. 1983; Hajra & Verma, Fl. Sikkim 1: 239. 1996; Stapleton in Noltie, Fl. Bhutan 3(2): 506. 2000. *Arundinaria intermedia* Munro, Trans. Lin. Soc. 26: 28. 1868; Hook.f., Fl. Brit. India 7: 381. 1897; Hara, Fl. E. Him. 379. 1966. *Chimonobambusa intermedia* Nakoi, JAA 6: 151. 1925.

Local Name: Titay Nigalo (Nep.).

Bamboo, small caespitose with tufted annual stems. **Culms** 3.5 – 4.3 m tall, nodes swollen with distinct ring; internodes upto 26cm long. Sheaths 18 - 25cm, ciliate, papery. **Leaves** tessellate; ligule 0.8cm long, triangular; petiole swollen; lamina 7 - 15cm long, shapes variable, bright green, attenuate at base into a short petiole. **Leaf-sheaths** glabrous, rarely stiffly hairy; callus minute.

Flower & Fruit : Not seen
Exsiccatae : Hattidara, 2549m, *SR Lepcha, T. Sharma & AP. Das 3442*, dated 15. 10.2008.
Status : Fairly Common.
Local Distribution : Hatidara-Rachela, 1500 – 2500 m.
General Distribution : E. HIMALAYAS, (NEPAL – BHUTAN).

Note : 1. Endemic to Eastern Himalaya.
2. The finely striped strings splitted through culms is used for making mats, baskets and also as ropes in house-tieing, head loads-carrying, etc.

Digitaria Haller

Key to the Species

1. Culm not branched or rarely branched; spikelets linear lanceolate *D. ciliaris*
+ Culm branched; spikelet lanceolate – oblong *D. sanguinalis*

Digitaria ciliaris (Retz.) Koel., Descr. Gram. 27. 1802; Blumea 21: 32. 1973; Hajra & Verma, Fl. Sikkim 1:251. 1996; Noltie, Fl. Bhutan 3(2): 728. 2000. *Digitaria sanguinalis* Scop f. *ciliaris* (Retz.) Haines, Bot. Bihar & Orissa 5: 1008. 1994. *D. ciliaris* ssp. *marginata* var. *fimbriata* (Link) Jain & Das, 99: 572. 1973.

Herbs, annual upto 60 cm tall. **Culms** rarely branched from lower nodes. **Leaves** upto 10 cm long, 0.32 - 0.9 cm wide, linear-lanceolate, margins cartilaginous, apex narrowed into sharp point, base slightly contracted, glabrous or hairy. **Sheaths** glabrous or hairy at base. **Ligules**

membranous. **Recemes** 4 - 9, sub-digitate. Rachis straight with winged lateral angles. Pedicels binate, unequal. **Spikelets** 0.4 - 0.4 cm long, lanceolate to lanceolate-oblong, appressed very slightly imbricate, pale green. Lower glume ovate, obtuse to subacute, turned towards rachis; upper glume 3-nerved, ovate-lanceolate, acute. Lower floret sterile; lemma 7-nerved, palea and lodicules minute. **Lemma** oblong-lanceolate, cartilaginous; **palea** minute.

var. *ciliaris* : *Panicum ciliare* Retz., Observ. Bot. 4: 16. 1786;

Lower lemma pubescent to villous, but lacking glassy bristles.

Flower : June - November
Exsiccatus : Panglakha 2250 m, *SR Lepcha & AP. Das 20276*, dated 28.10.2004
Status : Very Common.
Local Distribution : Panglakha, upto 2250 m.
General Distribution : PANTROPIC. (Throughout the tropics and subtropics, but rare in AFRICA)

Digitaria sanguinalis (L.) Scop., Fl. Carn. ed. 2, 1: 52. 1772; Noltie, Fl. Bhutan 3(2): 728. 2000. *Paspalum sanguinale* L., Sp. Pl. 1: 57. 1753. *Digitaria sanguinalis* ssp. *vulgaris* var. *rotleriana* Henr., Monogr. Digitaria 986. 1950. *D. sanguinalis* ssp. *aegyptiaca* var. *frumentacea* Henr., Monogr. Digitaria 986. 1950;

Herbs annual. **Culms** decumbent, branched; nodes slightly swollen. Ligules truncate and membranous. **Leaf sheaths** loose, often hirsute; **leaf lamina** 2.5 - 13 x 0.33 - 0.7 cm, linear-lanceolate, margin white, acute. **Panicle** with many spiked, erect; rachis very short, flexuous. Spikelets upto 0.5 cm long linear-lanceolate; **lower glume** sometimes absent; **upper glume** upto 0.13 cm long, oblong, 3-nerved. **Lower floret**: lemma upto 0.4 cm, linear-lanceolate, acute, nerves upto 78 slightly hairy, palea absent **Upper floret**: lemma upto 0.30 cm, elliptic-lanceolate, acuminate; palea equal or slightly shorter than lemma.

Flower : August - November
Exsiccatus : Subaney, 1850 m, *SR Lepcha & AP. Das 3503*, dated 15.06. 2007
Status : Fairly Common.
Local Distribution : Hangey, 1200 - 1900 m.
General Distribution : E. HIMALAYA; E. Himalaya, Meghalaya, Assam, S.China
Note : Endemic to Eastern Himalaya.

Echinochloa P. Beauvois

Echinochloa frumentacea Link, Hort. Berol. 1: 204. 1827. *Panicum frumentaceum* Roxb., Fl. Ind. 1: 307. 1820; Noltie, Fl. Bhutan 3(2): 703.2000.

Herbs, annual. **Culms** robust, erect, 1.5 - 2 m tall. **Leaf sheaths** glabrous; **leaf blades** linear, 13 - 36 x 1.5 - 2.5 cm, glabrous, margins thickened. **Inflorescence** erect, lanceolate, 8 - 18 cm, axis robust, scabrous along edges and with tubercle - based hairs; racemes 1.2 - 2.6 cm, curved, simple, closely spaced and overlapping. **Spikelets** greenish, tardily deciduous, plump, ovate-elliptic to rotund, 1.8 - 3 mm, pubescent, awnless; **lower glume** one third to two third as long as spikelet; **upper glume** slightly shorter than spikelet; **lower lemma** herbaceous, sterile; **Caryopsis** long persistent.

Flower & Fruit : August - September
Exsiccatus : Dhorok 2195 m, *SR Lepcha & AP. Das 30290*, dated 07.10.2004

Status : Common.
Local Distribution : Dhorok, upto 2400 m,
General Distribution : AFRICA AND TROPICAL ASIA

Festuca Linnaeus

Festuca cumminsii Stapf in Hook.f., Fl. Brit. India 7: 349. 1897; Hajra & Verma, Fl. Sikkim 1: 292: 1996; Noltie, Fl. Bhutan 3(2): 541. 2000.

Herbs, perennials tuft. **Culms** slender. Sheath open to below the middle, **Panicles** 2-4, narrow nodding or flexuous, 6-11cm long. **Spikelets** elliptic or open, obovate, pale green or purple, **glumes** unequal, **lemma** awned, **rachilla** scabrid, flower glumes oblong-lanceolate, **Palea** 2 fid, anther elliptic, scabrid.

Flower : July – August *Fruit*: September – October
Exsiccatus : Panglakha below 2800 m, **SR Lepcha & AP. Das** 32949, dated 26.07.2005
Status : Most Common
Local Distribution : Changu, Sherathang, Chamnego, upto 4400m.
General Distribution : E. HIMALAYA, INDIA (NEPAL – BHUTAN).
Note : Endemic to E. Himalaya

Himalayacalamus P.C. Keng

Key to the species

1. Culms yellowish green; ligule hairy *H. falconeri*
+ Culms bluish green purple or rarely yellow; ligule glabrous *H. hookerianus*

Himalayacalamus falconeri (Hook.f. ex Munro) Keng f., Journ. Bomb. Res. 2: 24. 1983; Hajra & Verma, Fl. Skim 1:240. 1966; Stapleton in Noltie, Fl. Bhutan 3(2): 510. 2000. *Thamnocalamus falconeri* Hook.f. ex Munro, Trans. Linn. Soc. 26: 34. 1868; Hara *et al*, Enum. Fl. Pl. Nepal 1: 147. 1978. *Drepanostachyum falconeri* (Hook.f. ex Munro) J. Camp. ex McClintok, Bomb. Soc. News 15: 12. 1992.

Bamboo small-sized laxly, caespitose. **Culms** usually upto 8m tall, fistular, rarely striped, yellowish-green; internodes to 17 cm long. Branchlets slightly fascicled at nodes. **Culm**-sheaths upto 32 cm long, usually straw-coloured and striate; ligule hairy. **Leaves** lamina 5.5 – 9.5 x 0.7 - 1.8 cm, acuminate, base attenuate. **Sheaths** slightly truncate above and glabrous.

Flower & Fruit : Fruit not seen
Exsiccatus : Dhorok 2300m, **SR Lepcha & AP. Das** 2597, dated 21.10.2004
Status : Common
Local Distribution : Dhorok-Phusrey, 2000 – 2500 m.
General Distribution : TEMP. HIMALAYAS; (Kumaon to BHUTAN).

- Note* : 1. Endemic to Eastern Himalaya.
2. Young shoots eaten as vegetable and also a good fodder for Red Panda.

Himalayacalamus hookerianus (Munro) Stapleton in Fl. Bhutan 3(2): 510. 2000. *Arundinaria hookeriana* Munro, Trans. Lin. Soc, 26: 29. 1868; Ann. Bot. Gard. Cal. 7: 17, t. 15. 1896; Hook.f., in Fl. Brit. India 7: 382. 1896; Stapleton in Noltie, Fl. Bhutan 3(2): 510. 2000. *Sinarundinaria hookeriana* (Munro) Chao & Renvoise, Kew Bull. 44: 358. 1989. *Chimonobambusa hookeriana* (Munro) Nakai, Journ. Arn. Arb. 6: 151. 1925; Fl. E. Himal. 379. 1966; Fl. Sikkim 1: 237. 1996. *Drepanostachium hookerianum* (Munro) Keng f., Journ. Bamb. Res. 2(1): 17. 1983.

Local Name: Prong, parang (Lep.) Pareng (Nep)

Bamboo, culms upto 8 m long, internodes to 45 cm, smooth, uniformly bluish green – purple or yellow. **Culm** sheaths glabrous, very long, long acuminate apically, auricle and oral setae absent; ligule rounded, lamina glabrous.

Flower & Fruit : Not seen

Exsiccatae : Phusrey below, 1800 m, *SR Lepcha & AP. Das* 2598, dated 05.10. 2004; Subaney dara below, 1600 m, *SR Lepcha, T. sharma & AP. Das* 3441; dated 17.10. 2008.

Status : Common

Local Distribution : Dhorok-Phusrey, 1600 – 2300 m.

General Distribution : TEMP. HIMALAYAS; (NEPAL – BHUTAN).

Note : 1. Endemic to Eastern Himalaya

2. The species is widely used in the hills of Sikkim and Darjeeling for making various types of basket, e.g. Doko, Tokri. The matured culms are often useful for making roof of the houses. The young shoots are one of the good source of wild vegetables and are being sold in the market.

Isachne R. Brown

Isachne albens Trin., Sp. Gram. Ic. t. 25. 1828; Hook.f. in Fl. Brit. India 7: 22. 1897; Hsu in Hara, Fl. E. Him. 366. 1966; Reinwardtia 2(2): 280. 1953; Hara *et al*, Fl. E. Him. 366. 1966; Hajra & Verma, Fl. Sikkim. 1: 296. 1996; Noltie, Fl. Bhutan 3(2): 743. 2000.

Herbs or grass perennial upto 45 cm tall. **Culms** erect or spreading. **Leaves** lamina 2.5 – 12 x 0.40 - 0.9 cm, linear to linear-lanceolate, margin ciliate, scabrid. Sheaths smooth, striate. **Ligule** with a rim of stiffy hairs. **Panicles** decompound, 4.15 – 26 cm long, branches capillary. Pedicels erect, or spreading. **Spikelets** slightly globose. **Lower glumes** 0.2cm, orbicular, nerves many, glabrous. **Upper glume** equalling the lower one. **Lemmas** with infolded margins. Lower **floret** male, upper usually hermaphrodite; **palea** equal or slightly shorter than lemmas. **Anthers** 2, short.

Flower : August – November *Fruit:* October – December

Exsiccatu : Panglakhā – Rachela, 2700m, *SR Lepcha & AP. Das* 27704, dated 30. 09.2004

Status : Common.

Local Distribution.: : Rachela middle, upto 2700 m.

General Distribution : AFRICA; E. HIMALAYA; INDIA, NEPAL, BHUTAN, THAILAND, CHINA, FORMOSA TO MALAYSIA; TEMPERATE REGIONS OF SOUTH- EAST ASIA.

Muhlenbergia Shreber

Muhlenbergia huegelii Trin. in Mem. Acad. Sci. Petersb. Ser. 6, 6(2): 41 et 293. 1841; Ohwi in Bot. Mag. Tokyo 55: 397. 1941; Bor, Grass. Ind. 401.1960; Hsu in Hara, Fl. E. Him. 368. 1966; Noltie, Fl. Bhutan 3(2): 673. 2000. *Muhlenbergia viridissima* Nees ex Steud., Syn. Pl. Glum. 1: 178. 1854; Hook.f. in Fl. Brit. India 7: 259. 1897.

Herbs rhizomatous. Culms weak usually scrambling, to 1.6 m long. Leaf lamina 5. – 13 x 04 – 07 cm oblong, acute scabrid above and below; sheaths glabrous scabrids near margins, ligules to 0.8 mm. Inflorescence purplish 8 – 27 x 1 – 4 cm. Spikelets to 3.5, excluding awn. Glumes less than lemma, lanceolate, subacute to finely acuminate, midrib indistinct, rarely hispid. Lemma lanceolate, acute, hispid on back and veins, with tuft of white hairs either side of midrib. Awn to 14 mm, apex filiform, flexuous. Palea lanceolate.

Flower & fruit : August – January
Exsiccatus : Beusa 1780m, *SR Lepcha & AP. Das 20276*, dated 28.10. 2004.
Status : Rare
Local Distribution : Hangey, Beusa, Phusrey, 1700 – 2590 m.
General Distribution : Temperate Himalaya, (NEPAL – BHUTAN), AMUR, CHINA, KOREA, JAPAN, FORMOSA, and PHILLIPINES.

Panicum Linnaeus

Panicum notatum Retz., Observ. Bot. 4: 18. 1786; Hsu in Hara, Fl. E. Him. 370. 1966; Noltie, Fl. Bhutan 3(2): 691. 2000.

Herbs, perennial. Culms usually rooting at lower nodes upto 2 m long branched, glabrous. Leaves cauline; leaf sheaths striate, puberulous to subglabrous, ciliolate on margins; leaf blades lanceolate, 3.5 – 18 x 1.5 – 3.5 cm, subglabrous to pubescent, margins scabrid, base cordate, apex finely pointed to acuminate; ligule minute ca. 0.4 mm, a ciliolate membrane. Panicle broadly ovate in outline, 9 – 38 cm, much branched; branches slender, glabrous, scabrid, bearing spikelets at distally. Spikelets elliptic, 1.5 – 2.3 mm, puberulous; lower glume ovate or oblong, third fourth as long to equaling the spikelet, 3 – 5-veined, usually separated by an internode; spikelet, 3 – 5-veined; lower lemma similar to upper glume, palea absent; upper floret as long as spikelet, pale yellow or green.

Flower & Fruit : May – November
Exsiccatus : Panglakha 2795 m, *SR Lepcha & AP. Das 27790*, dated 08.10.2004
Status : very Common.
Local Distribution : Panglakha, Rachel, 2195 m,
General Distribution : INDIA, NEPAL, BHUTAN, MYANMAR, CHINA, VIETNAM, THAILAND, MALAYSIA, BORNEO, INDONESIA, LAOS, PHILIPPINES,

Paspalum Linnaeus

Paspalum scrobiculatum L., Mant. 1: 29. 1767; Hook.f. in Fl. Brit. India 7: 10. 1897; Hsu in Hara, Fl. E. Him. 372. 1966; Hara et al., Enum. Fl. Pl. Nepal 1: 139. 1978; Hajra & Verma, Fl. Sikkim 1: 265. 1996; Noltie, Fl. Bhutan 3(2): 712. 2000. *P. orbiculare* G. Forster, Fl. Insul. Austree Prodr. 7. 1786. *P. cartilagineum* Presepal Rel. Haenk. 1: 216. 1830.

Herbs or grass tufted upto 60 cm tall. **Culms** spongy at base. **Leaves** upto 26 cm long, 0.3 - 0.7 cm wide, sublanceolate-linear, pointed into a fine point, base obscurely contracted, smooth and glabrous both sides. Leaf sheaths loose, scarious, persistent. **Inflorescence** of false spikes, erect or drooping. **Rachis** 0.2 - 0.4 cm wide, smooth and glabrous. Pedicels stout. **Spikelets** in 2 rows, overlapping. **Lower glume** 0, upper glume 5-nerved, glabrous. Lower floret sterile, 3-nerved membranous. **Upper floret** often hermaphrodite; lemma punctate, yellow, or brownish, **palea** just like lemma; **stamens** 3.

Var. scrobiculatum

Herbs annual or perennial. **Culms** erect or decumbent at base, up to 155cm tall. **Leaf blades** 9 – 18 × 0.5 – 1.4 cm, glabrous. **Spikelets** single, suborbicular, 2.5 – 3 mm; upper **glumes** 7 – 13 - veined, lower lemma 7 – 9-veined, veins often back; upper lemma dark brown at maturity.

- Flower & Fruit* : May – November
- Exsiccatus* : Padamchen 2495 m, **SR Lepcha & AP. Das 20249**, dated 28.10.2004
- Status* : Very Common.
- Local Distribution* : Padamchen, Zeluk, Changu, upto 3500 m.
- General Distribution* : INDIA, CHINA, TROPICS OF THE WORLD.
- Note* : The domesticated annual form is an important cereal [*Mong* (Lep), *Kudo* (Nep.), Millet].

Poa Linnaeus

- 1. Panicle stiff, often sub-secund; spikelets green or purple; lower palea nearly equal to glume *P. annua*
- + Panicle flexus; spikelets pale green ; lower palea shorter than glume *P. gammieana*

Poa annua L., Sp. Pl. ed. 1, 68. 1753; Hook.f. in Fl. Brit. India 7: 345. 1897; Act. Phytotax. Geobot. 10: 120. 1941; Reinwardtia 2(2): 322. 1953; Hsu in Hara, Fl. E. Him. 372. 1966; Hajra & Verma, Fl. Sikkim 1: 300. 1996; Noltie, Fl. Bhutan 3(2): 556. 2000.

