



**FLORA**  
**OF AMAR SINGH COLLEGE CAMPUS,**  
**SRINAGAR (KASHMIR), INDIA**

**B. L. Bhellum**

**TMKARPIŃSKI**  
PUBLISHER

Poznań, Poland, 2016



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## **PREFACE**

While serving in Amar Singh College, Srinagar for about 3 years between 2000-2003 as Assistant Professor of Botany, I could find an opportunity to closely observe the flowering plants of Campus of this College. Although, a number of books has already been published on the flowering plants of Kashmir in a row yet there seems to be a good scope to enhance the knowledge about plants of Kashmir. My attention was mainly focused to identify and to describe the species of the Flowering plants and arrange them family wise that could be helpful to the students and a variety of readers. Therefore, all families were arranged according to Bentham and Hooke's System of Classification (1862-1883). All species growing within Campus of this College include herbs, shrubs and trees. Most of these species bears pretty, beautiful colourful flowers that generates curiosity to work on these flowering plants. I could find a great deal of uniformity in charactersitics of of these species, however, the treatment in description of these species is somewhat equally base on the necessities in certain cases. A due attention has been paid to make this compilation good, giving citations, brief description of flowering plants, flowering and fruiting periods, distribution of species and ethnobotanical utility in some selected number of species.

The present compilation deals with taxonomic accounts of 315 species - genera and - families of flowering plants along with brief descriptions, citations, synonyms, and recent nomenclature.

I am grateful to Professor A. K. Koul and Professor Rani Magotra for encouragement. Thanks are due to Prof. G. M. Dar, Principal, Amar Singh College, Srinagar, Mohd. Asraf, Head, Department of Botany and other staff members.

It is hoped that the present publication will overcome the paucity of information about the flora of Srinagar, Kashmir. This book will definitely help the students, researchers, readers in a variety of ways.

B. L. Bhellum



## INTRODUCTION

Srinagar is the summer capital of Jammu and Kashmir State. The state has been centre of attraction in past for arts, culture, mountains, meadows, and pretty, beautiful flowers. Amar Singh College was established in 1942 as the first Degree College in the valley of Kashmir. It is known as one of the premier institutions of the state of Jammu and Kashmir having a large campus spread across 35 acres of land and picturesque surroundings. This college is located near Bakshi Stadium, Gogji, Bagh, Srinagar, Kashmir. Many of the botanists from Europe, and Asia have visited Kashmir for observation of colourful floral, diversity and research. Among them, who collected a specimens from different parts of Kashmir are Royle [1839] made extensive and study of the flora of this region. Hooker [1872-1897] has made mention of various species from Kashmir in the Flora of British India. Subsequently Coventry [1923-1930]), Blatter [1927-1929], Lambert [1933], Stewart [1916-1917, 1967, 1972] made remarkable botanical contributions to the flora of Kashmir in the form of valuable compilations. Recently, Singh and Kachroo [1976] Dhar and Kachroo [1983], Sharma and Jamwal [Sharma and Jamwal 1988, 1998] and are the important works on floras published from the Kashmir division of Jammu and Kashmir state. Sharma and Kachroo [1981, 1983], Swami and Gupta [1998], Bhellum and Magotra [2001, 2002, 2007, 2008a, 2008b] and Bhellum [2011, 2011b] compiled significant works confined to Jammu region of the State.

Studies on the flora of Campus Amar Singh College was conducted between 2001 and 2003. The species were confirmed with the help of available floristic literature and comparison of some of Herbarium specimens in (KUH.) Herbarium Centre For Taxonomy, University of Kashmir and IIIM (RRL.) Janki Emal Herbarium Jammu. All the families are arranged according to Bentham and Hooker's system of classification and all the genera and species under each family collected from the area have been arranged in alphabetical order. The 10 most dominant genera and families represented in the area of study are shown in the Bar graphs (Fig. 1 & 2). The most dominant family of the study is Asteraceae representing 41 species representing 30 genera.

The present author made an attempt to compile the Flora of Campus, Amar Singh College, Srinagar, based on the observation made in three years between 2001 and 2003. It is pertinent to mention here that the area of the present floristic study is very small. As a consequence of intensive study the author has collected as many as 315 species of

angiosperms. Many temperate species like butter cups, clovers, mallows, violets, bellflowers, mints, plantagos, spurges, stinging nettles, willows, gageas, rushes ad sedges have been collected from the campus. *Platanus orientalis* L. is a common shade tree, *Populus nigra* L. is planted along the roadsides, Willows are planted along boundary walls on one side.

In the present investigation, a total of 315 species representing 209 genera belonging to 75 families have been given. Among these, 265 species representing 171 genera are dicotyledons, belonging to 64 families. The monocotyledons species are 50 representing 38 genera belonging to 11 families as given (Table 1).

## MATERIAL AND METHODS

The present flora is based on the collections between 2001- 2003 during the stay at Srinagar in different seasons round the year for almost three years. The specimens were collected in the polythene bags or ruck-sacks, carried to the laboratory and then pressed in the wooden plant press after wrapping in the blotters. The specimens were changed frequently to reduce discoloration of the foliage and flowers. The collections were made alone or in the company of friends and a helper. The field data was entered in the field book. The levels were pasted after mounting the specimens on the herbarium sheets and data of the field notes were entered on the labels. The specimens were identified in the laboratory with the help of taxonomic literature. In some cases where there is difficulty in identification of the floral parts the part of the plant specimens were boiled for about 1 or 2 minute to get its natural shape and size.

### *FLORISTIC ANALYSIS*

A total of 315 species representing 209 genera of 74 families collected from Campus Amar singh College, Srinagar, Kashmir belongs exclusively to angiosperms. Of the total 75 families, 64 families (85.3%), 171 genera (81.8%), species 265 (84.1%) are dicotyledons and 11 families (14.7%), 38 genera (18.2%), and 50 species (15.9%) are monocotyledons. The genus species ratio is 1: 1.5 and ratio of dicotyledons to monocotyledons is 1: 5.3. The ten dominant families constitute 53.6% of the total number of species.

**Table 1: Showing number of species, genera and families of angiosperms**

S. No.	Group	Number of families	Number of genera	Number of species
1	Dicotyledons	64	171	265
2	Monocotyledons	11	38	50
3	Total	75	209	315

**Table 2: Showing ten dominant families of Campus Flora of A. S. College, Srinagar**

S. No	Name of the family	Number of genera	Number of species
1	Asteraceae	30	42
2	Poaceae	20	26
3	Brassicaceae	12	21
4	Fabaceae	09	18
5	Scrophulariaceae	05	15
6	Lamiaceae	08	12
7	Ranunculaceae	04	09
8	Cyperaceae	03	08
9	Euphorbiaceae	02	08
10	Apiaceae	04	08

**Table 3: Showing ten dominant Genera of Campus Flora of A. S. College, Srinagar**

S. NO.	Name of the genus	Number of species
1.	<i>Veronica</i> L.	10
2.	<i>Euphorbia</i> L.	07
3.	<i>Cyperus</i> L.	08
4.	<i>Ranunculus</i> L.	05
5.	<i>Plantago</i> L.	05
6.	<i>Amaranthus</i> L.	04
7.	<i>Chenopodium</i> L.	04
8.	<i>Mentha</i> L.	04
9.	<i>Geranium</i> L.	05
10.	<i>Trifolium</i> L.	04

The ten dominant families along with the number of genera and species are shown in Table 2. The most dominant family is Asteraceae, followed by Poaceae, Brassicaceae, Fabaceae, Scrophulariaceae, Lamiaceae, Ranunculaceae, Cyperaceae, Euphorbiaceae and Apiaceae. The ten dominant genera with more than 3 species are *Veronica*, *Euphorbia*, *Cyperus*, *Ranunculus*, *Amaranthus*, *Chenopodium*, *Mentha*, *Plantago*, *Polygonum* and *Trifolium* (Table 3).

**DIAGNOSTIC KEYS, ENUMERATION AND TAXONOMIC DESCRIPTION**

All the families are arranged according to Bentham and Hooker’s system of classification (1862- 1883) with a slight modification wherever necessary based on recent literature. The number of genera and species within each family are given below.

**KEY TO FAMILIES**

1	+	Root system characterized by tap roots; leaves usually net-veined; flowers usually 4-5 merous; embryo usually with 2 cotyledons ----- 2
	-	Root system characterized by adventitious roots; leaves usually parallel veined; flowers 3-merous or in multiple of 3; embryo with 1 cotyledon ----- 74
2	+	Plants parasitic ----- 3
	-	Plants non-parasitic ----- 4
3	+	Climbing herbs; leafless ----- Cuscutaceae
	-	Climbing shrubs; leaf bearing ----- Loranthaceae
4	+	Perianth 2-seriate ----- 5
	-	Perianth 1-seriate ----- 62
5	+	Petals free or very rarely united ----- 6
	-	Petals united ----- 40
6	+	Sepals usually usually free ----- 7
	-	Sepals united at least towards base ----- 32
7	+	Flowers 3-merous ----- Berberidaceae
	-	Flowers 4 or 5-merous ----- 8
8	+	Carpels free ----- 9
	-	Carpels free ----- 10
9	+	Plants herbs ----- Ranunculaceae
	-	Plants trees ----- Magnoliaceae
10	+	Ovary unilocular ----- 11
	-	Ovary bi- or multilocular ----- 18
11	+	Placentation parietal ----- 12
	-	Placentation not parietal ----- 18
12	+	Sepals 2-3 ----- 13
	-	Sepals 4-5 ----- 17

13	+	Flowers actinomorphic ----- Papaveraceae
	-	Flowers zygomorphic ----- 14
14	+	Stamens tetradynamous ----- Brassicaceae
	-	Stamens not tetradynamous ----- 15
15	+	Sepals 5, produced below insertion; stamens appendiculate ----- Violaceae
	-	Sepals 4, not produced below insertion ----- Cleomaceae
16	+	Leaves scale-like ----- Illeceberaceae
	-	Leaves not scale-like ----- 17
17	+	Plants succulent ----- Portulacaceae
	-	Plants not succulent ----- Caryophyllaceae
18	+	Ovary bilocular ----- Palygalaceae
	-	Ovary multilocular ----- 19
19	+	Ovules erect ----- 20
	-	Ovules pendulous ----- 26
20	+	Leaves exstipulate; stamens 3-5-adelphous ----- Hypericaceae
	-	Leaves stipulate; stamens monadelphous ----- 21
21	+	Epicalyx present; anthers 1-celled ----- Malvaceae
	-	Epicalyx absent; anthers 2-celled ----- 22
22	+	Stipules presnt ----- 23
	-	Stipules absent ----- Oxalidaceae
23	+	Leaves simple; stamens united at base ----- 24
	-	Leaves compound; stamens free ----- 25
24	+	Stamens 5, alternating with staminodes ----- Linaceae
	-	Stamens 10, or more ----- Flacourtiaceae
25	+	Staminal filament with scale at base; fruits armed ----- Zygophyllaceae
	-	Staminal filament without scale at base; fruits unarmed ----- Geraniaceae
26	+	Stamens antipetalous ----- 27
	-	Stamens alternipetalous ----- 28
27	+	Style short or absent; leaves palmately lobed ----- Vitaceae
	-	Style prominent; leaves not lobed ----- Rhamnaceae
28	+	Leaves simple ----- 29
	-	Leaves compound ----- 30
29	+	Leaves palmately lobed ----- Aceraceae
	-	Leaves not lobed ----- Celastraceae

30	+	Disc extra-staminal; flowers usually irregular ----- 31
	-	Disc intra-staminal; flowers regular ----- Meliaceae
31	+	Leaves pinnately compound ----- Sapindaceae
	-	Leaves palmately compound ----- Hippocastanaceae
32	+	Ovary semisuperior; carpel 1, rarely more ----- 33
	-	Ovary inferior; carpels more than 1; united ----- 38
33	+	Corolla papilionaceous ----- Fabaceae
	-	Corolla not papilionaceous ----- 34
34	+	Stamens indefinite; carpels many ----- Rosaceae
	-	Stamens definite; carpel 1 ----- 35
35	+	Staminodes present ----- 36
	-	Staminodes absent ----- 37
36	+	Stamens 5 ----- Parnassiaceae
	-	Stamens 10 ----- Saxifragaceae
37	+	Leaves pinnate; stipules not intra-petiolar ----- Rosaceae
	-	Leaves digitate; stipules intra-petiolar ----- Araliaceae
38	+	Plants usually aromatic ----- Apiaceae
	-	Plants non-aromatic ----- 39
39	+	Ovary superior or half superior; leaves compound ----- Zygophyllaceae
	-	Ovary inferior; leaves simple ----- Onagaraceae
40	+	Stamens free from corolla ----- 41
	-	Stamens adnate to corolla ----- 62
41	+	Flowers epigynous; ovary inferior ----- 42
	-	Flowers hypogynous; ovary superior ----- 46
42	+	Flowers aggregated into involucre heads ----- Asteraceae
	-	Flowers not aggregated into involucre heads ----- 43
43	+	Plants shrubs or trees ----- Caprifoliaceae
	-	Plants herbs ----- 44
44	+	Fruits indehiscent achene or drupe ----- 45
	-	Fruits dehiscent capsule ----- Campanulaceae
45	+	Herbs with aromatic rhizomes ----- Valerianaceae
	-	Herbs with non-aromatic rhizomes ----- Rubiaceae
46	+	Ovary superior, free from calyx ----- 47
	-	Ovary inferior, adnate to calyx ----- 61

47	+	Leaves alternate -----	48
	-	Leaves opposite -----	50
48	+	Ovules indefinite per ovary -----	Solanaceae
	-	Ovules definite per ovary -----	49
49	+	Latex often milky -----	Convolvulaceae
	-	Latex not milky -----	Boraginaceae
50	+	Flowers regular -----	51
	-	Flowers irregular -----	57
51	+	Stamens 2 -----	Oleaceae
	-	Stamens more than 2 -----	52
52	+	Latex generally milky; stamens 5 -----	53
	-	Latex not milky; stamens 4 or 5 -----	54
53	+	Filaments united in a tube -----	Asclepiadaceae
	-	Filaments free -----	Apocynaceae
54	+	Stamens opposite the corolla lobes -----	Primulaceae
	-	Stamens alternating the corolla lobes -----	55
55	+	Fruits of 4-nutlets -----	Boraginaceae
	-	Fruit a capsule or berry -----	56
56	+	Flowers in ebracteate cymes -----	Solanaceae
	-	Flowers in bracteates, racemes, spikes or cymes -----	Scrophulariaceae
57	+	Fruits elongate; seeds winged -----	Bignoniaceae
	-	Fruits usually oval -----	58
58	+	Stem swollen at nodes -----	Acanthaceae
	-	Stem not swollen at nodes -----	59
59	+	Seeds many per fruit -----	Scrophulariaceae
	-	Seeds a few per fruit -----	60
60	+	Ovary with style terminal -----	Verbenaceae
	-	Ovary with style gynobasic -----	Lamiaceae
61	+	Plants herbs; fruits achenes -----	Asteraceae
	-	Plants trees; fruits capsules -----	Platanaceae
62	+	Flowers unisexual -----	63
	-	Flowers bisexual -----	72
63	+	Inflorescence cyathium or racemes -----	64
	-	Inflorescence catkin or spike -----	69



64	+	Ovary 1-celled; ovule 1 per cell ----- 65
	-	Ovary 3-celled; ovules 1 or 2 per cell ----- 71
65	+	Leaves opposite; ovary inferior ----- Lornthaceae
	-	Leaves alternate; ovary superior ----- 66
66	+	Stamens inflexed in bud ----- Urticaceae
	-	Stamens erect in bud ----- 67
67	+	Aromatic herbs; leaves pinnatipartite or pinnatisect ----- Cannabaceae
	-	Non-aromatic trees; leaves simple ----- 68
68	+	Inflorescence cymose, subspike or catkin ----- Moraceae
	-	Inflorescence head ----- 70
69	+	Fruit a drupe ----- Celtaceae
	-	Fruit a winged samara ----- Ulmaceae
70	+	Leaves pinnately compound ----- Juglandaceae
	-	Leaves simple ----- Salicaceae
71	+	Flowers subtended in involucre ----- Euphorbiaceae
	-	Flowers not subtended in involucre ----- Buxaceae
72	+	Leaves stipulate; stipules ochreate ----- Polygonaceae
	-	Leaves exstipulate ----- 73
73	+	Leaves opposite ----- Nyctaginaceae
	-	Leaves alternate ----- 74
74	+	Perianth scarious ----- Amaranthaceae
	-	Perianth green, never scarious ----- Chenopodiaceae
75	+	Plants aquatic ----- 76
	-	Plants terrestrial ----- 78
76	+	Plants free floating ----- Lemnaceae
	-	Plants not free floating ----- 77
77	+	Inflorescence subtended by a spathe like leafy sheath ----- Butomaceae
	-	Inflorescence not subtended by a spathe like leafy sheath ----- Alismataceae
78	+	Stem triqueterous ----- Cyperaceae
	-	Stem not triqueterous ----- 79
79	+	Stem terete; leaves with open sheath ----- Poaceae
	-	Stem and leaves not as above ----- 80
80	+	Ovary superior ----- 81
	-	Ovary inferior ----- Iridaceae

81	+	Outer perianth segments calycine, inner coralline ----- Commelinaceae
	-	Outer and inner perianth segments alike ----- 82
82	+	Perianth glumaceous, not coloured ----- Juncaceae
	-	Perianth coloured, not glumaceous ----- 83
83	+	Plants bulbous; cladodes absent ----- Liliaceae
	-	Plants non-bulbous; cladodes present ----- Asparagaceae

## 1. RANUNCULACEAE

### Key to Genera

1	+	Flowers irregular; petals spurred ----- <i>Aquilegia</i>
	-	Flowers regular; petals not spurred ----- 2
2	+	Plants climbers ----- <i>Clematis</i>
	-	Plants never climbers ----- 3
3	+	Achenes with empty cell on either side ----- <i>Ceratocephalus</i>
	-	Achenes without empty cells ----- <i>Ranunculus</i>

### **AQUILEGIA L.**

*Aquilegia pubiflora* Wall. Ex Royle, Ill. Bot. Himal. Mount. 53. 1833; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 11. 2012. *A. vulgare* L., ssp. *pubiflora* Hook. f. & Thoms. Fl. Brit. Ind. 1: 24. 1872; Stewart, Ann. Cata. Vasc. Pl. W. Pak. & Kashm. 262. 1972.

Perennial, erect, pubescent or sparsely hairy herbs; leaves ternately compound, cauline leaves alternate, leaflets 3-lobed, margin crenate; flowers solitary or lax panicles, deeply purple; sepals 5, petaloid; petals 5, spurred, spur short; stamens many, filament short; carpels 6, apocarpous, hairy.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; Bhellum, 290

*Distribution:* India (Jammu and Kashmir); Atlantic Islands to East Siberia and America.

## **CERATOCEPHALUS Moench.**

### **Key to Species**

<b>1</b>	+	Achenes with falcate or more or less curved beak ----- <i>Ceratocephalus falcatus</i>
	-	Achene with straight beak ----- <i>Ceratocephalus testiculatus</i>

*Ceratocephalus falcatus* (L.) Pers. Syn. Pl. **1** : 341. 1805; Kitam., Fl. Afgh. 122. 1960; Stewart, Ann. Cata. Vasc. Pl. W. Pak. & Kashm. 263. 1972; Sharma and Jamwal, Fl. Upp. Lidd. Valley **1** : 75. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 12. 2012.

Annual, smooth or slightly wooly herbs; leaves all radical, 3-lobed or pinnately divided, segments narrow or finely divided; flower solitary, yellow; stamens 5-15; achenes gibbous at along sides, beak curved or falcate.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 118

*Distribution:* India (Jammu and Kashmir, Western Himalayas from Kashmir to Kumaon) and South East Europe.

*C. testiculatus* (Crantz) Roth, Enum. **1** : 1014. 1827. Stewart, *l.c.* 263. 1972; *C. orthoceras* DC., Syst. **1** : 231. 1818; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 11. 2012.

Annual slightly herbs a few cm in height; leaves radical 3-lobed or finely divided, flowers solitary, yellow; achenes gibbous at sides, beak straight.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 122

*Distribution:* India (Jammu and Kashmir) and South East Europe

## **CLEMATIS L.**

*Clematis connata* DC. Prodr. 1: 4. 1824; Hooker f. et Thoms. in Hooker f., FBI. **1** : 6. 1872; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 13. 2012.

A woody climber, glabrescent or sparsely hairy on twigs; leaves ternate to pinnate, segments 5-7, petiolate, broadly ovate cordate, coarsely dentate to incised dentate, sometimes 3-lobed, acute to nearly caudate; inflorescence panicles; flowers numerous; sepals whitish, upto 12 mm long long, oblong to oblong-lanceolate, acute sparsely hairy outside, densely

tomentose inside. Filaments flattened, narrowed upwards, densely hairy. Anthers bithecos; achenes pubescent. Styles about 3 cm, slender, ciliate.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 738

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh, W. Bengal, Arunachal Pradesh, & Sikkim); Nepal Bhutan and South Tibet & China.

## **RANUNCULUS L.**

### **Key to Species**

<b>1</b>	+	Plants of aquatic habitats; flowers white ----- <i>Ranunculus trichophyllus</i>
	-	Plants of terrestrial or marshy habitats; flowers yellow ----- 2
<b>2</b>	+	Plants glabrous ----- <i>R. sceleratus</i>
	-	Plants hairy ----- 3
<b>3</b>	+	Achenes muricate or spinous ----- 4
	-	Achenes neither muricate nor spinous ----- <i>R. laetus</i>
<b>4</b>	+	Achenes spinous ----- <i>R. arvensis</i>
	-	Achenes tuberculed ----- <i>R. muricata</i>

*Ranunculus arvensis* L. Sp. Pl. 555. 1753; Hooker f. et Thoms. in Hooker f., FBI. 1 : 20. 1872; Stewart, Ann. l.c. 269. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 15. 2012.

Annual, 10-50 cm high, branched, sparsely hairy especially above. Lower most leaves with a distinct petiole equalling or slightly longer than the leaf-blade, blade obovate-spathulate to oblanceolate. Other leaves 3-parted to ternate with obovate-spathulate segments again deeply divided into linear, toothed or entire lobes (2-6 mm wide). Flowers 5-12 mm in diameter, sulphur yellow to greenish-yellow. Petals obovate, indistinctly clawed. Achenes inserted in the pubescent receptacle.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 184

*Distribution:* India (Jammu and Kashmir); West Himalayas; Central Asia; South Europe. Type in London, described from Europe.

Parts used: Whole plant

Ethnobotanical utility: Decoction of whole plant is administered for curing diarrhoea. Leaf extract is prescribed in intermittent fever and asthma.

*R. laetus* Wall. ex D. Don Ill. Bot. Himal. Mount 53. 1834; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 15. 2012. *R. distans* Royle, Ill. Bot. Himal. Mount. 53. 1834; *R. laetus* Wall. ex Hooker f. & Thoms. in Hooker f., FBI. 1 : 19. 1872.

Tall perennial, 30-70 cm high, with a creeping rootstock producing numerous fibrous roots and flowering stems. Stems up to 5 mm thick, usually much branched, with appressed or spreading hairs, especially near the base often glabrescent later. Basal leaves with long petioles (12-15 cm), densely patent-hairy, rounded-reniform, ternate, with broadly obovate segments, free to near the base. Stem leaves sessile, lower ones shortly petiolate, decreasing in size upwards. Flowers 17-25 mm in diameter, yellow. Sepals 5-7 mm, lanceolate to ovate-lanceolate with a wide membranous margin. Petals 8-12 mm, roundish obovate, sometimes tapering into an indistinct claw. Achenes 2-2.5 (2.5) mm in diameter, numerous, suborbicular.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 232

*Distribution:* India (Jammu and Kashmir); Himalayas; Temperate Asia; Pakistan; Afghanistan; Nepal; Bhutan; Europe; Northern America. Type described from India.

Parts used: Latex

Ethnobotanical utility: Latex is applied at the site of alopecia to promote hair growth.

*R. muricatus* L. Sp. Pl. 555. 1753; Hooker f. et Thoms. in Hooker f., FBI. 1 : 20. 1872; Stewart, *l.c.* 271. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 16. 2012.

Glabrous annual, stem solitary, fistulose, or several short stems branched from near the base, sometimes stem absent, leaves and peduncles arising from base. All leaves similar, petioles of lower most upto 15 cm, decreasing in length towards apex, blade roundish reniform to suborbicular, ternate with perfectly separate segments. Flowers yellow. Sepals reflexed, membranous. Petals roundish-obovate. Achenes 5-6 mm long, ovate.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 276

*Distribution:* India (Jammu and Kashmir); West Asia; Pakistan; introduced in America, Africa, Europe and Australia. Type described from Mediterranean region

Flowering & Fruiting: March-April

Parts used: Whole plant

Ethnobotanical utility: Whole plant decoction is taken orally as a cure for periodic fever, asthma and arthralgia. Leaf paste is styptic and is applied on cuts, wounds and abscess as antiphlogistic.

*R. sceleratus* L. Sp. Pl. 551. 1753; Hooker f. et Thoms. in Hooker f., FBI. 1 : 19. 1872; Stewart, *l.c.* 273. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 16. 2012.

Annual, 20-60 cm tall, glabrous herbs; stem fistular; basal leaves petiolate, base cuneate, lobes obtuse, segments toothed; upper leaves shortly stalked or sessile, simple, linear; flowers nearly 8 mm across, yellow; achenes apiculate.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 111

*Distribution:* India (Jammu and Kashmir); Temperate Asia; Pakistan; Bhutan; Europe; Nepal; Afghanistan; Russia and Northern America.

*R. trichophyllus* Chaix in Vill., Hist. Pl. Daupf. 1: 335. 1786; Stewart, *l.c.* 273. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 16. 2012. *R. aquatilis* L. var. *trichophyllus* (Chaix) Hooker. f. & Thoms. in Hooker f., FBI. 1: 16. 1872.

Annual herbs; stem smooth; leaves radical, submerged, lobed or finely divided, segments threa-like; flowers stalked, white; stamens few; achenes transvesely wrinkled.

*Flowering and Fruiting:* June-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 203

*Distribution:* India (Jammu and Kashmir); Temperate North & South Hemisphere; Afghanistan; Bluchistan and West Tibet.

## 2. MAGNOLIACEAE

### *MAGNOLIA* L.

*Magnolia grandiflora* L., Syst. Nat. ed. 10, 2: 1082. 1759.

A medium sized to a large handsome tree; leaves broadly ovate, elliptic-oblong, coriaceous shining, margin entire, yellow-brown pubescent; flowers white fragrant; buds enclosed in a silky spathaceous bracts fruits a woody cone, seeds bright red. Planted in gardens as avenue tree.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 301

*Distribution:* India (Jammu and Kashmir; North West Himalaya; Kashmir to Kumaon. Native of South East United States of America.

### **3. PAEONIACEAE**

#### ***PAEONIA* L.**

*Paeonia emodi* Wall. ex Royle Ill. Bot. Himal. Mount. 57. 1834; Hooker f. & Thoms. in Hooker f., FBI. 1 : 30. 1872; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 17. 2012.

Shrubs stout; roots in clusters, fleshy; leaves alternate, divided into leaflets or deeply incised, glabrous; flowers usually solitary, sometimes 2 or 3, white; sepals 5, persistent; petals 5 - 10; carpels 1-5, sometimes with fleshy disc; fruit a follicle.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 515

*Distribution:* India (Jammu and Kashmir, North West Himalaya, Kashmir to Kumaon).

### **4. BERBERIDACEAE**

#### ***BERBERIS* L.**

*Berberis aristata* DC. Syst. 2 : 8. 1821; Hooker f. & Thoms. in Hooker f., FBI. 1 : 110. 1872; Stewart, l.c. 278. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 18. 2012.

Deciduous, erect shrubs with glabrous branches, stems 2-3 m tall, wood yellow; leaves obovate, 3-5 cm long, arranged in axillary simple drooping fascicled racemes longer than leaves, in 3-fid spines, sessile, tough, narrowly lanceolate, upper surface bright green, lower paler; racemes about 20 flowered; corolla pale-yellow; berries oblong-ovoid, blue-black.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 874

*Distribution:* India (Jammu and Kashmir); Africa; Tropical and temperate Asia; Europe; Northern and Southern America and Australasia.

## 5. PAPAVERACEAE

### *PAPAVER* L.

*Papaver rhoeas* L., Sp. Pl. 507. 1753; Hooker and Thoms. in Hooker's Fl. of Brit. Ind. 1: 117. 1872.

Annual branched, bristly herbs 30 – 60 cm in height; leaves pinnately divided, segments narrow, awned; scape with spreading or appressed hairs; flowers scarlet; Petals 4, in unequal pairs; anthers blue; capsule smooth, stalked, subglobose to obovoid, stigmatic rays 10 – 12.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 883

*Distribution:* India (Jammu and Kashmir); Europe; West Asia and Northern America

## 6. FUMARIACEAE

### *FUMARIA* L.

*Fumaria indica* (Hausskn.) Pugsley, Journ. L. Soc. Bot. **44** : 313. 1919; Whitmore, Enum. Fl. Pl. Nep. **2** : 36. 1979; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 23. 2012; Bhellum et al., Fl. Exot. J & K. 44. 2013.

Annual herbs, delicate, much branched, 5 – 25 cm long, glabrous, glaucous; leaves much dissected 2 – 3 pinnatisect, decomposed, racemes shortly peduncled or sessile; flowers white or pale pink, 5 – 6 mm long; fruit suborbicular with rounded apex; grows in cultivated fields as a weed.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 123

*Distribution:* India (Jammu and Kashmir); Thailand; Malayasia; Asia Tropical; Bangladesh; Africa; Pacific Islands, Fiji and N. Hemisphere.



## 7. BRASSICACEAE

### Key to Genera

1	+	Fruits dehiscent -----2
	-	Fruits indhiscent ----- <i>Coronopus</i>
2	+	Plants usually glabrous ----- 3
	-	Plants usually hairy ----- 10
3	+	Fruits 2 or few seeded ----- <i>Lepidium</i>
	-	Fruits many seeded ----- 4
4	+	Fruits linear ----- 5
	-	Fruits not linear ----- 9
5	+	Plants aquatic ----- 6
	-	Plants not aquatic ----- 7
6	+	Flowers white ----- <i>Cardamine</i>
	-	Flowers yellow ----- <i>Rorippa</i>
7	+	Cauline leaves absent or amplexicaule ----- <i>Arabis</i>
	-	Cauline leaves always present, not amplexicaule ----- 8
8	+	Capsule 1-nerved; flowers ebracteate ----- <i>Arabidopsis</i>
	-	Capsule 3-nerved; flowers bracteates ----- <i>Sisymbrium</i>
9	+	Flowers purple ----- <i>Lobularia</i>
	-	Flowers white ----- <i>Capsella</i>
10	+	Leaves compound; segments filiform ----- <i>Descurainia</i>
	-	Leaves simple ----- <i>Alliaria</i>

### **ALLIARIA Scop.**

*Alliaria petiolata* (M. Bieb.) Carava & Grande, in Boll. Orto. Bot. Napoli **3** : 418. 1913; Clapham et al., Fl. Brit Isles 228. 1952; Ball, Fl. Europaea **1** : 267. 1964; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 23. 2012; Bhellum et al., Fl. Exot. J & K. 44. 2013. *Erysimum alliaria* L., Sp. Pl. 660. 1753.

Annual herbs, 20 – 40 cm tall or more, usually glabrous or subglabrous; leaves simple, cordate, or ovate, lyrate pinnatifid, lower petiolate, petiole long, ovate cordate, upper sessile margin dentate; racemes upto 30 cm long, flowers white nearly 5 mm across; siliquae linear, terete, bilocular, dehiscent.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 260

*Distribution:* India (Jammu and Kashmir); Pakistan; Europe; North Africa and some Temperate parts of Asia.

## **ARABIDOPSIS Heynh.**

### **Key to Species**

<b>1</b>	+	Cauline leaves narrowed below, rosulate ----- <i>Arabidopsis wallichii</i>
	-	Cauline leaves broad at base ----- 2
<b>2</b>	+	Flowers yellow, turning pale with age ----- <i>A. pumila</i>
	-	Flowers white or pinkish ----- <i>A. himalaica</i>

*Arabidopsis himalaica* (Edgew.) O. E. Schulz. in Engl. Pflanzenr. **86** : 283. 1924; Jafri, in Fl. W. Pak. **55** : 272. 1973; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 24. 2012. *A. himalaica* Edgew. in Trans. L. Soc. **20** : 31. 1846.

Annual or biennial erect tomentose or hairy herbs; leaves shortly petioled, radical obovate, cauline sessile, oblong, flowers pink or white; siliquae erect, terete, glabrous, spreading.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 262

*Distribution:* India (Jammu and Kashmir); Africa; Temperate Asia; Europe and Northern America

*A. pumila* (Steph.) N. Busch in Fl. Cauc. Crit. 3(4): 457. 1919; Stewart, *l.c.* 299. 1972.

Annual erect or suberect herbs, upto 50 cm tall; stem branched, hairy; basal leaves rosulate or many, obovate-oblong, coarsely toothed, sometimes subentire, upper ones few, oblong, sessile, base sagittate; flowers yellow; siliquae linear, subcompressed, scabrous.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 230

*Distribution:* India (Jammu and Kashmir); Nepal; Pakistan; Temperate and tropical Asia. Native of Africa.

*A. wallichii* (Hooker f. & Anders.) Busch., Fl. Cauc. Crit. 3, **4** : 457. 1909; Stewart, *l.c.* 299. 1972; *Sisymbrium wallichii* Hooker f. & Thoms. in J. Linn. Soc. Bot. **5** : 158. 1861; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 24. 2012.

Annual herbs clothed with forked stellate hairs; stem slender, 15-45 cm tall; leaves pinnately divided, radical leaves obovate, obtuse, pointing downwards, terminal lobe the largest; cauline leaves few, sessile, smaller; flowers white turning pink; siliquae slender, glabrous, curved.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 259

*Distribution:* India (Jammu and Kashmir); West Asia; Europe and Britain.

### **ARABIS L.**

*Arabis alpina* L.; Hooker in Fl. Brit. Ind. 1: 135. 1872.

Annual herbs, clothed with more or less forked hairs; stem erect, branches very short; leaves simple, radical stalked, cauline sessile, stem-clasping, basal lobes long; flowers white erect racemes, spreading later; siliquae linear; seeds in a single row.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 258

*Distribution:* India (Jammu and Kashmir, West Himalaya); Africa; Temperate Asia; Europe and Northern America.

### **CAPSELLA Medik.**

*Capsella bursa-pastoris* (L.) Medik., Pflanzeng. 85. 1792; Moench, Meth. Pl. 271. 1794; Hooker f. & Anders. in Hooker f., FBI. 1 : 159. 1872; *Bhellum* & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 26. 2012.

Annual herbs; stem erect, upto 50 cm tall, clothed with simple or forked hairs; leaves in rosette, usually pinnatifid, sometimes lanceolate; segments lyrate or sinuately lobed; inflorescence racemes which appear as corymbs; sepals 4, polysepalous; corolla with 4 petals; fruits notched at the tip, glabrous; seeds oblong, obovate, brown, punctate.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 106

*Distribution:* India (Jammu and Kashmir); Pakistan, Europe; Asia and Northern America.

## CARDAMINE L.

### Key to Species

1	+	Perennial herbs; flowers 10 mm across; flowers lilac, pink or purple ----- ----- <i>Cardamine loxostemonoides</i>
	-	Annual or biennial; flowers about 5 mm across; flowers white ----- 2
2	+	Plants usually with a simple stem; leaves densely rosulate ----- <i>C. hirsuta</i>
	-	Plants usually branched from base; leaves loosely or hardly rosulate ----- <i>C. flexuosa</i>

*Cardamine flexuosa* With. Arr. Brit. Pl. ed. 3, 3: 578. 1796; Stewart, *l.c.* 304. 1972; Bhellum *et al.*, Fl. Exot. J & K. 55. 2013.

Annual or biennial herb, 10 – 30 cm tall; branches many from the base; basal leaves 2 – 7 jugate, glabrous or hairy, leaflets ovate-orbicular, terminal one slightly larger; flowers white; fruits generally overtopping flowers.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 795

*Distribution:* India (Jammu and Kashmir); Isles of Europe; Pakistan; Afghanistan; Asia and introduced in Northern America.

Uses: Eaten in N. E. India.

*C. hirsuta* L., Sp. Pl. 655. 1753; Stewart, *l.c.* 304. 1972.

