

PTERIDOPHYTA

For enumeration of this part A linear sequence of Lycophytes and Ferns after Christenhusz, M. J. M.; Zhang, X.C. & Schneider, H. (2011) has been followed

Subclass: Lycopodiidae Beketov (1863).

Order: Selaginellales (1874).

Selaginellaceae Willkomm, Anleit. Stud. Bot. 2: 163. 1854; Prodr. Fl. Hisp. 1(1): 14. 1861.

SELAGINELLA P. Beauvois, Megasin Encycl. 9: 478. 1804.

Selaginella monospora Spring, Mém. Acad. Roy. Sci. Belgique 24: 135. 1850; Monogr. Lyc. II:135. 1850; Alston, Bull. Fan. Mem. Inst. Biol. Bot. 5: 288, 1954; Alston, Proc. Nat. Inst. Sc. Ind. 11: 228. 1945; Reed, C.F., Ind. Sellaginellarum 160 – 161. 1966; Panigrahi *et* Dixit, Proc. Nat. Inst. Sc. Ind. 34B (4): 201, f.6. 1968; Kunio Iwatsuki in Hara, Fl. East. Himal. 3: 168. 1972; Ghosh *et al.*, Pter. Fl. East. Ind. 1: 127. 2004. *Selaginella gorvalensis* Spring, Monogr. Lyc. II: 256. 1850; Bak, Handb. Fern Allies 107. 1887; *Selaginella microclada* Bak, Jour. Bot. 22: 246. 1884; *Selaginella plumose* var. *monospora* (Spring) Bak, Jour. Bot. 21:145. 1883; *Selaginella semicordata sensu* Burkill, Rec. Bot. Surv. Ind. 10: 228. 1925, *non* Spring.

Plant up to 90 cm, main stem prostrate, rooting on all sides and at intervals, unequally tetragonal, main stem alternately branched 5 – 9 times, branching unequal, flexuous; leaves obscurely green, dimorphous, lateral leaves oblong to ovate-lanceolate, subacute, denticulate to serrulate at base. Spike short, quadrangular, sporophylls dimorphic, large sporophylls less than half as long as lateral leaves, oblong-lanceolate, obtuse, denticulate, small sporophylls dentate, ovate, acuminate.

Fertile: October to January.

Specimen Cited: Park, Rajib & AP Das 0521, dated 23. 07. 2007.

Local Distribution: Garden and conservation sectors.

General Distribution: India: West Bengal, Sikkim, Meghalaya, Arunachal Pradesh, Assam, Manipur; Myanmar, Bhutan, Indo-China, Nepal.

Subclass: Polypodiidae Cronquist (1966).

Order: Gleicheniales Schimper (1869).

Gleicheniaceae (R. Brown) Presl, ReI. Haenk 1(1): 70. 1825; Copeland, Gen. Fil. 26. 1947.

DICRANOPTERIS Bernahardi, Schrad. Neu. Jour. Bot. 1(2): 38. 1905.

Dicranopteris linearis (Burman f.) Underwood, Bull. Torrey Bot. Cl., 34(5): 250. 1907; Holttum, Reinwarditia 4: 275. 1957; Holttum, Fl. Males. Ser. 2. 1: 33. 1959; Mehra *et* Bir, Pterid. Fl. Darjeeling & Sikkim Him. 122. 2008; Hiroshi Ito in Hara, Fl. East. Himal. 1: 456. 1966; Singh *et* Panigrahi, Fern Fern-allies of Arun. Prad. I. 313-314. 2005; Ghosh *et al.*, Pter. Fl. East. Ind. 1: 211, 2004. *Polypodium lineare* Burman f., Fl. Indica: 235. T. 67. F. 2. 1768. *Gleichenia dichotoma* (Thunberg *ex* Murray) Hooker, Sp. Fil. 1: 6. 1844. *Gleichenia linearis* (Burman f.) Clarke, Trans. Linn. Soc. Lond. Ser. 2. Bot. 1: 428. 1880; Beddome, Handb. Ferns Brit. Ind. 4. 1883. *Diplopteridium lanigerum* (D. Don) Nakai, Bull. Nat. Sc. Mus. Tokyo 29: 53. 1950. *Gleichenia lanigera* D. Don, Prodr. Fl. Nep. 17. 1825. [PLATE: 6, Figure-50]

Rhizome wide creeping. Fronds large, forming thickets; stipes stout, brown, up to 12 cm, lanceolate, deeply lobed; ultimate-pinnae ca 30 x 7 cm, lanceolate, gradually acuminate, base unequal. Ultimate-lobes oblong, 4 – 5 mm wide, entire and incurved. Sori round, dorsal, exindusiate, sub-basal.

Fertile: July to September.

Specimen Cited: Forest, *Rajib & AP Das 0556*, dated 24. 07. 2007.

Local Distribution: All over the conservation sectors.

General Distribution: India: West Bengal, Assam, Sikkim, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, South India; Tropical and sub Tropical Asia, Malaysia, Australia.

Order: Schizaeales Schimper (1869).

Lygodiaceae M. Roemer, Handb. Allg. Bot. 3: 520. 1840.

LYGODIUM Swartz, Schrad. Jour. Bot. 1800 (2): 7. 1801.

Key to the species:

- 1a. Rhizome usually long creeping *L. microphyllum*
 1b. Rhizome short creeping or suberect *L. flexuosum*

Lygodium flexuosum (Linnaeus) Swartz, Schard. In Jour. Bot. 1800 (2): 7. 106. 1810; Beddome, Handb. Ferns Brit. Ind. 457. f. 283. 1883; Alston *et* Holttum, Reinwardtia 5: 15. 1959; Holttum, Fl. Males. Ser. 2. 1(1): 53, f. 9e – f. 1959; Panigrahi *et* Dixit, Proc. Aut. Sch. Bot. 217. 1967; Hiroshi Ito in Hara, Fl. East. Himal. 1: 455. 1966; Baishya *et* Rao, Ferns Ferns allies Meghalaya 37. 1982; Chauhan *et al.*, Fl. Namdapha 79. 1996; Singh *et* Panigrahi, Proc. Ind. Acad. Sci. 93B (2): 124. 1984; Ghosh *et al.*, Pter. Fl. East. Ind. 1: 221. 2004. *Ophioglossum flexuosum* Linnaeus, Sp. Pl. 2: 1063. 1753. *Ophioglossum scandens* Linnaeus, Sp. Pl. 2: 1063. 1753. *Ramondia flexuosa* (Linnaeus) Mirbel, Bull. Sci. Soc. Philom. Paris 2: 179. 1801. *Hydroglossum flexuosum* (Linnaeus) Willdenow, Schr. Akad. Erfurt 23, t. 1, f. 3. 23. 1802.

Rhizomes short, creeping. Fronds up to 35 cm, juvenile fronds once or twice dichotomously branched, each branch deeply palmately lobed, almost equal at the base, the whole leaflets cordate, serrate and sometimes crenately lobed, dorsal surface puberulous, ovate to deltoid, tripinnate to quadripinnatifid, secondary rachis branches narrowly winged, hairy, basal ones largest and stalked, becoming sessile upwards. Sorophores 4 to 9 mm. Spores pale.

Fertile: March to December.

Specimen Cited: Forest, *Rajib & AP Das 0525*, dated 23. 07. 2007.

Local Distribution: Marginal areas of the conservation sector.

General Distribution: India: West Bengal, Assam, Arunachal Pradesh, Meghalaya, Bihar; Africa, Australia, China, Malaysia, Philippines, Sri Lanka.

Lygodium microphyllum (Cavanilles) R. Brown, Prodr. Fl. Nov. Holl. 1: 162. 1810; Beddome, Handb. 455, t. 282. 1883; Alston *et* Holttum, Reinwardtia 5: 12. 1959; Holttum, Fl. Males. Ser. 2. 47. f. 5e-f. 1959; Panigrahi *et* Dixit, Proc. Aut. Sch. 224, f.4. 1967; Ghosh *et al.*, Pter. Fl. East. Ind. 1: 225. 2004. *Ugena microphylla* Cavanilles, Icon. Descr. Pl. 6(2): 76, t. 595, f. 2. 1801. *Lygodium scandens sensu* Swartz, Schrad. Jour. Bot. 1800 (2): 106. 1801; Beddome, Ferns of S. Ind. t. 61. 1863. *Ophioglossum filiforme* Roxburgh *ex* Griffith, Calc. Jour. Nat. Hist. 4: 476, t. 26, f. 3. 1844. *Hydroglossum scandens* (Linnaeus) Willdenow, Schr. Akad. Erfurt 20. 1802.

Climbers, up to 15 m, rhizome long creeping. Fronds up to 7 mm, 15 – 45 cm broad, tri pinnate, rachis surface glabrous, ovate-oblong, pinnate, primary rachis branches 3 – 5 mm, dormant apex brown, septate hairs, secondary rachis branches glabrous, apex of stalk swollen and articulate with

the lamina, pinnule lamina ovate-oblong, base cordate to auricled, entire, obtuse, surface smooth, veins many times forked, prominent, ending into the margin. Sorophores up to 3 mm.

Fertile: March to December.

Specimen Cited: Forest, *Rajib & AP Das 0537*, dated 23. 07. 2007.

Local Distribution: Conservation sectors.

General Distribution: India: West Bengal, Sikkim, Assam, Meghalaya, Arunachal Pradesh, South india; China, Sri Lanka, Africa, Malaysia, Australia.

Order: Salviniiales Bartling in Mart., *Consp. Regn. Veg.*: 4. 1835.

Marsileaceae Mirbel in Lamarck *et* Mirbel, *Hist. Vog.* 5: 126. 1802.

MARSILEA Linnaeus, *Sp. Pl.* 2: 1099. 1753.

Marsilea minuta Linnaeus, *Mant. Pl.* 308. 1771; Sledge, *Bot. Jour. Linn. Soc.* 84: 22. 1982; Fournier, *Bull. Soc. Bot. Fr.* 27: 329. 1880; Bak, *Handb. Fern Allies* 140. 1887; Kunio Iwatsuki in Hara, *Fl. East. Himal.* 1: 500. 1966; Prain, *Beng. Plants* 2: 957. 1903; Ghosh *et al.*, *Pter. Fl. East. Ind.* 1: 187. 2004. *Marsilea diffusa* var. *approximata* A. Braun, *Flora* 300. 1839. *Marsilea perrieriana* C. Christensen, *Dansk Bot. Ark.* 7: 179, t. 73, f. 15 – 16. 179. 1932. [PLATE: 10, Figure-120]

Local name: Susni Sasg

Aquatic with creeping rhizome, roots usually from nodes, stipes scattered, usually green, leaves four, sessile arranged at the tip of the stipe in cloud leaf model. Sporocarps borne at nodes in alternate clusters.

Fertile: January to April.

Specimen Cited: Chhotojan Beel, *Rajib & AP Das 0601*, dated 26. 07. 2007.

Local Distribution: All over the Beel areas.

General Distribution: allover India; Africa, Trinidad and Brazil.

Salviniaceae Martinov, *Tekhno-Bot. Slovar*: 559. 1820.

Key to the genera:

1a. Fronds two lobed, close together *Azolla*

1b. Fronds unlobed *Salvinia*

AZOLLA Lamarck, *Encycl. Meth.* 1. 343. 1783.

Azolla pinnata subsp. *africana* (Desvaux) R.M.K. Saunders *et* K. Fowler, *Bot. Jour. Linn. Soc.* 109: 351, f. 30A 351. 1992. *Azolla pinnata* R. Brown in *Prodr.* In *Fl. N. Holl.* 167, 1810; Holttum, *Fl. Malaya* 2: 621, 1968. Ghosh *et al.*, *Pterid. Fl. East. Ind.* 1: 184. 2004. [[PLATE: 10, Figure-111]

Small, triangular, free floating fern; many roots hanging downward. Fronds two lobed, close together. Sori indusiate on submerged leaf-lobes; microsporangium many with microspores; megasporangia few with one megaspore.

Fertile: May to August.

Specimen Cited: Chhotojan Beel, *Rajib & AP Das 0022*, dated 05. 02. 2007.

Local Distribution: Throughout the water body.

General Distribution: India: low lands throughout; Africa, Asia, Australia, Malaysia and Taiwan.

SALVINIA Seguir, Fl. Veron. 3: 52, 1754.

Key to the species:

- | | |
|---|---------------------|
| 1a. Hairs on papillae on upper surface of floating leaves in regular rows ... | 2 |
| 1b. Hairs on upper surface of floating leaves scattered | <i>S. cucullata</i> |
| 2a. Hairs on papillae jointed at the tips, ending in a deep brown cell | <i>S. adnata</i> |
| 2b. Hairs on papillae entirely free | <i>S. natans</i> |

Salvinia adnata Desvaux, Mém. Soc. Linn. Paris 6: 177. 1827. *Salvinia molesta* D.S. Mitchell, Brit. Fern Gaz. 10(5): 251 – 252. 1972; Ghosh *et al.*, Pter. Fl. East. Ind. 1: 179. 2004. [PLATE: 10, Figure-112]

Rhizomes horizontal, hairy, two leaves floating, third submerged into water and dissected, floating leaves petioled, clearly boat shaped, conduplicate, lower portion curved upwards, oblong elliptic to obovate, cordate, upper surface papillate, and are in regular rows, each papillae crowned with four uniseriate, colourless hairs. Macrosporocarp two, rarely three, globose, glabrous to subglabrous, stalked. Microsporocarp globose, densely hairy, sessile, containing mostly empty microsporangia.

Fertile: September to March.

Specimen Cited: Batikata Beel, Rajib & AP Das 0018, dated 05. 02. 2007.

Local Distribution: All over the Beel area.

General Distribution: India: West Bengal, South India; Sri Lanka, Indonesia, Western Australia, South and Central Africa, Brazil.

Salvinia cucullata Roxburgh *ex* Bory in C.P. Belanger, Voy. Indes Or. 2(1): 6. 1833; Griffith, Calc. Jour. Nat. Hist. 4: 470. 1844 & Calc. Jour. Nat. Hist. 5: 255, t. 20, f. 21. 1845; Bak, Handb. Fern Allies 186, 1887; Prain, Beng. Plnats 2: 956. 1903. [PLATE: 10, Figure-113]

Free floating herbs, 3 - 6 cm, rhizomes hairy. Uppermost leaves or frond arranged in a row, sub-erect, with infolded edged, hairs on upper surface of floating leaves irregularly scattered; lamina entire, papillae not regular. Sporocarp form on submerged, root like leaves. Sporocarps are in cluster, globose. Microcarp elongated and hairy.

Fertile: September to March.

Specimen Cited: Batikata Beel, Rajib & AP Das 0039, dated 05. 02. 2007.

Local Distribution: All over the Beel area.

General Distribution: India: West Bengal, Assam, Meghalaya, Manipur, Tripura, Nagaland and Mizoram, Bihar, Orissa, Uttar Pradesh; Malaysia, Bangladesh, Myanmar.

Salvinia natans (Linnaeus) Allioni, Fl. Pedemont. 2: 289. 1785; Baker, Handb. Fern Allies, 135. 1887; Prain, Beng. Pl. 2: 96. 1903; Ghosh *et al.*, Pter. Fl. East. Ind. 1: 181. 2004. *Mersilea natans* Linnaeus, Sp. Pl. ed. 2: 1099. 1762. *Salvinia verticillata* Roxburgh *ex* Griffith, Calc. Jour. Nat. Hist. 4: 469. 1844; Griffith, Calc. Jour. Nat. Hist. 4: 24, t. 18-20. 1845. [PLATE: 10, Figure-114]

Free floating herbs, 5 – 15 cm; rhizomes hairy. Uppermost leaves or frond flat, stalk hairy, hairs on papillae are entirely free, oval-oblong, upper surface with hooked papillae in regular row. Lamina entire, papillose. Sporocarps arise from nodes, globose with brown hairs. Sporocarp contains 25 microsporangia.

Fertile: November to March.

Specimen Cited: Varveri Beel, Rajib & AP Das 0031, dated 05. 02. 2007.

Local Distribution: All over the Beel area.

General Distribution: India: West Bengal, Bihar, Assam, Meghalaya, Manipur, Tripura, Uttar Pradesh and Kashmir; Europe, Asia, Africa and North America.

Order: Polypodiales Link, Hort. Berol. 2: 5. 1833.

Pteridaceae E.D.M.Kirchner, Schul-Bot.: 109. 1831.

Key to the Genera:

- | | |
|--|----------------------------|
| 1a. Surface white powdery or waxy | 2 |
| 1b. Surface never white powdery or waxy | 3 |
| 2a. Lamina lanceolate to oblong-lanceolate, surface white powdery | <i>Cheilanthes</i> |
| 2b. Lamina triangular, ending in a small leaflet, pinnae largest towards base, surface without powder coated | <i>Adiantum</i> |
| 3a. Sporangia dorsal, indusium absent, paraphyses absent | <i>Ceratopteris</i> |
| 3b. Sporangia ventral, indusium present, paraphyses present | 4 |
| 4a. Sori continuous of mostly all pinnae | <i>Pteris</i> |
| 4b. Sori not continuous of mostly along with vein | <i>Onychium</i> |

ADIANTUM Linnaeus, Sp. Pl. 1094, 1753.

Adiantum caudatum Linnaeus, Mant. Pl. 308. 1771; Bedd., Handb. 83. 1883; Hope, Jour. Bomb. Nat. Hist. Soc. 13: 237. 1900; Hiroshi Ito in Hara, Fl. East. Himal. 1: 459. 1966. *Adiantum caudatum* var. *angustilobatum* Bonaparte, Notes Pteridol. 7: 173 – 174. 1918. *Adiantum lyratum* Blanco, Fl. Filip. 832. 1837.

Rhizome short erect, clothed with deep brown lanceolate scales. Fronds simply pinnate, linear oblong, up to 20 cm. Stipe scaly at base, deep brown to black, glossy, terete. Lamina up to 15 cm, ending in a small leaflet, pinnae largest towards base, subsessile, upper margin 3 – 4 lobed, sinus narrow, lower margin straight, apex rounded, base cuneate, both surfaces glabrous. Venation free, dichotomously branched. Sorus transversely oblong.

Fertile: August to November.

Specimen Cited: Park, Rajib & AP Das 0629, dated 12. 02. 2008.

Local Distribution: Park sector.

General Distribution: India: West Bengal, Sikkim, Arunachal Pradesh, Manipur, Meghalaya, Western Himalaya; Nepal, Bhutan, China, Japan, Taiwan, Myanmar, Philippines, Malaysia.

CERATOPTERIS Brongniart, Bull. Sci. Soc. Philom. Paris. Ser. 3, 8: 186. 1821.

Ceratopteris thalictroides (Linnaeus) Brongniart, Bull. Soc. Philom. Paris ser. 3, 8: 186. 1821; Beddome, Handb. 123. 1883; Hope, Jour. Bombay Nat. Hist. Soc. 13: 458. 1901; Pal et Pal, Bot. Gaz. 124: 132 – 143. 1962; Lloyd, Brittonia 26(2): 148. 1974; Ghosh et al., Pter. Fl. East. Ind. 1: 190. 2004; Singh et Panigrahi, Fern Fern Allies Arun. Prad. 2: 430. 2005. *Acrosticum thalictroides* Linnaeus, Sp. Pl. 2: 1070. 1753. *Pteris thalictroides* (Linnaeus) Swartz, Schrad. Jour. Bot. 4: 651. 1801. *Acrostichum siliquosum* Linnaeus, Sp. Pl. 2: 1070. 1753. *Ceratopteris siliquosa* (Linnaeus) Copeland, Philip. Journ. Sci. 56: 107. 1935; Hiroshi Ito in Hara, Fl. East. Himal. 1: 468. 1966.

Rhizome short, erect, roots fibrous, annual. Fronds dimorphic, herbaceous; sterile fronds up to 40 cm, ovate-lanceolate, lobed. Stipes up to 20 cm, dirty green, wrinkled on drying; lamina 3-30 cm long, ovate, obtuse. Fertile fronds 3 – 100 x 3 – 40 cm, lanceolate, acute to acuminate. Stipes up to 25 cm, similar to sterile fronds; lamina 3 – 60 x 3 – 40 cm, acute to acuminate. Sporangia dorsal, solitary, indusium absent, paraphyses absent.

Fertile: September to December.

Specimen Cited: Forest, Rajib & AP Das 0016, dated 05. 02. 2007.

Local Distribution: Marginal and low depth water cover areas.

General Distribution: India: West Bengal, Assam, Manipur, Tripura, Arunachal Pradesh, Bihar, Uttar Pradesh, South India; throughout the tropics and sub-tropics.

ONYCHIUM Kaulfuss, Berlin Jahrb. d. Pharm. 21 : 45. 1820.

Onychium siliculosum (Desvaux) C. Christensen, Ind. Fil. 468, 1906; Hirosi Ito in Fl. E. Himal. 1: 464. 1966; Ind. Fil. 468. 1906; Lingnan, Sc. Journ. 13(3): 495. 1934. *Pteris siliculosa* Desvaux, Berlin. Mag. 5: 324. 1811. *Lomaria decomposita* D. Don, Prod. Fl. Nepal. 14. 1825. *Lomaria auria* Wallich, Cat.n. 38. 1828, *nom.nud.* *Lomaria caruifolia* Wallich, Cat. n. 39. 1828, *nom. nud.* *Pteris chrysocarpa* Hooker et Greville, Ie. Fil. t. 107. 1829. *Onychium siliculosum* (Desvaux) C. Christensen, Ind. Fil. 468. 1906; Ching, III Lingnan Sci. Journ. 13: 495. 1934. *Onychium auratum* Kaulfuss, Enum. Fil. 144. 1824; Beddome, Ferns Brit. Ind. t. 30. 1883; Hope, Jour. Bombay Nat. Hist. Soc. 13: 443. 1901.

Rhizome short, ascending; roots fibrous. Stipe tufted, up to 40 cm, naked except at base, sulcate, brown to pale brown. Fronds subdimorphous. Lamina as long as stipe, glabrous, ovate, lower pinnae subdeltoid, secondary and tertiary pinnae stalked, ultimate sterile pinnules very narrow, linear, entire, acute. Indusium membranaceous, entire, mass of sporangia yellow.

Fertile: August to December.

Specimen Cited: Forest, Rajib & AP Das 0058, dated 07. 02. 2007.

Local Distribution: All over the forest area.

General Distribution: India: West Bengal, Assam; Bhutan, Indo China, Myanmar, Malaysia, Philippines, Indonesia.

PTERIS Linnaeus, Sp. Pl. 1073. 1753.

Key to the species:

1a. Sori continuous in all pinnae of mature plants except basal ones *P. vittata*

1b. Sori continuous round the sinus but not reaching apices of lobes *P. biaurita*

Pteris vittata Linnaeus, Sp. Pl. 2: 1074. 1753; Heiron, Hedwigia 54: 290. 1914; Holttum, Rev. Fl. Males. 2: 396. 1955; Copeland, Fern Fl. Philip. 1: 128. 1958; Bir et Verma, Res. Bull. Panj. Univ. 14: 191. 1963; Mehra et Bir, Res. Bull. Panj. Univ. 15: 112. 1964; Shieh, Bot. Mag. Tokyo 79: 287. 1966; Hirosi Ito in Hara, Fl. East. Himal. 1: 467. 1966; Ghosh et. al., Pter. Fl. East. Ind. 1: 319. 2004. *Pteris longifolia* auct. Beddome, Ferns S. Ind.t. 33. 1863; Beddome, Handb. 106,t. 55. 1883; Hope, Jour. Bombay Nat. Hist. Soc. 13: 148. 1901; Clarke, Trans. Linn. Soc. Ser. 2. Bot. 1: 461. 1880. *Polypodium trapezoids* Burman f., Fl. Ind.t. 66, f. 2. 1768. *Pteris costata* Bory ex Willdenow, Sp. Pl., ed. 4, 5(1): 367. 1810. *Pteris longifolia* Wallich, Cat. no. 111. 1828. *Pteris amplexicaulis* Roxburgh, Calc. Jour. Nat. Hist.4: 505. 1844.

Rhizome short, erect to suberect, densely clothed, narrow, thin, entire scales, pale brownish when old. Stipes up to 40 cm, green, scaly almost throughout, pale brownish. Lamina 30 – 80 cm long, pinnae numerous, middle ones longest, all pinnae sessile and oblique, linear, base broadly cuneate to cordate, somewhat dilated, apex acuminate. Veins on both surfaces distinct. Sori continuous of mostly all pinnae in mature plants except the reduced basal ones.

Fertile: July to December.

Specimen Cited: Park, Rajib & AP Das 0627, dated 12. 02. 2008.

Local Distribution: Garden sector.

General Distribution: Throughout India; Tropical and Sub-tropical world.

Pteris biaurita Linnaeus, Sp. Pl. ed. 1,2: 1076. 1753; Hope, Jour. Bombay Nat. Hist. Soc. 13: 455. 1901; Agardh, Rec. Sp. Gen. Pterid. 26. 1839; Hooker, Sp. Fil. 2: 203. 1858; Clarke, Trans. Linn. Soc. ser. 2. Bot. I: 469. 1880, pp.; C. Christensen, Contr. U.S. Nat. Herb. 26: 312. 1931; Holttum, Fl. Malaya 2: 407. 1954; Shieh, Bot. Mag. Tokyo 79: 291. 1966; Tagawa *et* Iwatsuki, Fl. Thailand 3(2): 237. 1985; Hiroshi Ito in Hara, Fl. East. Himal. 1: 465. 1966; Ghosh *et al.*, Pter. Fl. East. Ind. 1: 338. 2004. *Campteria biaurita* Hook. *et* Bauer, Gen. Fil. t. 65A. 1841; Beddome, Ferns South. Ind. t. 44. 1863; Beddome, Handb. 116. 1883. *Campteria rottleriana* Presl, Tent. Pterid. 147, t. 5. f. 26. 1836. *Pteris pectinata* D. Don, Prod. Fl. Nepal. 15. 1825; *non* Cavanilles 1802; Morton, Contr. U.S. Nat. Herb. 38(6): 267. 1973. *Pteris flavicaulis* Hayata, Jour. Coll. Sci. Imp. Univ. Tokyo 30(1): 443 – 444. 1911.

Rhizome short, erect, clothed with brown scales. Stipe glabrous, grooved on adaxial surface, rachis and midrib of pinnae deeply grooved, rachis groove minutely hairy. Lamina slightly dimorphous, deeply bipinnatifid, pinnae opposite or subopposite, 5 – 9 pairs, lowest pinnae longest and bipartite on basioscopic side, other pinnae unbranched, sessile, oblique, acuminate, base cuneate. Sori continuous round the sinus but not reaching the apices of lobes.

Fertile: July to January.

Specimen Cited: Forest, Rajib & AP Das 0069, dated 07. 02. 2007.

Local Distribution: Throughout the beel margin and forest area.

General Distribution: India: West Bengal, Assam, arunachal Pradesh, Maghalaya Kerala, Karnataka, Andaman & Nicobar, Islands, Orissa, Uttar Pradesh, Tamil Nadu, Bihar and other parts of India; Bhutan, China, West Indies, Malaysia, South Africa, Brazil.

CHEILANTHES Swartz, Syn. Fil. 5, 126. 1806 (*nom. cons.*).

Cheilanthes anceps Blanford, Simla Nat. Hist. Soc. 25. 1886; Candollea 15: 203. 1956; Beddome, Handb. Supp. 21. 1892; Hope, Jour. Bomb. Nat. Hist. Soc. 13: 249. 1900; Alston *et* Bonner, Candollea 15: 203. 1956; Kunio Iwatsuki in Hara, Fl. East. Himal. 3: 173. 1972. *Cheilanthes farinose* (Forsk.) Kaulfuss, *Sensu* Hara, Fl. East. Himal. 3: 173. 1972; Kaulfuss, Candollea 27: 270. 1972. *Aleuritopteris anceps* (Blanford) Panigrahi, Bull. Bot. Surv. Ind. 2(3 & 4): 321. 1960; Wu, Acta Phytotax. Sin. 19(1): 70, t. 2. f. 1-3. 1981. *Cheilanthes farinosa* var. *anceps* Blanford, Jour. Asiat. Soc. 57, part 2 (4): 301. 1888. *Aleuritopteris farinosa* var. *anceps* (Blanford) Ching, Hong Kong. Nat. 10: 201. 1941. *Cheilanthes farinosa* Beddome, Handb. with suppl. 21. 1892.

Rhizome short, erect, clothed with linear-lanceolate, acuminate scales with apex and white margin. Stipe up to 30 cm long, dark chesnut to almost black. Lamina lanceolate to oblong-lanceolate, up to 25 cm, surface always coated with white powder, costa and rachis without scales, bipinnatifid, pinnae up to 15 pairs, apex of lamina pinnatifid. Sori along the margin of segments.

Fertile: August to May.

Specimen Cited: Park, Rajib & AP Das 0611. dated 11. 02. 2008.

Local Distribution: Garden sector.

General Distribution: India: West Bengal, Arunachal Pradesh, Assam, Meghalaya; Bhutan, Nepal, China.

Aspleniaceae Newman, Hist. Brit. Ferns: 6. 1840. Aspleniaceae (C. Presl) Mettenius *ex* A.B. Frank in Leunis, Syn. Pflanzenkd. ed. 2, 3: 1465. 1877; Copeland, Gen. Fil.: 163. 1947; Pichi-Sermolli in Webbia 31 (2): 337. 1977; Kramer *et* Viane in Kramer *et* Green, Fam. Gen. Vasc. Pl. 1: 52. 1990.

ASPLENIUM Linnaeus, Sp. Pl. 2: 1078. 1753.

Asplenium ensiforme Wallich ex Hooker et Greville, Ic. Fil. 1(4): t. 71. 1829; Beddome, Handb. Ferns Brit. Ind. 141. t. 71. 1883; Hope, Jour. Bombay Nat. Hist. Soc. 13: 460. 1901; Sledge, Bull. Brit. Mus. Bot. 3: 242. 1965; Kunio Iwatsuki in Hara, Fl. East. Himal. 1: 487. 1966; Singh et Panigrahi, Fern Fern-allies of Arun. Prad. I. 97. 2005. *Asplenium ensiforme* Wallich, Num. List. No. 200. 1829, *nom. nud.*

Rhizome erect, short. Fronds up to 40 cm, simple, repand. Lamina base decurrent, veins forked 1 – 2 times, free. Sori oblique, 8 – 12 mm long, blackish brown.

Fertile: August to November.

Specimen Cited: Forest, Rajib & AP Das 0547, dated 23. 07. 2007.

Local Distribution: Throughout the forest sectors.

General Distribution: India: West Bengal, Assam, Sikkim, Arunachal Pradesh, Bihar; Bhutan, Sri Lanka, Myanmar, S.W. China.

Blechnaceae Newman, Hist. Brit. Ferns, ed. 2 8. 1844.

BLECHNUM Linnaeus, Sp. Pl. 2: 1077. 1753.

Blechnum orientale Linnaeus, Sp. Pl. ed. 1, 2: 1077. 1753; Beddome, Handb. Ferns Brit. Ind. 132. t. 66. 1883; Singh et Panigrahi, Fern Fern-allies of Arun. Prad. I. 206 – 207. 2005.

Rhizome erect, up to 10 cm, apex densely paleaceous. Fronds up to 150 cm, tufted, pinnate, caudate acuminate. Stipes up to 40 cm long, paleaceous at base, thick, several pair of small auricles present, lamina 120 cm long, pinnae alternate, spreading, entire. Sori costal, elongated, indusium long, narrow, brown.

Fertile: September to January.

Specimen Cited: Forest, Rajib & AP Das 0557, dated 24. 07. 2007.

Local Distribution: Park sector.

General Distribution: India: West Bengal, Assam, Sikkim, Arunachal Pradesh, Bihar; Sri Lanka, Nepal, Bhutan, Bangladesh, China, Myanmar, Thailand, Indonesia, Malaysia, Australia.

Athyriaceae Alston, Taxon 5: 25. 1956.

Key to the genera:

- | | |
|------------------------------------|-------------------|
| 1a. Sori basal | <i>Allantodia</i> |
| 1b. Sori along with the vein | <i>Diplazium</i> |

ALLANTODIA Robert Brown, Prodr. Fl. Nov. Holland. 149. 1810.

Key to the Species:

- | | |
|---|------------------------|
| 1a. Sori diplazioid type; indusium brown. | <i>A. sikkimensis</i> |
| 1b. Sori athyroid to asplenioid; indusium whitish | <i>A. solenopteris</i> |

Allantodia sikkimensis (C.B. Clarke) Ching, Acta Phytotax. Sin. 9(1): 56. 1964. *Asplenium sikkimense* C.B. Clarke, Trans. Linn. Soc. London ser. II. Bot. 1(8): 500 – 501, pl. 65. f. 1. 1880. *Diplazium sikkimense* (C.B. Clarke) C. Christensen, Contrib. U.S. Nation. Herb. 26: 304. 1931; Singh et Panigrahi, Fern Fern-allies of Arun. Prad. I: 183 – 185. 2005.

Rhizome erect, up to 25 cm, roots thick. Paleae basifixed to pseudopeltate, ovate – lanceolate, entire. Fronds tufted, lanceolate, tripinnatisect, acuminate; stipes 75 – 120 cm, black at base, dirty brown, grooved dorsally. Lamina 100 – 150 cm, pinnae more than 8 pairs, alternate, lowest pinnae slightly short, pinnules opposite to sub opposite. Sori fewer, diplazioid, small, basal, indusium thin, brown.

Fertile: July to September

Specimen Cited: Forest, Rajib & AP Das 0607, dated 26. 07. 2007

Local Distribution: Common along the margin of Bochamari Beel.

General Distribution: India: West Bengal, Assam, Arunachal Pradesh; Bangladesh, Bhutan, China, Malaysia.

Allantodia solenopteris Kunze, Linnaea 24: 266. 1851. *Athyrium solenopteris* (Kuntze) T. Moore, Ind. Fil.: 43, 187. 1857; Beddome, Handb. Ferns Brit. Ind. 166, 1883, *p.p. excl. syn.*; Singh *et* Panigrahi, Fern Fern-allies of Arun. Prad. I: 132. 2005. *Athyrium pectinatum* Beddome, Ferns S. Ind.: t. 155. 1864.

Rhizome erect, fronds up to 60 cm, tufted. Lamina oblong, gradually acuminate; pinnae 14 – 20 pairs, 2nd or 3rd pair largest, basal slightly reduced. Pinnules ovate-oblong, oblique, acute, pinnule lobes up to 8 mm, oblong rectangular, crenate to serrate. Sori basal, athyrioid to asplenoid, indusium whitish pale, thin, persistent.

Fertile: June to September

Specimen Cited: Forest, Rajib & AP Das 0046, dated 05. 02. 2007

Local Distribution: Deer conservation area of the Beel

General Distribution: India: West Bengal, Assam, Arunachal Pradesh; Bangladesh, Bhutan, China, Malaysia.

DIPLAZIUM Swartz, Jour. Bot. (Schrader) 2: 4, 61. 1801.

Diplazium esculentum (Retzius) Swartz, Jour. Bot. (Schrader) 1801(2): 312. 1803; Beddome, Handb. Ferns Brit. Ind. 192. 1883; Sledge in Bull. Brit. Mus. Bot. 2: 310. 1962; Singh *et* Panigrahi, Ferns Fern-All. Arun. Prad. I: 161. 2005; Hiroshi Ito in Hara, Fl. East. Himal. 1: 474. 1966. *Hemionitis esculenta* Retzius, Obs. Bot. 4: 38. 1791; Beddome, Handb. Ferns Brit. Ind. 192. 1883. *Anisogonium esculentum* (Retzius) C. Presl, Tent. Pterid. 116. 1836. *Anisogonium serampurens* C. Presl, Tent. Pterid. 116. 1836.

Vernacular Name: Dhekia Saag.

Terrestrial fern; rhizome erect, dark brown. Fronds large; lamina 2 pinnate; pinnae petiolate; pinnules many; lobes acuminate, base broadly cuneate, shortly stalked. Sori linear, continuous along almost whole length on both sides of veins, brown; sporangia shortly stalked.

Fertile: July to September

Specimen Cited: Forest, Rajib & AP Das 0534, dated 23. 07. 2007

Local Distribution: Abundant along the Beel margins and Roadside forests.

General Distribution: India: West Bengal, Sikkim, Arunachal Pradesh, Assam, Meghalaya, Tripura, Western Ghats; Bangladesh, China and Malaysia.

Dryopteridaceae Herter, Revista Sudamer. Bot. 9: 15. 1949; *nom. cons.*

Key to the Genera:

- 1a. Pinnae widest at base, pinnules sessile, oblique deltoid *Dryopteris*
- 1b. Basal pair pinnae strongly reflexed and slightly reduced or equal, sessile *Polystichum*

DRYOPTERIS Adans, Familles des Plantes 2. 1763.

Dryopteris sparsa (Hamilton ex D. Don) O. Kuntze., Rev. Gen. Pl. 2: 813. 1891; Hiroshi Ito in Hara, Fl. East. Himal. 1: 478. 1966; Singh et Panigrahi, Fern Fern-allies of Arun. Prad. I. 286. 2005. *Nephrodium sparsum* D. Don, Prod. Fl. Nepal. 6. 1825; C.B. Clarke, Trans. Linn. Soc. London ser. II. Bot. 1: 523. 1880, *p.p.*; Hope, Jour. Bombay Nat. Hist. Soc. 14: 743. 1903. *Aspidium catophoron* Kuntze, Bot. Zeitung (Berlin) 6: 262. 1848. *Polystichum sparsum* (D. Don) Keyserling, Polyp. Herb. Bunge 43. 1873. *Aspidium sparsum* (Hamilton ex D. Don) Sprengel, Syst. Veg. 4: 106. 1827. *Lastrea sparsa* (Hamilton ex D. Don) Moore, Ind. Fil. 87. 104. 1858; Beddome, Handb. Ferns Brit. Ind. 252. 1883.

Rhizome erect, paleaceous. Fronds up to 70 cm, tufted, oblong-lanceolate, caudate acuminate. Stipes 20 - 30 cm, groove continuous to costae, scars of fallen paleae black and rough, purple. Lamina 30 - 45 cm long, pinnae 7 - 11 pairs, widest at base, pinnules sessile, oblique deltoid, acute, pinnatifid, lobes entire. Sori globose, receptacles elevated, dorsal, indusium reniform.