Herbs, annual or sub perennial tufted. **Culms** upto 32 cm tall and usually rooting basally. **Ligules** 0.2 cm, oblong to ovate. **Leaves**; sheaths oftenly loose and slightly compressed; **lamina** 2.4 - 3.3 cm x 0.25 -0.33 cm, linear, margin scaberulous, acute, flaccid. **Panicles** upto 6.9cm long, branched, stiff and often sub-secund. **Spikelets** 3 - 8 flowered, ovate, lower ones usually lanceolate, green or purple; **lower glume** lanceolate, acute; **upper glume** longer, ovate and 3-nerved; **lemmas** oblong, sub-acute or obtuse; **palea** nearly equal to lower glume; keels ciliate; anthers short upto 0.2 cm.

- Flower & Fruit* : March - November
- Exsiccatus* : Singhaney 2800 m, **SR Lepcha & AP. Das 32978**, dated 28.07.2008
- Status* : Common.
- Local Distribution* : Singhaney, Neora-Sikkim Border, 1500 – 2600 m.
- General Distribution* : COSMOPOLITAN IN SUBTROPICAL AND TEMPERATE REGIONS OF THE WORLD.

Poa gammieana Hook.f., Fl. Brit. India 7: 345.1896; Hajra & Verma, Fl. Skim 1: 300. 1996; Noltie, Fl. Bhutan 3(2): 553. 2000.

Herbs annual upto 50 cm tall. **Culms** leafy, terete. **Leaves lamina** 6 - 14 x 0.5 - 1.5 cm, scattered upto panicle, linear, long acuminate, glabrous, sheaths lax, mostly smooth or asperulous; ligule acute, pubescent beneath. Panicle upto 15 cm long, flexuous. **Spikelets** 0.9 cm long, pale green; **upper glume** lanceolate, 3 nerved with entire margin; **lower glume** narrow oblong, trinerved, flowering glumes 0.6 cm long, acute, keel silky-hairy; **palea** shorter than glumes, keels ciliate; anthers oblong. **Lodicules** nearly bilobed.

Flower : June – July
Exsiccatus : Rachela – Panglakha, 2450 m, **SR Lepcha & AP. Das** 3403, dated 13.07.2008.
Status : Very Common.
Local Distribution : Beusa, Premlakha above, upto 2500 m.
General Distribution : EASTERN HIMALAYA (Sikkim, Darjeeling, Bhutan).
Note : Endemic to Eastern Himalaya.

Setaria P. Beauvois

Key to the species

1. Herbs annual; leaf tip acute; leaf sheafs keeled, smooth *S. intermedia*
+ Herbs perennial; leaf tip acuminate; leaf sheaths ciliated or hispid *S. palmifolia*

Setaria intermedia Roem. et Schult., Syst. Veg. 2: 489. 1817; Hook.f., Fl. Brit. India7: 79. 1897; Hajra & Verma, Fl. Sikkim 1: 273. 1996; Noltie, Fl. Bhutan 3(2): 722. 2000. *S. pumila* (Poir) Roem. et Schult., Syst. Veg. 2: 891. 1817. *Panicum pumilum* Poir. in Lamk., Ency. Meth. Bot. Suppl. 4: 273. 1816. *Setaria pallidifusca* (Schum.) Stapf & Hubb. in Kew Bull. 1930: 259. 1930.

Herbs, annual, tufts slender to 20 cm long. **Leaves** 3-10 x 0.25 - 0.7 cm, linear, finely tapered into acute tip, flat or infolded, glabrous except basal region. Leaf sheaths keeled, smooth. Ligule truncate. **Inflorescence** an erect false spike, to 5 cm, rufous. **Rachis** slender, minutely pubescent. **Spikelets** upto 0.25 cm long; subtended by single or more glabrous bristles. Pedicels reduced to small stumps. **Lower glume** subacute or obtuse, 3-nerved, membranous, upper one 5-nerved. Lower floret male or barren, anthers if present 0.25 cm long; upper lemma not keeled, finely rugose, dorsally curved, 5-nerved and membranous; **palea** elliptic-oblong to oblong. **Upper** florets hermaphrodite, boat-shaped; **lemma** transversely rugose; palea granular-punctate.

Flower : June – September
Exsiccatus : Panglakha to Premlakha 2850 m, **SR Lepcha & AP. Das** 20288, dated 28.10.2004.
Status : Common.
Local Distribution : Lake below Tinsimana, Rachela Chowk, Upto 2500 m.
General Distribution : TROPICS OF THE OLD WORLD.
Note : Used as a fodder for cattle.

Setaria palmifolia (Koen.) Stapf in Journ. Lin. Soc. Bot. 42: 186. 1914; Hsu in Hara, Fl. E. Him. 376. 1966; Hajra & Verma, Fl. Sikkim 1: 273. 1996; Noltie, Fl. Bhutan 3(2): 723. 2000. *Panicum palmaefolium* Koen. in Naturf. 23: 208. 1788. *P. spicatum* Willd.(non-Lamk.);Hook.f. in Fl. Brit. India 7: 55. 1897.

Herbs or grass, perennial upto 2 m tall. **Culm** 30 cm. **Leaves** broad, 12 – 42 x 1.5 - 4.5 cm, linear-lanceolate, acuminate, base narrow, glabrous or sparsely hairy, blades folded between

primary nerves, leaf sheaths ciliated, or hispid, ligulate. **Panicles** 27 - 55 cm, spreading, open, loosely-spiculate. **Rachis** branched, scabrid. **Spikelets** 0.4 cm long, solitary, sessile, deciduous, glabrous. **Lower glume** half to spikelet in length, broadly ovate, obtuse 5-nerved and membranous; **upper glume** ovate, obtuse, 7-nerved and membranous. Lower oftenly floret barren, lemma ovate, shortly apiculate; **palea** hyaline, ovate. Upper floret hermaphrodite; **lemma** ovate-oblong, pale yellow with involute margins; palea ovate, striate.

Flower : September – October
Exsiccatus : Singaney 2600 m, *SR Lepcha & AP. Das* 20288, dated 20.10.2004
Status : Common.
Local Distribution : Chitray, Rachela Chowk, Upto 2600 m.
General Distribution : TROPICS OF THE OLD WORLD.

Thamnocalamus Munro

Thamnocalamus aristatus E.G. Camus, *Bambus*. 54. t. 36 E. 1913; Hsu in Hara, *Fl. E. Him.* 380. 1966; Hara *et al*, *Enum. Fl. Pl. Nepal* 1: 147. 1978; Hajra & Verma, *Fl. Sikkim* 1: 242. 1996. *Arundinaria aristata* Gamble, *Bamb. Brit. India* 18, t. 17: 1896; Hook.f., *Fl. Brit. India* 7: 382. 1897.

Local Name: *Pumom* (Lep.) *Rato Nigalo* (Nep.).

Bamboo gregarious. Stems usually tufted. **Culms** robust, to 4 m tall, branched, glaucous green; branches slightly red with long and thin sheaths. **Internodes** to 33 cm long. Culm-sheaths 13 - 23 x 5 - 7.5 cm, broad at the base; ligule pubescent. **Leaves** clustered at the branchlets tops; petioles upto 0.35 cm long, glandular; lamina oblong - lanceolate, base attenuate, lateral nerves 3 - 5 pairs. **Leaf-sheaths** 5 - 9 cm long; ligule acute.

Flower & Fruit : Not seen
Exsiccatae : Premlakha – Panglakha, 2580 m, *SR Lepcha & AP. Das* 2599, dated 09.10.2004; on way to NVNP border, 2650 m, *SR Lepcha, T. Sharma & AP. Das* 03445, dated 15.10.2008.
Status : Rare
Local Distribution : Rachela, 1200 – 2550 m.
General Distribution : E. HIMALAYA (NEPAL-NEFA).
Note : Endemic to Eastern Himalaya.

Thysanolaena Nees

Thysanolaena latifolia (Roxb. ex Horn.) Honda, *Journ. Fac. Sc. Tokyo Sect. III. Bot.* 3: 312. 1930; Hajra & Verma, *Fl. Sikkim* 1: 305. 1996; Noltie, *Fl. Bhutan* 3(2): 648. 2000. *Thysanolaena maxima* (Roxb.) O. Kuntze, *Rev. Gen. Pl.* 794. 1891; *Act. Phytotax. Geobot.* 10: 272. 1940; Hara, *Fl. E. Him.* 378. 1966.

Local Name: *Pusyor* (Lep), *Amliso*, *Kuccho* (Nep.).

Shrubby, perennial; **culms** 1.5 - 3 m tall, solid, rounded and glabrous. **Ligules** truncate and cartilagenous. Sheaths tight, hard. **Leaves** numerous, sub-amplexicul, lamina 23 - 50 x 4.5 - 13 cm, broadly lanceolate, margin scabrid, acuminate, glaucous below. **Panicle** upto 55 cm long, branches filiform, further redivided into numerous branchlets. **Spikelets** 0.13 - 0.15 cm, 2-flowered, ovoid-lanceolate, acuminate; **glumes** ca. 0.75 cm long, lanceolate, glabrous, 1-nerved. Upper floret ovate, acute; paleae truncate; **stamens** 2 - 3; **anthers** very short; styles free.

- Flower* : August – April
Exsiccatus : Talkharka 1700 m, **SR Lepcha & AP. Das** 30290, dated 07.10.2004
Status : Less Common.
Local Distribution : Talkharka, Premlakha, Subaney, Singhaney 1400 – 2000 m.
General Distribution : SUBTROP. & TEMP. REGIONS OF INDIA, NEPAL, BHUTAN, MYANMAR, INDOCHIN, CHINA, etc.
Note : Brooms are made from its panicles roots used in traditional medicine.

Trisetum Persoon

Trisetum spicatum (L.) Richt. Pl. Eur. 1: 59. 1890; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 148. 1978. Hajra & Verma, Fl. Sikkim 1: 306. 1996. *Aira spicata* L., Sp. Pl. 64. 1753.
Avena subspicata L., Syst. Nat. ed. 10: 873. 1759, Hook.f., Fl. Brit. India 7: 278. 1897. *Trisetum* sub Ess. Agrost. 88. 149. 1812. *spicatum* (L.) P. Beauv.,

Herbs perennial upto 70 cm tall. **Culms** usually pubescent. **Lamina** and sheaths densely pubescent to glabrous. **Panicles** linear to narrowly oblong, often interrupted below, 4.5 – 6.5 cm, green or brownish. **Spikelets** with 2 (–3) florets; **lower glume** 3 – 3.9 mm, **upper glume** 3.8 – 4.8 mm; lowest lemma 3.5 – 5.5 mm, scaberulous, tips entire or 2-denticulate; **awn** 2 – 5.5 mm, outwardly curved near base, not twisted.

- Flower* : June – August *Fruit*: September – October
Exsiccatus : Nathang – Panglakha, 3500m, **SR Lepcha & AP. Das** 30802, dated 29.07.2005
Status : Common
Local Distribution : Panglakha, 3200 – 5000 m.
General Distribution : KAZAKHSTAN, KYRGYZSTAN, TAJIKISTAN, PAKISTAN, INDIA, NEPAL, BHUTAN, CHINA, etc.

Yushania P.C. Keng

Key to the species

1. Arboreal grass upto 5 m tall; culm slender; culm sheath auricled *Y. maling*
+ Arboreal grass more than 6 m tall; culm straight; culm sheath not auricled ... *Y. pantlingii*

Yushania maling (Gamble) R.B. Majumdar in Karthikeyan *et al.*, Fl. Ind. Enum. – Monocot. 283. 1989; Hajra & Verma, Fl. Sikkim 1: 242. 1996; Stapleton in Noltie, Fl. Bhutan 3(2): 503. 2000. *Arundinaria maling* Gamble in Kew Bull. 1912: 139. 1912; Hara, Fl. E. Him. 379. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 122. 1978. *A. racemosa* Munro in Trans. Lin. Soc. Lond. 26: 17. 1868 p.p., Hook.f. in Fl. Brit. India 7: 379. 1897 p.p.

Local Name: Malingo (Nep.).

Shrubby erect, upto 5 m tall. **Culms** slender, fistular, nodes in between 25 - 45 cm gaps; internodes 22 – 35 cm long, 2.5 - 3 cm in diam., scabrid. **Culm-sheaths** upto 30 cm long, 8 cm in wide, blade subulate, erect or reflexed, coriaceous, apex attenuate, broadly auricled, scarcely yellowish -hispid; ligule 1 cm, fimbriate. **Leaves** 4.5 - 13 x 0.40 - 1.5 cm, linear-lanceolate, acuminate, base attenuate into a short stalk, glabrous, veinlets conspicuous. **Sheaths** striate, sparsely ciliate at the mouth, and back; ligule truncate, pubescent

- Flower & Fruit* : Not observed
Exsiccatus : On way to Rachel, 2550 m, **SR Lepcha, T. Sharma & AP. Das** 3443, dated 17.10. 2008.

Status : Fairly Common.
Local Distribution : Subaney – Singhaney, 1800 –2900 m.
General Distribution : E. HIMALAYA AND KHASIA HILLS

Note : 1. Endemic to Eastern Himalaya.
2. Leaves used as a foddors and roofing mats, floors mats for cattle. The culms are used for making numerous household articles.

Yushanta pantlingii (Gamble) R.B. Mujumdar in Karthikeyan *et al*, Fl. Ind. Enum. – Monocot. 283.1989. Hajra & Verma, Fl. Sikkim 1: 242.1996; Stapleton in Noltie, Fl. Bhutan 3(2): 504. 2000. *Arundinaria pantlingii* Gamble in Ann. Roy. Bot. Gard. Calc.7: 129.t. 118. 1896 *et in* Hook.f., Fl. Brit. India 7: 380. 1896; *Semiarundinaria pantlingii* (Gamble) Nakai in Journ. Arn. Arb. 6: 151. 1925.

Bamboos, rhizomatous. **Culms** to 8.5 m long; internodes striate, scabrous. **Culm-sheath** tough, appressed brown setose apically, or pilose towards base, margin ciliate, with basal fringe of reflexed, light brown hairs; auricle absent or small; oral setae few, erect; ligule long, rounded shortly pubescent, fimbriate. **Leaves sheaths** glabrous, tough, margin ciliate ; ligule very short ; auricle absent; oral setae long, erect, scabrous at base; exterior ligule long ciliate on one side or short ciliate on both sides.

Flower : Not observed
Exsiccatus : Rachela, 2950 m, *SR Lepcha, T Sahrma & AP. Das 03444*, dated 15.06.2008
Status : Fairly Common.
Local Distribution : Subaney- Singhaney, upto 2800 m.
General Distribution : E. HIMALAYA AND KHASIA HILLS
Note : Endemic to E. Himalaya

Subclass: Zingiberidae

Order: Zingiberales

MUSACEAE A. Jussieu

Musa Linnaeus.

Musa sikkimensis Kurze in Journ. Agric. Hort. Soc. Ind. n.s.v. 164.1865-1866; J.G. Baker in Fl. Brit. India 6: 262. 1894. *Musa hookeri* King ex A.M. & J.M. Cowan Trees Bengal 135.1929; Noltie, Fl. Bhutan 3(1):180.1994.
Local Name: *Tyangmoo fo-gom* (Lep.)

Plant robust upto 5 m tall. **Pseudo stem** 4.3 m long, fleshy, with girth ca. 45 cm in diam. **Leaves** spreading; Leaf sheath waxy, blackish brown; petiole upto 70cm; channel margin erect, blackish, blades oblong lanceolate, base rounded or cordate, **lamina** 1.5 – 2 x 0.8m, yellowish green , shining on both surface usually purplish when young. **Bract**

ovate or obtuse not reflexing, deep purple to crimson, glaucous outside, 1 -2 male bracts opening at one. **Male bud** to 13 x 10cm turbinate, . **Male flower** compound **tepal** to 4cm long, creamy – orange, free tepal, translucent, stamen equalling to tepal. **Fruit** in bunch oblique, 7 - 9 fruits born in two rows. **Fruits lax**, arise from axis. Pericarp green turning brown in maturity. Seed numerous, sharply angled, black, pulp dirty white – pale brown.

- Flower & Fruit* : October - April
Exsiccatus : Dhorok (lower region) 1980 m, *SR Lepcha & AP. Das* 03091, dated 26.08.2005
Status : Sparse,
Local Distribution : Premlakha, Subanney – Singhaney, Phusrey below upto 2000 m
General Distribution : E. HIMALAYA (NEPAL – BHUTAN) W. Bengal,
Note : 1. Endemic to Eastern Himalaya.
 2. Loves to grow on wet places.

ZINGIBERACEAE R. Brown.

Key to the Genera:

1. Herbs upto 50cm tall *Globba*
 + Herbs more than 50cm tall 2
 2. Root fiber thick; Corolla lobes dorsal narrow; anther cell connective produced at the base into a forked appendages *Cautleya*
 + Root fiber thin; Corolla lobes dorsal spreading; anther cell not connective produce..... *Hedychium*

Cautleya (Benth.) Hook.f.

Key to the Species :

1. Leaf lanceolate; base attenuate; staminode spatulate *C. gracilis*
 + Leaf elliptic; base narrow round; staminode oblanceolate oblong *C. spicata*

Cautleya gracilis (J.S.Smith) Dandy in Journ. Bot. 70. 328. 1954; Hara in Fl. E. Him. 1: 421. 1966; Noltie. Fl. Bhutan 3(1): 193. 1994; Hajra & Verma, Fl. Sikkim 1: 123. 1996. *Roscoea gracilis* J.E. Smith. in Trans. Linn. Soc. 13: 460. 1812. *Cautleya lutea* (Royal) Hook.f., in Bot. Meg. T. 699. 1888; Baker in Hook. f., Fl. Brit. India 6: 208. 1890. *Roscoea lutea* Royal, illustr. Bot. Him. 361. t. 89. f. 2. 1839.

Herbs perennial, with pseudo stem upto 55 cm tall. **Leaves** 3 - 5, lanceolate ± sessile, long caudate; leaf sheath greenish white or with purple red spot; ligule ca 2.5mm; adaxially green, abaxially usually purple or green, lanceolate, **lamina** 4.5 -13 x 1.5 - 7cm, glabrous, base attenuate, apex caudate-acuminate. **Inflorescence** 5 - 10cm, bracts usually red, acute. **Calyx** red, unilaterally split. **Corolla** tube 2-2.5cm, **petal** oblong, rounded, lateral **staminode** ± spatulate, lip bilobed; **filament** short, **anther** 2cm.

- Flower* : June-October.
Exsiccatus : Panglakha-Rachela *SR Lepcha & AP Das* 31034, 07.10.2004

Status : Common
Local Distribution : Rachela, Singhaney upto 3200 m,
General Distribution : INDIA (Kashmir), BHUTAN, MYANMAR, NEPAL, THAILAND,
VIETNAM.

Cautleya spicata (Smith) Baker in Fl. Brit. India 6: 209. 1890; Pfl.-reich IV-46, Ht. 20: 125. 1904; Fl. Simla 512, f. 170. 1921; Hara in Fl. E. Him. 1: 421. 1966; H.J. Noltie. Fl. Bhutan 3(1): 193. 1994; Hajra & Verma Fl. Sikkim 1:124. 1996.

