

A contribution to the study of Commelinaceae R. Br. in Darjeeling - Sikkim Himalayas

Jayashree Acharya¹, Dalia Banerjee¹ and Ambarish Mukherjee²

¹Ramakrishna Vivekananda Mission Institute of Advanced Studies, Kolkata 700058, W.B., India

²Department of Botany, Burdwan University, Burdwan-713104, W.B., India

Corresponding author: *E-mail*: jayashree.acharya85@rediffmail.com

Abstract

The present work records 21 species representing 11 genera of Commelinaceae R. Br. from Darjeeling-Sikkim region. *Commelina* L. is the most dominant genus with six species. Artificial keys to the identification of the concerned genera and species have been provided along with brief phytophography and flowering and fruiting periods, distribution and exsiccatae of the species.

Key words: Commelinaceae, Darjeeling, Sikkim, phytophography

INTRODUCTION

The Commelinaceae, familiar as 'Spiderwort family', was named after the famous Dutch botanist Caspar Commelijn (1667 – 1771) by R. Brown in 1810. It belongs to the order Commelinales of the Subclass Commelinidae under Liliopsida of Magnoliophyta. It is represented in the world by about 700 species (Cronquist 1988). The number of genera and species belonging to this family as shown by different authors is somewhat variable. Judd *et al.* (2001) mentioned the total number of genera as 40 and species as 640. According to Takhtajan (1997) this family includes 39 genera and 640 species and according to Watson & Dallwitz (1992 onwards) the number of species is 500 of 38 genera. Simpson (2006) mentions 30 genera and 640 species as the global representatives of Commelinaceae. The Angiosperm Phylogeny Group classification (APGII 2003) puts Commelinaceae in Commelinales under the subgroup Commelinids of Monocotyledons, one of the major Clades of the Angiosperms. Members of this family are widespread being mostly tropical to sub-tropical and some are temperate. An excellent systematic account of this taxon has been brought into light by Brenan in 1966. The floral morphology of the Commelinaceae was elucidated by Murty *et al.* (1974) and the taxonomic characteristics have been convincingly explained by Tucker (1989) and Faden & Hunt (1991). Chromosomal data pertaining to Commelinaceae has been used by Jones & Jopling (1972) in its classification. Tomlinson (1969) has contributed substantial anatomical data to the taxonomy of this family.

The Commelinaceae, although a warmth loving family of the Liliopsida, has a wide range of distribution in India stretching from the coastal plains to the subtropical and temperate regions including Darjeeling – Sikkim Himalayas. The ecological amplitude of this family is wide and being entomophilous it provides nutrients through pollen grains to diverse types of pollen gathering insects. As a very important component of the biodiversity as well as the ecosystem this family deserves systematic characterization, inventorization in spatial scale and conservation in view of which the present work was undertaken.

MATERIALS AND METHODS

This work is based on careful study and scrutiny of pertinent literature, specimens preserved in the Lloyd Botanic Garden (LBG), the Central National Herbarium, Calcutta (CAL) and those collected during field trips in conformity with the earlier work (Mukherjee 1988; Mukherjee *et al.* 2008). Standard taxonomic methods were followed to prepare comprehensive keys to the identification of genera and species and brief descriptions of the species to facilitate their identification. The taxa

are arranged alphabetically with correct nomenclature, citations, synonyms and basionyms, wherever necessary, together with information regarding flowering and fruiting periods, distribution, specimens examined etc.

SYSTEMATIC DISCOURSE

Commelinaceae is recognized on the basis of the following set of characters:

Perennial herbs, surface typically with 3-celled glandular microhair. Stem with swollen nodes. Leaves spiral, simple, entire, with a closed sheath and a well defined somewhat succulent lamina. Inflorescence a cyme, often coming out of the subtending spathaceous bracts. Flowers bisexual, mostly actinomorphic, rarely zygomorphic, diplochlamydous. Calyx 3, corolla 3, characteristically ephemeral. Stamens 3, or 3 + 3-staminodes; filaments with pillose trichomes; anthers 2-celled, basifixed, dehisce longitudinally; connective often prolonged. Carpels 3, syncarpous; ovary superior, trilocular; ovules many. Fruits mostly loculicidal capsule. Seeds with a conspicuous conical cap; endosperm starchy.