Annual glabrous, herbs, about 25 cm tall; leaves forming radical at base, cauline, pinnately compound, leaflets rather narrow, hairy or glabrous; inflorescence racemes, in terminal position; flowers white; sepals 4, free; petals 4, white free; stamens tetradynamous; ovary linear, stigma sessile; siliquae linear in outline; seed somewhat square in shape.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 821

*Distribution:* India (Jammu and Kashmir, Uttarakhand), West Himalayas.

*C. loxostemonoides* O. E. S., *Notizbl. Bot. Gart. Berl.* 9: 1069. 1927; Stewart, *l.c.* 304. 1972;  
*C. pratensis* Hk. f. & Anders., non. L.

Perennial herbs with short rootstock; leaves pinnately divided, basal leaves with larger leaflets, cauline leaves with smaller leaflets; inflorescence corymbose; petals 4, white or mauve; ovary elongate; siliquae thinly partitioned with a single row of seeds.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 335

*Distribution:* India (Jammu and Kashmir); Northern and Western Himalayas; China, Nepal and Pakistan.

**CORONOPUS Zinn.**

*Coropopus didymus* (L.) Smith., Fl. Brit. 2: 691. 1800-1804; Babu, Herb. Fl. DD. 57. 1977; Sharma Kachroo, Fl. Jmu. 1: 97. 1981; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 27. 2012; Bhellum *et al.*, Fl. Exot. J & K. 58. 2013.  
*Lepidium didymum* L. Mant. 1 : 92. 1767.

Annual or biennial foetid herbs; stem prostrate or suberect, clothed with simple or 2-forked hairs; leaves pinnately compound, segments pinnatifid or pinnatisect, apiculate; inflorescence racemes; flowers actinomorphic, pedicel elongating in fruiting; sepals ovate, green; petals absent, when present linear; stamens 2; when 4, two fertile; siliquae bilobed; seeds brown, punctate.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 130

*Distribution:* India (Jammu and Kashmir); Tropical and South America

**DESCURAINIA Webb. et Berthel.**

*Descurainia sofia* (L.) Webb. & Berth., in Engl. & Prantl., Natur. Pflanzenf. 3(2) : 192. 1891. ed. 2, 17b. 651. 1936. Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 27. 2012; Bhellum *et al.*, Fl. Exot. J & K. 59. 2013.

Annual or biennial herbs 30 – 60 cm tall or more hair, hairs simple or stellate and often glandular ; leaves 2- 3-pinnatisect, lobes linear oblong; flowers 2-3 mm across, yellow; stamens 6; style short, stigma depressed, capitate; siliquae linear, 15 – 35 mm long; seeds reddish-brown, 1 – 2 seriate.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 179

*Distribution:* India (Jammu and Kashmir); Pakistan; Afghanistan; Africa and Europe.

## **ERUCASTRUM**

*Erucastrum gallicum* (Willd.) O. E. Schulz., Bot. Jahrb. Syst. 54(119): 56. 1916.

Annual herbs, erect, more or less hairy, hairs retrorse; leaves alternate, petiolate, irregularly pinnate; racemes elongate; flowers yellow; siliquae elliptic compressed, minutely pitted reticulate.

Grows wild on waste places.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 109

*Distribution:* India (Jammu and Kashmir); Pakistan; Nepal and Europe; Native of Europe,.

## **LEPIDIUM L.**

### **Key to Species**

<b>1</b>	+	Hairs on the stem capitate, glandular ----- <i>Lepidium capitata</i>
	-	Hairs on the stem neither capitate nor glandular ----- <i>L. virginicum</i>

*Lepidium capitatum* Hooker f. & Thomson, . in J. L. Soc. Bot. **5** : 175. 1861; Hooker f. & T. Anders. in Hooker f., FBI. **1** : 160. 1872; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 28. 2012.

Annual or biennial herbs; stem suberect or procumbent, branched, often spreading glandular hairy; basal leaves pinnatifid, sessile, 3-6 cm long, acute, cauline leaves toothed, sessile; racemes capitate; flowers white.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 884

*Distribution:* India (Jammu and Kashmir); Bhutan; Tibet; Nepal; Pakistan and Northern & Southern America. Endemic to West Himalayas.

*L. virginicum* L., Sp. Pl. 645. 1753; Nair and Pandey, Bull. Bot. Surv. India **14** : 157. 1972. Stewart, *l.c.* 319. 1972; Babu Herb. Fl. DD. 59. 1977; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 28. 2012.

Annual herbs 30 – 50 cm tall; stem erect, minutely hairy or downy with long appressed simple hairs; basal leaves lyrate or pinnately lobed, with large rounded terminal lobe and numerous lateral lobes clothed with appressed hairs on both the surfaces; racemes 5 – 10 cm long;; flowers minute, 1 - 2 mm across; siliquae 3 – 4 mm across almost orbicular with a broad but a shallow notch at apex.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 327

*Distribution:* India (Jammu and Kashmir); Northern & South America; Europe; Temperate Asia; New Thailand and Australasia.

### **LOBULARIA Desv.**

*Lobularia maritima* (L.) Desv.

Perennial herbs with woody base; stem appressed hairy; leaves narrowly linear, oblanceolate, entire; inflorescence racemes; flowers white, scented like honey; petals more or less orbicular, clawed; fruits orbicular, compressed.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 305

*Distribution:* India (Jammu and Kashmir); Africa; Europe; N. America; Australasia and Mediterranean region.

### **RORIPPA Scop.**

#### **Key to Species**

1	+	Flowers white ----- <i>Rorippa nasturtium-aquaticum</i>
	-	Flowers yellow ----- 2
2	+	Siliquae oblong, turgid 5-9 mm long ----- <i>R. islandica</i>
	-	Siliquae slender, linear, 10-15 mm long ----- <i>R. sylvestris</i>

*Rorippa islandica* (Oeder) Borb., Balaton Tav. Pt. 2 : 392. 1900; Kitam., Fl. Afgh. 159. 1960; Stewart, *l.c.* 326. 1972; *Bhellum* & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 29. 2012.

Perennial herbs; stem weak, angular; basal, leaves withering as the plant advances with age, cauline leaves lyrate-lobed, lobes unequal, coarsely toothed; flowers in axillary or terminal; sepals elliptic, rounded at apex; petals white obovate, clawed; stamens tetradynamous; ovary elliptic, style short; stigma 2-lobed; fruits narrowly oblong; seeds closely held, pale-brown.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 129

*Distribution:* India (Jammu and Kashmir); Europe; Russia; Austria; Switzerland; United Kingdom; Norway and Bosnia.

***R. nasturtium-aquaticum*** (L.) Hayek. Sched. Fl. Stir. Exs. 22. 1905; Meikle in Kew Bull. 97. 1954; Bennet, Name Changes Fl. Pl. 488. 1987; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 29. 2012. *Sisymbrium nasturtium-aquaticum* L., Sp. Pl. 657. 1753.

Glabrous perennial herbs; stem short or long, creeping, much brached; leaves pinnately compound, leaflets sessile ovate, entire or sinuately lobed; inflorescence short racemes; flowers white; petals larger than sepals; siliquae linear.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 350

*Distribution:* India (Jammu and Kashmir); Northern Africa; Middle East; Europe and United States of America.

***R. sylvestris*** (L.) Besser; Bhellum *et al.*, Fl. Exot. J & K. 70. 2013.

Annual, erect or decumbent herbs, 15 – 50 cm tall, rather zigzag, angular, ribbed; leaves pinnate, deeply pinnatisect, lobes obovate, or oblong, cuneate; flowers 4 – 5 mm across, yellow, arranged in racemes; siliquae cylindrical, linear-oblong, glabrous, seeds many, brown, minutely pitted.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 191

*Distribution:* India (Jammu and Kashmir); Tropical and Central Asia; Pakistan; Nepal; introduced in N. America, temperate Eurasia and Europe.

## **SISYMBRIUM L.**

### **Key to Species**

1	+	Pedicele inconspicuous; leaflets not spreading ----- <i>Sisymbrium officinale</i>
	-	Pedicele conspicuous; leaflets spreading ----- 2
2	+	Flowers about 6-8 mm across; siliquae ascending ----- <i>S. loeselii</i>
	-	Flowers less than 4-5 mm across ----- <i>S. brassiciforme</i>

***Sisymbrium brassiciforme*** C. A. Mey in Ledeb. Fl. Alt. 3: 129. 1831; Stewart, *l.c.* 327. 1972.

Annual or biennial, 30-100 cm tall, erect, branched, glabrous or nearly so; lower leaves lyrate, a few lobed, shortly petioled; terminal lobe ovate-oblong, distantly toothed; lateral lobes smaller but similar, dentate to sub-entire; upper leaves gradually becoming



smaller and linear, subsessile to sessile; Racemes many flowered,; flowers c. 5 mm across, yellow; pedicels 5-10 mm long in fruit, spreading, slightly thickened; sepals 3-4 mm long. Petals (5-8 mm long; stamens c. 3:5 mm long; siliquae linear, subcylindrical; seeds many oblong, brown, finely granulate.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 371

*Distribution:* India (Jammu and Kashmir); Tropical and Central Asia; Afghanistan; Pakistan; China; Nepal and Russia.

*S. loeselii* L., Cent. Pl. **1** : 18 no. 49. 1755; Hooker f. & Anders. in Hooker f. FBI. **1** : 151. 1872; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 30. 2012; Bhellum *et al.*, Fl. Exot. J & K. 72. 2013.

Annual or biennial, upto 100 cm tall, branched, hispid below; basal leaves lyrate, pinnatifid, terminal lobe elongate, lateral lobes 3 – 4 paired, dentate, upper ones similar but smaller; racemes many flowered, upto 40 cm long in fruiting; flowers 6 – 8 mm across, bright yellow; siliquae 20 – 40 cm long or more linear subcylindrical, erect.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 326

*Distribution:* India (Jammu and Kashmir); Afghanistan; Pakistan, Nepal; Russia; Tibet and most part of Central Asia and distributed elsewhere.

*S. officinale* (L.) Scop., Fl. Carn. **2** : 26. 1772; Stewart, *l.c.* 327. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 30. 2012; Bhellum *et al.*, Fl. Exot. J & K. 72. 2013. *Erysimum officinale* L., Sp. Pl. 660. 1753.

Annual, erect, stiff, branched, hairy herb, 20 – 50 cm tall; basal leaves rosulate, deeply pinnatisect, terminal lobe stalked, irregularly toothed, cauline leaves smaller; racemes branched, 20 – 30 flowered; flowers 4 mm across, yellow; siliquae short, 10 – 15 mm long.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 212

*Distribution:* India (Jammu and Kashmir); Pakistan; Afghanistan; Europe; Asia; Africa; Australasia; Northern America and Southern America.

## 8. CLEOMACEAE

### CLEOME L.

#### Key to Species

1	+	Flowers white; filaments usually purple; stamens borne on long gynophore ----- ----- <i>Cleome gynandra</i>
	-	Flowers yellow; filaments not purple; stamens borne on sessile disc ----- <i>C. viscosa</i>

*Cleome gynandra* L., Sp. Pl. 671, 1753; Stewart, *l.c.* 295. 1972.

Annual erect, branched glandular-pubescent herbs; stem striate; leaves 3-5-foliolate, leaflets sessile, or subsessile, central one the largest, acute, base cuneate; flowers yellow or white tinged yellow; stamens on androgynophore; ovary linear; fruits dark brown, globose, depressed capsule.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 308

*Distribution:* India (Jammu and Kashmir); Australia and Southern Africa.

*C. viscosa* L. Sp. Pl. 672. 1753; Stewart, *l.c.* 296. 1972; Hooker, f., FBI. 1 : 170. 1872; Jacobs., Fl. Males. Ser. 1, 6 : 103. 1960; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 31. 2012.

Annual glandular hairy herb; stem striate, viscous to touch; leaves 3-5 foliolate; leaflets sessile, elliptic-oblong; flowers yellow in axillary or terminal racemes; ovary glandular pubescent; fruit a capsule, glandular hairy.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 887

*Distribution:* India (Jammu and Kashmir); China; Pakistan; Tropical Africa; Tropical Australia and Malayasia.

## 9. VIOLACEAE

### VIOLA L.

*Viola odorata* L., Sp. Pl. 2 : 934. 1753; Hooker f. & Thoms. in Hooker f., FBI. 1 : 184. 1872; Ross-Craig, Draw. Brit. Pl. 4 : t. 7. 1950; Stewart, *l.c.* 492. 1972; Bhellum & Magotra, A cata.

Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 32. 2012; Bhellum *et al.*, Fl. Exot. J & K. 75. 2013.

Herbs perennial, acaulescent, stoloniferous, 3-15 cm tall. Rhizome erect or oblique, brownish, robust, densely noded, with numerous roots. Leaves basal, leaf blade orbicular or reniform to broadly ovate-cordate. Flowers deep purple, large, fragrant. Sepals oblong or oblong-ovate. Petals crenate, upper ones obovate. Ovary puberulous, styles slender and straight at base. Capsule globose.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 156

*Distribution:* India (Jammu and Kashmir); Europe; Africa and Asia.

Parts used: Flowers, root, whole plant

Ethnobotanical utility: Flower and root decoction cures cough, cold and bronchitis. Petals are made in the form of syrup which is used against throat infections. Decoction of fresh flowering herb is used as diuretic and blood purifier.

## 10. CARYOPHYLLACEAE

### Key to Genera

1	+	Petals lobed ----- 2
	-	Petals entire or some times none ----- 3
2	+	Petals shortly 2-partite ----- <i>Cerastium</i>
	-	Petals deeply 2 partite ----- <i>Stellaria</i>
3	+	Leaves terete, base united in a scarious sheeth ----- <i>Sagina</i>
	-	Leaves flat, bases not united ----- 4
4	+	Flowers 13-15 mm across ----- <i>Myosoton</i>
	-	Flowers 5-7 mm across ----- <i>Arenaria</i>

### **ARENARIA L.**

#### Key to Species

1	+	Capsule thickened at base and exceeding the length of sepals ----- ----- <i>Arenaria serpyllifolia</i>
	-	Capsule neither thickened at base nor exceeding the length of sepals ----- ----- <i>A. leptocladis</i>

*Arenaria leptoclados* (Reichb.) Guss., Fl. Sic. 2 : 824. 1845; Stewart, *l.c.* 239. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 34. 2012; Bhellum *et al.*, Fl. Exot. J & K. 76. 2013.

Annual pubescent herbs about 20 cm tall; stem branched from the base; leaves ovate, obovate, elliptic, spatulate; flowers white; calyx gradually narrow above, sepals 5, petals 5; capsule cylindric, 2.5-4 mm long, reniform; seeds tuberculate.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 205

*Distribution:* India (Jammu and Kashmir); Asia; Central Europe; Turkey; China and North-W. Africa.

*A. serpyllifolia* L., Sp. Pl. 423. 1753; Edgew. & Hooker f. in Hooker f., FBI. 1 : 239. 1874; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 34. 2012.

Annual herbs; stem erect or ascending; leaves sessile or subsessile, elliptic-ovate, rarely orbiculate, 3-5 nerved, acute; inflorescence terminal cymes; sepals green, 3-nerved; petals 5, white; capsule loosely enclosed in calyx; seeds prominently tuberculate.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 208

*Distribution:* India (Jammu and Kashmir); Pakistan; Temperate N. Asia; Africa and Europe.

### **CERASTIUM L.**

*Cerastium vulgatum* L., Sp. Pl. ed 2, 627. 1762, non L. 1753; Edgew. & Hooker f. in Hooker f., FBI. 1 : 228. 1874.

Annual pubescent more or less viscid herbs; stem often many, spreading from the base; leaves stalked, ovate, narrowly oblong, upper sessile, more or similar and narrower; sepals lanceolate; petals as many as sepals;

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 295

*Distribution:* India (Jammu and Kashmir); Temperate N. Asia; Africa and Europe.

### **MYOSOTON Moench.**

*Myosoton aquaticum* (L.) Moench., Meth. 225. 1794; Sharma & Jamwal, Fl. Upp. Lidd. Valley 1 : 131. 1988; *Cerastium aquaticum* L., Sp. Pl. 439. 1753; *Malachium aquaticum* (L.) Fries, Fl. Hall. 77. 1817.

Perennial viscidly pubescent herbs; stem much branched; leaves ovate, cordate, basal one petiolate, upper sessile; flowers white in axillary or terminal cymes; petals 2-fid; capsule exerted, 10 mm long; seeds subreniform, brown.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 213

*Distribution:* India (Jammu and Kashmir); Temperate and tropical Asia; Europe and Northern America.

### **SAGINA L.**

*Sagina apetala* Ard., Animad. Bot. Spec. 2: 22. t. 8. 1763; Stewart, *l.c.* 250. 1972.

Perennial decumbent glabrous tufted herbs; stem many from base; leaves connate at base, margined with white sheath, acuminate, basal leaves larger, upper smaller; flowers white, solitary axillary; sepals 4 or 5 green; petals absent; stamens 4 or 5; capsule minute, exerted, 3 mm long.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 587

*Distribution:* India (Jammu and Kashmir); Pakistan; Zimbabwe; almost Cosmopolitan.

### **STELLARIA L.**

*Stellaria media* (L.) Vill. Hist. Pl. Dauph. 3 : 615. 1789; Edgew. & Hooker f. in Hooker f., FBI. 1 : 230. 1874; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 38. 2012; Bhellum *et al.*, Fl. Exot. J & K. 79. 2013. *Alsine media* L., Sp. Pl. 272. 1753; *Stellaria media* Cyr., Ess. Pl. Char. 36. 1784.

An annual, decumbent, glabrous, branching herb. Leaves ovate, usually cordate, lower ones stalked while upper ones sessile and narrower. Flowers in axillary or terminal cymes. Sepals hairy. Petals deeply two lobed. Capsules ovoid.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 133

*Distribution:* India (Jammu and Kashmir, almost throughout India); Europe; and almost Cosmopolitan.

Parts used: Whole plant

Ethnobotanical utility: Paste of whole plant is used as plaster on swelling and broken bones.

Plant extract is anti-pyretic, and also cures chest congestion, cough and cold.

## 11. PORTULACACEAE

### *PORTULACCA* L.

*Portulacca oleracea* L., Sp. Pl. 445. 1753; Edgew. & Hooker f. in Hooker f., FBI. 1 : 246. 1874. Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 39. 2012; Bhellum *et al.*, Fl. Exot. J & K. 80. 2013.

Annual erect, prostrate herbs; stem 15-30 cm long, nodes reddish brown to light pink; leaves linear, oblong, 1-3 cm long apex rounded, margin entire, base cuneate; flowers few, yellow; sepals 5; petals 5, yellow; stamens 8-12; styles variable, 3-8; fruit capsule; seeds many dark brown.

*Flowering and Fruiting:* April-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 770

*Distribution:* India (Jammu and Kashmir); Northern America and throughout the warm countries of the world.

## 12. TAMARICACEAE

### *TAMARIX* L.

*Tamarix parviflora* DC.; Bhellum *et al.*, Fl. Exot. J & K. 81. 2013.

Deciduous shrubs or trees; stem much branched, 2-3 m tall, branches slender, arching; leaves alterante, scale like, deltoid, acute to acuminate, gibbous at base, deciduous, bright green, tiny glands secrete salts; inflorescence spike like racemes, slender, 4-6 cm long; flowers 4-merous, minute, rose-pink; stamens 4, filaments dilated at base; styles 3 or 4; capsule, 3-4 mm long.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 222

*Distribution:* India (Jammu and Kashmir); Pakistan; Europe and Burma. Native of Southern Europe.

### 13. HYPERICACEAE

#### ***HYPERICUM L.***

*Hypericum perforatum* L., Sp. Pl. 785. 1753; Dyer in Hooker f., FBI. 1 : 255. 1874; Rech., Fl. Iran. 49 : 17. 1968; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 40. 2012.

Perennial herbs; leaves oblong, obtuse, veins pellucid on lower surface; flowers 2.5 cm across in terminal corymbs; sepals narrowly lanceolate, acute, margin black dotted; petals yellow, margin black dotted; stamens numerous in 3 bundles; twice as long as ovary; fruit a capsule; seeds many.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 284

*Distribution:* India (Jammu and Kashmir); Central Asia; Russia; Europe; N.-W. Africa and introduced in other parts of the world.

### 14. MALVACEAE

#### **Key to Genera**

1	+	Fruit a schizocarp, breaking up into mericarp ----- 2
	-	Fruit a capsule, dehiscing loculi or septicidally ----- <i>Hibiscus</i>
2	+	Stigma capitate ----- <i>Malvestrum</i>
	-	Stigma not capitate ----- 3
3	+	Segments of epicalyx united at base ----- <i>Lavatra</i>
	-	Segments of epicalyx free at base ----- <i>Malva</i>

#### ***HIBISCUS L.***

#### **Key to Species**

1	+	Flowers yellow with dark purple centre ----- <i>Hibiscus trionum</i>
	-	Flowers bluish purple ----- <i>H. mutabilis</i>

***Hibiscus mutabilis*** L., Sp. Pl. 694. 1753; Stewart, *l.c.* 479. 1972; Bhellum *et al.*, Fl. Exot. J & K. 83. 2013.

Unarmed shrubs; leaves cordate, about 10 cm long, margin serrate; peduncle upto 10 cm long; bracts shorter than calyx; flowers about 10 cm across, white or purplish pink; sepals ovate, lanceolate, connate below the middle; capsule globose, flattened, hairy.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 116

*Distribution:* India (Jammu and Kashmir); Native of China and introduced in India.

***H. trionum*** L., Sp. Pl. 697. 1753; Masters in Hooker f., FBI. 1 : 334. 1874; Stewart, *l.c.* 480. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 41. 2012.

Annual, erect or branched herbs; stem slender, clothed with white stellate hairs; leaves dimorphic, 3-5 lobed; flowers solitary, pale yellow spotted purple in the centre.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 400

*Distribution:* India (Jammu and Kashmir); China; Kazakhstan; Kyrgyzstan; Mongolia and Pantropical.

### **LAVATRA L.**

***Lavatra kashmirica*** Cambess in Jacq. voy. Bot. 4 : 29. t. 32. 1844; Masters in Hooker f., FBI. 1 : 319. 1874; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 41. 2012.

Perennial 1-2.5 m tall, hispid herbs, hairs branched; leaves ovate, cordate, 3-5 lobed, margin toothed; flowers 7-11 cm across, purple, pink or white, streaked with dark veins; calyx 5-lobed, pubescent, acute; petals obcordate, cuneate; staminal tube short; anther pale-yellow; fruits black, enclosed in persistent calyx and epicalyx.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 450

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh); Western Himalayas and Pakistan.



## MALVA L.

### Key to Species

1	+	Stem erect ----- 2
	-	Stem decumbent, spreading ----- <i>Malva parviflora</i>
2	+	Flowers nearly sessile; bracteoles lanceolate ----- <i>M. verticillata</i>
	-	Flowers distinctly stalked ----- <i>M. sylvestris</i>

*Malva parviflora* L., Demonstr. Pl. 18. 1753; Masters in Hooker f., FBI. 1: 321. 1874; Borss. in Blumea 14 : 149. 1966; Stewart, l.c. 481. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 41. 2012; Bhellum *et al.*, Fl. Exot. J & K. 84. 2013.

Annual pubescent herbs; stem decumbent, clothed with stellate hairs; leaves alternate, simple; flowers shortly stalked; petals pale purple, longer than calyx; stamens numerous, monadelphous; fruit breaking into as many as the number of carpels.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 239

*Distribution:* India (Jammu and Kashmir); North Africa; South & West Asia. Nativity S. Europe.

*M. sylvestris* L., Sp. Pl. 689. 1753; Stewart, l.c. 481. 1972.

Annual more or less pubescent, erect herbs; stem upto 1 m tall; leaves orbicular, 2.5-7.5 cm across, lobes narrow, middle one the largest; flowers large stalked, bracteoles ovate; petals 5, notched at apex, purple, darkly streaked at base; fruits enclosed in persistent calyx.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 670

*Distribution:* India (Jammu and Kashmir); Pakistan; W. Europe; North Africa and Asia.

*M. verticillata* L., Sp. Pl. 689. 1753; Stewart, l.c. 481. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 41. 2012.

Annual erect, stellately pubescent herbs, 1-1.4 m tall; leaves orbicular, cordate, bracteoles narrow, acute; flowers purple, nearly twice as long as calyx; flowers nearly sessile; fruits enclosed in persistent calyx, ultimately separating from calyx.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 879

*Distribution:* India (Jammu and Kashmir), Temperate Himalayas; China; Europe; Asia; Ethiopia and Egypt.

**MALVASTRUM A. Gray, nom Cons.**

*Malvastrum coromandelianum* (L.) Garcke, Bonplandia **5** : 297. 1857; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 42. 2012; Bhellum *et al.*, Fl. Exot. J & K. 85. 2013. *Malva coromandeliana* L. Sp. Pl. 687. 1753; *M. tricuspidatum* (R. Br.) A. Gray, Pl. Wright. **1** : 16. 1852.

Annual, erect or suberect 30-70 cm tall, stellately hairy herbs; leaves ovate, or oblong, lanceolate, apex acute; flowers axillary; calyx lobed up to middle, ovate, acute; petals yellow, obovate, slightly curved at apex; fruit bristly, spinous or horned.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 451

*Distribution:* India (Jammu and Kashmir); America; Tropics of both the Hemisphere and Australia.

**15. ZYGOPHYLLACEAE**

**TRIBULUS L.**

*Tribulus terrestris* L., Sp. Pl. 387. 1753; Edgew. & Hooker f. in Hooker f., FBI. **1** : 423. 1874; Sharma & Kachroo, Fl. Jmu. **1** : 118. 1981; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 44. 2012.

Procumbent, prostrate, hairy, annual or biennial herb. Stem slender, prostrate, branched, nodes swollen, slightly purplish and hairy. Leaves with 4-7 pairs of unequal leaflets; leaflets sub-sessile and mucronate. Flowers yellow pseudo-axillary. Stamens 5 or 10. Fruits schizocarpic, breaking into 4-6 cocci and each coccus with two sharp divaricate spines *terrestris*.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 891

*Distribution:* India (Jammu and Kashmir); Pakistan; Africa; South Europe; North Australia and Tropical and subtropical parts of the world.

Parts used: Seeds, fruits

Ethnobotanical utility: Seed decoction is administered as diuretic. Dried and powdered fruits are taken orally with milk and honey as a treatment for male impotency.

## 16. GERANIACEAE

### Key to Genera

1	+	Stamens 10, all anther bearing ----- <i>Geranium</i>
	-	Stamens 10, only 5 anther bearing ----- <i>Erodium</i>

### ***ERODIUM* L.' Hér. ex Aiton**

*Erodium cicutarium* (L.) L. Herit. ex Ait., Hort. Kew ed. 1, 2 : 414. 1789; Edgew & Hooker f. in Hooker f., FBI. 1 : 434. 1875; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 44. 2012. *G. cicutarium* L. Sp. Pl. 680. 1753.

Annual, more or less viscidly glandular pubescent herbs; stem branched from the base, joints swollen; leaves opposite, 3-10 cm, pinnately divided, leaflets pinnatifid, acute, sometimes lobed; flowers purple in stalked, axillary, 2-10 flowered per umbel; sepals 5, acute, minutely awned; petals 5, unequal with 5 alternate glands; carpel pitted at top, slightly silky on inner surface.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 317

*Distribution:* India (Jammu and Kashmir); Pakistan; Russia; China; North Africa; South-West Asia and Europe.

### ***GERANIUM* L.**

#### Key to Species

1	+	Flowers large, purplish pink about 3.5 cm across; flowers purple blue ----- ----- <i>Geranium wallichiana</i>
	-	Flowers smaller, less than 2 cm across ----- 2
2	+	Leaves glabrous, shining ----- <i>G. lucidum</i>
	-	Leaves hairy, pubescent ----- 3
3	+	Leaves reniform ----- 4
	-	Leaves palmately lobed ----- <i>G. pucillum</i>
4	+	Leaf-segment deeply not lobed ----- <i>G. rotundifolium</i>
	-	Leaf-segments deeply lobed ----- <i>G. nepalense</i>

***Geranium lucidum*** L., Sp. Pl. 682. 1753; Stewart, Ann. Cata. Vasc. Pl. W. Pak. & Kashm. 429. 1972.

Annual or biennial usually glabrous herbs, often turning light red; stem slender, erect, or diffuse; leaves orbicular, 2.5-5 cm across, 5-7 lobed, shining, segments toothed; flowers pink, 1-1.2 cm across; calyx 5, angled, erect, acute; petals 5, entire; ovary distinct, smooth, styles 5,

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 285

*Distribution:* India (Jammu and Kashmir); China; Pakistan; N. Africa; Temperate and tropical regions.

***G. molle*** L. Sp. Pl. 682. 1753; Malhotra in Hajra et al. Fl. Ind. 4: 74. 1947.

Annual herbs; stem diffuse, softly villous, glandular; leaves orbicular, 5-9 lobed; inflorescence in axillary peduncles; sepals 5, green; petals 5, purplish pink, notched at apex; maricaps almost spherical.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*,

*Distribution:* India (Jammu and Kashmir); N. Africa; Europe; Russia; Taiwan. Native to Afghanistan.

***G. pusillum*** Burm. f., Syst. Nat. ed. 10, 1144. 1759. Edgew. & Hooker f. in Hooker f., FBI. 1: 432. 1874; *Bhellum et al.*, Fl. Exot. J & K. 90. 2013.

Annual diffused herbs; stem glandular pubescent; leaves suborbicular or reniform, 10-30 across, margin pinnatifid, 5-7 lobed; flowers bracteate, bracts ovate-lanceolate, hairy; sepals ovate-oblong, glandular pubescent; corolla lilac or pink, petals slightly exceeding the sepals; maricarps appressed pubescent; seeds oblong, glabrous.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 756

*Distribution:* India (Jammu and Kashmir), Nativity Asia, Pakistan, Nepal Europe and introduce in N. America

***G. rotundifolium*** L., Sp. Pl. 683. 1753; Edgew. & Hooker f. in Hooker f., FBI. 1 : 432. 1874; Sharma & Kachroo, Fl. Jammu. 1 : 119. 1981; *Bhellum & Magotra*, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 45. 2012.

Annual erect or spreading glandular hairy herbs; stem branched from the base; leaves 3-4.5 cm across, 5-7 lobed, usually red dotted below the notch; petiole elongate, 8-12 cm long; flowers 2-3 in axillary slender peduncles; pedicle reflexed in fruits; fruits 1-2 cm long; seeds brown.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 289

*Distribution:* India (Jammu and Kashmir); Afghanistan; Pakistan; W. Asia; N. Africa; Tajikistan; Turkmenistan and Uzbekistan.

***G. wallichiaum*** D. Don ex Sweet, *Geran.* 1, t. 90. 1821; Edgew. & Hooker f. in Hooker f., *FBI.* 1 : 430. 1874; *Bhellum* & Magotra, *A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal.* 45. 2012.

Perennial hairy herbs; rootstock thick; stem robust, erect; leaves orbicular, 5-13 cm , palmately 3-5 lobed, segments triangular, acute, irregularly toothed; flowers bluish-purple, 3-5 cm across; sepals abruptly pointed; petals notched at apex; stamens 10, filaments flattened at base; ovary 5-carpellary, styles 5; seeds smooth.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 145

*Distribution:* India (Jammu and Kashmir); Nepal; Pakistan and Afghanistan.

## 17. BALSAMIACEAE

### ***IMPATIENS* L.**

***Impatiens brachycentra*** Kar & Kir in *Bull. Soc. Nat. Mosc.* 15: 179. 1842; Stewart, *l.c.* 464. 1972; *Bhellum* & Magotra, *A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal.* 46. 2012.

Annual branched herbs; stem flexuose, grooved, 15-45 cm tall; leaves elliptic, ovate, margin serrate to crenate, base glandular, stipitate; inflorescence racemes; flowers white, zygomorphic, lip boat-shaped, spur minute; capsule erect, cylindrical or subclavate.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 453

*Distribution:* India (Jammu and Kashmir); West Temperate Himalays and Central Asia.

## 18. OXALIDACEAE

### *OXALIS* L.

*Oxalis corniculata* L., Sp. Pl. 435. 1753; Edgew. & Hooker f. in Hooker f., FBI. **1** : 436. 1874; Calder, Rec. Bot. Surv. Ind. **6** : 131. 1919; Kunth, Pfreich. **95** : 146. 1930; Eiten, Taxon **4** : 99-105. 1955; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 47. 2012; Bhellum *et al.*, Fl. Exot. J & K. 91. 2013.

An annual or perennial procumbent herb, rooting at joints. Leaves alternate; leaflets 3, pale-green, obcordate. The leaves have inconspicuous stipules at the base of each petiole. Flowers small, long-stalked, axillary, regular; petals yellow, twice as long as calyx; capsule shortly-beaked, tomentose and cylindrical. The fruit is a narrow, cylindrical capsule.

*Flowering and Fruiting*: November-June

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 242

*Distribution*: India (Jammu and Kashmir); Nativity S. Europe; Cosmopolitan, throughout the warm parts of the world.

Parts used: Whole plant

Ethnobotanical utility: Chewing of fresh leaves checks toothache and halitosis. Leaf juice is used as eyedrop to cure cataract. Plant extract acts as blood purifier and diuretic. Fresh leaf juice soothes eye inflammation, counteracts intoxication as an antidote.

## 19. SIMAROUBACEAE

### *AILANTHUS* Desf.

*Ailanthus altissima* (Mill.) Swingle, Jour. Wash. Acad. Sci. 6: 495. 1916; Stewart, *l.c.* 440. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 48. 2012; Bhellum *et al.*, Fl. Exot. J & K. 93. 2013.

Deciduous trees; leaves upto 80 cm long, leaflets usually 1-3 pairs of glandular teeth; petals woolly-tomentose within; filaments longer than anther lobes; samara twisted at the top.

*Flowering and Fruiting*: May-July

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 899

*Distribution*: India (Jammu and Kashmir); Pakistan; China and Temperate and subtropical regions of the world.

## 20. CELASTRACEAE

### *EUONYMUS* L.

*Euonymus hamiltonianus* Wall. in Roxb., Fl. Ind. ed. 1, 2 : 403. 1824; Lawson in Hooker f., FBI. 1 : 612. 1875.

Glabrous shrubs or trees; leaves thin, membranous, ovate-oblong, margin minutely toothed; inflorescence axillary cymes; calyx with 5 sepals; petals 5, oblong, lanceolate, greenish-white; capsule deeply 5-lobed.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 454

*Distribution:* India (Jammu and Kashmir); West Himalayas; Russia; Nepal; Afghanistan; Pakistan; Thailand and China.

## 21. MELIACEAE

### *MELIA* L.

*Melia azedarach* L., Sp. Pl. 384. 1753; Stewart, *l.c.* 441. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 49. 2012; Bhellum *et al.*, Fl. Exot. J & K. 93. 2013.

A large tree with straight trunk; leaves bi or tripinnately compound, leaflets ovate, 9-13, sub-opposite, obliquely lanceolate, serrate; flowers white, or pale purple, honey-scented, on short slender panicles; drupe ovoid-oblong, smooth, single seeded, dark-purple when ripe.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 427

*Distribution:* India (Jammu and Kashmir); Pakistan; China; Burma; Turkey; Iran; Sri Lanka; Thailand; Bhutan; Vietnam and Tropical Australia.

## 22. RHAMNACEAE

### *RHAMNUS* Juss.

*Zizyphus oxyphylla* Edgew. in Trans. Linn. Soc. Bot. 20 : 43. 1846; Lawson in Hooker f., FBI. 1 : 634. 1875; Stewart, *l.c.* 470. 1972.

Erect, glabrous shrubs; leaves alternate, ovate, sharply toothed, pointed, acute, 3-5 nerved from base; stipule spinous, persistent; flowers stalked, in small axillary glabrous cymes; drupe ovoid.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 405

*Distribution:* India (Jammu and Kashmir); West Himalayas.

## 23. VITACEAE

### Key to Genera

<b>1</b>	+	Petals 4 ----- <i>Cayratia</i>
	-	Petals 5 ----- <i>Parthenocissus</i>

### **CAYRATIA (Baker) Suess.**

*Cayratia trifolia* (L.) Domin. Biblioth. Bot. 89: 371. 1917; Shetty & Paramjit Singh in Flora of India 5: 275. 2000. *Vitis trifolia* L. Sp. Pl. 203. 1753; Stewart, l.c. 471. 1972.

Climber up to 4 m tall; leaves trifoliolate, 7-9 cm, oblong, leaflets ovate-suborbicular, margin crenate-dentate; flowers pale green or greenish white; calyx 0.5 mm, minute; petals 1.5 mm long; berry obovoid.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 292

*Distribution:* India (Jammu and Kashmir, and throughout other part of India); Pakistan, Sri Lanka, Malaya and China.