Fertile: July to December.

Specimen Cited: Forest, Rajib & AP Das 0515; dated 23. 07. 2007.

Local Distribution: All over the forest area.

General Distribution: India: West Bengal, Assam, Sikkim, Arunachal Pradesh; Nepal, Sri Lanka, Myanmar, Tibet, China, Malaysia, Philippines, Japan, Taiwan.

POLYSTICHUM Roth, Tentamen Florae Germanicae 3. 1799.

Polystichum lentum (D. Don) Moore, Ind. Fil. 86: 95. 1858; Hiroshi Ito in Hara, Fl. East. Himal. 1: 480. 1966; Singh et Panigrahi, Fern Fern-allies of Arun. Prad. I. 299 - 301. 2005. *Aspidium lentum* D. Don, Prod. Fl. Nepal. 4. 1825. *Polystichum auriculatum* var. *subbipinnatum* (Hooker) Beddome, Ferns Brit. India, pl. 136. 1866. *Polystichum auriculatum* var. *lentum* (D. Don) Beddome, Handb. Ferns Brit. Ind. 204. 1883.

Rhizome erect, short, paleaceous, curve, teeth dark brown. Stipes dense, ascending, margin irregularly toothed. Lamina 20 - 35 cm, pinnae 20 - 40 pairs, basal pair strongly reflexed and slightly reduced or equal, sessile, sub opposite. Sori dorsal on basal acroscopic vein, entire, peltate, deciduous.

Fertile: August to December.

Specimen Cited: Forest, Rajib & AP Das 0049, dated 05. 02. 2007.

Local Distribution: All over the forest area.

General Distribution: India: West Bengal, Assam, Arunachal Pradesh; Nepal, Bhutan.

Tectariaceae Panigrahi, J. Orissa Bot. Soc. 8: 41. 1986.

TECTARIA Cavanilles, Anales Hist. Nat. 1: 115. 1799.

Tectaria coadunata (Wallich ex Hooker et Greville) C. Christensen, Contrib. U.S. Nation. Herb. 26(6): 331. 1931; Tagawa, Act. Phytotax. Geobot. 21: 180. 1965; Hiroshi Ito in Hara, Fl. East. Himal. 1: 481. 1966; Singh et Panigrahi, Fern Fern-allies of Arun. Prad. II. 633. 2005. *Aspidium coadunatum* Wallich ex J. Smith, Cat. no. 377. 1828; Hooker et Greville, Icon. Fil. 2: t. 202. 1831. *Sagenia coadunata* J. Smith, Bot. 4: 184. 1841; Beddome, Ferns S. India: 28. t. 81. 1863. *Tectaria macrodonta* C. Christensen, Ind. Fil. Suppl. III: 181. 1934. *Tectaria viridifrons* Ching, Acta Phytotax. Sin. 19(1): 130. 1981. *Aspidium cicutarium* subsp. *coadunatum* (Wallich ex Hooker et Greville) C. Christensen, Index Filic. 68. 1928.

Rhizome erect, short. pinnae ca 50 x 30 cm wide, tripinnatifid, oblong, caudate acute; costae grooved. Pinnules sub opposite, oblong, gradually acuminate. Secondary pinnules the largest on basal acroscopic side, sessile, deeply pinnatifid, not grooved; lobes broad ovate, obtuse. Sori round, terminal on included veinlets in 2 rows along midvein in areoles, slightly sunk; indusium large, thin, subentire.

Fertile: May to November.

Specimen Cited: Forest, Rajib & AP Das 0067, dated 06. 02. 2007.

Local Distribution: Throughout the study area.

General Distribution: India: West Bengal, Assam, Sikkim, Arunachal Pradesh, Bihar; Sri Lanka, Myanmar, S. W. China, North Malaysia, Taiwan, Thailand, Tropical Africa, Formosa.

Davalliaceae Mettenius *ex* Frank in Leunis, Syn. Pflanzenkd. ed. 2, 3: 1474. 1877; Pichi-Sermolli in Webbia 31(2): 343. 1977.

NEPHROLEPIS Schott, Gen. Fil. [Schott] t. 3. 1834.

Nephrolepis auriculata (Linnaeus) Trimen, Jour. Linn. Soc. London Bot. 24(160): 152. 1887; Beddome, Handb. Ferns Brit. India, 282, t. 144. 1883; Clarke, Trans. Linn. Soc. London, II, Bot., 1: 540. 1880; Mehra *et* Bir, Pter. Fl. Darj. Sikk. Him. 121. 2008. Sledge, Bot. Journ. Linn. Soc. 84: 7. 20. 1982; Singh *et* Panigrahi, Fern Fern-allies of Arun. Prad. I. 405. 2005. *Polypodium auriculatum* Linnaeus, Sp.Pl. 2: 1088. 1753. *Nephrolepis cordifolia sensu auct. pl., non* (Linnaeus) C. Presl, Tent. Pterid. 79. 1836; C.B. Clarke, Trans. Linn. Soc. London ser. II. Bot. 1: 541. 1880, *p.p.*; Beddome, Handb. Ferns Brit. Ind. 282. 1883, *p.p.*; Kunio Iwatsuki in Hara, Fl. East. Himal. 1: 469. 1966.

Rhizome short, erect, paleaceous at apex; roots thick, bearing fleshy tubers; paleae up to 6 mm, peltate, lanceolate, long acuminate, light brown. Fronds 35 – 50 x 4.5 – 5.0 cm, tufted, linear-elliptic, acuminate, pinnate; stipes 4 – 6 cm long, pale brownish, paleaceous; pinnae largest in the middle of the fronds, sessile, alternate, drying pale green. Sori median, terminal, indusium reniform.

Fertile: August to November.

Specimen Cited: Park, Rajib & AP Das 0589, dated 25. 07. 2007.

Local Distribution: All over the forest area.

General Distribution: India: West Bengal, Assam, Arunachal Pradesh; Tropical Asia.

Polyodiaceae J. Presel *et* C. Presel, Delic. Prag. 159. 1822.

Key to the Genera:

- 1a. Terrestrial; with creeping rhizome 2
- 1b. Epiphytic herbs; rhizome scandent 3
- 2a. Sori very close, sunk *Pyrrosia*
- 2b. Sori not so compact, superficial *Thelypteris*
- 3a. Sori irregularly scattered throughout the surface of the lamina *Neochheiropteris*
- 3b. Sori biseriate throughout the surface of lamina between lateral veins ... *Drynaria*

DRYNARIA (Bory) J. Smith, Hooker's Journal of Bot. 3. 1841.

Drynaria quercifolia (Linnaeus) J. Smith, Jour. Bot. 3: 398. 1841; Beddome, Handb. Ferns Brit. Ind. 341. t. 191. 1883; Kunio Iwatsuki in Hara, Fl. East. Himal. 1: 493. 1966; Baishya *et* Rao,

Fern Fern-allies Meghalaya 61. 1982; P.J. Bora *et al.*, Fl. Div. Ass. 436. 2003. *Polypodium quercifolium* Linnaeus, Sp. Pl. 2: 1087. 1753.

Epiphytic; rhizome scales linear, cordate, dark brown. Fronds dimorphic; sterile fronds overlapping the base of fertile fronds; fertile fronds ovate to oblanceolate, ca 30 – 70 cm long, pinnatisect, stipitate. Sori small, copious, biseriate throughout the surface of lamina in between lateral veins.

Fertile: May to July.

Specimen Cited: Forest, Rajib & AP Das 0063, dated 05. 02. 2007.

Local Distribution: An abundant epiphyte in forest sector.

General Distribution: throughout India; China, Sri Lanka, Fiji, Malaysia, Tropical Australia.

NEOCHEIROPTERIS C. Christensen, Bull. Soc. Bot. France 52(Mém. 1): 21. 1905.

Neocheiropteris superficialis (Blume) Bosman, Leiden Bot. Ser. 14: 121. 1991. *Polypodium superficiale* Blume, Jour. Fil. 130. t. 56 f. a.1828. & Enum. Pl. Jav. 123. 1828. *Microsorium superficiale* (Blume) Ching, Bull. Fan. Mem. Inst. Biol. Bot. 4: 299. 1933. Pp. 47. *Pleopeltis superficiale* (Blume) Beddome, Hand. Fer. Bri. Ind. 75. 1865.

Epiphytic herbs; rhizome scandent, scales denticulate, fronds linear to lanceolate, tapering at both ends, often sinuate, entire. Sori oval or rounded, superficially, irregularly scattered through the surface of the lamina.

Fertile: December.

Specimen Cited: Forest, Rajib & AP Das 0061, dated 07. 02. 2007.

Local Distribution: Epiphytic in forests.

General Distribution: India: West Bengal, Assam, Manipur, Tripura, Arunachal Pradesh, Bihar, Uttar Pradesh, South India; Bhutan, China, Malaysia.

PYRROSIA Mirbel, Hist. Nat. Pl. 4: 70. 1803; Hist. Nat. Veg. 3: 471; 5: 91. 1803.

Pyrrosia lanceolata (Linnaeus) Farwell, Amer. Midland. Nat. 12: 245. 1931; Singh *et* Panigrahi, Fern Fern-allies of Arun. Prad. II. 537. 2005. *Acrostichum lanceolatum* Linnaeus, Sp. Pl. 2: 1067. 1753. *Candollea lanceolata* (Linnaeus) Lamarck *et* Mirbel, Hist. Nat. Veg. 5: 89. 1803. *Niphobolus lanceolatus* (Linnaeus) Trimen, Journ. Linn. Soc. 24: 125. 1886. *Cyclophorus lanceolatus* (Linnaeus) Alston, Jour. Bot.: 102. 1931.

Rhizomes wide-creeping, paleaceous. Paleae up to 6 x 0.5 mm, peltate, lanceolate, long toothed to hairy, acuminate, brown. Fronds up to 11 x 0.5 cm, sessile to stipes ca 1 cm long, elliptic to lanceolate, entire, acute. Sori globose, very close, sunk, covered with stellate-hairs with lanceolate arms.

Fertile: June to January.

Specimen Cited: Forest, Rajib & AP Das 0064, dated 05. 02. 2007.

Local Distribution: Epiphyte in forest sectors.

General Distribution: India: tropical and sub tropical areas; Sri Lanka, China, Polynesia.

THELYPTERIS Schnidel, Ic. Pl. (ed. Keller) 1: 45. t. 11 (Oct.) 1762. sen. str., nom cons.

Thelypteris nudata (Roxburgh) C.V. Morton, Contr. U.S. Natl. Herb. 38(7): 352. 1974. *Polypodium nudatum* Roxburgh in Griffith, Calcutta Jour. Nat. Hist. 4: 491. 1844. *Pronephrium nudatum* (Roxburgh) Chandra, Bull. Bot. Surv. India 13: 274. 1971; Holttum, Blumea 20(1): 111. 1972; Singh *et* Panigrahi, Fern Fern-allies of Arun. Prad. II. 732. 2005. *Goniopteris lineata sensu*

Beddome, Ferns Brit. Ind: t. 3. 1865. *Nephrodium moulmeinense* Beddome, Ferns Brit. India: t. 18. 1876; Beddome, Handb. Ferns Brit. India: 275. t. 141. 1883. *Cyclosorus nudatus* (Roxburgh) B. Nayar *et* Kaur, Comp. Beddome, Handb. Ferns Brit. India: 66. 1974. *Pneumatopteris nudata* (Roxburgh) Punetha *et* Kholia, Jour. Bombay Nat. Hist. Soc. 86 (3): 476. 1989.

Rhizome creeping, paleaceous; paleae up to 6 mm, basifixed, lanceolate, entire, acuminate, pale brown. Fronds up to 150 cm, pinnate, caudate acuminate. Stipes 60 – 90 cm, paleaceous at base, grooved dorsally, hairy all over. Pinnae up to 30 cm, sub opposite to alternate, sessile, about 10 pairs; coastae grooved, densely hairy; veins simple. Sori round, median, indusium small.

Fertile: June to November.

Specimen Cited: Forest, Rajib & AP Das 0516, dated 23. 07. 2007.

Local Distribution: All over the forested areas.

General Distribution: India: West Bengal, Assam, Sikkim, Arunachal Pradesh, Meghalaya, Bihar, Orissa; Nepal, Bhutan, Bangladesh, Myanmar, Malaysia.

GYMNOSPERMS

The Gymnospermic plants family, genera and species with the accepted name as per the Plant List, through proper taxonomic treatments of species, collected from the Rasik Beel complex has been arranged in alphabetic order. The following sequence of enumeration is taken into consideration while enumerating each identified plants- (a) Accepted name (b) Basionyms (c) Synonyms if any (d) Vernacular name (e) Description (f) Cone formation time (g) Specimen cited (h) Local distribution (i) General distribution.

Araucariaceae Henkel *et* W. Hochstetter, Syn. Nadelholz. xvii, 1. 1865; *nom. cons.*

ARAUCARIA Jussieu, Gen. Pl. 413. 1789.

Araucaria columnaris (G. Forster) Hooker, Bot. Mag. 78: t. 4635 1852. *Araucaria cookii* Robert Brown *ex* Endlicher, Syn. Conif. 188 1847.

Vernacular name: Jhau.

Large trees, up to 20 m; crown tower-shaped when young, becoming flat topped with age; lateral branchlets dense, drooping, pinnately arranged. Leaves dimorphic, loosely arranged in lateral branchlets, needlelike, slightly curved, acute or acuminate, wide at base; leaves on mature trees densely arranged, overlapping, glaucous. Pollen cones terminal, solitary, ovoid to ellipsoid.

Cone formation: June to December.

Specimen Cited: Park, Rajib & AP Das 0265, dated 10.02.2007.

Local Distribution: Planted in Park.

General Distribution: Pantropicals.

Cupressaceae Gray, Nat. Arr. Brit. Pl. 2: 222, 225. 1822; *nom. cons.*

PLATYCLADUS Spach, Hist. Nat. V g. Phan. 11: 333. 1841.

Platycladus orientalis (Linnaeus) Franco, Portugaliae Acta Biol., ser. B, Sist. Vol. "J lio Henriques": 33. 1949. *Thuja orientalis* Linnaeus, Sp. Pl. 2: 1002. 1753. *Thuja decora* Salisbury, Prodr. Stirp. Chap. Allerton 398. 1796.

Vernacular name: Jhau.

Small trees, up to 5 m; crown ovoid-pyramidal, broadly rounded. Leaves 1–2 mm; facial leaves rhomboid; lateral leaves overlapping facial ones, boat-shaped, ridged. Pollen cones yellowish green, ovoid. Seed cones bluish green, subglobose.

Cone formation: March to October.

Specimen Cited: Park, Rajib & AP Das 0436, dated 22. 07. 2007.

Local Distribution: Planted in Park.

General Distribution: Cultivate in Pantropics.

Cycadaceae Persoon, Syn. Pl. 2: 630. 1807; *nom. cons.*

CYCAS Linnaeus, Sp. Pl. 2: 1188. 1753.

Cycas pectinata Buchanan-Hamilton, Mem. Wern. Nat. Hist. Soc. 5: 322. 1826. *Cycas jenkinsiana* Griffith, Not. Pl. Asiat. 4: 9. 1854.

Vernacular name: *Cycas*.

Trees, trunk cylindric, often dichotomously branched, up to 6 m. Leaves 50–90, pinnate; petiole 10–30 cm, with few spines; lamina oblong-lanceolate; leaflets in 50–100 pairs, thickly, leathery, acute, slightly recurved, base decurrent. Cataphylls triangular, brown tomentose. Pollen cones fusiform; microsporophylls cuneate, densely pale brown tomentose. Megasporophylls more than 30, tightly grouped. Seeds 2 to 4, orange, becoming dark brown.

Cone formation: June to March.

Specimen Cited: Park, Rajib & AP Das 0474, dated 23.07.2007.

Local Distribution: Planted in Park.

General Distribution: India: cultivate throughout; Bhutan, Nepal, Bangladesh, Cambodia, Laos, Myanmar, Thailand, Vietnam.

ANGIOSPERMS

For the enumeration of Angiospermic plants the APG III classification (Chase & Reveal, 2009) has been followed in this work

Angiosperms

Basal Angiosperms

Order: Nymphaeales Salisbury *ex* Berchtold *et* J. Presl (1820).

Nymphaeaceae Salisbury, Ann. Bot. 2: 70. 1805; *nom. cons.*

NYMPHAEA Linnaeus, Sp. Pl. 1: 510. 1753, *nom. cons.*

Key to the species:

- 1.a. Rhizomes producing slender stolons *N. pubescens*
- 1.b. Rhizomes does not producing slender stolons 2
- 2.a. Carpels only partially united, walls between locules
of ovary double; fruit globose *N. nouchali*
- 2.b. Carpels completely united, walls between locules of
ovary single. Fruit ovoid to subglobose *N. rubra*

Nymphaea nouchali Burman *f.*, Fl. Ind. 120. 1768; Van Royen in Nova Guinea 8: 110. f. 1962 *p*; Sharma *et al.*, Fl. Ind. 430. 1993. *Nymphaea stellata* Willdenow, Sp. Pl. 2: 1153. 1799; Hooker *f. et* Thomson in Hooker *f.*, Fl. Brit. Ind. 1: 114. 1872; Prain, Beng. Pl. 1: 213. 1903. *Nymphaea madagascariensis* de Candolle, Syst. Nat. 2: 50 50 1821. *Nymphaea emirnensis* Planchon, Rev. Hort. 2: 65. 1853.

Vernacular name: Shaluk.

Rhizomes erect, unbranched. Lamina elliptic-orbicular to orbicular, 8 – 20 cm, papery, abaxially glabrous, peltate a few mm from base of sinus, subentire to deeply crenate, base cordate, basal lobes parallel. Flowers slightly emergent, 3–10 cm in diam. Calyx inserted on receptacle; sepals lanceolate to oblong-lanceolate, slightly veined, persistent; petals 15 – 25, white. Carpels only partially united, walls between locules of ovary double. Fruits globose. Seeds ellipsoid-globose.

Flowers & Fruits: June to November.

Specimen Cited: Varveri Beel, Rajib & AP Das 0336, dated 21.07.2007.

Local Distribution: All over the beel water.

General Distribution: India, Bangladesh, Nepal, Afghanistan, Indonesia, Myanmar, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam, Australia, New Guinea.

Nymphaea pubescens Willdenow, Sp. Pl. 2: 1154. 1799; Sharma *et al.*, Fl. Ind., 431. 1993. *Nymphaea lotus* var. *pubescens* (Willdenow) Hooker *f. et* Thomson, Fl. Indica. 1: 241. 1855. Hooker *f. et* Thomson in Hooker *f.*, Fl. Brit. Ind. 1: 114. 1872.

Vernacular name: Shaluk.

Rhizomes erect, producing slender stolons. Lamina ovate – elliptic to suborbicular, 15 – 20 cm, papery, abaxially densely pubescent, peltate more than 5 mm from base of sinus, base deeply cordate and basal lobes subparallel, margin dentate and teeth acute to subspinose. Flowers emergent, 5 – 8 cm in diam. Calyx inserted on receptacle; sepals oblong, conspicuously veined, caducous or decaying after anthesis. Petals 12 – 16, white, red, or pink, oblong. Filament of inner stamens only slightly wider than anther; connective apically unappendaged. Carpels completely united, walls between locules of ovary single. Fruits ovoid to subglobose. Seeds ellipsoid to globose.

Flowers & Fruits: July to November.

Specimen Cited: Khottamari Beel, *Rajib & AP Das 0402*, dated 22. 07. 2007.

Local Distribution: All over the Beel.

General Distribution: India: throughout the plains; Bangladesh, Malaysia, Africa, Java, Philippines and Hungary.

Nymphaea rubra Roxburgh *ex* Andrews, Bot. Rep. 8 (104): t. 503.1808; Prain, Beng. Pl. 1: 213. 1903; Sharma *et al*, Fl. Ind., 431. 1993. *Nymphaea lotus auct. non.* Linnaeus, Hooker *f. et* Thomson in Hooker *f.*, Fl. Brit. Ind.1: 114. 1872; Campbell in Grierson *et* Long, Fl. Bhut. 1(2): 341. 1984 ; Prain, Beng. Pl. 1: 213. 1903. [PLATE: 5, Figure-36]

Vernacular name: Rakta shaluk.

Rhizomes erect. Lamina ovate to suborbicular, 15 – 30 cm, papery, abaxially densely pubescent, peltate more than 5 mm from base of sinus, margin dentate and teeth acute, base deeply cordate. Flowers emergent, 5 – 9 cm in diameter. Calyx inserted on receptacle, circular; sepals oblong, conspicuously veined, caducous or decaying after anthesis; petals 12–18, red, oblong. Filaments of inner stamens only slightly wider than anther; connective apically unappendaged. Carpels completely united, walls between locules of ovary single. Fruits ovoid to subglobose. Seeds ellipsoid to globose.

Flowers & Fruits: July to December.

Specimen Cited: Khottamari Beel, *Rajib & AP Das 0251*, dated 10. 02. 2007.

Local Distribution: All over the Beel.

General Distribution: India: throughout the plains; Sri Lanka, Myanmar, Taiwan, Thailand, Laos, Cambodia, Vietnam, Malaysia, Indonesia and Philippines.

Magnoliids (fr.: Magnoliidées)

Order: Laurales Perleb (1826).

Lauraceae A. Jussieu, Gen. Pl. 80. 1789; *nom. cons.*

Key to the Genera:

- 1a. Flowers unisexual, rarely bisexual, in pseudoumbels or racemes; bracts large, forming an involucre *Litsea*
- 1b. Flowers bisexual, rarely unisexual, in panicles or clusters, rarely in pseudoumbels; bracts small, not forming an involucre *Cinnamomum*

CINNAMOMUM Schaeffer, Bot. Exped. 74. 1760, *nom. cons.*

Key to the Species:

- 1a. Terminal branchlet of panicle bearing a 3–5-flowered cyme *C. tamala*
- 1b. Terminal branchlet of panicle bearing a 1–3-flowered cyme 2
- 2a. Leaf blade elliptic-oblong, Fl. Bhut. 1 2–30 × 4–9 cm, thickly leathery, base subrounded or attenuate *C. bejolghota*
- 2b. Leaf blade ovate to oblong-ovate or ovate-lanceolate, smaller, leathery or subleathery to papery, base acute *C. verum*

Cinnamomum bejolghota (Buchanan–Hamilton) Sweet, Hort. Brit. 344. 1826. Long in Grierson *et* Long, Fl. Bhut. 1(2): 258. 1984. *Laurus bejolghota* Buchanan – Hamilton, Trans. Linn. Soc. London 13(2): 559-560. 1822. *Laurus obtusifolia* Roxburgh, Fl. Ind., 2: 302-303. 1832.

Evergreen tree, up to 20m. Leaves coriaceous, opposite, elliptic, 25 – 40 x 6 – 12 cm, obtuse, base cuneate, glossy above, strongly 3 – veined from base; petioles 2 – 3cm. Flowers usually bisexual in axillary panicles. Panicles 12 – 20 cm, panicle bearing a 1–3-flower; perianth segments ovate, 2 – 3 mm, pubescent. Fruits ellipsoid.

Flowers & Fruits: March to May.

Specimen Cited: Forest, *Rajib & AP Das 0469*, dated 23. 07. 2007.

Local Distribution: Forest sector.

General Distribution: India: Tropical and subtropical forests in West Bengal, Assam, Sikkim, Bihar, Orissa, Uttar Pradesh; Nepal, Bhutan, Bangladesh, Laos, Myanmar, Thailand, Vietnam

Cinnamomum tamala (Buchanan-Hamilton) T. Nees *et* Ebermaier, *Handb. Med.-Pharm. Bot.* 2: 426 1831; Yasuiti Momiyama in Hara, *Fl. E. Himal.* 1: 99. 1966; Long in Grierson *et* Long, *Fl. Bhut.* 1(2): 355. 1984; Prain, *Beng. Pl.* 2: 899. 1903. *Laurus tamala* Buchanan-Hamilton, *Trans. Linn. Soc. London* 13(2): 555 – 558. 1822. *Cinnamomum reinwardtii* Nees, *Syst. Laur.* 70. 1836.

Vernacular name: Tejpata.

Evergreen trees, up to 20 m. Leaves coriaceous, opposite, lanceolate, 10 – 12 x 3 – 5 cm, shortly acuminate, base cuneate, glossy above, strongly 3 – veined from base; petioles 2 – 3cm. Flowers usually bisexual in axillary panicles. Panicles shorter, 5 – 10 cm, bearing 3–5-flowered units; perianth segments ovate, pubescent. Fruits ellipsoid, 1 – 1.4 cm, borne on enlarged perianth cup with lower part of segments persisting as short lobes 1 – 2 mm.

Flowers & Fruits: April to May.

Specimen Cited: Rasik Beel, *Rajib & AP Das 0540*, dated 23.07.2007.

Local Distribution: Cultivated in village areas.

General Distribution: India: West Bengal, Assam, Sikkim, Bihar, Orissa; Bhutan, Nepal, Bangladesh.

Cinnamomum verum J. Presl, *Prir. Rostlin* 2: 36. 1823. *Cinnamomum zeylanicum* Breyne, *Eph. Nat. Cur. Dec.* 4: 139. 1677; Prain, *Beng. Pl.* 2: 899. 1903. *Cinnamomum bengalense* Lukmanoff, *Nomencl. Icon. Cannel.* 5. 1889.

Vernacular name: Darchini.

Evergreen, up to 10 m. Young branchlets gray. Buds sericeous puberulent. Leaves usually opposite; petiole 1.5 – 2 cm, glabrous; leaf blade greenish white abaxially, green and shiny adaxially, ovate to ovate-lanceolate, 10 – 15 x 4 – 5 cm, leathery, glabrous on both surfaces, triplinerved, midrib and lateral veins elevated on both surfaces, base acute, margin entire, acuminate. Terminal branchlet of panicle bearing a 3–5 flowered cyme. Flowers yellow. Perianth tube obconical; perianth lobes 6, oblong. Fertile stamens 9. Ovary ovoid, glabrous; style short; stigma discoid. Fruit ovoid, black when mature

Flowers & Fruits: April to May.

Specimen Cited: Village sector, *Rajib & AP Das 1537*, dated 23. 05. 2009.

Local Distribution: Cultivated in village areas.

General Distribution: India: all over country; Bhutan, Nepal, Bangladesh, native to Sri Lanka; also cultivated in many Asian countries.

LITSEA Lamarck, *Encycl.* 3: 574. 1792, *nom. cons.*

Key to the Species:

- 1a. Leaf blade papery or membranous and deciduous *L. cubeba*
 1b. Leaf blade leathery or thinly leathery and evergreen 2
 2a. Perianth segments imperfect or lacking; leaf blade gray-yellow
 tomentose or subglabrous abaxially *L. glutinosa*
 2b. Perianth segments 6–8. Branchlets and petioles ferruginous pubescent;
 leaf blade abaxially ferruginous pubescent *L. monopetala*

Litsea glutinosa (Loureiro) C.B. Robinson, Philipp. Jour. Sci. 6(5): 321. 1911; Long in Grierson *et Long*, Fl. Bhut. 1(2): 277. 1984. *Sebifera glutinosa* Loureiro, Fl. Cochinch. 638. 1790. *Litsea sebifera* Persoon, Syn. Pl. 2: 4. 1807; Prain, Beng. Pl. 2: 902. 1903.

Vernacular name: Pipul.

Tree, up to 15 m, young shoots whitish pubescent. Leaves coriaceous, ovate – lanceolate, 10 – 16 x 4 – 8 cm, acute, base cuneate, glabrous or pale pubescent beneath; lateral veins 7 – 10 pairs; petioles slender, 2.5 – 3.5 cm. Umbels large, 7 – 10 mm in bud, whitish pubescent, pedicels 3 – 5 mm, white – pubescent. Fruits globose.

Flowers & Fruits: May to June.

Specimen Cited: Forest, Rajib & AP Das 0618, dated 11. 02. 2008.

Local Distribution: All over the forest areas.

General Distribution: Tropical and subtropical parts of India, Bhutan, Nepal, Myanmar, Philippines, Thailand, Vietnam.

Litsea monopetala (Roxburgh) Persoon, Syn. Pl. 2: 4. 1807; Y. Momiyama in Hara, Fl. E. Him. 1: 102. 1966; Hara *et al.*, Enn. Fl. Pl. Nep. 3: 185. 1982; Long in Grierson *et Long*, Fl. Bhut. 1(2): 276. 1984. *Tetranthera monopetala* Roxburgh, Pl. Coromandel 2: 26.t. 1798. *Litsea polyantha* Jussieu, Ann. Mus. Natl. Hist. Nat. 6: 211. 1805; Prain, Beng. Pl. 2: 903. 1903.

Vernacular name: Bonkanthal.

Trees to 10 m, branchlets brownish tomentose. Leaves broadly elliptic, 8 – 20 x 4.5 – 10 cm, obtuse or apiculate, base rounded, greenish beneath when dry, softly tomentose and prominently reticulate beneath, lateral veins 7 – 11 pairs; petioles 1 – 2.2 cm. Umbels densely pubescent, bud 4 mm, on tomentose peduncles 2.5 – 9 mm, forming dense clusters, peduncles sessile or borne on a short stout stalk 2 – 3.5 mm. Fruit subglobose, 7 x 5 mm, apiculate, borne on perianth cup 4 – 4.5 mm across, on slender pedicels 8 – 10 mm.

Flowers & Fruits: November to July.

Specimen Cited: Forest, Rajib & AP Das 0685, dated 14. 02. 2008.

Local Distribution: Forest areas.

General Distribution: Tropical and subtropical parts of India, Himalayas, Bhutan, Cambodia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Thailand, Vietnam.

Litsea cubeba (Loureiro) Persoon, Syn. Pl. 2(1): 44. 1807; Y. Momiyama in Hara, Fl. E. Him. 1: 101. 1966; Hara *et al.* Enum. Fl. Pl. Nep. 3: 185. 1982; Long in Grierson *et Long*, Fl. Bhut. 1(2): 274. 1984. *Laurus cubeba* Loureiro, Fl. Cochinch. 1: 252. 1790; Hooker *f.* in Hooker *f.*, Fl. Brit. Ind. 5: 155. 1885.

Shrubs up to 5 m high. Stem usually glabrous, blackened when dry. Leaf blade papery or membranous and deciduous; lower leaves opposite, upper alternate; petioles to 0.13 cm, slender; lamina lanceolate, entire-half lanceolate, entire-half contortate 5.5 – 13 x 1.8 – 2.5 cm, acuminate, cuneate, upper surface green above, lower surface glaucous, glabrous both sides, nerves distinct, lateral veins obliquely

ascending, 10 - 17 pairs. Inflorescence usually umbels in clusters of 3 - 4, 4 - 10 flowered, in short peduncled; pedicels white, pubescent. Flowers hairy; perianth toothed, tube slightly reduced at base. Fruits subglobose.

Flowers & Fruits: December to June.

Specimen Cited: Forest, Rajib & AP Das 0118, dated 07. 02. 2007.

Local Distribution: Forest areas.

General Distribution: India, E. Himalaya, Nepal, Bhutan, Myanmar, Java, W. & C. China.

Order: Magnoliales Bromhead (1838)

Annonaceae Jussieu, Gen. Pl. 283. 1789; *nom. cons.*

Key to the Genera:

- 1a. Fruits with completely united carpels and seeds embedded in pulp *Annona*
- 1b. Fruits with carpels forming free, often stipitate 2
- 2a. Sepals or inner petals and sometimes also outer petals clearly imbricate *Uvaria*
- 2b. Sepals and petal whorls all valvate or rarely very narrowly imbricate at tip .. 3
- 3a. Climbing shrubs. Peduncles and fruiting pedicels hooklike *Artabotrys*
- 3b. Trees or erect shrubs. Peduncles and fruiting pedicels not hooked *Polyalthia*

ANNONA Linnaeus, Sp. Pl. 1: 536. 1753.

Key to the Species:

- 1a. Outer petals outside surface and carpels hairy; areoles flattened and separated by ridges; fruit pulp yellowish *A. reticulata*
- 1b. Outer petals and carpels glabrous; areoles convex and separated by deep grooves; fruit pulp whitish *A. squamosa*

Annona reticulata Linnaeus, Sp. Pl. 1: 573. 1753; Hooker *f. et* Thomson in Hooker *f.* Fl. Brit. Ind. 1: 78. 1872; Sharma *et al.*, Fl. Ind. 1: 207. 1993; Panda *et al.*, Fl. Samb. 35. 2004; Grierson in Grierson *et* Long, Fl. Bhut. 1(2): 355. 1984; Prain, Beng. Pl. 1: 206. 1903. *Annona excelsa* Kunth, Nov. Gen. Sp. 5: 59. 1821. *Annona lutescens* Safford, Contr. U. S. Natl. Herb. 18: 41. 1914.

Vernacular name: Nona.

Trees, 4 – 10 m; glabrous. Leaves oblong – lanceolate, 9 –20 x 3 – 5cm, entire, acuminate, base rounded; petiole 1 –1.5 cm long, glabrous. Flowers in axillary or terminal cymes, 2 – 3; pedicels 1 – 2 cm long. Sepals 3, broadly ovate, shortly acuminate, 2 –3 x 2 – 3mm, pubescent outside. Petals 6, 3 in inner whorl; outer ones narrowly oblong, triquetrous, acute apex, pubescent outside. Stamens numerous, 1mm long. Carpels many, ovoid to linear, 1mm, 1 ovuled; style oblong; stigma entire. Fruits ovoid, reticulate, many loculed. Seeds black, arillate.

Flowers & Fruits: May to November.

Specimen Cited: Village sector, Rajib & AP Das 0253, dated 10. 02. 2007.

Local Distribution: Foresters house.

General Distribution: India: West Bengal, Delhi, Uttar Pradesh, Bihar; West Himalayas, Myanmar, Indo –China.

Annona squamosa Linnaeus, Sp. Pl. 1: 537. 1753; Panda *et al.*, Fl. Samb. 35. 2004; Sharma *et al.*, Fl. Ind. 1: 207. 1993; Grierson in Grierson *et* Long, Fl. Bhut. 1(2): 244. 1984 ; Prain, Beng. Pl.

1: 206. 1903. *Annona asiatica* Linnaeus, Sp. Pl. 537. 1753. *Annona forskahlii* de Candolle, Syst. Nat. 1: 472. 1817. *Guanabanus squamosus* M. Gómez, Fl. Haban. 114. 1897.

Vernacular name: Aata.

Small tree, up to 6 m. Leaves elliptic, 6–10 x 2–5 cm, acute, base cuneate, pubescent at first, soon glabrous; petioles 6–10 mm; flowers solitary or few, leaf-opposed; outer petals yellow, oblong; fruits ovoid–globose, 8–9 cm diameter, surface covered with the rounded tips of incompletely fused carpels, glaucous.

Flowers & Fruits: May to October.

Specimen Cited: Village sector, Rajib & AP Das 0229, dated 09. 02. 2007.

Local Distribution: Village areas.

General Distribution: India: Widely cultivated; Nepal, Bhutan, Myanmar, Indo–China, S. China.

ARTABOTRYS R. Brown ex Ker Gawler, Bot. Reg. 5: t. 423. 1820.

Artabotrys hexapetalus (Linnaeus f.) Bhandari, Bailey 12: 147. 1964; Sharma *et al.*, Fl. Ind. 1: 251. 1993; Grierson in Grierson *et Long*, Fl. Bhut. 1(2): 243. 1984. *Annona hexapetala* Linnaeus f., Sp. Pl. suppl. 270. 1781; *Artabotrys odoratissimus* R. Brown, Bot. Reg. 5, t. 423. 1819; Prain, Beng. Pl. 1: 202. 1903. *Annona uncinata* Lamarck, Encycl. 2(1): 127. 1786. *Artabotrys uncinata* (Loureiro) Baillon, Hist. Pl. 1: 232. 1867. *Uvaria uncinata* Loureiro, Fl. Cochinch. 1: 349. 1790. *Uvaria odoratissima* Roxburgh, Fl. Ind. 2: 666. 1832.

Vernacular name: Kanthal champa.

Climbing shrubs, up to 10 m. Branchlets glabrous. Petiole 4–8 mm; leaf blade oblong to broadly lanceolate, 6–20 x 3–6 cm, papery, adaxially glabrous, base cuneate to acute, apex acuminate to acute, lateral veins 8–16 pairs and elevated on both surfaces. Inflorescences 1–2 flowered. Flowers fragrant. Sepals green, ovate, sparsely puberulous. Petals greenish to yellowish, oblong lanceolate, outside basally densely pubescent. Stamens oblong; connective apex 3 angular. Carpels oblong, glabrous. Fruiting carpels ovoid, glabrous, apex conspicuously apiculate. Seeds pale brown, smooth.

Flowers & Fruits: May to December.

Specimen Cited: Park, Rajib & AP Das 0533, dated 23. 07. 2007.

Local Distribution: Planted in the park.

General Distribution: India: West Bengal, Assam, Bihar, Uttar Pradesh; Himalayas, Myanmar, China.

POLYALTHIA Blume, Fl. Javae, Annonaceae 68. 1829.

Polyalthia longifolia (Sonnerat) Thwaites, Enum. Pl. Zeyl. 398. 1864; Hooker f. *et Thomson* in Hooker f., Fl. Brit. Ind. 1: 62. 1872; Sharma *et al.*, Fl. Ind. 1: 274. 1993; Grierson in Grierson *et Long*, Fl. Bhut. 1(2): 244. 1984; Prain, Beng. Pl. 1: 204. 1903. *Uvaria longifolia* Sonnerat, Voyage aux Indes 2: 233. t. 131. 1782. *Unona longifolia* (Sonnerat) Dunal, Monogr. Fam. Anonac. 109. 1817.

Vernacular name: Debdaru.

Trees, up to 30 m. Leaves pendulous, narrowly lanceolate, 10–18 x 2–3 cm, gradually acuminate, base rounded, margin undulate; petioles 5–8 mm. Flowers 5–10 in subumbellate clusters, pedicels 1.5–2.5 cm. Sepals and petal whorls all valvate or rarely very narrowly imbricate at tip. Fruit apocarpous, with carpels forming free, ellipsoid, often stipitate.