Key to the Genera

- | | |
|--|----------------------|
| 1. Scandent flaccid herbs with ovate – cordate leaves | <i>Streptolirion</i> |
| 1. Prostrate or ascending herbs with leaves other than ovate cordate | 2 |
| 2. Flowers in axillary clusters ensheathed by leaves | <i>Tonningia</i> |
| 2. Flowers not in such clusters | 3 |
| 3. Cymes with spathaceous bracts or foliaceous, falcate bracteoles | 4 |
| 3. Cymes mostly without a spathe-like bract or bracteole | 6 |
| 4. Fertile stamens 6, staminodes absent | <i>Cyanotis</i> |
| 4. Fertile stamens 3, staminodes present | 5 |
| 5. Cymes solitary, included in a spathe | <i>Commelina</i> |
| 5. Cymes many, not included in a spathe | <i>Murdania</i> |
| 6. Fruit indehiscent, crustaceous | 7 |
| 6. Fruit dehiscent, capsule loculicidal | 8 |
| 7. Stamens 6 perfect | <i>Pollia</i> |
| 7. Stamens 3 perfect | <i>Aclisia</i> |
| 8. Stamens 6 perfect | 9 |
| 8. Stamens 2 – 3 perfect | 10 |
| 9. Flowers in capitate cymes | <i>Amischotolype</i> |
| 9. Flowers in panicles (axillary or terminal pyramidal, thyrsoid cymes) | <i>Floscopa</i> |
| 10. Capsule cells 1 – seeded each; flowers white; bracts funnel-shaped, persistent | <i>Dictyospermum</i> |
| 10. Capsule cell 5 – 9 seeded each; flowers purple; bracts lanceolate, | |

Aclisia Hasskarl

Key to the species

- | | |
|--|--------------------------|
| 1. Panicle peduncled, branches alternate | <i>A. secundiflora</i> |
| 1. Panicle sessile, branches subumbellately decurved | <i>A. subumbellata</i> . |

Aclisia secundiflora (Blume) Bakhuizen f. in Backer & Bakh.f., Fl. Java 3:658.1968; Gandhi, FHD 641. 1970. *Commelina secundiflora* Blume, Enum. 1: 5. 1827. *Pollia sorzogoneniss* (E. Meyer) Endl. Gen. 1029. 1840 extended nom. 2(2): 368. 1841; Hook, f., Fl. Brit. India 6: 367. 1892; Matthew, Fl. Pl. Kurseong 119. 1981. *P. sorzogoneniss* var. *indica* (Wt.) Clarke in DC., Monog. Phan. 3: 127, 1881; Hook, f., Fl. Brit. India 6: 368. 1892.

An erect herb, stem rigid and viscid; leaves lanceolate, very shortly petioled; panicle viscidly pubescent, ovoid, alternately branched, peduncle villous; petals white or pinkish; stamens 3, all perfect; capsule round, 3-celled, each with many seeds.

Flowering: April – August; **Fruiting:** June – November

Distribution: Eastern Himalaya, Assam and Burma, Malacca, Sri Lanka, Malaysia, China, New Caledonia.

Exsiccatae: Reang, 13:12:10. YHb. (LBG); Jalapahar, 2348 m, Darjeeling, *Mukherjee 5133*.

Aclisia subumbellata (C.B. Clarke) C.B. Clarke, Commelin. & Cyrt. Bengal t. 30. 1874; Bot. 11: 451. 1871; Hook.f., Fl. Brit. India 6: 368. 1892.

A herb with creeping stem becoming suberect; leaves elliptic-lanceolate, petioled; panicle depressed, branches subumbellately decurved, sessile; flowers white; stamens 3, all perfect; capsule globose, 3-celled, each with many seeds.

Flowering: April – September; **Fruiting:** July – December.

Distribution: Eastern Himalaya (Sikkim, Bhutan), Mishmi Hills, Assam and Manipur.

Exsiccatae: Badamtam, 1200 m. Ribu and Romo; Kalijhora 300 m, YHb (LBG), Mongpu, 900 m, YHb (LBG); Tista, 300 m, YHb(LBG); Mongpu, 900 m, *Mukherjee 4987*.

Amischotolype Hasskarl

Key to the Species

1. Leaves oblanceolate; capsule much longer than sepals *A. hookeri*
1. Leaves lanceolate; capsule much shorter than sepals *A. glabrata*

Amischotolype hookeri (Hasskarl) Hara in Fl. E.Himal 399. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 82. 1978. *Forrestia hookeri* Hassk., in Flora 1864: 639. 1864; Hook.f., Fl. Brit. India 6: 384. 1892.

An erect herb; leaves oblanceolate, glabrous above, nerves hairy beneath, petioled; flowers few, forming small heads, bluish; sepals and petals subequal; stamens 6, all perfect, filaments bearded; ovary 3-celled, cells 2-ovuled; capsule oblong lanceolate, much longer than the sepals; seeds oblong, rugose.

Flowering and Fruiting: June – December.

Distribution: Eastern Himalaya extending up to Assam, Khasia, Naga Hills.