Local Name: Pahinlo Sana (Nep.).

Herbs 55 - 65 cm tall. **Stem** glabrous. **Leaves**; petiolate much broader; **lamina** 13.5 - 23 x 3 - 6.5 cm, narrow elliptic, entire, acute to acuminate, base narrow round, lateral nerves upto 16 pairs on either sides. **Spike** upto 13 cm long, shortly peduncled, terminal and erect. **Bracts** oblong, as long as sepals, red. **Flowers** few or many, yellow. **Sepals** upto 1 - 2.1 cm long, red, obtusely toothed. **Petal-tube** shorter or hardly equal to sepal, upper segment upto 2.3 cm; lip bright yellow, **staminodes** nearly as long as the petal, oblanceolate - oblong. **Capsule** globose, red; seeds black.

Flower & Fruit : June - September
Exsiccatus : Panglakha 2870 m, *SR Lepcha & AP Das* 29379, dated 30.09.2004
Status : Less Common.
Local Distribution : Panglakha, Ramitey 1900-2500m.
General Distribution : TEMPERATE HIMALAYAS; INDIA, BHUTAN.

Hedychium Koenig.

Hedychium spicatum Buch-Hamilton ex J.E. Smith in Rees Cyclop. 17: 3. 1811; Hajra *et al.* Fl. Sikkim 1: 130. 1996; Baker in Hook. f., Fl. Brit. India 6: 227. 1892. *Var. acuminatum* (Rose) Wall. In Hook., Kew Journ. Bot. 5: 328. 1853; Hajra *et al.* Fl. Sikkim 1: 130., 1996; Baker in Hook. f., Fl. Brit. India 6: 227. 1892; Roa & Verma in Bull. Bot. Surv. India 14; 130. 1972.

Herbs robust. Pseudo-stem usually 0.5 - 2.5m long. Ligule ca 3.5mm long, apex obtuse; **petiole** ca 4.5mm long. **Leaf** oblong, lanceolate, acuminate, **lamina** 8 - 35 x 3 - 15cm pubescent cent. **Inflorescence** narrowly cylindric, 10 - 35cm long. **Flower** golden yellow or white tinged yellow or reddish at base, **Calyx** ca 5.5mm, obliquely split on 1 side. **Corolla** tube ca 7mm, lobes linear. **Petals** 2 - 3cm long. Lateral **staminode** lanceolate \pm equaling petals. **Lip** 4 - 4.5cm. ; **stamen** shorter than lips, usually orange. **Fruit** yellow, orange, stigma ciliate.

Flower : August - September
Exsiccatus : Dhorok Phusrey 2200-2300 m, *SR Lepcha & AP Das* 30246,
dated 06.10.2004
Status : Common
Local Distribution : Dhorok-Phusrey 2200-2300 m,
General Distribution : CULTIVATED AS AN ORNAMENTAL

Globba Linnaeus

Globba racemosa Smith, Exot. Bot. 2: 15. t. 117. 1804; Baker in Fl. Brit. India 6: 201. 1890; Noltie, in Fl. Bhutan 3(1): 191. 1994; Hajra *et al.* Fl. Sik. 1:127. 1996.

G. orixensis Roxb. in As. Res. 11: 358. 1810; Baker in Fl. Brit. India 6: 201. 1890.
G. clarkei Baker in Fl. Brit. India 6:201. 1890; Hara in Fl. E. Him. 1: 421.1966.
G. hookeri Cl. ex Baker in Fl. Brit. India 6: 201 1890.

Herbs, 10 - 45 cm tall. Rhizome short. **Stem** erect, leafy. **Leaves**; petioles upto 3cm. Leaf lamina 8 – 13 x 3 – 6 cm, oblong-lanceolate, entire, sub-caudate, base narrowed, dark green, glabrous or scantily hairy beneath. **Panicles** upto 20cm long, narrow. **Bracts** usually small, caducous. **Calyx** short to 0.4cm, slightly funnel-shaped, lobe short, yellowish. **Corolla-tube**, deep yellow, segments ovate, reflexed. **Capsule** smooth.

- Flower & Fruit* : June – September
Exsiccatus : Phusrey below 1850m, **SR Lepcha & AP. Das** 03080, dated 20.08. 2005.
Status : Frequent.
Local Distribution : Sakam, Phari, Chouda Feri, Jaributti. 700-1800m.
General Distribution : E. HIMALAYA; INDIA, Assam, Meghalaya, Manipur.
 Note: 1. Endemic to Eastern Himalaya.
 2. Cultivated as an ornamental.

Subclass: Liliidae Order: Liliales

LILIACEAE A. Jussieu

Key to the species

- 1. Leaves dichotomously branched *Disporum*
- + Leaves not dichotomously branched 2
- 2. Leaves mostly basal, rarely emerged from stem; lamina filiform *Lyoydia*
- + Leaves emerged from stem; lamina linear to ovate 3
- 3. Leaf petiolated; basal leaves in rosette *Cardiocrinum*
- + Leaf sessile; leaves not in rosette 4
- 4. Flower greenish; bulb scale not more than 2 *Fritillaria*
- + Flower purplish or yellowish; bulb scale up more than 7 *Allium*

Allium Linnaeus

Allium wallichii Kunth, Enum. Pl. 4: 443. 1834; Hook.f. in Fl. Brit. India 6: 341. 1892; Hara, Fl. E. Him. 405. 1966; Noltie, Fl. Bhutan 3(1): 79. 1994; Hajra & Verma, Fl. Sikkim 1: 145. 1996.

Herbs upto 1 m. Bulb solitary or clustered, cylindric; yellowish brown. **Leaves** linear to oblong-lanceolate or lanceolate, shorter than to sub equaling scape, lamina 2.5 - 5.5 x 20 mm wide, base narrowed into petiole, midvein distinct, Scape lateral, 3-angled, sometimes narrowly 3-winged, leaf sheaths only at base. **Spathe** 1- or 2-valved, deciduous. **Umbel** hemispheric, laxly or densely flowered. Pedicels sub-equal, ebracteolate. **Perianth** stellately spreading, pale red, red, or purple to blackish purple, rarely white; segments oblong - elliptic to narrowly so, apex retuse or obtuse.

Filaments subulate, shorter than to subequaling perianth segments, connate at base. **Ovary** obovoid-globose; **ovules** 2 per locule; style longer than ovary.

var. *wallichii*

Leaves linear to broad, base not narrowed into a petiole. Scape covered with leaf sheaths only at base.

- Flower* : July *Fruit*: October
Exsiccatus : Kupup 3950m, *SR Lepcha & AP. Das 2563*, dated 23.09.2005
Status : Common
Local Distribution : Kupup, Nathang, Rachel, Pangola, 2300 – 4800 m
General Distribution : HIMALAYA (Simla – NEFA), S.E. TIBET, N. BURMA.
Note : 1. Endemic to Himalaya.
2. Young shoots are eaten as vegetable and made into pickle.

Cardiocrinum Lindley

Cardiocrinum giganteum (Wall.) Makina, Bot. Mag. Tokyo 27: 125. 1913; Hara, Fl. E. Him. 406. 1966; Noltie, Fl. Bhutan 3(1):104. 1994; Hajra & Verma, Fl. Sikkim 1:146. 1996. *Lilium giganteum* Wall., Tent. Fl. Nep. 21, t. 12-13. 1824, excl. syn., Fl. Brit. India 6: 349. 1892.

Herbs bulbous, upto 3 m tall. **Bulbs** with ovate scales. **Stem** fistular. **Petioles** upto 23 cm long; basal leaves in rosette, to 35 x 38 cm, ovate, obscurely acute, base deeply cordate, lateral veins dichotomous; **Stem leaves** smaller than basal ones, acuminate, cordate. **Racemes** few to 25-flowered. **Bracteoles** deciduous. **Flowers** purple white, fragrant; **tepals** 8 – 19 x 1 – 3.5 cm, narrow-oblongate, rounded and reflexed at tip, base saccate; **anthers** purple-yellow; ovary to 3.5 cm, cylindrical; **style** to 5 cm long, yellowish; stigma trilobed. **Capsules** oblong; seeds reniform

- Flower* : June *Fruit*: August
Exsiccatus : Bhimbase 4300m, *SR Lepcha & AP. Das 2564*: dated 24.05.2005
Status : Common
Local Distribution : Bhimbase, 2000 – 2700 m
General Distribution : E. HIMALAYA (Simla – NEFA) S. TIBET, Khasia, Manipur, and N. Burma.

Note : Endemic to Himalaya.

Disporum Salisbury

Disporum calcaratum D. Don, Trans. Linn. Soc. 18:516.1841; Hook.f., in Fl. Brit. India 6:359.1892; Hajra & Verma, Fl. Sikkim 1:148. 1996.

Herbs upto 70 cm tall. **Roots** pale white, slightly fleshy. **Stem** dichotomously branched above ascending branches. **Leaves** ; scale leaves 7 or more, loosely sheathing, membranous; shortly petiolate; leaf lamina 3.5 - 13 x 1.5 – 5 cm, lanceolate, acute to acuminate, base cuncate, veins slightly elevated and papillose in dorsal side. **Inflorescence** lateral. Pedicels to 2cm long, papillose. **Tepals** oblong to oblongate, creamy or dull purple, spurred at base, spurs divergent from pedicel; filaments to 1cm, papillose; **anthers** oblong. **Ovary** obovoid; stigma lobes extending. **Berry** black.

- Flower & Fruit* : April - October
Exsiccatus : Kyongnosla 2480 m, *SR Lepcha & AP. Das 03087*, 20.08.2005.

Status : Frequent.
Local Distribution : Kyongnosla, Padamchen, NVNP border, 1800 - 2600m.
General Distribution : TEMPERATE E. HIMALAYAS, Meghalaya, Manipur and Myanmar.
Note : Endemic to Eastern Himalaya

Fritillaria Linnaeus

Fritillaria cirrhosa D. Don, Prodr. Fl. Nepal. 51. 1825; Hook.f., Fl. Brit. India. 6: 353. 1892; Hara, Fl. E. Him. 408. 1966; Hara *et al*, Enum. Fl. Pl. Nepal 1: 72. 1978; Noltie, Fl. Bhutan 3(1): 107. 1994; Hajra & Verma, Fl. Sikkim 1: 149. 1996.

Herbs bulbous, bulb of 2 scales, to 3cm in diam. Stem to 45 cm, mostly underground. **Leaves** whorled and sometime alternate; leaf blade linear to linear-lanceolate, apex filiform or cirrhose, 4 - 7 x 3 - 4.5 cm, vein 3 or more. **Inflorescence** 1 - 4 flowered; bract 3, apex curved or cirrose. **Flower** nodding companulate, Pedicle 2 - 3cm. **Flower** drooping, olive brown, inside yellowish green checkered dark red; Pedicle 3 - 6 cm. **Tepals** yellow or yellowish green, slightly spotted or tessellated with purple, usually elliptic, 3 - 7 x 1 - 1.9 cm; **Stamen** 2.5 -3 cm. **Style** 3 lobed. **Capsule** narrowly winged.

Flower : May - July. *Fruit*: August - October.
Exsiccatus : Nathang, 3880m, *SR Lepcha & AP. Das 2561*, dated 03.8.2005
Status : Not common
Local Distribution : Kyongnosla, Changu, Memenchu, 1500 - 4800 m.
General Distribution : HIMALAYA (Kashmir to BHUTAN), S. TIBET, W. CHINA.
Note : Endemic to Himalaya.

Lloydia Salisbury ex Reichenbach

Lloydia delicatula Noltie in Edinburgh J. Bot. 50(10): 55. 1983; Noltie, Fl. Bhutan 3(1): 109. 1994.

Herbs with bulbs densely clumped. Scape to 2 cm. **Leaf** 1 basal filiform exceeding stem to 0.6mm wide. **Bracts** leaf like (3 lower and 2 sub opposite) on upper part of scape. **Flower** single, erect. **Tepals** oblong, narrowly elliptic or rhombic, to sub acute apex and base, to 6 x 2 mm, white with prominent purplish veins arising from nectary. **Nectary** round or transversely elongated, yellowish. **Filament** glabrous; anther ±circular; **Ovary** narrowly ellipsoid to oblong -ovoid; **stigma** capitate. **Capsule** lobes spatulate.

Flower : June - July *Fruit*: October
Exsiccatus : Kupup, 3990 m, *SR Lepcha & AP. Das 800* dated 13.10.2006
Status : Not common
Local Distribution : Changu, Nathula, Kupup, 3600 - 4300 m
General Distribution : INDIA, NEPAL, BHUTAN, CHINA.
Note : Endemic to Himalaya.

MELANTHACEAE Batsch

Aletris Linnaeus

Aletris pauciflora (Kotzsch.) Hand- Mazz., Symb. Sin. 7: 1220. 1936. Hajra & Verma. Fl. Sikkim 1: 142. 1996. *Stachyopogon pauciflorus* Kotzsch. In Kotzsch & Garcke, Bot. Reise Pr. Waldemer 49. t. 94. 1862. *Aletris nepalensis* Hook. f., Fl. Brit. India 6: 264. 1898, nom. Illegit.

Herbs small, root thickened with stout rhizome. **Leaves** usually rather few (6 - 12) and laxly tufted, lamina linear lanceolate to linear, 2 - 22cm x 1 - 8 mm. **Scape** 3.5 - 35cm. **Raceme** to 5.5 cm. **Flowers** pedicellate; pedicel to 10 mm, pubescent; bract lanceolate, to 15 mm. **Perianth** dark, red, pink, orange, greenish yellow, or white, glabrous; lobes recurved, oblong-ovate to lanceolate. 2 - 2.5 x 0.5 - 1.6 mm, apex obtuse or rounded. **Capsule** ovoid-ellipsoid or ovoid-conical.

Flower : April *Fruit* : August
Exsiccatus : Nathang 3800 m, *SR Lepcha & AP. Das* 03088, dated 24. 08. 2005.
Status : Common
Local Distribution : Chhangu, Rachela, Panglakha, Nathang (1500 - 4300 m).
General Distribution : HIMALAYA (Kashmir - BHUTAN) and W. CHINA
Note : Endemic to Himalaya

TRILLIACEAE Lindl.

Paris Linnaeus

Paris polyphylla Smith in Rees. Cyclop. 26: Paris n. z. 1813; Hook. f, Fl. Brit. India 6: 362. 1892; Hara in Fl. E. Him. 1: 410. 1966; Hara *et al.* Enum. Fl. Pl. Nepal 1: 76. 1978; Noltie. Fl. Bhutan 3(1). 22. 1994; Hajra & Verma in Fl. Sikkim 1: 156. 1996.
 var. *Polyphylla*.

Local Name: *Satuwa* (Nep.), *Patar-ko* (H).

Herbs unbranched, rhizomatous, erect, upto 150cm tall. **Leaves** 5 - 10; Petiole 0.5 - 6cm; **Leaves** blade oblong to lanceolate, 5 - 12 x 0.4 - 5 cm, base rounded to cuneate. Peduncle 5 - 30cm. **Outer tepal** green or yellow green, ovate-lanceolate; Inner ones usually yellow-green narrowly linear, shorter than outer one. **Stamen** 2 as many as outer tepals; **Filament** 3 - 9mm; anther 4 - 11mm; **Ovary** sub globose, ribbed, 1-loculed, sometimes tuberculate, **style** short, base enlarged, purple to showy white; **stigma** 4 lobes. **Capsule** globose, seed enveloped by red, succulent aril.

Flower : April - July *Fruit* : August - November
Exsiccata : Rachela 3300 m, *SR Lepcha & AP Das* 31055, dated 08.10.2004
Status : Less Common
Local Distribution : Panglakha-Rachela 1800-3300 m.
General Distribution : CHINA, BHUTAN, INDIA, THAILAND, VIETNAM, NEPAL, MYANMAR, LAOS.

UVALIARACEAE Kunth

Key to the Genera

1. Flowers cup shaped; single; anther basifixed *Streptopus*
 + Flower campanulate; 2 - 9; anther dorsifixed *Disporum*

Disporum Salisbury ex D. Don

Key to the species:

1. Plant dichotomously branched; filaments not thickened below *D. calcaratum*
+ Plant simple or rarely branched; filaments thickened below *D. cantoniense*

Disporum calcaratum D. Don, Trans. Linn. Soc. 18: 516. 1841; Hook.f., Fl. Brit. India 6: 359. 1892; Noltie, Fl. Bhutan 3(1): 96. 1994; Hajra & Verma, Fl. Sikkim 1: 148. 1996.

Herbs upto 70 cm tall. Roots fleshy, pale white. **Stem** branched above dichotomously with ascending branches. Scale leaves 7 or more, loosely sheathing, membranous. **Leaves** shortly petiolate, **lamina** 3 - 10.5 x 1.3 - 3 cm, lanceolate, acute to acuminate, base cuncate, veins elevated and papillose beneath. Inflorescence lateral. Pedicels 1 - 1.9 cm long, papillose, deflexed in fruits. **Tepals** oblong to oblanceolate, creamy or dull purple, spurred at base, **spurs** to 0.8 cm long, often divergent from pedicel; filaments papillose; **anthers** oblong; **ovary** obovoid; style to 1 cm; stigma lobes extending. **Berry** blackish.

- Flower* : April *Fruit*: September
Exsiccatus : Lower Padamchen, 2195 - 2500 m, *SR Lepcha & AP. Das 2565*, dated 26.08.2005
Status : Less Common
Local Distribution : NNP border, 2100 - 2600 m
General Distribution : TEMPERATE E. HIMALAYAS; INDIA, Meghalaya, Manipur, NEPAL, BHUTAN, and MYANMAR.

Disporum cantoniense (Lour.) Merr. in Philip. J. Sci. 15:229.1919; Hara, Fl. E. Him. 407. 1966; Noltie, Fl. Bhutan 3(1): 95. 1994. *Fritillaria cantoniensis* Lour., Fl. Cochinch 206. 1790. *Uvularia chinensis* Ker- Gawl in Bot. Mag. t. 916. 1806. *D. pullum* Salisb. in Trans. Hort. Soc. Lond. 1: 331. 1812; Hook.f., Fl. Brit. India 6: 360. 1892 p.p.

Local Name: Bhuin Harchur (Nep.)

Herbs erect upto 50 cm tall. Simple or rarely branched. Stem loosely sheathed with membranous, brownish scale, root-stock creeping. **Leaves**; petioles to 0.5 cm; **lamina** 4 - 6 x 1 - 4.5 cm, lanceolate, acuminate, base cuncate, nerves raised beneath. **Inflorescence** apparently lateral, few flowered. Pedicels 1 to 2 cm long, papillose. **Flowers** 1 - 3 cm long, pendulous; **tepals** oblong to oblanceolate, tapered at apex, creamy or dull purple, saccate at base, rounded; filaments to 1 cm long, thickened below; **anthers** oblong; ovary to 0.3 x 0.3 cm, obscure obovoid; **style** upto 1 cm long; stigma lobed and extending. **Berries** blackish.