Flowers & Fruits: March to September.

Specimen Cited: Park, Rajib & AP Das 0440, dated 22. 07. 2007.

Local Distribution: Frontside of Garden.

General Distribution: India: grown as ornamental in all warmer parts of the country; Native of Sri Lanka; Bhutan, Bangladesh, Myanmar, China.

UVARIA Linnaeus, Sp. Pl. 1: 536. 1753.

Uvaria hamiltonii Hooker *f. et* Thomson, Fl. Brit. Ind. 1: 96. 1855; H. Ohashi in Hara, Fl. E. Himal. 1: 97. 1966; Hajra *et al.*, Fl. W. Beng. 1: 153. 1997; Prain, Beng. Pl. 1: 199. 1903; Grierson in Grierson *et* Long, Fl. Bhut. 1(2): 238. 1984. *Uvaria hamiltonii* var. *kurzii* King, Mat. Fl. Malay. Penins. 1(4): 263. 1892.

Scrambling shrubs, stems densely brownish pubescent. Leaves elliptic – obovate, 12 – 18 x 5 – 9 cm, shortly acuminate, baserounded, brownish pubescent specially beneath; petioles 5 mm. Flowers 6 cm across, pedicels 2 – 3.5 cm. Sepals broadly ovate, brown tomentose. Petals red, obovate – spatulate, finely tomentose. Fruiting carpels obovoid – ellipsoid, reddish – brown, tomentose.

Flowers & Fruits: May to June.

Specimen Cited: Forest, Rajib & AP Das 0475, dated 23. 07. 2007.

Local Distribution: Forests near conservation area.

General Distribution: India: West Bengal, Assam, Bihar, Uttar Pradesh; Bhutan, Bangladesh, Myanmar, China.

Magnoliaceae Jussieu, Gen. Pl. 280. 1789; *nom. cons.*

MAGNOLIA Linnaeus, Sp. Pl. 1: 535. 1753.

Key to the Species:

- 1a. Fruits cylindrical or terete, flowers terminal on axillary branches *M. champaca*
- 1b. Fruits globose to ovoid, flowers terminal in position *M. grandiflora*

Magnolia champaca (Linnaeus) Baillon *ex* Pierre, Fl. Forest. Cochinch. t. 3. 1880. *Michelia champaca* Linnaeus, Sp. Pl. 1: 536. 1753; Hooker *f. et* Thomson in Hooker *f.*, Fl. Brit. Ind. 1: 42. 1872; H. Hara in H. Hara, Fl. East. Himal. 2: 36. 1971; Grierson in Grierson *et* Long, Fl. Bhut. 1(2): 236. 1984; Sharma *et al.*, Fl. Ind. 1: 175. 1993 ; Prain, Beng. Pl. 1: 197. 1903. *Michelia rufinervis* Blume, Bijdr. Fl. Ned. Ind. 1: 8. 1825.

Vernacular name: Swarna Champa.

Trees up to 50 m. Twigs ascending and forming a narrow umbelliform crown. Petiole 2 – 4 cm; leaf blade elliptic or elliptic-ovate, 12 – 25 x 4 – 8 cm, abaxially slightly puberulous, base broadly cuneate to rounded, apex long acuminate to subcaudate. Flowers fragrant, terminal on axillary brachyblasts. Tepals 15 – 20, yellow, oblanceolate. Staminal connective exerted and forming a long tip. Gynophore 2.5 – 3 mm; gynoecium with trichomes. Fruit 6 – 12 cm; mature carpels cylindrical or terete, tuberculate. Seeds 2 – 4 per carpel, rugose.

Flowers & Fruits: July to October.

Specimen Cited: Park, Rajib & AP Das 0187, dated 09. 02. 2007.

Local Distribution: Park.

General Distribution: India: Tropical and subtropical forest, West Bengal, Assam, Sikkim, Nagaland, Arunachal Pradesh, Bihar, Orissa, Delhi, Uttar Pradesh, West Himalayas; native to India, Indonesia, Malaysia, Myanmar, Nepal, Thailand, Vietnam.

Magnolia grandiflora Linnaeus, Syst. Nat., ed. 10, 2: 1802. 1759. *Magnolia longifolia* Sweet, Hort. Brit. 11. 1826. *Magnolia angustifolia* Millais, Magnolias 55, 83. 1927.

Vernacular name: Magnolia.

Trees, up to 30 m. Bark pale brown to gray. Petiole 2–4 cm, deeply furrowed; leaf blade elliptic to obovate-oblong, Fl. Bhut. 1 1–21 × 4–8 cm, thickly leathery, adaxially deep green and glossy, secondary veins 8–10 on each side of midvein, base cuneate, apex shortly mucronate. Flowers 12–18 cm in diam., fragrant, terminal in position. Tepals 9–12, white, obovate, thickly fleshy. Stamens 1.8–2 cm; filaments purple, flat; connective exerted and forming a mucro; anthers introrse. Gynoecium ellipsoid, densely long tomentose; carpels ovoid; styles reclinate. Fruit ovoid, densely brown to pale grayish yellow tomentose; mature carpels abaxially rounded, dehiscing along dorsal sutures, apex long beaked. Seeds ovoid; testa red.

Flowers & Fruits: June to October.

Specimen Cited: Park, Rajib & AP Das 0123, dated 07. 02. 2007.

Local Distribution: Park.

General Distribution: India: widely cultivated; Himalayas, Myanmar, China, native to North America.

Order: Piperales Dumortier (1829)

Aristolochiaceae A. Jussieu, Gen. Pl. 72. 1789; *nom. cons.*

ARISTOLOCHIA Linnaeus, Sp. Pl. 2: 960. 1753.

Key to the species:

- 1a. Leaves leathery; racemes 5–8 flowered; capsules dehiscing basipetally *A. indica*
- 1b. Leaves papery; racemes 2–3 flowered; capsules dehiscing acropetally *A. tagala*

Aristolochia indica Linnaeus, Sp. Pl. (1): 960. 1753; Prain, Beng. Pl. 2: 891. 1903. *Aristolochia lanceolata* Wight, Icon. Pl. Ind. Orient. 5: t. 1858 1852. *Aristolochia indica* var. *lanceolata* (Wight) Duchartre, Prodr. 15(1): 479. 1864.

Vernacular name: Ishwarmul.

Shrubby climber. Stem terete, with elongate internodes. Petiole 3 cm; lamina ovate, 5–10 × 4–8 cm, acute, base deeply cordate, leathery, glabrescent, veins palmate, 3–5 pairs from base. 5–8 flowered short racemes axillary. Pedicels pendulous, 3–6 cm; bracts ovate. Perianth tube geniculately curved, abaxially villous to glabrous; limb subcylindric, 3-lobed; lobes slightly unequal, subrounded. Anthers oblong. Gynostemium 3-lobed. Capsules oval, dehiscing basipetally.

Flowers & Fruits: April to July.

Specimen Cited: Forest, Rajib & AP Das 0086, dated 06. 02. 2007.

Local Distribution: Forest areas.

General Distribution: India: West Bengal, Assam, Sikkim, Bihar, Orissa; Nepal, Bhutan.

Aristolochia tagala Chamisso, Linnaea 7: 207. 1832; H. Hara in Hara, Fl. E. Himal. 3: 29. 1971; Grierson *et* Long in Grierson *et* Long, Fl. Bhut. 1(2): 354. 1984; Prain, Beng. Pl. 2: 891. 1903. *Aristolochia roxburghiana* Klotzsch, Monatsber. Königl. Preuss. Akad. Wiss. Berlin 596. 1859. *Aristolochia acuminata* Lamarck, Encycl. 1: 254. 1783.

Shrubby twinners. Stems terete, slightly furrowed, glabrous. Petiole glabrous; lamina ovate-cordate to oblong-ovate, 8–12 × 4–10 cm, acute to acuminate, base deeply cordate, lateral lobes subrounded, papery, both surfaces glabrous, veins palmate. Racemes in axils of leafy shoots, 2 to 3

flowered. Pedicels sparsely hairy, glabrescent; bractlets ovate-lanceolate. Perianth pale yellowish to greenish; tube slightly curved; utricle globose; limb ligulate, oblong, apex obtuse. Anthers ovoid. Capsules obovoid-globose to ovoid-cylindric, dehiscing acropetally. Seeds triangular.

Flowers & Fruits: May to August.

Specimen Cited: Forest, Rajib & AP Das 0298, dated 10. 02. 2007.

Local Distribution: Forest areas.

General Distribution: India: West Bengal, Sikkim, Assam, Arunachal Pradesh; Nepal, Bhutan, Bangladesh, Cambodia, Indonesia, Japan, Malaysia, Myanmar, Philippines, Thailand, Vietnam.

Chloranthaceae R. Brown *ex* Sims, Bot. Mag. 48: ad t. 2190. 1820; *nom. cons.*

CHLORANTHUS Swartz, Philos. Trans. 77: 359. 1787.

Chloranthus erectus Sweet, Hort. Suburb. London 28. 1818. *Chloranthus elatior* Link, Enum. Hort. Berol. Alt. 1: 140. 1821; H. Hara in Hara, Fl. E. Himal. 2: 14. 1971; Grierson *et* Long in Grierson *et* Long, Fl. Bhut. 1(2): 351. 1984. *Chloranthus erectus* (Buchanan-Hamilton) Verdcourt, Kew Bull. 40: 217. 1985. *Cryphaea erecta* Buchanan-Hamilton, Edinburgh Jour. Sci. 2: 11. 1825. *Chloranthus officinalis* Blume, Enum. Pl. Javae 79. 1827.

Vernacular name: Bon cha.

Subshrubs up to 2 m. Stems terete, glabrous. Leaves opposite; leaf blade broadly elliptic or obovate to oblanceolate, 10 – 18 × 4 – 7 cm, serrate, caudate, base cuneate, rigidly papery, glandular, glabrous; lateral veins 5 – 9 pairs. Spikes terminal, dichotomously or racemously branched; bracts triangular to ovate. Flowers white, small. Stamens 3; 2-loculed; lateral lobes smaller, with a 1-loculed anther each. Ovary ovoid. Young fruits green, white at maturity.

Flowers & Fruits: April to September.

Specimen Cited: Forest, Rajib & AP Das 0188, dated 09. 02. 2007.

Local Distribution: Forest areas.

General Distribution: India: West Bengal, Sikkim, Assam, Nagaland, Arunachal Pradesh; Bhutan, Nepal, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam.

Piperaceae C. Agardh, Aphor. Bot. 201. 1824; *nom. cons.*

Key to the Genera:

- 1a. Prophylls present, leaving conspicuous scars around stem nodes *Piper*
 1b. Prophylls absent, without or scars at nodes *Peperomia*

PIPER Linnaeus, Sp. Pl. 1: 28. 1753.

Key to the Species:

- 1a. Bracts oblong or obovate-oblong, adnate to rachis with
 only sides and apex free *P. nigrum*
 1b. Bracts orbicular, peltate with free margin all round 2
 2a. Fruits apically tomentose, completely fused to each other
 to form a nearly smooth, fleshy *P. betle*
 2b. Fruit glabrous, distinct, sometimes very soft when fully ripe
 and then difficult to separate when pressed and dried 3
 3a. Leaves with veins all basal or nearly basal and all arising less than 3 mm
 from base of blade. Leaves very finely powdery pubescent abaxially *P. longum*

- 3b. Leaves with 2 or more lateral veins arising more than 1 cm from base of blade. Leaf blade and petiole glabrous or very finely powdery pubescent along veins ... 4
- 4a. Ovaries and fruit partly fused to rachis *P. hamiltonii*
- 4b. Ovaries and fruit free from rachis *P. sylvaticum*

Piper betle Linnaeus, Sp. Pl. 1: 28. 1753; Hooker *f.* in Hooker *f.*, Fl. Brit. Ind. 5: 85. 1886; Long in Grierson *et* Long, Fl. Bhut. 1(2): 349. 1984, *sensu Piper betleoides* C. de Candolle; Prain, Bengal Pl. 2: 893. 1903. *Chavica betle* (Linnaeus) Miquel, Syst. Piperac. 228. 1843. *Chavica densa* Miquel, Syst. Piperac. 252. 1843.

Vernacular name: Paan.

Dioecious climbers. Stems rooted at nodes, slightly woody. Petiole very finely powdery pubescent; leaf-blade ovate to ovate-oblong, acuminate, cordate to rounded, symmetric, veins 7, usually opposite, others basal; reticulate veins conspicuous. Bracts orbicular, peltate with free margin all round. Spikes leaf-opposed. Fruits apically tomentose, completely fused to each other to form a nearly smooth. Drupes fused to form terete, fleshy, reddish infructescence.

Flowers & Fruits: May to July.

Specimen Cited: Forest, Rajib & AP Das 0175, dated 08. 02. 2007.

Local Distribution: Forest sectors.

General Distribution: India: Tropical and subtropical forests; S.E. to S.W. China, Indonesia, Malaysia, Philippines, Sri Lanka, Vietnam, Africa.

Piper hamiltonii C. DC., Prodr. 16(1): 360. 1869; Hooker *f.* in Hooker *f.*, Fl. Brit. Ind. 5: 88. 1885; Long in Grierson *et* Long, Fl. Bhut. 1(2): 351. 1984; Prain, Beng. Pl. 2: 893. 1903.

Climber. Stem deeply striate, when dry. petiole to 2.4 cm; Lamina elliptic or elliptic obovate, 6 – 13 x 3.5 – 7 cm, obtuse, base rounded, 5 – veined, in lower most, 4.5 mm, without lateral veins, glabrous or very finely powdery pubescent along veins, coriaceous, pale in dry. Bracts orbicular, peltate with free margin all round. Fruiting spike interrupted, 10 – 16 cm, on peduncle 1- 2.5 cm. Ovaries and fruit partly fused to rachis. Drupes ovoid-subglobose, to 2.8 mm.

Flowers & Fruits: February to May.

Specimen Cited: Forest, Rajib & AP Das 0120, dated 07. 02. 2007.

Local Distribution: Forest areas

General Distribution: India: Tropical and subtropical forests; Nepal, Bhutan.

Piper longum Linnaeus, Sp. Pl. 1: 29. 1753; Hooker *f.* in Hooker *f.*, Fl. Brit. Ind. 5: 83. 1886; H. Hara in Hara, Fl. E. Himal. 1: 43. 1966; Hara *et al.*, Enn. Fl. Pl. Nep. 3: 183. 1982; Long in Grierson *et* Long, Fl. Bhut. 1(2): 348. 1984; Prain, Beng. Pl. 2: 893. 1903.

Vernacular name: Pipul, Pipla.

Climbing shrub. Lamina symmetric, subacute or bluntly acuminate, base deeply cordate-auriculate, membranous, veins all basal or nearly basal and all arising less than 3 mm from base, very finely powdery pubescent abaxially. Bracts orbicular, peltate with free margin all round. Male spikes slender and female spikes cylindrical. Fruits glabrous, distinct, sometimes very soft when fully ripe and then difficult to separate when pressed and dried.

Flowers & Fruits: September to January.

Specimen Cited: Forest, Rajib & AP Das 0206, dated 09. 02. 2007.

Local Distribution: Forest areas.

General Distribution: India: tropical and subtropical forest, West Bengal, Assam, Sikkim, Arunachal Pradesh, Nagaland; Bangladesh, Bhutan, Nepal, Malaysia, Sri Lanka.

Piper nigrum Linnaeus, Sp. Pl. 28. 1753; Hooker f. in Hooker f., Fl. Brit. Ind. 5: 90. 1887; Prain, Beng. Pl. 2: 893. 1903.

Vernacular name: Golmorich.

Slender climbers, rooting at nodes. Lamina broadly ovate oblong, oblique, base rounded, coriaceous. Bracts oblong or obovate-oblong, adnate to rachis with only sides and apex free. Spikes robust, Flowers dioecious. Fruits globose, sessile, black when ripe.

Flowers & Fruits: January to April.

Specimen Cited: Park, Rajib & AP Das 0262, dated 10. 02. 2007.

Local Distribution: Cultivated in Park sector.

General Distribution: India: widely cultivated in warmer regions; Nepal, Bhutan, Bangladesh, China.

Piper sylvaticum Roxburgh, Fl. Ind. 1: 156. 1832; Hooker f. in Hooker f., Fl. Brit. Ind. 5: 84. 1886; Long in Grierson *et* Long, Fl. Bhut. 1(2): 348. 1984; Prain, Beng. Pl. 2: 893. 1903.

Climbers. Stoloniferous. Lamina usually ovate, acuminate, base cordate, with 2 or more lateral veins arising more than 1 cm from base, glabrous or very finely powdery pubescent along veins. Spikes leaf-opposed. Bracts orbicular, peltate with free margin all round. Male spikes slender. Female spikes erect, very finely powdery pubescent. Ovary globose, distinct. Ovaries and fruits free from rachis. Fruits glabrous, distinct, sometimes very soft when fully ripe and then difficult to separate when pressed and dried. Drupes globose.

Flowers & Fruits: August to September.

Specimen Cited: Forest, Rajib & AP Das 0314, dated 10. 02. 2007.

Local Distribution: Forest sectors.

General Distribution: Tropical and sub-tropical parts of the world.

PEPEROMIA Ruiz & Pavon, Fl. Peruv. Prodr. 8: 8. 1794.

Peperomia pellucida (Linnaeus) Humboldt, Bonpland *et* Kunth, Nov. Gen. 1: 64. 1816 ; H. Hara in Hara, Fl. E. Himal. 1: 42. 1966; Long in Grierson *et* Long, Fl. Bhut. 1(2): 345. 1984; Prain, Beng. Pl. 2: 894. 1903. *Piper pellucidum* Linnaeus, Sp. Pl. 1. 30. 1753; *Micropiper pellucidum* (Linnaeus) Miquel, Comm. Phytogr. 54. 1840. *Peperomia ephemera* Ekman, Ark. Bot. 22 A(9): 20. 1929. *Peper exigua* (Blume) Miquel, Syst. Pip. 77. 1843; Hooker f. in Hooker f., Fl. Brit. Ind. 5: 97. 1886.

Vernacular name: Golpata.

Annual herbs, fleshy, up to 30 cm, glabrous. Stems ascending, much branched. Petiole 1–2 cm; lamina broadly ovate to ovate-triangular, acute, base cordate, length equal to width, membranous, both surfaces glabrous, translucent. Spikes terminal or leaf-opposed, slender, glabrous, flowers lax, slightly embedded in rachis; bracts shield-shaped, suborbicular, stalk short. Anthers subglobose. Ovary ellipsoid. Nuts globose.

Flowers & Fruits: April to July.

Specimen Cited: Park, Rajib & AP Das 0168, dated 08. 02. 2007.

Local Distribution: Abundant in park and conservation sectors.

General Distribution: Native of tropical America, Tropical and sub-tropical parts of the world.

Monocots - Monocotyledon (Einkeimblättrige)

Non Commelinids - Nicht-Commelinide

Order: Alismatales Dumortier (1829)

Alismataceae Ventenat, Tabl. Regn. Vég. 2: 157. 1799; *nom. cons.*

Key to the Genera:

- 1a. Plants with specialized tuber *Butomopsis*
- 1b. Plants with simple tuber *Sagittaria*

BUTOMOPSIS Kunth, Enum. Pl. 3: 164. 1841.

Butomopsis latifolia (D. Don) Kunth, Enum. Pl. 3: 165. 1841; Noltie, Fl. Bhutan 3(1): 163. 1994; Cook, Aqua. Wetl. Pl. Ind. 247. 1996. *Butomus latifolius* D. Don, Prodr. Fl. Nepal. 22. 1825. *Butomus lanceolatus* Roxburgh, Fl. Ind. 2: 315. 1832. *Butomopsis lanceolata* (Roxburgh) Kunth, Enum. Pl. 3: 165. 1841; Prain, Beng. Pl. 2: 1120. 1903.

Annual herbs with specialized tuber. Leaves radical, erect; petiole up to 18 cm; lamina 5 – 16 cm, 3 – 7 veined, acute, base attenuate. Scapes up to 30 cm; umbels 3 – 14 flowered. Sepals broadly elliptic, margin membranous, apex rounded to retuse.

Flowers & Fruits: May to September.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0007*, dated 05. 02. 2007.

Local Distribution: Throughout the Beel complex.

General Distribution: India, Nepal, throughout S.E. Asia, N. Africa, N. Australia.

SAGITTARIA Linnaeus, Sp. Pl. 2: 993. 1753.

Key to the species:

- 1a. Plants with floating leaf; lamina cordate, obtuse *S. guayanensis*
- 1b. Plants erect; stoloniferous; lamina hastate, acute *S. sagittifolia*

Sagittaria guayanensis Humboldt, Bonpland & Kunth, Nov. Gen. Sp.1: 250. 1815; Hooker *f.*, Fl. Brit. Ind. 6: 561. 1893; Prain, Beng. Pl. 2: 1120. 1903; Cook, Aqua. Wetl. Pl. Ind. 39, 1996; Rao & Verma in Bull. Bot. Surv. Ind. 18 (1-4): 39. 1976. *Sagittaria guayanensis* ssp. *lappula* (D. Don) Bogin, Mem. N. Y. Bot. Gard. 9: 192. t. 5. 1955. *Sagittaria guayanensis* Kunth, Syn. Pl. 1: 261. 1822. *Lophiocarpus guayanensis* (Kunth) Micheli, Monogr. Phan. 3: 62. 1881. *Echinodorus guayanensis* (Kunth) Grisebach, Fl. Brit. W. I. 505. 1862. [PLATE: 8, Figure-84]
Vernacular name: Kut.

Fleshy, aquatic or marshy immersed herbs. Leaves radical; lamina floating, broadly ovate, obtuse or rounded, cordate at base; petiole long. Flowers white, in close whirls on stout pedicels; upper and lower few bisexual; petals ovate. Achenes several, surrounded by a toothed wing.

Flowers & Fruits: August to December.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0009*, dated 05. 02. 2007.

Local Distribution: Margins of water bodies through out the Beel.

General Distribution: Throughout India; China, Malaysia, Australia.

Sagittaria sagittifolia Linnaeus, Sp. Pl. 2: 993. 1753; Hooker *f.*, Fl. Brit. Ind. 6: 561. 1893; Cook, Aqua. Wetl. Pl. Ind. 39, 1996; Rao & Verma in Bull. Bot. Surv. Ind. 18(1-4): 39. 1976; Rae *et* Noltie in Noltie, Fl. Bhut. 3(1): 164. 1994; Prain, Beng. Pl. 2: 1120. 1903; Bora & Kumar, Fl.

Div. Ass. 314. 2003. *Sagittaria sagittaria* Thunberg, Fl. Jap. 242. 1784. *Alisma sagittaria* Stokes, Bot. Mat. Med. 2: 335. 1812. *Sagittaria aquatica* Lamarck, Fl. Franç. 2:197. 1779. *Sagittaria heterophylla* Schreber, Fl. Erlang. 2:119. 1811. [PLATE: 9, Figure-92]

Vernacular Name: Chhoto kut.

Erect, fleshy aquatic or marshland stoloniferous herbs. Leaves radical; lamina hastate or sagittate, acute; petioles trigonous, spongy. 1-3 flowered whorls of panicles; flowers whitish purple. Achenes in a globose head, compressed, winged.

Flowers & Fruits: February to August.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0033*, dated 05. 02. 2007.

Local Distribution: Margins of water bodies of Conservatory sectors and open fishing areas.

General Distribution: Plains of India; N. Asia, N. America and Europe.

Aponogetonaceae Planchon, Bot. Mag. 82: ad. t. 4894. 1856; *nom. cons.*

APONOGETON Linnaeus *f.*, Suppl. Pl. 32, 214. 1782, *nom. cons.*

Key to the species:

- 1a. Leaves floating 2
- 1b. Leaves submerged *A. crispum*
- 2a. Flowers pink or purple *A. natans*
- 2b. Flowers white *A. lakhonensis*

Aponogeton crispum Thunberg, Nov. Gen. 4: 73. 1784; Hooker *f.*, Fl. Brit. Ind. 6: 564. 1893; Prain, Beng. Pl. 2: 1122. 1903; Cook, Aqua. Wetl. Pl. Ind. 48, 1996; Datta & Majumdar, Bull. Bot. Soc. Beng. 20 (2): 22. 1966. *Aponogeton echinatus* Roxburgh, Fl. Ind. 2: 210. 1832. *Spathium crispum* (Thunberg) Voigt, Hort. Suburb. Calcutt. 694. 1845. *Spathium echinatum* (Roxburgh) Voigt, Hort. Suburb. Calcutt. 694. 1845.

Perennial, submerged, stoloniferous aquatic herbs. Leaves submerged, translucent. Flowers white, bisexual on long scapes; perianth segments longer than mature carpel. Follicles 1-2 seeded.

Flowers & Fruits: September to February.

Specimen Cited: Varveri Beel, *Rajib & AP Das 0012*, dated 05. 02. 2007.

Local Distribution: Throughout Beel complex.

General Distribution: India: Andhra Pradesh, Kerala, Karnataka, Maharashtra, Punjab, West Bengal; Sri Lanka.

Aponogeton natans (Linnaeus) Engler & Krause, Engler Pfreich. 24: 11. 1906; Majumdar, Bull. Bot. Soc. Beng. 19 (1): 15. 1955; Cook, Aqua. Wetl. Pl. Ind. 48, 1996. *Saururus natans* Linnaeus, Mantissa 2: 227. 1767. *Aponogeton monostachyus* Linnaeus *f.*, Suppl. 214. 1781 (ut *monostachon*); Hooker *f.*, Fl. Brit. Ind. 6: 564. 1893; Prain, Beng. Pl. 2: 1122. 1903. *Spathium monostachyum* (Linnaeus *f.*) Edgew, J. Asiat. Soc. Bengal 11: 148. 1842. *Aponogeton lucens* Hooker *f.*, Fl. Brit. India 6: 564. 1893.

Aquatic, perennial, stoloniferous herbs; scapigerous. Leaves floating with scapes sticking out. Flowers differently coloured, pink or purple, bisexual; perianth segments longer than mature carpels. Follicles smooth, 4 – 8 seeded.

Flowers & Fruits: October to March.

Specimen Cited: Varveri Beel, *Rajib & AP Das 0015*, dated 05. 02. 2007.

Local Distribution: Throughout Beel complex.

General Distribution: India: Andhra Pradesh, Jharkhand, Hariyana, Kerala, Karnataka, Madhya Pradesh, Orissa, Punjab, Rajasthan, Tripura, West Bengal; Sri Lanka, Tropical Asia and Africa.

Aponogeton lakhonensis A. Camus, Notul. Syst. 1: 273. 1910; Cook, Aqu. Wet. Pl. Ind. 48. 1996. *Aponogeton luteus* A. Camus, Notul. Syst. (Paris) 2: 204. 1912. *Aponogeton pygmaeus* K. Krause, Bot. Jahrb. Syst. 44(101): 8. 1910. *Aponogeton taiwanensis* Masamune, Kudoa 2(1): 1. 1941.

Rhizome elongated, up to 2 cm. Petiole 8 – 13 cm in submerged leaves and 30 – 55 cm in floating leaves; lamina narrowly ovate to linear, entire, rounded, base rounded, herbaceous, with primary veins 7–9 at base. Inflorescence 4–5.5 cm, pedunculate. Flowers white, bisexual. Perianth segments 2, slightly obovate. Stamens 6. Carpels slightly united near base. Fruits ovoid.

Flowers & Fruits: September to February.

Specimen Cited: Khottamari Beel, Rajib & AP Das 0006, dated 05. 02. 2007.

Local Distribution: Throughout Beel complex.

General Distribution: India: West Bengal, Assam; Cambodia, Indonesia, Laos, Malaysia, Thailand, Vietnam.

Araceae A. Jussieu, Gen. Pl. 23. 1789. *nom. cons.*

Key to the Genera:

- 1a. Spadix with many flowers 2
- 1b. Spadix with 1 – 2 male and 1 – 2 female flowers 11
- 2a. Plants aquatic or semi-aquatic 3
- 2b. Plants terrestrial 6
- 3a. Plants free-floating *Pistia*
- 3b. Plants rooted at the bottom 4
- 4a. Plants much spiny; flowers bisexual *Lasia*
- 4b. Plants without spines; flowers unisexual or sterile 5
- 5a. Lamina peltate *Colocasia*
- 5b. Lamina not peltate, ovate to linear-lanceolate *Cryptocoryne*
- 6a. Plants erect 7
- 6b. Plants climbing 10
- 7a. Rhizome underground, short 8
- 7b. Rhizome arial, large *Alocasia*
- 8a. Plants stemless *Xanthosoma*
- 8b. Plants with globose tuber 9
- 9a. Leaves usually deeply 3-lobed *Typhonium*
- 9b. Leaves much divided, twice or more *Amorphophallus*
- 10a. Lamina oblong-elliptic or ovate-elliptic *Scindapsus*
- 10b. Lamina lanceolate to linear-lanceolate with an articulation near base *Pothos*
- 11a. Fronds rootless; inflorescences not enclosed in a membranous sheath *Wolffia*
- 11b. Fronds bearing roots; inflorescences enclosed in a membranous sheath 12
- 12a. Roots solitary on each frond segment *Lemna*
- 12b. Roots several from each frond segment *Spirodella*

LEMNA Linnaeus, Sp. Pl. 2: 970. 1753

Lemna aequinoctialis Welwitsch, Apont. 578. 1859; Cook, Aqua. Wetl. Pl. Ind. 227, 1996. *Lemna minor* Hegelmaier, J. Bot. 3: 112. 1865; Noltie, Fl. Bhut. 3(1): 160. 1994; Cook, Aqua. Wetl. Pl. Ind. 228, 1996; *Lemna perpusilla* var. *trinervis* Austin, Manual 5: 479. 1867. *Lemna paucicostata* Hegelmaier, Lemnac. 139. t. 8. 141. 1868; Hooker f., Fl. Brit. Ind. 6: 556. 1893; Prain, Beng. Pl. 2: 1117. 1903. [PLATE: 10, Figure-116]

Vernacular name: Topa/ Khudi Paana

Small, free floating herbs. Fronds 1.5 – 2 mm long, ovate or ovate – oblong, asymmetric, nearly flat. Root solitary with winged root-sheath and acute root cap (called root pocket). Female flowers with solitary orthotropous ovule. Seeds ovoid, prominently ribbed.

Flowers & Fruits: August to October.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0028*, dated 05. 02. 2007.

Local Distribution: Throughout the Beel Complex.

General Distribution: Throughout the India; Cosmopolitan in tropics and subtropics.

SPIRODELA Schleiden, Linnaea 13: 391. 1839

Spirodela polyrrhiza (Linnaeus) Schleiden, Linnaea 13: 392. 1829; Cook, Aqua. Wetl. Pl. Ind. 229, 1996. *Lemna polyrrhiza* Linnaeus, Sp. Pl. 2: 970. 1753; Hooker f., Fl. Brit. Ind. 6: 557. 1893; Prain, Beng. Pl. 2: 1117. 1903. *Lemna orbiculata* Roxburgh, Fl. Ind. 3: 565. 1832. *Lemna maxima* Blatter and Hallberg, J. India Bot. 2: 49. 1921. *Spirodela maxima* (Blatter & Hallberg) McCann, J. Bombay Nat. Hist. Soc. 43: 158. 1942. *Lemna major* Griffith, Not. Pl. Asiat. 3: 216. 1851. [PLATE: 10, Figure-115]

Vernacular name: Topa.

Free floating tufted herbs with ovate fronds; each fronds with 5 – 10 minute roots. Upper leaf orbicular to obovate, 7 – 13 nerved, dark green above, purplish beneath. Spathe open only at the top. Seeds smooth or faintly reticulate.

Flowers & Fruits: January to April.

Specimen Cited: Khottamari Beel, *Rajib & AP Das 0037*, dated 05. 02. 2007.

Local Distribution: Throughout the Beel Complex.

General Distribution: India; tropical and temperate parts of the world.

WOLFFIA Horkel ex Schleiden, Beitr. Bot. 233. 1844.

Wolffia arrhiza (Linnaeus) Horkel ex Wimmer, Fl. Schiiles. 3: 140. 1857; Hooker f., Fl. Brit. Ind. 6: 557. 1893. Prain, Beng. Pl. 2: 1117. 1903; Cook, Aqua. Wetl. Pl. Ind. 230, 1996. *Lemna arrhiza* Linnaeus, Mantiss. 2: 294. 1771. *Wolffia michelii* M.J. Schleiden, Beitr. Bot. 233. 1844 (*nom. Illeg.*). *Wolffia delilii* Miquel, Ned. Kruidk. Arch. 3: 429. 1855.

Vernacular name: Topa.

Minute, 1 – 5 mm, free floating annual herbs. Fronds sub-globose, minute, ellipsoid, upper surface convex, rootless. Inflorescence 2-flowered, with one male and one female spathe; anther 1-celled; ovary 1 ovuled.

Flowers & Fruits: July to October.

Specimen Cited: Varveri Beel, *Rajib & AP Das 0027*, dated 05. 02. 2007.

Local Distribution: Throughout the Beel Complex.

General Distribution: India, Bhutan, Bangladesh, Nepal, Cambodia, Indonesia, Japan, Laos, Malaysia, Myanmar, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Vietnam; introduced to America.

COLOCASIA Schott in Schott & Endlicher, Melet. Bot. 18. 1832, *nom. cons.*, not Link (1795).

Key to the Species:

- 1a. Leaf sheaths yellowish green *C. esculenta*
 1b. Leaf sheaths reddish brown *C. fallax*

Colocasia esculenta (Linnaeus) Schott in Schott & Endlicher, Melet. Bot. 18. 1832; Hara *et al.*, En. Flower. Pl. Nepal 1: 91. 1978; Noltie, Fl. Bhut. 3(1): 136. 1994; Cook, Aqua. Wetl. Pl. Ind. 51, 1996. Hajra *et al.*, Fl. Sikkim 1: 191. 1996. *Arum esculentum* Linnaeus, Sp. Pl. 2: 965. 1753. *Colocasia antiquorum* Schott in Schott & Endlicher, Melet. Bot. 18. 1832; Hooker *f.*, Fl. Brit. Ind. 6: 523. 1893. *Arum chinense* Linnaeus, Amoen. Acad. 4: 234. 1754. *Arum colocasia* Linnaeus, Sp. Pl. 985. 1753. *Caladium nymphaeifolium* Ventenat, Descr. Pl. Nov. t. 30. 1801. *Colocasia esculenta* var. *antiquorum* (Schott) F.T. Hubbard & Rehder, Bot. Mus. Leafl. 1(1): 5. 1932. *Colocasia nymphaefolia* Kunth, Enum. 3: 37. 1850; Hooker *f.*, Fl. Brit. Ind. 6: 523. 1893; Prain, Beng Pl. 2: 1112. 1903. *Arum nymphaeifolia* Roxburgh, Fl. Ind. 3: 495. 1832. [PLATE: 9, Figure-93]

Vernacular Name: Shola Kachu.

Erect, marshland herbs; rhizomes variable, leaves from the rhizome, dark-green above and glabrous, yellowish, convolute. Spadix long. Female flowers at the base, fertile ovaries intermixed with sterile ones; neuter above the female; male portion above the neuter synandrium lobed.

Flowers & Fruits: May to September.

Specimen Cited: Chhotojan Beel, *Rajib & AP Das 0036*, dated 05. 02. 2007; Forest, *Rajib & AP Das 0091*, dated 07. 02. 2007.

Local Distribution: Marshy low land areas.

General Distribution: India: West Bengal, Sikkim, Mizoram, Manipur, Maharashtra, Rajasthan, Delhi, Kerala, Karnatak, Goa; Himalaya, Tropical Asia, Bangladesh, Sri Lanka and South America.

Colocasia fallax Schott, Bonplandia 7: 28. 1859 ; Noltie, Fl. Bhutan 3(1): 137. 1994; Hajra *et al.*, Fl. Sikkim 1: 192. 1996; *Colocasia kerrii* Gagnepain, Notul. Syst. (Paris) 9: 130. 1941.

Vernacular Name: Kachu.

Rhizome erect, globose, 2 cm in diameter; stolons creeping. Petioles 15 – 25 cm, sheathing for almost half of length; sheaths reddish brown; lamina narrowly oblong-ovate, 8 – 17 x 4 – 9 cm, apiculate, base shallowly cordate, slightly glaucous abaxially, intramarginal veins several. Peduncle slender. Spathe tube green; limb orange-yellow, narrowly lanceolate, finely acuminate. Female part of spadix 1 – 2 cm, with 4 – 5 rows of whitish sterile ovaries at base; male part scaly-rough, with several rows of sterile male flowers at base, apex acute. Ovaries green, speckled with white, subglobose; stigmas discoid at base.

Flowers & Fruits: August to September.

Specimen Cited: Village sector, *Rajib & AP Das 0025*, dated 05. 02. 2007.

Local Distribution: Marginal lowland of open fishing areas.

General Distribution: India: West Bengal, Sikkim, Manipur, Maharashtra; Himalayas, Tropical Asia, Bangladesh, Sri Lanka.

CRYPTOCORYNE Fischer *ex* Wydler, *Linnaea* 5: 428. 1830.

Key to the species:

- 1a. Limb of spathe ciliate along the margin *C. ciliata*
 1b. Limb of spathe smooth *C. retrospiralis*

Cryptocoryne ciliata (Roxburgh) Fischer *ex* Wydler, *Linnaea* 5: 428. 1830; Hooker *f.*, *Fl. Brit. Ind.* 6: 492. 1893; Blatter, *J. Bomb. Nat. Hist. Soc.* 17: 27. 1911; Prain, *Beng. Pl.* 2: 1106. 1903; Cook, *Aqua. Wetl. Pl. Ind.* 54, 1996. *Ambrosinia ciliata* Roxburgh, *Corm. Pl.* 7. 90, t. 294. 1819. *Ambrosina ciliaris* Sprengel, *Syst. Veg.* 3: 771. 1826. *Cryptocoryne elata* Griffith, *Not. Pl. Asiat.* 3: 134. 1851.

Erect, unarmed aquatic herbs with stolons. Leaves linear-oblong or linear-lanceolate; limb of spathe ciliate along the margin. Spathe axillary, cuspidate with purple fimbriate margins. Carpels 5 – 7, fruit syncarpous, 5 – 7 loculed with 6 – 8 seeds in each, peduncle stout.