Exsiccatae: Sikkim, 600m, YHb (LBG); Duars, *Dr. Prain's* collector (LBG).

Amischotolype glabrata Hasskarl in Flora 392. 1863. *Campelia glabrata* Hassk., PL. Jungh. 154. 1851, non Kunth (1843). *Forrestia glabrata* Hassk. in Flora 360. 1864; Hook, f., Fl. Brit. India 6: 384. 1892.

An erect herb, creeping and rooting below; leaves lanceolate, glabrous or only margins hairy; flowers in crowded subsessile axillary panicles, pale blue; sepals and petals subequal; stamens 6, all perfect, filament sparsely hairy; capsule ellipsoid, much shorter than sepals; seeds elliptic, rugose.

Flowering & Fruiting: June – December.

Distribution: Eastern Himalaya: Sikkim, North Bengal, Assam and Burma; Sumatra, Java.

Exsiccatae: Sikkim, 900m, YHb (LGB) Sikkim, *W.W. Smith* (LGB).

Jalpaiguri, Rajabhatkhawa, V. Narayanswami and party 249A (CAL).

***Commelina* L.**
Key to the Species

- | | |
|---|-------------------------|
| 1. All ovary cells 1 –ovuled | 2 |
| 1. Two anterior ovary cells 2– ovuled, posterior 1-ovuled or obsolete | 5 |
| 2. Capsules 3-celled | 3 |
| 2. Capsules 2 –celled | <i>C. Suffruticosa</i> |
| 3. Spathe subsessile | 4 |
| 3. Spathe long peduncled | <i>C. appendiculata</i> |
| 4. Small, slender, viscidly villous | <i>C. maculata</i> |
| 4. Larger, stout, glabrous or pubescent | <i>C. paludosa</i> |
| 5. Spathe neither funnel shaped nor hooded, connate at base only | <i>C. sikkimensis</i> |
| 5. Spathe funnel shaped or hooded | <i>C. bengalensis</i> |

Commelina appendiculata C.B. Clarke, *Commel. & Cyrt. Bengal* 13. 1874; Hook, f., *Fl. Brit. India* 6: 374. 1892; Noltie, *Fl. Bhutan* 3(1): 237-238. 1994.

A slender perennial, much branched herb, creeping below; leaves sessile, linear or linear – lanceolate, almost glabrous, acuminate, narrowed into a sheath; inflorescence several per branch; spathes glabrous outside and hairy inside, caudate – acuminate, base cordate, very long peduncled; peduncles subequal, the longer one slightly exerted from the spathe, petals blue-white.; capsule 3 – celled.

Flowering & fruiting: August- January.

Distribution: Sikkim, North Bengal, Assam, Sri Lanka.

Exsiccatae: Terai (Darjeeling), *C.B. Clarke*, 487653 (CAL); Terai, (Darjeeling), 500m, *C.B.*

Clarke, 487655(CAL).

Commelina bengalensis L., *Sp. Pl.*41(1753); Hook.f., *Hook, f., Fl. Brit. India* 6: 370. 1892; Babu, *Herb. Fl. Dehra Dun* 526. 1977; Noltie, *Fl. Bhutan* 3(1): 238. 1994.

A diffuse herbs, stem at lower nodes rooting and bearing scale leaves and white cleistogamous flowers; aerial leaves ovate or oblong, obtuse; spathes 1-3 together, funnel – shaped or hooded, upper branch of cyme 1-flowered, blue;fertile stamens 3, ovary 3 – locular, 5 seeded.

Flowering & Fruiting: August – January

Distribution: Throughout India

Exsiccatae: Kalimpong, 3500 ft, *Dr.S.K.Mukherjee* 5103 (CAL); Darjeeling, 1200m, YHb (LGB)

Commelina maculata Edgeworth in *Trans. Linn. Soc. London* 20: 89. 1846; Rao in *Blumea* 14: 353. 1966; Hara *et al.*. *Enum. Fl. PL. Nepal* 1: 82. 1978; Noltie, *Fl. Bhutan* 3(1): 235-236. 1994. *Commelina obliqua* Buch.-Ham. var. *viscida* C.B. Clarke, *Commel. & Cyrt. Bengal* 19, t. 10. 1874. *C. paludosa* var. *viscida* (C.B. Clarke) Rao & Kammathy in *Bull. Bot. Surv. India* 3: 168. 1962; Rao in *notes Roy Bot. Gard. Edingburgh* 25: 181. 1964; Hara, *Fl. E. Himal.* 400. 1966.