### **PARTHENOCISSUS Planch.**

#### Key to Species

<b>1</b>	+	Leaves simple, usually 3-lobed on short branches or unlobed on long branches ----- ----- <i>Parthenocissus tricuspidata</i>
	-	Leaves compound, 3-foliolate; leaflets nearly sessile----- <i>P. semicordata</i>

*Parthenocissus tricuspidata* Planch; *Bhellum et al.*, Fl. Exot. J & K. 95. 2013.

A large climber; branchlets terete, nearly glabrous or sparsely pilose; tendrils 5-9-branched, young apex expanded and ball-shaped; leaves simple, 3-5lobed on short branches, or small and unlobed on long branches; blade obovoid, 4.5-17 × 4-16 cm, glabrous above,



abaxially sparsely pubescent, base cordate, margin with rough teeth on each side, apex acute; calyx entire or undulate. Petals elliptic, 1.8-2.7 mm, glabrous; ovary oval; stigma not enlarged. Berry 1-1.5 cm in diam., 1-3-seeded. Seeds obovoid.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 455

*Distribution:* India (Jammu and Kashmir); Taiwan; Korea and China. Nativity Japan,

***P. semicordata*** (Wall.) Planch. in DC. Monogr. Phan. 5: 451. 1887.

Glabrous shrubs, climbing by tendrils on the trees; branches furrowed; leaves digitately compound, leaflets 3, shortly stalked, ovate, sharply toothed, acuminate, upper surface dark, shining; inflorescence cymes, leaf-opposed; flowers yellow; petals 4 or 5; stamens 4 or 5; berry black, 6-8 mm across.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 234

*Distribution:* India (Jammu and Kashmir; Himachal; Uttarakhand; Sikkim); Burma; Thailand; W. China and Pakistan.

## 24. ACERACEAE

### **ACER L.**

*Acer negundo* L., Sp. Pl. 1050. 1753; Stewart, *l.c.* 462. 1972; *Bhellum et al.*, Fl. Exot. J & K. 96. 2013.

Deciduous handsome trees; branches light brown, drooping; leaves opposite, pinnately compound, leaflets 3-5, margin coarsely serrate; flowers appearing before leaves, yellowish-green, racemes drooping in spring; stamens 4-6; fruits u-shaped samara, brownish.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 901

*Distribution:* India (Jammu and Kashmir; Pakistan; China and Northern America. Native to North America.

## 25. SAPINDACEAE

### *CARDIOSPEMUM L.*

*Cardiospermum halicacabum* L., Sp. Pl. 366. 1753; Stewart, *l.c.* 463. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 55. 2012.

An annual climbing herbs; stem branched, grooved; leaves ternately lobed, lobes toothed; flowers white in axillary long stalked cymes; tendrils near the base; sepals 4, free, concave; petals 4, in unequal pairs, each with a small scale on its inner face; stamens 8, unequal inserted at the base of 3-celled ovary; style 3 parted; capsule globse, membranous, 3-cornered; seeds 3, black, spherical bearing a white heart-shaped excrescence.

*Flowering and Fruiting:* June-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 768

*Distribution:* India (Jammu and Kashmir); Africa; America; Sri Lanka; Pakistan; Zimbabwe and Tropical and Subtropical Countries.

## 26. HIPPOCASTANACEAE

### *AESCULUS L.*

*Aesculus indica* Colebr ex Camb., Sp. Pl. 366. 1753; Hiern. in Hooker f., *FBI*. 1 : 670. 1875; Babu, *Herb. Fl. DD.* 110. 1977; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 56. 2012.

Deciduous trees; leaves 5-9 foliolate; leaflets oblong-oblanceolate or oblong-lanceolate, serrulate, acuminate, glabrous; flowers 2-2.5 cm across, in numerous small terminal, erect, cymes or in narrow panicles; corolla irregular, pinkish white; capsules brown-tomentose, ovoid.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 460

*Distribution:* India (Jammu and Kashmir, Uttarakhand, Himachal); Pakistan and China

## 27. FABACEAE

### Key to Genera

1	+	Plants trees ----- <i>Robinia</i>
	-	Plants not trees ----- 2
2	+	Rachis of leaves modified at the apex into a simple branched tendril ----- 3
	-	Rachis of leaves neither modified in a tendril nor into a bristle ----- 4
3	+	Staminal tube truncate at the top; styles bearded lengthwise on inner side otherwise glabrous ----- <i>Lathyrus</i>
	-	Staminal tube very oblique at the top; styles with bunches of hairs near apex or all round downy near tip ----- <i>Vicia</i>
4	+	Leaves 3-foliolate ----- 5
	-	Leaves 5-foliolate ----- <i>Lotus</i>
5	+	Stipules free, often small, caduceous ----- <i>Lespedeza</i>
	-	Stipules adnate to petiole, persistent ----- 6
6	+	Terminal leaflet stalked; corolla free from the staminal tube; petals caducous after flowering ----- 7
	-	Terminal leaflet sessile; corolla adnate to staminal tube, marcescent ----- <i>Trifolium</i>
7	+	Pods spirally coiled or strongly falcate ----- <i>Medicago</i>
	-	Pods neither spirally coiled nor falcate, rarely slightly curved ----- 8
8	+	Pods stout, subglobose or ovoid, 1 or 2-seeded ----- <i>Melilotus</i>
	-	Pods elongate, straight or nearly so ----- <i>Trigonella</i>

### ***LATHYRUS L.***

*Lathyrus aphaca* L., Sp. Pl. 729. 1753; Baker in Hooker f., FBI. 2 : 179. 1876; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 65. 2012.

Trailing or scrambling annual. Stem upto 45 cm tall, not winged, glabrous. Stipules foliaceous, broadly ovate, hastate, opposite appressed, rest of the leaf reduced to a tendril. Inflorescence a 1-2-flowered, axillary raceme. Peduncle 1-4 times as long as the stipules. Calyx 3-9 mm long. Corolla bright to pale yellow. Fruit glabrous, 4-6-seeded.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 456

*Distribution:* India ( Jammu and Kashmir); Europe; South West and Central Asia and N. Africa.

Parts used: Whole plant

Ethnobotanical utility: Cooked as vegetable.

### **LESPEDEZA Michx.**

*Lespedeza juncea* (L.) Pers., Syn. Pl. **2** : 318. 1827; Ali in Biologia **12** : 40. 1966; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 65. 2012.

Undershrub, upto 1 m tall; stem much branched, pubescent; leaves trifoliolate, petiolate, leaflet 8-22 mm, obovate, mucronate, glabrous above, densely silky beneath; stipule linear; inflorescence 2-4 flowered; bracts and bracteoles minute; petals pale yellow; pods silky.

*Flowering and Fruiting*: April-June

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 791

*Distribution*: India (Jammu and Kashmir, Uttarakhand, Rajasthan, Bihar, Assam,); Pakistan; Burma; Pakistan; china; Japan and North Australia.

### **LOTUS L.**

*Lotus corniculata* L. Sp. Pl. 775. 1753; *L. tenuis* Wald. & Kit. ex Wild., Exum. Hort. Berol 797. 1809; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 66. 2012. *L. corniculatus* ssp. *minor* Baker in Hooker f., FBI. **2** : 91. 1876.

Perennial herb, prostrate, ascending or decumbent, branches glabrous, subglabrous to densely pilose. Leaf rachis up to 6 mm long, broadly cuneate-obovate to narrowly obovate or linear-lanceolate, obtuse and apiculate to acuminate. Inflorescence a 3-6-flowered axillary, pedunculate umbel. Bracts sessile, leaf-like. Calyx c. 6 mm long, teeth unequal, glabrous or pubescent. Corolla yellow. Fruit cylindrical, straight, glabrous.

*Flowering and Fruiting*: May-July

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 518

*Distribution*: India, (Jammu and Kashmir, Uttarakhand, Himachal Pardesh); West Himalaya; Pakistan; Nepal; Afghanistan; Iran; Syria; Lebanon; Egypt; Cyprus; Russia; Europe; Mongolia; China; Japan; Korea and Australia

Parts used: Whole plant

## **MEDICAGO L.**

### **Key to Species**

<b>1</b>	+	Leaflets oblong; flowers purple ----- <i>Medicago falcata</i>
	-	Leaflets obovate; flowers yellow ----- <b>2</b>
<b>2</b>	+	Pods smooth, black on ripening, 2-3 mm across ----- <i>Medicago lupulina</i>
	-	Pods spirally twisted, prickly, green or brownish after reopening, 5-6 mm across ----- ----- <i>M. polymorpha</i>

***Medicago falcata*** L., Sp. Pl. 779. 1753; Boiss., Fl. Or. **2** : 93. 1872; Baker in Hooker f., FBI. **2**: 90. 1876; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 66. 2012.

Perennial, erect or prostrate, almost glabrous herbs to 70 cm tall; leaves 3-foliolate, leaflets oblanceolate or oblong minutely dentate; flowers in axillary racemes; calyx 5-toothed, teeth as long as the tube; corolla yellow, twice as long as calyx ca. 10 mm long. Pods 5-7.5 mm dia. falcate or near 1-coiled, glabrous, rarely pubescent.

*Flowering and Fruiting*: April-May

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 148

*Distribution*: India (Jammu and Kashmir), Africa; Temperate and Tropical Asia; Northern and Middle and Eastern Europe; North and South America; Australia.

***M. lupulina*** L., Sp. Pl. 779. 1753; Baker in Hooker f., FBI. **2** : 90. 1876; Cooke, Fl. Bomb. Pres. (repr. ed.) **1** : 326. 1958; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 66. 2012.

Annual or perennial. Stem prostrate or ascending, up to 60 cm long, pubescent, hairs simple or glandular. Leaflets obovate, cuneate, retuse to obcordate, apiculate, serrate in the upper half, stipules cordate, dentate. Inflorescence an axillary, pedunculate raceme. Bracts c. 0.5 mm long. Calyx pubescent, teeth almost equal to slightly longer than the tube. Corolla yellow. Fruit curved, sparsely pubescent to glabrescent, black, 1-seeded.

*Flowering and Fruiting*: March-May

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 300

*Distribution*: India (Jammu and Kashmir, Uttarakhad, Himachal Pradesh); Pakistan; Central Asia; N. Africa; Russia; Afghanistan; Iran; Syria; Turkey; Europe; Ethiopia; Somali; Republic and Kenya.

Parts used: Aerial parts

Ethnobotanical utility: Aqueous extract of plant has anti-microbial activities. Leaf extract has laxative properties and is used against constipation.

***M. polymorpha*** L., Sp. Pl. 779. 1753. emend.; Shinnors, Rhodora **58** : 5. 1956; Sharma & Kachroo, Fl. Jammu. **1** : 134. 1981; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 66. 2012.

Annual, prostrate or decumbent herbs, stem decumbent, 15 – 70 cm long; leaves 3-foliolate, leaflets obovate or obcordate, cuneate, denticulate; flowers yellow, 2-6 on top of peduncles; calyx bell-shaped, 5-toothed; corolla yellow, twice as long as calyx; pods 2 to 4-spirally coiled armed with hooked spines or tubercles along the outer margin, many seeded.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 208

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh, Uttarakhand); Throughout the world except for tropical regions and deserts. Native of Europe.

## **MELILOTUS Mill.**

### **Key to Species**

<b>1</b>	+	Flowers yellow; pods 1-seeded ----- <i>Melilotus indica</i>
	-	Flowers white; pods often 2-seeded ----- <i>M. alba</i>

***Melilotus alba*** Medik ex Sestr., (Vorles., Churpf. Phys. Gen. 2 : 382. 1787, nom. nud.) ex Desr. Encycl. **4** : 63. 1797; Baker in Hooker f., FBI. **2** : 89. 1876; Mansf., Fedde Repert **49** : 45. 1940; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 67. 2012.

Annual erect slightly pubescent herbs; stem 1.5 m tall or more; leaves pinnately compound, leaflets narrowly oblong, obovate, serrate towards upper parts; stipules narrowly lanceolate, entire; flowers 4-12 cm long axillary racemes; calyx bell-shaped, 5-toothed; corolla with wings and keel equal, standard not clawed, white; pods reticulately veined, longer than calyx, glabrous.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 218

*Distribution:* India (Jammu and Kashmir); Pakistan; Tibet; Persia; Afghanistan; C. Asia; Arabia; Europe; introduced in America and Australia.

***M. indica*** (L.) All., Fl. Pedem **1** : 308. 1785; Sharma and Kachroo, Fl. Jmu. **1** : 134. 1981; Sanjappa, Legum. of Ind. 210. 1991; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 24. 2012. *M. parviflora* Desf., Fl. Alt. **2** : 192. 1798; Baker in Hooker f., FBI. **2** : 89. 1876.

An annual herb, 30-45 cm high, with hairless stem. Leaves are odd-1-pinnate, leaflets 3, 2.5 cm, inverted lance-shaped to wedge-shaped-obovate, generally sharply toothed on the broader part, obovate or oblanceolate, stipules linear. Yellow flowers appear in slender, compact racemes that are 1-2 inches in length. Flowers have a sepal cup.

*Flowering and Fruiting*: March-May

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 158

*Distribution*: India (Jammu and Kashmir, Himachal Pradesh, Uttarakhand); Pakistan; Orient; Europe; introduced in warmer part of temperate regions.

Parts used: Leaves, seeds

Ethnobotanical utility: Leaf extract is used as aperients. Leaf paste is applied on the skin to remove acne and to make the skin look healthy, glowing and young. Seed powder is taken with lukewarm water to expel intestinal worms and also as antipyretic.

## **ROBINIA L.**

***Robinia pseudo-acacia*** L., Sp. Pl. 722. 1753; Sanjappa, Legum. of Ind. 241. 1991; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 68. 2012.

Trees, 10-25 m tall, deciduous. Bark gray-brown to dark brown. Leaves rachis adaxially grooved; leaflets 2-12 pairs, usually opposite or subopposite; leaflet blades oblong, elliptic, or ovate. Racemes axillary. Calyx obliquely campanulate. Corolla white, stipitate. Stamens diadelphous, one opposite to standard free. Ovary linear, glabrous; style subulate. Legume brown or with reddish brown stripes, calyx persistent. Seeds brown to dark brown, glossy.

*Flowering and Fruiting*: April-June

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 267

*Distribution*: India (Jammu and Kashmir); Pakistan; Northern America; Armenia; China; Georgia; Japan; Korea; Cyprus; Australia and Europe.

Parts used: Leaves

Ethnobotanical utility: Dried leaf powder is styptic. Leaf decoction is anti-spasmodic and relieves acidity and dyspepsia. Pinch of flower powder is taken with water to cure gastritis.

## **TRIFOLIUM L.**

### **Key to Species**

<b>1</b>	+	Flowers pink ----- <i>Trifolium hybrid</i>
	-	Flowers not as above ----- 2
<b>2</b>	+	Heads 5-10 mm long ----- <i>T. tomentosum</i>
	-	Heads more than 12 mm long ----- 3
<b>3</b>	+	Heads purple; pods 1-seeded ----- <i>T. pratense</i>
	-	Heads dull-white; pods 3-4 seeded ----- <i>T. repens</i>

### ***Trifolium hybridum* L.**

Annual glabrous herbs, upto 60 cm tall; rootstock creeping; stem, hollow, branched; leaves trifoliolate, leaflets obovate, base wedge shaped, apex rounded, margin toothed, glabrous; stipules oblong, large, united to one third of length united to leaf-stalk; flowers on heads, white tinged pink becoming brown with age; calyx 5-toothed, teeth sharply narrow, glabrous; corolla papilionaceous, purple; stamens diadelphous, upper one free, nine united in a sheath, split at top; ovary globular, style slender, glabrous; pods ovoid, minute, indehiscent, 3-4 seeded.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 392

*Distribution:* India (Jammu and Kashmir); Russian; Central Asia; Continental Asia; Scandinavia Mediterranean regions; Europe and Subtropical Countries.

*T. pratense* L., Sp. Pl. 768. 1753; Baker in Hooker f., FBI. 2 : 86. 1876; Sanjappa, Legum. of Ind. 263. 1991; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 69. 2012.

Perennial herbs. Stems numerous from crown, erect or ascending. Leaves palmately 3-foliolate, basal and cauline. Flowers 30-70, in dense globose or ovoid, terminal, sessile to shortly pedunculate heads. Calyx slightly pubescent or glabrous. Corolla purple, rarely pink or white, standard spatulate, apex rounded, retuse. Ovary elliptic. Legume ovoid. Seed 1, yellow or brown, ovoid.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 395

*Distribution:* India (Jammu and Kashmir); West Asia; North-West Africa; Europe and Pakistan.



Ethnobotanical utility: Tea prepared from leaves is used as expectorant against whooping and dry cough. Plant extract is taken orally as anti-spasmodic.

*T. repens* L. , Sp. Pl. 767. 1753; Baker in Hooker f., FBI. **2** : 86. 1876; Sanjappa, Legum. of Ind. 263. 1991; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 69. 2012.

Perennial herbs. Stems 10-30 cm, prostrate, rooting at nodes. Leaves long petiolate, palmately 3-foliolate. Flowers 20-50(-80), in terminal, globose umbels. Calyx 3-5 mm. Corolla white, rarely pink-tinged, 5-12 mm, fragrant. Ovary sessile, ovules 3 or 4. Legume linear-oblong. Seeds 2-4, ovoid to reniform.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 127

*Distribution:* India (Jammu and Kashmir); Pakistan and Europe

Ethnobotanical utility: Whole plant extract is taken as blood purifier, and as a cure for arthralgia.

*T. tomentosum* L., Sp. Pl. 771. 1753; Hossain, Notes Roy. Bot. Gardn. Edinb. **23** : 453. 1961; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 69. 2012.

Annual or biennial herbs; stem hollow, 30-60 cm tall; leaves trifoliolate, leaflets obovate, longer than broad; fruiting heads smooth, globular, calyx 5-toothed, cottony or pilose; corolla papilionaceous; stamens diadelphous, one free, nine jointed into a sheath; ovary globose, style slender; pods ovoid, indehiscent.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 200

*Distribution:* Naturalized in Jammu and Kashmir; India; Temperate Asia; Africa; Europe, Native of Europe.

## **TRIGONELLA L.**

### **Key to Species**

<b>1</b>	+	Fruits about 15 cm long; flowers white or cream coloured ----- ----- <i>Trigonella foenum-graecum</i>
	-	Fruits less than 7 cm; flowers yellow ----- <b>2</b>
<b>2</b>	+	Fruits more than 5 cm long ----- <i>T. incisa</i>
	-	Fruits less than 4 cm long ----- <i>T. emodi</i>

***Trigonella foenum-graecum*** L., Sp. Pl. 777. 1753; Stewart, *l.c.* 423. 1972.

An annual, strongly scented, robust herb with little branching. Leaflets 3, obovate, smooth and toothed. Flowers yellow, axillary, 1-2 and without stalks. Fruit a pod, long, sickle-shaped with a persistent beak. The dried plant gives a peculiar odour which makes this highly valuable for culinary use

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 115

*Distribution:* India (Jammu and Kashmir); Asia; Europe; Pakistan and naturalized elsewhere.

Parts used: Seeds

Ethnobotanical utility: Seeds deep fried in mustard oil are used as a poultice to curb arthralgia. Seeds kept overnight in curd and consumed on an empty stomach are effective in diabetes.

***T. emodi*** Benth. in Royle, Ill. Bot. Himal. Mount. 197. 1835; Stewart, *l.c.* 423. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 70. 2012.

perennial erect herbs; root-stock woody. Stem much branched, glabrous or rarely sparsely hairy. Leaflets 0.5 – 1.8 mm long, 0.8 – 2 mm broad, glabrous above, hairy or glabrescent beneath; petioles 0.4 – 1 cm long; stipules up to 1 cm long, dentate, acuminate. Inflorescence many flowered racemes; pedicel about 2.5 cm long; calyx sparsely pubescent; teeth *ca* 2 mm long; corolla 0.5 – 1 cm long. Pods 1 – 1.6 cm long, sickle shaped, transversely veined, glabrous.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 667

*Distribution:* India (Jammu and Kashmir); Temperate and Tropical Asia.

***T. incisa*** Benth. in Royle, Ill. Bot. Himal. 197. 1835. Stewart, *l.c.* 423. 1972.

Annual, prostrate or ascending herbs. Leaflets 0.5 – 1.2 cm long, 0.3 – 0.9 mm long, oblong, dentate. Flowers yellow, in axillary racemes; calyx *ca* 6mm long; teeth as long as the tube; corolla *ca* 7 mm long. Pods 4 – 7 cm long linear, many seeded.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 505

*Distribution:* India (Jammu and Kashmir); Asia and Russia.

## VICIA L.

### Key to Species

1	+	Flowers nearly sessile; Pods glabrous; seeds 4 or more ----- <i>Vicia sativa</i>
	-	Flowers on long peduncles; pods hirsute; seds usually 2 ----- <i>V. hirsuta</i>

*Vicia hirsuta* (L.) Gray, Syst. Arrang. Brit. Pl. 2: 614. 1821; *Vicia sativa* L., Sp. Pl. 736. 1753; Baker in Hooker f., FBI. 2 : 177. 1876; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 71. 2012.

Annual hirsute herbs; stem weak, climbing; leaves 3-7 cm long; leaflets 4-10 pairs, linear oblong, apex notched; flowers 3-5 on elongate peduncles; calyx 5-toothed; corolla white or white tinged with purple; pods usually 2 seeded.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*,

*Distribution:* India (Jammu and Kashmir); Nepal; Bhutan; Pakistan; N. Africa; Continental Asia and Europe.

*V. sativa* L., Sp. Pl. 736. 1753; Baker in Hooker f., FBI. 2 : 178. 1876 (Excl. var.); Ali in Bot. Not. 120 : 48. 1967; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 71. 2012.

Annual herbs, climb with the help of tendrils; leaves pinnate, leaflets 6-12, obovate or oblong-linear, apex truncate or retuse, usually mucronate; flowers pink or purple, solitary or in axillary pairs; corolla twice as long as calyx; style bearded below the stigma on lower side; pods linear, 3.5-7 cm long; seeds black.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 171

*Distribution:* India (Jammu and Kashmir); Nepal; Bhutan; Pakistan; N. Africa; Continental Asia and Europe.

## 28. ROSACEAE

### Key to Genera

1	+	Carpels superior, neither enclosed within nor adnate to calyx tube ----- 2
	-	Carpels inferior, enclosed within the calyx tube ----- <i>Crataegus</i>
2	+	Calyx ebracteolate ----- <i>Rubus</i>
	-	Calyx bracteolate ----- 3
3	+	Achenes scattered on surface of a brightly coloured enlarged receptacle --- <i>Fragaria</i>
	-	Achenes on a dry receptacle ----- 4
4	+	Stamens 5 ----- <i>Sibbaldia</i>
	-	Stamens 10 or more ----- 5
5	+	Achenes hairy; style elongate, terminal ----- <i>Geum</i>
	-	Achenes glabrous; style short, lateral ----- <i>Potentilla</i>

### **CRATAEGUS L.**

*Crataegus monogyna* Jacq. Fl. Austr. **30** : 50. 1775; Ball, Fl. Europaea **2** : 75. 1968; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 75. 2012. *C. oxycantha* L., Sp. Pl. 477. 1753 (Vom. Ambig.); Hooker f., FBI. **2**: 383. 1878.

A large glabrous spiny shrub; leaves narrowly oblong, 2.5-5 cm long, shortly stalked, margin crenate, apex obtuse; flowers white in corymbs; calyx tube bell-shaped, adnate to ovary; corolla with 5 orbicular petals; stamens numerous; carpels 5, distinct, styles 5, stigmas capitate; fruits drupe.

*Flowering and Fruiting*: May-June

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 137

*Distribution*: India (Jammu and Kashmir); Australasia; Northern America; Africa; Russian Federation; Georgia; Iraq; Iran; Israel; Lebanon; Turkey; Cyprus; Egypt; and European countries.

### **FRAGARIA L.**

*Fragaria vesica* L., Sp. Pl. 494. 1753; Hooker f., FBI. **2** : 341. 1878; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 75. 2012.

Perennial herbs, often stoloniferous. Leaves mostly radical, alternate, petiolate, stipulate. Lamina 3-foliolate or occasionally pinnately 5-foliolate. Inflorescence erect, terminal, cymose, few flowered, rarely solitary. Flowers bisexual (or sometimes unisexual on

polygamo-dioecious plants). Hypanthium obconic, flattened to slightly concave. Epicalyx 5-lobed, alternating with and smaller than sepals. Sepals 5, valvate, persistent. Petals 5, white, rarely yellow. Stamens numerous. Carpels numerous, free, borne on a convex receptacle, ovule epitropous. Fruit a glandetum formed from enlarged, fleshy receptacle. Achenes numerous, brownish.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 837

*Distribution:* India (Jammu and Kashmir); West Asia; Europe and East of N. America.

**Parts used:** Leaves, fruit

**Ethnobotanical utility:** Topical application of fruit juice cures sun burns and blemishes. Leaf extract is antipyretic. Fruits are eaten as such to relieve dyspepsia and also act as aperient.

### **GEUM L.**

*Geum urbanum* L., Sp. Pl. 501. 1753; Hooker f., FBI. 2 : 343. 1878; Stewart, *l.c.* 352. 1972; Sharma & Jamwal, *l.c.* 1 : 182. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 76. 2012.

Perennial herbs, 20-50 cm tall; rootstock rhizomatous; leaves compound, leaflets closely toothed or serrate, pubescent on both the surfaces; inflorescence in long stalked terminal cymes; stamens many, filaments jointed; style elongate, terminal; achenes in globose heads, hooked at tips.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 261

*Distribution:* India (Jammu and Kashmir); Europe and Middle East.

### **POTENTILLA L.**

*Potentilla supina* L., Sp. Pl. 497. 1753; Hooker f., FBI. 2 : 359. 1878; Stewart, *l.c.* 359. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 78. 2012.

Annual hairy herbs; stem many from the base; leaves pinnately compound, leaflets 3-9, thily pubescent on both the surfaces; flowers solitary axillary; calyx tube 5-lobed; corolla with 5 petals, petals shorter than sepals; styles short, lateral; achenes glabrous.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 283

*Distribution:* India (Jammu and Kashmir); Pakistan; Naturalized elsewhere.

## **RUBUS L.**

### **Key to Species**

<b>1</b>	+	Flowers white ----- 2
	-	Flowers pink ----- <i>Rubus ulmifolium</i>
<b>2</b>	+	Stem bristly, drupe yellow----- <i>R. ellipticus</i>
	-	Stem pubescent; drupes scarlet ----- <i>R. saxitalis</i>

***Rubus ellipticus*** Sm. in Rees Cyclop. 30. n 16. 1819; Sharma & Kachroo, Fl. Jmu. 1: 169. 1981.

Straggling, large shrub; stem armed with recurved prickles; leaves pinnately 3-foliolate; leaflets orbicular, or obovate, thick, margin closely serrate; flowers white, 12-15 mm across; drupes yellow, many borne on villous receptacles.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*,

*Distribution:* India (Jammu and Kashmir, Himachal); Temperate Asia; Nepal; Philippines; Sri Lanka; Thailand and Bhutan.

***R. saxitalis*** L., Sp. Pl. 494. 1753; Stewart, *l.c.* 369. 1972.

Glabrous or slightly pubescent; stem woody rhizome; prickles few slender, straight; leaflets 3, rhomboid-ovate, somewhat lobed, acute, doubly toothed, lateral sessile, base cuneate; petiole slender; stipule linear, oblong; flowers white, 1-1.4 cm across; sepals 5, ovate, lanceolate, acute; petals 5, white; fruits a large scarlet drupe.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 665

*Distribution:* India (Jammu and Kashmir); Temperate Asia and Europe.

***R. ulmifolium*** Schott. in Oken, Isis, Fasc. 5: 821. 1818; Stewart, *l.c.* 369. 1972; *Bhellum* & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 81. 2012.

Erect or suberect, armed rambling shrub, twigs angular tomentose; prickles stout, recurved; leaves compound, leaflets usually 3, sometimes 5, ovate, elliptic or obovate; inflorescence in terminal panicles; petals 5, pink, exceeding the length of sepals; fruitlets yellow turning black.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 559

*Distribution:* India (Jammu and Kashmir); Africa; Europe; Northern America and Southern America.

### **SIBBALDIA L.**

*Sibbaldia cuneata* Hornem. in Linnaea **20** : 59. 1847; Kitam., Fl. Afgh. 183. 1960; Hara & Ohashi in Hara, Fl. East. Himal. 132. 1960; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 81. 2012. *S. parviflora* Kitam., Fauna & Flora Nep. Himal. 160. 1955. (non Willd.).

Perennial tufted herbs; stem 10-30 cm tall; leaves digitately compound, leaflets 3, wedge shaped, base cuneate; inflorescence in corymbs; flowers yellow; sepals 5; petals 5, alternating with sepals, rarely opposite; stamens 10; carpels numerous; achenes hard, glabrous.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 913

*Distribution:* India (Jammu and Kashmir); Africa; Temperate and tropical Asia; Australasia; Northern America; Pacific countries; Southern America.

## **29. SAXIFRAGACEAE**

### **BERGENIA Moench.**

*Bergenia ciliata* f. *ligulata* Yeo. in Kew Bull. **20** (1) : 134. 1966; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 83. 2012. *Saxifraga ligulata* Wall. in Asiat. Res. **13** : 398. 1820. nom. illeg.; Clarke in Hooker f., FBI. **2** : 398. 1878; *B. himalaica* Boriss. in Acta. Inst. Bot. Acad. Sci. USSR Ser. 5, **4** : 322. 1956.

Perennial erect herbs; rootstock thick; stem short; leaves a few from the base, glabrous on both the surfaces, margins ciliate; inflorescence in one sided racemes; flowers purple-pink; stamens 10; carpels 2; capsule ovate-oblong; seeds brown.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 522

*Distribution:* India (Jammu and Kashmir); Temperate Himalayas; Bhutan and Afghanistan.

### 30. ONAGRACEAE

#### *EPILOBIUM* L.

##### Key to Species

1	+	Leaves sessile; stigma distinct, spreading ----- <i>Epilobium hirsutum</i>
	-	Leaves shortly stalked; stigma combined, club-shaped ----- <i>E. royleanum</i>

*Epilobium hirsutum* L. Sp. Pl. **1** : 347. 1753; Raven, Bull. Brit. Museum (Nat. Hist.) Bot. **2** : (12) : 352. 1962; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 91. 2012.

Perennial erect or prostrate herbs; stem terete, 30-150 cm tall; leaves sessile, opposite, broadly lanceolate, hairy or tomentose; inflorescence in raceme; calyx tube united with ovary; petals 4, erect, notched, pink-purple; stamens 8; ovary 4-celled; stigma distinct; capsule many seeded.

*Flowering and Fruiting*: April-May

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 517

*Distribution*: India (Jammu and Kashmir); Africa; Temperate Asia; Nepal; France; Germany; Hungary; Portugal; Spain; Romania and Netherland.

*E. royleanum* Haussk. in Oesterr. Bot. Zeitschr. **29** : 55. 1879; Raven in Bull. Brit. Museum (Nat. Hist.) Bot. Lond. **2** (1) : 358. 1962; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 91. 2012. *E. roseum* var. *indicum* Clarke in Hooker f., FBI. **2** : 584. 1879; *E. roseum* var. *dalhousieanum* Clarke in Hooker f., FBI. **2** : 584. 1879.

Annual pubescent herbs; stem erect or ascending; leaves thin, lanceolate, tapering at both the ends; flowers in axillary racemes, pink; calyx tube 4-lobed; corolla 4-lobed, pink; ovary 4-celled; capsule 4-angled, many seeded.

*Flowering and Fruiting*: April-May

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 523

*Distribution*: India (Jammu and Kashmir, Himachal Pradesh, Uttarakhand);



## **OENOTHERA L.**

*Oenothera rosea* Soland in Ait., Hort. Kew ed. 1, 2 : 3. 1789; Clarke in Hooker f., FBI. 2 : 582. 1879.

Perennial herb, flowering the first year, stems ascending, 1-4 dm tall, densely strigillose, rarely mixed with sparse villous hairs. Leaves subentire or sinuate-pinnatifid, elliptic or rarely narrowly ovate. Flowers opening near sunrise; mature buds erect. Floral tube 4-8 mm long. Petals rose to rose-purple, obovate. Capsule clavate. Seeds in several indistinct rows in each locule.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 315

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh, Uttarakhand); Pakistan

*Parts used:* Leaves

*Ethnobotanical utility:* Decoction of fresh leaves is taken orally against renal colic.

## **31. ARALIACEAE**

### **HEDERA L.**

*Hedera nepalensis* Koch, Hort. Dendrol. 284. t. 75. 1853; Stewart, *l.c.* 509. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 103. 2012.

Perennial climbers, with aerial roots. Leaves simple, lanceolate to ovate to variously lobed, glabrous; base cordate to rounded or cuneate; apex sub-acute to obtuse. Flowers yellow; pedicels 7-12 mm long, pedicels and peduncles hairy. Calyx entire. Anthers 1-2 mm long. Stylar column c. 1 mm long, persistent. Fruit a berry

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 141

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh, Uttarakhand); Pakistan, Africa, Temperate Asia and Europe.

*Parts used:* Berries, leaves

*Ethnobotanical utility:* Ripe berries are eaten as aperient. Leaf decoction is used as hair wash to get rid of hair lice. Dry leaves are used to cure sores.

## 32. APIACEAE

### Key to Genera

1	+	Leaf segments ovate-lanceolate ----- <i>Sium</i>
	-	Leaf segments not as above -----2
2	+	Fruit wall prickly or bristly ----- 3
	-	Fruit wall neither prickly nor bristly ----- 4
3	+	Prickles long, dense, curved ----- <i>Torilis</i>
	-	Prickles soft, appressed ----- <i>Daucus</i>
4	+	Fruits prolonged into an elongated beak ----- <i>Scandix</i>
	-	Fruit not prolonged into an elongated beak ----- 5
5	+	Stem green not purple spotted; fruits laterally compressed ----- <i>Chaerophyllum</i>
	-	Stem green, purple spotted; fruits dorsally compressed ----- <i>Conium</i>

### **CHAEROPHYLLUM L.**

*Chaerophyllum acuminata* Lindl. in Royle, Ill. Bot. Himal. Mount. 232. 1835; Sharma and Jamwal, *l.c.* 1 : 250. 1988.

Perennial erect herbs; stem over 50 cm tall, pubescent; leaves pinnately compound, segments linear-lanceolate; flowers white in umbels; calyx teeth obsolete; corolla with 5 petals; stamens 5; fruits cylindrical, glabrous;

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 220

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh, Uttarakhand); Pakistan; Afghanistan; Iran and Iraq.

### **CONIUM L.**

*Conium maculatum* L., Sp. Pl. 243. 1753; Rao in Bull. Bot. Surv. Ind. 2 (3 & 4) : 304. 1960; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 97. 2012.

Perennial, erect herbs; roots spindle shaped; stem hairy, hairs reflexed; leaves 2-3 pinnate, segments lobed or toothed; flowers white in umbels; petals white; fruits cylindrical, 6-9 mm long.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 657

*Distribution:* India (Jammu and Kashmir); Afganistan; Iran; Iraq; Armenia; Georgia; Pakistan; Middle Asia; Northern America; Australasia; S. America and Russian Federation.

### **DAUCUS L.**

*Daucus carota* L. Sp. Pl. 242. 1753 var. *sativa*.

Biennial, erect herbs; root-stock thick, conical, stem grooves, 1 m tall; leaves pinnately compound, lobed or entire, segments lanceolate, pubescent above, densely tomentose beneath; flowers in umbels, white or cream-coloured; calyx teeth obsolete; corolla with 5 petals; fruit obovate, dorsally compressed.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 432

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh, Uttarakhand); Western Himalayas and Pakistan.

### **SCANDIX L.**

*Scandix pecten-veneris* L., Sp. Pl. 256. 1753; Stewart, *l.c.* 526. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 100. 2012.

Annual pubescent or glabrescent herbs; stem 20-40 cm tall; leaves compound, segments narrow; inflorescence in umbels; flowers white, bisexual or staminate; fruits clavate, oblong, redges blunt, mericarps slightly bristly.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 256

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh, Uttarakhand) and Pakistan

### **SIUM L.**

*Sium maculatum* C. B. Clarke, in Hooker f., Fl. Brit Ind. 2: 683. 1879; Sharma & Jamwal, Fl. Upp. Lidd. Valley 1: 249.1988.

Glabrous herbs, about 1 m tall; leaves pinnate, pinnae ovate, serrate; inflorescence umbels; flowers bracteates, minute, white; calyx teeth obsolete; corolla with 5 petals; fruit ovoid, oblong, furrowed.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 176

*Distribution:* India (Jammu and Kashmir); Western Himalayas; Poland; Germany; Ukrain; Norway; France; Spain; United Kingdom; Kazakistan; Russian Federation; Russia and Western Siberia.