Flowers & Fruits: May to September.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0043*, dated 05. 02. 2007; *Rajib & AP Das 0059*, dated 07. 02. 2007.

Local Distribution: Along the forest margins.

General Distribution: India and Malaysian Islands.

Cryptocoryne retrospiralis Fischer *ex* Wydler, *Linnaea* 5: 428. 1830; Kunth, *Enum.* 3: 12. 1841; Engler in de Candolle, *Monog. Phan.* 2: 625. 1879; Hooker *f.*, *Fl. Brit. Ind.* 6: 493. 1893; Noltie, *Fl. Bhutan* 3(1): 155. 1994; Prain, *Beng. Pl.* 2: 1106. 1903; Cook, *Aqua. Wetl. Pl. Ind.* 57, 1996.

Aquatic, submerged herbs with fibrous root. Leaves numerous, radical, narrowly linear, lanceolate, acute. Spathes as long as the leaves, dull green, entire. Carpels 5 – 6, ovules 3 or more; stigma orbicular.

Flowers & Fruits: May to September.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0045*, dated 05. 02. 2007.

Local Distribution: Along the forest margins.

General Distribution: India, S.E. Asia.

LASIA Loureiro, *Fl. Cochinch.* 1: 64, 81. 1790.

Lasia spinosa (Linnaeus) Thwaites, *Enum.* 336. 1864; Hajra *et al.*, *Fl. Sikkim* 1: 192. 1996; Noltie, *Fl. Bhut.* 3(1): 129. 1994; Cook, *Aqua. Wetl. Pl. Ind.* 64, 1996. *Dracontium spinosum* Linnaeus, *Sp. Pl.* 967. 1753. *Lasia heterophylla* (Roxburgh) Schott, *Melet. Bot.* 1: 21. 1832; Hooker *f.*, *Fl. Brit. Ind.* 6: 550. 1893; Prain, *Beng. Pl.* 2: 1116. 1903. *Pothos heterophyllus* Roxburgh, *Fl. Ind.* 1: 457. 1820. *Pothos lasia* Roxburgh, *Fl. Ind.* 1: 458. 1820. [PLATE: 7, Figure-74]

Vernacular Name: Knata Kachu.

Perennial, stout, prickly, aquatic herbs; rhizomes branched. Leaves coriaceous, glabrous, hastate or sagittate, pinnatifid; lobes narrow or broadly acuminate. Spathe greenish purple, axis spongy. Perianth pink, lobes hooked over the stamens. Stigma orange.

Flowers & Fruits: November to February.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0038*, dated 05. 02. 2007.

Local Distribution: Margins of water body in the Conservatory sector.

General Distribution: India (Tropical Himalaya), Bangladesh, China, Malaysia, Myanmar and Sri Lanka.

TYPHONIUM Schott in Wiener Zeitschr. Kunst 1829: 732. 1829.

Typhonium trilobatum (Linnaeus) Schott in Wiener Zeitschr. Kunst. 3: 72. 1829; Hooker *f.*, Fl. Brit. Ind. 6: 509. 1893; Hajra *et al.*, Fl. Sikkim 1: 195. 1996; Noltie, Fl. Bhut. 3(1): 139. 1994. *Arum trilobatum* Linnaeus, Sp. Pl. 965. 1753. *Typhonium triste* Griffith, Not. Pl. Asiat. 3: 145. 1851. *Arum orixense* Roxburgh, Fl. Ind., 3: 503-505. 1832.

Vernacular Name: Kharkon.

Rhizome short, tuberous, subglobose. Petiole green to purple; lamina cordate-ovate, usually deeply 3-lobed, 10 – 15 x 5 – 10 cm, acuminate to mucronate; lateral lobes 8 – 11 cm. Inflorescence appearing after the leaves. Spathe with dark purplish-red line, limb ovate-lanceolate, acuminate. Spadix shorter than spathe; female zone slightly conical; sterile zone densely covered with staminodes, upper half naked; male zone \pm 2 cm. Stamens pink. Ovaries yellowish green; stigma sessile.

Flowers & Fruits: April to September.

Specimen Cited: Forest, Rajib & AP Das 0054, dated 07. 02. 2007.

Local Distribution: Park side forest area.

General Distribution: India: West Bengal, Sikkim, Bihar, Odisha; China, Myanmar, Sri Lanka, Nepal, Thailand, Malaysia.

PISTIA Linnaeus, Sp. Pl. 2: 963. 1753.

Pistia stratiotes Linnaeus, Sp. Pl. 2: 963. 1763; Hooker *f.*, Fl. Brit. Ind. 6: 497. 1893; Noltie, Fl. Bhut. 3(1): 156. 1994; Prain, Beng. Pl. 2: 1105. 1903; Cook, Aqua. Wetl. Pl. Ind. 65, 1996. *Zala asiatica* Loureiro, Fl. Cochinch. 405. 1790. *Pistia minor* Blume, Rumphia 1: 78. 1836. *Pistia africana* C. Presl, Epimel. Bot. 240. 1851. [PLATE: 10, Figure-117]

Vernacular name: Topa paana.

Small, free floating fleshy stoloniferous herbs. Leaves several in a rosette, densely pubescent. Lamina sessile, obovate-cuneate. Spathe much shorter than leaves, shortly peduncled, open above. Spadix adnate to the back of the tube of spathe, very small, free above. Fruits membranous, few seeded. Seeds oblong or obovoid albuminous.

Flowers & Fruits: May to October.

Specimen Cited: Varveri Beel, Rajib & AP Das 0024, dated 05. 02. 2007.

Local Distribution: Throughout the Beel complex.

General Distribution: Throughout India, Sri Lanka, tropical and subtropical regions worldwide.

ALOCASIA (Schott) G. Don in Sweet, Hort. Brit., ed. 3, 631. 1839, *nom. cons.*

Alocasia macrorrhizos (Linnaeus) G. Don, Sweet, Hort. Brit. 3: 631. 1839; Hajra *et al.*, Fl. Sikkim 1: 186. 1996; Noltie, Fl. Bhut. 3(1): 139. 1994. *Arum macrorrhizon* Linnaeus, Sp. Pl. 965. 1753. *Alocasia indica* (Loureiro) Spach, Hist. Nat. Vég. 12: 47. 1846; Prain, Beng. Pl. 2: 1111. 1903. *Arum indicum* Loureiro, Fl. Cochinch. 536. 1790. *Colocasia indica* (Loureiro) Kunth, Enum. Pl. 3: 39. 1841.

Vernacular Name: Mann, Mankachu.

Rootstock stout, almost erect. Leaves large; lamina ovate, undulate, obtuse-rounded, bright green. Spathes yellowish green. Fertile male inflorescence white; females yellow.

Flowers & Fruits: April to September.

Specimen Cited: Forest, Rajib & AP Das 0044, dated 05. 02. 2007.

Local Distribution: Forests and road-side areas.

General Distribution: India, Bangladesh, Nepal, Sri Lanka, S.E. Asia to Pacific.

AMORPHOPHALLUS Blume *ex* Decaisne, Nouv. Ann. Mus. Hist. Nat. 3: 366. 1834, *nom. cons.*

Amorphophallus bulbifer (Roxburgh) Blume in Rumphia 1: 148. 1837; Hooker *f.*, Fl. Brit. Ind. 6: 515. 1893; Hara, Fl. East. Himal. 1: 394. 1966; Hajra *et al.*, Fl. Sikkim 1: 186. 1996; Noltie, Fl. Bhut. 3(1): 133. 1994; Prain, Beng. Pl. 2: 1110. 1903. *Arum bulbiferum* Roxburgh, Fl. Ind. 3: 516. 1832. *Amorphophallus aculatum* Hooker *f.*, Fl. Brit. India 6: 515. 1893.

Vernacular Name: Buno Ol.

Tuber subglobose. Cataphylls brown, membranous. Leaf divided into numerous leaflets; bulbels developed at primary or secondary divisions; leaflets acuminate. Spathe ovate, subacute, margins overlapping basally. Spadix subacute, pink, sometimes whitish.

Flowers & Fruits: April to July.

Specimen Cited: Forest, Rajib & AP Das 0105, dated 07. 02. 2007.

Local Distribution: Forests and road-side areas.

General Distribution: South East Asia, Australia.

POTHOS Linnaeus, Sp. Pl. 2: 968. 1753.

Pothos scandens Linnaeus, Sp. Pl. 2: 968. 1753; Noltie, Fl. Bhut. 3(1): 125. 1994; Prain, Beng. Pl. 2: 1115. 1903. *Pothos longifolius* C. Presl, Epimel. Bot. 242. 1851. *Pothos scandens f. angustior* Engler, Bot. Tidsskr. 24: 272. 1902. *Pothos fallax* Schott, Prodr. Syst. Aroid. 560. 1860. *Pothos angustifolius* (Rafinesque) C. Presl, Epimel. Bot. 243. 1851.

Shrubby root-climber. Stem more than 5 m; branches terete. Leaves petiolate; petiole cuneate, truncate at apex, many veined; lamina lanceolate to linear-lanceolate, 4–8 x 1–3 cm, acuminate, base obtuse. Inflorescence solitary, axillary, small; peduncle short; cataphylls imbricate, green, ovate, small. Spathe greenish to maroon, ovate, concave. Spadix stipitate; stipe erect, greenish; fertile zone yellow-green to off-white, globose or ovoid to subclavate. Fruit mid-green, ripening to deep scarlet, obclavate.

Flowers & Fruits: October to November.

Specimen Cited: Forest, Rajib & AP Das 0133, dated 07. 02. 2007.

Local Distribution: Forests and road side.

General Distribution: Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Philippines, Singapore, Sri Lanka, Thailand, Vietnam, Madagascar.

SCINDAPSUS Schott in Schott & Endlicher, Melet. Bot. 21. 1832.

Scindapsus officinalis (Roxburgh) Schott, Melet. Bot. 21. 1832; Noltie, Fl. Bhut. 3(1): 129. 1994; Prain, Beng. Pl. 2: 1114. 1903. *Pothos officinalis* Roxburgh, Fl. Ind. 1: 452. 1820. *Monstera officinalis* (Roxburgh) Schott, Wiener Z. Kunst 4: 1028. 1830. *Scindapsus annamicus* Gagnepain, Notul. Syst. (Paris) 9: 139. 1941.

Vernacular Name: Gajpipul.

Robust liana, root-climber. Petiole 26–32 cm, base imbricate, sheath reaching pulvinus; lamina pale green abaxially, green adaxially, oblong-elliptic or ovate-elliptic, 23–36 x 12–24 cm, entire,

acute to shortly acuminate, base subcordate, leathery; lateral veins numerous, diverging from midrib. Spathe yellow, involute-tubular, acuminate. Spadix sessile, cylindrical.

Flowers & Fruits: November to December

Specimen Cited: Forest, Rajib & AP Das 0124, dated 07. 02. 2007.

Local Distribution: Forests and road-side.

General Distribution: India, Bangladesh, Bhutan, China, Thailand, Vietnam.

XANTHOSOMA Schott, Melet. Bot. 19. 1832.

Xanthosoma brasiliense (Desfontaines) Engler, Engler Pflanzenr. Arac. Colocas. 58. 1920; Noltie, Fl. Bhut. 3(1): 139. 1994; *Caladium brasiliense* Desfontaines, Tabl. Ecole Bot., ed. 3: 386. 1829. *Xanthosoma hastatum* Eggers, Fl. St. Croix 99. 1879. *Xanthosoma hastifolium sensu* Duss, Fl. Phan. Antill. Franç. 481. 1897. *Philodendron fontanesii* Kunth, Enum. Pl. 3: 48. 1841. *Acontias hastifolius* Schott, Melet. Bot. 19. 1832. [PLATE: 7, Figure-67]

Vernacular Name: Dudh Kachu.

Stem small. Petiole 15 – 25 cm, sheathing for almost half of length; lamina large, ovate-hastate, undulate, obtuse-rounded, bright green, veins conspicuous; petiole to 40 cm.

Flowers & Fruits: September to December.

Specimen Cited: Forest, Rajib & AP Das 0697, dated 14. 02. 2008.

Local Distribution: Forest areas.

General Distribution: Native of tropical America; widely cultivated; often naturalized.

Hydrocharitaceae A. Jussuie, Gen. Pl. 67. 1789; *nom. cons.*

Key to the genera:

- 1a. Flowers enclosed in a bifid spathe or within 2 opposite spathal bracts 2
- 1b. Flower solitary or few in leaf axil *Najas*
- 2a. Perianth 3 in single whorls *Vallisneria*
- 2b. Perianth 3+3 in two whorls 3
- 3a. Leaves whorled sometime opposite 4
- 3b. Leaves scattered 5
- 4a. Leaves whorls arranged in regular and repeating patterns along elongated stems ... *Hydrilla*
- 4b. Leaves whorls in two rows even if sometimes spirally wound, arranged somewhat irregularly along the stem *Nechamandra*
- 5a. Leaves sessile, linear *Blyxa*
- 5b. Leaves petiolate, ovate-oblong *Ottelia*

BLYXA Noronha *ex* Thouars, Gen. Nov. Madagasc. 4. 1806.

Blyxa octandra (Roxburgh) Planchon *ex* Thwaites, Enum. 332. 1864; Cook, Aqua. Wetl. Pl. Ind. 218, 1996. *Vallisneria octandra* Roxburgh, Pl. Corom. 2: 34. t. 165. 1802. *Blyxa roxburghii* Richard, Mem. Inst. Paris 12(2): 23. 1812 (*nomen illegitimate*); Hooker *f.*, Fl. Brit. Ind. 5: 660. 1888; Prain, Beng. Pl. 2: 996. 1903.

Vernacular Name: Pata Seola.

Tufted, annual, submerged, delicate, aquatic herbs. Leaves radical, linear, entire, acuminate, base broad, membranous. Spathe linear, cylindrical with white flowers; peduncle slender, terete. Fruits linear; seeds many, small oblong-elliptic.

Flowers & Fruits: November to February.

Specimen Cited: Noldoba Beel, *Rajib & AP Das 0052*, dated 05. 02. 2007.

Local Distribution: Throughout Beel Complex.

General Distribution: India: West Bengal, Andrapradesh, Maharastra, Madhyapradesh, Orrisa, Kerala; Bangladesh, Myanmar, New Guinea, Sri Lanka, Vietnam, Australia.

HYDRILLA Richard, Mém. Cl. Sci. Math. Inst. Natl. France 1811(2): 9, 61, 76. 1814.

Hydrilla verticillata (Linnaeus f.) Royle, Ill. Bot. Himal. t. 376. 1839; Hooker f., Fl. Brit. Ind. 5: 659. 1888; Noltie, Fl. Bhut. 3(1): 165. 1994; Prain, Beng. Pl. 2: 995. 1903; Cook, Aqua. Wetl. Pl. Ind. 218, 1996. *Serpicula verticillata* Linnaeus f., Suppl. 416. 1781; Roxburgh, Cor. Pl. 2: 33. t. 164. 1798; Fl. Ind. 3: 578. 1832. *Hydrilla polysperma* Blatter in J. Proc. Asiat. Soc. Beng. (N.s.) 26: 356. 1931. *Elodea verticillata* (Linnaeus f.) F. Mueller, Key Vict. Pl. 1: 423. 1888. *Hydrilla angustifolia* Hasskarl, Pl. Jav. Rar. 117. 1848. *Hydrilla najadifolia* Zollinger & Moritzi, Syst. Verz. 91. 1846.

Vernacular Name: Kureli.

Submerged, leafy, dioecious herbs. Stem slender, branched. Leaves whorled, rarely opposite, oblong to linear, rarely lanceolate, serrate or sub-entire, acute. Flowers unisexual, perianth 3+3, male spathe solitary, axillary, globose; female spathe bifid, axillary, cylindric, 1-2 flowered. Fruits subulate, smooth to muricate; seeds oblong.

Flowers & Fruits: November to January.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0029*, dated 05. 02. 2007.

Local Distribution: Throughout Beel Complex.

General Distribution: India: throughout country; Japan, Malaysia, Philippines; S. & E. Europe, Africa, S. & E. Asia, Australia.

NECHAMANDRA Planchon, Ann. Sci. Nat., Bot., sér. 3, 11: 78. 1849.

Nechamandra alternifolia (Roxburgh ex Wight) Thwaites, Enum. Pl. Zeyl. 332. 1864; Subramanyam & Balakrishnan, Bull. Bot. Surv. Ind. 3: 23. 1961; Cook, Aqua. Wetl. Pl. Ind. 219, 1996; Datta & Majumdar, Bull. Bot. Soc. Beng 20 (20): 23. 1966. *Vallisneria alternifolia* Roxburgh ex R. Wight, Bot. Misc. 2: 344. 1831; Naskar, Aqu. Semiaquat. Pl. Low. Ganget. plain, 229. 1990.

Submerged, fresh water herb. Leaves 1 to 2, opposite below and crowded, scattered at the branches, linear or linear lanceolate, serrulate, acuminate to acute; sessile, amplexicaul, usually 3-nerved. Male spathe sessile, axillary, ovoid, 2-fid. Female spathe sessile, narrow oblong. Flowers many, densely arranged.

Flowers & Fruits: December to June.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0010*, dated 05. 02. 2007.

Local Distribution: Throughout Beel complex.

General Distribution: India: Assam, West Bengal, Bihar, Karnataka, Maharastra; Nepal, Bangladesh, Myanmar, Sri Lanka, Vietnam.

OTTELLIA Persoon, Syn. Pl. 1: 400. 1805.

Ottelia alismoides (Linnaeus) Persoon, Sys. Pl. 1: 400. 1805; Hooker *f.*, Fl. Brit. Ind. 5: 662. 1888; Noltie, Fl. Bhut. 3(1): 166. 1994; Prain, Beng. Pl. 2: 997. 1903; Cook, Aqua. Wetl. Pl. Ind. 220, 1996. *Strtiotes alismoides* Linnaeus, Sp. Pl. 1: 535. 1753. *Ottelia lanceolata* (Gagnepain) Dandy, J. Bot. 72: 138. 1934. *Boottia lanceolata* Gagnepain, Bull. Soc. Bot. France 54: 540. 1907. [PLATE: 10, Figure-107]

Local Name: Pani Kolla

Submerged herbs. Leaves crowded, submerged; petioles long, variable in shape; lamina ovate-lanceolate, oblong or cordate, entire, acute. Spathe solitary, axillary, 1-flowered; flowers bisexual, sessile, yellowish white; ovary of 6 united carpels covered by spathe with 3 - 6 wavy-wings. Fruits oblong, ellipsoid, crowded with the sepals. Seeds numerous, oblong.

Flowers & Fruits: October to February.

Specimen Cited: Varveri Beel, *Rajib & AP Das 0001*, dated 05. 02. 2007.

Local Distribution: Throughout Beel complex.

General Distribution: India, Nepal, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Cambodia, Philippines, Thailand, Sri Lanka, Vietnam, New Guinea, Africa, Australia; introduced in North America.

VALLISNERIA Linnaeus, Sp. Pl. 2: 1015. 1753.

Vallisneria natans (Loureiro) H. Hara, J. Jap. Bot. 49: 136. 1974; Cook, Aqua. Wetl. Pl. Ind. 221, 1996. *Physkium natants* Loureiro, Fl. Cochinch. 663. 1790. *Vallisneria asiatica* Miki, Bot. Mag. (Tokyo) 48: 329. 1934. *Vallisneria minor* Ito, Nippon Shokubutsumei 1: 23. ver. 1874. *Vallisneria spiralis* Linnaeus var. *denseserrulata* Mikino, Bot. Mag. Tokyo 28: 27. 1914; Lowden, Aquat. Bot. 13: 288. 1982. *Vallisneria physcium* Jussieu ex Sprengel, Syst. 3: 900. 1826. *Vallisneria spiralooides* Roxburgh, Fl. Ind. 3: 75. 1832; Naskar, Aqu. Semiaquat. Pl. Low. Ganget. plain, 231. 1990.

Submerged, stoloniferous, tufted herbs. Leaves linear, serrulate or entire, acute or obtuse, translucent green; male spathe 5 to 10 mm long; female spathe on long coiled peduncle which at maturity uncoils and helps fertilization after getting floating pollens from water surface. Fruits linear. Seeds numerous, oblong.

Flowers & Fruits: January to May.

Specimen Cited: Varveri Beel, *Rajib & AP Das 0005*, dated 05. 02. 2007.

Local Distribution: Throughout Beel Complex.

General Distribution: India, Nepal, China, Japan, Malaysia, Sri Lanka, Korea, Vietnam and Australia.

NAJAS Linnaeus, Sp. Pl. 2: 1015. 1753.

Key to the species:

- 1a. Male and female flowers alike without sheath; anthers 4 locular *N. graminea*
- 1b. Male flowers only in a sheath; anthers 1 locular *N. indica*

Najas graminea Delile, Descr. Egypt. Hist. Nat. 2: 282, t. 50, f. 3. 1813; Hooker *f.*, Fl. Brit. Ind. 6: 569. 1893; Prain, Beng. Pl. 2: 1125. 1903; Cook, Aqua. Wetl. Pl. Ind. 268, 1996. *Caulinia graminea* (Delile) Tzvelev, Novosti Sist. Vyssh. Rast. 13: 20. 1976.

Vernacular Name: Seola.

Stems up to 20 cm. Leaves narrowly linear to linear; sheath 1 – 3 mm, deeply auriculate; auricles lanceolate, serrulate with several teeth on each side, apex acute; lamina minutely and densely serrulate, acuminate. Monoecious; male flowers usually more toward upper axils with elliptic perianth; spathe absent; female flowers 1 – 2 mm; stigmas 2 – 4 lobed. Fruits oblong.

Flower & Fruits: October to July.

Specimen Cited: Raichangmari Beel, *Rajib & AP Das 0013*, dated 05. 02. 2007.

Local Distribution: Throughout Beel Complex.

General Distribution: India, Bhutan, Bangladesh, Nepal, Indonesia, Japan including Ryukyus, Korea, Malaysia, Myanmar, Phillipines, Sri Lanka, Thailand; throughout Old World, Africa, Australia, introduced into North America.

Najas indica (Willdenow) Chamisso, *Linnaea* 4: 501. 1829; Prain, *Beng. Pl.* 2: 1125. 1903; Cook, *Aqua. Wetl. Pl. Ind.* 269, 1996. *Cauline indica* Willdenow, *Mem. Ac. R. Sc. Berl.* 89, f. 3. 1801. *Najas falciculata* R. Brown, *J. Bot.* 2: 278, f. 4. 1864. *Najas minor sensu* Hooker f., *Fl. Brit. Ind.* 6: 569. 1893. *Najas lacerata* Rendle, *Trans. Linn. Soc.* 2, *Bot.* 5: 416, t. 41, f. 132-138. 1899. *Najas tenuis* A. Brown ex Magnus, *Beitr. Kenntn. Najas* 7. 1870 non *Zostera tenuis* Reuter, 1854.

Vernacular Name: Seola.

Submerged much branched, herbs. Leaves slightly recurved. Staminate flower solitary, enclosed in a spathe, perianth linear, anthers 4-celled; pistillate flower with no spathe or perianth. Seeds ellipsoid.

Flower & Fruits: November to February.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0003*, dated 05. 02. 2007.

Local Distribution: Throughout, in water bodies.

General Distribution: India, China, Japan and Taiwan.

Potamogetonaceae Dumortier, *Anal. Fam. Pl.* 59. 1829 ('Potamogetoneae'); *nom. cons.*

POTAMOGETON Linnaeus, *Sp. Pl.* 1: 126. 1753.

Key to the species:

- 1a. Submerged lamina clasping the stem at base, sessile; floating leaves absent *P. crispus*
- 1b. Submerged lamina never clasping the stem, petiolate; floating leaves present 2
- 2a. Submerged lamina lanceolate; petiole longer than lamina in floating leaves *P. nodosus*
- 2b. Submerged lamina linear; petiole shorter than lamina in floating leaves *P. octandrus*

Potamogeton octandrus Poiret, *Lamarck, Encycl. M. Bot., Suppl.* 4: 534. 1816; Noltie, *Fl. Bhut.* 3(1): 170. 1994; Hajra *et al.*, *Fl. Sikkim* 1: 196, 1996; Cook, *Aqu. Wet. Pl. Ind.* 333. 1996. *Potamogeton octandrus* var. *minduhikimo* (Makino) Hara, *J. Jap. Bot.* 20(6-7): 331. 1944. *Hydrogeton heterophyllus* Loureiro, *Fl. Cochinch.* 244. 1790. *Potamogeton huillensis* Welwitsch ex Schinz, *Ber. Schweiz. Bot. Ges.* 1: 61. 1891.

Plants annual. Stems few to densely branched, filiform, terete; nodal glands absent; dormant buds axillary, narrowly fusiform. Leaves dimorphic; stipules axillary, convolute, membranous, free from leaf base, decaying early, green to greenish brown when dry. Submerged leaves sessile, alternate, linear to filiform, acuminate, 3 veined. Floating leaves petiolate, usually alternate; lamina opaque, elliptic to oblong ovate, entire, acute to obtuse, base rounded, leathery. Spikes densely flowered. Fruits obovoid.

Flowers & Fruits: August to January.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0008*, dated 05. 02. 2007.

Local Distribution: Bochamari Beel.

General Distribution: India: West Bengal, Sikkim, Madhya Pradesh, Jammu and Kashmir, Meghalay; Indonesia, Japan including Ryukyus, Korea, Malaysia, Nepal, Russia; Africa, Asia, Australia.

Potamogeton crispus Linnaeus, Sp. Pl. 1: 126. 1753; Hooker *f.*, Fl. Brit. Ind. 6: 566. 1893; Noltie, Fl. Bhut. 3(1): 171. 1994; Prain, Beng. Pl. 2: 1123. 1903; Cook, Aqua. Wetl. Pl. Ind. 268, 1996; Majumdar, Bull. Bot. Soc. Beng. 19 (1): 15. 1965; Rao & Verma, Bull. Bot. Surv. Ind. 18 (1-4): 42. 1976. *Potamogeton tuberosus* Roxburgh, Fl. Ind. 1: 472. 1820. *Buccaferrea crispata* Bubani, Fl. Pyren. 4: 13. 1901. *Potamogeton crispus* var. *serrulatus* (Opiz) Roxburgh, Icon. Fl. Germ. Helv. 7: 18. 1845. *Potamogeton crispus* var. *najadoides* Graebner, Pflanzenr. IV, 11: 100. 1907. *Potamogeton lactucaceum* Montandon, Syn. Fl. Jura ed. 2: 305. 1868. *Potamogeton serrulatus* Opiz, Flora 5: 267. 1822.

Plants perennial, submerged in freshwater. Rhizome terete. Stems sparsely branched, terete to slightly flattened and angular, creeping at base. Leaves sessile; lamina broadly linear to narrowly oblong, undulate to crispate and serrate, obtuse, 3–7 veined. Spikes cylindrical. Fruits ovoid.

Flowers & Fruits: August to December.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0023*, dated 05. 02. 2007.

Local distribution: Bochamari Beel.

General Distribution: India: West Bengal, Sikkim, Madhya Pradesh, Uttar Pradesh, Karnataka, Goa, Maharashtra; Bhutan, Nepal, Japan, Kazakhstan, Korea, Pakistan, Russia, Tajikistan, Thailand, Uzbekistan; Cosmopolitan: Africa, Asia, Europe, Australia, introduced into New Zealand, North & South America.

Potamogeton nodosus Poiret, Encycl. Meth. Bot. Suppl. 4: 535. 1810; Majumdar, Bull. Bot. Soc. Beng. 20(2): 78. 1966; Noltie, Fl. Bhutan 3(1): 170. 1994; Cook, Aqua. Wetl. Pl. Ind. 333, 1996; Hajra *et al.*, Fl. Sikkim 1: 196, 1996; *Potamogeton indicus* Roxburgh, Fl. Ind. 1: 471. 1820 (*nomen illegitimate*); Hooker *f.*, Fl. Brit. Ind. 6: 565. 1893; Prain, Beng. Pl. 2: 845. 1903. *Potamogeton mexicanus* A. Bennett, J. Bot. 25: 289. 1887. *Potamogeton roxburghianus* Schultes & Schultes *f.*, Mant. 3: 367. 1827. *Potamogeton peruviana* C. Presl, J. Bot. 28: 298. 1890.

Aquatic herbs, stem terete, branched, length depends upon the depth of the water. Upper leaves floating, petiolate; lamina oblong or elliptic-lanceolate, entire, acuminate, base acuminate, coriaceous, glossy, many nerved. Spike 3–4 cm long, dense flowered, green. Flowers bisexual. Druplets long beaked, oblique.

Flowers & Fruits: September to March.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0035*, dated 05. 02. 2007.

Local Distribution: Bochamari Beel.

General Distribution: India, Sri Lanka, Malaya, Temperate and Tropical region.

Order: Asparagales Bromhead (1838)

Amaryllidaceae S.C. Chen, Acta Phytotax. Sin. 19(3): 323. 1981.

CRINUM Linnaeus, Gen. ed. I. 97. 1737.

Crinum amoenum Roxburgh *ex* Ker Gawler, J. Sci. Arts (London) 3: 106. 1817; Hajra *et al.*, Fl. Sikkim 1: 137. 1996. *Crinum himalense* Royle, Ill. Bot. Himal. Mts. 374. 1839. *Crinum verecundum* Carey *ex* M. Roemer, Fam. Nat. Syn. Monogr. 4: 75. 1847. *Crinum amoenum*

Roxburgh, Fl. Ind. 2: 127. 1832; Hooker *f.*, Fl. Brit. Ind. 6: 282. 1892; Noltie, Fl. Bhutan 3(1): 83. 1994.

Bulbs subglobose. Leaves spreading, ensiform, margins narrow membranous, acute. Umbels on long solid, purplish scape with 3 – 10 white; flowers fragrant; perianth white; anthers versatile. Capsules subglobose.

Flowers & Fruits: June to August.

Specimen Cited: Forest, Rajib & AP Das 0170, dated 08. 02. 2007.

Local Distribution: In plantation forests.

General Distribution: India: West Bengal, Sikkim, Assam; Sri Lanka, Bhutan, Bangladesh, China, Myanmar.

Hypoxidaceae R. Brown in Flinders, Voy. Terra Austr. 2: 576. 1814 ('Hypoxidaeae'); *nom. cons.*

Key to the genera:

- 1a. Inflorescences from base of stem, 4 to 6 flowered raceme *Curculigo*
- 1b. Inflorescences from node of stem, flowers more than 5 in raceme *Molineria*

CURCULIGO Gaertner, Fruct. i. 63. t. 16. 1788.

Curculigo orchioides Gaertner, Fruct. Sem. Pl. 1: 63, t. 13. 1788; Hooker *f.*, Fl. Brit. India 6: 279. 1894; Prain, Beng. Pl. 2: 1059. 1903; Noltie, Fl. Bhut. 3(1): 69. 1994; Hajra *et al.*, Fl. Sikkim 1: 139. 1996. *Curculigo brevifolia* Dryander in Aiton, Hort. Kew. 2(2): 253. 1811. *C. malabarica* Wight, Ic. t. 2043. A, f. 1. 1853. *Curculigo orchioides* var. *minor* Bentham, Fl. Hongk. 366. 1861.

Rhizomes erect, subcylindric. Leaves in rosette, sessile to shortly petiolate; lamina lanceolate to linear, usually 10 – 55 × 1 – 2.5 cm, narrowly acuminate. Racemes umbellate, 4 to 6 flowered. Pedicel 2 mm. Perianth yellow; segments oblong-lanceolate, 8 – 10 × 2 – 3 mm. Stamens half as long as perianth segments. Ovary narrowly oblong. Stigma lobes longer than style. Berry subfusiform.

Flowers & Fruits: April to September.

Specimen Cited: Forest, Rajib & AP Das 0140, dated 07. 02. 2007.

Local Distribution: In plantation forests.

General Distribution: Pakistan, India, Myanmar, Thailand, Cambodia, Indonesia, Japan, Laos, Papua New Guinea, Philippines, Vietnam.

MOLINERIA Colla, Hort. Ripul. App. ii. 333. t. 18. 1826.

Molineria capitulata (Loureiro) Herbert, Amaryllidaceae 84. 1837; Fl. Jow. 2: 533. 1987; Noltie, Fl. Bhut. 3(1): 67. 1994. *Leucojum capitulatum* Loureiro, Fl. Cochinch. 199. 1790. *Curculigo capitulata* (Loureiro) Kuntze, Rev. Gen. Pl. 2: 703. 1891; Hajra *et al.*, Fl. Sikkim 1: 1139. 1996; *Leucojum capitulatum* Loureiro, Fl. Cochinch. 199. 1790. *Curculigo recurvata* Dryander in Aiton, Hort. Kew 2(2): 253. 1811; Hooker *f.*, Fl. Brit. India 6: 278. 1894; Prain, Beng. Pl. 2: 1059. 1903. *Molineria recurvata* (Dryander) Herbert, Amaryllidaceae 84. 1837.

Herbs up to 1 m. Rhizomes tuberous. Leaves 4 to 7 in rosette; petiole 30 – 70 cm; lamina oblong-lanceolate, 40 – 70 × 5 – 15 cm, acuminate. Flowering stems brown villous. Racemes nodding, capitate to subovoid, densely many flowered. Perianth yellow; segments ovate-oblong. Stamens 5 mm. Ovary subglobose to oblong. Style longer than stamens. Berry white. Seeds black.

Flower & Fruit: April to May

Specimen Cited: Forest, Rajib & AP Das 0196, dated 09. 02. 2007.

Local Distribution: Backside of conservatory areas.

General Distribution: Subtropical and temperate Himalayas, India, Sri Lanka, Bhutan, Myanmar, Malaysia, Indochina, China, Australia.

Orchidaceae A. L. de Jussieu, Gen. Pl. 64. 1789 ('Orchideae').

Key to the genera:

- | | |
|---|-----------------------------|
| 1a. Roots through out leaf sheath | <i>Vanda</i> |
| 1b. Roots from the base and nodes | 2 |
| 2a. Roots fasciculate | <i>Dendrobium</i> |
| 2b. Roots not fasciculate | 3 |
| 3a. Stem covered by leaf sheath | 4 |
| 3b. Partially upper parts of nodes covered by leaf sheath | 5 |
| 4a. Petals yellow, blotched with brown | <i>Acampe</i> |
| 4b. Petals pinkish-purple | <i>Aeridis</i> |
| 5a. Stem stout; racemes dense flowered | <i>Rhynchostylis</i> |
| 5b. Stem slender; racemes with lax flowered | <i>Papilionanthe</i> |

RHYNCHOSTYLIS Blume, Bijdr. 285 ["Rynchostylis"], 434. 1825.

Rhynchostylis retusa (Linnaeus) Blume, Bijdr. 285.t. 49. 1825; Pearce *et* Cribb, Fl. Bhu. 3 (3): 552. 2002. *Epidendrum rentusum* Linnaeus, Sp. Pl. 953. 1753.

Epiphytic herb; stem stout, sheathed at base; pseudobulb absent, leaves oblong, curved, channeled, sessile. Flowers pink, mark with purple, in many flowered drooping racemes; bracts ovate, persistent, sepals ovate, obtuse, petals oblong, obtuse; fruits three angled capsule.

Flowers & Fruits: April to December.

Specimen Cited: Atiamochar, Rajib & AP Das 0474, dated 23.7.2007.

Local Distribution: Throughout Forests.

General Distribution: Throughout India; Bhutan, Nepal, Java, Malaysia, Myanmar, Thailand.

PAPILIONANTHE Schlechter, Orchis 9: 78. 1915.

Papilionanthe teres (Roxburgh) Schlechter, Orchis 9: 78. 1915; Pearce *et* Cribb, Fl. Bhu. 3 (3): 536. 2002. *Dendrobium teres* Roxburgh, Fl. Ind. 3: 485. 1832. *Vanda teres* (Roxburgh) Lindl, Gen. & Sp. Orchis. 217. 1833; Hooker *f.* in Hooker *f.*, Fl. Brit. Ind. 6: 49. 1890.

Epiphytic herbs; stem slender, cylindrical, greenish. Leaves fleshy, teret. Flowers pink, 5 cm. Long, in simple lax axillary racemes. Sepals broadly oblong, petals sub orbicular, narrowed to the base; lip 3-lobed, marked with crimson spotted lines.

Flowers & Fruits: April to September.

Specimen Cited: Takomari, Rajib & AP Das 0500, dated 23.07.2007.

Local Distribution: Throughout Forests.

General Distribution: North Eastern India, Andaman and Nicobar Island; Bhutan, Bangladesh, Bhutan, Nepal, Myanmar, Thailand.

VANDA Jones *ex* R. Brown, Bot. Reg. 6: ad t. 506. 1820.

Vanda griffithii Lindle in Paxton's Fl. Gard. 2: 22. 1851-52; Pearce *et* Cribb, Fl. Bhu. 3 (3): 575. 2002. *Luisia griffithii* (Lindle) Kranzlin, Xenia Orchid. 3: 119. 1893. *Trudelia griffithii* (Lindle) Garay, Orchid. Dig. 50 (2): 76. 1986.

Epiphytic; often forming large clumps, roots piercing through leaf sheaths, stem erect, sheathed, 7-13 cm long, leaves weakly curved, oblong, 3 lobed, 9 – 15 x 1 – 1.4 cm. Inflorescence many from leaf sheath, laxly 4 flowered. Flower bracts ovate to triangular; sepals and petals greenish- yellow, lip greenish with soft purple veins, column white, ovary slender, winged. Dorsal sepal lanceolate to obovate, obtuse, lateral sepal pendent, lanceolate, sub acute, lip 3- lobed, saccate at base.

Flowers & Fruits: March to June.

Specimen Cited: Atiamochar, Rajib & AP Das 0239, dated 09. 02. 2007.

Local Distribution: Throughout Forests.

General Distribution: India throughout; Bhutan, China, Sri Lanka, South East Asia, Philippines, Australia, New Guinea, Malaysia.