A slender herb, very viscidly villous, up to 60-90 cm, branched; leaves lanceolate, almost glabrous, caudate-acuminate, often oblique at base; spathe subsessile, solitary or many, funnel like; flowers blue; fertile stamens 3; capsule obovate-triangular; seeds 1 per locule, compressed.

Flowering & fruiting: June – October

Distribution: Throughout India, (from lower slopes of the Himalayas to peninsular India), Singapur, Sri Lanka, Malaysia, Burma, China, Taiwan.

Exsiccatae: Rungbee, 1500m, *Dr. K. Biswas 4580* (CAL).

Commelina paludosa Blume, Enum. Pl. Jav. 1: 2. 1817; Babu, Herb. Fl. Dehra Dun 527. 1977; Mukherjee, Fl. Pl. Darjiling 235. 1988; Noltie, Fl. Bhutan 3(1): 235. 1994. *C. obliqua* Buch.-Ham. ex. D. Don, Prodr. Fl. Nepal. 45. 1825. non Vahl 1805; Hook.f. in Hook, f., Fl. Brit. India 6: 372. 1892.

A stout, subscaudent herb, perennial, leaves ovate to elliptic lanceolate, acuminate, often oblique at base, sheath with hair at mouth and margin; spathes subsessile or very short peduncled; flowers blue; fertile stamens 3, ovary 3-locular; capsule elongate-triangular; seeds 3, smooth, 1-per locule, dehisce in three valves.

Flowering & Fruiting: May – December.

Distribution: Himalaya, India, Sri Lanka, Burma, Indo-china, Taiwan, Malaysia

Exsiccatae: Kalimpong, 1200m, *10483* (CAL); Darjeeling, 1200m. *R. Kammatty 12195* (CAL); Simulbarie, Eastern Himalaya, 1000ft, *Dr. A.K. Biswas 8705* (CAL); Mahananda Wildlife Sanctuary (Darjeeling), S.Chandra (CAL); Rongpu, Eastern Himalaya, 300ft, *Dr. A.K. Biswas 9272* (CAL); 21 miles from Rajabhatkawa, *Anonymous 2374* (CAL), Darjeeling 7000 ft, *Anonymous 1316* (CAL).

Commelina sikkimensis C.B. Clarke, Commel. & Cyrt. Bengal 16, t. 6. 1874; Hook.f. in Hook, f., Fl. Brit. India 6: 369. 1892; Matthew, Fl. Pl. Kurseong 118. 1981. Mukherjee, Fl. Pl. Darjiling 235. 1988; Noltie, Fl. Bhutan 3(1): 236-237. 1994.

A relatively smaller herb with slender stem, widely creeping; leaves lanceolate, base unequal; spathes peduncled, ovate – lanceolate, base cordate, complicate, somewhat connate at base only; capsule 3 – celled, each 2-seeded; seeds pyramidal, rugose.

Flowering & Fruiting: June – December.

Distribution: Sikkim Himalaya and Khasia Hills.

Exsiccatae: Jalapahar, 1800 m, YHb (LBG); Aloorari Road (Darjeeling) *Bahadur 6700* (CBG), Darjeeling 1800 m, YHb (LBG); Darjeeling, *V. Narayanswamy et al. 2702* (CAL).

Commelina suffruticosa Blume, Enum. Fl. Jav. 1: 3. 1827 – 1828; Hook. f., Fl. Brit. India 6: 374. 1892; Babu, Herb. Fl. Dehra Dun 528. 1977; Noltie, Fl. Bhutan 3(1): 236. 1994. *Spathodithyros suffruticosa* (Blume) Hasskarl, Commel. Ind. 11. 1870.

A stout, branched, nearly glabrous herb; leaves sessile, lanceolate, acuminate, scabridly pubescent, sheaths auricled; spathes short – peduncled, broadly ovate-cordate; flowers white or blue; seeds 2, ellipsoid, straw coloured, grossly reticulate-punctate, puberulous.

Flowering & Fruiting: June – December.

Distribution: Himalaya: (Nepal, Sikkim), India, Malaysia.

Exsiccatae: Labha, 3000 m, YHb (LBG); Chilapata (Jalpaiguri), *B. Safui* & party 10387 (CAL);
Selem, 1500 m (Darjeeling) *C.B. Clarke* 9053.

Cyanotis D. Don (*nom. cons.*)

Key to the species

1. Leaves after cobwebby beneath; capsules quadrate *C. vaga*
1. Leaves glabrous, not cobwebby beneath; capsules trigonous *C. cristata*

Cyanotis cristata (L.) D. Don, Prodr. Fl. Nepal. 46. 1825; Hook.f. in Hook, f., Fl. Brit. India 6: 3859. 1892; Hara in Fl. E. Himal 400. 1966.; Rao in Ind. For 93: 57. 1967; Hara *et al*, Enum. Fl. PL. Nepal 1: 82. 1978; Matthew, Fl. Pl. Kurseong 118. 1981; Mukherjee, Fl. Pl. Darjiling 235. 1988; Noltie, Fl. Bhutan 3(1): 222. 1994.