**TORILIS Adans.**

*Torilis japonica* (Houtt.) DC. Prodr. **4** : 219. 1830; Raizada, Ind. For. **92** (5) : 299. 1968; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 101. 2012. *Caucalis japonica* Houtt., Nat. Hist. **26** : 42. 1777; *Torilis anthriscus* (L.) Gmel., Fl. Bad. **1** : 615. 1805.

Annual erect hispid herbs; stem upto 70 cm tall, furrowed; leaves pinnately compound, segments oblong, inflorescence umbels; flowers white; calyx 5-lobed, lobes obsolete; corolla with 5 petals; stamens 5; fruits ellipsoid, narrowed upwards, primary redges spongy, tubercled.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 679

*Distribution:* India (Jammu and Kashmir); Japan; China; Bhurma; Formosa; Korea and Sumatra.

**33. CAPRIFOLIACEAE**

**Key to Genera**

<b>1</b>	+	Scandent shrubs; flowers in axillary cymes ----- <i>Lonicera</i>
	-	Erect shrubs; flowers in terminal cymes ----- 2
<b>2</b>	+	Flowers white or cream coloured; fruit a berry ----- <i>Viburnum</i>
	-	Flowers purplish pink streaked yellow; fruit a capsule ----- <i>Weigela</i>

**LONICERA L.**

*Lonicera japonica* Thunb., Fl. Jap. 89. 1784; Stewart, *l.c.* 693. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 104. 2012.

Scandant, spreading shrubs; leaves opposite, ovate, cordate, pilose on both the surfaces, margins ciliate; flowers pink, yellow or reddish in axillary pairs, rarely 3 in terminal cymes; calyx tube 5-toothed; corolla distinctly 2-lipped; stamens 5, exserted; ovary 2-3 celled, style long, stigma capitate; fruit a berry, distinct or united in pairs.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 272

*Distribution:* India (Jammu and Kashmir); Pakistan; Europe and N. Africa

### **VIBURNUM L.**

#### ***Viburnum opulus* L.**

Shrubs, deciduous, much branched 2-4 m tall; leaves opposite; inflorescence in corymbose cymes; flowers cream coloured or pretty pink or white tinged with pink, marginal flowers sterile; calyx 5-toothed; corolla campanulate, 5-lobed; fruit a drupe.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 965

*Distribution:* India (Jammu and Kashmir); China; Temperate Asia; Mongolia; Korea; Russia; Russian Federation; Japan and Eastern Siberia.

### **WEIGELA Thunb.**

*Weigela florida* (Bunge) A. DC. in Ann. Sci. Nat. Bot. ser. 2, 11. 241. 1839; Stewart, *l.c.* 696. 1972.

Showy, deciduous shrub; stem branched, branches arching; leaves opposite, oblong, margin toothed; inflorescence in corymbs; flowers pale-pink, funnel-shaped, 3 cm long; corolla lobes often unequal; capsules elongate, narrow, woody, dehiscent by 2-valves from the top.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 462

*Distribution:* India (Jammu and Kashmir) and N. China and other parts of East Asia

## **34. VALERIANACEAE**

### **VALERIANA L.**

*Valeriana jatamansi* Jones in Asiat. Res. 2 : 416. 1790; Rech. f., Fl. Iran. 62 : 20. 1969; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 110. 2012. *V. wallichii* DC. Mem. Valer. 15. t. 4. 1832; Clarke in Hooker f., FBI. 3 : 213. 1881.

Perennial herbs; stem 20-70 cm tall; rootstock thick, stout, fibrous, aromatic; stem many from the base; leaves radicle, long petiole, ovate-cordate, margin sinuate or crenulate; inflorescence in dense corymbs or cymes; flowers white tinged with pink; corolla 5-lobed; stamens 3; achenes shaggy.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 492

*Distribution:* India (Jammu and Kashmir); Afghanistan; Pakistan; Temperate and tropical Asia; China and Myanmar.

### 35. RUBIACEAE

#### Key to Genera

1	+	Corolla 5-lobed; fruits fleshy ----- <i>Rubia</i>
	-	Corolla 4-lobed; fruits dry ----- <i>Galium</i>

#### *GALIUM* L.

#### Key to Species

1	+	Plants glabrous; leaves penninerved ----- <i>Galium asperuloides</i>
	-	Plants scabrid, hairy to recurved prickly; nerves on leaves obsolete ----- <i>G. aparine</i>

*Galium aparine* L., Sp. Pl. 108. 1753; Hooker f., FBI. **3** : 205. 1881; Stewart, *l.c.* 684. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 106. 2012.

Annual trailing herbs; stem branched, angular, beset with minute recurved prickles; leaves in whorls of 6-8, linear or narrowly lanceolate, midribs and margins minutely prickly; flowers white tinged with green; fruits clothed with hooked bristles.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 450

*Distribution:* India (Jammu and Kashmir); Pakistan; Nepal; Iraq; Victoria; Libia and United States of America.

*G. asperuloides* Edgew., in Trans. L. Soc. **20** : 61. 1836; Kitam., Fl. Afgh. 368. 1960; Nazim. & Quais. in Nasir & Ali, Fl. W. Pak. **190** : 76. 1989. var. *asperuloides*; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 106. 2012. *G. triflorum* auct. non. Linn.; Hooker f., FBI. **3** : 205. 1881.

Annual erect, 15-40 cm tall herbs; stem 4-angular, smooth; leaves sessile, 6-8 in a whorl, 2-5 cm long, lanceolate, obovate or narrowly elliptic, acute or apiculate, margin

scabrid, glabrous; flowers white, 2.5-3.5 mm across; pedicel 5 mm long; fruits upto 4.5 mm across, clothed with hooked hairs.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 892

*Distribution:* India (Jammu and Kashmir); Pakistan; Libia; Mexico; Canada; Greenland; Iraq and Victoria.

### **RUBIA L.**

*Rubia cordifolia* L. Syst. Nat. ed. 12, 3: 229. 1769; Kitam. in Fl. Afghan. 369. 1960; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 109. 2012.

Perennial climbing herbs; stem 4-angular, angles sharp, prickly or scabrous; leaves usually in whorls of 4, cordate, ovate, margins prickly, apex acuminate; inflorescence in numerous axillary cymes; flowers white or cream-coloured; corola 4-lobed, lobes recurved; stamens 5; carpels 2, united, styles 2, united at base, stigam capitate; fruit succulent, globose, purple or balck when ripe, seeds 2, minute.

*Flowering and Fruiting:* March-April

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 206

*Distribution:* India (Jammu and Kashmir); Zimbabwe; Africa; Kenya; Sudan; Awetzerland; China; Afghanistan; Veitnam; Indonesia; Philippines and Pakistan.

## **36. ASTERACEAE**

### **Key to Genera**

<b>1</b>	+	Heads simple ----- 2
	-	Heads compound ----- <i>Echinops</i>
<b>2</b>	+	Heads discoid ----- 3
	-	Heads radiate or ligulate ----- 16
<b>3</b>	+	Pappus of hairs ----- 4
	-	Pappus of scales or bristles ----- 11
<b>4</b>	+	Involucral bracts spiny ----- 5
	-	Involucral bracts not spiny ----- 9
<b>5</b>	+	Leaves not prickly; spines hooked ----- <i>Arctium</i>
	-	Leaves prickly; spines not hooked ----- 6

6	+	Stem winged ----- <i>Carduus</i>
	-	Stem not winged ----- 7
7	+	Pappus of feathery hairs ----- 8
	-	Pappus of simple hairs ----- <i>Silybum</i>
8	+	Filaments of stamen hairy ----- <i>Cirsium</i>
	-	Filaments of stamens glabrous ----- <i>Cousenia</i>
9	+	Erect herbs ----- <i>Centaurea</i>
	-	Prostrate herbs ----- 10
10	+	Heads solitary ----- <i>Cotula</i>
	-	Heads numerous paniced racemose ----- <i>Artemisia</i>
11	+	Leaves pinnately divided ----- 12
	-	Leaves undivided ----- 13
12	+	Leaves opposite ----- <i>Siegesbeckia</i>
	-	Leaves alternate ----- 14
13	+	Florets purple ----- <i>Ageratum</i>
	-	Florets never purple ----- 15
14	+	Florets yellow ----- <i>Carpesium</i>
	-	Florets white or cream coloured ----- <i>Xanthium</i>
15	+	Heads radiate ----- 17
	-	Heads ligulate ----- 27
16	+	Pappus of 2 lateral reflexed awns ----- <i>Parthenium</i>
	-	Pappus absent or of hairs or scales never reflexed ----- 18
17	+	Pappus o 2-4 setae, retroseely bristly ----- <i>Bidens</i>
	-	Pappus of hairs or absent ----- 19
18	+	Ray florets yellow ----- 20
	-	Ray florets purple or white ----- 25
19	+	Leaves stalked -----22
	-	Leaves sessile ----- 21
20	+	Prostrate herbs; achenes straight ----- <i>Bellis</i>
	-	Erect herbs; achenes strongly incurved ----- <i>Calendula</i>
21	+	Ligules conspicuous ----- 23
	-	Ligules inconspicuous ----- <i>Conyza</i>
22	+	Heads paleaceous ----- <i>Achillea</i>
	-	Heads not paleaceous ----- 24



23	+	Pappus absent ----- <i>Matricaria</i>
	-	Pappus of hairs ----- 25
24	+	Phyllaries uniseriate ----- <i>Solidago</i>
	-	Phyllaries multiseriate ----- <i>Senecio</i>
25	+	Disc florets yellow ----- <i>Helianthus</i>
	-	Disc florets white or purple ----- 27
26	+	Pappus of 2-5 teeth ----- <i>Eclipta</i>
	-	Pappus of several fringed scales ----- <i>Galinsoga</i>
26	+	Pappus of scales ----- <i>Cichorium</i>
	-	Pappus of hairs ----- 28
27	+	Pappus of simple hairs ----- 29
	-	Pappus of feathery hairs ----- 32
28	+	Achenes beaked ----- 30
	-	Achenes not beaked ----- <i>Sonchus</i>
29	+	Achenes dilated at tip ----- <i>Lactuca</i>
	-	Achenes not dilated at tip ----- 31
30	+	Beak of achene very short ----- <i>Youngia</i>
	-	Beak of achene longer than achene ----- <i>Taraxacum</i>
31	+	Plants non-aromatic; leaves simple, entire ----- <i>Tragopogon</i>
	-	Plants strongly aromatic; pappus scales unequal ----- <i>Tagetes</i>

### **ACHILLEA L.**

*Achillea millefolium* L., Sp. Pl. 899. 1753; Hooker f., FBI. **3** : 312. 1881; Stewart, *l.c.* 711. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 112. 2012.

Perennial herb. Stem 15-60 cm high. Leaves sessile, pinnately compound, radial leaves petiolate. Head radiate, 5-7 mm in diameter, crowded in compound corymb. Ray florets reflexed, white. Achenes oblong, pappus absent

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 136

*Distribution:* India (Jammu and Kashmir); N. Asia, Europe and America

## **AGERATUM L.**

*Ageratum houstonianum* Mill., Gard. Dict. ed. 8, 2. 1769; Stewart, *l.c.* 712. 1972.

Annual herb, about 90 cm high, stem erect, branched, and hairy, green or purple; leaves opposite but upper leaves may be alternate, ovate, hairy on both sides and stalked; inflorescence heads mauve, pale-blue or faintly pinkish-purple, fragrant, discoid, in terminal corymbs; pappus scales and achenes angled and black.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 521

*Distribution:* India (Jammu and Kashmir) and all Tropical countries of the world.

## **ARCTIUM L.**

*Arctium lappa* L., Sp. Pl. 816. 1753; Hooker f., FBI. **3** : 359. 1881; Stewart, *l.c.* 714. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 115. 2012.

Erect, coarse herbs; stem branched, furrowed; leaves alternate, broadly ovate or cordate, margin minutely toothed, hoary; involucre bracts many serriate, spiny, hooked, outer free, inner connate; heads homogamous, upto 3.5 cm across; disc florets 5-fid, purple; stamens 5, anther cells sagittate, purple; style arms 2; pappus hairs short; achenes oblong, trigonous.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 128

*Distribution:* India (Jammu and Kashmir); Mediterranean region; British Isles; China; Middle East; Russia and Japan.

## **ARTEMISIA L.**

### **Key to Species**

<b>1</b>	+	Plants glabrous; leaflets pinnatisect, glabrous ----- <i>Artemisia biennis</i>
	-	Plants hairy; leaflets pinnatipartite, grey tomentose underneath ----- <i>A. vulgaris</i>

*Artemisia biennis* Willd., Phytogr. 11. n. 39. 1794; Hooker f., FBI. **3** : 324. 1881; Stewart, *l.c.* 715. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 115. 2012. *A. tournefortiana* Reichenb. *l.c.* exot. **1** : 6. t. 5. 1824; Hooker f., FBI. **3** : 324. 1881.

Annual or perennial glabrous herbs; stem 1-2 m tall; leaves linear-oblong, 6-12 cm long, pinnate, lobes small, oblong, toothed; heads 3-4 mm in dense panicles; bracts erect, glabrous, obovate-oblong, acute; achenes minute.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 516

*Distribution:* India (Jammu and Kashmir); Temperate Asia; Nepal; Pakistan; Afghanistan; Europe and Russian Federation.

***A. vulgaris*** L., Sp. Pl. 848. 1753; Stewart, *l.c.* 720. 1972.

Perennial, erect or ascending aromatic woody shrubs; stem branched, branches grooved; glabrous; leaves pinnatipartite, segments lanceolate, oblong, margin entire, glabrate above, densely tomentose beneath; heads with 5-11 florets; achenes minute.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 708

*Distribution:* India (Jammu and Kashmir); Nepal and Temperate Himalayas

### **BELLIS L.**

***Bellis perennis*** L., Sp. Pl. 886. 1753; Stewart, *l.c.* 299724. 1972; *Bhellum* & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 118. 2012; *Bhellum et al.*, Fl. Exot. J & K. 2013.

Perennial herbs; leaves radical, obovate, slightly crenate, pubescent; heads on elongate peduncle of variable length; bracts green, narrowly oblong; rayflorets white tinged with pink; disc florets cream coloured; achenes pubescent.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 155

*Distribution:* India (Jammu and Kashmir); Europe, Zimbabwe and Pakistan.

### **BIDENS L.**

#### **Key to Species**

<b>1</b>	+	Leaves bipinnate; pappus with 2-4 bristly ----- <i>Bidens bipinnata</i>
	-	Leaves unipinnate; pappus usually with 2 bristles ----- <i>B. tripartita</i>

***Bidens bipinnata*** L., Sp. Pl. 832. 1753; Stewart, *l.c.* 724. 1972.; Stewart, *l.c.* 724. 1972; Babu, Herb. Fl. DD. 242. 1977; Rao et al., Floe. Inde. Enum. – Aster. 13. 1988; *Bhellum* &

Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 118. 2012. *B. decomposita* Wall. ex DC. Prodr. **5** : 602. 1836; *B. pilosa* var. *bipinnata* (L.) Hooker f., FBI. **3**: 309. 1881.

Erect, branched herbs; stem 4-angular 25-100 cm tall; leaves opposite, towards base and alternate above, 2-3 pinnate or pinnatifid, segments ovate, acuminate; heads yellow; involucre bracts 2-seriate; rays absent; disc florets bisexual, 5-fid; stamens sagittate at base; achenes 4-angular; setae retrose bristly.

*Flowering and Fruiting*: April-August

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 729

*Distribution*: India (Jammu and Kashmir); Northern America and Southern America.

*B. tripartita* L., Sp. Pl. 831. 1753; Hooker f., FBI. **3** : 309. 1881; Stewart, *l.c.* 725. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 119. 2012.

Annual almost glabrous herbs; stem 4-angular; leaves divided into 3 main segments; segments lanceolate, lobulate, margin sharply toothed, base ciliate, otherwise glabrous; heads nodding; involucre bracts in two rows, outer broader than inner, shining; disc 5-lobed, dull-yellow, brown; achenes flattened with 2 bristles, barbs reflexed.

*Flowering and Fruiting*:

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 759

*Distribution*: India (Jammu and Kashmir) and Europe

## **CALENDULA L.**

*Calendula arvensis* L., Sp. Pl. ed. 2, 1303. 1762; Stewart, *l.c.* 726. 1972.

Annual viscid pubescent herbs; stem erect, or decumbent branched from the base; basal leaves spatulate, upper oblong, or lanceolate, remotely sinuate, teeth dark tipped; heads yellow; achenes curved, muricate on dorsal side.

*Flowering and Fruiting*: April-May

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 433

*Distribution*: India (Jammu and Kashmir); Pakistan; Europe and N. Africa.

## **CARDUUS L.**

*Carduus edelbergii* Rech. f., in K. Danske vid. Selsk. Biol. **8** (2) Symb. Afghan. **2** : 175. 1955; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 120. 2012. *C. nutans* L.; Hooker f., FBI. **3** : 361. 1881. non L.

Annual or biennial, unbranches, stout herbs; stem winged, spinous grooved; leaves 15-30 cm long, pinnately lobed; margin wavy, spiny; flowers many in nodding heads; involucral bracts lanceolate, awl-shaped, ending in erect or reflexed spines; pappus united at base, soon falling off; disc florets deeply 5-lobed; anther sagittate at base; style arms 2, short blunt; achenes quadrangular, smooth, pale-brown.

*Flowering and Fruiting:*

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 999

*Distribution:* India (Jammu and Kashmir); Afghanistan; Pakistan and Nepal.

## **CARPESIUM L.**

*Carpesium abrotanoides* L., Sp. Pl. 860. 1753; Hooker f., FBI. **3** : 301. 1881; Stewart, *l.c.* 727. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 120. 2012.

Perennial, erect herbs; stem branched, branches slender; leaves subsessile, ovate-lanceolate, 5-15 cm long, narrow at both ends, margin entire, serrate, glabrous on upper surface, pubescent beneath on ribs, glandular, glands pale-yellow, shining; heads numerous, in remote secund, discoid, 4-6 mm across; outer involucral bracts green, inner scarious; florets bisexual 5-toothed; anther bases sagittate; achenes elongate with glandular beak, minutely ribbed.

*Flowering and Fruiting:*

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 736

*Distribution:* India (Jammu and Kashmir); China and Russia.

## **CENTAUREA L.**

### **Key to Species**

<b>1</b>	+	Phyllaries spine tipped ----- <i>Centaurea iberica</i>
	-	Phyllaries not spine tipped ----- <i>C. cyanus</i>

*Centaurea cyanus* L., Sp. Pl. 911. 1753; Stewart, *l.c.* 729. 1972; Bhellum *et al.*, Fl. Exot. J & K. 198. 2013.

Annual or biennial erect, branched, medium sized cottony herbs; basal leaves oblong, pinnately lobed, upper linear lanceolate; heads obovoid; involucral bracts with margin scarious; outer florets with dark blue florets; heads solitary or clustered, densely bristly or cottony; achenes oblong, somewhat 4-angular, shining, silky; pappus none.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 737

*Distribution:* India (Jammu and Kashmir); Russia; Europe and Northern America.

**C. iberica** Trev. ex Spreng., Syst. 3: 406. 1826; Stewart, *l.c.* 729. 1972.

Annual or perennial, much branched herbs; stem 15-60 cm tall or more, branches divaricate; basal leaves runcinate-lyrately pinnatisect, lobes ovate or lanceolate, denticulate at margins, upper sessile or subsessile; heads 1 cm across; involucral bracts with margin scarious, spine tipped; achenes 3-3.5 mm long,

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 434

*Distribution:* India (Jammu and Kashmir); Pakistan; China; S.-W. Asia; Russia and Europe.

## **CICHORIUM L.**

*Cichorium intybus* L., Sp. Pl. 813. 1753; Hooker f., FBI. 3 : 391. 1881; Stewart, *l.c.* 732. 1972; Rao *et al.*, *l.c.* 25. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 120. 2012.

Annual or perennial herbs; rootstock thick; stem stiff, angular, branched, branches spreading; leaves in rosette at base, stalked, runcinate, more or less bristly underneath, upper sessile exutes white milky; involucral bracts ovate, spreading, inner shorter than outer; heads ligulate, blue; cypselae fringed with bristles.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 933

*Distribution:* India (Jammu and Kashmir); South-West Asia; Pakistan; Europe and Northern America.

## **CIRCIUM Mill.**

### **Key to Species**

<b>1</b>	+	Florets dingy purple ----- <i>Circium arvense</i>
	-	Florets yellow, cream coloured or white ----- <i>C. wallichii</i>

*Circium arvense* (L.) Scop., Fl. Carn. ed. 2, 2: 126. 1772; Stewart, *l.c.* 733. 1972.

Erect branched herb; stem 1 m tall or more; stem somewhat cottony upwards; leaves oblong, 6-20 cm long, sinuate, pinnatifid, white tomentose beneath; heads pale-purple, 2-2.5 cm long; involucre bracts green tinged purple, outer spiny, spreading; achenes 3-3.5 mm long, brown; pappus light brown.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 387

*Distribution:* India (Jammu and Kashmir); Afghanistan; S.-W. Asia; Russia; Japan; Korea; Mongolia; Nepal and Europe.

*C. wallichii* DC., Prodr. **6** : 643. 1838; Stewart, *l.c.* 734. 1972; Kitamura & Gould in Enum. Fl. Pl. Nep. **3** : 20. 1982; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 121. 2012. *Cnicus wallichii* (DC.) Hooker f., FBI. **3** : 363. 1881.

Annual or perennial, erect herbs; stem robust, fleshy, grooved, hollow; leaves oblong undulate, lobes spiny, radical 30 cm long, upper smaller, 10-20 cm long, glabrous or cottony beneath; heads erect, 2-4 cm across, sessile or shortly peduncled; involucre bracts narrow, oblong, rigid, spine tipped, spreading; achenes brownish white; pappus light-brown.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 494

*Distribution:* India (Jammu and Kashmir); Afghanistan; China and Nepal.

## **CONYZA Less.**

### **Key to Species**

<b>1</b>	+	Plants appressed hairy; heads 1-12 mm across----- <i>Conyza bonariensis</i>
	-	Plants velvety-hairy or glabrous; heads 5-7 mm across ----- 2
<b>2</b>	+	Ray florets pinkish purple ----- <i>C. canadensis</i>
	-	Ray florets white ----- <i>C. stricta</i>

*Conyza bonariensis* (L.) Cronq., in Bull. Torrey Bot. Club. **70**(6) : 632. 1943; Stewart, *l.c.* 734. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 121. 2012. *Erigeron bonariensis* L., Sp. Pl. 863. 1753; Matthew, Exot. Fl. Kod. & Palni Hills **3** : 21. 1982.

Annual or biennial herbs; stem branched, 0.5-1.5 m tall, hirsute; rootstock thick; leaves oblanceolate, 3-10 cm long, acute; heads 5-10 mm across; involucral bracts 2-4 mm long, hirsute; disc florets purple tipped; achenes 1 mm long; pappus pale yellow.

*Flowering and Fruiting*: April-August

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 194

*Distribution*: India (Jammu and Kashmir); Afghanistan; Nepal; China; Srilanka, Pakistan, Bhutan, Tropical America. Originated in S. Europe.

*C. canadensis* (L.) Cronq., in Bull. Torrey Bot. Club. **70** : 632. 1943; Stewart, *l.c.* 734. 1972; Kitamura & Gould in Enum. Fl. Pl. Nep. **3** : 21. 1982; Rao et al., *l.c.* 27. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 121. 2012.

Annual 15-100 cm tall herbs; stem branched above, grooved, hirsute or glabrous; leaves linear or linear-lanceolate, margin or toothed; heads 5-6 mm across; involucral bracts narrow, glabrate, acuminate; ligules pale rosy, purplish; achenes 1 mm long, glabrous; pappus dirty white.

*Flowering and Fruiting*: April-August

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 797

*Distribution*: India (Jammu and Kashmir); Cosmopolitan; Originated in N. America and now widely distributed in the old world.

*C. stricta* Willd., var. *pinnatifida* Kitamura, Fl. East. Himal. 337. 1966; Lauener in Notes Roy. Bot. Gardn. Edinb. **34** : 342. 1975; Rao et al., Floe. Inde. Enum. – Aster. 28. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 122. 2012. *Erigeron pinnatifida* D. Don, Prodr. 172. 1925. non Thunb. 1800; *E. trisulcum* D. Don, Prodr. 172. 1825; *Conyza stricta* Sensus Hooker f., FBI. **3** : 258. 1881.

Annual, 60-100 cm tall herbs; stem branched; leaves linear, oblanceolate, spatulate, margin entire or serrate; heads numerous, 3-4 mm across; involucral bracts linear-lanceolate or oblanceolate, margin scarious, acute; achenes minute; pappus hairs reddish, 1 mm long.

*Flowering and Fruiting*: July-August

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 452



*Distribution:* India (Jammu and Kashmir); Srilanka; Malesia; America; Australia. Pantropic weed of American origin.

### **COTULA L.**

*Cotula anthemoides* L., Sp. Pl. 891. 1753; Hooker f., FBI. 3 : 316. 1881; Stewart, *l.c.* 735. 1972; Rao et al., *l.c.* 28. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 122. 2012.

Annual procumbent, 5-20 cm tall herbs; stem branches from base; leaves pinnatifid or pinnatisect, segments linear, lanceolate, entire or toothed; heads solitary, 3-4 mm across, yellow; involucre bracts 2-subseriate, oblong, obtuse, margin scarious; outer florets female, fertile; disc florets bisexual, bisexual, tubular, yellow; anther bases obtuse, entire; style arms 2; achenes of margin florets winged and of disc florets minutely winged.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 320

*Distribution:* India (Jammu and Kashmir); E. W. Himalayas; China and N. S. Africa

### **COUSENIA Cass.**

*Cousenia falconeri* Hook. f., FBI. 3 : 360. 1881; Stewart, *l.c.* 736. 1972; Rao et al., *l.c.* 29. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 122. 2012.

Perennial, erect, branched cottony herbs; basal leaves pinnatifid, cobwebby above, densely tomentose beneath, segments lobulate or entire, spinescent at tip; heads solitary, 1.2-6.2 cm across; involucre bracts numerous, numerous, outer ending in stiff, straight spine; inner bracts scarious, shining; florets all alike, disc florets tubular, 5-fid, purplish; filaments glabrous, anther sagittate or auricled; achenes oblong subtriquetrous, many ribbed.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 482

*Distribution:* India (Jammu and Kashmir) and W. Himalayas.

### **ECLIPTA L.**

*Eclipta prostrata* (L.) L., Mant. Pl. 2 : 286. 1771; Santapau, J. Bomb. Nat. Hist. Soc. 52 : 475-476. 1956; Koyama in Taxon 30 : 505. 1981; Rao et al., *l.c.* 34. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 123. 2012. *Verbesina*

*prostrata* L. Sp. Pl. 902. 1753; *V. alba* L., Sp. Pl. 902. 1753; *E. erecta* L., Mant. Pl. 2 : 286. 1771.

Annual, strigose herbs, rooting at basal nodes ; leaves opposite, sessile, narrowly lanceolate, 1.5-8 cm long margin toothed, lamina appressed with hair on both surfaces ; heads axillary or terminal, 6-10 mm in dia.; involucre bracts biseriata, ovate, lanceolate, acute, appressed pubescent; ligules 2-dentate, white; ray florets female, fertile or sterile ; disc florets bisexual, fertile, achenes oblong, minute.

*Flowering and Fruiting:* July-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 953

*Distribution:* India (Jammu and Kashmir) and Cosmopolitan.

### **GALINSOGA Ruiz & Pav.**

*Galinsoga parviflora* Cav., Anal. Cienc. Nat. Descr. Pl. 3 : 41. t. 281. 1796; Hooker f., FBI. 3: 311. 1881; Stewart, *l.c.* 747. 1972; Rao et al., Floe. Inde. Enum. – Aster. 39. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 124. 2012.

Annual erect herbs; stem much branched, pubescent, 15-15cm tall; leaves opposite, ovate-lanceolate, 2-5.7 cm long, apex acuminate, margin subentire or minutely serrate; heads 4-7mm in dia., held in axillary or subterminal panicles ; involucre bracts ovate, oblong, ray florets female, few, equal, white; disc florets bisexual, fertile, tubular; achenes obconic.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 306

*Distribution:* India (Jammu and Kashmir); Tropical America and Cosmopolitan.

### **HELIANTHUS L.**

*Helianthus tuberosum* L., Sp. Pl. 905. 1753; Stewart, *l.c.* 750. 1972; Bhellum *et al.*, Fl. Exot. J & K. 208. 2013.

Perennial rhizomatous herbs; stem 0.5-2.0 m tall, erect, hispid or hirsute; leaves ovate, lanceolate, margin entire or serrate; phyllaries dark green; heads yellow; ray and disc florets yellow.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 915

*Distribution:* India (Jammu and Kashmir) and Europe.

## LACTUCA L.

### Key to Species

1	+	Plants upto 50 cm tall; beak of achenes always twice as long as achene ----- ----- <i>Lactuca dissecta</i>
	-	Plants upto 200 cm tall; beak of achenes not longer than achene ----- 2
2	+	Leaves cordate, deltoid, hastate, upto 15 cm long ----- <i>L. rapunculoides</i>
	-	Leaves linear-lanceolate, sagittate upto 25 cm long ----- <i>L. dolichophylla</i>

***Lactuca dissecta*** D. Don, Prodr. Fl. Nep. 164. 1825; Hooker f., FBI. 3 : 405. 1881; Stewart, *l.c.* 758. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 126. 2012.

Erect herbs, 15-45 cm tall herb, glabrous or pubescent herbs; stems dichotomously branched; leaves entire, lyrate, radical leaves many, sessile, cauline leaves alternate, amplexicaule; head ligulates, corymbose, blue; achenes blackish-brown, compressed, 3-ribbed on entire side; pappus vary, white hairy.

*Flowering and Fruiting:* March - May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 393; J & K- Upper Lidder Valley, Gha Shangan, *B.M. Sharma* 20714 (RRLH)

*Distribution:* India (Jammu and Kashmir Uttaranchal, Sikkim, Darjeeling and Himachal Pradesh); Pakistan; Nepal; Temperate and Tropical Asia; Bhutan, Bangladesh, Nepal, China, Kazakhstan, Kyrgyzstan, Tajikistan, United Arab Emirates and Afghanistan.

***L. dolichophylla*** Kitam., Fl. East. Himal. 341. 1966; Stewart, *l.c.* 758. 1972; Rao et al., *l.c.* 48. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 126. 2012. *L. longifolia* DC., Prodr. 7 : 135. 1838; Hooker f., FBI. 3 : 405. 1881.

Annual, erect herbs; stem simple, slender, 1-1.5m tall, glabrous except the hispid base; leaves sessile, long, lanceolate, base stem-clasping, apex acuminate, margin entire; heads held in panicles; outer involucre bracts few, inner linear; ligule blue; achenes elliptic or oblanceolate, beak capillary equal or shorter than the body of the achene.

*Flowering and Fruiting:* July-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 718

*Distribution:* India (Jammu and Kashmir); Bhutan; Afghanistan; Nepal; Temperate & Tropical Asia;

***L. rupunculoides*** (DC.) Clarke, Comp. Ind. 268. 1876.

Annual or biannual 50-100 cm tall, herb; stem erect branched above; basal leaves cordate or deltoid with margins incurved, hastate, middle and upper ovate, lanceolate, petiole winged; heads terminal panicles; ligule white or purple; achenes fusiform compressed, narrow at both the ends, beak brown; pappus dirty white.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 473

*Distribution:* India (Jammu and Kashmir, W. Himalayas); Afghanistan; China; Pakistan and Nepal.

*Flowering & Fruiting:* August-October

*Distribution:* India (J & K, Himachal Pradesh in Western Himalaya, Maharashtra, Goa, Madhya Pradesh, Bihar), Afghanistan, China, Pakistan, Nepal.

### **MATRICARIA L.**

***Matricaria chamomilla*** L., Sp. Pl. 891. 1753; Hooker f., FBI. 3 : 315. 1881; Stewart, *l.c.* 766. 1972; Rao et al., *l.c.* 54. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 128. 2012.

Annual or perennial aromatic herbs; stem much branched, glabrous; leaves 2-pinnatifid or pinnatisect, segments linear, thread-like; heads held in panicles; involucre bracts oblong hemispheric; ray florets female, fertile or sterile, white; disc florets bisexual, fertile, yellow; achenes oblong, dorsally convex, ventrally 4-5 ribbed.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 322

*Distribution:* India (Jammu and Kashmir)

### **SENECIO L.**

***Senecio vulgaris*** L., Sp. Pl. 867. 1753; Gamble, Fl. Pres. Madras 2: 724. 1921.

Annual 20-40 cm tall, herb; stem flexuose, glabrous or thinly clothed with tomentose hairs; leaves alternate, sessile, pinnately lobed, teeth irregular; heads terminal, corymbose; involucre bracts small, black tipped; heads 4-5 mm across; florets discoid, 5-6 mm long; achenes cylindrical, 2-2.5 mm long, ribbed.

*Flowering and Fruiting:* May-October

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 124

*Distribution:* India (Jammu and Kashmir, Nilgiri Hills, Assam and Tamil Nadu),

### **SIEGESBECKIA L.**

*Siegesbeckia orientalis* L., Sp. Pl. 900. 1753; Hooker f., FBI. 3 : 304. 1881; Stewart, *l.c.* 784. 1972; Rao et al., *l.c.* 71. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 132. 2012.

Erect, velvety undershrub, 20-120 cm tall. Leaves stipulate, filiform, stellate hairy; stellate tomentose. Flowers axillary, solitary or paired or more in terminal branches. Calyx 5-10 mm long. Petals yellow, slightly exceeding the calyx, obliquely obovate. Staminal column, hairy or glabrous. Fruit discoid. Seeds brown to dark brown.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 423

*Distribution:* India (Jammu and Kashmir); Australia; Asia; Europe and Northern America.

*Flowering & Fruiting:* October-November

*Parts used:* Whole plant

*Ethnobotanical utility:* Decoction of the whole plant is considered diaphoretic, cardiotonic, and also used in rheumatism.

### **SILYBUM Adans., Nom. Cons.**

*Silybum marianum* (L.) Gaertn., Fruct. & Sem. 2 : 378. t. 168. 1808; Hooker f., FBI. 3 : 364. 1881; Stewart, *l.c.* 784. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 132. 2012.

Erect, stout, upto 1 m tall herbs; leaves sinuate lobed, 10-60 cm long, somewhat dusted white on upper surface; margin strongly spinous; heads rose-purple; achenes ovoid-oblong, dark brown.

*Flowering and Fruiting:* May-October

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 485

*Distribution:* India (Jammu and Kashmir); Pakistan; Nepal; Europe; introduced in Britain.

### **SOLIDAGO L.**

*Solidago virga-aurea* L., Sp. Pl. 880. 1753; Hooker f., FBI. 3 : 245. 1881; Stewart, *l.c.* 784. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 132. 2012.

Perennial, erect, short herbs; stem 0.5-1.5 m or more tall, simple or branched; radical leaves petiolate, ovate or oblong cauline leaves simple, entire; capitula held in axillary

panicles; involucre bracts narrow, acute unequal; ray florets female, yellow; disc florets bisexual style bilobed, lobes equal; achenes puberulous.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 686

*Distribution:* India (Jammu and Kashmir); Pakistan; Nepal and introduced in Asia and Europe.

## **SONCHUS L.**

### **Key to Species**

<b>1</b>	+	Rhizomatous; annual or bienn perennial----- <i>Sonchus brachyotus</i>
	-	Non-rhizomatous; annual or biennial, rarely perennials ----- 3
<b>2</b>	+	Leaves with acute auricles ----- <i>S. oleraceous</i>
	-	Leaves with obtuse auricles ----- <i>S. asper</i>

*Sonchus asper* (L.) Hill, Herb. Brit. **1** : 47. 1769; Hooker f., FBI. **3** : 414. 1881; Stewart, *l.c.* 784. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 133. 2012.

Annual, erect, glabrous herbs, latex milky white; stem branched, 20-90 cm tall, branches umbellate; leaves lanceolate, pinnatifid, base semiamplexicaule with rounded auricles; heads yellow, held in panicles; involucre bracts seriate, outer smaller; receptacle flat; ligules 5-toothed; achenes obovoid or ellipsoid, muricate.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 148

*Distribution:* India (Jammu and Kashmir); Asia; Europe; Mediterranean region; China; Afghanistan and Bhutan.