- Flower* : April *Fruit*: June
Exsiccatus : Mulkharka -Phusrey, 2095 - 2300 m, *SR Lepcha & AP. Das 256i6*, Dated 07.08.2005
Status : Common
Local Distribution : Mulkharka, NNP border, 2100 - 2600 m
General Distribution : TEMPERATE HIMALAYAS; INDIA Khasia Hills, Manipur, BHUTAN, MYANMAR, THAILAND, INDO-CHINA, MALAYSIA.

Streptopus Michaux

Streptopus simplex D. Don, Prodr. Fl. Nepal. 48. 1825; Hara, Fl. E. Him. 349. 1966; Noltie, Fl. Bhutan 3(1): 97. 1994.

Herbs upto 90 cm tall. Stem glabrous. Scale leaves to 3, oblong, pale brown. **Leaves** mostly born on the upper half of the stem; lanceolate, - elliptic, finely acuminate, base cordate, basal lobes with clasping stems, **lamina** 4.5 – 11 x 1.5 – 5 cm, with numerous parallel veins. **Flowers** white, rarely spotted with red, tinged greenish, yellowish, or purplish at base, cup shaped; **tepals** oblong – elliptic, to 2 cm. **Filament** flattened lanceolate, slightly shorter than anther; **anther** lanceolate, base cordate; **ovary** obovoid, style stout, stigma lobes equalling to style. **Berry** red.

Flower & Fruit : May – July

Exsiccatus : Lingtu 2750 m, *SR Lepcha & AP. Das 0245*, dated 05.08.2003.

Status : Fairly Common.

Local Distribution : Yakla, Sherabthang, Nathang, Lingtu, 1900 - 2750m.

General Distribution : HIMALAYAS (Kumaon – NEFA) S. TIBET, N. BURMA, W, CHINA.

Note : Endemic to Himalaya.

IRIDACEAE G.J. Lewis ex Goldblatt

Iris Linnaeus

Iris clarkei Baker ex Hook.f., Fl. Brit. India 6: 275. 1894; Hara in Fl. E. Him. 1: 420. 1966; Hajra & Verma, Fl. Sikkim 1: 137. 1996. *Iris himalaica* Dykes in Gard. Chron. 45: 3, 36. 1909.

Local Name: *Si-takpa* (Lep.) *Tehma* (Sherpa & Tibetan)

Herbs upto 1m tall. Rhizome creeping, cylindrical. **Leaves** grayish green and dull on 1 surface and glossy on other, sword shaped, linear 23 - 53 x 0.3 - 1.5cm. **Flowering** stem 2 or 3 branched, solid, 1 - 3 leaves, green broadly lanceolate. 6.8 – 10 cm. **Flowers** bluish violet with white or greenish - yellow tinged patch at base violet, with white or greenish-yellow tinged patch at base 5.5 - 8cm in diam. Pedicel slender, 3 – 4 cm long. **Perianth** tube green, ca 2 x 4 mm; outer segments mottled darker on central. **Style** branches broad, forming flattened top to flower lobes half-ovate. **Anthers** usually whitish - mauve or cream. **Capsules** oblong - trigonous, abruptly contracted at apex and bottom. **Seeds** flattened, D-Shaped.

Flower : August *Fruit*: October

Exsiccatus : Kupup 3950 m, *SR Lepcha & AP. Das 148*, dated 13.10. 2003; Nathang 3800m, *SR Lepcha & AP Das 2550*, dated 13.07.2005.

Status : Common

Local Distribution : Nathang, Kupup, Bhimbase, upto 4200 m.

General Distribution : E. HIMALAYA (E. NEPAL to BHUTAN) and S. TIBET.

Note : 1. Endemic to Himalaya.

2. The dried leaves (*Thema*) are potential winter fodder in high altitude areas.

SMILACACEAE Ventenat

Smilax Linnaeus

Key to the species

1. Leaf hastate to truncate; umbels sessile *S. aspera*
- + Leaf not truncate ; umbels peduncled 2
2. Stem prickles absent or rarely present *S. aspericaulis*
- + Stem without bristles; prickles recurved 3
3. Leaf lamina ovate-elliptic; umbel single *S. ovalifolia*
- + Leaf lamina narrowly ovate; umbels one paired 4
4. Leaf lamina ovate-cordate; ovary ovoid *S. elegans*
- + Leaf lamina lanceolate to oblong, rarely orbicular; ovary not ovoid 5
5. Petioles upto slightly longer ; winged *S. ferox*
- + Petioles absent or very short, without wing *S. rigida*

Smilax aspera L., Sp. Pl. ed. 1:1028. 1753. Hook.f. in Fl. Brit. India 6: 306. 1892; Koyama in Hara, Fl. E. Him. 414. 1966; Noltie, Fl. Bhutan 3(1): 27. 1994; Hajra & Verma, Fl. Sikkim 1: 163. 1996. *S. maculata* Roxb., Fl. Ind. ed. 2. 3: 796. 1832. *S. fulgens* Wall. [Cat. No. 5122.1830] *nom. nud.*

Local Name: Pa 'lan jyu (Lep.).

Climber with prickles. **Leaves** alternate; petioles upto 3 cm, prickled, base narrowly winged; **lamina** 3.5 – 13 x 2.5 – 6 cm, triangular to hastate, lanceolate or ovate, acute or mucronate, base truncate to slightly cordate, margins with spines, costae 5 - 9, midrib prickles below, coriaceous. Tendrils emerged from apex of petiole wings. **Racemes**, emerged from axils of prophylls of lateral branch with upto 12 sessile umbels. **Female umbels** consist of upto 3 flowered; receptacle globose; bracteoles brownish; female flowers smaller than male ones, ovary ellipsoidal; stigmas 3; staminodes 6. **Male umbels** upto 16 flowers; tepals oblanceolate; anthers oblong. **Berries** reddish.

Flower : September – November **Fruit** : April - August
Exsiccatus : Singhaney dara 2400 m, **SR Lepcha & AP. Das** 2612, dated 23.08.2004
Status : Frequent.
Local Distribution : Rachela, Dohrok, Premlekha, upto 2800 m,
General Distribution : MEDITERRANEAN REGION throughout SOUTHERN CENTRAL ASIA eastwards to INDIA and SOUTHWARDS TO SRI LANKA.

Smilax aspericaulis Wall. ex DC., Monogr. Phan. 1: 195. 1878; Hook.f. in Fl. Brit. India 6: 306. 1892; Noltie, Fl. Bhutan 3(1): 29. 1994; Hajra & Verma, Fl. Sikkim 1: 163. 1996.

Local Name: Pa 'lan jyu (Lep.) Kukurdaine (Nep.).

Climber. Stems and branches with bristle, recurved prickles. Tendrils terete, glabrous. **Leaves** simple, alternate; petioles to 2.5 cm long, sheathing at the base; **lamina** 4 – 20 x 3 - 12 cm, ovate-oblong, or linear-oblong, acute, base cuneate or rounded, margin entire, cartilaginous, costae 3. **Umbels** solitary or 2 - 3, pedunculate. **Male umbels** with numerous flowered with globose receptacle, tepals reflexed, biseriolate. **Female umbels** upto 22 flowered; **tepals** similar to male flowers; stigma lobes recurved, staminodes 3. **Berries** globose.

Flower : October – December *Fruit*: February – May
Exsiccatus : Phusrey 2200 m, **SR Lepcha & AP. Das 2613** dated 24.08.2004
Status : Less Frequent.
Local Distribution : Phusrey, Premlakha, Talkharka, 1300 – 2200 m.
General Distribution : E. HIMALAYAS,; INDIA, MYANMAR.
Note : Fruits edible.

Smilax elegans Wall. (Cat. No. 5117 B. 1830. *nom. nud.*) ex A. DC., Monogr. Phan. 107. 1878; Cowan & Cowan, Trs. N. Beng. 135. 1829; Hajra & Verma, Fl. Sikkim 1: 163. 1996. *S. glaucophylla* Klotz., Reise Prinz. Wald. Bot. 45, t. 91. 1862. Koyama in Hara, Fl. E.Him. 415. 1966; Hara *et al.*, Enum.Fl. Pl. Nepal 1: 89. 1978; Noltie, Fl. Bhutan 3(1): 35. 1994. *S. parviflora* Wall. ex Hook.f., Fl. Brit. India 6: 304. 1892. *S. longibracteolata* Hook.f. in Fl. Brit. India 6: 305. 1892.

Shrubs, climbing on trees. Stem glabrous. Tendrils simple with sinistrorse coils, glabrous. Petioles upto 2 cm long. **Leaf** lamina 4 -13 x 1 – 6 cm, ovate-cordate, acute, cordate at base, margin entire, costate upto 5. **Umbel** with many flowered, bracteolate. **Flowers** pedicelled ; **sepals** linear-oblong; **petals** 0.2 x 0.2 cm, ovate-oblong, glabrous; **stamens** 4 with whitish ; **ovary** ovoid; **staminodes** 3.

Flower : April - May
Exsiccatus : Neora pathak, 2600m, **SR Lepch & AP. Das 1950**, dated 04.11.1997.
Status : Frequent.
Local Distribution : Rachela below, Neora pathak, upto 2800 m.
General Distribution : E. HIMALAYA.
Note : Endemic to Eastern Himalaya.

Smilax ferox Wall. [Cat. No. 5119. 1830, *nom. nud.*] ex Kunth, Enum. Pl. 5:251. 1850; Monog. Phan.1: 103. 1878; Hook.f. in Fl. Brit. India 6: 307. 1892; Noltie, Fl. Bhutan 3(1): 33. 1994; Hajra & Verma, Fl. Sikkim 1: 164. 1996.

Climber with recurved prickles. **Leaves** alternate, simple; petioles upto 70 cm, winged, semi-elliptic, membranous and pale; tendrils rarely on older wood; leaf **lamina** 3 - 13 x 2 - 3 cm, lanceolate to oblong, mucronate, base cuneate to rounded, coriaceous, glaucous beneath. **Umbels** single, upto 22 flowered; peduncle upto 2.5 cm long; bracteoles lanceolate, brown. **Flowers** unisexual, differentiated into 2 whorls each of 3 free tepals. **Male flowers** campanulate. **Female flowers**: stigmas ; **staminodes** 2 - 3. **Berries** red.

Flower : April - May *Fruit* : May – November
Exsiccatus : Below Panglakha 2750 m, **SR Lepcha & AP. Das 2614**, dated 14. 10.2005
Status : Fairly Common.
Local Distribution : Below Jorpokhari, Reshete, Hattidara, Thosum Hill, 1900 – 3000 m.
General Distribution : E. HIMALAYA; INDIA, Manipur.
Note : Endemic to Eastern Himalaya

Smilax ovalifolia Roxb., Fl. Ind. 3: 794. 1832; Koyama in Hara, Fl. E. Him. 417. 1966; Noltie, Fl. Bhutan 3(1): 30. 1994; Hajra & Verma, Fl. Sikkim 1: 165. 1996. *S. macrophylla* Roxb., Fl. Ind. 3: 793. 1832; Hook.f. in Fl. Brit. India 6: 310. 1892, *non* Willd. 1805. *S. zeylanica* L., Sp. Pl. 1029. 1753; Hook.f. in Fl. Brit. India 6: 309. 1892; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 79. 1978.

Local name: Kukurdaine (Nep.)

Climbers, branchlets glabrous, rarely with prickled. Tendrils sinistrorsely coiled, glabrous. **Leaves**; petioles 2- 2.5 cm long; lamina 9 - 17 x 7 - 14cm, ovate-elliptic, acute, cuneate at base, margin entire, 7-nerved. **Umbels** many flowered, on branched peduncle. Bracteoles upto 0.20 cm long. **Flowers** pedicellate (pedicels upto 2 cm long); **tepals** short; filament linear. **Berries** reddish.

Flower : March – August *Fruit:* September – December
Exsiccatus : Phusrey below 1500 m, **SR Lepcha & AP. Das** 1503, dated 04.7.2005.
Status : Sparse
Local Distribution : Phusrey, upto 1500 m.
General Distribution : TROP. HIMALAYA, INDIA, Central provinces and Concan.,
BANGLADESH, MYANMAR,

Smilax rigida Wall. ex Kunth, Enum. Pl. 5: 164. 1850; Monog. Phaner. 1: 105. 1878; Hook.f. in Fl. Brit. India 6: 304. 1892; Koyama in Hara, Fl. E. Him. 417. 1966; Noltie, Fl. Bhutan 3(1): 32. 1994.

Local name: Kukurdaine (Nep.)

Shrub 1- 3 m tall. Stems spiny, decurrently ridged from leaf bases. Spines straight, less than 1cm. **Leaves** sessile or petioles with ciliate and brownish free stipular, scales at base; leaf **lamina** 1- 2.5 x 0.70 – 2 cm, ovate, orbicular, mucronate, base rounded to cordate, costae 3, coriaceous. **Tendrils** absent. **Umbel** 2 - 5 flowered; peduncle emerged from lower leaf axil of lateral shoots. **Female flowers** with 2 seriate tepals, outer tepals 0.30 x 0.19 cm, inner tepals 0.13 cm wide; stigmas 3, staminodes 3. **Male flowers** campanulate, outer tepals 0.20 - 0.25 x 0.13 - 0.15 cm, inner one 0.2 cm wide; **Berries** blackish.

Flower : May – June *Fruit:* September – October
Exsiccatus : Near Jorhpokhari, 2600 m, **SR Lepcha & AP. Das** 1765, dated 15.07. 2004.
Status : Frequent.
Local Distribution : Jorhpokhari, upto 2900 m.
General Distribution : E. HIMALAYA; INDIA, BHUTAN.
Note : Endemic to Eastern Himalaya.

DIOSCOREACEAE R. Brown

Dioscorea Linnaeus

Key to the species:

1. Tuber globose; leaf lamina ovate; bract lanceolate *D. bulbifera*
+ Tuber ovoid flobose; leaf lamina elliptic to oblanceolate; bract ovate *D. pentaphylla*

Dioscorea bulbifera L., Sp. Pl. ed. 1:1033. 1753; Hara in FL. E. Him. 1:419. 1966; Noltie, Fl. Bhutan 3(1):9. 1994. *D. sativa* Thunb., Fl. Jap. 151. 1784; *non* L. (1753); Hook.f. in Fl. Bhutan 6:295. 1892.

Local Name: Kucha'ng (Lep.); Gittha (Nep.).

Twinnings. Tubers globose, pale yellow mesocarp. **Stem** climbing and twining almost without prickles; Bulbils several, warty. **Leaves** alternate; petioles as long as leaf blade, winged above

and auriculate at base; lamina 6 – 23 x 4 - 13cm , ovate, acuminate, base cordate. **Male inflorescence spikes** in fascicles on axillary axes, in groups of 4-6 in main axils. **Flowers** sessile and borne singly. Bracts lanceolate, acuminate. **Male flowers:** sepals and petals similar, linear-lanceolate, sub-acute, whitish in young bud and brown to purple at maturity. **Stamens** 6. **Female spikes axillary** and in groups of 2-5; flower overlapping. **Sepals** and petals alike with male flowers, whitish, aromatic. **Capsules** oblong-elliptic, reflexed, winged.

Flower : June – September *Fruit* : September - October
Exsiccatus : *Subaney dara 1700 m*, SR Lepcha & AP Das 03078, dated 20.08.2005.

Status : Frequent.

Local Distribution : Reshete, Sakam, Machuki. Upto 2100m.

General Distribution : TROPICS OF THE OLD WORLD.

Dioscorea pentaphylla L., Sp. Pl. ed.1, 1032. 1753; Hook.f., in Fl. Brit. India 6: 289. 1892; Ann. Roy. Bot. Gard. Calc. 14(1):160. 1936; Hara in Fl. E. Him. 1:420. 1966; Noltie, in Fl. Bhutan 3(1):10. 1994. *D. jacquemontii* Hk. f., Fl. Brit. India 6:290. 1892.

Local Name: Bhegur (Nep.); Sili Kussok (Lep.).

Twiner. Tubers ovoid-globose, with rootlets on surface. Stems subglabrous to appressed pubescent, rarely with prickles. **Leaves** 3 to 5 foliolate; petiole to 5cm; leaflets 5.5 - 20 x 2.2 - 5cm, elliptic to oblanceolate, cuspidate, base narrowed, white-hairy above, subglabrous beneath. **Spikes** in male inflorescence many, borne on branched inflorescence axis, solitary or pairs, greyish-white, pubescent. **Bracts** ovate, cuspidate, brownish. **Male flowers** sessile, globose, borne singly. **Sepals**, lanceolate, acute, brownish. **Petals** oblanceolate, rounded, glabrous and brownish; staminodes 3; pistillode columnar. **Female spikes** slender. **Female flowers:** sepals, lanceolate, acute, scarcely bristly; petals glabrous; ovary whitish and hairy. **Capsules** oblong, reflexed, winged.

Flower : June – September *Fruit* : November - December
Exsiccatus : Subaney dara 1740 m, SR Lepcha & AP. Das 03079 , dated 20.08.2005.

Status : Sparse.

Local Distribution : Subaney, Prelakha below, Below phusrey, upto 1750m.

General Distribution : HIMALAYAS (Simla- BHUTAN), BURMA, THILAND, INDO-CHINA, MALAYSIA, CHINA.

Order: Orchidales

ORCHIDACEAE A. Jussieu.