A slender, fleshy herb with low creeping stem, branches erect or ascending, glabrous or hirsute, purplish green; leaves alternate, ovate-oblong to lanceolate, membranous, subacute, purplish green; cymes terminal and axillary; flowers blue-violet to violet; bracts twice as long as the cyme, bracteoles ovate, falcate; fertile stamens 6, staminodes absent, filaments bearded.

Flowering & Fruiting: July – December.

Distribution: Sikkim, Darjeeling, Assam

Exsiccatae: Golaghat, Mahananda Wildlife Sanctuary, Darjeeling, *S. Chandra* 10894 (CAL).

Cyanotis vaga (Loureiro) J.A. *et* J. H. Schuttes, Syst. Veg. (ed. 15) 7(2): 1153. 1830; Hara in FL. E. Himal. 400. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 82. 1978; Matthew, Fl. Pl. Kurseong 118. 1981; Mukherjee, Fl. Pl. Darjiling 236. 1988; Noltie, Fl. Bhutan 3(1): 220. 1994. *Tradescantia vega* Lour., Fl. Cochinch. 1: 193. 1790. *Cyanotis barbata* D. Don, Prodr. Fl. Nepal. 46. 1825; Hook.f. in Hook, f., Fl. Brit. India 6: 385. 1892.

A very slender herb with branched and tufted stem, ascending from creeping and rooting base; leaves linear lanceolate or narrow oblong, cob-webby beneath; cymes sessile, axillary as well as terminal; bracts much longer than cyme; bracteoles ovate, falcate; fertile stamens 6, staminodes absent, filaments bearded; ovary tipped with hair.

Flowering & Fruiting: June – December.

Distribution: In the subtropical Himalaya and even up to 2400 m; Khasia Hills, Burma and China.

Exsiccatae: Pelling, 600m, YHb (LBG); Darjeeling, 2100 m, YHb (LBG); Sureil, 1500 m, YHb (LBG); Sikkim, *J. D. Hooker* 488722 (CAL).

Dictyospermum Wight

Dictyospermum scaberrimum (Blume) Morton *ex* Hara, Enum Fl. P. Nepal 3: 82. 1982. *Commelina scaberrima* Blume, Enum. Pl. Jav. 1: 4. 1827. *Aneilema Scaberrimum* (Blume) Kunth, Enum. Pl. 4: 69. 1843; Hook.f., Fl. Brit. India 6: 382. 1892.

A tall, suffruticose herb of shady places, slender, leaves distant, lanceolate or oblong-lanceolate, acuminate, dorsally hispid; panicle with long slender peduncle and branches; spathe funnel shaped, acuminate, persistent; flower white to light purple; stamens 2-3 perfect, filaments naked; capsule globose, pubescent; seeds 1- per locule, rugose.

Flowering & Fruiting: May – December

Distribution: Tropical Eastern Himalaya (Nepal to Bhutan), South India, Sri Lanka.

Malaysia, NEFA, East Taiwan

Exsiccatae: Laddak and Sikkim, 600m, YHb (LBG); Singtam, Sikkim, 600 m, YHb (LBG); Rangsen, Sikkim, 900 m, Ribu and Rhomoo (LBG); Jalpaiguri, *B. Safui & party 10478* (CAL); Sikkim, Murgan, *N.C.Majumdar 523* (CAL).

***Floscopa* Loureiro**

Floscopa scandens Loureiro, Fl. Coch. 1: 93. 1790; Hook.f. in Hook, f., Fl. Brit. India 6: 390. 1892; Hara in Fl. E. Himal. 401. 1966; Dep. Pl. Nepal Bull. 2: 120. 1969; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 81. 1978; Mukherjee, Fl. Pl. Darjiling 236. 1988; Noltie, Fl. Bhutan 3(1): 225. 1994. *Tradescantia paniculata* Roxburgh, Pl. Coromand. 2: 6, t, 109. 1799. *Aneilema hispida* D. Don, Prodr. Fl. Nepal. 45. 1825.

Suberect herb, creeping below, common in moist places and river banks; leaves with small petiole, lanceolate, acuminate; flowers in panicles; panicle axillary or terminal pyramidal, thyrsoid cyme, villous or hirsute; flowers small with white lilac or rosy petals; stamens 6, all perfect, purplish; ovaries 2-celled; capsule subglobose-ellipsoid, crustaceous, 2-seeded.