*S. brachyotus* DC., Prodr. **6** : 136. 1838; Boublos, Bot. Not. **114** : 58-64. Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 133. 2012. *S. arvensis* auct. (non L. 1753); Hooker f., FBI. **3** : 414. 1881.

Perennial, rhizomatous herbs; stem erect, 70-200 cm tall; leaves often radical; cauline glabrous; heads cylindrical; involucre bracts many seriate, linear lanceolate; ligules yellow; achenes oblong-lanceolate, dark brown

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 466

*Distribution:* India (Jammu and Kashmir) and Europe

*S. oleraceus* L., Sp. Pl. 794. 1753; Hooker f., FBI. **3** : 414. 1881; Rao et al., *l.c.* 72. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 133. 2012.

Annual glabrous, latex milky; stem branched, upto 1 m tall; leaves pinnatifid, base semiamplexicaule, auricles acute, entire, runcinate; capitula homogamous, yellow, in panicles; involucre bracts many seriate, outer smaller; ligule 5-toothed, spreading; achenes ellipsoid, ribbed, muricate between the ribs.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 917

*Distribution:* India (Jammu and Kashmir); Cosmopolitan.

### **TAGETES L.**

*Tagetes minuta* L. Sp. Pl. 887. 1753; Maheshwari in J. Bomb. Nat. Hist. Soc. 69: 451. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 133. 2012.

Annual, erect, strongly aromatic herbs; stem furrowed, 0.4-1.5 m tall; leaves pinnately compound, 10-20 cm long, leaflets lanceolate, oblong, margin conspicuously, midrib prominent underneath; capitula held in panicle; involucre bracts united forming cylindrical 10 mm long tube; ray florets female.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 114

*Distribution:* India (Jammu and Kashmir); naturalized in N. W. Himalaya; Native of America

### **TARAXACUM F. H. Wigg.**

*Taraxacum officinale* Wigg., Prim. Fl. Hols. 56. 1780; Hooker f., FBI. **3** : 401. 1881; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 134. 2012.

Dandelion is a perennial plant growing almost everywhere, which can reach 38 cm in height. This plant has only basal leaves. Each leaf is toothed or lobed. The flower-heads are up to 4.5 cm wide, yellow. The florets number 40 to over 100 per head that are yellow or orange-yellow in color. Blooms first appear in mid spring and continue into early winter.

Seeds are enclosed singly within fruiting bodies and are attached to a long slender stalk that terminates in a parachute-like structure called a pappus.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 486

*Distribution:* India (Jammu and Kashmir); Throughout temperate Himalaya and W. Tibet and temperate region of N. W. Hemisphere.

*Flowering & Fruiting:* March-April, September-October

Parts used: Leaves

Ethnobotanical utility: Boiled leaves are used as pre and post pregnancy food for ladies. Root decoction is useful against chronic kidney and liver problems. Leaves are cooked as vegetable and given to pregnant ladies at the time of delivery for reducing labour pains and also act as galactagogue. Decoction of leaves is given twice a day post delivery to ladies to overcome anaemia.

### **TRAGOPOGON L.**

*Tragopogon dubius* Scop., Fl. Carn. ed. 2, 2 : 95. 1772; Stewart, Ann. Cata. Vasc. Pl. W. Pak. & Kashm. 797. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 136. 2012.

Annual or biennial, glabrous herbs, milky latex; stem branched, 25-70 cm tall; leaves alternate, linear, upto 25 cm long, apex acute, margin entire; heads solitary, terminal; involucre bracts 8; ligules yellow; achenes 10-16 mm long.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 937

*Distribution:* India (Jammu and Kashmir)

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 385

*Distribution:* India (Jammu and Kashmir); Europe; Australia; Africa; West Asia; France and Northern America.



## **XANTHIUM L.**

### **Key to Species**

<b>1</b>	+	Armed shrubs; stem 50-70 cm tall; leaves green above, white beneath ----- ----- <i>Xanthium spinosum</i>
	-	Unarmed shrubs; stem 50-150 cm tall; leaves green on both surfaces -- ----- ----- <i>X. strumarium</i>

*Xanthium spinosum* L., Sp. Pl. 987. 1753; Razi in Rec. Bot. Surv. India 18: 56. 1959; Bhellum *et al.*, Fl. Exot. J & K. 216. 2013.

Annual brached herbs, stem 50-70 cm tall; spines 3-fid, yellow in the axil of leaves, sometimes replaced by leafy fascicles, margins entire, white-grey tomentose on underneath, dark green above; male heads in terminal inflorescence, female solitay, utricles yellow, hooked, spinous.

*Flowering and Fruiting:* June-October

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 135

*Distribution:* India (Jammu and Kashmir); Mexico; Central America; Old and new world; Cosmopolitan.

*X. strumarium* L., Sp. Pl. 987. 1753; Hooker f., FBI. 3 : 303. 1881; Rao *et al.*, Floe. Inde. Enum. – Aster. 91. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 136. 2012.

An annual or perennial herb up to 1.5m tall. Leaves petioled. Flower heads in terminal and axillary racemes, flowers unisexual; male flowers above female below on separate branches, fruits with two mucronate beaks, clothed with hooked prickles. Achenes thick, enclosed in the hardened involucre bracts and clothed with strong hooked spines.

*Flowering and Fruiting:* March-November

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 426

*Distribution:* India (Jammu and Kashmir), Western Himalayas; Central and Southern America; Mexico and Java.

Parts used: Leaves, fruit, whole plant

Ethnobotanical utility: Leaf paste prepared in mustard oil is applied on the head to relieve headache. Topical application of the paste of fruits and/or whole plant in *Sesamum orientale* oil is effective in reducing arthralgia.

**YOUNGIA** Cass.

*Youngia japonica* (L.) DC., Prodr. **7** : 194. 1838; Rech. f., Fl. Iran. **122** : 217. 1977; Rao et al., *l.c.* 92. 1988; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 136. 2012. *Prenanthes japonica* L., Mant. Pl. 107. 1767.

Annual or perennial herbs; stem slender, hollow, 25-50 m tall, pubescent; leaves alternate, 5-15 cm long, margin sinuately lobed, lobes toothed, cauline leaves few, smaller; capitula held in corymbs or panicles; involucral bracts outer ovate, acute, inner oblong or lanceolate, green, acute; receptacle flat; ligules long, spreading; stigma bilobed; achenes fusiform, small, finely ribbed.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 917

*Distribution:* India (Jammu and Kashmir); Asia; Central and South America; Northern America; Africa; Australia and China; Native of Japan.

**37. CAMPANULACEAE**

**CAMPANULA** L.

**Key to Species**

<b>1</b>	+	Plants 60-90 cm tall; flowers 7-12 cm long ----- <i>Campanula media</i>
	-	Plants 15-30 cm tall; flowers 1.5-2 cm long ----- <i>C. aristata</i>

*Campanula aristata* Wall. in Roxb., Fl. Ind. **2** : 98. 1824; Clarke in Hooker f., FBI. **3** : 441. 1881; Stewart, *l.c.* 707. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 137. 2012.

Erect, perennial herbs, 15-30 cm tall; leaves radical, peiolate, 1-5 cm long, oval, oblong, or oblanceolate, glabrous, margin entire, cauline leaves linear, sessile; flower solitary terminal; calyx adnate to the ovary, segments 5, linear awn-like, green; corolla 5-lobed; stamens 5; ovary 3-celled, style shorter than corolla, stigma 3-lobed; capsule oblong, contracted at blunt apex.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 946

*Distribution:* India (Jammu and Kashmir); Afghanistan; Bhutan; China; Nepal and Pakistan.

*C. media* L. Sp. Pl. 1: 167. 1753.

Annual or biennial herbs; stem 50-70 cm tall, erect, robust, reddish brown, bristly hairy; basal leaves alternate, lanceolate, elliptic, 12-15 cm long, margin serrate, upper leaves smaller, sessile, lanceolate; inflorescence racemose; flowers bell-shaped, blue; corolla campanulate, fused petals sharply bent.

*Flowering and Fruiting:* April-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 956

*Distribution:* India (Jammu and Kashmir); Originated in S. Europe, Europe and N. America.

### 38. PRIMULACEAE

#### *ANAGALLIS* L.

*Anagallis arvensis* L., Sp. Pl. 148. 1753; Hooker f., FBI. **3** : 506. 1882; Gambel, Fl. Pres. Madrass **2** : 525. 1957; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 140. 2012; Bhellum *et al.*, Fl. Exot. J & K. 223. 2013.

Annual erect, or prostrate glabrous, herb; stems slender, erect, branched from the base, branches 4-angled; leaves opposite, sessile, cordate, entire and acute; flowers bright- blue with red base, solitary, axillary; capsule globose, opening by a circumsissible fissure round the middle; seeds 3-angled.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 231

*Distribution:* India (Jammu and Kashmir); West Asia and Europe.

### 39. OLEACEAE

#### Key to Genera

1	+	Flowers white or pale white ----- 2
	-	Flowers bright yellow ----- <i>Forsythia</i>
2	+	Leaves ovate, white tomentose beneath; corolla tube cylindrical ----- <i>Syringa</i>
	-	Leaves lanceolate, green underneath; corolla tube funnel-shaped ----- <i>Ligustrum</i>

## **FORSYTHIA Vahl.**

*Forsythia viridissima* Lindl., J. Hort. Soc. 226. 1846.

Deciduous shrubs, 1-3 m tall; leaves opposite, sometimes trifoliolate, with basal pairs of leaflets smaller, elliptic to lanceolate, margin serrate or entire; flowers 1-4, axillary, bright yellow, tinged with orange, stripes, pedent; calyx 2-4 lobed, ciliate; corolla deeply 4-lobed, tube 5-6 mm long, reolute; capsule ovoid, 1-1.5 cm long.

*Flowering and Fruiting:* February-March

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 159

*Distribution:* India (Jammu and Kashmir); Japan; China; America and Canada.

Uses: Flowers produce lactose (milk sugar).

## **LIGUSTRUM**

*Ligustrum lucidum* Ait. f., Hort. Kew ed. 2, 1: 19. 1810; Stewart, *l.c.* 549. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 143. 2012.

An evergreen, trees or shrubs, bark grey green; leaves opposite, simple, 6-17 cm long, base rounded, glabrous, glossy green, margin entire; flowers bisexual, scented on terminal panicles; calyx 4-lobed; corolla funnel-shaped; 4-lobed; stamens 2, inserted on corolla tube, shorter than corolla lobes; ovary 2-celled, style intruded, stigma bifid; fruit 2-locular, berry.

*Flowering and Fruiting:* August-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 998

*Distribution:* India (Jammu and Kashmir) W. Himalayas; Temperate Asia; Southern Africa; Australia; New Zealand; Southern America.

## **SYRINGA L.**

*Syringa emodi* Wall. ex Royle, Ill. Bot. Himal. Mount. 267. t. 65. f. 2. 1835; *S. emodi* Wall. ex G. Don, Hist. Dichlam Pl. 4 : 51. 1838; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 140. 2012.

Erect shrubs, about 5 m tall, stem branched; leaves oval, subcordate, acuminate, subcoriaceous, 5-12 x 2-5 cm, glabrous; flowers white and lilac; calyx 4-toothed, farinose; corolla 4-toothed, limb narrowly cylindrical, lobes reflexed; capsule acuminate, smooth, seeds 2, compressed, winged.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 968

*Distribution:* India (Kashmir); W. Asia; S. E. Europe, distributed in temperate parts of the world.

#### 40. APOCYNACEAE

##### ***NERIUM* L.**

*Nerium indicum* Mill., Gardn. Dict. ed. 8. 2 : 86. 1768; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 145. 2012. *N. odorum* Soland. in Ait Hort. Kew 1 : 297. 1789; Hooker f., FBI. 3 : 655. 1882.

An erect evergreen shrub, branches glabrous with milky juice, young branches green; leaves linear-lanceolate, tapering at both ends, acuminate, thick coriaceous, midrib prominent, nerves numerous; flowers white, pink or dark red, single or double in cultivated, form, fragrant 3-4 cm across, bracts small. Calyx divided into 5 linear, acute lobes, hairy with gland at the base inside. Corolla tube 1.8 cm long, hairy within, throat narrow, ending in five twisted petals, tips rounded, corona of 5 scales near the throat of the corolla, cleft into 4-7 linear segments. Stamen included, filament short, Anthers connivent and adherent to stigma, connectives hairy, produced upward into long thread-like hairy appendages. Ovary with two distinct carpels, style filiform, thickened upward; stigma two lobed.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 996

*Distribution:* India (Jammu and Kashmir); Mediterranean region; Persia; Japan; China and Pakistan.

#### 41. ASCLEPIADACEAE

##### ***VINCETOXICUM* Wolf**

*Vincetoxicum hirundinaria* Medik.ssp. *glaucum* (Wall. ex Wight) Hara, Enum. Fl. Pl. Nep. 3: 89. 1982; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 147. 2012.

Erect, pubescent herbs; stem 15-50 cm tall, sparsely hairy; leaves opposite, stalked, ovate, lanceolate, 6-10 cm long, apex acute, acuminate, margin ciliate; inflorescence axillary stalked, peduncled cymes; flower yellow; calyx 5-segmented; corolla lobes 5, twisted, hairy within, corona 5-lobed, lobes rounded, broad, fleshy; stamens 5, united, pollinia projecting stigma in length, stigma 5-angled; fruit follicles; seeds comose.

*Flowering and Fruiting:* August-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 436

*Distribution:* India (Jammu and Kashmir) and West Himalayas.

## 42. BORAGINACEAE

### Key to Genera

1	+	Calyx saucer-like ----- <i>Asperugo</i>
	-	Calyx not saucer-like----- 2
2	+	Corolla throat studded with scales ----- 3
	-	Corolla throat not studded with scales ----- <i>Lithospermum</i>
3	+	Nutlets bristly ----- <i>Cynoglossum</i>
	-	Nutlets smooth ----- <i>Myosotis</i>

### **ASPERUGO**

*Asperugo procumbens* L., Sp. Pl. 138. 1753; Clarke in Hooker f., FBI. 4 : 167. 1883; Boiss., Fl. Or. 4 : 275. 1875.; Clarke in Hooker f., FBI. 4 : 156. 1883; Kazmi, in Journ. Arn. Arb. 52 : 243. 1971; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 151. 2012.

Annual herbs, decumbent-ascending, upto 50cm tall; stem much branched, branches spreading, striate, scabrid; leaves shortly stalked, oblong-lanceolate, acute or obtuse, appressed with hairs on both surfaces, hairs with bulbous base; flowers axillary, bisexual; calyx 5-lobed, lobes linear, lanceolate, accrescent; corolla blue, slightly exceeding; nutlets 4, compressed, ellipit-ovoid, reddish brown.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 117

*Distribution:* India (Jammu and Kashmir); Northern parts of N. America; Native to East and Central Europe.

### **CYNOGLOSSUM L.**

*Cynoglossum lanceolatum* Forssk., Fl. Aegypt. – Arab. 41.1775; Clarke in Hooker f., FBI. 4 : 156. 1883; Kazmi, in Journ. Arn. Arb. 52 : 243. 1971; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 152. 2012.

Erect, annual or biennial hispid herbs, 40-50 cm tall; stem branched, hispidly hairy; basal leaves petioled, upper sessile, lanceolate, appressed hispid on both surfaces; inflorescence axillary or terminal cymes; flower pale-blue or white, 3-4 mm across; calyx 5-lobed, accrescent, densely hairy without, glabrous within; corolla pale-blue or white, lobes ovate, obtuse, throat scales broader than long; ovary 4-lobed; fruit has 4-nutlets.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 702

*Distribution:* India (Jammu and Kashmir); Arabia; Pakistan; Sri Lanka; Burma; China and Malayasia.

### **LITHOSPERMUM L.**

*Lithospermum arvense* L., Sp. Pl. 132. 1753; Clarke in Hooker f., FBI. 4 :174. 1883; Boiss., Fl. Or. 4 : 216. 1875; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 151. 2012. *Margarospermum arvense* (L.) Decne. in Jacq. Voy. Inde. Bot. 122. 1844.

Annual herb, base woody; stem 30-45 cm tall, somewhat angular; leaves lanceolate, linear, margin entire, hairy on both surfaces; inflorescence cymes; calyx 5-lobed, lobes near to base; corolla 5-lobed, white, without scales in the throat; stamens 5, inserted on petals below the middle; style gynobasic; nutlets warted.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 915

*Distribution:* India (Jammu and Kashmir)

### **MYOSOTIS L.**

#### **Key to Species**

<b>1</b>	+	Calyx clothed with appressed hairs, lobed upto the middle ----- <i>Myosotis caespitosa</i>
	-	Calyx clothed with hooked hairs; lobed upto the base ----- <i>M. sylvatica</i>

*Myosotis caespitosa* C. F. Schultz., Prodr. Fl. Stargard, Suppl. 1 : 11. 1819; DC. Prodr. 10 : 105. 1846; Boiss. Fl. or. 4 : 235. 1875; Clarke in Hooker f., FBI. 4 : 173. 1883; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 154. 2012.

Annual hairy herbs; stem weak, ascending, 15-45 cm tall, clothed with nearly appressed hairs; leaves sessile, oblong, about 4 cm long; calyx 5-lobed, lobes deep upto middle, appressed hairy; corolla bright blue, about 6.2 mm across with centre spotted yellow,

lobes spreading; stamens included; ovary 4-lobed, ovules one in each cell, ultimately separating from receptacle.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 827

*Distribution:* India (Jammu and Kashmir); W. Asia; Europe and N. America

*M. sylvatica* Hoffm., *Deutschl. Fl.* **1** : 61. 1791; *DC Prodr.* **10** : 107 1846; Nasir & Ali, *Fl. W. Pak.* **191** : 113. 1989; *Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal.* 154. 2012.

Annual hairy herbs; stem tufted, erect or decumbent, 15-45 cm tall, clothed with spreading hairs; leaves oblong, about 4 cm long, basal stalked, upper sessile; calyx 5-lobed, almost to the base, hairy, spreading, hooked; corolla bright blue, spotted yellow at centre.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 294

*Distribution:* India (Jammu and Kashmir); W. Asia; Russia; Pakistan; Turkey; Northern Africa; Bhutan and Europe (Britain).

### 43. CONVULVACEAE

#### Key to Genera

1	+	Stigam globose ----- <i>Ipomoea</i>
	-	Stigma linear ----- 2
2	+	Bracts present on outer side of calyx ----- <i>Calystegia</i>
	-	Bracts absent on on side of calyx ----- <i>Convolvulus</i>

#### *CALYSTEGIA* Br.

*Calystegia hederacea* Wall. In *Roxb.* **2**: 94. 1824; Clarke in *Hooker f., FBI.* **4** : 217. 1883; Duthie, *Fl. Upper Ganget. Plains* **2** : 105. 1911; Ridley, *Fl. Malay. Penins.* **2** : 454. 1923; *Convolvulus acetosaefolium* Tusz. In *Bull. Soc. Nat. Mosc.* 73. 1840; *Calystegia acetosaefolia* Turcz. *FL. Baical – Dahur* **2** : 289. 1856; *C. pubescens* Lindl. in *Journ. Hort. Soc.* **1** : 70 et. *Bot. Reg. t.* 42. 1846; *Volvulus hederaceus* (Wall.) O.K., *Rev. Gen.* **2** : 447. 1891.

Prostrate, hairy, annual herbs, stem weak, 15-40 cm long; leaves opposite, petioled, ovate, cordate or orbicular, margin crenate-serrate; flower pedicellate, pedicel equaling the



leaves, solitary axillary, light blue; calyx 4-lobed, lobes cordate, ciliate, exceeding the corolla, acuminate; corolla tube very short, 4-lobed, light blue; stamens 2, exserted, style linear ; capsule biglobose; seed subglobose, rugose, 1-2 per cell.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 400

*Distribution:* India (Jammu and Kashmir); Asia; Japan; China; Afghanistan; Russia; Mongolia; Nepal; Pakistan; Malayasia.

*Calystegia hederacea* Wall. var. *longipedicellata* Bhellum et Magotra Jour. of Non-Timer For. Products. 18(2): 169-170. 2011.

*Calystegia hederacea* Wall. var. *longipediellata* Bhellum et Magotra differs from the typical variety in having remarkable longer length of Pedicel and larger fruit size. In the literature published so far the length of pedicel is upto 5 cm long in *Calystegia hederacea* Wall var. *hederacea* Wall. In addition to it the flower colour differs in both these varieties. The flowers of the typical variety are pinkish purple and in new variety is comparatively white.

Endemic to Kashmir.

### **CONVOLVULUS L.**

*Convolvulus arvensis* L., Sp. Pl. 153. 1753; Clarke in Hooker f., FBI. 4 : 219. 1883; Ooststr. in Blumea 3 : 283. 1939; & Fl. Males Ser. 1, 4 : 437. 1953; Stewart, Ann. Cata. Vasc. Pl. W. Pak. & Kashm. 572. 1972.

Prostrate, creeping or twining herbs with milky latex; stem weak, twining, angular, glabrous; leaves alternate, ovate-lanceolate, oblong, 2.5-10 cm long, base sagittate, hastate, apex obtuse, mucronate; flowers usually 2-3 flowered cymes; flower white tinged pink, 1.5-2.5 cm across; sepals 5, united, oblong, obtuse, green; corolla tube short, limb spreading; stamens 5, unequal, epipetalous; ovary 2-celled, ovules 2 in each cell, style short stigma 2-lobed linear; capsule ovoid-globose, 4-seeded.

*Flowering and Fruiting:* April-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 161

*Distribution:* India (Jammu and Kashmir); Africa; Temperate Asia; Nepal; Pakistan; Tropical Asia and Europe.

## **IPOMOEA L.**

### **Key to Species**

<b>1</b>	+	Leaves trilobed; flower white, tinged blue ----- <i>Ipomoea nil</i>
	-	Leaves cordate; flowers pink ----- <i>I. purpurea</i>

*Ipomoea nil* (Linn.) Roth, Catalogue Bot. 1:36. 1797. van Ooststroom in van Steenis, Fl. Males., ser. 1, 4:465.1953, Austin, l.c. 193.; Sinners, Taxon 14: 231. 1965; Sharma & Kachroo, Fl. Jammu 1: 226. 1981; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 157. 2012. *I. hederacea* auct. (non L.) Jacquin 1768.

Annual, hairy twiner; stem slender, villous; leaves ovate, cordate, 7-9 cm long, usually palmately 3-lobed, lateral lobes acute, central one acuminate, sparsely hairy on both surfaces; inflorescence 1-few flowered cymes; flower blue or pink, nearly 5 cm long; sepals 5, linear, densely villous at base; corolla funnel shaped; ovary 3-celled, stigma capitate; capsule subglobose, nearly 8 mm in diameter.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 487

*Distribution:* India (Jammu and Kashmir, common throughout); All tropical and subtropical regions.

*I. purpurea* (L.) Roth, Bot. Abh. 27. 1787; Austin, Taxon 35(2):357. 1986; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 157. 2012. *Convolvulus purpureus* L., Sp. Pl. ed. 2, 1: 219. 1762.

Annual twining herbs; stem slender; leaves ovate, cordate, margin entire, apex acuminate; inflorescence in axillary cymes; flowers rosy-pink; calyx hairy towards base, glabrous above; corolla infundibuliform; capsule ovoid, depressed, or globose; seeds black, glabrous.

*Flowering and Fruiting:* August-November

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 939

*Distribution:* India (Jammu and Kashmir); Native of America, now pantropical,

#### 44. CUSCUTACEAE

##### *CUSCUTA* L.

*Cuscuta capitata* Roxb., Corom. Pl. 2 : 3. t. 104. 1819; Clarke in Hooker f., FBI. 4 : 227. 1883; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 578. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 157. 2012.

Parasitic, twiner, leafless; stem weak; flowers white tinged pink; corolla ovoid, contracted, 5-lobed, lobes triangular, covered with minute papillae; capsule exceedingly thin, fragile; seeds 4, ellipsoid.

*Flowering and Fruiting:* Agust-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 730

*Distribution:* India (Jammu and Kashmir)N.-W. Himalayas; N.-W. Asia.

#### 45. SOLANACEAE

##### Key to Genera

1	+	Flowers in racemes, corymbs or umbellate clusters; fruits smooth, upto 2 cm across ----- ----- <i>Solanum</i>
	-	Flowers solitary axillary; fruits prickly, about 5 cm across----- <i>Datura</i>

##### *DATURA* L.

*Datura stramonium* L., Sp. Pl. 179. 1753; Clarke in Hooker f., FBI. 4 : 242. 1883; Stewart, l.c. 640. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 159. 2012.

Erect, foetid, herb; stem branched, 0.5-1 m in height; radical leaves petioled, ovate-oblong, 15-20 cm long, sinuately toothed, cauline alternate, sessile, irregularly lobed, upper ones bract-like; flower sessile, 2.5-3 cm across, pale, greenish yellow, with purple centre; calyx urn-shaped, softly hairy, viscid; corolla funnel-shaped, 5-lobed, lobes spreading; stamens 5, inserted on corolla tube; ovary 2-celled; fruit 1-1.2 cm across, enclosed by persistent, accrescent calyx.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 138

*Distribution:* India (Jammu and Kashmir); China; Central Asia; America. Native to Mexico

## **SOLANUM L.**

*Solanum nigrum* L., Sp. Pl. 186. 1753; Clarke in Hooker f., FBI. 4 : 299. 1883; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 160. 2012.

An erect, annual or biennial diffuse, much branched, almost glabrous herbs; stem weak, much branched, glabrous or minutely hairy. leaves ovate or oblong, sinuate, toothed or lobed, dark-green; flowers white, small subumbellate, in extra- axillary cymes. calyx 5-lobed, lobes up to the middle; corolla rotate, 5-lobed, recurved, slightly hairy on margins; fruit a berry black or reddish-yellow; seeds many, discoid, yellow and minutely pitted.

*Flowering and Fruiting:* May-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 488

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); introduced in Northern America; Australia and S. Africa.

Parts used: Leaves, fruits

Ethnobotanical utility: Leaf paste is applied on ulcers and wounds as antiphlogistic. Leaf decoction is anti-spasmodic and also relieves cough. Leaf extract is prescribed in piles, dysentery and liver enlargement. Fruits are edible and used as tonic for overcoming anaemia.

*S. surattense* Burm. f., Fl. Ind. 57. 1768; Stewart, *l.c.* 644. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 160. 2012. *S. xanthocarpum* Schrad. & Wendl. Sert. Hannov. 1. 8. t. 2. 1795; Clarke in Hooker f., FBI. 4 : 236. 1883.

Prostrate or decumbent-ascending annual or perennial herbs; stem much branched, solid, armed, with straight pale yellow prickles; leaves pinnatifid or pinnatipartite, oblong, lobed, obtuse, 8-12 cm long, marginal lobes and ribs provided with 1 cm long prickles; inflorescence extra-axillary cyme; flower pedicellate, 2.5-3.1 cm across, purple; sepals 5, green, stellately hairy; corolla purple or blue, rotate pubescent inside, 5-lobed; stamens 5, epipetalous, anthers yellow, bitheous; ovary 2-carpellary, style 1.2-1.5 cm long, stigma capitate, slightly 2-lobed; berry yellow, nearly 2 cm in dia., seeds white, many.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 430

*Distribution:* India (Jammu and Kashmir); Pakistan; Iran; South and South-East Asia; Polynesia and North Africa.

## 46. SCROPHULARIACEAE

### Key to Genera

1	+	Calyx 4-lobed ----- <i>Veronica</i>
	-	Calyx 5-lobed ----- 2
2	+	Corolla distinctly 2-lipped ----- 3
	-	Corolla not 2-lipped ----- <i>Leptorhabdos</i>
3	+	Corolla yellow ----- <i>Kickxia</i>
	-	Corolla blue or pink ----- <i>Mazus</i>

### ***KICKXIA* Dumort.**

***Kickxia incana*** (Wall.) Penn., Scroph. W. Himal. (Acad. Nat. Sci. Philad., Monogr. 5) 59. 1943; Stewart, *l.c.* 649. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 162. 2012. *Linaria incana* Wall., Pl. Asiat. Rar. **2** : 43. 1831; Hooker f., FBI. **4** : 252. 1884.

Annual or perennial hairy, 25-40 cm tall herbs; stem prostrate, decumbent branched; leaves stalked, ovate or somewhat obovate-lanceolate, densely hirsute; flowers subsessile in axillary clusters; calyx 5-toothed, densely hirsute, margin scarious; corolla bilipped, hairy upto 7 mm long, upper lip purplish, spur deflexed or straight; stamens 5, filaments dialted at base; fruit capsule included in persistent calyx.

*Flowering and Fruiting*: May-August

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 948

*Distribution*: India (Jammu and Kashmir); Afghanistan; Nepal and Pakistan.

### ***LEPTORHABDOS* Schrenk ex Fisch. & Mey.**

***Leptorhabdos parviflora*** (Benth.) Benth. in DC., Prodr. 10: 510. 1846; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 650. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 163. 2012.

Erect, nearly glabrous herbs; stem 30-90 cm tall, branched; leaves sessile, basal opposite, cauline alternate, 2.5-7.5 cm long, pinnatisect, segments linear, toothed or entire; inflorescence raceme; flowers light-pink; calyx bell-shaped, 5- toothed; corolla tube short, limb 5- lobed; stamens 4, didyanamous, anthers free; style long, stigma minute; capsule oblong flattened, enclosed in persistent calyx; seeds 2-4 per capsule.

*Flowering and Fruiting*: May-July

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 969

*Distribution*: India (Jammu and Kashmir); Western Himalayas.

### **MAZUS** Lour.

*Mazus japonicaus* (Thunb.) Ktze., Rev. Gen. Pl. 2: 462. 1891; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 653. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 164. 2012.

*Flowering and Fruiting*: April-June

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 976

*Distribution*: India (Jammu and Kashmir); Western Himalayas.

*M. pumila* (Burm. f.) Steenis, Nova Guinea N. Sect. **9** : 31. 1958; *Lobelia pumila* Burm. f., Fl. Ind. 186. t. 60. f. 3. 1768; *Lindernia japonica* Thunb., Fl. Jap. 253. 1784; *Mazus rugosus* Lour., Fl. Cochinch. 385. 1790; Hooker f., FBI. **4** : 259. 1884; *M. japonicus* (Thunb.) O. Kuntze, Rev. Gen. Pl. 462. 1891; Li in Brittonia **8** : 31. 1954.

Annual, non-stoloniferous herbs; stem often branched from base, glabrous or sparsely hairy ; radical leaves obovate, oblong, spatulate, 3-8 cm long, base cuneate, apex rounded, margin crenate, glabrous or patently long hairy, cauline leaves sessile, obovate, margin crenate; inflorescence lax racemes; flower pedicellate, longer than calyx; calyx 5-lobed, lobes accrescent; corolla bilipped, upper lip bilobed, lower lip trilobed, spreading, white or pale – blue, hairs glandular without; capsule 3 mm long.

*Flowering and Fruiting*: May-July

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 520

*Distribution*: India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand), Western Himalayas.

### **VERBASCUM** L.

*Verbascum thapsus* L., Sp. Pl. 177. 1753; Hooker f., FBI. **4** : 250. 1883; Penn., Acad. Nat. Sci. Philad. Monogr. **5** : 40. 1943; Stewart, *l.c.* 663. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 167. 2012.

Annual, erect herbs; stem 0.5 – 1.5 m tall, simple or branched, densely stellate tomentose; basal leaves petiolate, alternate, simple, ovate, 15-50 cm long, margin entire or nearly so, cauline leaves sessile, ovate, base decurrent densely tomentose on both surfaces; inflorescence spicate spikes, rarely subsessile; flowers yellow; calyx 5-lobed, lobes ovate,

lanceolate, acute; corolla 5-lobed, upper petal yellow, pubescent without; stamens 5, lower 3 with short filaments, bearded, other have long filaments, glabrous; stigma capitate; capsule ovoid, as long as calyx, 7 mm long; tomentum stellate.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 786

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand Western Himalayas); Asia; Europe; N. Africa; China; Siberia; Australia and New Zealand.

## VERONICA L.

### Key to Species

1	+	Flowers in racemes ----- 2
	-	Flowers solitary or axillary ----- 6
2	+	Capsule somewhat compressed ----- 3
	-	Capsule laterally flat ----- 4
3	+	Stem erect ----- <i>Veronica anagallis-aquatica</i>
	-	Stem creeping ----- <i>V. beccabunga</i>
4	+	Flowers blue or pinkish; leaf margin crenate ----- 5
	-	Flowers white or light blue; leaf margin entire ----- <i>V. serpyllifolia</i>
5	+	Inflorescence longer than leaves ----- <i>V. officinale</i>
	-	Inflorescence shorter than leaves ----- <i>V. arvensis</i>
6	+	Plants erect ----- <i>V. biloba</i>
	-	Plants prostrate ----- 7
7	+	Flower blue ----- <i>V. persica</i>
	-	Flowers white, white tinged blue or pink ----- 8
8	+	Sepals obtuse ----- <i>V. agrestis</i>
	-	Sepals acuminate ----- 9
9	+	Flowers pinkish; fruits prominently deflexed in fruits ----- <i>V. hederifolia</i>
	-	Flowers blue streaked pink; fruits not prominently deflexed ----- <i>V. stewartii</i>

*Veronica agrestis* L., Sp. Pl. 13. 1753; Hooker f., FBI. 4 : 294. 1884; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 168. 2012.

Annual procumbent herbs; stem branched from the base; lower leaves opposite, becoming alternate upwards, ovate, margin crenate, glabrous or thinly pubescent; flowers axillary; sepals green, longer than petals; corolla white tinged blue; stamens 2, inserted at the base of the tube; capsule compressed, deeply notched.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 107

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand), Western Himalayas; Pakistan.

*V. anagallis-aquatica* L., Sp. Pl. 12. 1753; Stewart, *l.c.* 663. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 168. 2012.

Erect, somewhat succulent herbs; base stoloniferous, glabrous, puberulous, glandular towards apex; leaves sessile, oblong, lanceolate, 3-10 cm long, base amplexicaule, apex acute, margin entire or serrate; inflorescence lax up to 15 cm long racemes; flower zygomorphic, bisexual, pink or purplish; calyx 4-lobed, up to 5 mm long, corolla tube longer than calyx, lobes 4, spreading; stamens 2, exerted another cells parallel; stigma subcapitate; capsule oval, strongly flattened, emarginated.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 157

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand), Western Himalayas and Pakistan.

*V. arvensis* L., Sp. Pl. 13. 1753; Hooker f., *FBI*. 4 : 296. 1884; Stewart, *Ann. Cat. Vasc. Pl. W. Pak. & Kashm.* 663. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 168. 2012.

Annual, pubescent, spreading herbs; stem much branched from the base; leaves, opposite, sessile, rounded at base, remotely dentate; flowers axillary, nearly sessile; sepals linear, lanceolate, glandular hairy; corolla shorter than sepals; blue, streaked dark blue; stamens 2, inserted at the base of the tube; ovary rounded, style short; fruit rounded, notched.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 461

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand), Western Himalayas and Pakistan.

*V. beccabunga* L., Sp. Pl. 12. 1753; Hooker f., *FBI*. 4 : 293. 1884; Penn., *Acad. Nat. Sci. Philad. Monogr.* 5 : 9. 1943; Stewart, *Ann. Cat. Vasc. Pl. W. Pak. & Kashm.* 663. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 168. 2012.



Perennial herbs, rooting at nodes; stem decumbent, hollow, glabrous; leaves rounded, elliptic, obovate; flowers in axillary racemes; bracts minute; flowers pedicellate; sepals 4, green; petals 4-lobed, dark blue; stamens attached at the base of tube; ovary 2-locular, style slender, stigma capitate; capsule notched, rounded.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 535

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand), Western Himalayas; distributed to north Hemisphere.

***V. biloba*** L., Mant. Pl. 172. 1771; Hooker f., *FBI*. **4** : 294. 1884; Penn. Acad. Nat. Sci. Philad. Monogr. **5** : 81. 1943; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 664. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 168. 2012.

Annual, erect herbs; stem slender, pubescent; leaves ovate or lanceolate, basal leaves opposite, 1.2-2.5 cm long, margin serrate, cauline leaves alternate, margin entire, glandular hairy; flowers solitary axillary, pedicellate, pedicel 1 cm long; calyx 4 parted, margin glandular hairy; corolla blue, tubular, tube short, lobes 4; stamens 2, epipetalous, exerted, anther cells bithecous, filaments short, 2 mm long; ovary with 2-carpels, style short, stigma capitate; capsule deeply bilobed, pubescent; seeds oblong, deeply pitted.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 120

*Distribution:* India (Jammu and Kashmir Himachal Pradesh and Uttarakhand), Western Himalayas; Pakistan and Westwards to S. E. Europe.