ACAMPE Lindley, Fol. Orchid. 4(Acampe): 1. 1853, *nom. cons.*

Acampe papillosa (Lindle) Lindle, Fol. Orchid. Acompe 4: 2. No. 5. 1853; Pearce *et* Cribb, Fl. Bhu. 3(3): 491. 2002. *Saccolabium papillosum* Lindle, Bot. Reg. 18: t. 1552. 1833. *Saccolabium cariantum* Griffith, Not. Pl. Asiat. 3: 354. 1851. *Gastrochilus papillosum* (Lindle) Kuntze, Revis. Gen. Pl. 2: 661. 1891.

Plant epiphytic, roots arising from nodes. Stem elongate, branched, scandent, covered by leaf sheath. Leaves coriaceous, oblong, obliquely notched at apex, jointed, sessile. Inflorescence racemose, many flowered, peduncle sheathed at base, bracts semi circular to triangular, sepals oblong to elliptic, obtuse, yellow, linear to elliptic, obtuse; petals yellow, blotched with brown, linear to elliptic, obtuse; lip whitish, 3- lobed; pedicel and ovary 5 – 6 mm long. Column short, thick.

Flowers & Fruits: November to May.

Specimen Cited: Atiamochar, Rajib & AP Das 0527, dated 23.07.2007.

Local Distribution: Throughout Forests.

General Distribution: North Eastern to North western India; Bhutan, Nepal, Bangladesh, Myanmar, Thailand, Vietnam and Laos.

DENDROBIUM Swartz, Nova Acta Regiae Soc. Sci. Upsal., ser. 2, 6: 82. 1799, *nom. cons.*

Dendrobium aphyllum (Roxburgh) C. E. C. Ficher in Gamble, Fl. Madras 3: 1416. 1928; Pearce *et* Cribb, Fl. Bhu. 3 (3): 406. 2002. *Limodorum aphyllum* Roxburgh, Pl. Coromandel 1: 34. t. 41. 1795. *Cymbidium aphyllum* (Roxburgh) Swartz, Ventensk. Acad. Nya. Handl. 6: 73. 1799. *Dendrobium cucullatum* Robert Brown, Bot. Reg. 7: t. 548. 1821.

Epiphytic; roots fasciculate. Stem pendant, slender, expanded at nodes; inter node sheathed. Leaves ovate to lanceolate, sub acuminate, sessile, distichous. Inflorescence lateral, arising from nodes of old stems, 1 flowered, bracteate, fragrant, scarious, sepals and petals pink to purple, lip pale yellow, shortly clawed, broadly sub orbicular, pubescent, convolute over the column; pedicel and ovary slender.

Flowers & Fruits: March to May.

Specimen Cited: Takomari, Rajib & AP Das 0233, dated 09. 02. 2007.

Local Distribution: Throughout Forests.

General Distribution: India, Bhutan, China, Nepal, Myanmar, Thailand, Vietnam to Malaysia.

Aeridis multiflorum Roxburgh, Pl. Coromandel 3: 67. t. 271. 1820; Pearce *et* Cribb, Fl. Bh. 3(3): 493. 2002. *Aeridis affine* Lindle, Gen. Sp. Orch. Pl.: 239. 1833. *Epidendrum geniculatum* Buchanan - Hamilton *ex* Hooker *f.*, Fl. Brit. Ind. 6: 1.45. 1890.

Epiphytes. Root flashy, fibrous, thick. Stem many leaved, covered by persistent leaf sheath. Lamina oblong, weakly curved, distichous. Inflorescence racemes, from leaf-sheath, densely many flowered; peduncle sheathed; bracts triangular-ovate, flowers fragrant, sepals and petals pinkish-purple. Apex often spotted with darker amethyst- purple, lip light amethyst purple, clawed geniculate, 3 –lobed, spur porrect, straight and compressed, column white.

Flowers & Fruits: May to July.

Specimen Cited: Atiamochar, *Rajib & AP Das 0749*, dated 22. 05. 2008.

Local Distribution: Throughout Forests.

General Distribution: North Eastern India; Bhutan, Nepal, Myanmar, China, Bangladesh, Thailand, Vietnam, Cambodia.

Order: Dioscoreales Hook.f. (1873)

Burmanniaceae Blume, Enum. Pi. Jav. 1: 27. 1830. *nom. cons.*

BURMANNIA Linnaeus, Sp. Pl. 1: 287. 1753.

Burmattia coelestis D. Don, Prodr. Fl. Nepal. 44. 1825; Prain, Beng. Pl. 2: 998. 1903; Noltie, Fl. Bhut. 3(1): 91. 1994; Hajra *et al.*, Fl. Sikkim 1: 23. 1996. *Burmattia triflora* Roxburgh, Fl. Ind. 2: 117. 1832. *Burmattia javanica* Blume, Enum. Pl. Javae 1: 28. 1827. *Burmattia bifurca* Hamilton *ex* Hooker *f.*, Fl. Brit. India 5: 665. 1888.

Small erect herbs. Stems green. Leaves few in basal rosette; cauline leaves linear, 1 – 3 x 0.2 – 0.5 cm. Racemes terminal, 2– 4 flowered. Flowers pedicellate to subsessile, bluish purple with yellow tepals. Perianth tube 4–12 mm; outer tepals ovate triangular, margin double. Stamens sessile. Capsule obovoid.

Flowers & Fruits: July to October.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0428*, dated 22. 07. 2007.

Local Distribution: Marshy low land of conserved sector.

General Distribution: India, Bangladesh, Nepal, Myanmar, Thailand, Malaysia, Cambodia, Indonesia, Laos, New Guinea, Vietnam, Australia.

Dioscoreaceae R. Brown, Prodr. 1: 294. 1810 ('Dioscoreae'). *nom. cons.*

DIOSCOREA Linnaeus, Sp. Pl. 2: 1032. 1753.

Key to the Species:

- 1a. Leaves palmately 3 – 7 foliolate *D. pentaphylla*
- 1b. Leaves simple 2
- 2a. Stem twining to right *D. pubera*
- 2b. Stem twining to left 3
- 3a. Plant densely hairy *D. bulbifera*
- 3b. Plants glabrous *D. esculenta*

Dioscorea bulbifera Linnaeus, Sp. Pl. 1: 1033. 1753; Prain, Beng. Pl. 2: 1066. 1903; Hara, Fl. East. Himal. 1: 419. 1966; Noltie, Fl. Bhut. 3(1): 9. 1994. *Dioscorea sativa* Thunberg, Fl. Jap. 151. 1784; *non* Linnaeus, 1753; Hooker *f.*, Fl. Brit. Ind. 6: 295. 1892. *Dioscorea latifolia* Benthams, Niger Fl. 535. 1849. *Dioscorea pulchella* Roxburgh, Fl. Ind. 3: 801. 1832.

Vernacular Name: Metay aalu.

Tuber solitary, ovoid; roots fibrous. Stem twining to left. Bulblets purplish brown with orbicular spots. Leaves alternate, lamina broadly cordate, 9 – 17 × 4 – 14 cm, entire, caudate-acuminate. Male spikes usually clustered in leaf axils. In female flowers- staminodes 6. Capsule reflexed or drooping, oblong-globose. Seeds inserted near apex.

Flowers & Fruits: June to February.

Specimen Cited: Village sector, *Rajib & AP Das 0330*, dated 21. 07. 2007.

Local Distribution: Cultivated in village areas.

General Distribution: A native of Old World; India, Nepal, Sri Lanka.

Dioscorea esculenta (Loureiro) Burkill, Gard. Bull. Straits Settlem. 1: 396. 1917; Noltie, Fl. Bhut. 3(1): 8. 1994; Hajra *et al.*, Fl. Sikkim 1: 141. 1996. *Onchus esculentus* Loureiro, Fl. Coch. 194. 1790. *Dioscorea spinosa* Roxburgh *ex* Wallich, Numer. List n. 5103. 1830. *Dioscorea fasciculata* Roxburgh, Fl. Ind. 3: 801. 1832; Prain, Beng. Pl. 2: 1066. 1903. [PLATE: 9, Figure-102]

Vernacular Name: Mete Alu.

Twining to left with large unequal tubers; densely hairy; stems prickly. Lamina simple, reniform or orbicular, acuminate or cuspidate, base cordate, 5 – 7 veined. Male spikes erect, sessile or shortly pedicellate; bracteoles very broad. Female racemes short. Capsules obcordate; seeds broadly winged.

Flowers & Fruits: September to January.

Specimen Cited: Village sector, *Rajib & AP Das 0341*, dated 21. 07. 2007.

Local Distribution: Cultivated in villages.

General Distribution: Cultivated in tropical Asia.

Dioscorea pentaphylla Linnaeus, Sp. Pl. 1: 1032. 1753; Hooker *f.*, Fl. Brit. India 6: 289. 1892; Prain, Beng. Pl. 2: 1066. 1903; Hara, Fl. East. Himal. 1: 420. 1966; Noltie, Fl. Bhut. 3(1): 10. 1994. *Dioscorea jacquemontii* Hooker *f.*, Fl. Brit. India 6: 290. 1892. *Dioscorea digitata* Miller, Gard. Dict. 8: 6. 1768. *Dioscorea pentaphylla* var. *jacquemontii* (Hooker *f.*) Prain & Burkill, J. Proc. Asiat. Soc. Bengal 10(1): 23. 1914.

Vernacular Name: Panchpata.

Tubers irregular, long-ovoid; blaze white when fresh, becoming brown. Stem twining to left, prickly. Leaves alternate, palmately 3 – 7 foliolate; petiole 7 – 10 cm; leaflets ovate to lanceolate, 7 – 20 × 2 – 7 cm, pinnately veined, base attenuate, entire, acute. Male spikes in axillary panicles with long, lateral branches; axis brown pubescent. Female spikes simple or branched, brown puberulent. In female flowers bracts, perianth, and ovary hairy. Capsule long ellipsoid.

Flowers & Fruits: September to February.

Specimen Cited: Forest, *Rajib & AP Das 0337*, dated 21. 07. 2007.

Local Distribution: In plantation forests.

General Distribution: India, Bangladesh, Sri Lanka, Myanmar, tropical Africa.

Dioscorea pubera Blume, Enum. Pl. Javae 1: 21. 1827; Noltie, Fl. Bhut. 3(1): 14. 1994. *Dioscorea anguinea* Roxburgh, Fl. Ind. 3: 803. 1832; Hooker *f.*, Fl. Brit. Ind. 6: 293. 1892; Prain, Beng. Pl. 2: 1066. 1903. *Dioscorea cornifolia* Kunth, Enum. Pl. 5: 385. 1850.

Tubers 1 or 2, narrowly cylindrical, rootlets few, flesh lemon yellow. Stem twining to right, lacking prickles, shortly pubescent; bulbeles sometimes produced. Leaves alternate-subopposite; lamina

ovate, cuspidate to shortly caudate, base shallowly cordate, margins cartilaginous, persistently pubescent beneath.

Flowers & Fruits: August to January.

Specimen Cited: Forest, Rajib & AP Das 0324, dated 21. 07. 2007.

Local Distribution: In forest areas.

General Distribution: Himalayas, India, Myanmar, Sumatra, Java.

Order: Liliales Perleb (1826)

Smilacaceae Ventenat, Tabl. Regne V6g. 2: 146. 1799 ('Smilacae'); *nom. cons.*

SMILAX Linnaeus, Sp. Pl. 2: 1028. 1753.

Key to the Species:

1a. Lamina ovate, peduncles slightly zigzagged, berries globose *S. perfoliata*

1b. Lamina ovate - elliptic, peduncles stout, berries oblong;..... *S. zeylanica*

Smilax perfoliata Loureiro, Fl. Cochinch. 2: 622. 1790; Noltie, Fl. Bhutan 3(1): 28. 1994; Hajra *et al.*, Fl. Sikkim 1: 165. 1996. *Smilax prolifera* Roxburgh, Fl. Ind. 3: 795. 1832; Prain, Beng. Pl. 2: 1071. 1903.

Climbing shrubs. Stem branched, woody. Petiole 2–4 cm, broadly winged; wings 7–10 mm wide. Lamina usually ovate, 6–15 × 3–10 cm. umbels in panicles with slightly zigzagged rachis, 15–30 flowered. Male flowers: stamens 3–5 mm. Female flowers: tepals slightly smaller than male ones; staminodes 3. Berries globose.

Flowers & Fruits: Not recorded.

Specimen Cited: Forest, Rajib & AP Das 0242, dated 09. 02. 2007.

Local Distribution: In plantation forests.

General Distribution: India, Myanmar, Thailand, Laos, Vietnam.

Smilax zeylanica Linnaeus, Sp. Pl. 1: 1029. 1753; Hooker *f.* in Fl. Brit. India 6: 309. 1892; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 79. 1978; Hajra *et al.*, Fl. Sikkim 1: 166. 1996. *Smilax collina* Kunth, Enum. Pl. 5: 261. 1850.

Vernacular Name: Kukur dainy.

Shrubby climbers. Branchlets striate, glabrous, prickly. Tendrils simple, glabrous. Lamina ovate–elliptic, entire, acute, base cuneate. In female umbels peduncles stout; receptacle globose. Receptacles in male umbels globose with brown bracteoles, flower buds oblong. Berries red when ripen.

Flowers & Fruits: March to December.

Specimen Cited: Forest, Rajib & AP Das 0335, dated 21. 07. 2007; Forest, Rajib & AP Das 0285, dated 10. 02. 2007.

Local Distribution: In plantation forests.

General Distribution: Tropical Himalayas, India: West Bengal, Assam, Bihar; Bhutan, Nepal, China, Bangladesh, Myanmar.

Commelinids

Order: Arecales Bromhead (1840)

Areaceae C. H. Schultz, Nat. Syst. Pflanz. 317. 1832 (nom. alt. vs. Palmae); *nom. cons.*

Key to the genera:

- 1a. Leaves twice pinnate; leaflets wedge shaped ***Caryota***
- 1b. Leaves simply pinnate 2
- 2a. Leaf rachis spiny; slender climber ***Calamus***
- 2b. Leaf rachis not spiny; not climbing but with slender to stout trunk ... 3
- 3a. Inflorescence interfoliar 4
- 3b. Inflorescence intrafoliar ***Cocos***
- 4a. Stem 10 – 18 cm in diameter throughout; inflorescence branched
to only 3 order ***Areca***
- 4b. Stem swollen at base with 30 – 60 cm diameter, often irregularly
swollen at the middle portion, upward gradually narrowed; inflorescence
branched generally to 2 order ***Roystonea***

ARECA Linnaeus, Sp. Pl. 2: 1189. 1753.

Areca catechu Linnaeus, Sp. Pl. 1189. 1753; Hajra *et al.*, Fl. Sikkim 1: 180. 1996; Noltie, Fl. Bhut. 3(1): 430. 1994; Prain, Beng. Pl. 2: 1097. 1903. *Areca cathechu* Burman f., Fl. Indica 241. 1768. *Areca hortensis* Loureiro, Fl. Cochinch. 568. 1790.

Vernacular Name: Supari.

Trunk green when young, distant annual scars, 10 – 18 cm in diameter throughout. Leaves pinnate; leaflets narrow. Calyx minute in male flowers; corolla lobes lanceolate, ribbed. Calyx lobed to base in females, oblong – ovate, imbricate; corolla lobes small. Fruits orange when ripe, large, mesocarp fibrous; nuts ellipsoid.

Flowers & Fruits: March to July.

Specimen Cited: Village sector, Rajib & AP Das 0089, dated 06. 02. 2007.

Local Distribution: Throughout; parks and village areas; commonly planted.

General Distribution: Widely cultivated throughout tropical Asia; origin probably C. Malaysia.

CALAMUS Linnaeus, Sp. Pl. 325. 1753.

Calamus tenuis Roxburgh, Fl. Ind. 3:780. 1832; Blatter, J. Bomb. Nat. Hist. Soc. 25(3): 392. 1918; Noltie, Fl. Bhut. 3(1): 421. 1994; Prain, Beng. Pl. 2: 1099. 1903. *Palmijuncus tenuis* (Roxburgh) Kuntze, Revis. Gen. Pl. 2: 734. 1891. *Calamus amarus* Loureiro, Fl. Cochinch. 210. 1790. *Calamus royleanus* Griffith, Calcutta J. Nat. Hist. 5: 40. 1845.

Vernacular Name: Bandari Bet.

Climbing shrubs, growing in clumps, stem large, slender. Leaves glabrous, pinnate, 40 – 70 cm long, leaflets 18 – 30 on each side, equidistant, alternate, linear lanceolate, acuminate, gradually becoming smaller upward, setose above. Petiole short; petiole and the nerves of the leaflets armed with straight spines. Leaf sheath armed with flat spines. Inflorescence very long, flexuose. Flowers minute. Fruit subglobose, mucronate.

Flowers & Fruits: April to October.

Specimen Cited: Forest, Rajib & AP Das 0055, dated 07. 02. 2007.

Local Distribution: Plantation forests.

General Distribution: India: West Bengal, Assam; Tropical Himalaya, Bangladesh, Bhutan, Myanmar.

CARYOTA Linnaeus, Sp. Pl. 1189. 1753.

Caryota urens Linnaeus, Sp. Pl. 1181. 1753; Noltie, Fl. Bhut. 3(1): 428. 1994; Hajra *et al.*, Fl. Sikkim 1: 182. 1996; Prain, Beng. Pl. 2: 1093. 1903.

Vernacular Name: Sagu Paam.

Tree, up to 25 m tall, stem blackish brown, 40–65 cm diameter throughout, surface not covered, leaf scars ringed. Leaves 3–5 m long; leaflets broadly cuneiform to narrowly oblique cuneiform, regularly toothed margins, tips irregularly cut with sharp angles. Cymba 1–2 m covering much branched numerous spikes. Fruits globose to oblate, red when ripe.

Flowers & Fruits: January to July.

Specimen Cited: Forest, Rajib & AP Das 0088, dated 06. 02. 2007.

Local Distribution: Planted near the entrance.

General Distribution: India, peninsula of Indo-china, Myanmar, Sri Lanka.

COCOS Linnaeus, Sp. Pl. 1188. 1753.

Cocos nucifera Linnaeus, Sp. Pl. 1188. 1753; Noltie, Fl. Bhut. 3(1): 430. 1994; Prain, Beng. Pl. 2: 1095. 1903. *Cocos indica* Royle, Ill. Bot. Himal. Mts. 395. 1840. *Cocos nana* Griffith, Not. Pl. Asiat. 3: 166. 1851. *Calappa nucifera* (Linnaeus) Kuntze, Revis. Gen. Pl. 2: 982. 1891.

Vernacular Name: Narkel.

Trees to 30 m tall, leaf scars ringed, enlarged towards the base. Leaves 3–4 m long; leaflets numerous, reduplicate, entire, linear lanceolate, 60–100 x 3–4 cm, acuminate. Inflorescence axially, branched multiple; cymba spindle shaped, thickly woody. Fruits ovoid to subglobose, slightly trigonous apical.

Flowers & Fruits: Round the year.

Specimen Cited: Village sector, Rajib & AP Das 0090, dated 07. 02. 2007.

Local Distribution: In the villages.

General Distribution: Cultivated throughout Asia.

ROYSTONEA O.F. Cook in Sci. Ser. 2. 12: 479. 1900.

Roystonea regia (Humboldt, Bonpland & Kunth) O.F. Cook, Sci. Ser. 2. 12: 479. 1900. *Oreodoxa regia* Humboldt, Bonpland & Kunth, Nov. Gen. & Sp. Pl. 1: 244. 1815. *Oenocarpus regius* (Humboldt, Bonpland & Kunth) Sprengel, Syst. Veg. 2: 140. 1825. *Roystonea elata* (W. Bartram) F. Harper, Proc. Biol. Soc. Wash. 59: 29. 1946. *Roystonea regia* var. *hondurensis* P.H. Allen, Ceiba 3: 17. 1952.

Vernacular name: Palm.

Trees to 20 m tall, swollen at base, often irregularly swollen at the middle portion, upward gradually narrowed. Leaves 4–5 m long; leaflets 150 to 250 on both side of rachis; leaflets 4-farious, linear lanceolate, acuminate; terminal leaflets shorter. Inflorescence interfolier, branched, 2 and 3 order. Female flowers only at base of rachillae.

Flowers & Fruits: December to April.

Specimen Cited: Park, Rajib & AP Das 0092, dated 07. 02. 2007.

Local Distribution: Often planted in parks and villages.

General Distribution: Usually planted in tropical areas as avenue tree.

Order: Commelinales Dumortier (1829)**Commelinaceae** R. Brown, Prodr. 1: 268. 1810 ('Commelineae'); *nom. cons.***Key to the genera:**

- 1a. Inflorescence within leaf sheath, sessile *Amischotolype*
 1b. Inflorescence outside of leaf sheath, stalked 2
 2a. Fruits indehiscent baccate *Pollia*
 2b. Fruits dehiscent capsular 3
 3a. Inflorescence broomlike, with innumerable small flowers; capsule
 2-valved *Floscopa*
 3b. Inflorescence not broomlike, with few flowers; capsule 3-valved 4
 4a. Involucral bracts spathe-like 5
 4b. Involucral bracts absent or spreading or sheathlike *Murdannia*
 5a. Petals connate with 2 ends free; bracts imbricately arranged in
 2 rows *Cyanotis*
 5b. Petals wholly free; bracts not imbricately arranged in 2 rows *Commelina*

AMISCHOTOLYPE Hasskarl, Flora 46: 391. 1863.

Amischotolype hookeri (Hasskarl) Hara, Fl. East. Himal. 1: 399. 1966; Noltie, Fl. Bhut. 3(1): 223. 1994; Hajra *et al.*, Fl. Sikkim 1: 167. 1996; *Forrestia hookeri* Hasskarl, Flora 47: 629. 1864; Prain, Beng. Pl. 2: 1086. 1903.

Perennial herbs. Stems erect, distally branched. Leaf sheaths overlapping in distal part of stem; lamina elliptic, 25 – 30 × 5 – 10 cm, adaxially sparsely hispid or glabrous, abaxially yellow hirsute along veins, entire, caudate-acuminate, base cuneate. Heads with up to 10 flowers, within leaf sheath, sessile. Sepals ovate-oblong, 5 × 4 mm, sub-glabrous. Petals pale purple to reddish. Capsule ovoid, trigonous, rugose.

Flowers & Fruits: June to July.

Specimen Cited: Varveri Beel, Rajib & AP Das 0148, dated 08. 02. 2007.

Local Distribution: Marginal low land areas of open fishing part.

General Distribution: Bangladesh, Bhutan, India, Laos, Myanmar, Nepal, Vietnam.

COMMELINA Linnaeus, Sp. Pl. 1: 40. 1753.

Key to the species:

- 1a. Lamina elliptic-ovate; capsule 5 seeded *C. benghalensis*
 1b. Lamina ovate-lanceolate or linear-lanceolate; capsules 2 – 3 seeded 2
 2a. Leaves scabridly pubescent; ovary 2 celled *C. suffruticosa*
 2b. Leaves glabrous with only a few hairs at mouth or hirsute throughout; ovary 3 celled ... 3
 3a. Leaves acute; spathes 2 – 3 cm 4
 3a. Leaves acuminate; spathes 2 – 4 cm *C. longifolia*
 4a. Spathes conduplicate or free margins *C. diffusa*
 4b. Spathes funnel shaped or fused margins *C. paludosa*

Commelina benghalensis Linnaeus, Sp. Pl. 1: 41. 1753; Hooker *f.*, Fl. Brit. Ind. 6: 370. 1892; Noltie, Fl. Bhut. 3(1): 238. 1994; Hajra *et al.*, Fl. Sikkim 1: 168. 1996; Prain, Beng. Pl. 2: 1082.

1903; Cook, Aqua. Wetl. Pl. Ind. 86, 1996; Guha Bakshi, Fl. Mur. Dist. 326. 1984.

Vernacular Name: Kanchera.

Perennial herbs. Stems mostly creeping. Leaf sheaths sparsely hirsute-ciliate; lamina ovate, 3 – 6 × 1.5 – 3 cm, subglabrous. Involucral bracts borne opposite to leaves, often several, aggregated at branch-tips, proximal margins connate, acute. Proximal branch of cincinni with elongate peduncle and 1 – 3 exserted, flowers sterile, distal branch longer with fertile flowers. Sepals 2 mm, membranous. Petals blue, free, 5 mm. Chasmogamous flowers underground. Capsule ellipsoid, dehiscent.

Flowers & Fruits: January- September

Specimen Cited: Forest, Rajib & AP Das 0156, dated 08. 02. 2007.

Local Distribution: Forests and road side.

General Distribution: India, Bangladesh, Myanmar, Java and Hong Kong.

Commelina diffusa Burman f., Fl. Indica 18. t. 7. f. 2. 1768; Datta & Majumdar, Bull. Bot. Soc. Bengal 20(2): 39. 1966; Noltie, Fl. Bhutan 3(1): 237. 1994; Cook, Aqua. Wetl. Pl. Ind. 86, 1996; Hajra *et al.*, Fl. Sikkim 1: 168. 1996; *Commelina nudiflora* auct. non Linnaeus, Sp. Pl. 1: 41. 1753; Hooker f., Fl. Brit. Ind. 6: 369. 1892; Prain, Beng. Pl. 2: 1082. 1903.

Vernacular Name: Kanchera.

Annual herbs. Stems creeping, branched. Leaves subsessile; lamina lanceolate, 3 – 10 × 1 – 3 cm. Spathes conduplicate. Involucral bracts borne opposite to leaves, folded, ovate-lanceolate, acuminate. Cincinni dichotomously branched from base; 1 – 4 long exserted male flowers; other branches with much shorter peduncle and 3 – 5 bisexual flowers. Sepals 3 – 4 mm, membranous. Petals blue, free, 2 longer ones 5 mm. Capsule oblong, trigonous.

Flowers & Fruits: January to September

Specimen Cited: Forest, Rajib & AP Das 0182, dated 09. 02. 2007.

Local Distribution: Forests and road side.

General Distribution: Pantropical.

Commelina longifolia Lamarck, 111. Gen. 1: 129. 1791; Cook, Aqua. Wetl. Pl. Ind. 85, 1996; Khan & Alam, Fl. Banglad. 4: 22. 1977. *Commelina salicifolia* Roxburgh, Fl. Ind. 1: 172. 1832; Hooker f., Fl. Brit. Ind. 6: 370. 1892; Prain, Beng. Pl. 2: 1082. 1903. *Commelina pedunculosa* Sprengel & Link, Jahrb. Gewächsk. 1(3): 74. 1820.

Vernacular Name: Pani Kanchera.

Stem slender, diffuse or spreading with long internodes; rooting from the basal nodes. Lamina glabrous, linear or linear-lanceolate, acute; sheath ciliate. Spathe axillary, ovate to ovate-lanceolate usually acuminate. Flowers blue. Petals free. Capsule upto 6 mm long, broadly oblong, 3-celled; seeds 2 – 4 mm long, ovoid, smooth, appendiculate.

Flowers & Fruits: July to January.

Specimen Cited: Barojan Beel, Rajib & AP Das 0216, dated 09. 02. 2007.

Local Distribution: Throughout the study area.

General Distribution: India, Java and Hong Kong.

Commelina suffruticosa Blume, Enum. Pl. Jav. 1: 3. 1827-28; Hooker f., Fl. Brit. Ind. 6: 374. 1892; Noltie, Fl. Bhut. 3(1): 236. 1994; Hajra *et al.*, Fl. Sikkim 1: 169. 1996; Prain, Beng. Plants 2: 1083. 1903. *Commelina rugulosa* C.B. Clarke, J. Linn. Soc., Bot. 11: 446. 1871. *Commelina simsonii* C.B. Clarke, J. Linn. Soc., Bot. 11: 446. 1871. *Spathodithyros suffruticosus* (Blume) Hasskârl, Commelin. Ind. 11. 1870.

Vernacular Name: Kanchera.

Perennial herbs. Stems erect or ascending, branched only distally, glabrous. Leaf sheaths sparsely hirsute ciliate; lamina lanceolate to ovate lanceolate, 8 – 10 × 3 – 5 cm, glabrous on both surfaces. Involucral bracts borne opposite to leaves, broadly cordate, obtuse. Cincinni 4 flowered; pedicels 3 mm, twisted in fruit. Petals white, free. Capsule sub globose, 2 valved. Seeds 1 per valve.

Flowers & Fruits: January to March.

Specimen Cited: Barojan Beel, *Rajib & AP Das 0201*, dated 09. 02. 2007.

Local Distribution: Throughout the study area.

General Distribution: India, Bangladesh, Nepal and Malaysia.

Commelina paludosa Blume, Enum. Pl. Jav. 1: 2. 1827; Hooker *f.*, Fl. Brit. India 6: 372. 1894; Hara *et al.*, En. Fl. Pl. Nepal 1: 82. 1978; Noltie, Fl. Bhut. 3(1): 235. 1994; Cook, Aqua. Wetl. Pl. Ind. 85, 1996; Hajra *et al.*, Fl. Sikkim 1: 169. 1996. *Commelina obliqua* Buchanan–Hamilton *ex* D. Don, Prodr. Fl. Nepal. 45. 1825 (*nomen illegitimate*); Hooker *f.*, Fl. Brit. India 6: 372. 1894; Prain, Beng. Pl. 2: 1083. 1903. *Commelina donii* A. Dietrich, Sp. Pl. 2: 895. 1832. *Commelina paludosa f. pedunculata* Qaiser & Jafrin, Fl. W. Pakistan 84: 13. 1975.

Vernacular Name: Jota Kanchera.

Perennial herbs. Stems often semi-erect. Leaves sessile; sheath densely brown hispid at mouth; lamina lanceolate to ovate-lanceolate, 9 – 18 × 3 – 6 cm. Spathes funnel shaped. Involucral bracts often 5 – 8, forming terminal heads, sessile, glabrous, proximal margins connate, acute. Cincinnus 1; peduncle 1 cm; flowers 1 to several; pedicels twisted. Sepals 3 – 6 mm, membranous. Petals blue, 5 – 8 mm. Capsules ovoid – globose, trigonous.

Flowers & Fruits: August to April.

Specimen Cited: Noldoba Beel, *Rajib & AP Das 0282*, dated 10. 02. 2007.

Local Distribution: Throughout the study area.

General Distribution: India, Nepal, Bhutan, Myanmar, China, Thailand, Malaysia, Laos, Vietnam, Cambodia, Indonesia.

CYANOTIS D. Don, Prodr. Fl. Nepal. 45. 1825, *nom. cons.*

Key to the species:

- 1a. Cincinni reduced, 3 - 6 in axillary fascicles *C. axillaris*
- 1b. Cincinni solitary, rarely terminal and also with flowers in axillary heads 2
- 2a. Capsule obovoid, roots not fibrous *C. vaga*
- 2b. Capsule columnar, roots fibrous *C. cristata*

Cyanotis axillaris (Linnaeus) D. Don *ex* Sweet, Hort. Brit. 430. 1826; Noltie, Fl. Bhut. 3(1): 222. 1994; Hajra *et al.*, Fl. Sikkim 1: 167. 1996; Prain, Beng. Pl. 2: 1085. 1903; Cook, Aqua. Wetl. Pl. Ind. 87, 1996. *Commelina axillaris* Linnaeus, Sp. Pl. 1: 42. 1753; *Cyanotis axillaris* (Linnaeus) Schultes *f.*, Syst. Veg. 7(2): 1154. 1830. *Tonningia axillaris* (Linnaeus) Kuntze, Revis. Gen. Pl. 2: 722. 1891. *Cyanotis disruptens* Hasskarl, Commelin. Ind. 105. 1870.

Annual herbs; roots fibrous. Stems creeping, branched, 25 – 40 cm. Leaves all cauline; lamina linear, 20 – 60 × 5 – 7 mm, abaxially glabrous. Cincinni reduced, in axillary fascicles of 3 – 6 flowers. Sepals free, linear spatulate, abaxially hirsute. Petals blue, connate with 2 ends free; bracts imbricately arranged in 2 rows. Filaments blue, lanate. Capsules oblong, trigonous.

Flowers & Fruits: June to September.

Specimen Cited: Forest, Rajib & AP Das 0721, dated 14. 02. 2008.

Local Distribution: Throughout the study area.

General Distribution: India, Sri Lanka, Myanmar, Malaysia, Indonesia, Cambodia, Laos, Philippines, Thailand, Vietnam, Oceania.

Cyanotis vaga (Loureiro) J.A. Schultes & J.H. Schultes, Syst. Veg. 7: 1153. 1830; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 82. 1978; Noltie, Fl. Bhut. 3(1): 220. 1994; Hajra *et al.*, Fl. Sikkim 1: 169. 1996. *Transescantic vaga* Loureiro, Fl. Cochinch. 193. 1790. *Cyanotis barbara* D. Don, Prodr. Fl. Nepal 46. 1825; Hooker *f.*, Fl. Brit. India 6: 385. 1894. *Commelina hirsuta* Hochstetter *ex* A. Richard, Tent. Fl. Abyss. 2: 344. 1850. *Tonningia vaga* (Loureiro) Kuntze, Revis. Gen. Pl. 2: 722. 1891. *Tradescantia vaga* Loureiro, Fl. Cochinch. 193. 1790.

Perennial herbs, bulbiferous. Bulbs globose. Stem branched, branching usually from base. Leaves all cauline; lamina linear to lanceolate, 4–12 cm × 0.3–1.5 cm. Cincinni solitary, rarely terminal and also with flowers in axillary heads. Sepals connate at base, oblong-lanceolate, abaxially white hirsute. Petals blue-purple, connate; bracts imbricately arranged in 2 rows. Filaments blue lanate. Capsule obovoid, trigonous. Seeds gray-brown, striate and finely reticulate.

Flowers & Fruits: July to October.

Specimen Cited: Forest, Rajib & AP Das 0729, dated 14. 02. 2008.

Local Distribution: Throughout the study area.

General Distribution: India, Nepal, Bhutan, Myanmar, Laos, Thailand, Vietnam.

Cyanotis cristata (Linnaeus) D. Don, Prodr. Fl. Nepal. 46. 1825; Noltie, Fl. Bhut. 3(1): 222. 1994; Hajra *et al.*, Fl. of Sikkim 1: 169. 1996; Prain, Beng. Pl. 2: 1085. 1903; Cook, Aqua. Wetl. Pl. Ind. 87, 1996. *Commelina cristata* Linnaeus, Sp. Pl. 1: 42. 1753; *Tonningia cristata* (Linnaeus) Kuntze, Revis. Gen. Pl. 2: 722. 1891. *Tradescantia cristata* (Linnaeus) Linnaeus, Syst. Nat. 12(2): 233. 1767. *Cyanotis imbricata* (Roxburgh) Kunth, Enum. Pl. 4: 103. 1843. *Tradescantia imbricata* Roxburgh, Fl. Ind. 2: 120. 1824.

Annual herbs; roots fibrous. Stems creeping, often branched, 10 – 30 cm. Leaves all cauline; lamina oblong, lanceolate to narrowly elliptic, 2 – 8 × 1 – 2 cm. Cincinni often solitary, terminal or also axillary. Sepals connate at base, linear-lanceolate to oblanceolate, abaxially hirsute along mid-vein and margin. Petals blue or purple, connate with 2 ends free, 4 – 5 mm; bracts imbricately arranged in 2 rows. Filaments blue, lanate. Capsules columnar, trigonous, 2.5 mm. Seeds gray-brown, pitted.

Flowers & Fruits: July to October.

Specimen Cited: Forest, Rajib & AP Das 0654, dated 13. 02. 2008.

Local Distribution: Throughout the study area.

General Distribution: India, Bhutan, Sri Lanka, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam.

FLOSCOPA Loureiro, Fl. Cochinch. 1: 189, 192. 1790.

Floscopa scandens Loureiro, Fl. Cochinch. 1: 193. 1790; Noltie, Fl. Bhut. 3(1): 225. 1994; Hajra *et al.*, Fl. Sikkim 1: 170. 1996; Prain, Beng. Pl. 2: 1086. 1903; Cook, Aqua. Wetl. Pl. Ind. 88, 1996. [PLATE: 6, Figure-55]

Perennial herbs. Stems 50 – 70 cm, simple, prostrate proximally. Leaves usually sessile or with short, winged petiole; lamina elliptic to lanceolate, 5 – 10 × 1–3 cm. Inflorescence broomlike, with extremely numerous small flowers; peduncle nearly absent; pedicels very short. Sepals shallowly

boat shaped. Petals blue - purple. Fertile stamens 6; filaments glabrous. Capsules ovoid, 2-valved, compressed. Seeds semi-ellipsoid.

Flowers & Fruits: July to November.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0671*, dated 13. 02. 2008.

Local Distribution: Margin of the Bochamari Beel.

General Distribution: India, Bhutan, Laos, Myanmar, Thailand, Vietnam; Oceania.

MURDANNIA Royle, Ill. Bot. Himal. Mts. 1: 403. 1840, *nom. cons.*

Key to the species:

1a. Lamina linear; inflorescence scorpioid cymose *M. nudiflora*

1b. Lamina ovate-lanceolate; inflorescence terminal panicle *M. spiralis*

Murdannia nudiflora (Linnaeus) Brenan, Kew. Bull. 7: 189. 1952; Noltie, Fl. Bhut. 3(1): 229. 1994; Hajra *et al.*, Fl. Sikkim 1: 171. 1996; Cook, Aqua. Wetl. Pl. Ind. 90, 1996. *Commelina nudiflora* Linnaeus, Sp. Pl. 1: 41. 1753. *Aneilema nudiflorum* (Linnaeus) R. Brown, Prodr. 271. 1810; Hooker *f.*, Fl. Brit. Ind. 6: 378. 1892; Prain, Beng. Pl. 2: 1084. 1903. *Commelina minuta* Blume, Catalogus 34. 1823. *Aneilema minutum* (Blume) Kunth, Enum. Pl. 4: 661. 1843.

Annual herbs. Roots fibrous. Rhizomes absent. Stems diffuse, creeping proximally. Leaves nearly all cauline; lamina linear to lanceolate, 3 – 10 × 0.5 – 1 cm, obtuse or acuminate. Involucral bracts absent or spreading or sheathlike. Cincinni several, in terminal panicles, several densely arranged flowers; peduncle slender; pedicels slender, straight. Sepals ovate-elliptic. Petals purple, obovate-orbicular. Fertile stamens 2. Capsules ovoid globose, trigonous.

Flowers & Fruits: October to April.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0613*, dated 11. 02. 2008.

Local Distribution: Marshy low land of conserved areas.