Flowering & Fruiting: June – November

Distribution: Throughout tropical India, in Nepal and Sikkim Himalaya, Khasia Hills, China, Malacca, Sri Lanka, Taiwan, Malaysia and Tropical Australia.

Exsiccatae: Gangtok, 1500 m, YHb (LBG), Kalijhora, 300 m, YHb (LBG); Bhalsa (Duars plains), 100 m, YHb (LBG); Jalpaiguri, *A.K. Ghosh 20447* (CAL), Duars, *L.K. Banerjee 12819* (CAL).

***Murdannia* Royle (*nom. cons.*)**

Key to the Species

- 1. Cells of ovary 2 – ovuled *M. nudiflora*
- 1. Cells of ovary 3 – many ovuled 2.
- 2. Leaves large, narrowly oblong or ensiform; base rounded or cordate, margin white, panicle stout *M. japonica*
- 2. Leaves small, flat, oblong, base amplexicaul, margin not white; panicle small, leafy below *M. spirata*

Murdannia nudiflora (L.) Brenan in Kew Bull. 7: 189. 1952; Hara in Fl. E. Himal. 401. 1966; C.R. Rao in Ind. For 93: 57. 1967; Shrestha in Dept. Med. Pl. Nepal. Bull. 2: 121. 1969; Hara *et al.*, Enum Fl. Pl. Nepal 1: 83. 1978; Mathew, Fl. Pl. Kurseong 119. 1981; Mukherjee, Fl. Pl. Darjiling 237. 1988; Noltie, Fl. Bhutan 3(1): 229. 1994. *Commelina nudiflora* L., Sp. PL. 41. 1753, P.P. *Aneilema nudiflorum* R. Br. ex Hook.f. in Hook, f., Fl. Brit. India 6: 378. 1892.

A slender, diffuse herb; branches decumbent, rooting; leaves linear or somewhat linear – lanceolate, leaf sheath bearded; panicle sub-terminal, cymes many, not included in spathe, at the end of branches, few flowered, bracts deciduous; flowers blue; stamens 3 and staminodes 3, filaments bearded; capsule oblong or subglobose; ovary 3-celled; capsule subglobose-oblong; seeds 2 in each cell, rugose and pitted.

Flowering & fruiting: September – November

Distribution: Throughout India including the Himalaya up to 1800 m, Khasia Hills; China, Malaysia, Myanmar, Sri Lanka.

Exsiccatae: Tista, Sikkim, 300 m, G.H. Cane (LBG); Reshap (Sikkim), 900 m, YHb (LBG) Sellong (Sikkim), 900 m, YHb (LBG); Ryang, 900, YHb (LBG).

Murdannia japonica (Thunberg) Faden in Taxon 26: 142. 1977; Noltie, Fl. Bhutan 3(1): 226 – 228. 1994. *Commelina japonica* Thunberg in Trans. Linn. Soc. London 2: 332. 1794. *Aneilema lineolatum* (Blume) Kunth, Enum. Pl. 4: 69. 1843; Hook. f., Fl. Brit. India 6: 376. 1892. *A. latifolium* Wight, Ic. Pl. Ind. Or 6: t 2072. 1853; Rao in Indian Forester 93: 57. 1967. *Murdania elata* (Vahl) Bruckner in Pfamilien, ed. 2, 15a : 173. 1930; Hara in Fl. E. Himal. 401. 1966.

A stout, erect herb; leaves large, narrowly oblong or ensiform, acuminate, scabrous or smooth, often crisped, white; cymes many in glabrous, stout panicle, effuse, not enclosed in spathe; flowers blue, bracts marcescent; stamens 2-3 with 2-3 staminodes, filaments bearded; capsule ellipsoid or sub-globosely trigonous; seeds 3-4 per cell, smooth.

Flowering & Fruiting: July – September.

Distribution: Himalaya (Sikkim, Bhutan) Khasia Hills, Burma, Malaysia.

Exsiccatae: Tarai, 1.1 mile. YHb (LBG); Tista, 300 m, YHb (LBG); Tista 300 m YHb (LBG)

Murdannia spirata (L.) Bruckner in Pfamilien. Ed. 2, 15a: 173. 1930; Hara *et al.*, Enum. Fl. Pl. Nepal 3: 83. 1982; Noltie, Fl. Bhutan 3(1): 229-230. 1994. *Commelina Spirata* L. Mant. Pl. 1: 176. 1767. *Aneilema Spiratum* (L.) R. Br., Prodr. 271. 1810; Hook.f., Fl. Brit. India 6: 377. 1892.