### ***V. hederifolia*** L.

Annual herbs; stem green, branched, branches on one side from the base; leaves usually alternate, spade-shaped, yellowish-green, 1-nerved, pubescent, margin toothed or lobulate, base rounded; flowers solitary axillary, stalked deflexed in fruits; sepals ovate, hairy; corolla blue, 4-lobed, lobes recurved; stamens 2; ovary bilocular, 2-ovules in each locule. fruit bilobed enclosed in persistent calyx.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 110

*Distribution:* India (Jammu and Kashmir), Western Himalayas.

***V. officinale*** L.

Perennial herbs; stem much branched from the base, rooting from the lower nodes, sparsely pubescent; leaves opposite, stalked, ovate, margin serrate, pubescent on both surfaces; flowers in racemes; calyx 4-lobed, sepals lanceolate, pubescent; corolla 4-lobed, pale-blue, veins darker; stamens 2, inserted on base of the corolla tube, anther ovoid; ovary rounded, glabrous, notched, pubescent; seed yellow, minute.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 848

*Distribution:* India (Jammu and Kashmir) and Europe.

***V. persica*** Poir., Dict. Encyc. Meth. Bot. **8** : 542. 1808; Hooker f., FBI. **4** : 294. 1884; Stewart, *l.c.* 666. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 169. 2012.

Annual, hairy, prostrate or decumbent herbs; stem 5-25 cm long; leaves petiolate, ovate-oblong, base rounded, apex obtuse, margin crenate; flowers solitary axillary, pedicel much longer than subtending leaves; calyx 4-parted, lobes ovate or lanceolate, spreading; corolla tube cylindrical, 4-lobed, bright blue; stamens 2, exserted; capsule much broader than long, reticulations distinct, 5-12 seeded; seeds boat-shaped, deeply pitted.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 131

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand), Western Himalayas; Pakistan and S. Europe.

***V. serpyllifolia*** L., Sp. Pl. 12. 1753; Hooker f., FBI. **4** : 296. 1884; Penn., Acad. Nat. Sci. Philad. Monogr. **5** : 77. 1943; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 169. 2012.

Annual herbs; stem branched, right from base; leaves opposite, spatulate, oblong, coriaceous, margin entire; inflorescence raceme; flower white or blue with yellow base, pedicellate, pedicel 3 mm long; calyx 4-parted, glandular hairy; corolla tube slender, short, 4-lobed white or blue with yellow base; stamens 2, exserted, anthers bithecous, filaments short, glabrous; ovary bicarpellary, style white, stigma capitate, blue; capsule bilobed, hairy.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 185

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand), Western Himalayas, Pakistan; Native to Europe.

*V. stewartii* Penn., Scroph. W. Himal. 81. 1943; Stewart, *l.c.* 666. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 169. 2012. *V. hederæfolia* Hooker f., FBI. 4 : 294. 1884 (non Linn.).

Prostrate, hairy, annual herbs, stem weak, 15-40 cm long; leaves opposite, ovate, cordate or orbicular, margin crenate-serrate; flower pedicellate, pedicel equaling the leaves, solitary axillary, light blue; calyx 4-lobed, lobes ciliate, exceeding the corolla, acuminate; corolla tube very short, 4-lobed, light blue; stamens 2, exserted, style linear ; capsule biglobose; seed subglobose, rugose, 1-2 per cell.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 207

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh), Western Himalayas and Pakistan.

## 47. BIGNONIACEAE

### Key to Genera

<b>1</b>	+	Woody vines; leaves uni- or bipinnate; calyx not 2-lipped ----- <i>Campsis</i>
	-	Trees; leaves simple; calyx 2-lipped ----- <i>Catalpa</i>

### *CAMPSIS*

*Campsis grandiflora* (Thunb.) K. Schum., Engl. Pflanzf. 4, 3b. 230. 1894; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 668. 1972.

A climber, shrub; leaves imparipinnate, leaflets 7-11, broadly ovate, oblong, margin entire or serrate, glabrous, acuminate; flowers orange-scarlet in lax panicles; corolla 4.6-5.5 cm long, tube short; ovary bicelled, disc annular; fruit an elongate capsule.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 982

*Distribution:* India (Jammu and Kashmir, Uttarakhand); USA and Pakistan.

### *CATALPA* Scop.

*Catalpa bignonioides* Walt.; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 668. 1972.

A deciduous, medium sized tree; stem branched, branches spreading; leaves large, rounded, abruptly acuminate; flowers 5-7.5 cm across; yellow with orange blotches and purple spotted; calyx 5-lobed, glabrous; capsule 15-50 cm long.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 308

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand), USA; Pakistan; United Kingdom; Austria; Czech Republic and Hungary.

#### 48. VERBENACEAE

##### Key to Genera

<b>1</b>	+	Calyx 5-dentate; styles 2-lobed ----- <i>Verbena</i>
	-	Calyx 2-partite; styles entire ----- <i>Phyla</i>

##### **PHYLA** Lour.

*Phyla nodiflora* (L.) Greene in Pittonia **4** : 46. 1899; Meeuse in Blumea **5** : 69. 1942; Bennet, Fl. Howrah 310. 1979; *Verbena nodiflora* L., Sp. Pl. 20. 1753.

Perennial, creeping on ground, rooting at nodes, often forming dense patches; leaves subsessile, spatulate, cuneate, 1.3-2.6 cm long, margin sharply toothed, apex rounded; flowers in dense globose oblong, long peduncled axillary heads; bracts elliptic or obovate, acuminate; corolla white tinged purple at centre, obscurely 2-lipped; 2-2.5 cm long; stamens 4, didynamous; fruit globose or oblong-obovoid.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 464

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Throughout Tropical and subtropical regions.

##### **VERBENA** L.

*Verbena officinalis* L., Sp. Pl. 20. 1753; Clarke in Hooker f., FBI. **4** : 565. 1885; Babu, Herb. Fl. DD. 401. 1977; Sharma & Kachroo, Fl. Jammu. **1** : 254. 1981.

Erect, perennial herbs; stem quadangular, 0.5-1.5 m tall; basal leaves long stalked, upper sessile, opposite, oblong, obovate, 6-10 cm long, pubescent on both surfaces; inflorescence spike; calyx tubular, 5-lobed; corolla 2-lipped, tube cylindrical, longer than calyx, glandular hairy, limb spreading; fruit a nut, 4-seeded.

*Flowering and Fruiting:*

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 463

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Asia; Europe; N. Africa; Northern America and S. Africa.

## 49. LAMIACEAE

### Key to Genera

1	+	Stamens 2 ----- 2
	-	Stamens 4 ----- 3
2	+	Corolla irregular, limb 2-lipped ----- <i>Salvia</i>
	-	Corolla regular, not 2-lipped ----- <i>Lycopus</i>
3	+	Stamens all equal ----- <i>Mentha</i>
	-	Stamens unequal, didynamous ----- 4
4	+	Calyx 2-lipped ----- 5
	-	Calyx not 2-lipped ----- 6
5	+	Calyx mouth remain open after flowering ----- <i>Clinopodium</i>
	-	Calyx mouth closes after flowering ----- <i>Prunella</i>
6	+	Leaves 4-8 mm long ----- <i>Micromeria</i>
	-	Leaves 12-60 mm long ----- 7
7	+	Upper lip of corolla flat or nearly so; calyx not prickly ----- <i>Ajuga</i>
	-	Upper lip of corolla concave or hood-like; calyx prickly ----- <i>Marrubium</i>

### **AJUGA L.**

*Ajuga lobata* D. Don,

*Flowering and Fruiting:* May-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 666

*Distribution:* India (Jammu and Kashmir); Bhutan; Nepal and N. Myanmar.

*A. parviflora* Benth. in Wall. Pl. As. Rar. **1** : 59. 1830; Hooker f., FBI. **4** : 703. 1885; Stewart, *l.c.* 609. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 175. 2012.

Annual or perennial decumbent, softly pubescent herbs; rootstock thick; stem quadangular, many branched from base; leaves shortly stalked or sessile, variable, ovate,

oblong, obovate, 3-12 cm long, hairy on both surfaces, margin toothed, lobed or entire; flowers white tinged blue; calyx 5-lobed; corolla 2-lipped; stamens included; nutlets 4, reticulate.

*Flowering and Fruiting:* May-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 727

*Distribution:* India (Jammu and Kashmir), W. Himalayas and Afghanistan; Native to Eastern Australia.

### **CLINOPODIUM L.**

*Clinopodium vulgare* L., Sp. Pl. 587. 1753; Press. in Enum. Fl. Pl. Nep. **3** : 151. 1982; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 175. 2012. *Calamintha clinopodium* Benth in DC., Prodr. **12** : 233. 1848; Hooker f., FBI. **4** : 650. 1885.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 307

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Western and Central Asia and Northern America.

### **LYCOPUS**

*Lycopus europaeus* L., Sp. Pl. 21. 1753; Hooker f., FBI. **4** : 648. 1885; Stewart, *l.c.* 616. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 178. 2012.

Perennial herbs; rootstock creeping; stem quadangular, 30-70 cm tall; leaves sessile, opposite, lobate, toothed; flowers bisexual in axillary clusters; calyx 5-lobed, lobes rigid, sharply pointed; corolla bluish-white, dotted purple, scarcely longer than calyx, lobes nearly equal, 4-lobed; stamens 2, scarcely exerted from corolla; nutlets truncate, margin thick.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 441

*Distribution:* India (Jammu and Kashmir); Temperate and tropical Asia and Europe.

### **MARRUBIUM L.**

*Marrubium vulgare* L., Sp. Pl. 583. 1753; Hooker f., FBI. **4** : 671. 1885; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 617. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 178. 2012.

Perennial herbs; rootstock thick; stem many from base; leaves opposite, stalked, ovate, margin crenate, wooly; flowers many in sessile clusters; bracts subulate, tip hooked; calyx tubular, 10 ribbed; corolla 2-lipped, upper lip 2-lobed, lower 3-lobed, white; stamens 4, inserted on corolla tube; nutlets 4, glabrous.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 312

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); America; Australia; New Zealand; Native to Africa.

## **MENTHA L.**

### **Key to Species**

<b>1</b>	+	Whorls of flowers all axillary ----- <i>Mentha</i>
	-	Whorls of flowers terminal spikes or some in upper axillary ----- 2
<b>2</b>	+	Leaves petiolate ----- <i>M. piperata</i>
	-	Leaves sessile or nearly so ----- 3
<b>3</b>	+	Plants glabrous; leaves lanceolate ----- <i>M. spicata</i>
	-	Plants pubescent or tomentose; leaves oblong or oblong-lanceolate ----- <i>M. longifolia</i>

*Mentha arvensis* L., Sp. Pl. 577. 1753; Hooker f., FBI. 4 : 648. 1885; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 617. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 179. 2012.

An aromatic perennial herb growing up to 10–60 cm. Stem prostrate and erect, squarish rooting at nodes. Leaves are in opposite pairs, simple, opposite, hairy, decussate, exstipulate, ovate, serrate, reticulate, aromatic with a coarsely serrated margin. Flowers small, present in axillary, cymose clusters, arranged in racemose manner. Corolla lavender-purple to whitish, bilabiate, glabrous. Stamens 4, exserted. Filaments, glabrous, pinkish-white.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 926

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Europe and America.

*Flowering & Fruiting:* May-September

Parts used: Leaves

Ethnobotanical utility: Leaf decoction checks flatulence, abdominal spasms and acts as an appetizer.

***M. longifolium*** (L.) Huds., Fl. Angl. 221. 1762; *M. sylvestris* L., Sp. Pl. ed. 2, 804. 1763; Hooker f., FBI. 4 : 647. 1885; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 179. 2012.

An aromatic fast-growing herb, 5-7.5 cm tall that creeps along an underground rootstock. Stem robust or slender. The leaves are formed in pairs opposite each other along the square-shaped stem. The leaves are usually coarsely hairy and the edges sparsely toothed. The colour of the leaves varies from light and dark green to grey. The small flowers are pale-lilac crowded into spikes at the tip of the stems; corolla white to mauve, in clusters forming a tapering cylindrical raceme. Sepals sharply 5-tooth, bell shaped, petals 4-lobed, lobes erect, stamen 4, exerted. Fruit nutlet.

*Flowering and Fruiting:* May-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 868

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Temperate and Tropical Asia; Europe and Northern America.

Parts used: Leaves

Ethnobotanical utility: Leaf decoction checks flatulence, abdominal spasms and acts as an appetizer.

***M. piperata*** L., Sp. Pl. 576. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 618. 1972.

Perennial erect herbs; stem quadangular, 30-45 cm tall; leaves shortly stalked, opposite, spreading, punctate beneath; inflorescence with foliar bracts; calyx 5-lobed, lobes equal, shining; corolla mauve, 4-lobed; ovary 4-lobed, style gynobasic; nutlets minute.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 476

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Russia; Africa; Northern America; Australasia; Europe and Tropical and Subtropical Asia.

***M. spicata*** L., Sp. Pl. 576. 1753, emend; Huds, Fl. Engl. 221. 1762; Stewart, *l.c.* 618. 1972; *M. viridis* L., Sp. Pl. ed. 2, 804. 1763; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 179. 2012.

Perennial herbs; rootstock thick; stem quadangular, clothed with white hairs; leaves sessile, opposite, oblong, lanceolate, tomentose; flowers in spikes, bracts awl-shaped; calyx 5-lobed, lobes equal; corolla 4-lobed, hairy without; stamens 4, exerted; ovary deeply 4-lobed, style gynobasic; nutlets 4.



*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 528

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Russian Federation; Australasia; Europe; Tepmerate Asia and Northern America.

### **MICROMERIA Benth.**

*Micromeria biflora* (Ham.) Benth., Labiat. Gen. et Sp. 378. 1835-1836; Hooker f., FBI. 4 : 650. 1885; Gamble, Fl. Pres. Madras 2 : 796. 1957 (repr. ed.); Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 179. 2012.

Low suffruticose herb, tufted or lax; stems ascending-erect, unbranched, slender, glabrous, pubescent or hirsute with spreading or retrorse hairs. Leaves narrowly to broadly ovate, thickish-textured, entire, apically acute. Verticillasters few-flowered, rather lax. Bracts small, linear. Calyx narrow tubular, prominently ribbed, with spreading eglandular hairs and with or without sessile oil globules; teeth slightly unequal, narrow triangular-linear, subulate, ciliate, tube bearded at throat. Corolla rose to mauve, upper lip emarginated, lower lip longer than upper. Stamens included; thecae glabrous, spreading. Nutlets brown, oblong, apically rounded.

*Flowering and Fruiting:* Almost throughout the year

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 339

*Distribution:* India (Jammu and Kashmir), Himalayas, W. Asia and Africa

Parts used: Leaves

Ethnobotanical utility: Leaf decoction checks flatulence, abdominal spasms and acts as an appetizer. Leaves are also used in the preparation of tea.

### **PRUNELLA L.**

*Prunella vulgaris* L., Sp. Pl. 600. 1753; Hooker f., FBI. 4 : 670. 1885; Gamble, Fl. Pres. Madras 2 : 799. 1957(repr. ed.); Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 183. 2012. "*Brunella*".

Annual or perennial about 30 cm tall herbs; rooting at basal nodes; stem branched, 4-angular; leaves opposite, shortly stalked, ovate, lanceolate, thinly hairy on both surfaces; flowers in terminal spikes; bracts foliar; calyx 5-lobed, 2-lipped; corolla 2-lipped, upper hood-like, almost entire; lower unequally 3-lobed; limb spreading; stamens 4 in pairs; ovary deeply 4-lobed; nutlets 4, angular.

*Flowering and Fruiting:* April-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 425

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Nepal; Pakistan; Iran; Iraq; Turkey; Japan; Afghanistan; Morocco; Tunisia; Russian Federation; Portugal; Spain; Algeria; Europe and Northern America.

### **SALVIA L.**

*Salvia mukerjeea* Bennet & Raizada in Ind. For. 108: 303. 1982; *Bhellum* & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 184. 2012. *S. lanata* Roxb., Fl. Ind. 1 : 146. 1820. non Salisb. 1796; Hooker f., FBI. 4 : 654. 1885; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 631. 1972.

Annual erect herbs; stem 4-angular; radical leaves oblong, serrate, tomentose underneath; upper leaves 5-10 cm long, opposite, oblong, lanceolate, obtuse, margin serrate; bracts orbicular, hairy; calyx bell-shaped, hairy, teeth spine tipped; corolla 2-lipped, blue; stamens 2, filaments short; nutlets 4, smooth.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 322

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Pakistan; Afghanistan; Arabia; Egypt; Libya and E. Africa.

## **50. PLANTAGINACEAE**

### **PLANTAGO L.**

#### **Key to Species**

<b>1</b>	+	Plants with tap root ----- <i>Plantago amplexicaulis</i>
	-	Plants with adventitious roots ----- 2
<b>2</b>	+	Ovary 2-ovuled ----- <i>P. lanceolata</i>
	-	Ovary 3 to many ovuled ----- 3
<b>3</b>	+	Ovary 3-5 ovuled ----- <i>P. depressa</i>
	-	Ovary 6-35 ovuled ----- 4
<b>4</b>	+	Calyx stipitate; seeds upto 6 ----- <i>P. himalaica</i>
	-	Calyx not stipitate; seeds upto 35 ----- <i>P. major</i>

*Plantago amplexicaulis* Cav. Icon Descr. 2: 22.t. 125. 1753; Edgew. in Journ. Linn. Soc. Bot. London 6: 192. 1862; Hooker f., FBI. 4: 706. 1885; Sharma and Kachroo, Fl. Jmu. 1: 266.

1981; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 185. 2012.

Annual, sparsely pilose to nearly glabrous acualescent, herbs; leaves lanceolate, 5-15 cm long, 3-5 nerved from base; inflorescence 1-4.5 cm long dense spikes; bracts ovate, oblong; sepals ovate; petals ovate, glabrous, acute; stamens 4, subequal; ovary bilocular, single to many ovuled; capule membrous, circumscissile; seeds black.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 329

*Distribution:* India (Jammu and Kashmir); Pakistan; Egypt and Greece.

*Occurrence :* Abundant in meadows.

*P. depressa* Willd. Enum. Pl. Hort. Berol. Suppl. 8 1813; Patzak and Rech. f. in Rech. f., Fl. Iran. 15: 7. 1965; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 186. 2012. *P. tibetica* Hook. f. & Thoms. in Hooker f., FBI. 4: 706. 1885; *P sibirica* Hort. ex Poir. Encyc. Suppl. 4: 383. 1816; *P.; leptostachya* Ledeb., Fl. Ross. 3: 479. 1849.

Perennial glabrous herbs; leaves lanceolate, 5-10 cm long, shortly petiolate; inflorescence lax spike.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 302

*Distribution:* India (Jammu and Kashmir); Nepal; Pakistan; China; Korea; Russian Federation and Tropical and Temperate regions.

*P. lanceolata* L. Sp. Pl. 113. 1753; Hooker f., FBI. 4: 706. 1885; Kitam., Fl. W. Pak. & Afghan. 135. 1964; Verdc. in Fl. Trop. E. Afr. Plantag. 6. 1971; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 186. 2012. *P. Orientalis* Stapf in Denkschr. Akad. Wiss. Wien. Math. Nat. Kl. 50: 33. 1885.

Perennial herb, acaulescent, small to 30 (-60) cm tall. Leaves membranous, narrow lanceolate to narrow elliptic, glabrous slightly pilose or attenuated, acute, at the base narrowed into a narrow petiole, nerves 5. Scapes erect, sparsely covered with white hairs. Spikes dense, conic-cylindrical, subglobose to globose. Sepals glabrous or at the margin villose, anterior sepals connate, obovate, bilobed. Corolla lobes narrow ovate to ovate. Seeds 2, smooth.

*Flowering and Fruiting:* April-October

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 529

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Pakistan; Europe and Northern America.

Parts used: Leaves, seeds

Ethnobotanical utility: Leaf decoction taken orally cures cough, asthma and bronchitis. Seeds are taken with milk as aperient. Leaves are cooked as vegetable and eaten to increase eye sight. Leaf paste is styptic and is also applied topically on abscess to help them ripen.

***P. major*** L. Sp. Pl. 112. 1753; Hooker f., FBI. 4: 705. 1885; Blatter, Halberg & Mc Cann. In Journ. Ind. Soc. Bot. 1: 265. 1920; Verdc. in Fl. Trop. Afr. Plantag. 2. 1971; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 186. 2012.

Perennial acaulescent herbs, variable, erect, rootstocks and numerous adventitious roots; leaves in rosettes, spirally arranged, petiolate, and lamina ovate elliptic, rounded at apex, entire; scapes many, arched, erect, glabrous to slightly pilose; inflorescence spike; Bracts equalling or shorter than the calyx glabrous, sepals broadly elliptic, oblong to rounded obtuse or subacute, margins broadly scarious; corolla greenish or yellowish white, glabrous, lobes elliptic-ovate to narrowly triangular; capsule globose or subconic; Seeds minute, dull black.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 16

*Distribution:* India (Jammu and Kashmir); Nepal; Pakistan; N. C. Asia; Europe and widely naturalized in many parts of the world.

Parts used: Leaves, seeds, whole plant

Ethnobotanical utility: Leaf paste is styptic and is applied on cuts and wounds to counteract inflammation. Seed decoction cures gastric and peptic ulcers, irritable bowel syndrome, diarrhoea and dysentery. Plant extract is prescribed in bronchitis, asthma and hay fever.

## 51. NYCTAGINACEAE

### **MIRABILIS**

***Mirabilis jalapa*** L., Sp. Pl. 177. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 234. 1972.

*Flowering and Fruiting:* May-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 305

*Distribution:* India (Jammu and Kashmir),

## 52. ILLECEBERACEAE

### *HERNIARIA* L.

#### Key to Species

1	+	Annual herbs; stamens usually 2-3; ----- <i>Herniaria hirsuta</i>
	-	Perennial herbs; stamens 5----- <i>H. incana</i>

*Herniaria hirsuta* L., Sp. Pl. 218. 1753; Hooker f., FBI. 4 : 712. 1885; Ghafoor in Fl. W. Pak. 47 : 6. 1973; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 187. 2012.

Prostrate hirsute herbs; stem with numerous radiating 6-13 cm long branches; leaves elliptic or lanceolate, 0.2-1 cm long; stipules scarious; flowers geen; petals absent; stamens 5, alternating with 5 staminodes; fruit an utricle enclosed in persistent calyx.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 438

*Distribution:* India (Jammu and Kashmir); Belgium; France; Spain; Portugal; Italy; Austria Switzerland; Germany; Czechoslvakia; Poland; Hungry; Yugoslavia; Greece; Turkey; Cyprus; Lebanon; Palestine; Iran; Afghanistan; Morocco; Algeria and Ethiopia.

*H. incana* (Lamak.) Hk. f.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 925

*Distribution:* India (Jammu and Kashmir; Himachal Pradesh); Pakistan; West Asia; N. W. Africa and Europe.

## 53. AMARANTHACEAE

#### Key to Genera

1	+	Leaves always opposite; anthers 1-celled ----- <i>Alternanthera</i>
	-	Leaves alternate or opposite; anthers 2-celled ----- 2
2	+	Ovules erect' flowers unisexual ----- <i>Amaranthus</i>
	-	Ovules pendulous; flowers bisexual ----- 3
3	+	Spikes short, axillary or paniculate; tepals woolly ----- <i>Aerva</i>
	-	Spikes elongate, simple; tepals spinescent ----- <i>Achyranthes</i>

### **ACHYRANTHES L.**

*Achyranthes bidentata* Blume, Bijdr. 545. 1825; Hooker f., FBI. 4 : 730. 1885; Stewart, *l.c.* 228. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 187. 2012.

Annual or perennial herbs; stem ascending, subglabrous, appressed hairy; leaves opposite, shortly stalked, ovate, lanceolate, 9-20 cm long, acuminate, sparsely hairy on both surfaces; inflorescence 10-20 cm long, slender spikes; bracts ovate, acuminate; bracteoles 3-5 mm; tepals 5, subequal; stamens 5, alternate with staminodes; utricle cylindrical, 2-3 mm long, smooth.

*Flowering and Fruiting:* August-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 372

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Japan; Bhutan; Indonesia; China; Myanmar; Malaysia; Nepal; N. Guinea; Russia; Thailand and Vietnam.

### **AERVA Forssk.**

*Aerva sanguinolenta* (L.) Bl., Bijdr. Fl. Nederl. Ind. 547. 1825; Stewart, *l.c.* 229. 1972; Babu, Herb. Fl. DD. 427. 1977; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 187. 2012. *Achyranthes sanguinolenta* L. Sp. Pl. ed. 2, 249. 1762.

Perennial rambling herbs; stem terete, branched from base; clothed with dense appressed with white or yellow hairs; leaves alternate, opposite, elliptic or ovate lanceolate, 2.6-10 cm long, apex acute; spikes solitary or fascicled; flowers silvery white; bracts deltoid, ovate, persistent; bracteoles similar but smaller; perianth 5-parted, tepals ovate, woolly without; stamens 4 or 5 unequal, alternate with staminodes; ovary 1-ovuled.

*Flowering and Fruiting:* July-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 394

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); China; Pakistan; Philippines; Malay Islands; Java; Bhutan; Cambodia; Laos and Nepal.

### **ALTERNANTHERA Forssk.**

*Alternanthera sessilis* (L.) R. Br. ex DC. Cat. Hort. Monspel. 77. 1813; Hooker f., FBI. 4 : 731. 1885; Backer, Fl. Males. Ser. 1, 4 : 92. 1949; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 188. 2012.

Annual or perennial prostrate, spreading, polymorphic herbs, , rooting at the nodes; branches many, often light purplish-grey; leaves simple, opposite, shortly-stalked, linear-oblong, lanceolate, oblong or elliptic; flowers white shiny, borne in small axillary, sessile, chaffy heads.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 227

*Distribution:* India (Jammu and Kashmir); Pakistan and almost all warm countries.

## AMARANTHUS L.

### Key to Species

1	+	Spinous herbs Bracts ----- <i>Amaranthus spinosa</i>
	-	Non-spinous herbs ----- 2
2	+	Bracts shorter than tepals ----- 3
	-	Bracts longer than tepals ----- <i>A. caudatus</i>
3	+	Spikes axillary or terminal; utricles sharply beaked ----- <i>A. viridis</i>
	-	Bracts longer than tepals; utricles not as above ----- <i>A. blitum</i>

*Amaranthus blitum* L. Sp. Pl. 990. 1753.

Annual glabrous herbs; stem ascending or prostrate, sometimes erect, branched, leaves petiolate, petiole as long as twice the ovate blade, base cuneate, apex emerginate; inflorescence in slender terminal spikes or panicles forming axillary clusters; barcts spatulate; staminate flowers with 3 tepals; stamens 3; pistillate flowers with 3 tepals; utricles compressed, brown, lenticular, smooth, shining.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 349

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Central America; Eurasia; Nepal; Japan; South America; Northern America; Eurasia and Africa.

*A. caudatus* L., Sp. Pl. 990. 1753; Hooker f., FBI. 4 : 719. 1885; Thell in Aschers. & Gray, Syn. 5 : 231. 1914; Backer, Fl. Males. Ser. 1, 4 : 80. 1949; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 1188. 2012.

Erect, annual herbs; stem angular, angles obtuse, often much branched on upper parts, tinged purple; leaves simple, opposite, ovate, elliptic or rhomboid-oblong, 10-25 cm long, apex acute or obtuse; inflorescence in axillary, rarely terminal panicles, nodding

only in upper half; bracts ovate, acuminate, longer than tepals; male flowers with 5 tepals, stamens 5, often 3, as long as tepals; female flowers with 5 tepals; ovary 1-celled, ovule erect; utricle ovoid.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 321

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Pakistan; Central, South and Northern America.

*A. spinosus* L., Sp. Pl. 991. 1753; Hooker f., FBI. 4 : 718. 1885; Stewart, *l.c.* 231. 1972; Babu, Herb. Fl. DD. 431. 1977; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 189. 2012.

An erect, diffuse, branched, herb; leaves alternate, simple, entire, obtuse, rhomboid or deltoid-ovate; flowers in axillary dense clusters, forming long distantly interrupted spikes, trimerous; bracts and sepals acute or awned; fruit minute.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 430

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Pakistan; Mexico; China; West Indies; Central, Southern and Northern America and warm Temperate and Tropical regions.

*A. viridis* L., Sp. Pl. ed. 2, 1405. 1762; Hooker f., FBI. 4 : 720. 1885; Stewart, *l.c.* 231. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 189. 2012.

Annual erect herbs; stem angular, grooved, branched; leaves ovate, upto 10 cm long or more, apex acute or obtuse; inflorescence in paniculate, spiciform racemes; bracts ovate, triangular, sharply acute; male flowers with 3 tepals, lanceolate; female flowers with 3 tepals, narrowly oblong; ovary 1-celled; utricles ovoid; seeds dark brown to black.

*Flowering and Fruiting:* June-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 275

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Tropical and Subtropical and many warm Temperate regions.



## 54. CHENOPODIACEAE

### Key to Genera

1	+	Leaves foliaceous, neither fleshy nor terete ----- <i>Chenopodium</i>
	-	Leaves fleshy, terete ----- <i>Suaeda</i>

### *CHENOPODIUM* L.

#### Key to Species

1	+	Plants glandular pubescent; strongly aromatic ----- 2
	-	Plants eglandular, non-aromatic ----- 3
2	+	Calyx glandular ----- <i>Chenopodium botrys</i>
	-	Calyx glabrous ----- <i>C. ambrosoides</i>
3	+	Tepals 5, herbaceous, non-succulent ----- <i>C. album</i>
	-	Tepals 1-3, succulent ----- <i>C. foliosum</i>

*Chenopodium album* L., Sp. Pl. 219. 1753; Hooker f., FBI. 5 : 3. 1886; Stewart, *l.c.* 220. 1972; Babu, Herb. Fl. DD. 437. 1977; Sharma & Kachroo, Fl. Jammu. 1 : 274. 1981; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 190. 2012.

Annual, 10-150 cm, usually erect herbs; stem variously branched, farina grey, green, sometimes reddish or with red spots at leaf axils. basal and middle leaves petiolate, blade variously trullate, rhombic-ovate to lanceolate; inflorescence a variable spiciform or cymosely branched panicle, mostly terminal; perianth segments 5, dorsally keeled; pericarp thin, adherent; Seeds horizontal, black, 1-1.5 mm across.

*Flowering and Fruiting:* May-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 278

*Distribution:* India (Throughout India); Nepal; Burma; Europe; Asia, Africa; Australia; Native of Tropical America.

*C. ambrosoides* L., Sp. Pl. 219. 1753; Hooker f., FBI. 5 : 4. 1886; Stewart, *l.c.* 220. 1972; Babu, Herb. Fl. DD. 437. 1977; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 190. 2012.

Strongly armatic herbs; stem branched, angular, grooved, pubescent; leaves lanceolate, oblong, 5-10 cm long, margin serrate; inflorescence in axillary paniced spikes; tepals 5, gland dotted, hairy without; stamens 3-5; stigma 3-5; seeds reddish brown, smooth.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 318

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Pakistan; Nepal; Saudi Arabia; Zimbabwe; America and throughout Tropical and Subtropical regions.

*C. botrys* L., Sp. Pl. 219. 1753; Hooker f., FBI. 5 : 4. 1886; Collett, Fl. Sim. 416-417. 1921 (rep. ed.); Stewart, *l.c.* 220. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 191. 2012.

Annual, aromatic herbs; stem 20-50 cm tall, much branched, glandular pubescent; leaves oblong, 3-8 cm long, basal lobed, upper entire, glandular pubescent on both surfaces; inflorescence interrupted spikes; tepals 5, connate at base, gland-dotted pubescent; stamens 3-5; stigma bilobed; seeds reddish brown.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 716

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Mediterranean region; Africa; Europe; Northern America and Temperate and Subtropical Asia.

*C. foliosum* (Moench.) Aschers., Prodr. Fl. Brandenb. 1 : 572. 1863; Stewart, *l.c.* 221. 1972; *C. blitum* Hooker f., FBI. 5 : 5. 1886; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 191. 2012. *Monocarpus foliolosum* Moench, Meth. 342. 1794.

Annual or biennial herbs; stem brached, braches stout, angular, striated; leaves alternate, upto 7 cm long; basal leaves triangular, base hastate; upper ones rhomboid, lanceolate, margin dentate; inflorescence in bracteate spike; tepals 4-5; fruit, berry-like red utricle; seeds smooth, opaque.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 226

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Pakistan; Nepal and China.

## SUAEDA L.

### Key to Species

1	+	Perennial herbs; styles usually 3-5, short ----- <i>Suaeda fruticosa</i>
	-	Annual herbs; styles 2, long, slender ----- <i>S. maritima</i>

*Suaeda fruticosa* Forssk., Fl. Aegypt.-Arab. 69. 1775; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 227. 1972. *Chenopodium fruticosa* L. Sp. Pl. 221. 1753.

Annual or perennial herbs; stem branched, branches many, spreading or ascending; leaves linear or oblong, 5-115 mm long; inflorescence in spikes; flowers bisexual, green turning red at maturity; perianth acrescent, persistent; stigmas 3; utricles ovoid or oblong, beaked, black, shining.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 772

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Tropical Africa; Egypt; Algeria; Pakistan and Europe.

*S. maritima* (L.) Dumort., Fl. Belg. 22. 1827; *Chenopodium maritima* L. Sp. Pl. 221. 1753.

Annual, erect or ascending, robust herbs; stem branched, branches many from the base, horizontal; leaves linear, oblong, fleshy, often turning red at maturity; inflorescence in slender, lax spikes; perianth 5-lobed, lobes fleshy; stigmas 2; utricles whitish; seeds black, shining.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 773

*Distribution:* India (Jammu and Kashmir); Asia; Pacific Islands; Japan; New Zealand and Europe.

## 55. POLYGONACEAE

### Key to Genera

1	+	Tepals 6; stigma fimbriate ----- <i>Rumex</i>
	-	Tepals 4 or 5, stigma capitate ----- 2
2	+	Ochrea white silvery, hyaline, eventually deep laciniate ----- <i>Polygonum</i>
	-	Ochrea brown, usually opaque, entire, fimbriate or laciniate ----- <i>Persicaria</i>

## **PERSICARIA L.**

### **Key to Species**

<b>1</b>	+	Plants erect, white villous; leaves broadly ovate ----- <i>Persicaria orientale</i>
	-	Plants ascending or creeping; not villous; leaves lanceolate ----- <i>P. hydropiper</i>

*Persicaria hydropiper* (L.) Spach, Hist. Veg. **10** : 536. 1841; Munshi & Javied, Polygon. Kashm. Himal. 75. 1976; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 194. 2012. *Polygonum hudropiper* L. Sp. Pl. 361. 1753; Hooker f., FBI. **5** : 39. 1886.

Annual tufted herbs; stem slender, sometimes creeping at basal bears roots; stem ascending 25-50 cm long; leaves alternate, subsessile, oblong, lanceolate, stipule ochreate, ciliate; bracts minute, fringed with ciliate hair; perianth glandular; nutlets trigonous, opaque, granulate.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 801

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Northern America; Europe; introduced in Asia; N. W. Africa; Pacific Islands; New Zealand and Australia.

*P. orientale* (L.) Spach, Syst. Veg. 537. 1841; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 194. 2012. *Polygonum orientale* L. Sp. Pl. 362. 1753; Hooker f., FBI. **5** : 30. 1886; *P. pilosum* Roxb., Fl. Ind. **2** : 286. 1832.

Annual, branched pubescent or silky villous herbs; 0.7-2 m tall; stem hollow, white silky villous; leaves 10-20 cm long, ovate or ovate-lanceolate, apex acuminate; petiole 3-7 cm long; stipule ochreate, tubular, hirsute without; inflorescence dense racemes in lax terminal panicles; flowers 2-2.5 cm across, pale greenish white; stamens included; nuts 2.5 mm across, black, shining.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 356

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); S. Asia and Northern America.

## **POLYGONUM L.**

### **Key to Species**

<b>1</b>	+	Stipules with prominent nerves; nuts 3-angled, minutely wrinkled ----- ----- <i>Polygonum aviculare</i>
	-	Stipules nerves absent or faint; nuts 3-angled, smooth ----- <i>P. plebium</i>

*Polygonum aviculare* L., Sp. Pl. 362. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 203. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 194. 2012.

Annual, prostrate, glabrous, 30-60 cm tall, herbs; stem much branched from base; leaves elliptic, oblong, or oblanceolate, narrowed to stalk; flowers axillary, pink; pedicel short, jointed at tip; perianth obovoid, 3-gonous, connate at base; stamens alternate with tepals; fruit surrounded by persistent calyx, trigonous, beaked.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 787

*Distribution:* India (Jammu and Kashmir); Pakistan; Europe; N. Africa; Temperate and Subtropical Asia; Java; Australia and Northern America.