Key to the Genera

1. Plants leafy, non-saprophytic	2
+ Plants leafless, saprophytic	<i>Yuania</i>
2. Plants terrestrial	3
+ Plants epiphytic, rarely lithophytic	16
3. Tubers or pseudobulbs present	4
+ Tubers or pseudobulbs absent	14
4. Plants with stems	5
+ Plants with pseudobulbs	10
5. Lips without spur	<i>Herminium</i>
+ Lips with 1 or 2 spurs	6
6. Lips with 1 spur	7
+ Lips with 2 spurs	<i>Satyrium</i>
7. Stigma lobes with stigmatophores	<i>Habenaria</i>
+ Stigma lobes without stigmatophores	8
8. Tubers often Finger-like or 5-lobed	<i>Dactylorhiza</i>
+ Tubers usually entire, rarely 2-lobed	9
9. Lip entire	<i>Platanthera</i>
+ Lip 3-lobed	<i>Orchis</i>
10. Flowers tubular	<i>Anthogonium</i>
+ Flowers not tubular	11
11. Leaves petioled	<i>Spathoglottis</i>
+ Leaves sessile	12
12. Pollinia 4	13
+ Pollinia 8	<i>Calanthe</i>
13. Lip without auricles	<i>Liparis</i>
+ Lip with auricles	<i>Malaxis</i>
14. Inflorescence spirally twisted	<i>Spiranthes</i>
+ Inflorescence not spirally twisted	15
15. Claws of Lip with toothed flange	<i>Odontochilus</i>
+ Claws of Lip without toothed flange	<i>Zeuxine</i>
16. Plants with pseudobulbs	17
+ Plants without pseudobulbs	<i>Oberonia</i>
17. Pseudobulbs directly rooting on host	21
+ Pseudobulbs arise from stems or rhizomes	18
18. Pollinia 8	<i>Eria</i>
+ Pollinia 4	19
19. Sepals unequal; Lip mobile	<i>Bulbophyllum</i>
+ Sepals equal; Lip not mobile	20

20. Leaves 2, Pollinia lying in pairs *Coelogyne*
 + Leaves few to many; Pollinia lying together *Dendrobium*
21. Pseudobulbs formed of leaf-bases; Pollinia 2 *Cymbidium*
 + Pseudobulbs distinct from the leaves; Pollinia 4 22
22. Lateral sepals united at base forming a mentum *Dendrobium*
 + Lateral sepals free, not forming a mentum 23
24. Leaves and flowers appearing together *Otochilus*
 + Leaves and flowers not appearing together..... *Pleione*

Anthogonium Wallich ex Lindley

Anthogonium gracile Lindl., Gen. Sp. Orchid. Pl. 426. 1840; Hara, Fl. E. Him. 408. 1966; Tuyuma in Hara, Fl. E. Him. 425. 1966; Pearce & Cribb in Fl. Bhutan 3(3); 280.2002. Lucksom in Orchid. Sikkim & NE. Him. 394. 2007. *A. griffithii* H.G. Reichenbach f. in Bonplandia 2: 90.1851.

Terrestrial herbs, upto 60 cm tall. **Pseudobulbs** ovoid, partly buried in soil, with 2–5 leaves. Stem the basal part is enveloped in single 5.6 – 6.8 cm long tubular clasping sheath. **Leaves** usually 2 – 5, usually 3, blade narrowly linear lanceolate, 6.5 – 40 × 1.5 x 3.5 cm, base petiolate, apex acuminate; petioles and sheaths forming a pseudostem. **Inflorescence** erect; peduncle slender, glabrous, rachis bearing laxly 4 – 8-flowered; floral bracts ovate-lanceolate. **Flowers** nodding, lip rose-pink or white and tinged with red. **Sepals** half forming a tube with apical half free; dorsal sepal oblong-lanceolate; lateral sepals falcate-spatulate. **Petals** narrowly oblong-spatulate. **Lip** ca. 1.2 cm, cuneate, apical part 3-lobed; lateral lobes ovate-triangular; mid-lobe subovate. **Column** ca. short 1.3 cm.

Flower : June *Fruit*: October
Exsiccatus : Tungya 2250 m, *SR Lepcha & AP. Das 31008*, dated 04.08.2004
Status : Common.
Local Distribution : Deorali Dara, 1600 – 2300 m.
General Distribution : TEMPERATE HIMALAYA; INDIA, (NEPAL – BHUTAN) Khasia, Naga hills and Burma.

Bulbophyllum Thouars

Key to the species

1. Leaf single; flower pale green; anther dome shaped *B. reptans*
 + Leaves 2; flower yellowish green; anther helmet shaped *B. viridiflorum*

Bulbophyllum reptans (Lindl.) Lindl., Gen. Spec. Orch. Pl. 51. 1830; Hook.f., F. Brit. India 5: 768. 1885; Tuyuma in Hara, Fl. E. Him. 427. 1966; Hajra & Verma, Fl. Sikkim 1: 37. 1996; Pearce & Cribb in Fl. Bhutan 3(3); 454.2002; Lucksom in Orchid. Sikkim & N.E. Him. 702. 2007. *Tribrachia reptans* Lindl., Collect. Bot. t. 41 a. 1826. *Bulbophyllum grandiflorum* Griff., Itin. Pl. Khasyah Mts.: 146, no.705. 1848; Not. Pl. Asiat. 3: 293. 1851. Icon. Pl. Asiat. 3: t. 294. 1851. Pearce & Cribb in Fl. Bhutan 3(3); 280.2002.

Epiphytic herbs. **Pseudobulb** small obpyriform bottle green enveloped in tatters skin fibrous sheaths continually till the tip. Petioles 0.7 – 1.2 cm long. **Leaf 1**, lamina 4 - 13 x 0.8 – 1.2 cm, linear-loblong, sub-acute, apex obliqually notched, base narrowed dark green above, pale green

below. **Inflorescences** 1 or rarely 3, 3.5 – 10 cm long, peduncle 2 – 25 cm long, basally sheathed, terete; rachis decurved, green shaded with purplish brown, bearing 4 – 15 shortly pedicellate laxly flowers; **Flowers** pale green, with dark purple spot; floral bracts oblanceolate; pedicellate ovary dark- purplish brown. **Sepals** sub-equal, apically spreading, 3 nerved, pale green, with dark purple spot; the dorsal sepal lanceolate, lateral pairs lanceolate, bearing slightly concave dilated base. **Petals** oblong, blunt, shorter than sepals, 1-nerved, translucent pale green with two dark purple band from base to apex. **Lips** stipitate, oblong, expanded and grooved at the base pale green bearing two dark purple band, ca 1.5 mm long, bearing lateral wings, with two filiform apical processes and short lateral wings; **anthers** dome-shaped, yellow; **pollinia** subglobose, translucent yellow, ovary green.

Flower : October – December
Exsiccatus : Dhorok 2300 m, **SR Lepcha & AP. Das 30213**, dated 06.10.2004
Status : Common
Local Distribution. : Dhorok, Phusrey, 1600 – 2400 m.
General Distribution : E. HIMALAYA; INDIA (E.NEPAL – BHUTAN) Khasia, Naga hills),
 Note : Endemic to Eastern Himalaya.

Bulbophyllum viridiflorum (Hook.f.) Schltr. in orchis 4: 108. 1910; Tuyama in Hara, Fl. E. Him. 428.1966. Seidenf. in Dansk Bot. Ark. 29 (1): 237 : t. 131. 1973; Pearce & Cribb in Fl. Bhutan 3(3); 465.2002; Lucksom in Orchid. Sikkim & N.E. Him. 715. 2007. *Cirrhopetalum viridiflorum* Hook.f., Fl. Brit. India 5: 779.1885; 1898.

Epiphytic, Pseudobulbs 2.5 x 3 x 0.7 x 1.5 cm, coepitose, ovoid, much taper at apex. **Leaves** usually 2, **lamina** 6 – 13 x 3 – 4.2 cm oblong-lanceolate or narrowly oblong, acute narrowed to sessile, deciduous after flowering. **Inflorescence** upto 25 cm long, erect; peduncle 6- 13 cm long, teret, glabrous yellowish green suffused with dark- purple, bearing tubular sheaths; rachis 4.5 – 11 cm long, arching, slightly flattered, green with dark-purple strips, many flowered; pedicellate ovary dark green, ribbed; floral bracts ovate, acuminate, yellowish – brown, 3 nerved. **Flowers** upto 2.5 cm long, drooping, imbricate, yellowish –green turning to golden yellow on maturity. **Sepals** sub-equal, greenish to yellow, acute; the dorsal sepals oblong-ovate, concave, 5 nerved; lateral pairs dimedately ovate – lanceolate, 8 nerved. **Petals** sub-orbicular with dark purple central patch and bearing dark purple glandular hairs on edge. **Lips** oblong, blunt entire, edged of the grooved lower half up-turned. **Column** bearing broadly falcate hook apical processes; foot short, perpendicular to column, translucent white striped with purple lines in front. **Anthers** helmet-shaped, papillose, cream coloured; pollinia inner ones minute but outer ones narrowly reniform, dull orange-yellow.

Flower : September – November
Exsiccata : Dhorok 2300 m, **SR Lepcha & AP. Das 30280**, dated 07.10.2004
Status : Rare
Local Distribution. : Alubari, Reshete, 1600 – 2400 m.
General Distribution. : E. HIMALAYA; INDIA (Sikkim, Meghalaya, Nagaland).
 Note : Endemic to NE. Himalaya

Calanthe R. Brown

Key to the species

- 1. Plant with cylindrical pseudobulb; Flowers pink, whitish purple *C. puberula*
- + Plant with conical pseudobulb; Flowers white with brownish purple shade *C. brevicornu*

Calanthe brevicornu Lindl., Gen. Sp. Orchid. Pl. 251. 1833; Hook.f., Fl.Brit. India 5: 848. 1885; King & Pantl. in Ann.Roy. Bot. Cale. 8: 168.t. 277. 1898 (incl.var.*watii*.Hook.f.); Pearce & Cribb in Fl.Bhutan 3(3); 284.2002; Lucksom in Orchid. Sikkim & N.E. Him. 424. 2007. *Alismorchis brevicornu* (Lindl.) Kuntze, Revis. Gen. Pl. 2: 650. 1891. *Calanthe lamellosa* Rolfe in Bull.Misc. Inform. Keew. 1896. 197. 1896.

Terrestrial, herbs upto 50 cm tall. **Pseudobulbs** conical, with 3 or 4 sheaths. **Leaves** 3 or 4, not deciduous; blade elliptic or obovate-lanceolate, 15 – 33 × 4.5 – 10.5 cm, apex acute; petiole-like base sheathing, forming a pseudostem. **Inflorescences**, scape arising from leaf axil, puberulous; rachis to laxly 5 – 13 -flowered; floral bracts persistent, lanceolate. **Flowers** white with brownish purple shade to yellowish green, with pinkish red striations; pedicel and ovary puberulous. **Sepals** similar, oblong, abaxially puberulous, 5-veined. **Petals** oblong-lanceolate, glabrous, 3-veined; lip adnate to base of column wings, base 3-lobed; lateral lobes falcate-oblong,; mid-lobe nearly reniform or orbicular; disk pinkish red, with 3 yellow lamellae; spur very short, ca. 1.3 mm, puberulous. **Column** dilated toward apex, ventrally villous; rostellum 2-lobed; operculum beaked; pollinia obovoid.

Flower : May *Fruit:* July
Exsiccatu : Dhorok 2300 m, *SR Lepcha & AP. Das* 20255, dated 03.08.2004
Status : Fairly common
Local Distribution : Dhorok Phusrey, 1600 – 3100 m.
General Distribution : E. HIMALAYA ; INDIA (NEPAL –Sikkim) BHUTAN.
 Note : Endemic to Eastern Himalaya.

Calanthe puberula Lindl., Gen. Sp. Orchid. Pl. 252. 1833; Hook.f., Fl.Brit. India 5: 848. 1885; King & Pantl. in Ann. Roy. Bot. Gard. Calc. 8:166.t.224. 1898; Pearce & Cribb in Fl.Bhutan 3(3); 289.2002; Lucksom in Orchid. Sikkim & N.E. Him. 421. 2007. *Calanthe amoena* W.W. Smith in Notes Roy .Bot .Gard. Edinburg 13: 191. 1921; *C. lepida* W.W. Smith, *op.cit.*192.1921.

Terrestrial herbs upto 60 cm tall. **Pseudobulbs** cylindrical, under leaf sheaths. **Leaves** 4 or 5, basal, not deciduous; blade elliptic or elliptic-oblong, 9 – 23 × 4.5 – 6 cm, glabrous or sparsely puberulous along 5 main veins, apex acute or acuminate. **Inflorescences** scape(s) 1 or 2, arising from near apex of pseudobulb, with several lanceolate sterile bracts; rachis with laxly 4 –10 -flowered; floral bracts persistent, lanceolate. **Flowers** pink; whitish purple, pedicel and ovary puberulous. **Sepals** similar, ovate-lanceolate, puberulous, 5-veined; lateral sepals oblique. **Petals** linear, whitish purple, 1 – 3-veined, single nerved. **Lip** adnate to base of column wings, spurless, 3-lobed; lateral lobes oblong-falcate; mid-lobe rhombic-elliptic to obovate-cuneate, margin dentate or fringed; disk without lamellae or calli. **Column** wing with mucronate projection, purplish – white, glabrous; rostellum 3-lobed; operculum ovate-cordate. Pollinia clavate; viscidium linear. Capsule narrowly elliptic.

Flower : July *Fruit:* August
Exsiccatu : Phusrey 2100 m, *SR Lepcha & AP. Das* 30243, dated 06.10.2004;
 Tungya 2190 m, *SR Lepcha & AP. Das* 31040, dated 08.10.2004
Status : Common
Local Distribution : Phusrey, Panglakha 1600–3000 m
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, JAPAN, VEITNAM.

Chusua Nevski

Chusua pauciflora (Lindl.) P.E. Hunt in Kew Bull.26(1): 175. 1971; Pearce & Cribb in Fl.Bhutan 3(3); 135.2002; Lucksom in Orchid. Sikkim & N.E. Him. 169: 2007. *Ponerorchis chusua* (D. Don) Soó, Acta Bot. Acad. Sci. Hung. 12: 352. 1966. *Orchis pauciflora sensu* Fisher ex Lindl., loc.cit. 1835, *nom.nud.*, non Tenore 1810. *Orchis chusua* D. Don, Prodr. Fl. Nepal. 23. 1825.

Terrestrial herbs upto 20 cm tall. Tubers oblong or globose. Stem with 1 – 3 tubular sheathing at base, 2 – 5-leaved. **Leaves** cauline, alternate, green, linear, oblong-lanceolate, or elliptic, lamina 3.5 – 13 × 0.3 – 3.5 cm, apex acute or acuminate. **Inflorescence** erect or slightly curved; rachis bearing upto 20-flowered; floral bracts lanceolate. **Flowers** pink, purplish red, or purple, medium-sized; ovary fusiform. **Sepals** : dorsal sepal erect, oblong or ovate-oblong, 3-veined; lateral sepals reflexed, ovate-lanceolate, oblique, 3-veined. **Petals** erect, forming a hood with dorsal sepal, narrowly ovate, ovate-oblong, oblique 3-veined. **Lip** broadly oblong to obovate, spurred, disk tinged white at base, marked with deep purple blotches; lateral lobes broadly oblong to subtriangular, falcate, apex obtuse or acute; mid-lobe oblong, subentire to notched and forming 2 lobules, spur pendulous, curved upward toward apex, attenuate.

Flower & Fruit : July

Exsiccatus : Nathang 3700 m, *SR Lepcha & AP. Das* 32987 & 32888, dated 03.10.2004.

Status : Common

Local Distribution : Nathang, KAS, Kupup, upto 4300 m.

General Distribution : HIMALAYA; INDIA (Kumaon – Sikkim) BHUTAN, S. CHINA.

Note : Endemic to Eastern Himalaya

Coelogyne Lindley

Key to the species

1. Leaf blade narrowly lanceolate; anthers dome shaped *C. punctulata*
+ Leaf blade narrowly oblong; anthers ovate *C. nitida*

Coelogyne nitida (Wall. ex D. Don) Lindl., Gen. Sp. Orchid. Pl. 40 . 1830; Pearce & Cribb in Fl.Bhutan 3(3); 332.2002; Lucksom in Orchid. Sikkim & N.E. Him. 476. 2007. *Cymbidium nitidum* Wall. ex D. Don, Prodr. Fl. Nepal. 35. 1825. *Coelogyne ochracea* Lindl. in Bot.Reg.32: 1.69. 1846.

Epiphytic herbs, rhizomatous with scaly sheaths. **Pseudobulbs** cylindrical, furrowed, bearing 4 -5 scaly sheath, yellowish brown and strongly wrinkled when dried with 2 leaves at apex. **Leaves** 1 – 2, lamina ca. 16 – 30 x 2.5 – 3.6 cm, narrowly oblong, channeled petiole or base attenuate into petiole. **Inflorescence** ca. 4.5 cm, lower part covered by sheaths; rachis 2- or 3-flowered; floral bracts caduceous. **Flowers** white or light tinged yellowish, lip with 2 eye-like colored blotches, fragrant. **Sepals** subequal, pure white, dorsally keeled at base, 7-nerved, dorsal sepals ellipting oblong, subacute; lateral pair oblong ovate, acute, slightly twisted. **Petals** broadly linear or narrowly oblong, pure white 7 nerved. **Lip** oblong - ovate, 3-lobed; lateral lobes erect, subobovate, white with brownish lines, mid-lobe nearly elliptic. **Column** slightly broadly winged at apex. **Anthers** ovate, 2 chamber; pollinia 4, broadly oblong, compressed, yellow. Capsule 4 -4, narrowly clavate, yellowish green,

Flower : April *Fruit:* June
Exsiccatus : Tungya 2200m, **SR Lepcha & AP. Das 32312**, dated 13.09.2004
Status : Common.
Local Distribution : Tungya, Hangey, Singhaney, 1900 – 2500 m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, MYANMAR.

Coelogyne punctulata Lindl., Coll. Bot. sub. t. 33. 1821; Pearce & Cribb in Fl.Bhutan 3(3); 332.2002 Lucksom in Orchid. Sikkim & N.E. Him. 480. 2007. *Cymbidium nitidum sensu* Roxb., Hort. Bengal. 63. 1814, *nom.nud.*, Fl. Indica ed. 3. 459. 1832 *non* Wall.ex D.Don.

Epiphytic herbs with short rhizome. **Pseudobulbs** bright yellow when dried, with 2 apical leaves; sheaths ovate-oblong; **Lamina** narrowly lanceolate, 6.5 – 13 × 1 – 3 cm, adaxially veinlets, apex acuminate. **Inflorescence** hysteranthous, slightly recurved; peduncle laterally compressed, glabrous; rachis 3- 4 cm bearing 2 – 4-flowered; floral bracts caducous, many nerved; scarious brown, suboblong-lanceolate; pedicellate ovary glabrous, pedicel white, ovary greenish white, distinctly lobed. **Flowers** white, with orange yellow spots or deep-colored eye-like blotches on lip. **Sepals** lanceolate or oblong-lanceolate; dorsal sepal elliptic – oblong, slightly arched over column but its tip reflexed; lateral pairs oblong – lanceolate, spreading. **Petals** linear to elliptic – lanceolate, pure white, single nerved. **Lips** elliptic oblong, 3 lobed, 3-lobed; lateral lobes erect, suborbicular, broad yellow blotch at its anterior end bordering by orange- brown; mid-lobe ovate-lanceolate, dentate lamellae extending from base of lip. **Columns** arcuate, both sides winged at apex, crenulate, 3 – orange – brown lines in front. **Anthers** dome-shaped cream – green, glabrous; pollinia 4 ca 2.5 x 2.2 mm, clavate, yellow. Capsules obovoid-oblong.

Flower : October *Fruit:* November
Exsiccatus : Tungya 2200m, **SR Lepcha & AP. Das 31150**, dated 03.10.2004
Status : Rare
Local Distribution : Tungya, 1300 – 2000 m.
General Distribution : INDIA, BHUTAN, CHINA, MYANMAR, THAILAND.