A dwarf, tufted, prostrate herb; stem branched, decumbent; leaves small, sessile, flat, oblong, base amplexicaul, cymes terminal, many, not enclosed in spathe; bracts ovate, persistent; capsule oblong or subglobose; seeds 3-7 per cell smooth or minutely scaberulous.

Flowering & Fruiting: June – November

Distribution : Throughout India, Sri Lanka, Malaysia, China

Exsiccatae: Tista, 300 m, YHb (LBG), Duars (Sikkim), M.S.I. YHb (LBG), Jalpaiguri, *J.K. Sikdar* 626 (CAL).

Pollia Thunberg.

Pollia hasskarlii Rao in notes Roy. Bot. Gard Edin burgh 25: 188. 1964; Hara *et al.*, Enum. Fl. Pl. Nepal 83. 1978; Noltie, Fl. Bhutan 3(1): 232-233. 1994. *Pollia aclisia* Hasskarl in Pl. Jungh. 148. 1852, *Nom. Illegit*, PP., Hook. f., Fl. Brit. India.

A large herb with stout and erect stem; leaves narrowed into a broad petiole, lanceolate, caudate acuminate, glabrous or scaberulous, margins crisped; panicle lax flowered, terminal; peduncle short, stout, villous, sepals membranous and petals white; stamens 6, all perfect; fruit indehiscent, subglobose, fragile, blue; seeds many per cell.

Flowering & Fruiting: June - December.

Distribution: Himalaya (Nepal to Bhutan), India, Burma, Indochina, Malaysia.

Exsiccatae: Kalimpong, 1500 m, YHb (LBG); *Ghaman Bahadur* (LBG); Sellong, 1200 m, YHb (LBG).

Streptolirion Edgewarth

Streptolirion volubile Edgewarth in J. Proc. Linn. Soc. Lond. 1: 254. 1854; Hook.f. in Hook, f., Fl. Brit. India 6: 389. 1892; Hara in Fl. E. Himal. 402. 1966; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 83. 1978; Mukherjee, Fl. Pl. Darjeeling 238. 1988; Fukuka & Kurusaki in Acta Phytot. Geobot 42(1): 57 – 60. 1991; Noltie, Fl. Bhutan 3(1): 219. 1994. *Tradescantia cordifolia* Griffith, Priv. Journ. 208. 1847; non Swartz (1768).

A thin Scandent, flaccid herb, almost glabrous; stem terete; leaves long petioled, ovate-cordate, multicostate, concentric; flowers few in axillary and terminal scorpioid cyme, white; petals linear, free; filaments bearded with yellow hairs ; connective two-lobed; anther cells transverse; ovary 3-celled, each 2-0vuled; capsule oblong-trigonous, beaked.

Flowering & Fruiting: July – December.

Distribution: Himalaya (Gashwal to Assam) and Khasia Hills, Burma, China, W. Japan.

Exsiccatae: Senchal, 2400 m, YHb (LBG); Rangbee (in forests), 1800 m; YHb (LBG); Senchal, 2400 m, YHb (LBG); Darjeeling, 2100 m, YHb (CBG) YHb (LBG); Darjeeling, 2100 m, YHb (CBG)

Tonningia Necker ex A. Juss.

Tonningia axillaris (L.) O. Ktze., Rev. Gen. Pl. 2: 721.1891; Mabberley, The Plant Book: 584.1987[as “(L.) Juss.”]. *Amischocephalus axillaris* (L.) Rolla Rao & Kammathy in J. Linn. Soc. Bot. 306. 1966, in Dept. Med. Pl. Nepal Bull 2: 120. 1969; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 81. 1978. *Commelina axillaris* L., Sp. Pl. 42. 1753; *Cyanotis axillaris* (L.) J.A & J.H. Schultes, Sept. Veg. 7(2): 1154. 1830; Hook f., Fl. Brit. Ind. 6: 388. 1892.

An annual herb; stem elongate, glabrous or sparsely hairy; leaves linear or linear-lanceolate; flowers bright blue, clustered, enclosed in the short inflated leaf sheaths; stamens 6, all perfect, with bearded filaments; style glabrous, filiform, spiral; capsule acute, glabrous; seeds subcylindric, punctate.

Flowering & Fruiting: June – December

Distribution: Himalayas, India to china, Malaysia, Australia.

Exsiccatae: Mongpoo, YHb (LBG); Ghoom, YHb (LBG), Pokhriabong, 4500 m, *Mukherjee 4799*.