*P. plebeium* R. Br., Prodr. 420. 1810; Hooker f., FBI. **5** : 27. 1886; Stewart, Contr. Gray Herb. **5** (88) : 24. 1930; Sant., Fl. Khandala ed. 3, 226. 1967; Saldanha & Nicolson, Fl. Hass. Dist. 111. 1976; Babu, Herb. Fl. DD. 445. 1977; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 195. 2012. (*Plebejum*).

Annual or perennial, prostrate, spreading herbs; stem striate, glabrous, 10-40 cm tall; often tinged purple, otherwise green; ochrea tubular, often torn in the middle; leaves linear, narrowly obovate, 1-1.5 cm long, glabrous; inflorescence axillary or terminal cymes; flowers white or pink; perianth 4 or 5 parted; stamens 4 or 5, epipetalous; ovary trigonous, styles 3, short, stigmas 3, capitate; nuts 3-gonous, smooth, shining.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 668

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Pakistan; Afghanistan; Tropical Asia; Austria and Tropical and Southern Africa.

## **RUMEX L.**

### **Key to Species**

<b>1</b>	+	Leaves hastate -----2
	-	Leaves not hastate ----- <i>Rumex patientia</i>
<b>2</b>	+	Leaves all petiolate; flowers polygamous ----- <i>R. hastata</i>
	-	Leaves on upper parts sessile; flowers unisexual ----- <i>R. acetosa</i>

***Rumex acetosa*** L. Sp. Pl. 337. 1753; Stewart, Ann. Cata. Vasc. Pl. W. Pak. & Kashm. 213. 1972.

Perennial erect herbs; stem 30-70 cm tall, hollow, furrowed; leaves petiolate, basal oblong, acute or obtuse, cauline sessile, oblong, acute, 4-6 cm long; flowers pink in paniced racemes or axillary whorls; pedicel jointed in middle; male flowers with 6-parted parianth; stamens 6; female and bisexual with 6-parted parianth; ovary trigonous; nuts dark-brown, shining.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 525

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Eastern Asia; Pacific Islands; Africa; Tropical and Temperate Asia; Northern America; Europe and South America.

***R. hastata*** D. Don, Prodr. Fl. Nep. 74. 1825; Meissner in DC. Prodr. **14** (1) : 72. 1856; Hooker f., FBI. **5** : 60. 1886; Babu, Herb. Fl. DD. 446. 1977; *Bhellum* & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 196. 2012.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 731

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); W. Himalayas; Afghanistan; Pakistan; China and Bhutan.

***R. patientia*** L., Sp. Pl. 33. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 215. 1972.

Annual erect herbs; stem roust, terete; leaves linear, lanceolate, margin entire; flowers unisexual or bisexual in dense clusters; pedicellate, pedicel short, slender; tepals accrescent in fruits.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 830

*Distribution:* India (Jammu and Kashmir); Northern pacific Islands; North America; Asia; Indonesia; Tropical and Temperate region and S. & C. America.

## 56. EUPHORBIACEAE

### Key to Genera

1	+	Plants shrubs; leaves palmately lobed; male and female flowers in common involucre; each cell 1-ovuled; capsule muriccate about 2 cm across ----- <i>Ricinus</i>
	-	Plants herbs; leaves not palmately lobed; male and female flowers in distinct involucre; each cell 2-ovuled; capsule smooth, upto 1.6 cm across----- <i>Euphorbia</i>

### *EUPHORBIA* L.

#### Key to Species

1	+	Plants about 100 cm tall; capsule upto 16 mm across ----- <i>Euphorbia lathyris</i>
	-	Plants about 50 cm tall; capsule upto 5 mm across ----- 2
2	+	Erect herbs ----- 3
	-	Prostrate herbs ----- 5
3	+	Seeds small, grey, longitudinally grooved ----- <i>E. pepulus</i>
	-	Seeds smooth or net-veined; glands crescent-shaped ----- 4
4	+	Seeds minutely net-veined; glands rounded ----- <i>E. helioscopia</i>
	-	Seeds smooth; glands crescent-shaped ----- <i>E. meddani</i>
5	+	Capsule smooth; seeds 4-angled; slightly wrinkled transversely ----- <i>E. clarkeana</i>
	-	Capsule pubescent or hairy ----- 6
6	+	Glands red or purple; capsule hairy at angles ----- <i>E. prostrata</i>
	-	Glands green; capsules pubescent ----- <i>E. indica</i>

*Euphorbia clarkeana* Hook. f., 5: 253. 1887; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 447. 1972.

Annual glabrous herbs; stem much branched, prostrate; leaves oblong, narrowly oblique, more or less falcate, 2-13 cm long, apex emerginate, glabrous; glandular appendages minute; margin denticulate; cyathia axillary, glandular, minute appendages; fruits trigonous glabrous, distally rugose; seed ovoid, shallowly rugose or smooth.

*Flowering and Fruiting:* May-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 723

*Distribution:* India (Jammu and Kashmir, N. W. India); Afghanistan and Pakistan

*E. helioscopia* L., Sp. Pl. 459. 1753; Hooker f., FBI. 5 : 262. 1887; Sharma & Kachroo, Fl. Jmu. 1 : 281. 1981; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 201. 2012.

Annual glabrous herbs; stem erect, much branched at the top; leaves alternate, obovate, margin minutely toothed; inflorescence cyathia in umbellate rays; involucre 4, toothed, smooth; gland yellow; capsule smooth; seeds veined.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 160

*Distribution:* India (Jammu and Kashmir), W. Himalayas; Pakistan; Afghanistan and Westwards.

*E. indica* Lam., Dict. Bot. 2 : 423. 1786; Stewart, *l.c.* 450. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 201. 2012. *E. hypericifolia* Hooker f., FBI. 5 : 249. 1887. P.P. (auct. non. L.).

Erect, suberect or decumbent ascending annual pubescent herbs; leaves elliptic oblong, base obliquely rounded, serrulate except at base; stipule intrapetiole; cyathia in loose clusters, glands purple; fruit trigonous, smooth or sparingly pubescent; seeds almost smooth, shallowly rugose.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 717

*Distribution:* India (Jammu and Kashmir); Africa; Arabia; Iran; Afghanistan; Pakistan and China

*E. lathyris* L., Sp. Pl. 457. 175; Boiss., in DC. Prodr. 15(2): 99. 1862.

Annual or biennial glabrous, glaucous herb; juice milky. Stem erect, hollow, 70- 90 cm tall, branched above the middle; leaves lanceolate, opposite, decussate, sessile, margin entire, 2.5 - 10.5 cm long, base cordate, apex acute or subacute, bluish green; pseudoumbels 2-4 rayed; cythia pale-green, glands 2-horned; male flower each with one stamen, anther pale yellow; style three lobed, each lobe erect or recurved; fruit subglobose, hexalobate, 0.8 - 1.4 x 1.3 - 1.6 cm, smooth turning wrinkled with age.

*Flowering and Fruiting:* June - August



*Specimens examine: Bhellum, 655*

*Distribution:* India (Jammu and Kashmir); Atlantic Islands; Europe; N-W & N-E Africa; Caucasus; China; Japan North America & South America and Russia.

*E. meddani* Boiss. in DC. Prodr. **15** (2) : 141. 1862; Hooker f., FBI. **5** : 263. 1887; Stewart, l.c. 450. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 201. 2012.

Annual, erect or ascending herbs; stem much branched from the base; leaves alternate, sessile, obovate, base rounded, apex retuse; cyathia rays in pseudoumbels; glands semilunar, horns 2; fruits trilobate, smooth; seeds ovoid, caruncle white.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum, 878*

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh) and Pakistan.

*E. peplus* L., Sp. Pl. 456. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 451. 1972.

Annual glabrous herbs; stem branched from the base; leaves ovate, obovate, apex obtuse or rounded; cyathia in pseudoumbels; rays repeatedly dichotomously branched. glands greenish, crescent shaped with 2-white horns; capsule 3 lobed, longitudinally grooved; seeds grey, small, caruncle white.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum, 123*

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); S. & C. Asia; Europe, N. Africa; N & C. America and Australia.

*E. prostrata* Ait., Hort. Kew. ed. 1, **2** : 139. 1789; Boiss. in DC. Prodr. **15** (2) : 47. 1862; Hooker f., FBI. **5** : 266. 1887; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 202. 2012.

Annual, prostrate, pubescent herbs; leaves obovate or suborbicular, rounded at apex; stipule triangular; cyathia solitary in axillary lateral shoots; glands transversely ovate, purplish with minute pinkish appendage; fruits smooth and pilose on sides.

*Flowering and Fruiting:* May-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum, 655*

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Pakistan, native of Tropical and Subtropical America and introduced in many parts of old world.

### ***RICINUS L.***

*Ricinus communis* L., Fl. Ind. **3** : 693. 1832; Hooker f., FBI. **5** : 470. 1887; Parker For. Fl. Punj. 458. 1918; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 456. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 203. 2012.

Perennial monoecious, glabrous, herbs; leaves alternate, long petiolate, palmately lobed; petioles glandular at base and apex; inflorescence paniculate, leaf-opposed; male flowers pedicellate, anthers with numerous pollens; female flowers pedicellate, ovary 3-celled, one ovule in each cell; seeds dorsoventrally compressed;

*Flowering and Fruiting:* July-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 868

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Pakistan; Tropical Africa and spreading in tropical and subtropical regions of the world.

### **57. CELTACEAE**

#### ***CELTIS L.***

*Celtis australis* L., Sp. Pl. 1043, 1753; Hooker f., FBI. **5** : 482. 1888.

A large, deciduous tree; leaves alternate, shortly stalked, ovate or elliptic, base unequal, glabrous, serrate, acuminate,; flowers unisexual or polygamous, appearing before or with foliage; stamens 4-5, surrounding the silky disc; ovary ovoid seated on silky disc; fruit long-stalked, ellipsoid, usually solitary.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 340

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); North Africa; Asia Minor; United Kingdom; Native to South Europe.

### **58. ULMACEAE**

#### ***ULMUS L.***

*Ulmus wallichianum* Planch, in Ann. Sc. Nat. Ser. 3, **10** : 277. 1848; Hooker f., FBI. **5** : 480. 1888; Malville & Heybroek in Kew Bull. 26, **1** : 8. 1971.

Large, deciduous trees, bark rough, young shoots more or less pubescent; leaves elliptic, oblong orobovate, 5-15 x 3-6 cm, scabrid above at maturity, pubescent or glabrate beneath, base quite oblique, not 3-nerved at base, lateral nerves parallel, apex acute or

acuminate; flowers actinomorphic, bisexual, reddish brown; perianth lobes 5-6, reddish brown, papery, margins ciliate; filaments longer than perianth, anthers reddish-purple; ovary 2-celled, style arms 2, villous, long, slender; fruit winged, nut or samara, wings membranous.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 823

*Distribution:* India (Jammu and Kashmir); Afghanistan; Pakistan; Nepal and West Himalayas.

## 59. CANNABACEAE

### *CANNABIS* L.

*Cannabis sativa* L., Sp. Pl. 1027. 1753; Hooker f., FBI. 5 : 487. 1888; Sharma and Kachroo, Fl. Jammu 1 : 289. 1981; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 205. 2012.

Annual or perennial erect dioecious, strongly aromatic herbs; stem 1-2.5 m height, grooved; leaves alternate, lower opposite, upper 1-3, lower 5-ll palmatipartite, segments generally lanceolate, oblong, apex acuminate, margin coarsely serrate, thinly gland hairy above, appressed-pubescent or gland punctate beneath; male flowers in short cymes, combined into terminal panicles, tepals 5; stamens 5, erect in bud; female flowers sessile in axillary pairs; perianth 5-lobed, hyaline, ovary sessile, style arms 2, filiform; fruit greyish brown or yellowish, smooth.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 839

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Pakistan; Nepal; Afghanistan; North-West Himalayas and Central Asia.

## 60. URTICACEAE

### *URTICA* L.

#### Key to Species

<b>1</b>	+	Plants monoecious; stipules united ----- <i>Urtica ardens</i>
	-	Plants dioecious; stipules usually free ----- <i>U. dioica</i>

*Urtica ardens* Link., Enum. Hort. Berol. **2** : 385. 1822; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 197. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 206. 2012. *U. parviflora* Roxb., Fl. Ind. ed. Carey **3** : 581. 1832; Hooker f., FBI. **5** : 548. 1888.

Annual, erect, dioecious herbs clothed with stinging hairs; stem angular, grooved; leaves opposite, ovate, lanceolate, cordate, acuminate, petiole 2-3 cm long, leaf margin coarsely toothed, teeth regular, nerves prominent underneath; stipule interpetiolar, free, linear, 2-3 cm long; inflorescence axillary panicle; flower actinomorphic, unisexual, small, green; male flowers with 4- parted perianth, segments minute, hairy without; stamens 4, free, filaments with sheathy base, anthers bithecous; female flowers with unequal persistent perianth lobes; achenes flat.

*Flowering and Fruiting*: July-September

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 384

*Distribution*: India (Jammu and Kashmir); West Himalayas; Pakistan and West China.

*U. dioica* L., Sp. Pl. 984. 1753; Hooker f., FBI. **5** : 548. 1888; Stewart, Ann. Cata. Vasc. Pl. W. Pak. & Kashm. 197. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 206. 2012.

Dioecious, perennial, 50-150 cm herb with a dense indumentum of stinging hairs. Stem angled. Leaf lamina narrowly lanceolate to ovate, cordate at the base, margin serrate, apex acute-acuminate, stipules free lateral, oblong-lanceolate, ciliate. Racemes of cymes axillary. Flowers pale-greenish, or whitish, bracteate, bracts of male flowers smaller than those of female flowers. Sepals pubescent. Achenes ovoid-ellipsoid, pale green or greenish-brown

*Flowering and Fruiting*: June-September

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 351

*Distribution*: India (Jammu and Kashmir); Asia; Europe; North Africa; N.-W. America.

Parts used: Leaves, roots, whole plant

Ethnobotanical utility: Leaf paste is styptic and is also applied on the scalp before hair wash to get rid of dandruff. Leaf extract is administered orally as tonic for female reproductive health and also regulates menstrual cycle. Leave decoction is taken orally for curing urinary tract infections.

## 61. MORACEAE

### Key to Genera

1	+	Flowers in catkin ----- <i>Morus</i>
	-	Flowers inside the hollow receptacle ----- <i>Ficus</i>

### *FICUS* L.

#### Key to Species

1	+	Leaves scabrid above; receptacles sub-globose, purple on ripening ---- <i>Ficus palmata</i>
	-	Leaves not scabrid above; receptacles globose, yellow on ripening ----- <i>F. carica</i>

*Ficus carica* L., Sp. Pl. 1059. 1753; Stewart, *l.c.* 192. 1972.

Shrubs, or small trees; stem much branched, twigs tomentose; leaves coriaceous, ovate, oblong, apex rounded or obtuse; tomentose, deep green; receptacle more or less pyriform, peduncle short; male receptacle spheroid.

*Flowering and Fruiting:* July-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 844

*Distribution:* India (Jammu and Kashmir); Western Asia; Iran; Iraq; Turkey; supposed to be indigenous to Syria and Palestine.

*F. palmata* Forssk., Fl. Aegypt. – Arab. 179. 1775; King, in Hooker f., FBI. **5** : 530. 1888; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 208. 2012.

Deciduous tree or small shrub; tender parts tomentose or pubescent; leaves petiolate, petiole 2.5-5 cm long, lamina quite variable in size, broadly ovate, orbicular, margin crenate-dentate or deeply lobed, scabrous above tomentose underneath, base rounded or cordate, 3-nerved at base, lateral nerves 3-6 pairs; male flowers held towards upper part of the receptacle, female flowers below; stamens 3-6 per flower, fruit globose, 1.2-2.3 cm in diameter.

*Flowering and Fruiting:* July-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 244

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Nepal; Pakistan; Africa; Afghanistan; Ethiopia; Iran; Iraq; Jordan and Sudan.

## **MORUS L.**

### **Key to Species**

<b>1</b>	+	Leaves long pointed; fruits purple white or red ----- <i>Morus australis</i>
	-	Leaves pointed; fruits purple or red ----- <i>M. alba</i>

***Morus alba*** L., Sp. Pl. 986. 1753; Hooker f., FBI. **5** : 492. 1888; Stewart, *l.c.* 194. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 208. 2012.

A deciduous, 8-15 m or rarely up to 20 m tall tree with a dense, compact leafy crown. Leaves with a crisped hairy, filiform, lamina cordate, broad, ovate, highly variable on the same tree, upper surface glabrous, midrib and principal veins pubescent, margin regularly serrate or crenate-serrate. Male catkins 10-20 (-30) mm long including slender, hairy peduncle, with lax flowers. Male flowers: sepals free, broadly ovate, cucullate, obtuse, glabrous to hairy; staminal filaments equal to sepals, with ovate, exerted anthers. Female catkins ovoid, (2) 5-10 (-12) mm long. Female flowers: sepals suborbicular, ovary with glabrous free styles. Sorosis ovoid, white to pinkish-purple or black, sweet.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 211

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Java; Malaya; Burma; introduced in Northern Africa and Eastern Asia.

***M. australis*** Poir, in Lam. Encyc. **4** : 380. 1797; *M. indica* auct. non L. 1753; Hooker f., FBI. **5** : 492. 1888; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 209. 2012.

A small or medium sized trees; young shoots smooth; leaves ovate, simple to 3-5 lobed, scabrous above, sparsely hairy beneath, margin crenate, apex sharply pointed; female flowers with longer style, stigmas 2, pubescent; fruits smaller than the earlier species, scarcely edible, red to dark purple.

*Flowering and Fruiting:* March-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 513

*Distribution:* India (Jammu and Kashmir), Australia; China; Nepal; Bhutan; Myanmar; Russian Federation; Korea; Taiwan and South Asia.

## 62. PLATANACEAE

### *PLATANUS* L.

*Platanus orientalis* L., Sp. Pl. 999. 1753; Hooker f., FBI. 5 : 594. 1888; Stewart, *l.c.* 395. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 208. 2012. *P. cuneata* Willd., Sp. Pl. 4 : 473. 1797; *P. orientalis* Dode, in Bull. Soc. Dendr. Fr. 7 : 57. 1908; Palikin in Fl. USSR 9 : 276. 1939.

A large deciduous tree, young shoots tomentose covered with stellate hair; bark peeling off in strips; leaves alternate, 5-7 palmately lobed, lobes coarsely toothed, 8-25 x 10-30 cm; stipules 2, connate below, usually 2 cm long; inflorescence globose capitulum, 1-2 cm across, peduncle pendent; flowers unisexual; male capitulum subsessile, globose, 4-5 mm in dia; perianth lobes free; stamens 3-8, anthers oblong; female capitulum sessile, globose; perianth lobes spatulate; carpels 3-8, free, ovary linear, style hooked at the tip; capitulum 2-3 cm in fruiting; achenes 7-9 mm long, obpyramidal, densely clothed with long, jointed hairs at the base, style persistent.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 235

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Turkey; N. Iran; C. W. Asia; Afghanistan; Pakistan and S. E. Europe.

## 63. JUGLANDACEAE

### *JUGLANS* L.

*Juglans regia* L., Sp. Pl. 997. 1753; Clarke in Hooker f., FBI. 5 : 595. 1888; Stewart, *l.c.* 188. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 208. 2012.

Deciduous tree up to 25 m tall. Leaves imparipinnate; leaflets 5-9, softly tomentose, opposite to sub-opposite, ovate to elliptic-ovate, acute to acuminate, glabrescent to pubescent on nerves beneath. Male catkins, lateral; bract c. 2 mm long; bracteoles 2, ovate to obovate, pubescent; tepals 4, ovate; stamens 10-20, subsessile; anthers irregularly apiculate, basifixed, dehiscing longitudinally. Female flowers 1-3, terminal on short spikes; involucre of fused bract and bracteoles, tomentose, glandular, obscurely 4-toothed and irregular at the margin; tepals 4, linear, alternating with the teeth; margin sparsely pubescent; ovary ovoid,

inferior. Drupe ovoid to subglobose; epicarp green, glandular; endocarp 2-valved; seed 2 to 4-lobed.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 765

*Distribution:* India (Jammu and Kashmir, Himachal Pradesh and Uttarakhand); Nepal; China; Europe; Afghanistan; Burma; Pakistan and Tibet.

Parts used: Leaves, bark, fruit wall

Ethnobotanical utility: Leaf decoction is effective in tuberculosis and leucorrhoea. The leathery pericarp of unripe fruit (rind) is finely ground and then applied on alopecia affected site to promote hair growth. Bark and rind of the unripe fruit is used to clean teeth and strengthen gums. Intake of unripe kernel acts as aperient. Ripe kernel is eaten as memory enhancer.

## 64. SALICACEAE

### Key to Genera

1	+	Stamens 2 or 5-10 ----- <i>Salix</i>
	-	Stamens numerous ----- <i>Populus</i>

### POPULUS L.

#### Key to Species

1	+	Petioles compressed; mature leaves glabrous ----- 2
	-	Petioles tetete; mature leaves tomentose beneath ----- 3
2	+	Plants of somewhat pyramidal canopy ----- <i>Populus nigra</i>
	-	Plants not as above ----- <i>P. ciliata</i>
3	+	Leaves white cottony beneath ----- <i>P. balsamifera</i>
	-	Leaves brown tomentose beneath ----- <i>P. caprea</i>

*Populus balsamifera* L. Sp. Pl. 990. 1753.

Cultivated trees, stem flexuose, yellowish brown or grey branches; leaves coriaceous; catkins drooping; male flowers sessile; female flowers pedunculate.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 794

*Distribution:* India (Jammu and Kashmir); Native to N. America.



***P. capsica*** Bornm., Fedde, Repert. 47:70. 1939; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 181. 1972.

Trees, stem branched; leaves petiolate, ovate, white tomentose, apex obtuse; catkin hairy, 5-10 cm long; female catkin shorter; tepals oblanceolate; capsule shortly stalked, 2-valved.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 781

*Distribution:* India (Jammu and Kashmir); Australia; Europe; Bhutan; Nepal; Sri Lanka; Myanmar; Thailand and Papua New Guinea.

***P. ciliata*** Wall. ex Royle, Ill. Bot Himal. Mount. 346. t. 84. 1836; Hooker f., FBI. 5 : 638. 1888; Stewart, *l.c.* 181. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 210. 2012.

A larger tree; bark greenish – grey, smooth on young parts; buds sticky; leaves broadly ovate-cordate, base cordate, apex acuminate, margin crenate serrulate, teeth minutely ciliate; petiole 5-12 cm long; inflorescence catkin, male catkin 7-10 cm long, female lax when fruiting, 15-30 cm long; flowers unisexual, bracteate; bracts caducous; male flowers with bell-shaped perianth; stamens numerous, filaments free; bracts fringed with hairs; disc cup-shaped, female flowers bracteate, disc embracing half the ovary, margin undulate; ovules erect and sessile, stigmas 3-4, very large; capsule ovoid, 3-4 valved; seeds embroiled in long silky hairs.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 833

*Distribution:* India (Jammu and Kashmir, Uttarakhand); N. W. Himalayas.

***P. nigra*** L. Sp. Pl. 1034. 1753. var. *italica* (Moench.) Koehn

A large tree with fastigiate branches; crown narrow, cylindrical; buds sticky; leaves 5-10 cm long, ovate, glabrous, margin crenate, acuminate; petiole upto 7 cm long; male catkin upto 8 cm long; stamens 6-30; female catkin upto 10 cm long; stigmas 2, sessile; capsule shortly pedicelled.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 936

*Distribution:* India (Jammu and Kashmir, Uttarakhand); Africa; Temperate Asia and Europe.

## **SALIX L.**

### **Key to Species**

<b>1</b>	+	Leaves narrowly lanceolate ----- 2
	-	Leaves ovate or oblong, clothed with pale bloom beneath ----- <i>Salix elegans</i>
<b>2</b>	+	Leaves silky beneath ----- <i>S. alba</i>
	-	Leaves glabrous underneath ----- <i>S. babylonica</i>

*Salix alba* L., Sp. Pl. 1021. 1753; Hooker f., FBI. **5** : 629. 1888; Stewart, *l.c.* 182. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 211. 2012.

Trees of 20-25 m height. Stipules caduceous. Flowering coetaneous. Male catkin 3-5 cm; bracts yellowish, ovate-lanceolate or obovate-oblong, ciliate, abaxially glabrous, adaxially subglabrous or pilose at base, margin entire. Male flower: glands adaxial and abaxial; stamens 2, free; filaments pilose at base; anthers yellow. Female catkin 3-4.5 cm, bracts yellowish, lanceolate or ovate-lanceolate. Female flower: glands adaxial and abaxial; ovary ovoid-conical, glabrous; style short, 2-lobed; stigma 2-parted.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum, 143*

*Distribution:* India (Jammu and Kashmir); Eurasia; Temperate Asia; Russian Federation and Africa.

Parts used: Stem, leaves, bark

Ethnobotanical utility: Fresh and tender twigs are used as toothbrush to clean teeth, check tooth decay, halitosis and to keep gums healthy and strong. Leaf decoction is taken orally to relieve headache. Bark decoction is administered in arthralgia. Leaf extract is prescribed for curing fever.

*S. babylonica* L., Sp. Pl. 1017. 1753; Hooker f., FBI. **5** : 629. 1888; Stewart, *l.c.* 182. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 211. 2012.

A medium sized tree; stem branched, branchlets pedulous; leaves linear-lanceolate, 7-18 cm long, margin finely serrulate or serrate, apex acuminate, glabrous or sparsely hairy beneath; bracts silky; stamens 2, filaments free, villous towards base; disc glands 2; female catkin as long as male; style absent, stigma sessile; capsule sessile, glabrous.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 589

*Distribution:* India (Jammu and Kashmir); Chian; Asia; Europe; North America and South America;

*S. elegans* Wall. ex Anders.

A small branched tree; stem with black or brown braches; leaves 4-6 cm long; male catkin 4-5 cm long; stamens 2; female catkin still longer, nearly 5.6-7.5 cm long; stigma spreading; capsule 3-4 mm long.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 265

*Distribution:* India (Jammu and Kashmir, Uttarakhand); Afghaistan; Pakistan and Nepal.

## 65. IRIDACEAE

### *IRIS* L.

*Iris kashmiriana* Baker, Gard. Chron. 2: 744. 1877; Singh and Kachroo, For. Fl. Sgr. 216. 1976.

Perennial tuberous herbs; leaves upto 60 cm long glaucous; bracts with narrow papery margin; inflorescence many flowered; flowers white or tinged bluish about 6 cm across, fragrant; capsule many seeded.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 229

*Distribution:* India (Jammu and Kashmir),

## 66. LILIACEAE

### Key to Genera

1	+	Flowers yellow ----- <i>Gagea</i>
	-	Flowers white ----- <i>Ornithogalum</i>

### *GAGEA* Salisb.

*Gagea lutea* (L.) Ker-Gawl. In Curtis Bot. Mag. 30. t.1200. 1809. *Ornithogalum lutea* L. Sp. Pl. 306. 1753. *Gagea elegans* Wall ex Royle, Ill. Bot. Himal. 387. t. 95. f. 2. 1839; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 53. 1972.

A small, bulbous, glabrous 5-15 cm tall herbs, radical leaves 5-30 cm long, linear lanceolate, acute, overtopping the inflorescence; caluline leaves 1-2, flowers yellow in 3-7 scorpioid cymes.

*Flowering and Fruiting:* April-May

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 361

*Distribution:* India (Jammu and Kashmir)

### **ORNITHGALUM L.**

*Ornithgalum umbellatum* L. Sp. Pl. 1: 307. 1753.

Perennial herbs with bulbous base; rootstock fibrous, many; stem 10-30 cm tall; leaves few, oblong, narrow, inflorescence corymbs; pedicels of older flowers longer than younger ones; bracts linear, lanceolate; perianth segments free, spreading, nearly twice as long as stamens; ovary 3-locular, style shorter than ovary; fruit a capsule.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 237

*Distribution:* India (Jammu and Kashmir); Europe to Caucasus; North Africa; United Kingdom and Asia.

## **67. ASPARAGACEAE**

### **ASPARAGUS L.**

*Asparagus officinalis* L., Sp. Pl. 313. 1753; *Bhellum* & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 220. 2012.

Herbaceous; cladodes slender, subulate, 0.7-2.3 cm long; pedicle 3-6 ; flowers solitary or in pairs.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 223

*Distribution:* India (Jammu and Kashmir); Europe; Russia; Mongolia; China; N. W. Africa and N. W. Asia.

## 68. COMMELINACEAE

### *COMMELINA* L.

*Commelina paludosa* Bl., Enum. Pl. Jav. 1: 2. 1827; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 37. 1972.

Annual or perennial, glabrous or subglabrous decumbent herbs; stem creeping, and rooting at nodes; leaves lanceolate, or elliptic, 5-10 cm long; apex acuminate; inflorescence simple or branched cymes subtended by spathe; flowers blue, nearly 1 cm across; capsule trigonous, obovoid or ellipsoid.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 869

*Distribution:* India (Jammu and Kashmir, Uttarakhand); Sri Lanka; Bangladesh; Malaysia; Indonesia and Pakistan.

## 69. JUNCACEAE

### *JUNCUS* L.

#### Key to Species

1	+	Plants 5-20 cm tall; flowers pale green; seeds brown ----- <i>Juncus bufonius</i>
	-	Plants 30-90 cm tall; seeds yellowish ----- <i>J. effusus</i>

*Juncus bufonius* L., Sp. Pl. 328. 1753; Hooker f., FBI. 6 : 392. 1893; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 38. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 221. 2012.

Annual, tufted herbs, 5-20 cm in height; stem erect, often decumbent at base, simple or branched, terete, glabrous; basal leaves flat, linear, 10 x 0.2 cm, upper ones smaller, leaf sheath not auricled; flowers sessile, solitary or in small clusters, occasionally viviparous; bracts often foliar, upper scarious; flower bisexual; tepals 6, imbricate, persistent, sharply acute, margin scarious; stamens 6, often only 3 in terminal flowers; ovary 1 or 3 celled, style 3-branched; capsule oblong, minutely pointed, shorter than perianth.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 281

*Distribution:* India (Jammu and Kashmir, Uttarakhand), Himalayas, N. Temperate regions including Britain.

*J. effusus* L., Sp. Pl. 326. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 40. 1972.

Glabrous herbs; stem soft, slender, 30-90 cm tall, densely matted; inflorescence nodding, decurrent, 7-13 cm long cymes; sepals lanceolate, exceeding capsule; stamens 3, rarely 6, shorter than sepals; capsule obtuse, mucronate; seeds minute, obtuse at ends.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 863

*Distribution:* India (Jammu and Kashmir); Russia and N. America.

## 70. LEMNACEAE

### *SPIRODELA* Schleid.

*Spirodela polyrrhiza* (L.) Schleid., in Linnaea 13: 392. 1839; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 36. 1972. *Lemna polyrrhiza* L. Sp. Pl. 970. 1753.

Floating herbs; fronds 5-8 mm across, obovate or suborbicular, flat, convex beneath, 5-7 mm across; green above, purple beneath; 7-11 nerved; roots 5-10; spathe open at tip; seeds smooth, reticulations faint.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 182

*Distribution:* India (Jammu and Kashmir, Uttarakhand); Temperate or Tropical regions.

## 71. BUTOMACEAE

### *BUTOMUS* L.

*Butomus umbellata* L., Sp. Pl. 372. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 32. 1972.

Perennial, erect, glabrous aquatic herbs; stem upto 1 m tall; basal leaves linear, long pointed, 3-angled; flowers pink, 1.5-2.5 cm across in terminal umbels; bracts brown.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 389

*Distribution:* India (Jammu and Kashmir); Britain; Africa; Armenia; Russian Federation; Mongolia; Europe; Austria; China; Pakistan; Afghanistan; Iran; Iraq; Israel; Jordan; Lebanon; Syria and Turkey.

## 72. ALISMATACEAE

### Key to Genera

1	+	Flowers bisexual; achenes in a ring like fruit ----- <i>Alisma</i>
	-	Flowers unisexual or polygamous; achenes in globose or oblong head ----- <i>Sagittaria</i>

### **ALISMA L.**

*Alisma plantago-aquatica* L., Sp. Pl. 342. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 32. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 224. 2012.

Emergent or submerged, scapigerous, glabrous herbs; leaves all basal, erect, ovate-lanceolate with subcordate, rounded or cuneate base, 6-12 x 2.5-5 cm, margin entire; petiole 5-30 cm long; inflorescence terminal, pyramidal, panicles of 4-8 erect or suberect whorled branches; flowers actinomorphic, bisexual, 5-8 mm in dia.; pedicel 1-3 cm long; bract linear, lanceolate, gradually becoming smaller upwards; sepals 3, elliptic-ovate or oblong, margin scarious, persistent; petals 3, oblong, almost double the size of sepals, ephemeral, white or light pink with yellow claws; stamens 6, anthers yellow, bithecous, oblong; carpels many, free, styles slender, longer than ovaries; achenes 20- 30 in one ring, surrounded by 3 accrescent sepals; achenes compressed, oblong-ovoid, 1-2 ribbed at back, light brown.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 390

*Distribution:* India (Jammu and Kashmir, Uttarakhand); Africa; Tropical Asia; Myanmar; Thailand; Pakistan; Nepal; Europe; Australasia and North America.

### **SAGITTARIA L.**

*Sagittaria sagittifolia* L., Sp. Pl. 993. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 32. 1972.

Erect, marshy, 30-60 cm tall herbs; rootstock thick, stononiferous; leaves 10-25 cm long, arrow-shaped, apex acute, basal lobes sagittate; flowers white tinged purple blotch at the base; inflorescence scape with upper male and lower female; achenes dorsal entire, winged.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 843

*Distribution:* India (Jammu and Kashmir); Russian Federation; Lebanon; Turkey; Asia Temperate; Pakistan; Europe; Austria; China; Belgium; Czech Republic; Ireland; Norway; Romania and Britain.

### 73. CYPERACEAE

#### Key to Genera

1	+	Root-stock creeping ----- <i>Blysmus</i>
	-	Root-stock not creeping; rhizomatous ----- <i>Cyperus</i>

#### ***BLYSMUS***

*Blysmus compressus* Panzer ex Link; Hutchinson, in Brit. Wild Fl. 2: 791. 1973.

Perennial herbs; rootstock creeping; stem 25-30 cm tall; leaves 15-20 cm long; inflorescence spike, 2-2.3 cm long, sessile; glume ovate, imbricate, lower often empty; ovary shortly stipitate; style with 2 branches; nuts slightly flattened.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 854

*Distribution:* India (Jammu and Kashmir); Pakistan; Morocco; N. Africa; Armenia; Russian Federation; Mongolia; Bhutan; Nepal; Europe and China.

#### ***CYPERUS* L.**

#### Key to Species

1	+	Rachilla of spikelets deciduous ----- 4
	-	Rachilla of spikelets persistent ----- 2
2	+	Fruits compressed, 2-faced nut ----- 3
	-	Fruits trigonous or triqueterous nut ----- 4
3	+	Spikelets greenish brown or reddish brown ----- <i>Cyperus sanguinolentus</i>
	-	Spikelets green ----- <i>C. pumila</i>
4	+	Spikelets digitate or clustered, in spike ----- 5
	-	Spikelets racemose, never spicate ----- 6
5	+	Perennial with woody rhizome ----- <i>C. niveus</i>
	-	Annual with fibrous roots ----- <i>C. difformis</i>
6	+	Rachilla of spikelets distinctly winged ----- <i>C. rotundus</i>
	-	Rachilla of spikelets indistinct or not winged at all ----- <i>C. iria</i>



*Cyperus difformis* L., Amoen. Acad. **4** : 302. 1750; L., Cent. Pl. **2** : 6. 1756; Clarke in Hooker f., FBI. **6** : 599. 1893; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 227. 2012.

Annual tufted herbs; roots fibrous; stem triqueterous; basal leaves shorter or longer than stem; bracts unequal; inflorescence spikelets compressed; glumes broadly ovate, mucronate; stamens 1-2; style arms 2; nut obovoid.

*Flowering and Fruiting*: July-August

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 269

*Distribution*: India (Jammu and Kashmir); Afghanistan; Eurasia; Pacific Island; North America; South America; Bangladesh; Japan; Australia; Russia; Thailand; Madagascar; Veitnam; Africa and N. W. Asia.

*C. iria* L., Sp. Pl. 45. 1753; Clarke in Hooker f., FBI. **6** : 606. 1893; Babu, Herb. Fl. DD. 557. 1977; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 228. 2012.