General Distribution: Pantropical.

Murdannia spirata (Linnaeus) G. Brueckner, Pfamilien. 2, 15a: 173. 1930 (ut “*spiratum*”); Noltie, Fl. Bhut. 3(1): 229. 1994; Cook, Aqua. Wetl. Pl. Ind. 91, 1996. *Commelina spirata* Linnaeus, Mant. Alt. 176. 1771. *Aneilema spiratum* (Linnaeus) R. Brown, Prodr. 271. 1810; Hooker *f.*, Fl. Brit. Ind. 6: 377. 1892; Prain, Beng. Pl. 2: 1084. 1903.

Perennial herbs. Roots fibrous. Rhizomes horizontal. Stems slender. Lamina narrowly ovate to lanceolate, 2 – 3.5 × 1 cm, margin undulate, obtuse to acute, base truncate, glabrous on both surfaces. Cincinni 1 – 4, forming terminal panicles; bracts very small; pedicels elongate. Sepals elliptic, persistent. Petals pale blue or nearly white, obovate-orbicular. Fertile stamens 3; staminodes 3. Capsules oblong, trigonous.

Flowers & Fruits: July to February.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0591*, dated 25. 07. 2007.

Local Distribution: Marshy low land of conserved areas.

General Distribution: India and Indo-Malaysia.

POLLIA Thunberg, Nov. Gen. Pl. 1: 11. 1781 [24 Nov 1781].

Pollia hasskarlii Rao Rolla, Notes Roy. Bot. Gard. Edinburgh 25: 188. 1964; Noltie, Fl. Bhut. 3(1): 232. 1994; Hajra *et al.*, Fl. Sikkim 1: 171. 1996.

Perennial herbs. Stems ascending. Leaves sessile; lamina elliptic to obovate-oblongate, 20–30 × 4–8 cm, glabrous on both surfaces. Inflorescence usually shorter than distal leaves; cincinni numerous; bracts membranous. Sepals subovate, shallowly boat shaped, abaxially puberulent glandular, caducous. Petals white or pale purple, obovate. Stamens 6, all fertile. Fruits indehiscent baccate, globose.

Flowers & Fruits: March to June.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0568*, dated 24. 07. 2007.

Local Distribution: Marshy low land of conserved sector.

General Distribution: India, Bhutan, Bangladesh, Myanmar, China.

Pontederiaceae Kunth in Humboldt, Bonpland *et* Kunth, Nov. Gen. et Sp. 1: 265. 1816; *nom. cons.*

Key to the genera

- 1a. Flowers sessile; perianth zygomorphic, segments basally united ***Eichhornia***
 1b. Flowers pedicellate; perianth actinomorphic, segments free nearly
 to base ***Monochoria***

EICHHORNIA Kunth, Enum. Pl. iv. 129. 1843.

Eichhornia crassipes (Martius) Solms in de Candolle, Monogr. Phan.4: 527. 1883; Subramanym, Aquat. Angiosp. 70. 1962; Noltie, Fl. Bhut. 3(1): 175. 1994; Cook, Aqua. Wetl. Pl. Ind. 329, 1996; Hajra *et al*, Fl. Sikkim 1: 166. 1996; Bora *et* Kumar, Fl. Div. Ass. 358. 2003. *Pontederia crassipes* Martius, Nov. Gen. Pl. 9. t. 4. 1823. *Heteranthera formosa* Miquel, Linnaea 17: 60. 1843. *Piaropus crassipes* (Martius) Rafinesque, Fl. Tellur. 2: 81. 1837. [PLATE: 8, Figure-86]

Local name: Kachuri pana

Floating herbs. Roots many, long fibrous. Stems very short; stolons simple, apically producing new plants. Leaves radical; petiole green, 5–30 cm, spongy, usually very much swollen; lamina orbicular to broadly ovate, 5–18 × 5–16 cm, leathery, shallowly cordate to rounded. Spike spirally 7–15 flowered. Perianth 6 parted. Stamens 6; filaments curved. Pistil heterostylic; stigma glandular hairy.

Flowers: September to January.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0179*, dated 09. 02. 2007.

Local Distribution: Throughout the water body.

General Distribution: India: all states of the country; Sri Lanka, Nepal, Bhutan, Bangladesh, Pakistan. Native to Brazil, now Pantropic.

MONOCHORIA Presl, Rel. Haenk. i. 127. 1827.

Key to the species

- 1a. Lamina triangular with sagittate or hastate base ***M. hastata***
 1b. Lamina broadly ovate to oblong, base obtuse ***M. vaginalis***

Monochoria hastata (Linnaeus) Solms in de Candolle, Mon. Phan.4: 523. 1883; Prain, Beng. Pl. 2: 1079. 1903; Noltie, Fl. Bhut. 3(1): 175. 1994; Bora *et* Kumar, Fl. Div. Ass. 358. 2003. *Pontederia hastata* Linnaeus, Sp. Pl. 1: 288. 1753. *Monochoria hastaefolia* Presl, Rel. Haenk.1: 128. 1827; Hooker *f.*, Fl. Brit. Ind. 6: 362. 1882. *Carigola hastata* (Linnaeus) Rafinesque, Fl. Tellur. 2: 10. 1837. [PLATE: 5, Figure-45]

Perennial herbs, aquatic. Radical leaves with sheath broadened at base; petiole 10 – 60 cm; lamina triangular to triangular-ovate, 5 – 20 × 3 – 15 cm, sagittate to hastate, acuminate. Racemes short, erect, subumbellate; peduncle shorter than associated leaf petiole. Perianth segments bluish with green median vein and reddish blotch, ovate. Stamens filaments filiform. Style hairy at apex. Capsule oblong. Seeds oblong.

Flowers & Fruits: August to March.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0212*, dated 09. 02. 2007.

Local Distribution: Marginal areas of Bochamari Beel.

General Distribution: Throughout India; Sri Lanka, China, Malaysia and S.E. Asia.

Monochoria vaginalis (Burman f.) C. Presl, *Reliq. Haenk. 1: 128. 1827*; Prain, *Beng. Pl. 2: 1079. 1903*; Noltie, *Fl. Bhut. 3(1): 174. 1994*; Hajra *et al.*, *Fl. Sikkim 1: 166. 1996*. *Monochoria vaginalis* (Burman f.) C. Presl *ex* Kunth, *Enum. 4: 134. 1834*; Hooker f., *Fl. Brit. Ind. 6: 363. 1892*. *Pontederia vaginalis* Burman f., *Fl. Ind. 80. 1768*. *Monochoria vaginalis* var. *plantaginea* (Roxburgh) Solms, in A. de Candolle, *Monog. Phan. 4: 524. 1883*; Hooker f., *Fl. Brit. Ind. 6: 363. 1892*. *Gomphima vaginalis* (Burman f.) Rafinesque, *Fl. Tellur. 2: 10. 1837*. [PLATE: 10, Figure-106]

Aquatic herbs. Stems erect. Radical leaves with broad sheath; petiole 3 – 40 cm; lamina narrowly cordate, ovate to lanceolate, 2 – 20 × 1 – 8 cm, acute to acuminate. Flowering stems 12 – 35 cm. Inflorescences reflexed after anthesis; bract lanceolate. Flowers pedicellate. Perianth segments purplish. Filaments of smaller stamens filiform. Capsules ovoid. Seeds ellipsoid.

Flowers & Fruits: September to May.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0257*, dated 10. 02. 2007.

Local Distribution: Marginal areas of Bochamari Beel.

General Distribution: India, Bangladesh, Sri Lanka, Malayan Islands, China, Japan, Tropical Africa.

Order: Poales Small (1903)

Sub order: Graminoid

Poaceae Nash in Small, *Fl. Southeast U.S. 48. 1903* (nom. alt. cum Gramineae); *nom. cons.*

Key to the genera

- | | |
|---|-----------------------------|
| 1a. Spikelets unisexual, male and female in same or different inflorescence ... | <i>Coix</i> |
| 1b. Spikelets hermaphrodite, sterile and fertile in mixed inflorescence | 2 |
| 2a. Spikelets 2 flowered | 3 |
| 2b. Spikelets 3 to many flowered | 16 |
| 3a. Spikelets paired | 4 |
| 3b. Spikelets solitary | 7 |
| 4a. Spikelets in false compact spike..... | <i>Hemarthria</i> |
| 4b. Spikelet not in above manner | 5 |
| 5a. Spikelets awned; glumes coriaceous | <i>Sclerostachya</i> |
| 5b. Spikelets awnless; glumes herbaceous | 6 |
| 6a. Panicle cylindric; all spikelets pedicellate | <i>Imperata</i> |
| 6b. Panicle wide; only one spikelet pedicellate | <i>Saccharum</i> |
| 7a. Some spikelets replaced by solitary bristle | <i>Setaria</i> |
| 7b. Spikelets not replaced by any bristle | 8 |
| 8a. Spikelets in panicles | 10 |

8b. Spikelets in spike or raceme like inflorescence	9
9a. Lateral inflorescence erect... ..	<i>Sacciolepis</i>
9b. Lateral inflorescence densely congested and spike like	<i>Panicum</i>
10a. Upper lemma cartilaginous	<i>Digitaria</i>
10b. Upper lemma crustaceous or coriaceous	11
11a. Spikelets abaxial	<i>Bracharia</i>
11b. Spikelets adaxial	12
12a. Spikelets surrounded by one or more bristles	<i>Pennisetum</i>
12b. Spikelets not surrounded by bristles	13
13a. Glumes awned	14
13b. Glumes awnless	15
14a. Lamina ovate- lanceolate; spikelet solitary	<i>Oplismenus</i>
14b. Lamina linear; spikelets crowded	<i>Echinochloa</i>
15a. Lower glume absent or very small	<i>Paspalum</i>
15b. Lower glume usually half length of spikelets	<i>Paspalidium</i>
16a. Spikelets with only one fertile floret and others sterile	17
16b. Spikelets with 2 or more fertile florets	23
17a. Raceme deciduous or spikelets falling entire	<i>Perotis</i>
17b. Raceme persistent; spikelets breaking up at maturity	18
18a. Spikes arranged digitately	19
18b. Spikes usually in panicle	20
19a. Spikelets without reduced florets, awnless	<i>Cynodon</i>
19b. Spikelets with one or more reduced florets; awned	<i>Chloris</i>
20a. Glumes well developed; stamens 1-3	<i>Sporobolus</i>
20b. Glumes minute or absent; stamens 6	21
21a. Culms floating, lamina ovate-lanceolate	<i>Hygroryza</i>
21b. Culms not floating, lamina linear	22
22a. Spikelets consist of a single fertile florets	<i>Leersia</i>
22b. Spikelets with 2 glume like sterile lemmas below fertile florets	<i>Oryza</i>
23a. Lower glumes absent; upper one long	<i>Axonopus</i>
23b. Both glumes present	24
24a. Spikelets arranged in open, contractile or spike like panicle	<i>Eragrostis</i>
24b. Spikelets arranged in solitary digitate spike	25
25a. Inflorescence solitary terminal spike	<i>Desmostachya</i>
25b. Inflorescence not in solitary terminal spike	26
26a. Spikes racemosely arranged	<i>Leptochloa</i>
26b. spikes digitatly arranged	27
27a. Rachis ending in a sharp point	<i>Dactyloctenium</i>
27b. Rachis ending in a spikelet	<i>Eleusine</i>

AXONOPUS P. Beauvois, Ess. Agrostogr. 12. 1812.

Axonopus compressus (Swartz) P. Beauvois, Ess. Agrost. 12: 154, 167. 1812; Noltie, Fl. Bhut. 3(2): 717. 2000. *Milium compressus* Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

Perennial ascending tufted grass, culms slender, compressed. Lamina oblong to linear-lanceolate; sheath keeled; ligules thin, fimbriate. Inflorescence racemose. Upper glumes elliptic-lanceolate, laterally hairy. Lemma ovate, acute.

Flowers & Fruits: August to December.

Specimen Cited: Forest, Rajib & AP Das 0605, dated 26. 07. 2007.

Local Distribution: Open forests and road side areas.

General Distribution: India: Arunachal Pradesh, Assam, North India, West Bengal, Andaman & Nicobar Islands; America, Brazil, Mexico, Myanmar.

BRACHIARIA (Trinius) Grisebach, Ledebour, Fl. Ross. 4: 469. 1853.

Key to the species:

- 1a. Lamina linear-lanceolate, hispid at margin *B. distachya*
 1b. Lamina ovate-lanceolate, amplexicaul, hairy *B. reptans*

Brachiaria distachya (Linnaeus) Stapf in Prain, Fl. Trop. Afr. 9: 565. 919. *Panicum distachyum* Linnaeus, Mant. 1: 138. 1767; Hooker f., Fl. Brit. Ind. 7: 37. 1896; Prain, Beng. Pl. 2: 1178. 1903.

Annual decumbent creeping grass. Lamina linear-lanceolate, hispid at margin; ligule with ring of hairs. Spikelets in panicle, elliptic–obovate. Caryopsis oblong.

Flowers & Fruits: September to December.

Specimen Cited: Barojan Beel, Rajib & AP Das 0659, dated 13. 02. 2008.

Local Distribution: Marginal high land of central plantation area.

General Distribution: Plains of India, Myanmar, Malaysia, China and Australia.

Brachiaria reptans (Linnaeus) Gardner & Hubbard in Hooker, Pl. sub. t. 3: 363. 1938; Hajra *et al.*, Fl. Sikkim 1: 246. 1996. Guha Bakshi, Fl. Mur. Dist. 378. 1984. *Panicum reptans* Linnaeus, Syst. Nat. 10: 870. 1759. *Panicum prostratum* Lamarck in Tab. Morais, Encycl. Meth. Bot. 1: 171. 1791; Hooker f., Fl. Brit. Ind. 7: 33. 1896; Prain, Beng. Pl. 2: 1177. 1903. *Urochloa reptans* Stapf; *sensu* Haines, Bot. Bihar & Orissa V: 1003. 1924.

Clumps long, creeping below, nodes glabrous; much branched, innovation shoots intravaginal. Lamina amplexicaul, hairy, ovate–lanceolate, sheaths ciliate not up to the next node. Racemes spreading, usually crowded, rachis hairy, trigonous pedicels with cilia longer than spikelets. Spikelets crowded, sub-sessile, ellipsoid glabrous.

Flowers & Fruits: March to December.

Specimen Cited: Forest, Rajib & AP Das 0362, dated 21. 07. 2007.

Local Distribution: Roadside areas.

General Distribution: Pantropical.

BAMBUSA Schreber, Gen. Pl. 236. 1789, *nom. cons.*

Key to the Species:

- 1a. Culms sheaths without auricles *B. balcooa*
 1b. Culms sheaths with auricles 2
 2a. Nodes with rings of gray-white silky hairs below and above sheath scar ... *B. tulda*
 2b. Nodes without hairs and sheath scar but a deep yellow ring is present *B. vulgaris*

Bambusa balcooa Roxburgh, Hort. Beng. 25. 1814; Fl. Ind. 2: 196. 1832; Hooker f., Fl. Brit. Ind. 7: 39. 1896; Noltie, Fl. Bhut. 3(2): 488. 2000; Prain, Beng. Pl. 2: 1233. 1903.

Vernacular Name: Boro Bansh

Culms up to 25 m long, to 16 cm in diameter, green when young, pale grayish-green on maturity; wall thick at base, sheaths without auricles; nodes swollen with whitish ring above, hairy below; lower internodes 10 – 12 cm and upper internodes upto 45 cm long. Lamina oblong – lanceolate,

rounded or sub-cordate at the base, glabrous above; leaf-sheaths with dense, brown hairs. Mature spikelets flattened.

Flowers & Fruits: June to December.

Specimen Cited: Village sector, *Rajib & AP Das 0702*, dated 14. 02. 2008.

Local Distribution: Planted in Villages.

General Distribution: Bangladesh, India, Indonesia.

Bambusa tulda Roxburgh, Fl. Ind., 2: 193. 1832; Noltie, Fl. Bhut. 3(2): 491. 2000; Prain, Beng. Pl. 2: 1232. 1903; Hajra *et al.*, Fl. Sikkim 1: 237. 1996.

Vernacular Name: Talda Bansh

Culms up to 14 m, internodes 30 – 35 cm, wall very thick, sheaths with auricles; nodes with rings of gray-white silky hairs below and above sheath scar, apex subtruncate; auricles unequal, shortly fimbriate; blade erect, slightly asymmetrical, broadly triangular, apex acutely acuminate. Lamina broadly linear or linear – lanceolate, densely villous, glabrous.

Flowers & Fruits: June to December.

Specimen Cited: Village sector, *Rajib & AP Das 0715*, dated 14. 02. 2008.

Local Distribution: Planted in Villages.

General Distribution: Bangladesh, Nepal, Bhutan, India, Thailand, Vietnam.

Bambusa vulgaris Schrader *ex* J.C. Wendland, Coll. Pl. 2: 26. 1810; Prain, Beng. Pl. 2: 1233. 1903.

Culms up to 15 m, straight, sheaths with auricles; internodes deep yellow; nodes prominent; usually branching from lower nodes. Branches many, clustered. Culm sheaths deciduous. Lamina lanceolate, 10 – 25 x 1 – 3 cm. Pseudospikelets several, clustered at nodes, narrowly lanceolate to linear lanceolate, slightly flattened, apparently bifid.

Flowers & Fruits: June to January.

Specimen Cited: Village sector, *Rajib & AP Das 0678*, dated 14. 02. 2008.

Local Distribution: Commonly planted in local villages.

General Distribution: Pantropical.

CHLORIS Swartz, Prodr. 25. 1788.

Chloris inflata Link, Enum. Pl. 1: 105. 1821. *Andropogon barbatum sensu* Linnaeus, Mantissa 2: 302. 1771. *Chloris barbata sensu* Swartz, Prodr. 1: 200. 1797; Hooker *f.*, Fl. Brit. Ind. 7: 292. 1897; Prain, Beng. Pl. 2: 1228. 1903; Guha Bakshi, Fl. Mur. Dist. 379. 1984.

Perennial tufted grass; culms erect, stout with creeping branched base; nodes with large tuft of leaves. Lamina flat, sometimes folded, sheath mouth ciliate, ligules a narrow membranous ring. Inflorescence a whorl of 4 – 22 spikes, sub-erect, rachis scabrid.

Flowers & Fruits: June – October.

Specimen Cited: Barojan Beel, *Rajib & AP Das 0628*, dated 12. 02. 2008.

Local Distribution: Marginal to highland areas of central plantation.

General Distribution: Pantropical.

COIX Linnaeus, Sp. Pl. 2: 972. 1753.

Coix lachryma-jobi Linnaeus, Sp. Pl. 2: 972. 1753; Hooker *f.*, Fl. Brit. Ind. 7: 100. 1897; Noltie, Fl. Bhut. 3(2): 839. 2000; Prain, Beng. Pl. 2: 1210. 1903; Hajra *et al.*, Fl. Sikkim 1: 248. 1996;

Coix lachrymal Linnaeus, Syst. Nat. (ed. 10) 1261. 1759. *Coix arundinacea* Lamark, Encycl. Meth. Bot. 3: 422. 1791.

Tall densely tufted or perennial, grass; culms much branched, rooting at lower nodes, robust, spongy, glabrous, polish leafy. Lamina flat, firm, acuminate, cordate at base; inflorescence sub erect, false spikes, peduncles long.

Flowers & Fruits: October to March.

Specimen Cited: Noldoba Beel, *Rajib & AP Das 0657*, dated 13. 02. 2008.

Local Distribution: Marginal to lowland areas of open fishing sector.

General Distribution: India; Tropical Asia, Africa, America.

CYNODON Richard in Persoon, Syn. Pl. 1: 85. 1805, *nom. cons.*

Cynodon dactylon (Linnaeus) Persoon, Syn. Pl. 1: 85. 1805; Hooker *f.*, Fl. Brit. Ind. 7: 288. 1896; Noltie, Fl. Bhut. 3(2): 678. 2000; Prain, Beng. Pl. 2: 1227. 1903; Hajra *et al.*, Fl. Sikkim 1: 285. 1996; Bor, Grass. Bur. Cey. Ind. & Pak. 269, t. 52. 1960; Guha Bakshi, Fl. Mur. Dist. 381. 1984. *Panicum dactylon* Linnaeus, Sp. Pl. 58. 1753.

Vernacular Name: Durbaghas

Perennial prostrate or creeping; runners rooting at nodes. Lamina linear-lanceolate or ovate-lanceolate, sparsely hairy; sheath margin ciliate; ligule membranous. Panicle of radiating branches, peduncle erect; spikelets pedicelled, 2-flowered; lower florets sterile; upper bisexual, glumes 3 – 5 nerved.

Flowers & Fruits: Most part of the year.

Specimen Cited: Forest, *Rajib & AP Das 0689*, dated 14. 02. 2008.

Local Distribution: Forests and road side open areas.

General Distribution: India and S.E. Asia.

DESMOSTACHYA (Stapf) Stapf in Dyer, Fl. Cap. 7: 316. 1898.

Desmostachya bipinnata (Linnaeus) Stapf, Fl. Cap. 7: 632. 1900; Majumdar, Bull. Bot. Soc. Beng. 10(1 & 2): 30. 1956; Guha Bakshi, & Sen, Bull. Bot. Soc. Beng. 23: 34. 1964. *Briza bipinnata* Linnaeus, Syst. Nat. (ed. 10) 2: 875. 1759. *Uniola bipinnata* Linnaeus, Sp. Pl. (ed. 2) 104. 1762. *Cynosurus durus* Forsskål, Fl. Aegypt. Arab. 21. 1775. *Eragrostis cynosuroides* Beauverd, Agrost. 71: 162. 1812; Hooker *f.*, Fl. Brit. Ind. 7: 324. 1896; Prain, Beng. Pl. 2: 1223. 1903.

Perennial, giant grass, branches from base. Root stock very stout; stolons with shiny sheath. Stem tufted, sub-erect. Leaves many, basal, rigid; lamina with filiform apex, margin hispid; sheath with long hairs, ligule ciliate, ridged. Panicles strict and erect; rachis puberulous. Spikelets sessile, jointed. Caryopsis obliquely obovoid to ovate-oblong.

Flowers & Fruits: April to January.

Specimen Cited: Forest, *Rajib & AP Das 0707*, dated 14. 02. 2008.

Local Distribution: Forests and road side areas.

General Distribution: India, Persia, Arabia, North Africa to Tropical Africa.

DACTYLOCTENIUM Willdenow, Enum. Pl. 2: 1029. 1809.

Dactyloctenium aegyptium (Linnaeus) Willdenow, Enum. Pl. Horti. Berol. 1029. 1809, as “*aegypticum*”; Bor, Grass. Bur. Cey. Ind. & Pak. 489, t. 52. 1960; Hajra *et al.*, Fl. Sikkim 1: 285. 1996. *Cynosurus aegyptius* Linnaeus, Sp. Pl. 1: 72. 1753. *Eleusine aegyptiaca* (Linnaeus)

Desfontaines, Fl. Atlant. 1: 85. 1798; Prain, Beng. Pl. 2: 1230. 1903. *Panicum dactylon* Linnaeus, Sp. Pl. 1: 58. 1753; Hooker f., Fl. Brit. Ind. 7: 295. 1896.

Annual herbs; rooting at nodes. Leaves distichous; lamina linear-lanceolate, flat, ciliate on margin; ligule membranous. Panicle of 2–6 digitate horizontal spikes; spikelets long, compressed, sessile, densely crowded; glumes unequal. Stamens 3. Caryopsis laterally flattened.

Flowers & Fruits: July to December.

Specimen Cited: Forest, Rajib & AP Das 0718, dated 14. 02. 2008.

Local Distribution: Forests and road side areas.

General Distribution: India, Tropical parts of the world.

DIGITARIA Haller, Hist. Stirp. Helv. 2: 244. 1768, *nom. cons.*, non Heister *ex* Fabricius (1759), *nom. rej.*

Key to the species:

- 1a. Racemes 2–9; decumbent *D. bicornis*
- 1b. Racemes 2; erect *D. ciliaris*

Digitaria bicornis (Lamarck) Roemer & Schultes, Syst. 2: 470. 1817; Guha Bakshi, Fl. Mur. Dist. 384. 1984. *Paspalum bicorne* Lamarck, Encycl. 1: 176. 1791. *Digitaria biformis* Willdenow, Enum. Pl. Hort. Berol. 1: 92. 1809. *Paspalum sanguinale* Lamarck var. *commutatum* Hooker f., Fl. Brit. Ind. 7: 15. 1896. *Digitaria sanguinalis* Scopoli var. *commutata* J.D. Hooker *sensu* Haines, Bot. Bihar & Orissa V: 1007. 1924; Prain, Beng. Pl. 2: 1181. 1903.

Erect, annual herbs. Lamina linear, scabrid, sparsely soft-hairy; sheath glabrous to pilose. Spikelets binate, glabrous to slightly hairy, sessile spikelet slightly pubescent; stamens 3. Caryopsis elliptic, 0.25 cm long.

Flowers & Fruits: July – November.

Specimen Cited: Forest, Rajib & AP Das 0725, dated 14. 02. 2008.

Local Distribution: Forests and road side areas.

General Distribution: India, Tropical and Sub-tropical Asia and Africa.

Digitaria ciliaris (Retzius) Koeler, Descr. Gram. 27. 1802; Noltie, Fl. Bhut. 3(2): 728. 2000; Hajra *et al.*, Fl. Sikkim 1: 251. 1996; Guha Bakshi, Fl. Mur. Dist. 385. 1984. *Panicum ciliare* Retzius, Obs. Bot 4: 16. 1786. *Paspalum sanguinale* Lamarck Var *ciliaris* (Retzius) Hooker f., Fl. Brit. Ind. 15. 1896. *Digitaria sanguinalis* Scopoli, fa. *commutata sensu* Haines, Bot. Bihar & Orissa V: 1007. 1924; Prain, Beng. Pl. 2: 1181. 1903. *Digitaria adscendens* (Humboldt, Bonpland & Kunth) Henrard, Blumea 1: 92. 1934.

Erect or decumbent, annual grass. Lamina linear-lanceolate, glabrous, ligule truncate. Racemes 2–9, sub-digitate; spikelets in pairs, oblong, acute, awnless. Stamens 3. Caryopsis 0.2 cm long.

Flowers & Fruits: May to December.

Specimen Cited: Varveri Beel, Rajib & AP Das 0674, dated 13. 02. 2008.

Local Distribution: Marginal lowland of open fishing areas.

General Distribution: Pantropical.

ECHINOCHLOA P. Beauvois, Ess. Agrostogr. 53. 1812, *nom. cons.*

Key to the species:

1a. Stem slender, decumbent; lowest racemes usually under 2 cm *E. colona*

1b. Stem stout, erect; lowest racemes usually over 3 cm *E. crus-galli*

Echinochloa crus-galli (Linnaeus) Beauverd, Ess. Agrost. 53: 161. 1812; Noltie, Fl. Bhut. 3(2): 703. 2000; Hajra *et al.*, Fl. Sikkim 1: 254. 1996; Guha Bakshi, Fl. Mur. Dist. 387. 1984. *Panicum crusgalli* Linnaeus, Sp. Pl. 1: 56. 1753; Hooker *f.*, Fl. Brit. Ind. 7: 30. 1896; Prain, Beng. Pl. 2: 1177. 1903.

Annual, aquatic, floating or ascending, glabrous grass. Lamina linear, tapering to the acute point, subflaccid, margin finely cartilaginous. Inflorescence erect, much branched, pedicles binate or flascicled, very short; spikelets crowded, ovate elliptic, cuspidate or awned. Caryopsis broadly elliptic.

Flowers & Fruits: August to December.

Specimen Cited: Barojan Beel, *Rajib & AP Das 0730*, dated 14. 02. 2008.

Local Distribution: Marginal to highland areas of central plantation.

General Distribution: India, Myanmar, S. E. Asia, Sri Lanka, Africa.

Echinochloa colona (Linnaeus) Link, Enum. Hort. Berol. 2: 209. 1833; Noltie, Fl. Bhut. 3(2): 702. 2000; Hajra *et al.*, Fl. Sikkim 1: 253. 1996; Bor, Grass. Bur. Cey. Ind. & Pak. 308. 1960; Guha Bakshi, Fl. Mur. Dist. 387. 1984. *Panicum colonum* Linnaeus Syst. 870. 1759; Hooker *f.*, Fl. Brit. Ind. 7: 295. 1896; Prain, Beng. Pl. 2: 1177. 1903. [PLATE: 9, Figure-91]

Annual, marshland, prostrate, slender grass; branched at lower parts, glabrous and smooth. Lamina narrow, linear, glabrous; sheath loose, smooth, compressed. Panicles branches 6 to many; spikelets ovate or elliptic, nearly sessile, glabrous, crowded, 4-ranked. Caryopsis elliptic.

Flowers & Fruits: July to December.

Specimen Cited: Barojan Beel, *Rajib & AP Das 0708*, dated 14. 02. 2008.

Local Distribution: Marginal to highland areas of central plantation.

General Distribution: India, Tropical Asia, Australia.

ELEUSINE Gaertner, Fruct. Sem. Pl. 1: 7. 1788.

Eleusine indica (Linnaeus) Gaertner, Fruct. 1: 8. 1788; Hooker *f.*, Fl. Brit. Ind. 7: 293. 1896; Noltie, Fl. Bhut. 3(2): 667. 2000; Hajra *et al.*, Fl. Sikkim 1: 288. 1996; Bor, Grass. Bur. Cey. Ind. & Pak. 493. 1960; Prain, Beng. Pl. 2: 1229. 1903. *Cynosurus indicus* Linnaeus, Sp. Pl. 1: 72. 1753.

Annual herbs. Culms tufted, rooted at nodes. Lamina flat or folded, 8 – 14 x 0.2 – 0.5 cm, glabrous to adaxial surface tuberculate-pilose. Inflorescence of digitate, 2 – 5 linear ascending racemes; spikelets elliptic, florets 3 – 9; glumes lanceolate, scabrid along keel; lower glume 1 veined; upper glume with thickened keel; lemmas ovate, acute; palea keels winged. Grain blackish, oblong to ovate.

Flowers & Fruits: June to October.

Specimen Cited: Forest, *Rajib & AP Das 0574*, dated 25. 07. 2007.

Local Distribution: open areas on forest margins and road side.

General Distribution: India, tropical and subtropical parts of world.

ERAGROSTIS Wolf, Gen. Pl. 23. 1776.

Key to the species:

- 1a. Rachilla jointed *E. tenella*
 1b. Rachilla tough and smooth 2
 2a. Spikelets flate, elliptic-oblong..... *E. unioloides*
 2b. Spikelets not flat, linear-oblong *E. pilosa*

Eragrostis pilosa (Linnaeus) P. Beauvois, Ess. Agrost. 71. 162. 175. 1812; Hooker *f.*, Fl. Brit. Ind. 7: 323. 1896; Noltie, Fl. Bhut. 3(2): 665. 2000; Prain, Beng. Pl. 2: 1223. 1903; Hajra *et al.*, Fl. Sikkim 1: 291. 1996; *Poa pilosa* Linnaeus, Sp. Pl. 1: 68. 1753.

Annual grass. Culms tufted. Lamina finely acuminate; sheath glabrous, ligule a ridge of hairs. Panicles long, pyramidal, spikelets linear, purplish; rachilla persistent; glumes unequal, ovate; stamens 3. Caryopsis ellipsoid.

Flowers & Fruits: June – August.

Specimen Cited: Barojan Beel, *Rajib & AP Das 0558*, dated 24. 07. 2007.

Local Distribution: Marginal to highland of central plantation.

General Distribution: Tropical and warmer regions of world.

Eragrostis tenella (Linnaeus) Beauverd *ex* Roemer *et* Schultes, Syst. Veg. 2: 576. 1817; Noltie, Fl. Bhut. 3(2): 657. 2000; Prain, Beng. Pl. 2: 1221. 1903; Hajra *et al.*, Fl. Sikkim 1: 291. 1996; Guha Bakshi, Fl. Mur. Dist. 392. 1984. *Poa tenella* Linnaeus, Sp. Pl. 1: 69. 1753. *Eragrostis tenella* var. *plumosa* (Retzius) Stapf, 315. 1896; Prain, Beng. Pl. 2: 1220. 1903.

Annual, erect, tufted grass. Lamina narrowly linear; sheath ciliate at the mouth; ligule ciliate. Panicles loose, plumose; spikelets oblong. Glumes ovate-oblong. Caryopsis ovoid.

Flowers & Fruits: August – February.

Specimen Cited: Barojan Beel, *Rajib & AP Das 0514*, dated 23. 07. 2007.

Local Distribution: Marginal to highland areas of central plantation.

General Distribution: India, tropical parts of world.

Eragrostis unioloides (Retzius) Nees *ex* Steudel, Syn. Pl. Glum. 1: 264. 1854; Hajra *et al.*, Fl. Sikkim 1: 292. 1996. *Poa unioloides* Retzius, Obs. Bot. 5: 19. 1789. *Eragrostis amaBeelis auct. non* Wight & Arnott in Hooker *f.*, Fl. Brit. Ind. 317. 1896; Prain, Beng. Pl. 2: 1220. 1903.

Annual, erect, tufted grass. Lamina flat; sheath striate; ligules membranous. Spikelets ovate – oblong, obtuse, pinkish-white. Caryopsis pointed.

Flowers & Fruits: August to March.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0572*, dated 24. 07. 2007.

Local Distribution: Moist areas of backside to the conservatory sector.

General Distribution: India, Myanmar, Sri Lanka, S.E. Asia.

HEMARTHRIA R. Brown, Prodr. 207. 1810.

Key to the species:

- 1a. Decumbent, pubescent grass *H. compressa*
 1b. Erect, glabrous grass *H. longifolia*

Hemarthria compressa (Linnaeus *f.*) R. Brown, Prodr. 207. 1810; Majumdar, Bull. Bot. Soc. Beng. 10(1&2): 102. 1956. Hajra *et al.*, Fl. Sikkim 1: 256. 1996. *Rottboellia compressa* Linnaeus *f.*, Suppl. 114. 1781; Hooker *f.*, Fl. Brit. Ind. 7: 153. 1896; Prain, Beng. Pl. 2: 898. 1903. *Rottboellia glabra* Roxburgh, Fl. Ind. 1: 253. 1820.

Annual, erect, tufted grass; usually branched; culms leafy throughout; lamina linear, acute; sheath loose and short; ligule small and round. Racemes, compressed, erect; spikelets linear, lanceolate.

Flowers & Fruits: March to January

Specimen Cited: Forest, Rajib & AP Das 0584, dated 25. 07. 2007.

Local Distribution: Forests and road side areas.

General Distribution: India and hotter part of world.

Hemarthria longiflora (Hooker f.) A. Camus in Lecomte, Fl. Gen. Indo-Chine, 7: 380. 1922. Chowdhury & Das in Indian J. Appl. Res. 3(5): 48 – 49. 2013. *Rottboellia longiflora* Hooker f., Fl. Brit. Ind. 7: 154. 1896; Naskar, Aqu. Semiaquat. Pl. Low. Ganget. plain, 252. 1990.

Perennial. Stoloniferous, culms prostrate. Lamina conduplicate, acuminate; sheaths purple. Racemes subtended by an inflated leaf-sheath; spikelets in pairs with cuneate callus; base truncate; attached obliquely. Fertile lemma oblong; lemma apex obtuse. Palea absent or minute.

Flowers & Fruits: February to May.

Specimen Cited: Forest, Rajib & AP Das 0564, dated 24. 07. 2007.

Local Distribution: Forests and road side areas.

General Distribution: Eastern India: West Bengal; Bangladesh, Myanmar, Thailand, Vietnam, China, Malaysia.

HYGRORYZA Nees, Edinburgh New Philos. J. 15: 380. 1833.

Hygroryza aristata (Retzius) Nees ex Wight et Arnott, Edinb. New Phil. Journal 15: 380. 1838; Hooker f., Fl. Brit. Ind. 7: 95. 1896; Prain, Beng. Pl. 2: 1185. 1903. [PLATE: 5, Figure-37]

Culms floating. Leaf sheaths open, strongly inflated, forming floats. Lamina 4 – 6 × 0.5 – 2 cm, obtuse, base rounded to cordate, adaxial surface papillate; ligule truncate. Inflorescence triangular; branches short, lowermost sub-verticillate; spikelets greenish; stipe 2 – 5 mm; lemma body 5 – 8 mm, spinulose on veins; palea keeled and spinulose along midvein, outer veins smooth, apex acute.

Flowers & Fruits: October to December.

Specimen Cited: Noldoba Beel, Rajib & AP Das 0623, dated 11. 02. 2008.

Local Distribution: Throughout the beel areas.

General Distribution: India, Myanmar, S.E. Asia.

IMPERATA Cirillo, Pl. Rar. Neapol. 2: 26. 1792.

Imperata cylindrica (Linnaeus) Raeuschel, Nom. Bot. ed. 3: 10. 1797; Bor, Grass. Bur. Cey. Ind. & Pak. 169. 1960; Hajra *et al.*, Fl. Sikkim 1: 257. 1996. *Lagurus cylindricus* Linnaeus, Syst. Nat. ed. 10, 2: 878. 1759. *Imperata arundinacea* Cyrillo, Pl. Rar. Neap. 2: 26. 1792; Hooker f., Fl. Brit. Ind. 7: 106. 1896; Prain, Beng. Pl. 2: 1188. 1903. *Imperata cylindrica* var. *major* (Nees) Hubbard & Vaughan, Grasses Maur. 96. 1940. *Cynosurus indicus* Linnaeus, Sp. Pl. 1: 72. 1753.

Perennial, tufted, erect, long grass. Rootstock rigid, creeping with deep-seated succurs. Lamina linear-lanceolate, margin scabrid; ligule membranous. Inflorescens compact panicle; spikelets lanceolate, densely white-silky. Stamens 2. Stigmas 2. Caryopsis oblong.

Flowers & Fruits: February to May.

Specimen Cited: Barojan Beel, Rajib & AP Das 0656, dated 13. 02. 2008.

Local Distribution: Marginal highland areas of central plantation sector.

General Distribution: India, Asia, Australia, S. E. Africa.

ISACHNE R. Brown, Prodr. 196. 1810.