Tricarpelema J. K. Morton

Tricarpelema giganteum (Hasskarl) Hara in Fl. E. Himal. 160. 1971; Mukherjee, Fl. Pl. Darjeeling 238. 1988; Noltie, Fl. Bhutan 3(1): 231 – 232. 1994. *Dichoespermum giganteum* Hasskarl, Commel. Ind. 42. 1870. *Aclissia thomsoni* C.B. Clarke, Comm. et Cyrt. Beng. 46, t. 31 (1874). *Aneilema thomsoni* (C.B. Clarke) C.B. Clarke in J. Linn. Soc. Bot. 15: 121. 1876; Hook.f., Hook, f., Fl. Brit. India 6: 376. 1896.

A more or less stout herb; leaves petioled, broadly lanceolate or sword like, caudate acuminate, leaf sheath large, pubescent; flowers in axillary and terminal glabrous panicles, bracts lanceolate, caducous; petals purple; stamens 3 and staminodes 3; capsule cell 5 – 9 seeded each.

Flowering & Fruiting: July – September

Distribution: Eastern Himalaya & Naga Hills

Exsiccatae: Rangbee, 1800 m, S.R. Rolla (LBG); Senchal, 300 m, YHb (LBG); 3rd mile (Ghoom), 2100 m, YHb (LBG).

DISCUSSION

The present work records 11 genera and 21 species of Commelinaceae from the Sikkim and Darjeeling Himalayan regions. The family is warmth loving being somewhat mesothermous. However the distribution ranges from the Duars and Tarai to such elevations as 2100 m or more above the mean sea level, *Commelina*, the most dominant genus with 6 species, has the widest range of distribution pattern. *Commelina suffruticosa* could be detected from high altitude while *C. palludosa* and *C. sikkimensis* are quite familiar at semitemperate regions. *Streptolirion volubile* is also a cold tolerant plant having dispersed itself in regions as high as 2400 m above m.s.l. Distribution of *Commelina appendiculata* is somewhat disjunct being found from North Bengal, Sikkim to Assam in one hand and Sri Lanka on the other. *Commelina sikkimensis* and *Tricarpelema giganteum* are mainly found in Sikkim. Interestingly, not a single member of Commelinaceae was reported from among the high altitude flowering plants of Western Himalaya (Rau 1975).

Acknowledgements

The authors express their regards and gratitude to Swami Nityananda, Secretary Ramakrishna Vivekananda Mission for his kind cooperation and blessings. They are also grateful to the Director, Botanical survey of India and to the Curator, Lloyd Botanic Garden, Darjeeling for affording herbarium and library facilities.

LITERATURE CITED

- APGII 2003. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants. APGII. *Bot. J. Linn. Soc.* 141: 399 – 436.
- Brenan, J.P.M. 1966. The Classification of Commelinaceae. *J. Linn. Soc. Bot.* 59: 349 – 380.
- Cronquist, A. 1988. *Evolution and Classification of Flowering Plants*. Pp.476 – 477. The New York Botanical Garden, Bronx, New York 10458.
- Faden, R.B. & Hunt, D.R. 1991. The Classification of Commelinaceae. *Taxon* 40: 19 – 31.
- Jones, K. & Jopling, C. 1972. Chromosomes and the classification of the Commelinaceae. *Bot. J. Linn. Soc.* 65: 129 – 162.
- Mukherjee, A. 1988. *The Flowering Plants of Darjeeling*. Atma Ram & Sons, Delhi & Lucknow.
- Mukherjee, A.; Banerjee, D. & Acharya, J. 2008. A contribution to the study of Gesneriaceae Dum. in Eastern Himalaya. *Pleione* 2(2): 151 – 161.
- Murty, Y.S.; Saxena, N.P. & Singh, V. 1974. Floral morphology of the Commelinaceae. *J. Indian Bot. Soc.* 53: 127 – 136.
- Rau, M.A. 1975. *High Altitude Flowering plants of West Himalaya*, Bot. Surv. India, Indian Botanic Garden, Howrah.
- Simpson, M.G. 2006. *Plant Systematics*. Pp.188 – 190. Elsevier Academic Press. Amsterdam, Boston, Heidelberg, London etc.
- Takhtajan, A. 1997. *The Diversity and Classification of Flowering Plants*. Pp. 541 – 542. Columbia University Press, New York.
- Tomlinson, P.B. 1969. Vol.3 Commelinales-Zingiberales. In: *Anatomy of the Monocotyledons* (ed. C.R. Metcalfe). Clarendon Press, Oxford.
- Tucker, G.C. 1989. The genera of Commelinaceae in southeastern United States. *J. Arnold Arb.* 70: 97 – 130.
- Watson, L. & Dallwitz, M. J. (1992 onwards). *The Families of Flowering Plants: Descriptions, Illustrations, Identification, and Information Retrieval*. Version: 14th December 2000. <http://biodiversity.uno.edu/delta/>.