Annual or perennial herbs; stem triqueterous; 20-70 cm tall; basal leaves longer than stem; spikes about 15 cm long; spikelets 2-6 cm long; glumes obovate, mucronate; nuts trigonous, smooth.

*Flowering and Fruiting*: July-August

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 870

*Distribution*: India (Jammu and Kashmir); Pakistan; Taiwan; Austria; Myanmar; New Guinea; Sri Lanka; Philippines; Veitnam; Mayalaysia and S. W. Asia.

*C. nivalis* Boott in Trans. Linn. Soc. 20: 136. 1846; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 80. 1972.

Perennial rhizomatous herbs; culms tufted, 3-angular, smooth; inflorescence 20-30 cm long spikelets, narrowly oblong, compressed; glumes yellowish-white or straw coloured; stamens 3; styles elongate; stigmas 3; nutlets broadly obovate, triqueterous.

*Flowering and Fruiting*: July-August

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 761

*Distribution*: India (Jammu and Kashmir), N. Myanmar, Nepal, Pakistan, Thailand, Vietnam, Tropical Africa, S. W. Asia.

*C. nubigena* D. Don, Trans. Linn. Soc. 14: 326. 1825; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 80. 1972.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 224

*Distribution:* India (Jammu and Kashmir); Australasia; North America; Africa; Tropical and Temperate region; Europe and Pacific Asia.

*C. pumilus* L. Cent. Pl. 2: 6. 1756; *Pycreus nitens* (Retz.) Nees in Nova Acta. Ac. Nat. Cur. 19, 1: 53. 1843.

Perennial, glabrous, tufted herbs 20-40 cm tall; stem triquetrous; basal leaves longer or shorter than the bracts; spikelets clustered, digitate; glumes boat-shaped, ovate, acute, nerved on either side of keel; styles 3, braches unequal; nut obovoid-ellipsoid.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 835

*Distribution:* India (Jammu and Kashmir); Asia; Africa; Madagascar; Pacific Islands and Australia.

*C. rotundus* L., Sp. Pl. 45. 1753; Clarke in Hooker f., FBI. 6 : 614. 1893; Stewart, *l.c.* 91. 1972; *Bhellum* & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 228. 2012.

Perennial herbs; rhizome stoloniferous, stolons many; stem herbaceous, triquetrous; leaves dark green above, light beneath; spikes few in spikelets; glumes reddish brown or light brown, apiculate; nuts obovoid-oblong.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 530

*Distribution:* India (Jammu and Kashmir); Pakistan; Nepal; Bhutan France; United Kingdom; Brazil; Portugal; Temperate and Tropical Asia; Europe; Pacific countries; and North America.

*C. sanguinolentus* Vahl., Enum. Pl. 2 : 351. 1806; Henry et al., Fl. Tam. Nad. Ser. 1, 3 : 74. 1989; *Bhellum* & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 228. 2012. *Pycreus sanguinolentus* (Vahl) Nees in Linnaea 9 : 283. 1834; Clarke in Hooker f., FBI. 6 : 590. 1893.

Annual or perennial herbs; stem triquetrous; stem 20-35 cm tall; roots fibrous; leaves shorter or longer than stem; spikelets shorter or longer than stem, acute; spikelets 3-8 greenish brown; glumes ovate, acute; styles 3; nuts dark brown, laterally compressed.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 250

*Distribution:* India (Jammu and Kashmir); Pakistan; Nepal; Asia; Africa; China; Malaysia; Myanmar; Saudi Arabia and Armenia.

## 74. POACEAE

### Key to Genera

1	+	Spikelets 2-flowered; falling entire at maturity ----- 2
	-	Spikelets 1-flowered, breaking up at maturity ----- 14
2	+	Spikelets paired with one sessile and one pedicellate flower, similar or dissimilar ---- 3
	-	Spikelets solitary or paired, usually similar; glumes shorter or as long as the spike --- 12
3	+	Spikelets in similar pairs; female florets joints thin, linear or slightly dilated at the tip -- ----- 4
	-	Spikelets in dissimilar pairs; sessile florets bisexual, pedicellate male or sterile absent -- ----- 10
4	+	Spikelets in panicles or in compoune racemes ----- 5
	-	Spikelets in racemes; either solitary or several arranged along the short main axis --- 7
5	+	Rachis tardily stiff or breaking up; lemma awned ----- <i>Imperata</i>
	-	Rachis fragile; breaking up; lemma unawned ----- 6
6	+	Spikelets all usually 1-flowered ----- <i>Andropogon</i>
	-	Spikelets usually all in threes ----- <i>Saccharum</i>
7	+	Glumes deeply or shallowly furrowed on back ----- <i>Microstegium</i>
	-	Glumes broadly truncate ----- 8
8	+	Joints of rachis and pedicels swollen ----- <i>Hemarthria</i>
	-	Joints of rachis and pedicels not swollen ----- 9
9	+	Racemes 1-flowered ----- <i>Perotis</i>
	-	Racemes subdigitate ----- <i>Dicanthium</i>
10	+	Spikelets with an involucre of bristles or subtended by a solitary bristle ----- 11
	-	Spikelets without any involucre or solitary bristle ----- 12
11	+	Upper lemma transversely rugose ----- <i>Setaria</i>
	-	Upper lemma smooth ----- <i>Pennisetum</i>

12	+	Spike in second, 1-sided, digitate or solitary ----- 13
	-	Spikelets in open panicles ----- <i>Panicum</i>
13	+	Lemma of upper florets more or less crustaceous or coriaceous, usually with enrolled margins expressing much of palaea ----- <i>Paspalum</i>
	-	Lemma of upper florets thinly cartilaginous, usually with flat hyaline margins ----- ----- <i>Digitaria</i>
14	+	Spikelets with 3 florets; lower 2-florets, reduced to lemma or absent ----- <i>Phalaris</i>
	-	Spikelets with 1 or 2 florets ----- 15
15	+	Glumes as long as or longer than lower florets ----- <i>Avena</i>
	-	Glumes shorter than lower florets ----- 16
16	+	Lemma 5-13 nerved ----- 17
	-	Lemma 1-3 nerved ----- 18
17	+	Spikelets in a simple solitary raceme, awned ----- <i>Lolium</i>
	-	Spikelets in panicle awnless ----- <i>Poa</i>
18	+	Inflorescence in panicles ----- 19
	-	Inflorescence in digitate second-spike ----- 21
19	+	Spikelets in open contracted spike-like panicles ----- 22
	-	Spikelets in digitate racemose arranged spikes ----- 20
20	+	Axis of branches of inflorescence ending in a spike, spikelets breaking up --- <i>Eleusine</i>
	-	Axis of spikes ending in a sharp point ----- <i>Dactyloctenium</i>
21	+	Spikelets without imperfect florets, awnless ----- <i>Cynodon</i>
	-	Spikelets with 1 or more perfect florets, awned ----- <i>Enteropogon</i>
22	+	Spikelets awned ----- 23
	-	Spikelets awnless ----- <i>Eragrostis</i>
23	+	Spikelets 3-5 flowered, 1-sided, ovoid, clustered; glumes rigid, 5-nerved, shortly awned ovary glabrous ----- <i>Dactylis</i>
	-	Spikelets 3-8 flowered; glumes ending in an awn, ovary solitary, hairy at the top----- ----- <i>Festuca</i>

### **ANDROPOGON L.**

*Andropogon distans* W. Wats. in Atkins. Gaz. N. W. Province Ind. 392. 1882; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 107. 1972.

Annual or perennial 30-60 cm tall herbs; roots fibrous; leaves filiform, flexuous, tufted at base, distant, large, pale or reddish; spikes long, deflexed, spikelets long, deflexed, spikelets with strong nerves, more or less 2-cuspidate, marginal glume pubescent.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 243

*Distribution:* India (Jammu and Kashmir); N. W. & C. Himalayas and Yunan.

#### **AVENA L.**

*Avena fatua* L., Sp. Pl. 80. 1753; Bor, Grass. Burm. Cey. Ind. Pak. 434. 1960; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 234. 2012.

Annual 30-100 cm tall; culms erect; basal leaves linear, lanceolate, base sheathy; spikelets pendulous; glumes nerved, thin, hairy, tip 2-lobed, awn 3-times the length of glume; rachilla joints glabrous; grain free from lema and glumes.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 287

*Distribution:* India (Jammu and Kashmir, Uttarakhand), N. W. Himalayas, N. Asia, N. Africa, Europe including Britain.

#### **BORHRIOCHLOA Kuntze**

*Bothriochloa ischaemum* (L.) Keng in Contr. Boil. Lab. Sci. Soc. China. **10** : 201. 1936, Stewart, *l.c.* 106. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 234. 2012. *Andropogon ischaemum* L. Sp. Pl. 1047. 1753.

Perennial herbs; stem erect, geniculate, rootstock woody; culms single, glabrous at nodes, upto 50 cm tall; inflorescence 2-8; spikelets 3-5 cm long, subdigitate or on very short axis; glumes not pitted.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 819

*Distribution:* India (Jammu and Kashmir); North-West Himalayas; Afghaistan; Bhutan; Nepal; N. Africa; S. W. Asia; China; Taiwan; Europe; United States of America.

#### **CYNODON Rich.**

*Cynodon dactylon* (L.) Pers., Syn. Pl. **1** : 85. 1805; Hooker f., FBI. **7** : 288. 1896; Bor, Grass. Burm. Cey. Ind. Pak. 496. t. 52. 1960; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 234. 2012. *Panicum dactylon* L., Sp. Pl. 58. 1753.

Glabrous rhizomatous perennial herbs, rooting at nodes; culms prostrate or decumbent ascending, nodes glabrous; leaves linear, spathulate, minutely scabrid on both the

surfaces and along the margins; spikes 2-6 digitate, green or purple; glumes linear acute, 1-nerved; lemma 3-nerved; style 2-branched.

*Flowering and Fruiting:* April-September

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 279

*Distribution:* India (Jammu and Kashmir); Warm Temperate region; Pakistan; China; Taiwan; Nepal and almost Cosmopolitan.

### **DACTYLIS L.**

*Dactylis glomerata* L., Sp. Pl. 71. 1753; Hooker f., FBI. 7 : 335. 1896; Bor, Grass. Burm. Cey. Ind. Pak. 530. 1960; Stewart, *l.c.* 150. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 237. 2012.

Perennial herbs; stem tufted upto 30 cm tall; leaves 2-3.5 cm long, rarely more, margin scarbrid, ligules membranous; panicles secund, spikelets laterally compressed; rachilla prolonged; glumes lanceolate; styles 2-branched, stigma plumose; grains oblong, triquetrous, grooved.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 195

*Distribution:* India (Jammu and Kashmir; Uttarakhand); S. W. Asia; Europe, Kazakhstan; Bhutan; China; Nepal; Russia; Mongolia; Taiwan and N. Africa.

### **DACTYLOCTENIUM Willd.**

*Dactyloctenium aegyptiacum* (L.) Willd., Ess. Agrost. Expl. 15. 1812; Stewart, *l.c.* 144. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 237. 2012. *Cynosurus aegyptius* L. Sp. Pl. 72. 1753.

Annual, stem with culms slender, erect, creeping, rooting below the nodes; leaves lanceolate, acute, scabrid on both the surfaces; ligules hairy; outer glumes acute with ciliate wings; grains globose, rugose.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 392

*Distribution:* India (Jammu and Kashmir; Uttarakhand); Pakistan; Afghanistan; Sri Lanka and throughout Tropical region.

**DICHANTHIUM Willem**

*Dichanthium annulatum* (Forssk.) Stapf in Prain Fl. Trop. Afr. 9: 178. 1917; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 108. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 238. 2012.

Caespitose, perennials; culms decumbent-ascending, nodes tinged purple, glabrous; leaves linear, lanceolate, sparsely tubercled hairy; spikes forming digitate clusters; rachis bearded at nodes.

*Flowering and Fruiting:* June-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 382

*Distribution:* India (Jammu and Kashmir, Uttarakhand and almost throughout India); Pakistan; China; Australia; and Tropical Africa.

**ECHINOCHLOA P. Beauv.**

*Echinochloa crusgalli* (L.) P. Beauv., Ess. Agrost. 53: 161. 1812; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 120. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 238. 2012.

Annual, erect, tufted herbs; culms slender, to stout, 30-80 cm tall; leaves linear, 10-25 cm long; smooth or scarberulous underneath, apex acuminate; inflorescence erect, 5-15 cm long spikes; spikelets bisexual, elliptic, awned, awn green or purple; grain broadly elliptic.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 280

*Distribution:* India (Jammu and Kashmir, Uttarakhand); Pakistan; Burma; Malaya; Sri Lanka; S. E. Asia and Africa.

**ELEUSINE Gaertn.**

*Eleusine indica* (L.) Gaertn., Fruct. 1: 8. 1779; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 145. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 239. 2012.

Annual glabrous herbs; stem culms erect, decumbent, upto 60 cm tall; leaves linear, lanceolate, glabrous; ligule obsolete; spikes subdigitate, spreading, ending in spikelets; glumes thin, boat-shaped; lemma also boat-shaped, mucronate; grain trigonous, reddish-brown.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 767

*Distribution:* India (Jammu and Kashmir, Uttarakhad); Pakistan and Tropical and Subtropical region.

### **ERAGROSTRIS Wolf**

*Eragrostris japonica* (Thunb.) Trin, in Mem. Acad. Sci. Petersb. Ser. 6, 1 : 405. 1830; Stewart, *l.c.* 147. 1972; *Poa japonica* Thunb., Fl. Jap. 51. 1784; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 240. 2012.

Annual herbs; culms tufted, erect, decumbent, spreading, 30-60 cm tall; leaves linear lanceolate; ligule minute, scarious; panicles loosely branched; glumes unequal, obovate; lemma ovate, obtuse; stamens 3; grain obovoid, brown.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 820

*Distribution:* India (Jammu and Kashmir, Uttarakhand); Pakistan; Baluchistan; South & South-East Asia and Tropical Africa.

### **FESTUCA L.**

*Festuca pratensis* Huds., Fl.-Angla. ed. 1, 37. 1762; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 153. 1972.

Perennial or rarely annual herbs; culms smooth; leaves flat, 3-7 nerved, acute or obtuse; ligules very short, truncate; spikelets oblong, lax, 4-9 flowered; ligules oblong, lanceolate, acuminate, margin broadly hyaline towards apex; grains linear, oblong, grooved.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 674

*Distribution:* India (Jammu and Kashmir); South West Asia; Europe and North America.

### **HEMARTHRIA R. Br.**

*Hemarthria compressa* (L. f.) R. Br., Prodr. 207. 1810; Stewart, *l.c.* 110. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 240. 2012. *Rottboellia compressa* L. f.; Hooker f., FBI. 7 : 153. 1896.

Annual or perennial; culms usuallu robust, slender, 30-60 cm tall; leaves linear, acute, base rounded or cordate; spikes solitary, compressed; joints of rachis tough, breaking up; spikelets thick, swollen; glumes concave, elliptic-lanceolate; stamens 3; styles 2, stigma plumose.

*Flowering and Fruiting:* May-August



*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 452

*Distribution:* India (Jammu and Kashmir); Pakistan; Burma; Sri Lanka; Malayasia; East India and East Africa.

### **IMPERATA Cirillo**

*Imperata cylindrica* (Steud.) Raeusch., Ess. Agrost. 165. 1812; Raizada et al., Ind. For. Rec. (N.S.) Bot. 4 : 182. 1957; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 240. 2012. *Lagurus cylindricus* L., Syst. Nat. ed. 10, 878. 1759; *Imperata arundinacea* Cyr., Pl. Rar. Neap. 2 : 26. 1792; Hooker f., FBI. 7 : 106. 1896.

Perennial herbs, 20-50 cm tall; rhizome creeping; culms erect; leaves linear, glabrous, scabrid, ligule scarious; rachis tough, breaking up; outer glume lanceolate, acuminate; lemma awnless, ciliate; stamens 2, anthers yellow; ovary ovoid.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 391

*Distribution:* India (Jammu and Kashmir); Pakistan; Sri Lanka; Java; Japan; China and Australia.

### **LOLIUM L.**

*Lolium temulentum* L., Sp. Pl. 83. 1753; Hooke f., FBI. 7 : 364. 1896; Bor, Grass. Burm. Cey. Ind. Pak. 546. 1960; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 241. 2012.

Annual herbs, 40-100 cm tall; culms erect, nodes glabrous; leaves linear, upto 40 cm long; spikelets 3-8 flowered, awned; outer glume absent, inner one linear, lanceolate, oblong; lemma elliptic, oblong, awn longer than glumes; stamens 3; styles 2, stigma plumose.

*Flowering and Fruiting:* May-June

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 112

*Distribution:* India (Jammu and Kashmir, Uttarakhand); North-West Himalayas; Mediterranean region; Persia and Iraq.

### **PANICUM L.**

*Panicum miliaceum* L., Sp. Pl. 58. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 121. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 243. 2012.

Annual herbs; culms tufted, 60-120 cm tall; leaves 15-30 cm long, glabrous, ciliate or hirsute, base narrow, spinosely toothed, scabrid; panicles 15-20 cm long, fasciated, densely crowded; spikelets green, erect, turgid, dorsally 5-streaked.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 661

*Distribution:* India (Jammu and Kashmir, Uttarakhand); Central and Eastern Asia; Pakistan; Nepal; Japan; Taiwan; N. China; Europe; W. Australia and S. America.

### **PASPALUM L.**

*Paspalum paspaloides* (Michx.) Scribner in Mem. Torrey Bot. Club 5: 29. 1894; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 123. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 244. 2012.

Perennial herbs; rhizomatous forming loose mats; culms upto 1 m tall, ascending, rooting at nodes; leaves linear, upto 16 cm long; ligule short, truncate, or jagged; panicles 2-3 rarely more, upto 10 cm long, erect, appressed; glumes usually 4, lower minute or wanting; stamens 3; styles 2; grains free within hardened glume and palea.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 752

*Distribution:* India (Jammu and Kashmir, Uttarakhand) and Tropical and Subtropical region.

### **PENNISETUM Rich ex Pers.**

*Pennisetum flaccidum* Griseb. in Goett. Nachr. 86. 1868; Hooker f., FBI. 7 : 84. 1896; Bor, l.c. 344. 1960; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 244. 2012.

Perennial 15-60 cm tall herbs; leaves ovate-lanceolate, flat, 5-15 cm long, glabrous, sparsely hairy, base contracted, mouth ciliate; spikelets ovate-lanceolate, often flexuose, sessile, rachis glabrous.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 216

*Distribution:* India (Jammu and Kashmir); Nepal; Pakistan; China; Russia; Bhutan and USA.

## **PEROTIS**

*Perotis indica* (L.) Kuntze, Rev. Gen. Pl. 2: 787. 1891; Bor, Grasses Ind. 611. 1960.

Perennials; culms tufted, ascending; leaves ovate, acute, base amplexicaule, 2.2 cm long, sheath glabrous; spikes purple; glumes unequal; lemma half as long as the glumes; stamens 3; styles 2; stigma plumose.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 807

*Distribution:* India (Jammu and Kashmir, Uttarakhand); China; South-East Asia; Indian Subcontinent; Africa; New Guinea and Madagascar.

## **PHALARIS L.**

*Phalaris minor* Retz., Obs. 3 : 8. 1783; Hooker f., FBI. 7 : 221. 1896; Stewart, *l.c.* 163. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 244. 2012.

Annual erect herbs; culms 30-60 cm tall; leaves lanceolate, 15-30 cm long, acuminate, glabrous, minutely glandular on both surfaces; inflorescence densel spiciform cylindric; spikelets flat, shining; glumes nearly equal, 3-nerved, acute, keel winged; paleae lanceolate,, 2-keeled, ciliate towards apex; stamens 3, anthers linear; styles 2, stigma plumose.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 322

*Distribution:* India (Jammu and Kashmir); N. W. Himalayas; Pakistan; Nepal; Afghanistan; Banglaesh; Bhutan; Iran; Iraq; Jordan; Saudi Arabia; Turkey; Syria; Mediterranean region and Tropical and Subtropical region.

## **POA L.**

### **Key to Species**

<b>1</b>	+	Plants annual ----- <i>Poa annua</i>
	-	Plants perennial ----- 2
<b>2</b>	+	Florets converted into bulbils ----- <i>P. bulbosa</i>
	-	Florets not converted into bulbils ----- 3
<b>3</b>	+	Basal leaves 0.5-1.5 mm wide, sparsely pubescent ----- <i>P. angustifolia</i>
	-	Basal leaf 1.5-4 mm wide, usually glabrous ----- <i>P. pratensis</i>

***Poa angustifolia*** L. Sp. Pl. 67. 1753; Stewart, Ann. Cata. Vasc. Pl. W. Pak. & Kash. 155. 1972.

Annual stoloniferous, herbs; leaves narrow, ligule truncate; spikelets crowded, ovate, lanceolate, nerves prominent, margin aperulous, glabrous;

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 204

*Distribution:* India (Jammu and Kashmir); Asia; Japan; Indonesia; Austria; Belgium; Seberia; Afghanistan; USA; France; Greece; Hungary; Iran; Iraq; Mongolia; Tajikkistan and Europe.

***P. annua*** L., Sp. Pl. 68. 1753; Hooker f., FBI. 7 : 345. 1896; Bor, Grass. Burm. Cey. Ind. Pak. 555. 1960; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 245. 2012.

A nnuual or perennial herbs; stem slender, 12-30 cm tall, tufted, erect, often zigzag near the base; leaves 5-10 cm log; ligule oblong, pointed; panicles 2.2-7 cm long, stiff; spikelets numerous, shining; outer glume empty, 1-nerved; flowering glumes 5-nerved, hairy or nearly glabrous.

*Flowering and Fruiting:* May-July

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 113

*Distribution:* India (Jammu and Kashmir); Indonesia; Japan; Kazakistan; Korea; Vietnam; Mongolia; Myanmar; Russia; New Guinea; South West Asia; N. Temperate regions including Britain and Africa.

***P. bulbosa*** L., Sp. Pl. 70. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 155. 1972.

Annual or perennial, erect herbs; stem upto 30 cm tall; leaves linear, flat, acute; ligule ovat or oblong; panicles oblong; spikelets 4-7 flowered, sessile, crowded, often viviparous; styles 2, distinct, short, feathery; grains enclosed within persistent glumes.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 201

*Distribution:* India (Jammu and Kashmir); North America; Eurasia and USA.

***P. pratensis*** L., Sp. Pl. 67. 1753; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 157. 1972.

Perennial herbs; stem slender, erect, 30-60 cm tall; rootstock produces stolons; leaves linear, 5-30 cm long; ligules short, blunt; panicles stiff, upto 6.5 cm long; spikelets numerous, 3-5 flowered; outer glumes empty, 1-nerved; flowering glumes hairy.

*Flowering and Fruiting:* May-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 153

*Distribution:* India (Jammu and Kashmir, Uttarakhand), N. Temperate regions including Britain.

## **SETARIA P. Beauv.**

### **Key to Species**

1	+	Epidermal hairs on veins ----- <i>Setaria tomentosa</i>
	-	Epidermal hairs between veins ----- 2
2	+	Bristles on spikelets pointed towards base ----- <i>S. verticellata</i>
	-	Bristles on the spikelets pointed towards apex ----- <i>S. viridis</i>

*Setaria tomentosa* (Roxb.) Kunth, Rev. Gram. 1: 47. 1829; Stewart, Ann. Cat. Vasc. Pl. W. Pak. & Kashm. 124. 1972.

Annual or perennial tufted herbs; stem brached from base, 45-70 cm tall; leaves linear-lanceolate, upto 16 cm long, acuminate, sparingly hairy; panicles lax, linear to narrow-lanceolate; ligule with a fringe of hairs; spikelets ovate to elliptic, 1.5 to 2 mm long; upper florets fertile; stamens 3; styles 2, free to base; grain free, enclosed within glume and palea.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 218

*Distribution:* India (Jammu and Kashmir, Uttarakhand); South East Asia; Sri Lanka; Pakistan, Burma, Sri Lanka, Malaysia and Polynesia.

*S. verticellata* (L.) P. Beauv., Ess. Agrost. **51** : 178. 1812; Hooker f., FBI. **7** : 80. 1896; Stewart, *l.c.* 125. 1972; *Bhellum* & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 246. 2012. *Panicum verticillata* L. Sp. Pl. ed. 2, 82. 1762.

Annual or perennial herbs; culms erect, glabrous at nodes, 30-90 cm tall; leaves lanceolate, margin scabrid, hairy on both surfaces, hairs tuberculate; panicles dense, 1.5-7 cm long; ligule a fringe of hairs; outer glume ovate, apiculate; inner obtuse, transversely rugose, linear, empty, apiculate; stamens 3; styles distinct.

*Flowering and Fruiting:* July-August

*Specimens Examined:* A. S. College, Srinagar; *Bhellum*, 381

*Distribution:* India (Jammu and Kashmir); Sri Lanka; Angola; Pakistan; Somalia; Aourth East Asia and Zimbabwe.

*S. viridis* (L.) P. Beauv., Ess. Agrost. **51** : 171. 1812; Hooker f., FBI. **7** : 80. 1896; Bor, Grass. Burm. Cey. Ind. Pak. 365. 1960; Stewart, *l.c.* 125. 1972; Bhellum & Magotra, A cata. Fl. Pl. Doda, Kishtwar and Ramban Districts, Kash. Himal. 247. 2012.

Annual, tufted herbs; culms erect, 30-80 cm tall; leaves flat, 20-30 cm long, green, glabrous or few scattered hairs, margin scabrid; panicles upto 20 cm long; rachis hairy; spikelets solitary, elliptic; outer glume ovate, subacute; inner one obtuse, 7-nerved, transversely rugose; lemma obtuse; stamens 3, styles distinct; grains smooth.

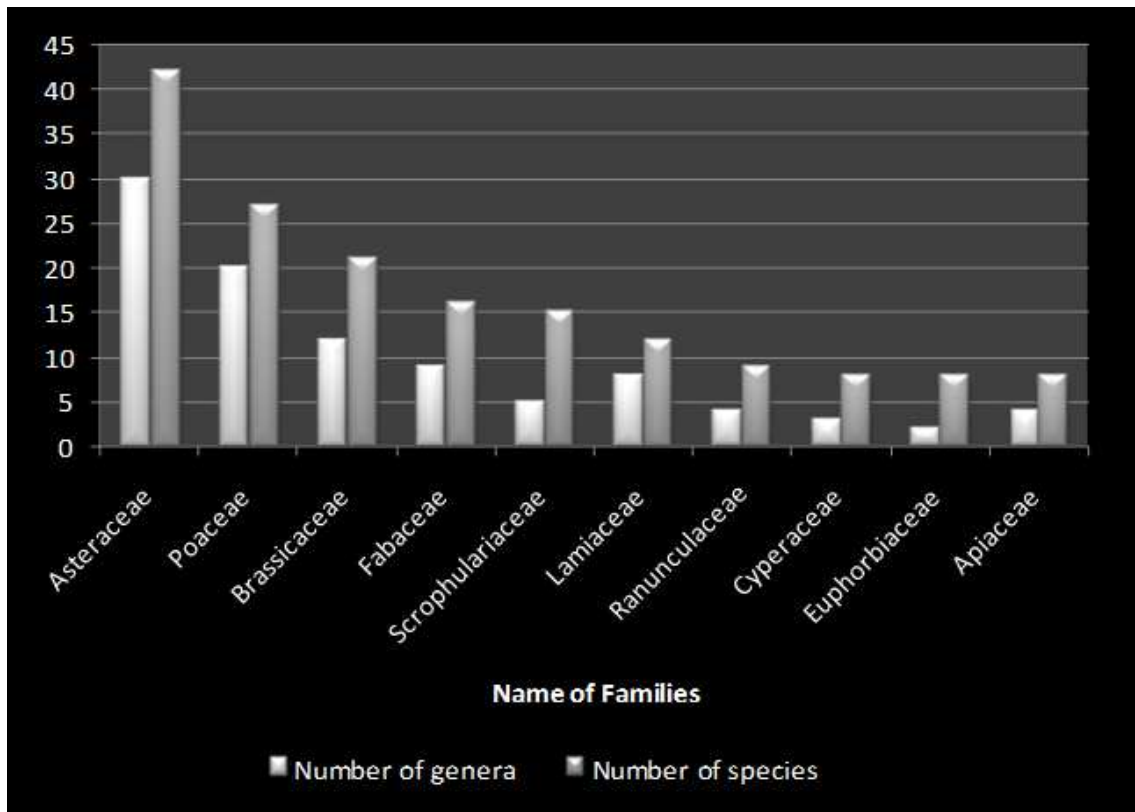
*Flowering and Fruiting*: June-August

*Specimens Examined*: A. S. College, Srinagar; *Bhellum*, 785

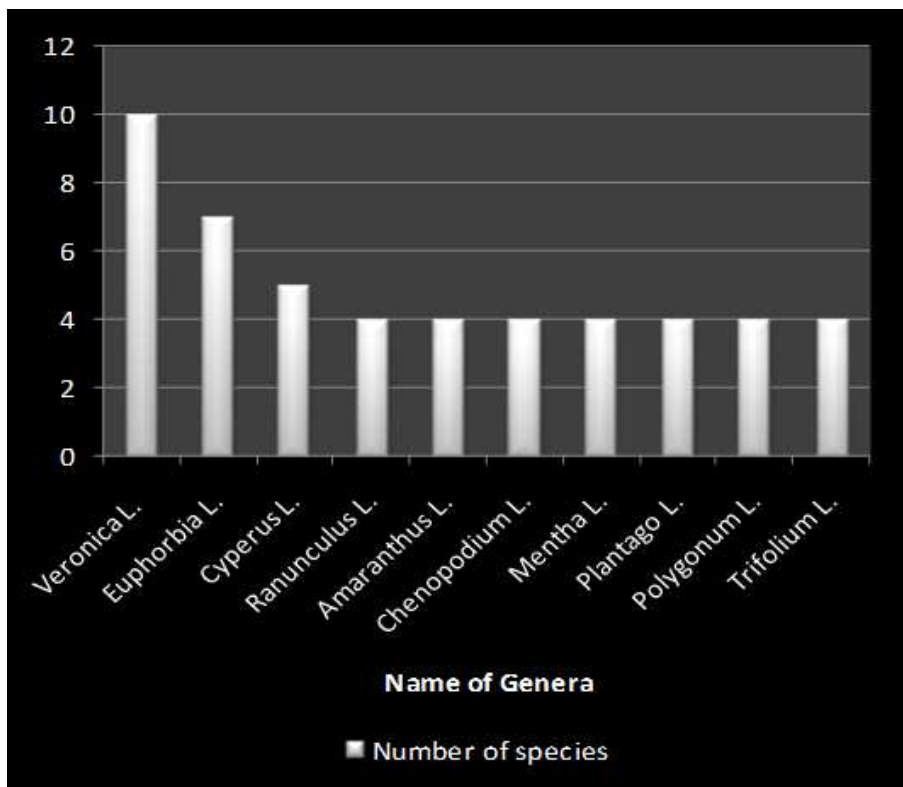
*Distribution*: India (Jammu and Kashmir, Uttar Pradesh); Sweden; Libya; Egypt; China; Turkey; Nepal; Russia and Europe.

## DISCUSSION AND CONCLUSION

Areawise Campus Flora of Amar Singh College, is perhaps the smallest Flora published so far in Jammu and Kashmir State. The Flora represents micro unit of floristic diversity that unlock significant knowledge of plant wealth. The main stress is focused on the intensive floristic study. The total numbers of genera represented by single species are 33. The ten dominant families in terms of number of species in each family (Fig. 1) are Asteraceae (42 spp.), Poaceae (28 spp.), Brassicaceae (21 spp.), Fabaceae (16 spp.), Scrophulariaceae (15 spp.), Lamiaceae (12 spp.), Ranunculaceae (9 spp.), Cyperaceae, Euphorbiaceae, and Apiaceae (8 spp. each). The ten dominant genera and their number of species in each genus (Fig. 2) are *Veronica* (10 spp.), *Euphorbia* (7 spp.), *Cyperus*, *Geranium*, *Plantago* and *Ranunculus* (5 spp. each), and *Amaranthus*, *Chenopodium*, *Mentha* and *Trifolium* (4 spp. each). As many as 315 species representing 209 genera belonging to 75 families collected from the Campus Amar Singh College, Srinagar. Of these 265 species belonging to 171 genera are dicotyledons and 50 species of 38 genera are monocotyledons. The most dominant family of the study is Asteraceae representing 42 species belonging to 30 genera (Fig. 1). The ten dominant families account for 53.6% of the total number of species collected from College Campus. Number of families representing single species are 33 which are 44% of the total families studied from the area of study. The ratio of genus to species is 1: 1.5 which is low because of small pocket of area of study. However, this figure is very close to genus species ratio 1: 1.7. for India which indicates that area is studied intensively.



**Fig. 1.** Bar graph showing numerical size of 10 dominant families in terms of number of genera and species.



**Fig. 2.** Bar graph showing numerical size of 10 dominant genera and number of species in each genus.



As a consequence of exhaustive studies of the Campus Flora a total of 75 families were studied of these 265 species representing 171 genera and 64 families are dicotyledons and 50 species representing 38 genera belonging to 11 families are monocotyledons. The genus species ratio of the Campus Flora of Amar Singh College, Srinagar is 1: 1.5 which is very close to the Flora of British India which is 1: 1.7. This indicates the exhaustive present floristic study. *Euphorbia lathyris* L. has been reported as a new record for the flora of India by the author (Bhella and Magotra 2001) another new record for the Flora of Jammu and Kashmir reported by the author (Bhella and Magotra 2008) and *Ornithogalum umbellatum* L. recorded new for the Flora of Jammu and Kashmir State.

*Result:* As many as 315 species representing 209 genera belonging to 75 families collected and identified from the Campus Amar Singh College, Srinagar. A total of 171 genera representing 265 species identified are dicotyledons and 50 species of 38 genera are monocotyledons. The main highlight of the Campus Flora are *Euphorbia lathyris* L. new record for India and two species viz. *Calystegia hederacea* Wall. and *Ornithogalum umbellatum* L. recorded new for the Flora of Jammu and Kashmir State.

*Conclusion:* The ten dominant families in terms of number of species are Asteraceae, Poaceae, Brassicaceae, Fabaceae, Scrophulariaceae, Lamiaceae, Ranunculaceae, Cyperaceae, Euphorbiaceae, and Apiaceae. Number of families representing single species are 33. The ratio of genus to species is 1: 1.5 which is low because of small pocket of area of study and 1: 1.7 for India.

## COLOUR PLATES



### PLATE I

1 - *Anagallis arvensis* L.

2 - *Celtis australis* L.

3 - *Chenopodium album* L.

4 - *Cirsium arvense* (L.) Scop.



**PLATE II**

**5. *Circium wallichii* DC.**

**6. *Coromopus didymus*(L.)Smith**

**7. *Ecpipta prostata* (L.) L.**

**8. *Erodium cicutarium* (L.) L. Herit. ex. Ait.**



**PLATE III**

**9. *Euphorbia helioscopia* L.**

**10. *Ficus palmata* Forssk.**

**11. *Fragaria vesica* L.**

**12. *Fumaria indica* (Hauskn.) Pugsley**



**PLATE IV**

**13. *Galinsoga parviflora* Cav.**

**14. *Geranium rotundifolium* L.**

**15. *Ipomoea nil* (L.) Roth.**

**16. *Lactuca dissecta* D. Don.**



**PLATE V**

**17. *Lathyrus aphaca* L.**

**18. *Malvestrum coromandelianum* (L.) Garcke**

**19. *Medicago polymorpha* L.**

**20. *Melilotus indica* (L.) All.**



PLATE VI

21. *Myosoton aquaticum* (L.) Moench.

22. *Oenothera rosea* Soland

23. *Oxalis corniculata* L.

24. *Paspalum paspaloides* (Michx.) Scribner



**PLATE VII**

**25. *Ranunculus laetus* Wall. ex. D. Don.**

**26. *Ranunculus muricatus* L.**

**27. *Ranunculus sceleratus* L.**

**28. *Ricinus communis* L.**





**PLATE VIII**

**29. *Rorippa nasturtium-aquaticum* (L.) Hayek.**

**30. *Salix babylonica* L.**

**31. *Silybum marianum* (L.) Gaertn.**

**32. *Solanum nigrum* L.**



**PLATE IX**

**33. *Solanum surattense* Burm. f.**

**34. *Sonchus brachyotus* DC.**

**35. *Sonchus oleraceus* L.**

**36. *Stellaria media* (L.) Cry.**



37



38



39



40

**PLATE X**

**37. *Suaeda fruticosa* Forssk.**

**38. *Trigonella incisa* Benth.**

**39. *Verbascum thapsus* L.**

**40. *Veronica persica* Poir.**

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