Isachne globosa (Thunberg) Kuntze, Revis. Gen. Pl. 2: 778. 1891. *Milium globosum* Thunberg, Fl. Jap. 49 1784. *Isachne miliacea* Roth, Syst. Veg. 2: 476. 1817; Prain, Beng. Pl. 2: 1172. 1903.

Perennial herbs. Culms slender, erect to decumbent. Leaf sheaths shorter than internodes; lamina narrowly lanceolate, 3 – 11 × 0.4 – 0.8 cm, acute, base rounded, glabrous. Panicle open; branches and pedicels filiform, flexuose; spikelets elliptic-globose; lower floret male, upper female; glumes subequal, broadly elliptic; lower lemma oblong, shallowly convex.

Flowers & Fruits: October to March.

Specimen Cited: Chhotojan Beel, *Rajib & AP Das 0350*, dated 21. 07. 2007.

Local Distribution: Open areas of forests and road side vegetation.

General Distribution: India, Bangladesh, Sri Lanka, Bhutan, Nepal, Thailand, Malaysia, Indonesia, Japan, Korea, New Guinea, Philippines, Vietnam; Australia, Pacific Islands.

LEERSIA Solander *ex* Swartz, Prodr. 21. 1788, *nom. cons.*

Leersia hexandra Swartz, Prodr. 1: 21. 1788; Hooker *f.*, Fl. Brit. Ind. 7: 94. 1896; Prain, Beng. Plants 2: 1184. 1903; Bora & Kumar, Flor. Div. Ass. 412. 2003. *Leersia australis* R. Brown, Prodr. 210. 1810.

Annual, aquatic, erect grass. Branches slender, creeping, rooting at base. Lamina linear, acuminate, rigid, flat; sheath somewhat loose; ligules glaucous and truncate. Panicles, oblong, contracted, branches few; spikelets, oblong, closely imbricate, pale brown, sparsely hispidous, keels bristly ciliate. Caryopsis narrowly oblong.

Flowers & Fruits: October to December.

Specimen Cited: Chhotojan Beel, *Rajib & AP Das 0327*, dated 21. 07. 2007.

Local Distribution: Margins of Bochamari Beel.

General Distribution: India (Lower Himalaya); Tropical Africa, Australia, Myanmar.

LEPTOCHLOA P. Beauvois, Ess. Agro. 71. 1812.

Leptochloa panicea (Retzius) Ohwi, Bot. Mag. Tokyo 55: 311. 1941; Bor, Grass. Burma, Ceyl., Ind. & Pak. 517. 1960. *Poa panicea* Retzius, Obs. 3: 11. 1783. *Leptochloa filiformis* Roemer & Schultes, Syst. 2: 580. 1870; Hooker *f.*, Fl. Brit. Ind. 7: 298. 1896; Prain, Beng. Pl. 2: 924. 1903. *Aira filiformis* Koenig *ex* Roxburgh, Fl. Ind. 1: 328. 1820.

Annual, slender, aquatic grass. Lamina flat, finely tapering; sheath papillose-pilose, lacerate. Panicle diffuse, much branched; spikelets 2 – 4-fid, almost sessile, unilateral, alternate.

Flowers & Fruits: May to October

Specimen Cited: Chhotojan Beel, *Rajib & AP Das 0368*, dated 21. 07. 2007.

Local Distribution: Margins of Bochamari Beel.

General Distribution: India, Sri Lanka; Asia, Tropical Africa and America.

OPLISMENUS P. Beauvois, Fl. Oware 2: 14. 1810 [“1807”], *nom. cons.*

Key to the Species:

- 1a. Inflorescence with 4 – 7 racemes, glume awns antrorsely scabrid,
very slender *O. burmannii*
- 1b. Inflorescence with 5 – 10 racemes, glume awns smooth, stout *O. compositus*

Oplismenus burmannii (Retzius) P. Beauverd, Ess. Agrost. 54: 168 – 169. 1812; Hooker *f.*, Fl. Brit. Ind. 7: 68. 1896; Noltie, Fl. Bhut. 3(2): 684. 2000; Prain, Beng. Pl. 2: 1173. 1903; Hajra *et al.*, Fl. Sikkim 1: 261. 1996. *Panicum burmannii* Retzius, Obs. Bot. 3: 10. 1783. [PLATE: 7, Figure-69]

Annual herbs, prostrate; rooting at nodes. Lamina ovate-elliptic to lanceolate, pubescent; sheath compressed, ciliate. Panicle of 4 – 7 racemes; spikelets elliptic-lanceolate. Caryopsis convex.

Flowers & Fruits: August to December.

Specimen Cited: Forest, Rajib & AP Das 0396, dated 22. 07. 2007.

Local Distribution: Abundant in forests and road side areas.

General Distribution: India, Bangladesh, Sri Lanka, China, Japan.

Oplismenus compositus (Linnaeus) P. Beauvois, Ess. Agrost. 54: 168. 1812; Noltie, Fl. Bhut. 3(2): 684. 2000; Prain, Beng. Pl. 2: 1173. 1903; Hajra *et al.*, Fl. Sikkim 1: 261. 1996. *Panicum compositum* Linnaeus, Sp. Pl. 1: 57. 1753.

Annual prostrate herb; rooting at nodes. Lamina lanceolate, acuminate, pubescent; sheath compressed, ciliate. Panicle 12 – 23 cm long with 5 – 10 racemes; spikelets 3 – 4 mm, elliptic – lanceolate. Caryopsis convex.

Flowers & Fruits: August to December.

Specimen Cited: Forest, Rajib & AP Das 0443, dated 22. 07. 2007.

Local Distribution: Abundant on forest margins and road side open vegetation.

General Distribution: Pantropical.

ORYZA Linnaeus, Sp. Pl. 1: 333. 1753.

Oryza rufipogon Griffith, Notul. 3: 5. 1851; Hooker *f.*, Fl. Brit. Ind. 7: 92. 1896; Shukla, Grass. North East Ind. 301. 1996. *Oryza sativa* Linnaeus var. *fatua* Prain, Beng. Pl. 1184. 1903.

Annual grass; culms long, spongy bellow. Lamina linear, acuminate, margins scabrid; sheath loose; ligules splitting at tip. Spikelets long, long awaned. Caryopsis elliptic or oblong.

Flowers & Fruits: October to January.

Specimen Cited: Bochamari Beel, Rajib & AP Das 0401, dated 22. 07. 2007.

Local Distribution: Marginal areas of lowland of open fishing sector.

General Distribution: India: Assam, Meghalaya, Sikkim, West Bengal, Central India; Tropical Australia and Peru.

PANICUM Linnaeus, Sp. Pl. 1: 55. 1753.

Panicum repens Linnaeus, Sp. Pl. 2: 87. 1762; Hooker *f.*, Fl. Brit. Ind. 7: 49. 1896; Prain, Beng. Pl. 2: 1179. 1903. Hajra *et al.*, Fl. Sikkim 1: 263. 1996.

Perennial, tufted, erect, marshland grass. Rooting at nodes. Lamina long, linear-lanceolate; sheaths ciliate at throat. Spikelets long, elliptic-lanceolate. Caryopsis oblong.

Flowers & Fruits: September to December.

Specimen Cited: Varveri Beel, Rajib & AP Das 0445, dated 22. 07. 2007.

Local Distribution: Marginal marshy areas of open fishing sector.

General Distribution: India, S. Europe, Asia, Africa, America.

PASPALUM Linnaeus, Syst. Nat., ed. 10, 2: 855. 1759.

Paspalum conjugatum Bergius, Acta Helv. Phys. – Math. 7: 129. 1772; Hooker f., Fl. Brit. Ind. 7: 11. 1897; Prain, Beng. Pl. 2: 1182. 1903; Hajra *et al.*, Fl. Sikkim 1: 264. 1996; Shukla, Grass. North East. Ind. 345. 1996.

Perennial with long stolons producing small tufts of culms, compressed. Leaf sheaths keeled, glabrous or pilose along upper margins and mouth, a line of hairs at junction with blade; lamina lanceolate-linear, acute, thin, glabrous or papillose along margins. Peduncled panicle of 2 racemes; spikelets single, in 2 rows, ovate to suborbicular; upper glume hyaline, long silky hairs along margins; lower lemma similar but not ciliate; upper lemma pallid at maturity, ovate, crustaceous.

Flowers & Fruits: May to September.

Specimen Cited: Khottamari Beel, Rajib & AP Das 0403, dated 22. 07. 2007.

Local Distribution: Lowland and moist areas of open fishing sector.

General Distribution: India; throughout tropics and subtropics of the world.

PASPALIDIUM Stapf in Prain, Fl. Trop. Africa 9: 582. 1920.

Paspalidium punctatum (Burman) A. Camus in Lecomte, Fl. Gen. Del. Indo–China 7: 419. 1922; Hajra *et al.*, Fl. Sikkim 1: 264. 1996; Sukla, Grass. North East. Ind. 344. 1996; Bora & Kumar, Flor. Div. Ass. 421. 2003. *Panicum punctatum* Burman, Obs. Bot. 4: 15. 1786; Prain, Beng. Pl. 2: 1177. 1903.

Perennial grass. Culms long, floating, rooting at base, spongy. Lamina long, linear, acute, scabrid margined; sheaths glabrous; ligule hairy. Spikes longer than internodes; spikelets long, ovate-oblong, imbricate, sessile; glumes membranous. Caryopsis compressed.

Flowers & Fruits: August to December.

Specimen Cited: Khottamari Beel, Rajib & AP Das 0279, dated 10. 02. 2007.

Local Distribution: Lowland moist areas of open fishing sector.

General Distribution: India, tropical Asia, North Africa.

PENNISETUM Richard ex Persoon, Pers. Syn. i. 72. 1805.

Pennisetum polystachion (Linnaeus) Schultes, Syst. Veg. Mant. 2: 146. 1824; Noltie, Fl. Bhut. 3(2): 741. 2000. *Panicum polystachion* Linnaeus, Syst. Nat. 10, 2: 870. 1759.

Annual grass, culms ± 1 m tall. Leaves linear, acuminate, glabrous or hairy. Sheath glabrous. Ligule line fringed with soft hairs. Panicle purplish brown; rachis glabrous. Spikelet solitary, sessile; upper glumes oblong; lemma oblong, truncate, smooth; palea oblong, toothed or ciliate at tip.

Flowers & Fruits: October to November.

Specimen Cited: Bochamari Beel, Rajib & AP Das 0548, dated 24. 07. 2007.

Local Distribution: Margin of the Bochamari Beel.

General Distribution: Tropical Africa to India.

PEROTIS Aiton, Hort. Kew. 1: 85. 1789.

Perotis indica (Linnaeus) O. Kuntze, Rev. Gen. Pl. 2: 787. 1891; Majumdar, Bull. Bot. 10(1 & 2): 44. 1956. *Anthoxanthum indicum* Linnaeus, Sp. Pl. 1: 28. 1753. *Saccharum spicatum* Linnaeus, Sp. Pl. 1: 54: 1753. *Perotis latifolia* Aiton, Hort. Kew 1: 85. 1789; Hooker f., Fl. Brit. Ind. 7: 98. 1896; Prain, Beng. Pl. 2: 1186. 1903.

Aquatic, soft, wiry, spongy grass. Leaf-sheaths short, loose, striate; ligule short. Inflorescence terminal, rachis simple and scabrid; spikelets 1-flowered; pedicel small. Stamens 3. Caryopsis free in glume, terete.

Flowers & Fruits: July – August.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0308*, dated 10. 02. 2007.

Local Distribution: Marginal areas of the Bochamari Beel.

General Distribution: India, Sri Lanka, Mayanmer, tropical Africa.

SACCHARUM Linnaeus, Sp. Pl. 1: 54. 1753.

Saccharum spontaneum Linnaeus, Mant. Alt. 183. 1771; Hooker *f.*, Fl. Brit. Ind. 7: 118. 1896; Prain, Beng. Pl. 2: 1188. 1903; Hajra *et al.*, Fl. Sikkim 1: 271. 1996; Bor, Grass. Bur. Cey. Ind. & Pak. 214. 1960. *Imperata spontanea* (Linnaeus) Beauverd, Ess. Agro. 8. 1812.

Tall perennial herbs; rhizomes long. Culms hollow, softly pilose below inflorescence. Leaf-sheaths pilose at mouth and margin; lamina 60 – 150 × 0.2 – 1 cm, glaucous, long attenuate; ligule brown. Panicle up to 40 cm; spikelets 3–4 mm; lower glume papery, acuminate; lower lemma ovate-lanceolate; upper lemma linear to linear-oblong. Lodicules ciliate.

Flowers & Fruits: September to December.

Specimen Cited: Raichangmari Beel, *Rajib & AP Das 0322*, dated 21. 07. 2007.

Local Distribution: Marginal lowland areas of Changmari Beel.

General Distribution: Afghanistan, Pakistan, India, Sri Lanka, Bhutan, Japan, Myanmar, Thailand, Malaysia, Indonesia, Cambodia, New Guinea, Philippines, Turkmenistan, Vietnam; SW Asia, Australia, Pacific Islands, Africa.

SACCIOLEPIS Nash, Man. Fl. N. States 89. 1901.

Key to the species:

1a. Plants annual; panicles under 4 cm long; caryopsis elliptic/..... *S. indica*

1b. Plants perennial; panicles more than 6 cm long; caryopsis obovoid*S. interrupta*

Sacciolepis indica (Linnaeus) Chase, Proc. Biol. Soc. Wash. 21: 8. 1908; Hajra *et al.*, Fl. Sikkim 1: 271. 1996; Bor, Grass. Bur. Cey. Ind. & Pak. 357. 1960. *Panicum indicum* Linnaeus, Mant. 2: 184. 1771 (*non P. indicum* Miller); Hooker *f.*, Fl. Brit. Ind. 7: 156. 1896; Prain, Beng. Pl. 2: 1178. 1903.

Erect, annual grass. Culms long, spreading. Lamina linear, acuminate, glabrous; sheath slightly keeled; ligule membranous. Panicle spike like, terete, upto 4 cm long; spikelets shortly pedicelled, ovoid. Stamens 3. Caryopsis elliptic.

Flowers & Fruits: August to January.

Specimen Cited: Varveri Beel, *Rajib & AP Das 0352*, dated 21. 07. 2007.

Local Distribution: Lowland moist areas of open fishing sector.

General Distribution: India, tropical and sub-tropical regioes of Asia and Australia.

Sacciolepis interrupta (Willdenow) Stapf in Prain, Fl. Trop. Afr. 9: 757. 1920; Blatter & Mac Cann, Bombay grass 167. 1935; Majumdar, Bull. Bot. soc. Beng. 10(1&2): 58. 1956; Hajra *et al.*, Fl. Sikkim 1: 272. 1996. *Panicum interrupta* Willdenow, Sp. Pl. 1: 341. 1798; Hooker *f.*, Fl. Brit. Ind. 7: 40. 1896; Prain, Beng. Pl. 2: 1178. 1903.

Erect, branched, perennial, quite glabrous. Culms creeping, spongy, lower nodes rooting. Lamina soft, glabrous, base sub-cordate; ligule short. Panicles spike-like, terete; spikelets lanceolate, densely arranged, imperfect, ovoid, turgid spreading. Caryopsis obovoid.

Flowers & Fruits: August to January.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0437*, dated 22. 07. 2007.

Local Distribution: Marginal marshy areas of Bochamari Beel.

General Distribution: India, Sri Lanka, Myanmar and China.

SETARIA P. Beauvois, Ess. Agrostogr. 51. 1812, *nom. cons.*, non Acharius *ex* Michaux (1803).

Key to the Species:

- 1a. Leaves linear, margins rough; panicles spike-like; bristles in clusters of 6 or more *S. glauca*
 1b. Leaves linear-lanceolate, margins ciliate; panicles partially distant; bristles borne singly *S. palmifolia*

Setaria palmifolia (Koenig) Stapf, J. Lin. Soc. Bot. 42: 186. 1914; Hara *et al.*, Fl. East. Himal. 1: 376. 1966; Noltie, Fl. Bhut. 3(2): 723. 2000; Hajra *et al.*, Fl. Sikkim 1: 273. 1996. *Panicum palmaefolium* Koenig, Naturf. 22: 208. 1788.

Perennial, rhizomatous stem woody, knotted. Culms decumbent. Lamina linear-lanceolate, ciliate margins, acuminate, glabrous or sparsely hairy; sheath margin ciliate. Panicles partially distant, loose. Spikelets solitary, bristle single.

Flowers & Fruits: May to February.

Exsiccatus: Raichangmari Beel, *Rajib & AP Das 0450*, dated 22. 07. 2007.

Local Distribution: Marginal lowland moist areas of Changmari Beel.

General Distribution: Tropics of the Old World.

Setaria glauca (Linnaeus) P. Beauvois, Ess. Agro. 51: 178. 1812; Hooker *f.*, Fl. Brit. Ind. 7: 78. 1896; Bor, Grass. Bur. Cey. Ind. & Pak. 360. 1960. *Panicum glaucum* Linnaeus, Sp. Pl. 56. 1753; Prain, Beng. Pl. 2: 1170. 1903.

Small erect annual. Culms light. Lamina linear, rough on margins; sheaths keeled; ligules ciliate. Panicle spike like, dense, terete; spikelets long, elliptic; bristles in clusters of 6 or more; ciliate margins upper lemma coarsely rugose, boat-shaped. Caryopsis rounded-elliptic.

Flowers & Fruits: February to August.

Specimen Cited: Raichangmari Beel, *Rajib & AP Das 0489*, dated 23. 07. 2007.

Local Distribution: Marginal lowland areas of Changmari Beel.

General Distribution: India, throughout the warm and temperate countries.

SPOROBOLUS R. Brown, Prodr. 169. 1810.

Sporobolus diander (Retzius) P. Beauvois, Ess. Agro. 26: 147 – 178. 1812; Hooker *f.*, Fl. Brit. Ind. 7: 247. 1896; Hajra *et al.*, Fl. Sikkim 1: 303. 1996; Prain, Beng. Pl. 2: 1213. 1903; Bora & Kumar, Flor. Div. Ass. 427. 2003. *Agrostis diandra* Retzius, Obs. Bot. 5: 19. 1789.

Perennial grass. Culms tufted, slender, branched. Lamina narrowly lanceolate, 1 – 7 × 0.1 – 0.4 cm. Panicle linear, spikelike, 1.5 – 7 × 0.3 – 0.6 cm; branches short, erect, mostly unbranched; spikelets narrowly lanceolate-oblong; lower glume lanceolate, upper glume oblong; lemma oblong, acute; palea broader, obtuse. Anthers 3. Grains red-brown, elliptic, apex rounded.

Flowers & Fruits: August to December.

Specimen Cited: Raichangmari Beel, *Rajib & AP Das 0619*, dated 11. 02. 2008.

Local Distribution: Marginal lowland areas of Changmari Beel.

General Distribution: India: Assam, Manipur, Nagaland, Bihar, Orissa, West Bengal; Sri Lanka, Australia.

Sub order: Cyperoid

Cyperaceae A. L. de Jussieu, Gen. Pl. 26. 1789 ('Cyperoideae'); *nom. cons.*

Key to the genera :

- | | |
|--|------------------------------|
| 1a. Flowering glumes all distichous | 2 |
| 1b. Flowering glumes spirally arranged | 4 |
| 2a. Rachilla deciduous..... | 3 |
| 2b. Rachilla persistent | <i>Kyllinga</i> |
| 3a. Style base dilated, separate from achene by a constriction | <i>Fimbristylis</i> |
| 3b. Style base neither dilated nor constricted | <i>Cyperus</i> |
| 4a. Style base dilated and constricted | 5 |
| 4b. Style base neither dilated nor constricted | 6 |
| 5a. Hypogynous bristles present | <i>Eleocharis</i> |
| 5b. Hypogynous bristles absent | <i>Bulbostylis</i> |
| 6a. Glumes awned | 7 |
| 6b. Glumes not awned | <i>Fuirena</i> |
| 7a. Leaves reduced to sheath | <i>Schoenoplectus</i> |
| 7b. Leaves well developed | 8 |
| 8a. Spikelets solitary in terminal | <i>Bolboschoenus</i> |
| 8b. Spikelets in terminal cluster | <i>Scirpus</i> |

BOLBOSCHOENUS (Ascherson) Palla in Hallier & Brand, Syn. Deut. Schweiz. Fl., ed. 3, 3: 2531. 1905.

Bolboschoenus maritimus Palla var. ***affinis*** (Roth) P.J. Parmar, B.V. Shetty & V. Singh, Fl. Rajsthan 3: 888. 1993. *Scirpus affinis* Roth, Roemer & Schultes, Veg. 2: 140. 1817. *Bolboschoenus affinis* (Roth) Drobow, Trav. Mus. Bot. Acad. Sc. Imp. Petersburg 16: 139. 1916. *Scirpus maritimus* Linnaeus ssp. *affinis* (Roth) T. Norlindh Nils, Bot. Not. 125: 404. 1972; Clarke in Hooker f., Fl. Brit. Ind. 6: 659. 1893; Pain, Beng. Pl. 2: 1161. 1903.

Aquatic, erect, annual sedge. Stem triangular, glabrous. Leaves linear-lanceolate; sheath brown. Spikes terminal, compact, oval; glumes brown, oval, membranous. Achenes black-brown, cordate, hard, compressed.

Flowers & Fruits: October to January.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0192*, dated 09. 02. 2007.

Local Distribution: Marshy lowland of conserved sector.

General distribution: India to Europe.

BULBOSTYLIS Kunth, Enum. Pl. 2: 205. 1837. *nom. cons.*

Bulbostylis densa (Wallich) Handle-Mazzetti *ex* Karsten & Schenck, Vegetations Beelder 20. 7: 16. 1930; Noltie, Fl. Bhut. 3(1): 298. 1994; Hajra *et al.*, Fl. Sikkim 1: 198. 1996; *Scirpus densus* Wallich, Roxburgh, Fl. Ind. 1: 231. 1820. *Bulbostylis capillaris* var. *trifida* (Nees) Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 652. 1893; Prain, Beng. Pl. 2: 1156. 1903.

Annual herbs, without rhizome. Clumps tufted, slender. Leaves basal, erect, half or more of stem length, entire, slightly evolute on margins, acuminate. Bracts 2 – 3. Inflorescence simple or subcompound anthela, bearing 4 – 7 spikelets. Spikelets solitary or clustered, 5 – 18 flowered. Glumes ovate to broadly ovate, ciliate. Stamens 2; style filiform, stigmas 3. Achenes obovate, trigonous.

Flowers & Fruits: April to December.

Specimen Cited: Forest, Rajib & AP Das 0160, dated 08. 02. 2007.

Local Distribution: Marshy lowland of conserved sector.

General Distribution: India, Bangladesh, Nepal, China, Japan, Africa.

CYPERUS Linnaeus, Sp. Pl. 1: 44. 1753.

Key to the species:

- 1a. Spikelets digitate or clustered *C. haspan*
- 1b. Spikelets spicate or racemose 2
- 2a. Rachilla of spikelet prominently winged 3
- 2b. Rachilla of spikelet not winged or slightly winged 5
- 3a. Spikelets 3 – 9 in short spike *C. rotundus*
- 3b. Spikelets more than 8 in long spike 4
- 4a. Wing of rachilla deciduous *C. stoloniferus*
- 4b. Wing of rachilla persistent *C. pangorie*
- 5a. Slender annual, tufted 6
- 5b. Stout perennial 7
- 6a. Bracts ovate, margin not curved *C. iria*
- 6b. Bracts oblong, margin curved; spikelets winged *C. compressus*
- 7a. Rachilla of spikes hairy *C. pilosus*
- 7b. Rachilla of spikes glabrous 8
- 8a. Glumes obtuse; spikelets ovate *C. distans*
- 8b. Glumes mucronate; spikelets linear *C. cyperoides*

Cyperus compressus Linnaeus, Sp. Pl. 46. 1753; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 605. 1893; Noltie, Fl. Bhut. 3(1): 310. 1994; Hajra *et al.*, Fl. Sikkim 1: 214. 1996; Prain, Beng. Pl. 2: 1143. 1903. *Cyperus pectiniformis* Roemer & Schultes, Mantissa 2: 128. 1824; Guha Bakshi, Fl. Mur. Dist. 352. 1984.

Glabrous annual; roots fibrous; stems tufted, erect or rarely prostrate, 3- gonous. Leaves shorter, sometimes longer than stem, acuminate. Bracts 3 – 7, leafy. Spikelets digitately clustered, much compressed; glumes ovate-lanceolate, closely imbricate; keel produced, laterally compressed. Nuts obovate, dark- brown or brown or brownish-black.

Flowers & Fruits: July – December.

Specimen Cited: Bochamari Beel, Rajib & AP Das 0211, dated 09. 02. 2007.

Local Distribution: Margin of the Bochamari Beel.

General Distribution: Throughout India; Sri Lanka, Tropical Africa, Asia and America.

Cyperus cyperoides (Linnaeus) Kuntze, Revis. Gen. Pl. 3 (2): 333. 1898; Noltie, Fl. Bhut. 3(1): 307. 1994. *Scirpus cyperoides* Linnaeus, Mantissa Pl. 181. 1771; Hajra *et al.*, Fl. Sikkim 1: 230. 1996; *Mariscus sieberianus* Nees *ex* Steudel, Synops. Pl. Glum. 2: 61. 1855; Prain, Beng. Pl. 2: 1147. 1903.

Perennials herbs. Rhizome short. Culms laxly tufted, acutely triquetrous. Lamina 5 mm wide, conduplicate at basal part, gradually flatted upward, margin not scabrous. Bracts leaf-shaped, longer than inflorescence. Spikes cylindric to oblong, with densely arranged many spikelets. Spikelets linear-lanceolate; rachilla wings white. Stamens 3; anthers shortly linear. Style short; stigmas 3, slender. Achenes dark brown.

Flowers & Fruits: April to October.

Specimen Cited: Khottamari Beel, *Rajib & AP Das 0237*, dated 09. 02. 2007.

Local Distribution: Marginal lowland areas of open fishing sector.

General Distribution: Pakistan, India, Sri Lanka, Nepal, Bhutan, Myanmar, Malaysia, Indonesia, Japan, Korea, Laos, Philippines, Thailand, Vietnam; tropical Africa, America, and Oceanic Islands

Cyperus haspan Linnaeus, Sp. Pl. 45. 1753; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 600. 1892; Noltie, Fl. Bhut. 3(1): 313. 1994; Hajra *et al.*, Fl. Sikkim 1: 215. 1996; Prain, Beng. Pl. 2: 1142. 1903.

Perennial, erect sedge. Stems solitary, compressed-trigonous. Lamina broad, spreading. Spikelets linear-lanceolate. Glumes ovate-oblong. Stamen-1; style bifid. Nuts shortly apiculate.

Flowers & Fruits: May to January.

Specimen Cited: Chhotojan Beel, *Rajib & AP Das 0131*, dated 07. 02. 2007.

Local Distribution: Marginal highland areas of central plantation.

General Distribution: India, Tropical, sub-tropical and temperate regions of the old world.

Cyperus iria Linnaeus, Sp. Pl. 45. 1753; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 606. 1893; Noltie, Fl. Bhut. 3(1): 312. 1994; Hajra *et al.*, Fl. Sikkim 1: 215. 1996; Prain, Beng. Pl. 2: 1143. 1903; Guha Bakshi, Fl. Mur. Dist. 356. 1984.

Annuals. Roots fibrous. Culms tufted, slender to slightly stout, compressed triquetrous. Leaves much shorter than culm; sheath reddish brown to brownish purple; lamina slightly folded. Bracts 3 to 5, leaf-like, basal 2 longer than inflorescence. Spikes ovoid; spikelets laxly arranged, lanceolate to oblong, compressed; rachilla almost wingless. Stamens 3; anthers ellipsoid. Style very short; stigmas short. Achenes dark brown.

Flowers & Fruits: August to February.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0343*, dated 21. 07. 2007.

Local Distribution: Margin of the Bochamari Beel.

General Distribution: India; Southern Hemisphere.

Cyperus distans Linnaeus *f.*, Suppl. Pl. 103.1781; Clarke in Hooker *f.*, Fl. Brit. Ind 6: 607. 1893; Noltie, Fl. Bhut. 3(1): 314. 1994. Hajra *et al.*, Fl. Sikkim 1: 214. 1996; Prain, Beng. Pl. 2: 1143. 1903.

Perennial sedge, usually rhizomatous. Stem solitary, trigonous. Leaves shorter or as long as stem. Umbels compound, large. Spikelets spicate, narrowly linear, erect or spreading 10 – 20 flowered; rachilla slender, scarcely winged. Glumes long, elliptic-oblong, redish-brown, margins membranous, obtuse, slightly imbricate. Stamens 3. Achenes oblong, trigonous, brown.

Flowers & Fruits: August to December.

Specimen Cited: Khottamari Beel, *Rajib & AP Das 0359*, dated 21. 07. 2007.

Local Distribution: Marginal lowland areas of open fishing sector.

General distribution: Tropical and sub-tropical regions of the old world.

Cyperus rotundus Linnaeus, Sp. Pl. 45. 1753; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 598. 1893; Noltie, Fl. Bhut. 3(1): 316. 1994; Prain, Beng. Pl. 2: 1145. 1903; Hajra *et al.*, Fl. Sikkim 1: 217. 1996; Guha Bakshi, Fl. Mur. Dist. 358. 1984; Bora & Kumar, Fl. Div. Ass. 382. 2003.

Vernacular Name: Mutha ghas

Perennial sedges; rhizome elongated tuberous, ovoid, black, fragrant. Stems trigonous. Leaves acuminate. Umbel simple to compound; bracts usually 3, shorter or longer than inflorescence. Spikelets linear-lanceolate, many-flowered redish-brown; rachilla winged; glumes ovate to elliptic, imbricate. Achenes broadly obovoid, trigonous, dark-brown.

Flowers & Fruits: July to December.

Specimen Cited: Raichangmari Beel, *Rajib & AP Das 0370*, dated 21. 07. 2007.

Local Distribution: Marginal lowland of Changmari Beel.

General distribution: Throughout India; warm countries.

Cyperus stoloniferus Retzius, Observ. Bot. 4: 10. 1786. *Cyperus arenarius* Hance ex C.B. Clarke, *J. Linn. Soc., Bot.* 21: 173 1884; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 616. 1893; Prain, Beng. Pl. 2: 1142. 1903.

Rhizome long, thick. Culms solitary, trigonous. Leaves usually shorter than culm; lamina folded, rarely flat. Bracts leafy. Spikelets oblong-lanceolate to lanceolate, 8 – 14 x 2 – 3 mm; rachilla narrowly winged; scales densely imbricate, broadly ovate, acute to subobtuse. Stamens 3; anthers linear. Style medium in length; stigmas 3. Achenes dark brown when mature, trigonous.

Flowers & Fruits: July.

Specimen Cited: Raichangmari Beel, *Rajib & AP Das 0042*, dated 05. 02. 2007.

Local Distribution: Marginal low land of Changmari Beel.

General Distribution: Pakistan, India, Sri Lanka, Myanmar, Malaysia, Indonesia, Cambodia, Laos, New Guinea, Philippines, Thailand, Vietnam; N Australia, Indian Ocean Islands, Madagascar

Cyperus pangorei Rottboëll, Descr. Pl. Rar. 18. 1772; Noltie, Fl. Bhut. 3(1): 314. 1994; Hajra *et al.*, Fl. Sikkim 1: 216. 1996; Prain, Beng. Pl. 2: 1144. 1903.

Rhizome short. Culms trigonous. Leaves apically bladeless or with a short blade. Bracts longer than inflorescence. Anthela compound, unequal. Spikes broadly ovate, with 4 - 12 laxly arranged spikelets, slightly compressed, 6 – 30 flowered; scales reddish brown on both surfaces, obtuse. Stamens 3. Styles medium in length; stigmas 3. Achenes dark brown.

Flowers & Fruits: November to January.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0084*, dated 06. 02. 2007.

Local Distribution: Marshy lowland areas of conserved sector.

General Distribution: Pakistan, India, Sri Lanka, Nepal, Bhutan, Myanmar, Vietnam.

Cyperus pilosus Vahl, Enum. Pl. 2: 354. 1805; Noltie, Fl. Bhut. 3(1): 315. 1994; Hajra *et al.*, Fl. Sikkim 1: 216. 1996; Prain, Beng. Pl. 2: 1143. 1903.

Perennial herbs. Rhizome with slender stolons. Culms scattered, triquetrous. Leaves shorter than culm; sheath brownish; lamina flat. Bracts 5, basal 3 longer than inflorescence. Spikes ovate to

oblong; rachis densely yellow hispid. Spikelets distichous, laxly arranged; rachilla wings white; scales pale, mucronate. Stamens 3. Style short; stigmas 3. Achenes blackish, trigonous.

Flowers & Fruits: August to November.

Specimen Cited: Barojan Beel, *Rajib & AP Das 0099*, dated 07. 02. 2007.

Local Distribution: Marshy lowland of conserved sector.

General Distribution: India, Nepal, Bhutan, Malaysia, Indonesia, Philippines.

ELEOCHARIS R. Brown, Prodr. 224. 1810.

Key to the species:

- | | |
|---|------------------------|
| 1a. Erect, over 1m high; spikes over 30 mm long | <i>E. tetraquetra</i> |
| 1b. Erect, less than 1m high; spikes less than 20 mm long | 2 |
| 2a. Styles 2-fid, nuts compressed | 3 |
| 2b. Styles 3-fid, nuts trigonous or obovoid | 5 |
| 3a. Rhizome present, creeping | <i>E. palustris</i> |
| 3b. Rhizome absent | 4 |
| 4a. Bristlets glistening, white | <i>E. atropurpurea</i> |
| 4b. Bristlets brown or rusty | <i>E. geniculata</i> |
| 5a. Nuts smooth, spikelets dense | <i>E. conjesta</i> |
| 5b. Nuts coarse, spikelets lax | <i>E. retroflexa</i> |

Eleocharis retroflexa (Poiret) Urban ssp. *chaetaria* (Roemer & Schultes) Koyama, Bull. Nat. Sci. Mus. Tokyo 17: 68. 1974; Noltie, Fl. Bhut. 3(1): 287. 1994. *Eleocharis chaeraria* Roemer & Schultes, Syst. 2: 154. 1871; Prain, Beng. Pl. 2: 1149. 1903.

Tufted annual, marshland sedge. Stems filiform, recurved. Leaves reduced to sheaths. Purple spikelets elliptical or ovoid, few flowered. Glumes 6 – 8, boat-shaped, obtuse or subacute, margin hyaline, membranous, purple-tinged, pale-brown, style base pyramidal, 3-lobed; style 3-fid. Achenes obovate, trigonous, trabeculate.

Flowers & Fruits: July to December.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0220*, dated 09. 02. 2007.

Local Distribution: Marshy lowland areas of conserved sector.

General distribution: Tropical to temperate regions of the world.

Eleocharis tetraquetra Nees in Wight, Contr. Bot. Ind. 112. 1834; Noltie, Fl. Bhut. 3(1): 186. 1994; Naskar, Aqu. Semiaquat. Pl. Low. Ganget. plain, 245. 1990.

Annual, erect, strait, stoloniferous. Stems rather firm, tetraquetrous. Leaf-sheaths 2, reddish brown. Spikelets erect, ovoid-lanceolate, acute, 1 nerved. Perianth bristles 5, subequal, rather coarse; stamens 2; style long; stigmas 3. Nuts narrowly of broadly obovoid, biconvex, smooth, pale brown.

Flowers & Fruits: October to November.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0234*, dated 09. 02. 2007.

Local Distribution: Marshy lowland areas of conserved sector.

General distribution: India to Malaysia.

Eleocharis congesta D. Don, Prodr, Fl. Nepal 41.1825; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 630. 1893; Noltie, Fl. Bhut. 3(1): 286. 1994; Prain, Beng. Pl. 2: 1149. 1903. *Eleocharis afflata* Steudel, Syn. Pl. glum. 2: 76. 1855.

Annual or perennial marshland sedge; stems triangular, ridged. Sheath apex truncate, apiculate. Spikelets oblong, terete, sub-acute, purplish; glumes loosely imbricate, oblong; stigmas 3. Nuts 0.15 cm long, yellow-green. Bristles 7, white or brown.

Flowers & Fruits: July to December.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0219*, dated 09. 02. 2007.

Local Distribution: Marshy lowland areas of conserved sector.

General distribution: India, Sri Lanka, Malaysia.

Eleocharis palustris R. Brown, Prodr. 224. 1810; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 628. 1893; Noltie, Fl. Bhut. 3(1): 285. 1994; Prain, Beng. Pl. 2: 1149. 1903. *Helocharis palustris* Lindley, syst. 2: 154. 1817 & Syn. Brit. Fl. 280.1829.

Erect tufted sedge with creeping rhizome. Stem terete. Lamina absent, sheath truncate. Spikelets ellipsoid or cylindrical. Glumes imbricate, ovate-lanceolate. Nuts broadly obovoid, biconvex.

Flowers & Fruits: November to March.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0266*, dated 10. 02. 2007.

Local Distribution: Marshy lowland areas of conserved sector.

General Distribution: Cosmopolitan except Australia.

Eleocharis atropurpurea (Retzius) Kunth, Enum. 2: 151. 1837; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 627. 1893; Noltie, Fl. Bhut. 3(1): 287. 1994; Prain, Beng. Pl. 2: 1149. 1903. *Scirpus atropurpurea* Retzius, Obs. 5: 14. 1788. *Eleocharis atropurpurea* Nees in Wight, Contrib. Bot. Ind. 113. 1834.

Marshy unbranched sedge. Stem terete, short. Spikelets in terminal head. Glumes imbricate. Nut black, obtuse, biconvex, tipped with the pale disciform style base, style 2-fid.

Flowers & Fruits: October to December.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0293*, dated 10. 02. 2007.

Local Distribution: Marshy lowland areas of conserved sector.

General Distribution: Pantropical.

Eleocharis geniculata (Linnaeus) Roemer & Schultes, Syst. Veg. 2: 150. 1817; Svenson, Rhodora 41: 50. 1939. *Scirpus geniculata* Linnaeus, Sp. Pl. 1: 48.1753. *Eleocharis capitata* R. Brown, Prodr. 225. 1810; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 627. 1893; Prain, Beng. Pl. 2: 1149. 1903.