Crepidium Blume

Crepidium acuminatum (D. Don) Szlachetko, Fragm. Florist. Geobot., Suppl. 3: 123.1995; Pearce & Cribb in Fl.Bhutan 3(3); 214.2002; Lucksom in Orchid. Sikkim & N.E.Him. 323: 2007. *Malaxis acuminata* D. Don, Prodr. Fl. Nepal. 29. 1825. *M. wallichii* Lindl. Gen.Sp. Orchid. Pl.: 20. 1830.

Terrestrial herbs, usually lithophytic upto 35 cm tall. **Pseudobulb** enclosed in 2 – 3, upto 6.5 cm long sheathing bract. Stem cylindrical. **Leaves** 3 – 4, obliquely ovate, ovate- lanceolate, acute – acuminate, 5 – 13 × 2 – 6.5 cm, many nerved, thinly membranous, sheathing petiole. base contracted into a sheathlike, amplexicaul. **Inflorescences** erect; peduncle wingless; 10- or more flowered; floral bracts lanceolate. **Flowers** 13 – 35 cm long, ribbed, peduncle 5.5 – 13 cm long, ebracteate rachis laxly many flowered; pedicellate ovary ribbed, glabrous, lanceolate, reflexed. **Flower** yellowish green, **Sepals** subequal, margin convolute, reflexed, dorsal sepals 5.5 – 6.5 x 1.4 – 2mm, linear – oblong, acute; lateral pair 5.5 – 6 x 2 – 2.6 mm, broadly oblong, obtuse. **Petals** narrowly linear, margin revolute. **Lip** superior, ovate-oblong or obovate-oblong, shallowly 2-lobed, with a sinus 1.5 (–2) mm deep, with a pair of auricles embracing column, adaxially with a central groove in apical half; auricles ± narrowly ovate. **Column** long, fleshy; anther ovate, two chambered; pollinia 4.

Flower : June *Fruit:* August
Exsiccatus : Tungya, 2200m, **SR Lepcha & AP. Das 2577**, dated 23.07.2004

- Status* : Less common
Local Distribution : Tungya, Singhaney, upto 2300 m
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, MYANMAR, VIETNAM, THAILAND, MALAYSIA, PHILIPPINES, JAVA.

Dactylorhiza Necker

Dactylorhiza hatagirea (D. Don) Soó, Nom. Nova Gen. *Dactylorhiza* 4. 1962; Pearce & Cribb in Fl. Bhutan 3(3); 581.2002. *Orchis hatagirea* D. Don, Prodr. Fl. Nepal. 23. 1823.

Terrestrial herbs, slender to robust, 30 - 60 cm tall. **Stem** with 2 or 3 tubular sheaths at base, slightly angular, glabrous green, 3 - 6 -leaved. **Leaves** 3 -5, upper 3 - 4, linear lanceolate, reddening in size upwards, sheathing petiole, dark green above and light green below, clustered subopposite near base of stem, alternate above, not spotted, 6.2 - 18 × 1.5 - 5.5 cm, obtuse or acuminate. **Inflorescences** upto 30 cm long, angular, glabrous; peduncle upto 10cm long, ebracteate; rachis densely many flowered; floral bracts lanceolate. **Flowers**, green to greenish yellow, medium-sized. **Sepals** subequal, oblong, ovate, the dorsal reflex. Elliptic, adnate to the petal to form hood over column; lateral pairs, oblong, - ovate, reflexed. **Petals** broadly ovate, subacute to acute, pale green. **Lip** oblong obtuse, slightly broader towards base. **Column** long, stout. **Anther cells** close together, parallel without tubes; pollinia elliptic, slightly clavate, without caudicles; staminodes obovate, lying transversely below the anther, above the conjoint stigma; spur pendent, ± straight to slightly curved forward, slightly shorter than ovary.

- Flower* : September - october
Exsiccatus : Nathang 3760 m, **SR Lepcha & AP. Das** 30805, dated 29.07.2005
Status : Rare
Local Distribution : Nathang, Donkyala, upto 3800 m
General Distribution : RUSSIA, SIBERIA, PAKISTAN, INDIA, NEPAL, BHUTAN, MONGOLIA.

Dendrobium Swartz

Dendrobium longicornu Lindl., Gen. Sp. Orchid. Pl. 80. 1830; Tuyuma in Hara Fl. E. Him. 432. 1966; Pearce & Cribb in Fl. Bhutan 3(3); 417.2002; Luckson in Orchid. Sikkim & N.E. Him. 628. 2007. *Dendrobium flexuosum* Griff., Not. Pl. Asiat. 3: 317. 1851. *D. longicornu* var. *hirsuta* (Griff.) Hook.f., Fl. Brit. India 5: 720. 1885.

Epiphytic herbs. **Pseudobulb** upto 35 cm long, tuft, slender, covers with short coarse black hairs. **Leaves** many, 2.5 - 6 × 0.7 - 1.9 cm, linear lanceolate, bearing tubular stem clasping sheaths. **Inflorescences** corymb, terminal or axillary on leafless stem. **Peduncle** smooth, ovate to ovate lanceolate, acute bearing imbricate sheaths with black hairs; rachis slightly tetrate 1 -3 pedicellate flowers pedicellate ovary obscurely ribbed. **Flowers** white with orange yellow lamellae of lip. **Sepals** subequal, not spreading, slightly opening at mouth, externally keeled, white, dorsal oblong -ovate, acute or acuminate, white, the lateral pair, ovate lanceolate, acute - acuminate. **Petals** ovate - lanceolate, acute or acuminate externally keeled, white. **Lips** upto 3.0 cm long, broadly triangular 3-lobed, with a broad ridge running the centre from the base to the apex. **Column** 4 -5 mm long, bearing funnel shaped spur. **Anthers** dome-shaped, lip truncate, fringes, white, **Pollinia** unequal, inner one narrower.

- Flower* : August - December

Exsiccatu : Tungya 2300 m, **SR Lepcha & AP. Das 30218**, dated 06.10.2004
Status : Common.
Local Distribution : Panglakha, 1830 – 3000 m.
General Distribution : TEMPERATE HIMALAYA; INDIA, (NEPAL, Sikkim) Khasia, Naga Hills.
Note : Endemic to Eastern Himalaya.

Eria Lindley

Key to the species

1. Plants epiphytic; flowers 1 – 3; lips oblong ovate *E. spicata*
 + Plants epiphytic or lithophytic; flowers solitary; lips suborbicular *E. excavata*

Eria excavata Lindl., Gen. Sp. Orchid. Pl. 67. 1830; Tuyuma in Hara Fl. E. Him. 434. 1966; Pearce & Cribb in Fl. Bhutan 3(3); 381.2002; Lucksom in Orchid. Sikkim & NE. Him. 562. 2007.
Pinalia excavata (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Epiphytic Herbs or lithophytic. **Pseudobulbs** cylindrical, bearing 1 distinct internode, base sheathing 4- or 5-leaved, distinctly many nerved. **Leaves** 4 – 6, 6.5 - 14.5 x 0.85 – 2.8 cm, elliptic-oblong, base slightly contracted into petiole, acute. **Inflorescence** born on leaf axil, reddish brown pubescent, sparsely few flowered; floral bracts lanceolate, abaxially brown pubescent, apex acuminate, peduncle puberulous. **Flowers** single, dull white or white suffused with pink, puberulous. **Sepals** subequal, distinctly 3 nerved, externally puberulous; dorsal sepal subelliptic, lateral sepals falcate-lanceolate. **Petals** elliptic – oblong, obtuse, distinctly 3 nerved, whitish pink. **Lip** suborbicular, 3-lobed white obovate in outline; lateral lobes ovate-triangular, obtuse, each with an erect callus adaxially, white stripe with redish purple line; mid-lobe subreniform, or thickened veins from base; central one extending to apex forming an apiculum. **Column** foot incurved; pollinia clavate elliptic. **Capsules** cylindrical.

Flower : May – June
Exsiccatu : Neora Pathak 2700 m, **SR Lepcha & AP. Das 2588**, dated 05.09.2004
Status : Common.
Local Distribution : Neora Pathak, Bara Ramitey, Siighaney 1800 – 2743 m.
General Distribution : TEMPEARETE HIMALAYA; INDIA, (NEPAL – Sikkim) Khasia, CAMBODIA, LAOS, MYANMAR, VEITNAM.

Eria spicata (D. Don) Hand.-Mazz., Symb. Sin. 7: 1353.1936; Pearce & Cribb in Fl. Bhutan 3(3); 383.2002; Lucksom in Orchid. Sikkim & NE. Him. 559. 2007. *Octomeria spicata* D. Don, Prodr. Fl. Nepal. 31. 1825. *Eria convallarioides* Lindl. in Wall. Cat. ; 1975 .1829, *nom. nud.*; Gen. Sp. Orchid. Pl. 70. 1830.

Epiphytic herbs. **Pseudobulb** cylindrical, oblong flattened many nerved, fusiform with internode, 2 – 4-leaved. **Leaves** 4 -6, unequal, uppermost petiolate and lower one sessile, elliptic or obovate-lanceolate, lamina 4.5 – 23 x 1.5 – 6.5 cm, apex obtuse. **Inflorescences** usually 1 – 3, densely many flowered, with 2 basal sheaths; rachis, pedicel, and ovary densely rusty puberulent; floral bracts lanceolate, glabrous. **Flowers** white or pinkish white. **Sepal** subequal, broadly oblong – obtuse, white or with shade of pale straw colored, 5 – nerved; ; dorsal sepal oblong – ovate subacute, concave; lateral sepals ovate, falcate, adnate to the foot of column to form a short obtuse mentum concave. **Petals** narrowly elliptic-oblong, shortly acuminate, 3-nerved. **Lip** 3-lobed, whitish purple, cuneate, oblong ovate with purple shade, the disc without lamellae; lateral lobes perpendicular to mid-lobe, ovate-triangular; mid-lobe deltoid. **Column** slender, upper part slightly enlarged. **Anthers** ca 1.4 x 1 mm. dark purple, two chambered. **Capsules** cylindrical.

Flower : February *Fruit* : August
Exsiccatu : Bara Ramitey Dara 2400 m, **SR Lepcha & AP. Das** 30233, dated 02.09.2004
Status : Common.
Local Distribution : Bara Ramitey Dara, 330 – 2330 m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, MYANMAR, THAILAND.

Habenaria Willdenow

Habenaria stenopetala Linl., Gen. Sp. Orchid. Pl. 319. 1835; Tuyuma in Hara Fl. E. Him. 439. 1966; Pearce & Cribb in Fl. Bhutan 3(3): 153. 2002; Lucksom in Orchid. Sikkim & N.E. Him. 222. 2007. *Habenaria delessertiana* Kranzlin in annuaire Conserv. Jard. Bot. Geneva 1: 108. 1897. *H. lineripetala* Hayta, Icon. Pl. Formos. 4: 126, t. 23. 1914. *H. amanoana* Ohwi in J. Japan Bot. 31(5): 136. 1956.

Terrestrial herbs upto 110 cm tall. Stem upto 80 cm long, bearing nodes and internodes. **Leaves** 10 – 13, **lamina** 6 – 18 x 2.5 – 6.5 cm, ovate lanceolate to oblong – lanceolate, acute to acuminate, margin undulate, base usually broad amplexicaulis. **Inflorescence** 13 – 23 cm long, erect terminal peduncle upto 5 cm long, terete, glabrous, linear lanceolate, acute to acuminate sheathing bracts; rachis 8 – 16 cm long, bearing crowded pedicellate flowers; pedicellate – ovary, shallowly ribbed, glabrous and slightly curved at top; floral bract ovate – lanceolate to linear – lanceolate, acuminate, 3-nerved. **Flowers** 1 – 3 cm long, pale green, lip brownish. **Sepals** subequal, ovate – lanceolate, acuminate, 3 – nerved; dorsal sepals erect, slightly reflexed; lateral sepals weakly falcate, acuminate to sub – caudate, totally reflexed. **Petals** linear, acute, erect. **Lip** 0.7 – 1.5 cm long, shortly clawed at base, apically 3 – partite; central segment 6 – 8.5 cm long, horizontal. **Column** 3 – 5 mm long, stout. **Anther cell** parallel, narrow, erect, tubes long; pollinia oblong, caudicles slender long, staminotes ovate, rigose; stigma 2, oblong.

Flower : August – September
Exsiccatu : Padamchen below, 2050 m, **SR Lepcha & AP. Das** 2567, dated 14.10. 2004
Status : Extremely Rare
Local Distribution : Padamchen, 300 – 2050 m.
General Distribution : INDIA, NEPAL, CHINA, BHUTAN
Note : Endemic to Eastern Himalaya

Herminium R. Brown

Key to the species

1. Plants to 80 cm tall; leaf linear lanceolate; 3 lobed *H. lanceum*
 + Plants to 20 cm tall; leaf oblong elliptic; obscurely 3 lobed *H. macrophyllum*

Herminium lanceum (Thunb. ex Sw.) Vuijk in Blumea 11(1): 228. 1961; Pearce & Cribb in Fl. Bhutan 3(3): 162. 2002; Lucksom in Orchid. Sikkim & N.E. Him. 175. 2007. *Ophrys lancea* Thunb. ex Sw., Kongl. Vetensk. Acad. Nya. Handl. 21: 223. 1800. *H. angustifolium* (Lindl.) Benth. et Hook. f., Gen. Pl. 3: 622. 1880; Hook. f., in Fl. Brit. India 6: 129. 1885.

Terrestrial herbs, 20 – 80 cm tall. Tuber small, single, oblong or ellipsoid, puberulous. Stem 13 – 40 cm, with 2 tubular sheaths at base. **Leaves** 3 – 4, cauline **lamina** 7.5 – 23 x 1.5 – 2.1 cm, linear or linear lanceolate, acute to acuminate, many nerved, sub tubular sheaths. **Inflorescences**

spike 15 - 43cm long, erect, peduncle 5 - 13 cm long, cylindrical, angular lanceolate, bearing many flowers. **Flowers** 5 - 7 mm across, green, glabrous; flower bracts 1 - few, linear lanceolate. **Sepals** subequal, green 1-nerved oblong-ovate; dorsal sepal fused with petals to form a hood over column; lateral sepals spreading. **Petals** united linear, single nerved, translucent pale green. **Lip** 3-lobed, deflexed from the base, oblong in general outline the hypochile minutely auriculate; mesochile concave epichile narrowly tri-lobed. **Column** long, white; staminode large lying externally towards base of anther cell; **anther-cells** parallel closed together; pollinia globose, viscidia orbicular.

Flower : July - August

Exsiccatus : Nathang - Panglakh, 3600m, *SR Lepcha & AP. Das 30867*, dated 16.10.2004

Status : Common.

Local Distribution : Tungya, Nathang - Panglakh, 2100 - 3600 m.

General Distribution : TEMPERATE HIMALYA; INDIA, BHUTAN, MYANMAR, THAILAND, INDOCHINA, INDONESIA, KOREA, PHILIPPINES, VEITNAM, MALAYSIA, CHINA, AND JAPAN.

Hermanium macrophyllum (D. Don) Dandy in J. Bot. 70: 328. 1932; Pearce & Cribb in Fl. Bhutan 3(3): 164. 2002; Luckson in Orchid. Sikkim & N.E. Him. 174. 2007. *Neottia macrophylla* D. Don., Prodr. Fl. Nepal. 27. 1825. *H. congestum* Lindl. in Bot. Reg. 18 sub t. 1499. 1832.

Terrestrial herbs, upto 20 cm tall. Tuber ovoid- globose, hairy. **Stem** erect, terete, glabrous, bearing obtuse open mouth, tubular. **Leaves** 2 - 3, arising close together near base, **lamina** 3.5 - 13 x 0.5 - 2 cm, narrowly oblong - elliptic, rarely lanceolate, acute, or acuminate, distinctly nerved, narrow to short sheathing base. **Inflorescence** 2.5 cm long, ribbed, green, glabrous peduncle often naked but rarely bearing a solitary upto 2 mm long, ovate, acute sheathing bract; rachis to 5 cm long, many flowered; pedicellate ovary ovoid, hooked at apex; floral bracts ovate lanceolate to triangular, acute. **Flowers** to 3.5 mm across, drooping. **Sepals** subequal, obtuse; dorsal sepals broadly ovate, obtuse, 1 nerved; lateral sepals narrowly oblong - ovate, subacute, slightly spreading. **Petals** obliquely triangular - lanceolate, 1 nerved. **Lip** obscurely 3 -lobed, fleshy, triangularly ovate - lanceolate, blunt. **Column** 0.5 - 0.8 mm tall; pollinia broadly ellipsoid with blunt ends, caudicles very short, its gland oblique; stamens oblong with tapering ends. **Capsule** ca 0.55 cm long.

Flower : August

Exsiccatus : Singhaney 2500 m, *SR Lepcha & AP. Das 27780*, dated 17.10.2004

Status : Most common

Local Distribution : Padamchen, 2800 - 4300 m.

General Distribution : INDIA, NEPAL, BHUTAN, CHINA.

Liparis L.C. Richard

Liparis resupinata Ridley, Journ. Linn. Soc., Bot. 22: 290. 1886. *L. ridlei* Hk.f., Icon, Pl. ser. 3 (19): f. 1887. 1889; Hook.f. in Fl. Brit. India 5: 705. 1885; Tuyuma in Hara Fl. E. Him. 441. 1966; Pearce & Cribb in Fl. Bhutan 3(3): 209. 2002; Luckson in Orchid. Sikkim & N.E. Him. 289. 2007. *L. resupinata* var. *ridleyi* King et Pantling in Ann. Roy. Bot Gard. (Calcutta) 8: 37, t. 1898.

Epiphytic herbs. **Pseudobulbs** subcylindrical or ± spindle-shaped, with 3 or 4 remote leaves. **Leaves** 2- 4; **lamina** linear-lanceolate, acute or acuminate, membranous, 3.5 – 6.5 × 0.3 – 1.3 cm, base slightly contracted, articulate, subsessile, margin serrate. Scape arching or pendant with several sterile bracts. **Inflorescences** 13 – 33 cm long, sub-pendulous, laterally compressed; peduncle erect, laceolate, concave; rachis 7 – 30 cm long, pedulous, 4 ribbed bearing many well spaced pedicellate 10 – 50-flowered; floral bracts lanceolate. **Flowers** brownish – yellowish green, smooth. **Sepals** sub-equal, oblong, obtuses longer than lip, margin recurved; dorsal sepal oblong or elliptic-oblong, 1-veined, retroflexed, abaxially carinate; lateral pair not carinate. **Petals** narrowly linear; light brownish yellow. **Lip** broadly oblong ovate; hypochile with semi-orbicular lobes on both sides, centrally with 1 bilobed callus. **Column** erect, semi-orbicular wings on both sides, greenish yellow with translucent white wings; anther ovate, two chambered, pale brownish-green. Pollinia orange yeallow, clavate. **Capsules** obovoid-oblong.

Flower : October *Fruit.* March
Exsiccatu : Phusey 2100 m, **SR Lepcha & AP. Das** 30277, dated 07.10.2004
Status : Common.
Local Distribution. : Dhorok, 600 – 4100 m.
General Distribution : E. HIMALAYA; INDIA (Sikkim), and Assam.
 Note : Endemic to Eastern Himalaya.

Malaxis Soland ex Swartz

Malaxis mucifera (Lindl.) Kuntze, Rev. Gen. Pl. 2: 673. 1891; Tuyuma in Hara Fl. E. Him. 444. 1966; Pearce & Cribb in Fl. Bhutan 3(3):219. 2002; Lucksom in Orchid Sikkim & N.E.Him. 319. 2007. *Dienia mucifera* Lindl. in Wall. Cat.: 1835. 1829, *nom. nud.*; Gen. Sp. Orchid. Pl. 23. 1830. *Microstyylis mucifera* (Lindl.) Ridley in Journ. Linn. Soc. 24: 333. 1888.

Terrestrial herbs. **Pseudobulbs** enveloped in 3 -4 1.5 – 4.5 cm long, many nerved, ovate shortly acuminate sheath. **Stem** upto 4cm long, bearing sheathing bract. **Leaves-** 2 unequal; lamina 3.5 x 11.5 – 1.5 x 5.5 cm, orovate – rotund to ovate – lanceolate; cordate base sheathing petiole. 2 – 6 (–13) × 1.5 – 3.5 (–5) cm, base contracted into ± amplexicaul petiole 3–5.5 cm, obtuse or subacute. **Inflorescence** straight or ribbed, glabrous, peduncle upto 14cm long; ebracteate, raceme bearing many minute flowers; pedicellate ovary 4 – 4.7 cm long, ovary ribbed; floral bracts lanceolate. **Flowers** ca 5.5 mm long. **Sepals** unequal, oblong, lanceolate, acute to acuminate; dorsal 1.8 - 2.5 x 0.7 – 1.7 mm; lateral pair 1.9 - 2.2 x 0.7 – 1.5 mm. **Petals** linear, very narrow, subacute, reflexed. **Lip** broadly ovate, fleshy concave at base slightly acuminate at upper portion. **Column** 0.7 mm long, fleshy. **Anthers** transversely oblong, two chambered; pollinia 4, ellipsoid, unequal, inner one smaller.

Flower : June *Fruit:* August
Exsiccatu : Beusa, 2580 m, **SR Lepcha & AP. Das** 31045, dated 27.07.2005
Status : Rare
Local Distribution : Panglakha, 2600 – 4300m
General Distribution : AFGHANISTAN AND TEMPERATE HINMALAYA; INDIA, (Gharwal – BHUTAN)

Oberonia Lindley

Oberonia falcata King & Pantling in Journ. Asiat. Soc. Beng. 64(3): 329. 1896; Tuyuma in Hara Fl. E. Him. 445. 1966; Pearce & Cribb in Fl. Bhutan 3(3): 229. 2002; Lucksom in Orchid. Sikkim & N.E. Him 244. 2007. *Oberonia pendula* Ridley in Journ. Straits branch Roy. Asiat. Soc. 61: 38. 1912.

Epiphytic, herbs. Stem 3.5-13 cm long, laterally complexed, leaf sheaths smooth pale green. **Leaves** 5-6, **lamina** 1-5.5 x 0.4-0.50 cm falcate, ensiform, acute or shortly acuminate. **Inflorescence** 6-13 cm long, erect; peduncle upto 2 cm long, terete, acuminate, bracts; rachis ribbed, bearing many short pedicellate flowers; **pedicellate** ovary translucent green; floral bracts lanceolate, translucent green. **Flowers** upto 3 mm long, orange yellowish-green, glabrous. **Sepals** ovate, subacute or obtuse, entire. **Lip** 1.3-1.8 mm long, orange yellow, broadly oblong in outline. **Column** very short bearing 2 staminal wings, green. **Anthers** ovate, membranous, light white; **pollinia** ovate, orange yellow.

Flower & Fruit : July - October

Exsiccatus : Nathang - Panglakha, 2800 m, *SR Lepcha & AP. Das 02590*, dated 07.09.2005

Status : Common

Local Distribution : Nathang, Rachel, upto 3500 m.

General Distribution : HIMALAYA; INDIA, (E. NEPAL - Sikkim)

Note : Endemic to Eastern Himalaya.

Odontochilus Blume

Odontochilus lanceolatus (Lindl.) Blume, Coll. Orchid. 80. t. 29. 1858; Pearce & Cribb in Fl. Bhutan 3(3): 105. 2002; Lucksom in Orchid. Sikkim & N.E. Him. 2007. *Anoetochilus lanceolatus* Lindl., Gen. Sp. Orchid. Pl. 499. 1940. *A. luteus* Lindl., Journ. Proc. Linn. Soc., Bot. 1: 179. 1857.

Epiphytic herbs upto 40 cm tall. Stem terete, glabrous, 4- or 5-leaved. **Lamina** abaxially pale green, adaxially dark green with whitish stripes along midvein and 2 lateral veins, ovate-lanceolate, or elliptic, 2-6.5 x 1.5-5.5 cm, acute; petiole-like base with tubular sheath. **Inflorescence**: peduncle pubescent, with 1 or 2 sheathing sterile bracts; rachis 4-7 cm, ± 10-flowered, floral bracts lanceolate to ovate-lanceolate, abaxially glabrous, acuminate. **Flowers** resupinate, yellow; ovary and pedicel twisted. **Sepals** yellowish green, glabrous, 1-veined; dorsal sepal forming a hood with petals, ovate to ovate-oblong; lateral sepals ovate-elliptic, oblique. **Petals** whitish green, ovate, strongly oblique, 1-veined. **Lips** golden-yellow, Y-shaped, hypochile slightly dilated, bisaccate; mesochile with a pectinate flange along either margin; epichile transversely dilated, 2-lobed; cuneate-oblong to obovate. **Columns** short, with 2 deltoid wings toward apex; rostellum twisted.

Flower : August *Fruit*: September

Exsiccatus : Dhorok, 2250 m, *SR Lepcha & AP. Das 30205*, dated 24.10.2004

Status : Rare.

Local Distribution : Phusrey, Singhaey, Hangey, 1500-2200 m.

General Distribution : INDIA, BHUTAN, MALAYSIA, PHILIPPINES; SULAWESI, SUMATRA.

Otochilus Lindley

Otochilus albus Lindl., Gen. Sp. Orchid. Pl. 35. 1830; Pearce & Cribb in Fl.Bhutan 3(3); 342.2002; Lucksom in Orchid. Sikkim & N.E. Him. 509. 2007. *Broughtonia pendula* Wall. ex Lindl., Gen. Sp. Orchid. Pl. 35. 1830, *nom. nud.*

Epiphytic herbs, or lithophytic. **Pseudobulbs** subcylinder, grooved, enclosed in tubular sheaths. Leaf -2, narrowly elliptic - oblong, acuminate, lamina 8 -18 × 1.3 - 2.5 cm, acuminate. **Inflorescence** synanthous with young leaves, bearing gland dotted imbricate sheaths, peduncle terete, sheathed; rachis slender, with laxly 8- or 9-flowered; floral bracts caducous, ovate-lanceolate. **Flowers** uniformly white with yellowish brown band at the middle of the lip. **Sepals** subequal, oblong - lanceolate, acute, concave, white; dorsal sepal narrowly oblong, 3-veined, acuminate; lateral sepals slightly oblique. **Petals** narrowly oblong-lanceolate, 3-veined, acute. **Lips** 3-lobed; lateral lobes embracing column, nearly one fifth to one fourth of its length; mid-lobe oblong, adaxially ± papillate, apex apiculate. **Columns** upto 6 mm; rostellum usually broadly ligulate, oblong, slightly winged towards apex, bent downwards at its base.

Flower : June - July

Exsiccatus : Phusrey, 2150 m, *SR Lepcha & AP. Das 30205*, dated 06.10.2004;
Beusa 2200 m, *SR Lepcha & A.P Das 30749*, dated 12.08.2005

Status : Common

Local Distribution : Phusrey, Beusa, upto 2200 m.

General Distribution : INDIA Sikkim, NEPAL BHUTAN, Assam, khasia, MYANMAR, THAILAND, VIETNAM.

Platanthera L.C. Richard

Key to the species

1. Plant upto 50 cm tall; leaves 3 - 5; flower not strongly fragrant *P. bakeriana*
+. Plant more than 50 cm tall; leaves 3 - 11; flower strongly fragrant *P. clavigera*

Platanthera bakeriana (King & Pantl.) Kranzlin, Orchid. Gen. Sp. 1: 632. 1898; Tuyuma in Hara Fl. E. Him. 448. 1966; Pearce & Cribb in Fl.Bhutan 3(3); 185.2002; Lucksom in Orchid. Sikkim & N.E. Him. 144-145. 2007. *Habenaria bakeriana* King & Pantl. in Journ. Asiat. Soc. Beng. 65(2): 132. 1896.

Terrestrial herbs upto 25 - 50 cm tall. Stem upto 30cm long, slightly angular, glabrous, green, oblong-ovate, sheaths. **Leaves** usually 3 - 5, **lamina** 4.5 - 23 × 1.3 - 6.5 cm, upper 3 - 4, linear lanceolate, tapering upwards, sheathing petiole, dark green above and light green below, with prominent midrib. **Inflorescence** erect, upto 32 cm long, angular, glabrous; **peduncle** 5 - 12 cm long, ebracteate; rachis upto 22 cm long bearing many well spaced flowers; pedicellate ovary 0.6 - 2 cm long, shortly beaked at top; floral bracts : lower most bract biggest and reflexed, linear lanceolate; **Flowers** to 1.5 cm across, greenish - yellow. **Sepals** subequal, oblong, ovate; dorsal sepals elliptic - ovate, subacute. **Petals** broadly ovate, subacute, oblique, pale green with broad base. **Lips** 5.5 - 6.1.8 mm long oblong, obtuse, slightly broader towards base; spur slender, recurved. Column 2 mm long, stout. **Anther** cell closed together, parallel without tubes; pollinia elliptic, slightly clavate, without caudicles; staminodes obovate; stigma conjoint to form a bilobed elliptic under of spur.

Flower & Fruit : September - October

Exsiccatus : Panglakha 2960 m, **SR Lepcha & AP. Das 31078**, dated 28.10.2004
Status : Rare
Local Distribution : Panglakha, Rachela, below upto 3000 m.
General Distribution : TEMPERATE HIMALAYAS; INDIA, NEPAL, BHUTAN, CHINA.
Note : Endemic to Eastern Himalaya

Platanthera clavigera Lindl., Gen. Sp. Orchid. 226. 1835; Pearce & Cribb in Fl.Bhutan 3(3); 186.2002; Lucksom in Orchid. Sikkim & N.E. Him 147. 2007. *Habenaria densa* Wall. ex Lindl., Gen. Sp. Orchid. 326. 1835. *Habenaria clavigera* Dandy, Journ. Bot. 48: 246. 1930.

Terrestrial, herbs, upto 145 cm tall. Tuber 2 one spherical, oblong, and other one oblong, horizontal, compress. Stem upto 65 cm long, erect, enveloped in 4.5 – 5.5 cm long, tubular stem clasping leaf sheaths, tubular sheath. **Leaves** 3 – 11, very unequal, **lamina** 7.5 – 16 x 2 – 8 cm, narrowly elliptic, acute, tapering towards long tubular sheaths. **Inflorescence** 35 – 75 cm long, erect, angular; peduncle 13 – 16 cm long, bearing 3 – 4, linear-lanceolate acuminate bracts, reducing in size upwards; rachis 13 – 70 cm long, bearing dense shortly pedicellate flowers; pedicellate ovary obliquely ridge, glabrous; floral bracts lanceolate, single nerved. **Flowers** 6 – 10 mm., greenish yellow, strongly fragrant. **Sepals** sub-equal, ciliolate, spreading; dorsal sepals elliptic-oblong, obtuse, concave; lateral pairs oblong-ovate, obtuse, reflexed. **Petals** oblong-lanceolate, obtuse, bearing oblique bases. **Lip** linear obtuse. Bearing a transverse callus at its base close to column; spurs ca 5 mm, clavate, pendulous. **Column** ca 1.5 – 2 mm long. Anther cells distant, parallel, without tubes; staminode large; pollinia 2, ca 0.9 mm long, elliptic, light brown; caudicle ca 0.13 mm long; gland oblong white. Stigma 2 small, Fruit suborbicular.

Flower : August – September
Exsiccatus : Singhaney, 2500m, **SR Lepcha & AP. Das 02575**, dated 30.10.2004
Status : Not Common.
Local Distribution : Singhaney, Rachela, 1800 – 2800 m
General Distribution : INDIA, NEPAL, BHUTAN, CHINA.
Note : Endemic to Himalayas

Pleione D. Don

Key to the species

1. Pseudobulbs barrel shaped; leaves upto 2; flowers solitary or rarely 2 *P. praecox*
 + Pseudobulbs conical to ovoid; leaf solitary; flowers solitary *P. hookeriana*

Pleione hookeriana (Lindl.) B.S. Williams, Orch. Grow. Man. (ed. 6): 548. 1885; Tuyuma in Hara Fl. E. Him. 448. 1966; Pearce & Cribb in Fl.Bhutan 3(3); 356.2002; Lucksom in Orchid. Sikkim & N.E. Him. 503. 2007. *Coelogyne hookeriana* Lindl., Fol. Orchid. 5(Coelogyne): 14. 1854. *Pleione hookeriana* var. *brachyglossa* (Reichenb.) Rolfe in Orchid. Rev. 11: 291. 1903.

Epiphytic herbs or lithophytic. **Pseudobulb** coepitose, conical to ovoid, green or purple, 1-foliolate. **Leaves** solitary, elliptic-lanceolate or suboblong, 5.6 – 13 x 2.5 – 3 cm, base attenuate into a petiole-like stalk, many nerves, proceeding from the base of the adult pseudo-bulb, tapering towards petiole base, enclosed in tubular, overlapping sheaths.. **Inflorescence** bearing 1 – 2 pedicellate flower, arising from base of pseudobulb, erect; peduncle 5.8 – 12 cm; floral bract suboblong, 9 – 15 x 4 – 5.9 mm, apex obtuse. **Flower** solitary; sepals and petals pale purplish red to nearly white, lip white with a yellow center and purple or yellowish brown spots. **Sepals**;

dorsal sepal suboblong or oblanceolate, apex acute; lateral sepals lanceolate, falcate, slightly oblique, slightly shorter than dorsal sepal. **Petals** oblanceolate. **Lip** oblate or subcordate, 3-lobed, apical margin irregularly denticulate; disc with 7 rows of papillae. **Column** ± arcuate, wings narrow below and dilated above. **Capsules** suboblong.

Flower : May *Fruit*: July
Exsiccatae : Ramitey dara NNP border, 2400 m, **SR Lepcha & AP. Das 31125**, dated 03.10.2004; Singhaney dara 2300 m, **SR Lepcha & AP. Das 27723**, dated 03.10.2004; Phusrey 2100 m, **SR Lepcha & AP. Das 30225**, dated 07.10.2004.
Status : Rare
Local Distribution : Panglakha, 2200 – 3500 m.
General Distribution : TEMPERATE E. HIMALAYA; INDIA, (E. NEPAL – BHUTAN, MYANMAR, THAILAND)

Pleione praecox (J.E. Smith) D. Don, Prodr. Fl. Nepal. 37. 1825; Tuyuma in Hara Fl. E. Him. 449. 1966; Pearce & Cribb in Fl. Bhutan 3(3); 358.2002; Luckson in Orchid. Sikkim & N.E. Him. 504. 2007. *Epidendrum praecox* J.E. Smith, Exot. Bot. 2: 73. 1806. *Coelogyne praecox* (J.E. Smith) Lindl., Bot. 2: 73, t.97. 1806.

Epiphytic herbs. **Pseudobulb** barrel shaped, green mottles with purplish-brown, enveloped in warty fibrous sheath 2- or rarely 1-foliolate. **Leaves** -2; **lamina** elliptic-oblanceolate to elliptic, 7.5 – 23 × 3 – 6 cm, papery, base attenuate into a petiole-like stalk many nerved petiolate base; deciduous during flowering time. **Inflorescence** usually appears after withering of leaves, erect; peduncle with imbricate in 3 papillate sheaths, dark – purple mottled with green; rachis with one or rarely 2 pedicellate flower; pedicellate ovary ribbed, obovoid, obtuse, caduceous; floral bract oblong-oblanceolate. **Flowers** solitary or rarely 2, large, white suffused with purplish red. **Sepals** subequal, oblanceolate, 7 nerved, purple; dorsal sepal suboblong-lanceolate; lateral sepals slightly wider at base than dorsal sepal. **Petals** linear-lanceolate, slightly falcate, 5-nerved, purple. **Lip** ovate-orbicular, whitish purple, bearing 3-lobed; apical lobes broadly, oblong-ovate, with irregular serrulate edges into 5 laciniate keels, lateral lobes inconspicuous; mid-lobe lacerate; disc with 3 – 5 rows. **Column** bearing short sag at the base, aex expanded into a wide undulate irregularly lobulate hood, pure white. Anther 5 – 6, oblong ovate, white. Pollinia 4, in pai, clavate, yellow.

Flower : September – December
Exsiccatus : Deorali dara, 2300 m, **SR Lepcha & AP. Das 24584**, dated 15.07.2005
Status : Common.
Local Distribution : Phusrey, Deorali dara, 1900 – 3000 m.
General Distribution : INDIA, NEPAL, BHUTAN, CHINA, MYANMAR, THAILAND.

Satyrium Swartz

Key to the species

1. Stem upto 60 cm; leaves elliptic; dorsal sepal linear oblong *S. nepalense*
- + Stem upto 35 cm; leaves oblong lanceolate; dorsal sepal oblong – obtuse *S. ciliatum*

Satyrium ciliatum Lindl., Gen. Sp. Orchid. Pl. 341. 1838; Pearce & Cribb in Fl. Bhutan 3(3); 195.2002; Luckson in Orchid. Sikkim & NE. Him. 224 -225 . 2007. *Satyrium nepalense* var. *ciliatum* (Lindl.) Hook. f., Fl. Brit. India 6(1): 168. 1885. *S. setchunicum* Kranzlin in Bot. Jahrb. Syst. 29: 266 .1900.