Small, marshland sedge. Roots fibrous, stem terete. Leaf-sheath short, base oblique with acute tip. Spikelets terminal, brown, globose – oblong. Glumes imbricate. Nuts brownish, slightly compressed.

Flowers & Fruits: July to December.

Specimen Cited: Raichangmari Beel, *Rajib & AP Das 0248*, dated 10. 02. 2007.

Local Distribution: Marginal lowland areas of Changmari Beel.

General Distribution: India and in other warmer countries.

FIMBRISTYLIS Vahl, Enum. Pl. 2: 285. 1805, *nom. cons.*

Key to the species:

- 1a. Stem with only one spikelet *F. tetragona*
 1b. Stem with more than one spikelet 2
 2a. Stems tufted, compressed, grooved; nuts whitish *F. dichotoma*
 2b. Stems filiform, slender, not grooved; nuts yellow *F. aestivalis*

Fimbristylis tetragona R. Brown, Prodr. 226. 1810; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 631. 1893; Prain, Beng. Pl. 2:1152. 1903.

Tufted, erect perennial sedge. Stems slender, quadrangular. Leaves reduced to sheaths. Inflorescence of one terminal ovoid or conical spikelet. Glumes obovate-oblong or obtuse, rounded on the back. Stamens usually 2, rarely 3; style flattened, villous, 2-fid. Achenes linear – oblong, pale, tapering towards base, with a slender stalk.

Flowers & Fruits: October to December.

Specimen Cited: Batikata Beel, Rajib & AP Das 0290, dated 10. 02. 2007.

Local Distribution: Marshy lowland areas of conserved sector.

General distribution: India, Bangladesh, Nepal, Sri Lanka, E. Asia to tropical Australia.

Fimbristylis aestivalis (Retzius) Vahl, Enum. Pl. 2: 288. 1806; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 637. 1893; Noltie, Fl. Bhut. 3(1): 296. 1994; Hajra *et al.*, Fl. Sikkim 1: 219. 1996; Prain, Beng. Pl. 2: 1154. 1903. *Scirpus aestivalis* Retzius, Obs. Bot. 4: 12. 1786.

Culms densely tufted without rhizome, flatly trigonous, few leaves at base. Leaves shorter than culms, flat; sheaths short. Bracts filiform; anthelae compound, loose; spikelets solitary, ovate to oblong-lanceolate, many-flowered; glumes spiral, membranous, ovate to oblong, mucronate, reddish brown; stamen 1, anther lanceolate; style long and compressed. Achenes obovate, yellow.

Flowers & Fruits: May to August.

Specimen Cited: Batikata Beel, Rajib & AP Das 0616, dated 11. 02. 2008.

Local Distribution: Marshy lowland areas of conserved sector.

General distribution: India, China, Japan, Malaysia and N. Australia.

Fimbristylis dichotoma (Linnaeus) Vahl, Enum. Pl. 2: 287. 1806; Noltie, Fl. Bhut. 3(1): 294. 1994; Hajra *et al.*, Fl. Sikkim 1: 220. 1996; Bora & Kumar, Fl. Div. Assam, 385. 2003. *Scirpus dichotomus* Linnaeus, Sp. Pl. 50. 1753. *Fimbristylis diphylla* (Retzius) Vahl, Enum. Pl. 2: 289. 1806; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 636. 1893; Prain, Beng. Pl. 2: 1153. 1903.

Annual or perennial, erect, marshland sedge, shortly rhizomatous. Leaves flat, broad. Anthela simple or sub-compound. Spikelets ovate, acute, terete; glumes broadly ovate; stamens 3. Nuts obovate – elliptic, whitish.

Flowers & Fruits: May to November.

Specimen Cited: Batikata Beel, Rajib & AP Das 0555, dated 24. 07. 2007.

Local Distribution: Marshy lowland areas of conserved sector.

General Distribution: Tropical to temperate zones across the world.

FUIRENA Rottbøll, Descr. Icon. Rar. Pl. 70. 1773.

Fuirena ciliaris (Linnaeus) Roxburgh, Fl. Ind. 1: 184. 1820; Noltie, Fl. Bhut. 3 (1): 282. 1994. *Scirpus ciliaris* Linnaeus, Mant. Ail. 182. 1771. *Fuirena glomerata* Lamarck, Encyl. 1: 150. 1791; Clarke in Hooker f., Fl. Brit. Ind. 6: 666. 1893; Prain, Beng. Pl. 2: 1158. 1903.

Erect, annual, marshland sedge. Rhizome absent. Stems tufted. Leaves linear – lanceolate, acuminate; sheaths striate. Spikelets in clusters of 3 – 10, gray-green or brownish, ovoid or oblong. Glumes obovate or oblong; keel green. Achenes triquetrous, obovoid, surface smooth, pale.

Flowers & Fruits: October to January.

Specimen Cited: Bochamari Beel, Rajib & AP Das 0509, dated 23. 07. 2007.

Local Distribution: Marginal areas of Bochamari Beel.

General distribution: Cosmopolitan to tropical and sub-tropical regions.

KYLLINGA Rottboøll, Descr. Icon. Rar. Pl. 12. 1773, *nom. cons.*, not *Killinga* Adanson (1763).

Key to the species:

- 1a. Keel of achene glume winged; heads greenish *K. brevifolia*
- 1b. Keel of achene glume not winged; heads whitish *K. nemoralis*

Kyllinga brevifolia Rottboøll, Descr. 13. t. 4. f. 3. 1773; Clarke in Hooker f., Fl. Brit. Ind. 6: 588. 1893; Noltie, Fl. Bhut. 3(1): 324. 1994; Prain, Beng. Pl. 2: 1135. 1903; Hajra *et al.*, Fl. Sikkim 1: 227. 1996. *Cyperus brevifolius* (Rottboøll) Hasskarl, Cat. Hort. Bogor. 24. 1844.

Rhizome slender. Culms tufted, compressed, trigonous, 4 to 5 sheathed. Leaf-sheaths brown, acuminate; lamina 5 – 17 cm x 2 - 4 mm, flaccid. Bracts 3, leaf-like. Spike 1, ovoid-globose, with numerous densely arranged spikelets. Spikelets oblong-lanceolate, compressed, 1 to 2 flowered; scales ovate, keel spinulate. Stamens 1 – 3; anthers short, linear. Style long; stigmas 2. Achenes obovoid-oblong.

Flowers & Fruits: May to October.

Specimen Cited: Barojan Beel, Rajib & AP Das 0485, dated 23.07.2007.

Local Distribution: Forests and road side areas.

General distribution: Tropical and warm regions of South-East Asia.

Kyllinga nemoralis (J.R. Forster & C. Forster) Dandy *ex* Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 487. 1936; Noltie, Fl. Bhut. 3(1): 325. 1994; Hajra *et al.*, Fl. Sikkim 1: 227. 1996. *Kyllinga monocephala* Rottboell, Descr. 13, t. 4, F. 4. 1773, *nom. Superfl.*; Prain, Beng. Pl. 2: 1141. 1903. *Thryocephalon nemorale* J.R. Forster & C. Forster, Char. Gen. Pl. 65. 1775. *Cyperus kyllinga* Endlicher, Cat. Hort. Ac. Vindob. 1: 94. 1842. [PLATE: 9, Figure-95]

Vernacular Name: Gothube.

Perennials herbs. Culms tufted, compressed triquetrous. Leaves usually shorter than culm; sheath brown; lamina flat. Bracts 3 to 4, much longer than inflorescence. Spikes ovoid to globose, with numerous spikelets. Spikelets sub-obovoid, compressed, 1-flowered; scales boat-shaped, apex slightly recurved mucronate. Stamens 3. Style long; stigmas 2. Achenes brown, oblong to obovoid-oblong.

Flowers & Fruits: May to August.

Specimen Cited: Chhotojan Beel, Rajib & AP Das 0550, dated 24. 07. 2007.

Local Distribution: Margin of the Bochamari Beel.

General Distribution: Pantropical.

RHYNCHOSPORA Vahl, Enum. Pl. 2: 229. 1805 [“Rynchospora”], *nom. cons.*

Rhynchospora corymbosa (Linnaeus) Britton in Trans. New York Acad. Sci. 11: 84. 1892; Noltie, Fl. Bhut. 3(1): 329. 1994; Cook, Aqua. Wetl. Pl. Ind. 173, 1996; Hajra *et al.*, Fl. Sikkim 1: 233. 1996. *Scirpus corymbosus* Linnaeus, Cent. Pl. 2: 7. 1956.

Rhizome short. Culms erect, trigonous. Leaves basal and cauline, blades broadly linear, long acuminate; sheaths membranous. Bracts shorter than large compound paniculate inflorescence; anthela 2–5, distant corymbiform. Spikelets many, lowest flower bisexual, upper 1–2 male. Glumes ovate to ovate lanceolate. Stamens 3. Achenes oblong-obovate to obovate, brown.

Flowers & Fruits: June to November.

Specimen Cited: Varveri Beel, Rajib & AP Das 0423, dated 22.07.2007.

Local Distribution: Marshy lowland areas of conserved sector.

General Distribution: Pantropical; India: West Bengal, Assam, Arunachalpradesh, Meghalaya, Tripura, Nagaland, Kerala, Karnataka; Sri Lanka, Bangladesh, Bhutan, Nepal.

SCHOENOPECTUS (Reichenbach) Palla, Verh. K. K. Zool.-Bot. Ges. Wien 38 (Sitzungsber.): 49. 1888, *nom. cons.*

Key to the species:

- 1a. Nuts smooth, triangular *S. grossus*
- 1b. Nuts transversely wavy 2
- 2a. Glumes distinctly keeled, spikelets angular *S. laterifolius*
- 2b. Glumes faintly keeled, spikelets terete 3
- 3a. Spikelets 2–4; nuts plano-convex *S. juncooides*
- 3b. Spikelets more than 10; nut triquetrous *S. articulatus*

Schoenoplectus articulatus (Linnaeus) Palla, Bot. Jahrb. 10: 229. 1888; Palla, Fl. Hassan dist. 697. 1976; Noltie, Fl. Bhut. 3(1): 284. 1994. *Scirpus articulatus* Linnaeus, Sp. Pl. 47. 1753; Hooker *f.*, Fl. Brit. Ind. 6: 656. 1893; Prain, Beng. Pl. 2: 1160. 1903. *Isolepis articulate* Nees in Wight, Contrib. Bot. Ind. 108. 1834.

Glabrous, annual, tufted marshland robust sedge. Stems terete, spongy, transversely septate. Leaves reduced to sheaths. Inflorescence of many sessile spikelets, head like cluster. Spikelets ovoid to cylindrical-oblong. Glumes ovate, concave, acute; hypogynous bristles absent. Style linear. Achenes obovate, triquetrous, black, smooth.

Flowers & Fruits: October to January.

Specimen Cited: Khottamari Beel, Rajib & AP Das 0439, dated 22. 07. 2007; Varveri Beel, Rajib & AP Das 0617, dated 11. 02. 2008.

Local Distribution: Marginal lowland areas of open fishing sector.

General distribution: Tropical Asia, Africa and Australia.

Schoenoplectus grossus (Linnaeus *f.*) Palla, Allg. Bot. Z. 17. Biebl. 3. 1911; Srivastava in Hajra *et al.*, Fl. Sikkim 1: 234. 1996. *Scirpus grossus* Linnaeus *f.*, Suppl. 104. 1781; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 659. 1896; Noltie, Fl. Bhut. 3(1): 280. 1994; Prain, Beng. Pl. 2: 1160. 1903.

Perennial, aquatic, glabrous sedges. Rootstock stout, stolons produces tubers; roots fibrous, triquetrous spongy. Leaves few, radical, concave, strongly keeled, spongy; sheaths long open. Inflorescence decomposed, terminal, open, ovoid, dark brown. Glumes broadly elliptic concave. Nuts elliptic-obovoid.

Flowers & Fruits: September to December.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0617*, dated 11. 02. 2008.

Local Distribution: Marginal lowland areas of open fishing sector.

General distribution: India, Bhutan, Bangladesh, Sri Lanka, China, Malaysia, Philippines.

Schoenoplectus juncoides (Roxburgh) Palla, Bot. Jahrb. 10: 299. 1888; Noltie, Fl. Bhut. 3(1): 283. 1994; Srivastava in Hajra *et al.*, Fl. Sikkim 1: 235. 1996. *Scirpus juncoides* Roxburgh, Fl. Ind. 1: 218. 1820; *Scirpus erectus sensu* Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 656. 1893; Prain, Beng. Pl. 2: 1160. 1903.

Tufted annual, marshland sedge. Stems flaccid or rigid. Leaves reduced to sheaths. Spikelets sessile, 2–5 in a lateral cluster; glumes suborbicular, concave, acute, pale–brown; hypogynous bristles 5–6, unequal, retrorsely scarbid, shorter or longer than achenes. Style linear, branches 2. Achenes globosely obovoid, brown to black.

Flowers & Fruits: July to February.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0631*, dated 12. 02. 2008.

Local Distribution: Marginal areas of Bochamari Beel.

General distribution: India, China, Japan, Malaysia, Australia.

Schoenoplectus lateriflorus (J.F. Gmelin) K.A. Lye, Bot. Nat. 290. 1971; Bhat *et al.*, Sedg. & Gras. 82. 2001. *Scirpus lateriflorus* J.F. Gmelin, Syst. Nat. 2, 1: 127. 1791. *Scirpus supinus* Linnaeus var. *uninoides* Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 656. 1893; Prain, Beng. Pl. 2: 1160. 1903. *Scirpus supinus* var. *lateriflorus* (Gmelin) Koyama, J. Fac. Sci. Univ. Tokyo sect. 3, Bot. 7: 302. 1958; Noltie, Fl. Bhut. 3(1): 284. 1994. *Scirpus supinus auct non* Linnaeus, Sp. Pl. 1: 49. 1753; Hara *et al.*, Enn. Flower. Pl. Nepal 1: 119. 1978.

Aquatic or marshland annual, erect, tufted. Stems glabrous, trigonous. Leaves short, sheath short. Spikelets in a axillary cluster, ovate, oblong, sessile, rachilla slender. Glumes ovate, membranous. Nuts transversely lineolate.

Flowers & Fruits: August to December.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0635*, dated 12. 02. 2008.

Local Distribution: Marginal areas of Bochamari Beel.

General distribution: India, Tropical Asia, N. America and Australia.

SCIRPUS Linnaeus, Sp. Pl. 1: 47. 1753, *nom. cons.*

Scirpus michelianus Linnaeus, Sp. Pl. 1: 52. 1753; Clarke in Hooker *f.*, Fl. Brit. Ind. 6: 662. 1893; Noltie, Fl. Bhut. 3(1): 280. 1994; Prain, Beng. Pl. 2: 873. 1903; Datta & Majumdar, Bull. Bot. Soc. Beng. 20(2): 35. 1966. *Cyperus diffuses* Roxburgh, Fl. Ind. 1: 189. 1832.

Small, annual, tufted sedge; root fibrous. Stem triquetrous, leafy towards and base. Leaves as long as stem, linear, acute. Spikelets numerous, in dense compound terminal heads. Glumes elliptic. Nuts fusiform.

Flowers & Fruits: July to January.

Specimen Cited: Chhotojan Beel, *Rajib & AP Das 0349*, dated 21. 07. 2007.

Local Distribution: Marginal areas of Bochamari Beel.

General distribution: Warmer parts of India, South Asia, South Europe to Japan.

Juncaceae A. L. de Jussieu, Gen. Pl. 43. 1789 ('Junci'); *nom. cons.*

JUNCUS Linnaeus, Sp. Pl. 1: 325. 1753.

Juncus prismatocarpus R. Brown, Prodr. Fl. Nov. Holl. 1: 259. 1810; Noltie, Fl. Bhut. 3(1): 254. 1994; Hajra *et al*, Fl. Sikkim 1: 176. 1996; Prain, Beng. Pl. 2: 1088. 1903.

Perennial tufted herbs. Stems erect. Basal leaves few; lamina linear, 8 – 22 cm × 2 – 4 mm, obtuse to acute. Inflorescence terminal, much branched; involucre bracts leafy, shorter than inflorescence; heads globose to hemispheric; bracts broadly ovate to ovate lanceolate. Perianth segments narrowly lanceolate to linear-lanceolate, acute. Stamens 3. Stigmas very long. Capsules narrow.

Flowers & Fruits: May to November.

Specimen Cited: Batikata Beel, Rajib & AP Das 0169, dated 08. 02. 2007.

Local Distribution: Marshy lowland of conserved sector.

General Distribution: Pakistan, India, Sri Lanka, Bhutan, Nepal, Indonesia, Japan, Korea, Laos, Cambodia, Malaysia, Papua New Guinea, Thailand, Vietnam, Australia, Pacific Islands.

Typhaceae A. L. de Jussieu, Gen. Pl. 25. 1789 ('Typhae').

TYPHA Linnaeus, Sp. Pl. 2: 971. 1753.

Typha elephantina Roxburgh, Fl. Ind., 3: 566. 1832; Noltie, Fl. Bhut. 3(1): 177. 1994; Prain, Beng. Pl. 2: 1102. 1903. *Typha schimperi* P. Rohrbach, Verh. Bot. Vereins Prov. Brandenburg 11: 95. 1869. *Typha maresii* Battandier, Bull. Soc. Bot. France 34: 389. 1887. *Typha elephantina* var. *schimperi* (P. Rohrbach) Graebner, Pflanzenr. IV, 8: 11. 1900. *Typha latifolia* subsp. *maresii* (Battandier) Battandier, Fl. Algérie 1(2): 18. 1895.

Plants up to 2.5 m, stout. Leaves 1 – 1.5 m long, abaxially carinate, transverse section triangular. Staminate part of spikes with 1 bract, axis with dense brown hairs; pistillate part of spikes separated from staminate part. Female flowers with whitish bracteoles; bracteoles linear; ovary lanceolate, stalked; stigmas lanceolate.

Flowers & Fruits: unknown.

Specimen Cited: Chhotojan Beel, Rajib & AP Das 0566, dated 24. 07. 2007.

Local Distribution: Forests of central area.

General Distribution: Pakistan, India, Bangladesh, Bhutan, Nepal, Myanmar; Africa.

Eriocaulaceae P. Beauvois *ex* Desvaux, Ann. Sc. Nat. 13: 45. 1828 ('Eriocauloneae').

ERIOCAULON Linnaeus, Sp. Pl. 1: 87. 1753.

Key to the Species :

- 1a. Leaves upto 5 cm long; anthers white or pale yellow *E. cinereum*
- 1b. Leaves 5 – 12 cm long; anthers black *E. alpestre*

Eriocaulon cinereum R. Brown, Prodr. 254. 1810; Noltie, Fl. Bhut. 3(1): 244. 1994; Cook, Aqua. Wetl. Pl. Ind. 191. 1996. *Eriocaulon sieboldianum* Siebold & Zuccarini *ex* Steudel, Syn. Pl. Glum. 2: 272. 1855; Hooker *f.*, Fl. Brit. Ind. 6: 577. 1893; Prain, Beng. Pl. 2: 1127. 1903.

Small, stemless, tufted annual sedge. Leaves 2 – 5 cm long, narrowly linear glabrous, gradually attenuate to filiferous apex. Peduncle 10 – 15 cm, numerous, aggregated, glabrous, 5-ribbed. Heads small, whitish globose or ovoid; bracts glabrous.

Flowers & Fruits: October to March.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0734*, dated 14. 02. 2008.

Local Distribution: Marshy low land of conserved sector.

General Distribution: India and Tropical parts of world.

Eriocaulon alpestre Hooker *f.* & Thomson *ex* Körnicke, Miquel Ann. Mus. Bot. Lugduno-Batavi 3: 163. 1867; Noltie, Fl. Bhut. 3(1): 245. 1994; Hajra *et al.*, Fl. Sikkim 1: 197. 1996; Cook, Aqua. Wetl. Pl. Ind. 187. 1996. *Eriocaulon alpestre* var. *ampullaceum* P. Royen, Blumea 10: 126. 1960.

Leaves linear, 5 – 12 x 0.3 – 0.5 cm. Scapes 5 – 8 cm; sheath 3 – 8 cm; heads straw colored at base, black at apex; involucre bracts yellowish green, ovate, usually silky, glabrescent; floral bracts obovate to oblanceolate, glabrescent. Male flowers: petals 3, subequal, anthers black. Female flowers: petals 3, spatulate; ovary 3 loculed. Seeds narrowly ovoid.

Flowers & Fruits: June to August.

Specimen Cited: Varveri Beel, *Rajib & AP Das 0136*, dated 07. 02. 2007.

Local Distribution: Marshy lowland of conserved areas.

General Distribution: India, Bhutan, Nepal, Japan, Korea, Philippines, Thailand.

Xyridaceae C. A. Agardh, Aphor. Bot. 158. 1823 ('Xyrideae').

XYRIS Linnaeus, Sp. Pl. 1: 42. 1753.

Xyris pauciflora Willdenow, Phytogr. 1: 2, t. f. 1 & Sp. Pl. 1: 255. 1794; Hooker *f.*, Fl. Brit. Ind. 6: 363. 1892; Noltie, Fl. Bhut. 3(1): 242. 1994; Hajra *et al.*, Fl. Sikkim 1: 167. 1996; Prain, Beng. Pl. 2: 1080. 1903; Cook, Aqua. Wetl. Pl. Ind. 369, 1996. *Xyris denticulata* R. Brown, Prodr. Fl. Nov. Holl. 256. 1810. *Xyris maritima* T. Koyama, Philipp. J. Sci. 84: 367. 1956. *Xyris dajacensis* P. Royen, Blumea 7: 208. 1953.

Tufted, aquatic, erect annual herbs. Lamina linear acuminate. Heads globose or ovoid. Flowers 4 – 6 in a head, bracts orbicular. Capsule broadly ovoid. Seeds minute, linear oblong, many.

Flower & Fruits: November to February.

Specimen Cited: Batikata Beel, *Rajib & AP Das 0143*, dated 08. 02. 2007.

Local Distribution: Marginal areas of water body of conservatory sector.

General Distribution: India; native to Tropical Australia.

Order: Zingiberales Grisebach (1854)

Cannaceae A. L. de Jussieu, Gen. Pl. 62. 1789 ('Cannae'); *nom. cons.*

CANNA Linnaeus, Sp. Pl. 1: 1. 1753.

Canna indica Linnaeus, Sp. Pl. 1: 1. 1753; Prain, Beng. Pl. 2: 1047. 1903. *Canna orientalis* var. *flava* Roscoe, Monandr. Pl. Scitam. 40. 1826; Noltie, Fl. Bhut. 3(1): 212. 1994; *Canna montana* Blume, Enum. Pl. Javae 35. 1827. *Canna indica* var. *rubra* Aiton, Hort. Kew. 1: 1. 1789.

Rhizome much branched. Stems up to 2 m. Leaf sheath green; petiole short; lamina adaxially green, 25 – 55 x 8 – 16 cm. Racemes compact, branched; bracts ovate. Flowers 1 – 2 per cincinnus. Sepals pale. Corolla tube apricot yellow. Stamines 2 or 3; labellum red, lanceolate. Ovary green, globose. Capsule broadly ovoid.

Flowers & Fruits: Through out the year.

Specimen Cited: Park, *Rajib & AP Das 0167*, dated 08. 02. 2007.

Local Distribution: Grown in parks and gardens; often escapes.

General Distribution: Native to tropical America; cultivated throughout the tropics. Seminatralized in many areas.

Costaceae (Meisner) Nakai, Journ. Jap. Bot. 17: 203. 1941.

CHEILOCOSTUS C.D. Specht, Taxon 55(1): 159. 2006

Cheilocostus speciosus (J. König) C. Specht, Taxon 55: 159. 2006. *Banksia speciosa* J. König, Retzius Obs. 3: 75. 1783. *Hellenia grandiflora* Retzius, Observ. Bot. 6: 18. 1791. *Costus speciosus* (J. König) J.E. Smith, Trans. L. Soc. 1: 249. 1791; G. Watt, Dict. Econ. Prod. 2: 579. 1889; Baker in Hooker f., Fl. Brit. Ind. 6: 249. 1892; Prain, Beng. Pl. 2: 786. 1903; Noltie, Fl. Bhut. 3(1): 210. 1994; Hajra *et al*, Fl. Sikkim 1: 124. 1996.

Stems up to 3 m. Petiole 5 – 7 mm; lamina oblong to lanceolate, 12 – 22 × 5 – 11 cm. Condensed spike terminal, ellipsoid to ovoid; bracts bright red, apex sharply pointed; bracteoles pale red. Calyx red, apex 3 lobed. Corolla tube 1 cm; lobes oblong-elliptic, apex white. Labellum white. Stamen petaloid, white with orange-yellow base. Capsule red, globose. Seeds black.

Flowers & Fruits: July to November.

Specimen Cited: Forest, Rajib & AP Das 0195, dated 09. 02. 2007.

Local Distribution: In plantation forests and bushes.

General Distribution: India, Bangladesh, Sri Lanka, Java.

Marantaceae Lindley, Nat. Syst. 267. 1830; *nom. cons.*

PHRYNIUM Willdenow, Sp. Pl., ed. 4, 1(1): 1, 17. 1797; *nom. cons.*

Phrynium pubinerve Blume, Enum. Pl. Javae 1: 38. 1827; Noltie, Fl. Bhut. 3(1): 214. 1994. *Phrynium densiflorum* Moritzi ex Körnig, Bull. Soc. Imp. Naturalistes Moscou 35(1): 101. 1862. *Phrynium malaccense* H.N. Ridley, J. Asiat. Soc. Straits 32: 180. 1899.

Plants up to 1 m. Rhizomes tuberous. Basal leaves several; cauline leaf 1; petiole to 60 cm, pulvinus 5 – 6 cm, glabrous; lamina ovate-oblong to oblong, 30 – 45 × 8 – 12 cm, glabrous, shortly acuminate, base acute. Inflorescence sessile, capitate; bracts purple-red, oblong-lanceolate, apex initially acute. Flower sessile. Sepals linear, sericeous. Corolla tube violet, shorter than calyx; lobes dark red, oblong-obovate. Outer staminodes light red, obovate, slightly corrugated. Ovary sericeous. Fruit dark red, shiny, pyriform; exocarp hard. Seeds shallowly grooved.

Flowers & Fruits: June to September.

Specimen Cited: Batikata Beel, Rajib & AP Das 0232, dated 09. 02. 2007.

Local Distribution: Margins of water body of conservatory sector.

General Distribution: Eastern Himalaya, including Terai and Duars; South East Asia.

Musaceae A. L. de Jussieu, Gen. Pl. 61. 1789 ('Musae'); *nom. cons.*

MUSA Linnaeus, Sp. Pl. 2: 1043. 1753.

Key to the Species:

- 1a. Bracts adaxially purple red, abaxially yellowish green *M. balbisiana*
- 1b. Bracts adaxially deep red, abaxially purple *M. paradisiaca*

Musa balbisiana Colla, Mem. Reale Accad. Sci. Torino 25: 384. 1820; Kew Bull. 1948: 14. 1948; Hara, Fl. East. Himal. 3: 136. 1975; Hara *et al.*, En. Flower. Pl. Nepal 1: 63. 1978; Noltie, Fl. Bhutan 3(1): 180. 1994; Hajra *et al.*, Fl. Sikkim 1: 135. 1996.

Vernacular Name: Bichikola

Pseudostems upto 5 m high, green with dark markings. Lamina oblong, entire, petiole spongy, base asymmetric. Compound spadix pendulous, 1 - 1.5 m; peduncle and rachis glabrous. Bracts of bisexual and male flowers adaxially purple red, abaxially yellowish green; bracts of female flowers deciduous. Flowers numerous. Berries yellow when ripe, obovoid, distinctly angled at maturity. Seeds numerous, brown, oblate, minutely warty.

Flowers & Fruits: Round the year.

Specimen Cited: Village sector, Rajib & AP Das 0567, dated 24. 07. 2007.

Local Distribution: In villages.

General Distribution: India, Sri Lanka, Nepal, Myanmar, Thailand, Malaysia, Indonesia (Java), New Guinea, Philippines.

Musa × *paradisiaca* Linnaeus, Sp. Pl. 2: 1043. 1753. Hajra *et al.*, Fl. Sikkim 1: 135. 1996. *Musa sapientum* Linnaeus, Syst. 10, 2: 1303. 1759; Hooker *f.*, Fl. Brit. Ind. 6: 262. 1892; Prain, Beng. Pl. 2: 1050. 1903.

Pseudostems clumped. Leaves erect; lamina adaxially deep green, abaxially light green, oblong, Fl. Bhut. 1.5 – 2.5 m × 30 – 55 cm, base subsymmetric, acute. Compound spadix pendulous; rachis glabrous. Bracts adaxially deep red, abaxially purple, deciduous. Flowers in 2 rows in each bract. Tepal suborbicular to oblong, acuminate. Infructescence with 6 – 8 clusters of erect to slightly curved berries. Seeds absent.

Flowers & Fruits: All round the year.

Specimen Cited: Bochamari village, Rajib & AP Das 0630, dated 12. 02. 2008.

Local Distribution: Commonly cultivated in villages.

General Distribution: Native to tropical Asia; widely cultivated in the tropics.

Zingiberaceae Lindley, Nat. Syst. ed. 2. 322. 1836 (nom. cons. prop. vs. Amomeae); *nom. cons.*

Key to the genera:

- | | |
|---|-----------------|
| 1a. Inflorescence terminal or lateral on pseudostems | 2 |
| 1b. Inflorescence on separate shoots arising from rhizomes | 3 |
| 2a. Lateral staminodes reduced to small subulate point or swellings | <i>Alpinia</i> |
| 2b. Lateral staminodes attached to corolla tube and petal-like | <i>Globba</i> |
| 3a. Style exerted well beyond anther-thecae and enfolded in a long anther-crest | <i>Zingiber</i> |
| 3b. Style not exerted much beyond anther-thecae and not enfolding style..... | <i>Curcuma</i> |

ALPINIA Roxburgh, Asiat. Res. 11: 350. 1810, *nom. cons.*

Key to the species:

- | | |
|---|---------------------|
| 1a. Bracteoles funnel-shaped, persistent | <i>A. nigra</i> |
| 1b. Bracteoles shell-shaped, deciduous after anthesis | <i>A. calcarata</i> |

Alpinia calcarata (Haworth) Roscoe, Trans. Linn. Soc. London 8: 347. 1807; Prain, Beng. Pl. 2: 1047. 1903; Noltie, Fl. Bhut. 3(1): 206. 1994. *Renalmia calcarata* Haworth, Bot. Repos. 6: t. 421. 1805. *Alpinia calcarata* var. *compacta* Gagnepain, Bull. Soc. Bot. France 48: 85. 1902.

Vernacular Name: Purundi.

Pseudostems up to 1 m. Leaves sessile, lamina linear-lanceolate, 20 – 40 × 2 – 4 cm, glabrous, acuminate and caudate-mucronate, base attenuate. Panicles terminal, less than 10 cm; rachis slightly velvety. Calyx split on 1 side. Corolla tube white; lobes oblong. Lateral staminodes red. Labellum white with rose red and purple streaks. Filament 1.5 cm. Capsule red, globose.

Flowers & Fruits: May.

Specimen Cited: Bochamari Beel, *Rajib & AP Das 0716*, dated 14. 02. 2008; *Rajib & AP Das 0660*, dated 13. 02. 2008.

Local Distribution: Marginal areas of Bochamari Beel.

General Distribution: India, Sri Lanka, Myanmar.

Alpinia nigra (Gaertner) Burtt, Notes Roy. Bot. Gard. Edinburgh 35(2): 213. 1977; Noltie, Fl. Bhut. 3(1): 205. 1994; Hajra *et al.*, Fl. Sikkim 1: 121. 1996. *Zingiber nigrum* Gaertner, Fruct. Sem. Pl. 1: 35. 1788. *Alpinia allughas* (Retzius) Roscoe, Trans. Linn. Soc. London 8: 346. 1807; Prain, Beng. Pl. 2: 1047. 1903. *Amomum nigrum* (Gaertner) Räsusch, Nomencl. Bot. 3: 1. 1797. *Heritiera allughas* Retzius, Observ. Bot. 6: 17. 1791.

Vernacular Name: Purundi.

Pseudostems up to 2 m. Leaves sessile to subsessile; lamina elliptic-lanceolate, 25 – 50 × 6 – 8 cm, apex and base acute. Panicles terminal, erect; branches expanded; bracts ovate; bracteoles funnel shaped. Pedicel 5 mm. Calyx tubular. Corolla, cucullate. Lateral staminodes subulate. Labellum obovate. Stamen ca. 2 cm; anther curved. Ovary pubescent. Capsule black when dry.

Flowers & Fruits: July to October.

Specimen Cited: Noldoba Beel, *Rajib & AP Das 0155*, dated 08. 02. 2007.

Local Distribution: Marginal areas of Noldoba Beel.

General Distribution: India, Bhutan, Sri Lanka, Thailand.

CURCUMA Linnaeus, Sp. Pl. 1: 2. 1753, *nom. cons.*

Curcuma aromatica Salisbury, Parad. Lond. 2: t, 96. 1807; Hooker *f.*, Fl. Brit. Ind. 6: 210. 1890; Prain, Beng. Pl. 2: 1042; Noltie, Fl. Bhut. 3(1): 192. 1994. 1903; Hajra *et al.*, Fl. Sikkim 1: 125. 1996. *Curcuma wenyujin* Y.H. Chen & C. Ling, Acta Pharm. Sin. 16: 387. 1981.

Vernacular Name: Soti.

Plants up to 1 m. Rhizomes pale yellow inside, aromatic. Petiole equaling leaf blade; lamina oblong, Fl. Bhut. 25 – 50 × 10 – 20 cm, narrowly caudate, base attenuate. Inflorescences on separate shoots arising from rhizomes; spike cylindrical; fertile bracts pale green, ovate. Calyx sparsely hairy. Corolla tube funnel-shaped, villous at throat; lobes pinkish white. Lateral staminodes yellowish. Labellum yellow. Ovary villous.

Flowers & Fruits: May to September.

Specimen Cited: Forest, *Rajib & AP Das 0189*, dated 09. 02. 2007.

Local Distribution: Forest and road side areas.

General Distribution: India, Nepal, Bangladesh, Sri Lanka, Myanmar, Java.

GLOBBA Linnaeus, Mant. Pl. 2: 143, 170. 1771.

Globba racemosa J.E. Smith, Exot. Bot. 2: 115. 1806; Noltie, Fl. Bhut. 3(1): 191. 1994; Hajra *et al.*, Fl. Sikkim 1: 127. 1996. *Globba orixensis* var. *racemosa* (J.E. Smith) Gagnepain, Bull. Soc. Bot. France 48: 201. 1901; Prain, Beng. Pl. 2: 1037. 1903.

Pseudostems up to 100 cm. Leaves sessile; lamina oblong to ovate-lanceolate, 12 – 20 × 4 – 5 cm, caudate, base acute, glabrous. Flowers in terminal thyrses, yellow, with orange, glandular spots. Calyx turbinate. Corolla lobes reflexed. Lateral staminodes lanceolate. Labellum reflexed, obcuneate. Filament 1 cm; anther without appendages. Capsule ellipsoid, smooth.

Flowers & Fruits: June to September.

Specimen Cited: Forest, Rajib & AP Das 0204, dated 09. 02. 2007.

Local Distribution: Common in plantation forests.

General Distribution: India, Nepal, Bhutan, Myanmar, Thailand.

ZINGIBER Miller, Gard. Dict. Abr., ed. 4, [1545]. 1754, *nom. cons.*

Zingiber montanum (J. König) Link *ex* A. Dietrich, Sp. Pl. 1: 52. 1831. *Amomum montanum* J. König, Observ. Bot. 3: 51. 1783. *Zingiber purpureum* Roscoe, Trans. Linn. Soc. London 8: 348. 1807; Noltie, Fl. Bhut. 3(1): 188. 1994. *Zingiber cassumunar* Roxburgh, Asiat. Res. 11: 347. t. 5. 1810; Roxburgh, Fl. Ind. 1: 48. 1820; Hooker *f.*, Fl. Brit. Ind. 6: 248. 1892; Prain, Beng. Pl. 2: 1045. 1903.

Vernacular Name: Bon aada.

Rhizome perennial, fleshy, aromatic, yellow inside. Leaves sessile; ligule short, beelobed, pubescent; lamina linear-lanceolate, acute, base slightly rounded. Inflorescence basal, ovate; spike ovate, deep red. Calyx white, membranous. Style exerted well beyond anther-thecae and enfolded in a long anther-crest. Capsules ovoid; seeds purple.

Flowers & Fruits: June to August.

Specimen Cited: Forest, Rajib & AP Das 0246, dated 09. 02. 2007.

Local Distribution: Plantation forests.

General Distribution: Native of India; Sri Lanka and Malay Peninsula.

Ceratophyllaceae Gray, Nat. Arr. Brit. Pl. 2: 395, 554. 1822; *nom. cons.*

CERATOPHYLLUM Linnaeus, Sp. Pl. 2: 992. 1753.

Ceratophyllum demersum Linnaeus, Sp. Pl. 2: 992. 1753; Hooker *f.* in Hooker *f.*, Fl. Brit. Ind. 5: 639. 1888; Prain, Beng. Pl. 2: 743. 1903. *Dichotophyllum demersum* (Linnaeus) Moench, Methodus 345. 1794. *Ceratophyllum cornutum* Richard *ex* S.F. Gray, Nat. Arr. Brit. Pl. 2: 555. 1821.

Stems up to 3 m long, suspended in water. Leaves bright green, coarse textured; whorls 1.5 – 6 cm in diameter; segments linear to filiform, not inflated. Flowers 1–3 mm in diameter. Achenes dark green to reddish brown, smooth or slightly tuberculate, margins wingless and spineless, facial spines absent; basal spines or tubercles 2, straight or curved; terminal spine 1.5 – 14 mm.

Flowers & Fruits: August to December.

Specimen Cited: Bochamari Beel, Rajib & AP Das 0076, dated 06. 02. 2007.

Local Distribution: Marginal areas of the Beel.

General Distribution: India: West Bengal, Assam, Sikkim, Bihar, Uttar Pradesh; Bhutan, Bangladesh.