Terrestrial herbs slender, upto 35 cm tall. Stem enveloped by tuber sheaths 1- or 2-leaved. **Leaves** oblong – lanceolate to narrowly ovate, **lamina** 13 – 14.5 × 2.8 – 5.2 cm, acuminate to acute, long sheathing base. **Inflorescences** erect terete, peduncle 5 – 12 cm, lanceolate; rachis long, slightly angular, bearing many shortly pedicellate flowers; pedicellate ovary, ridged, dark-purple and erect; many nerved, deflexed. **Flowers** upto 8 mm across, hermaphrodite, rarely stamen abortive or absent, pinkish- white or purely white. **Sepals** ciliated margin, pink; dorsal sepal 4.5 – 5.5 × ca. 1.8 mm, oblong, obtuse; lateral sepals oblong-spatulate, 3.5 – 7.7 × ca. 1.3 mm. **Petals** linear, obtuse, bearing erose margin, pink. **Lip** 5.5mm superior, ovate, hooded, strongly keeled at the back. **Column** ca 5.5 mm long, curved, contracted at the base; pollinia 2 pyriform, bipartite, ; staminodes rugulose, hemispheric, situated in upper sides of anther cells; rostellum broadly and bluntly triangular.

Flower : July - October
Exsiccatus : Panglaxha, 2900 m, *SR Lepcha & AP. Das* 230, dated 12.10.2004
Status : Rare
Local Distribution : Panglaxha, 2600 – 4350 m.
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN S. CHINA,
Note : Endemic to Eastern Himalaya.

Satyrium nepalense D. Don, Prodr. Fl. Nepal 26. 1825; Gen. and Spec. Orch. 340. 1838; Journ. Lin. Soc. 3: 44. 1859; Hook.f., in Fl. Brit. India 6: 168. 1885; Tuyuma in Hara Fl. E. Him. 450. 1966; Hajra & Verma, Fl. Sikkim 1: 110. 1996; Pearce & Cribb in Fl. Bhutan 3(3); 193. 2002; Luckson in Orchid. Sikkim & N.E. Him. 224. 2007. *Satyrium perrottetianum* A. Richard in Ann. Sci. Nat. (Paris) Ser.2, 15: 76. 1841. *S. albiflorum* A. Richard, *loc.cit.* 1841. *S. pallidum* A. Richard, *op.cit.* 77. 1841.

Terrestrial herbs, slender upto 60cm tall. Tubers oblong-ellipsoidal 1.5 – 4.5 × 0.5–1.8 cm. Stem with 1 – 3 membranous, sheaths at base. **Leaves** 2 – 3; **lamina** 13 x 22 x 5 – 11 cm, narrowly elliptic, acute, slightly fleshy, prominently nerved, broad, tubular sheaths, dark-green above and silvery lining below, basal leaves subopposite, or cauline and rarely alternate, broadly ovate, ovate-lanceolate, or lanceolate-oblong, 3.5 x 16 × 1.5 – 6.6 cm, margin crisped, apex acute or acuminate. **Inflorescences** with more than 20 laxly pedicellate flowered; floral bracts reflexed; peduncle 4.5 – 23cm, slender to stout, with several tubular bracts; rachis slightly angular. **Flowers** fragrant, whitish, pinkish green, or pale purple, glabrous, hermaphroditic; pedicel and ovary glabrous. **Sepals**; dorsal sepal narrowly oblong-elliptic, apex obtuse; lateral sepals oblong to subovate, slightly oblique. **Petals** narrowly oblong to narrowly elliptic. **Lip** superior, strongly keeled on the back, tubular, hooded, 2-spurred, margin irregularly dentate; **Column** contracted at base, expanded at apex. **Anther cell** long, distantly separated from each other; staminodes hemispheric, rugulose; rostellum triangular, column incurved.

Flower : October *Fruit*: November
Exsiccatae : Changu 3720m, *SR Lepcha & AP. Das* 29380, dated 11.10.2004;
 Padamchen – Premlakha 2600 m, *SR Lepcha & AP. Das* 32870,
 Dated 27.10.2004; Memenchu 3600 m, *SR Lepcha & AP. Das* 100,
 dated 20.07.2005.
Status : Rare.
Local Distribution : Rachel, 2100 – 3720m.
General Distribution : TEMPERATE HIMALAYA; INDIA, NEPAL, BHUTAN,
 MYANMAR, SRI LANKA.

Spathoglottis Blume

Spathoglottis ixioides (D. Don) Lindl., Gen. Sp. Orch. Pl. 120. 1931; Pearce & Cribb in Fl. Bhutan 3(3); 307.2002; Luckson in Orchid. Sikkim & N.E. Him. 402:1.2007. *Cymbidium ixioides* D. Don, Prodr. Fl. Nepal 36. 1825.

Lithophytic or terrestrial herbs, Pseudobulbs, rounded-compressed pinkish,-white, bearing 2 or 3 leaves. **Leaves** 2 or 3, blade linear-lanceolate, **lamina** 4.5 – 13 × 0.3 – 1 cm, base acute, sheathing; leaf base forming a pseudostem, many nerved. **Inflorescence** slender, with 2 tubular sheaths at base, sparsely pubescent; peduncle slender, terete, 1-3 pedicellate flowers; rachis short, bearing 1- or 2-flowered; floral bracts ovate-lanceolate, pubescent. **Flowers** yellow; pedicel and ovary densely villous. **Sepals**, dorsal sepal elliptic, 5- or 6-veined, outer surface sparsely villous; lateral sepals ovate-lanceolate to oblong-lanceolate, outer surface sparsely villous. **Petals** 7-veined. **Lip** erect, saccate at base, 3-lobed, with 2 acute auricles at base; disk with 1 keel; lateral lobes ovate-triangular, shallowly incised, mid-lobe obovate, keel arising from base of lip, pubescent, dividing into 2 large, rounded-obtuse extensions; **Column** upto 1.9 cm.

- Flower* : July *Fruit*: August
Exsiccatu : Bara Ramitey Dara 2050m, *SR Lepcha & AP. Das 30259*, dated 08.10.2004
Status : Rare
Local Distribution : Bara Ramitey Dara, 1950 – 2050 m
General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN.
Note : Endemic to Eastern Himalaya

Spiranthes L.C. Richard

Spiranthes sinensis (Pers.) Ames, Orchidaceae 2: 53. 1908; Tuyuma in Hara Fl. E. Him. 450. 1966; Pearce & Cribb in Fl. Bhutan 3(3); 117.2002; Luckson in Orchid. Sikkim & N.E. Him. 136. 2007. *Neottia sinensis* Pers., Syn Pl. 2: 511. 1807. *Spiranthes pudica* Lindl., Coll. Bot. t.30. 1831; *S. indica* Steud., Nomencl. Bot. ed.2: 625. 1841.

Terrestrial Herbs, upto 45 cm tall. Stem stout or slender. Tuber cylindric, fleshy. **Leaves** 3 – 5, erect; , **lamina** broadly linear to broadly linear-lanceolate, rarely oblanceolate, 3.5 – 13 × 0.6 – 1.5 cm, acute or acuminate. **Inflorescence** erect 11 – 23 cm, glabrous; rachis bearing many spirally arranged flowers; floral bracts ovate-lanceolate, long acuminate. **Flowers** purplish red, pink, or white. **Dorsal sepal** forming a hood with petals, narrowly oblong, cymbiform, glabrous, subacute; lateral sepals lanceolate, oblique, subacute, base gibbose. **Petals** rhombic-oblong, oblique, ca. as long as dorsal sepal, obtuse. **Lip** broadly oblong, concave base containing 2 clavate glands; disk papillate. **Column** erect, anther ovoid; rostellum narrowly triangular-lanceolate; ovary pale green, glabrous; stigma discoid.

- Flower* : March – October
Exsiccatae : Rachel 2950 m, *SR Lepcha & AP. Das 20279*, dated 25.10.2004
Singhaney – Panglakha 2850 m, *SR Lepcha & AP. Das 31153*, dated 03.10.2004.
Status : Rare
Local Distribution : Panglakha, Rachel, KAS, 2300 – 2990 m.
General Distribution : RUSSIA, INDIA, BHUTAN, AUSTRALIA, E.ASIA, MALAY ARCHIPELAGO, AND SOUTH WEST PACIFIC.

Younia

Younia pranii King & Pantling in Ann.Roy.Bot.Gard.(Calcutta) 8:175,t.237.1898; Hajra & Verma, Fl. Sikkim 118. 1996; Pearce & Cribb in Fl.Bhutan 3(3); 245.2002.

Terrestrial plant upto 13 cm, rhizome densely clothed with small, overlapping, narrowly lanceolate, acuminate appressed scales, stem glabrous. Sheaths 2 Or 3, loose, 0.5 – 1 x 0.4 – 0.4 cm. **Inflorescence** laxly 3- 4 flowered; floral bracts ovate, fleshy. **Flowers** c. 1.3 x 1.8 cm, white; pedicel and ovary upto 5 cm long. **Sepals** similar, ovate – lanceolate, subacute 3 veined. **Petals** ovate anther orbicular, obtuse, entire, 5- veined, 1.8 – 0.7 cm. **Lip** entire, spurless upto 2.5 cm long. **Column** stout; anther anticous, broad beaked, to 7 mm long. **Fruits** fusiform.

Flower & Fruit : July

Exsiccatus : Rachela below, 2850m, **SR Lepcha & AP. Das 2990**, dated 05.10.2004

Status : Rare

Local Distribution : Rachela, upto upto 3000 m

General Distribution : E. HIMALAYA; INDIA, NEPAL, BHUTAN, VEITNAM.

Note : 1. Endemic to Eastern Himalaya
2. Extremely rare

Zeuzine Lindley

Zeuzine affinis (Lindl.) Benth. ex Hook.f., Fl. Brit. India 6(1): 108. 1840; Pearce & Cribb in Fl.Bhutan 3(3); 110.2002; Lucksom in Orchid. Sikkim & N.E. Him. 118: 2007. *Etaeria affinis* Lindl. in Wall.Cat.: 7383. 1832, *nom.nud.* *Zeuzine arisanensis* Hayata, Icon. Formos.4:106,t.55(1914). *Monochilus affine* Lindley, Gen. Sp. Orchid. Pl. 487. 1840.

Terrestrial herbs or epiphytic upto 35cm tall. Rhizome slightly elongated. Stem erect, deep reddish brown to greenish brown enveloped in hyaline, subtular. **Leaves** 6 – 7, often reddish, ovate, ovate-lanceolate, **lamina** 2.5 – 4.5 × 1.5 – 3.5 cm, apex acute or obtuse; sheathing. **Inflorescence** upto 25 cm, with 1 or 2 puberulent sterile bracts, pale brown; rachis upto 7.5 cm, ± dense flowered; floral bracts ovate-lanceolate. **Flowers** resupinate or rarely erect, ovary and pedicel fusiform. **Sepals** distinctly not spreading, dark brownish green at base, white toward apex, pubescent; dorsal sepal broadly ovate, concave, 1-veined, apex obtuse or acute; lateral sepals ovate-oblong, slightly oblique, 1-veined, apex obtuse. **Petals** white, elliptic to obovate, oblique, ca. as long as dorsal sepal, 1 veined, apex obtuse; **lip** white or pale yellow, Y-shaped, 3-partite; epichile dilated, 2-lobed; lobes not diverging obovate. **Column** wings triangular; anther ovoid-lanceolate, rostellum arms oblong.

Flower : October

Fruit: Janaury

Exsiccatus : Dhorok 2100 m, **SR Lepcha & AP. Das 30206**, dated 22.10.2004

Status : Rare

Local Distribution : Phusrey, Singhaney, Premlakha, 1600 – 2400 m.

General Distribution. : INDIA, BHUTAN, CHINA, LAOS, MALAYSIA, MYANMAR, THAILAND.

Note : Extremely Rare, only report from Pangolakha, (Lucksom,2007).

PLATE VII



PLATE VIII

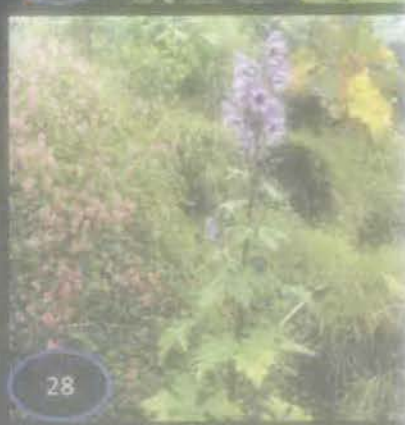


PLATE IX

33



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PLATE X



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PLATE XI



PLATE XII



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PLATE XIII



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73



74

PLATE XIV



PLATE XV



LEGEND OF PHOTOS

Plate VII

17. *Elastostema obtusum*
18. *Berginia purpurascens*
19. *Arisaema concinnum*
20. *Paris polyphylla*
21. *Panax pseudo ginseng* var.
angustifolius
22. *Panax pseudo ginseng* var. var.
bipinnatifidus
23. *Gentiana* spp.
24. *Rubia manjith*

Plate VIII

25. A young sapling of *Picrorhiza*
kurrooa
26. *Rheum acuminatum*
27. *Helwingia himalaica*
28. *Aconitum spicatum*
29. *Saxifraga montana*
30. *Pedicularis furfuraceae*
31. *Gaultheria trichophylla*
32. *Juncus grisebachii*

Plate IX

33. *Rheum australe*
34. *Rheum nobile*
35. *Zanthoxylum oxyphyllum*
36. *Saussurea auriculata*
37. *Heracleum wallichii*
38. *Nardostachys grandiflora*

Plate X

39. *Younia pranii*
40. *Anthogonium gracile*
41. *Eria spicata*
42. *Dendrobium chrysanthum*
43. *Silene gonosperma*

44. *Calanthe puberula*
45. *Pleione praecox*
46. *Spiranthes sinensis*

Plate XI

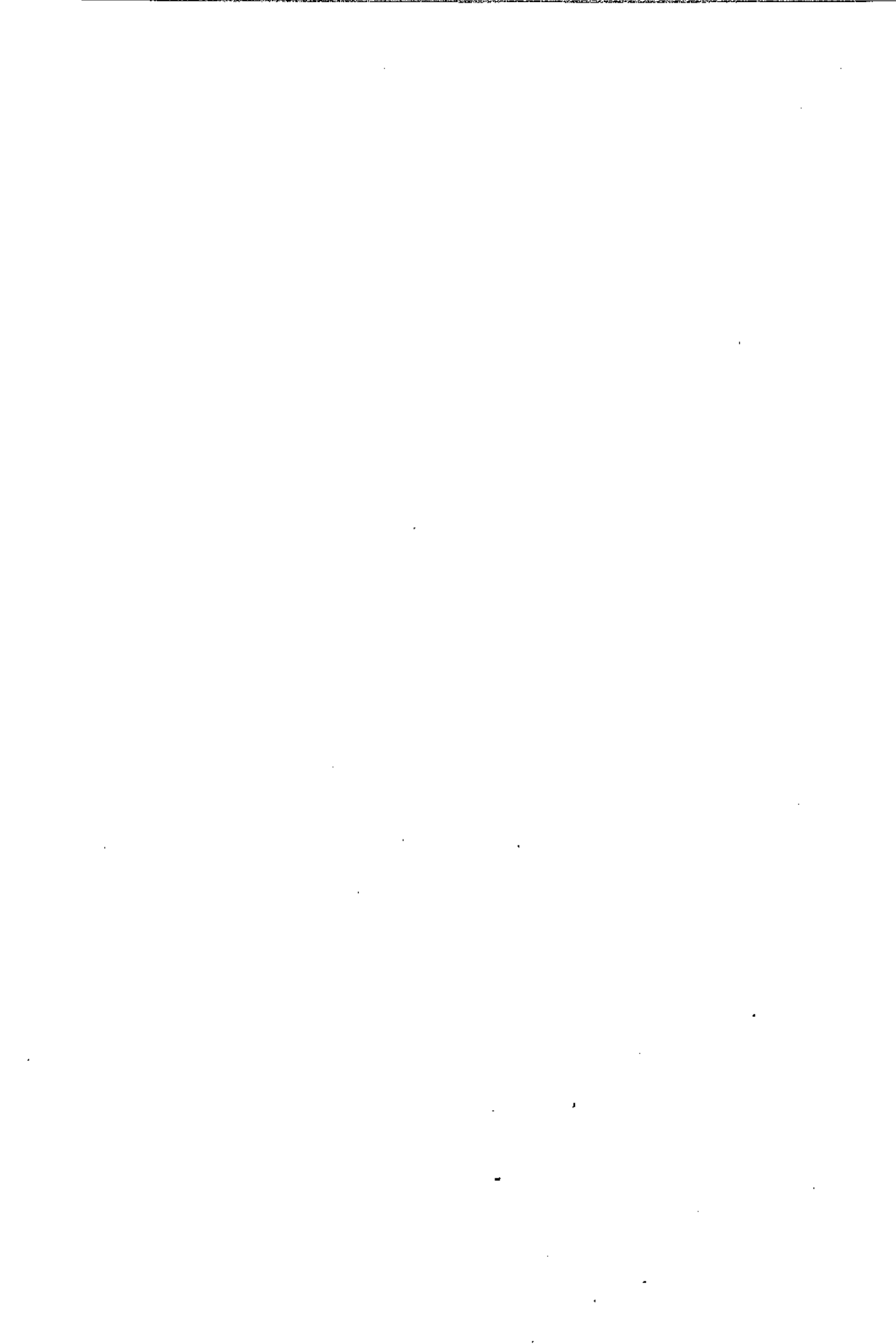
47. *Hypericum choisianum*
48. *Ribes lacinatum*
49. *Corydalis chaerophylla*
50. *Tupistra aurantiaca*
51. *Prunella vulgaris*
52. *Hydrocotyle sibthorpioides*
53. *Fragaria nubicola*
54. *Corydalis chaerophylla*

Plate XII

55. *Swertia bimuculata*
56. *Pedicularis siphonantha*
57. *Dendrocnide sinuate*
58. *Tripterospermum volubile*
59. *Bistorta amplexicaulis*
60. *Swertia bimuculata*
61. *Cremathodium decaisnei*
62. *Hedychium spicatum*
63. *Meconopsis napualensis*
64. *Potentilla peduncularis*
65. *Curculigo orchioides*
66. *Cuscuta reflexa*

Plate XIII

67. Local Trekkers, near Phusrey SW
PWS.
68. Enroute to Rachela, trench created
by water flood.
69. Horse, local facilities for carrying
goods
70. Recording field data at Rachela
trijunction point



- 71. Enroute to Panglakha (a near southern transit point of PWS)
- 72. Common Leeches of PWS
- 73. A research team visiting PWS
- 74. *Impatiens spirifer*

Plate XIV

- 75. *Ceropegia pubescens*
- 76. *Triplostegia glandulifera*
- 77. *Gaultheris nummularis*
- 78. *Rubus calycinus*
- 79. *Viburnum mullaha*
- 80. *Neillia rubiflora*
- 81. *Viburnum erubescens*

- 82. *Sanicula elata*

Plate XV

- 83. *Nyssa javanica*
- 84. *Rubus rugosa*
- 85. *Engelhardia spicata*
- 86. *Vaccinium retusum*
- 87. *Agapetis serpens*
- 88. *Impatiens urticifolia*
- 89. *Viola canescens*
- 90. *Holboellia latifolia* subsp. *latifolia*
- 91. *Bistorta macrophylla*
- 92. Habitat of *Rheum acuminatum*

